

Technology Innovation News Survey

Entries for September 1-15, 2019

Market/Commercialization Information

ABERDEEN PROVING GROUNDS (APG) REMEDIATION SERVICES & INDUSTRY DAY

U.S. Army Corps of Engineers, USACE HHC, Huntsville, AL
Federal Business Opportunities, Solicitation W912DY-20-R-0001, 2019

The Government is seeking to identify qualified sources under NAICS code 562910 (Environmental Remediation), small business size standard 750 employees, to award a 5-year, \$25M, firm-fixed-price (C-type) contract to perform a range of remediation and demolition services with experience in chemical agent, biological agent, agent breakdown products, asbestos-containing material, and other regulated material to assist the U.S. Army with the disposition of real property at Aberdeen Proving Ground (APG), Maryland. Interested firms should submit detailed responses to the capabilities questionnaire attached to the FBO notice by 2:00 PM CT on Monday, November 4, 2019.

ENVIRONMENTAL REMEDIATION DREDGING, STRATFORD ARMY ENGINE PLANT

U.S. Army Corps of Engineers, USACE District, New England, Concord, MA
Federal Business Opportunities, Solicitation W912WJ20X0001, 2019

The U.S. Army Corps of Engineers, New England District is issuing this sources sought announcement to determine interest, availability, and capability of small and large business concerns under NAICS code 562910 to perform environmental remediation dredging of tidal flats and an outfall drainage channel in the Housatonic River adjacent to the Stratford Army Engine Plant, Stratford, Conn., for remediation of metals- and PCBs-affected sediments. The District plans to award this project using a design-bid-build model, with the issued-for-bid (100%) design to be issued on or about November 2020. Construction is expected to take 18 months at an estimated cost between \$50M and \$60M. Interested firms are invited to submit an information package (20 pages max) that describes the firm's relevant capabilities and preferred acquisition approach. Responses are due by 3:00 PM ET on October 25, 2019.

SUPERFUND ENVIRONMENTAL REMEDIATION SERVICES

DOT, Federal Aviation Administration, W.J. Hughes Tech Center, Atlantic City, NJ
Federal Business Opportunities, Solicitation 692M15-19-R-00005, 2019

Strictly for informational purposes, the FAA is releasing a DRAFT Statement of Work for review (comments/questions due by 10-29-19) in anticipation of a future solicitation for environmental remediation support services for the William J. Hughes Technical Center (WJTC), Atlantic City International airport, NJ. The WJTC is listed on the NPL, and the majority of its work will be in areas of concern undergoing active remediation. Release of the full solicitation (NAICS code 562910) is anticipated in the first quarter of FY20. <https://www.fbo.gov/sq/DOI/FAA/WJTC/692M15-19-R-00005/listing.html>

OPTIMIZED REMEDIATION CONTRACTS (ORCs): OK-AR GROUP & TX/LA GROUP

U.S. Army Corps of Engineers, USACE District, Tulsa, OK
Federal Business Opportunities, Solicitations W912BV20S0010 & W912BV20S0015, 2019

The USACE Tulsa District intends to issue RFPs for two firm-fixed-price, performance-based contracts for Environmental Remediation Services under NAICS code 562910 to meet the Air Force's requirements for ORCs to conduct environmental remediation activities. **Solicitation W912BV20S0010** (<https://www.fbo.gov/sq/DOI/FAA/MA/CTR/6923CH-19-R-00250/listing.html>) will be for the five Air Force installations in Oklahoma and Arkansas collectively known as the Oklahoma/Arkansas sites and the enclosed remediation program (ERP) sites consisting of 64 Installation Restoration Program (IRP) sites and one Military Munitions Restoration Program (MMRP) site. **Solicitation W912BV20S0015** (<https://www.fbo.gov/sq/USA/CF/DAC/AS6/W912BV20S0015/listing.html>) will be for the nine Air Force installations in Texas and Louisiana collectively known as the Texas/Louisiana (TX/LA) Group, which encompasses 99 ERP sites consisting of 81 IRP sites and 18 MMRP sites. The government invites constructive comments from contractors or potential offerors regarding either the DRAFT PWS or CLIN/sub-CLIN structure files attached to the respective FBO notices. Comments must be submitted via ProNet (instructions provided) by 4:00 PM CT on October 31, 2019.

ASBESTOS ABATEMENT AT U.S. AIR ROUTE SURVEILLANCE RADAR SITES

DOT, FAA, Mike Monroney Aeronautical Center, Oklahoma City, OK
Federal Business Opportunities, Solicitations 6973GH-19-R-00250 / 6973GH-19-R-00236, 2019

The Federal Aviation Administration has released two solicitations relevant to large-scale cleanup of asbestos-contaminated facilities throughout the United States. Solicitation 6973GH-19-R-00250 requires asbestos abatement and remediation at 39 sites (<https://www.fbo.gov/sq/DOI/FAA/MA/CTR/6923CH-19-R-00250/listing.html>). Solicitation 6973GH-19-R-00236 requires asbestos abatement monitoring and project oversight at the same 39 sites (<https://www.fbo.gov/sq/DOI/FAA/MA/CTR/6923CH-19-R-00236/listing.html>). Each of the IDIQ-type contracts is a total small business set-aside with a 3-year period of performance. The NAICS code is 562910, size standard 750 employees. Responses are due by 5:00 PM CT on November 4, 2019.

Cleanup News

INNOVATIVE WASTE MINIMIZATION DURING PFAS CONTAMINATED WATER REMEDIATION

Woodard, S. and M. Kuffer. | CRC Care International Cleanup Conference, 8-12 September, Adelaide, Australia, 16 slides, 2019

As part of its response to PFAS contamination from historical aqueous film-forming foam use, the Australian Department of Defence completed a detailed environmental site investigation of a >150 km² area that included Royal Australian Air Force Base Tindal and surrounding private land. Results showed that PFAS had entered groundwater and migrated off-site toward the Katherine River. A water treatment system that combined regenerable ion exchange (IX) resins and a centralized regeneration system was installed at the Fire Training Area (contamination <40 µg/L) and Fire Station Area (contamination <50 µg/L) on the Tindal Base. Contaminated groundwater is extracted from wells located within the plumes and pumped to the treatment systems. The regenerable IX system uses a lead/lag/polish treatment train arrangement. Where breakthrough is detected in the lead treatment vessel, it is removed and transported to the regeneration system, where the resin is processed using a solvent-brine blend, distillation for regenerant recovery/reuse, and super-loading to strip PFAS off the resin. The process takes ~6-8 hours to complete, after which the vessel is placed back into service. The regeneration process forms a highly-concentrated solids waste that minimizes PFAS waste generation at the site. The government invites constructive comments from contractors or potential offerors regarding either the DRAFT PWS or CLIN/sub-CLIN structure files attached to the respective FBO notices. Comments must be submitted via ProNet (instructions provided) by 4:00 PM CT on October 31, 2019.

MULTI-SCALE FULL-SCALE REMEDIATION OF HEAVILY IMPACTED VICTORIAN CHLORINATED SOLVENT SITE

Bell, L. and R. Fassbender. | CRC Care International Cleanup Conference, 8-12 September, Adelaide, Australia, 20 slides, 2019

Activities at a former dry cleaning site contaminated soil and groundwater with chlorinated solvents, including PCE. Pre-remedial activities included demolishing above and below ground structures and decommissioning underground storage tanks that contained diesel and petrol. PCE contamination measured < 13,000 mg/kg in soil, < 99 mg/L in groundwater, and < 112,000 ft³ in soil vapor. An extensive environmental site assessment determined that contamination stretched over 1 km from the subject site and was discharging into a regional marine surface water body. Remedial activities spanning 18 months included excavation and ex situ soil vapor extraction of 800 tons of soil, and ISCO and enhanced in situ bioremediation for groundwater. Following treatment, soils were reused on-site, avoiding high off-site disposal costs. PCE concentration in groundwater was reduced to less than 0.1 mg/L. Site boundary groundwater PCE concentrations were also successfully reduced from 15 mg/L to below laboratory detection limits. As a result, further off-site migration of the contaminant has been halted and the site will be divested and redeveloped for future commercial/industrial uses. <http://adelaide2019.cleanupconference.com/wp-content/uploads/2019/09/M27n.pdf>

SRS USES RECYCLED IRON TO TREAT CONTAMINATED GROUNDWATER

U.S. Department of Energy, Office of Environmental Management (DOE-EM), 13 Aug 2019

DOE-EM is using 760 tons of iron filings recycled from the automotive industry to treat groundwater contaminated by solvents in a section of an aquifer beneath the Savannah River Site (SRS). The filings will be mixed with a food-grade, starch-like material and injected into 22 wells installed at 12-ft intervals. High-pressure injection will create fractures in the subsurface rock, creating space to be filled by the mixture. Upon completion, a 23,000 ft² water-permeable wall consisting of iron filings will extend ~135 ft bgs at its deepest point and 264 ft long. As groundwater flows through metal wall, the iron filings neutralize the dissolved-phase solvents. This type of treatment wall can be installed at greater depths than the trench-and-backfill method used at the site in the past. The technology also allows for precision placement, enabling SRS to intercept the contaminated groundwater plume in a narrow zone as it travels along an old subsurface stream-bed channel. The treatment wall is scheduled for completion in November 2019. <https://www.energy.gov/en/articles/uses-recycled-iron-treat-contaminated-groundwater>

MODIFIED CORRECTIVE ACTION PLAN (COST PROPOSAL NO. 44): FRIDAY OIL CO. INC., FORMER FRIDAY OIL NO. 9, 1801 CULVER ROAD, TUSCALOOSA, ALABAMA

Alabama Department of Environmental Management (ADEM), 265 pp, 2019

The former Friday Oil No. 9 is an active retail petroleum and convenience store facility now known as Shell Food and Fuel West. This corrective action plan summarizes pertinent environmental activities conducted to date at the facility and provides an approach to decrease constituent of concern-BTEX, MTBE, and naphthalene-concentrations in groundwater to below site-specific corrective action levels. A schedule and cost estimates are included. A total of 4,800 gals of free product and water were pumped from the site subsurface in 2007. Mobile enhanced multiphase extraction (MEME) was also conducted, and passive skimmer devices were employed in 2007-2008. To evaluate a proposed ozone sparging remedy, three sparge wells were installed and a pilot test was conducted during the first four months of 2010, but the technology was not pursued at that time. Remediation by natural attenuation (NA) supplemented by MEME was proposed and approved by ADEM. Remedial events were conducted in August and September 2016, November 2018, and February 2019. The new (2019) site contractor recommends the following combination of remedial techniques: (1) ozone sparging in areas beyond 12 ft of UST system components and underground utilities; (2) installation of ozone monitoring devices; and (3) NA monitoring to evaluate changes in groundwater chemistry. <http://adem.alabama.gov/newsEvents/ndrcs/a19/ndrcs/44/Friday.pdf>

Demonstrations / Feasibility Studies

INFILTRATION OF SULFATE TO ENHANCE SULFATE-REDUCING BIODEGRADATION OF PETROLEUM HYDROCARBONS

Wei, Y., N.R. Thomson, R. Aravena, M. Marchesi, J. Barker, E.L. Madsen, R. Kolhatkar, et al.
Groundwater Monitoring and Remediation 38(4):73-87(2019)

A surficial infiltration pond overlying a well-characterized shallow aquifer contaminated with petroleum hydrocarbon (PHC) was pilot-tested as a delivery method for sulfate to stimulate PHC bioremediation. The experiment 1) assessed the spatial and temporal distribution of sulfate in groundwater and associated changes in PHC concentrations and 2) augmented conventional groundwater parameters with isotopic and molecular-biological procedures to evaluate enhanced biodegradation of PHCs. A high-resolution monitoring network consisting of multiple transects of depth-discrete sampling points was employed to capture the behavior of the infiltrating sulfate. These data were enhanced with compound-specific isotope analysis (CSIA) and biomarkers. Monitoring data indicated that the sulfate-enriched water mixed with upgradient groundwater as it migrated downward through the residual PHC zone and formed a commingled downgradient plume with the dissolved sulfate. The enrichment of ³⁴S in conjunction with a decrease in sulfate concentration and increased dissolved inorganic carbon concentrations indicated biodegradation of PHCs. Despite fluctuations in benzene, toluene, and o-xylene (BTEX) concentrations, CSIA data for BTX showed biodegradation occurred. Biomarker data provided supporting evidence that toluene and o-xylene were undergoing anaerobic biodegradation due to sulfate reduction. <https://ngwa.onlinelibrary.wiley.com/doi/10.1111/gwmr.12296>

RADIO FREQUENCY HEATING FOR IN SITU THERMAL TREATMENT OF ETHYLENE DICHLORIDE AND 1,1,2-TRICHLOROETHANE IN GROUNDWATER

Gray, A., A. Hunt, J. Fiacco, C. Pearson, C. Coladonato, J. Kong, R. Kasevich, et al.
CRC Care International Cleanup Conference, 8-12 September, Adelaide, Australia, 16 slides, 2019

A field-scale trial began in January 2019 at an operating chemical plant in Victoria, Australia, to assess the feasibility and effectiveness of radio frequency heating (RFH) to stimulate enhanced dissolution of DNAPLs and abiotic degradation of VOCs, including ethylene dichloride (EDC) and TCA. Numerical simulations calculated a target temperature of 80°C at a distance of 1.5 m from the antenna to maximize the thermal radius of influence of the RF energy, enhance the dissolution of DNAPL, and maximize abiotic hydrolysis of EDC and TCA. Within 7 weeks of operation at < 70% of the full power of the generator, groundwater temperatures within 3 m of the antenna increased to > 50°C, with a maximum temperature of 70°C measured at 1.5 m from the antenna. Baseline concentrations in eight monitoring wells surrounding the antenna were as high as 1,320 mg/L EDC and 10.9 mg/L TCA. In the monitoring wells immediately surrounding the antenna, groundwater temperatures increased to >60°C and EDC concentrations decreased by 68% (from 116 mg/L to 37.1 mg/L) and 41% (91 mg/L to 53.3 mg/L). Concurrently, concentrations of ethylene glycol increased from non-detect to 236 µg/L and 557 µg/L, respectively, indicating the commencement of hydrolysis reactions. <http://adelaide2019.cleanupconference.com/wp-content/uploads/2019/09/W23rd.pdf>

PILOT-SCALE EVALUATION OF A PERMEABLE REACTIVE BARRIER WITH COMPOST AND BROWN COAL TO TREAT GROUNDWATER CONTAMINATED WITH TRICHLOROETHYLENE

Grajes-Mesa, S.J. and G. Malina. | Water 11(9):1922(2019)

A 198-day study at a site in Poland evaluated the efficiency of a permeable reactive barrier (PRB) with compost and brown coal to remediate TCE-contaminated groundwater. Concentrations measured 109 µg/L. Three stainless steel boxes (1.2 x 0.5 x 0.5 m) with the brown coal-compost mixture at 3 different mixing ratios of 1:1, 1:3, and 1:5 were installed to simulate the PRB. Groundwater from a TCE-contaminated aquifer was pumped into the system at a flow rate of 3.6 L/h and resided for 25, 20, or 10 h. Effluent samples were analyzed for TCE and its daughter products DCE, VC, and ethane. During the study period, TCE concentrations in groundwater decreased to < 1.1 µg/L. After 16 days, an increase in cis-1,2-DCE indicated possible TCE reductive dechlorination, but complete transformation of TCE into non-toxic by-products was not evidenced during the pilot, indicating that reductive dechlorination slowed down or stopped at DCE and designed residence times were not long enough to allow the complete dechlorination process. This article is **Open Access** at <https://www.mdpi.com/2077-3444/11/9/1922>

RAPID REMOVAL OF POLY- AND PERFLUORINATED COMPOUNDS FROM INVESTIGATION-DERIVED WASTE (IDW) IN A PILOT-SCALE PLASMA REACTOR

Singh, R.K., N. Muttari, N. Hui, R.H. Anderson, T.M. Holsen, et al.
Environmental Science & Technology 53(19):11375-11382(2019)

A pilot-scale plasma reactor installed into an 8 x 20 ft² mobile trailer was used to degrade 12 PFAS compounds in 13 liquid investigation-derived waste (IDW) samples from site investigations at Air Force installations. Total PFAS concentrations (PFACs and PFASAs) ranged from 2.7-1440 µg/L and PFOs+PFPA concentrations ranged from 365-37300 ng/L. Plasma-based water treatment resulted in rapid PFASAs removal from 4-L individual IDW samples with faster rates for longer-chain PFACs (C ≥ 8). In 9 of the 13 IDW samples, both PFOs and PFPA were removed to below EPA's health advisory concentration level concentrations in

Research

IN-SITU PFAS REMEDIATION USING COLLOIDAL ACTIVATED CARBON

Carey, G.R., A.L.-T. Pham, S.G. Hakimabadi, R. McGregor, and B. Sleep.
CRC Care International Cleanup Conference, 8-12 September, Adelaide, Australia, 37 slides, 2019

A remediation model using similar chemical and hydrogeological conditions at a former fire training area (FTA) simulated the longevity range of an in situ colloidal activated carbon (CAC) remedy in a hypothetical site scenario. The real FTA site was contaminated with < 313 µg/L PFHxS, < 152 µg/L PFOA, and < 74 µg/L PFOS. Two source zones were simulated: a smaller, high-concentration 15 m x 15 m source zone and a larger, lower-concentration 100 m x 100 m source zone surrounding the high concentration zone. The study evaluated the remedy's sensitivity to various PFAS constituent properties, mass discharge rates, length of the CAC barrier, and the in situ CAC concentration. Laboratory-derived isotherms indicated that 1) PFAS sorption affinity to CAC is directly proportional to molecular chain length, with sulfonates having a higher affinity than carboxylates of the same chain length and 2) affinity to CAC is reduced for mixtures of PFAS compounds with CAC. The study also reviews studies on granular activated carbon (GAC) performance with PFAS mixtures relative to CAC implementation. Strategies for incorporating CAC-based mass flux reduction alternatives for managing PFAS sites are discussed, including the benefits and limitations of this remedial approach. Research needs for evaluating factors influencing CAC performance at lab and field scale are presented. <http://adelaide2019.cleanupconference.com/wp-content/uploads/2019/09/M2a.pdf>

PERFLUOROALKYL AND POLYFLUOROALKYL SUBSTANCES THERMAL DESORPTION EVALUATION

Crownover, E., D. Oberle, M. Kluger, and G. Heron. | Remediation 29(4):77-81(2019)

In situ thermal heating was evaluated as a treatment method to achieve a high degree of PFAS removal from soils through volatilization. To minimize vapor treatment required for PFAS thermal remediation, a scrubber was incorporated into the treatment train to transfer PFAS to the liquid phase in a concentrated low-volume solution. Vapor-liquid equilibrium behavior and the extent of PFAS volatilization from impacted soil over a range of temperatures were evaluated. Heating soil to 350°C and 400°C reduced PFAS soil concentrations by 99.91% and 99.998%, respectively. Sulfonate-based PFAS generally required higher temperatures for volatilization to occur than carboxylate-based PFAS.

DEFLUORINATION OF PERFLUOROCTANOIC ACID (PFOA) AND PERFLUOROCTANE SULFONATE (PFOS) BY *ACIDIMICROBIUM* SP. STRAIN

Huang, S. and P.R. Jaffe. Environmental Science & Technology 53(19):11410-11419(2019)

Incubations with pure and enrichment cultures of *Acidimicrobium* sp. strain A6 were used to biodegrade/defluorinate 0.1 mg/L and 100 mg/L PFOA or PFOS, using NH_4^+ or H_2 as electron donors under iron-reducing conditions. An increase of fluoride, shorter-chain perfluorinated products, and acetate was observed, as well as a decrease in Fe(III). Incubations with H_2 resulted in the removal of $\leq 60\%$ of PFOA and PFOS during 100-day incubations, while total fluoride remained constant throughout the incubations. Dissolved organic carbon (DOC) was tracked to determine if PFOA/PFOS or some of their degradation products were metabolized. At 100 mg/L, PFOA/PFOS were the main contributors to DOC, which remained constant during the pure A6 culture incubations. In the A6 enrichment culture, DOC decreased slightly with time, indicating that as defluorination of PFOA/PFOS occurred, some of the products were being metabolized by heterotrophs present in the culture. Results show that A6 can defluorinate PFOA/PFOS while reducing iron, using NH_4^+ or H_2 as the electron donor. <https://pubs.acs.org/doi/pdf/10.1021/acs.est.9b04047>

USE OF CONTROLLED SLOW-RELEASE ENCAPSULATED SUBSTRATES TO ENHANCE IN-SITU REDUCTIVE DECHLORINATION PROCESSES

Meese, W. | 48th Annual Environmental Show of the South, 15-17 May, Chattanooga, TN, 32 slides, 2019

Encapsulated organic substrates were tested as an alternative method to control the release rate of organic hydrogen donors during reductive dechlorination in a 14-day experimental procedure. The procedures were performed using encapsulated calcium propionate (ECP), 80% in a distilled monoglyceride matrix. ECP was compared with regular calcium propionate (RCP) at 0.5 g/L and 1 g/L doses. Results demonstrated a significant difference in the release rates of calcium ions when comparing ECP to RCP. At 0.5 g/L ECP, calcium did not release in the first 2 days and released 5.8% after 14 days compared with 37.4% after 2 days and 56.1% after 14 days for RCP. At 1 g/L ECP, total calcium content measured 11.7% at 2 days and 17.5% at 14 days compared with 56.1% after 2 days and 65.4% after 14 days for RCP. https://www.tn.gov/content/dam/tn/environment/solid-waste/documents/esos/sw_esos-11_2019-05-16-0900-meese.pdf

PRELIMINARY INVESTIGATION OF POLYMER-BASED IN SITU PASSIVE SAMPLERS FOR MERCURY AND METHYLMERCURY

Taylor, V.F., K.L. Buckman, and R.M. Burgess. | Chemosphere 234:806-814(2019)

An in situ passive sampler using simple polymer films was explored as an efficient and environmentally relevant monitoring tool for Hg and MeHg. The sulfur-containing polymers polysulfone (PS) and polyphenylene sulfide (PPS) accumulated MeHg and inorganic Hg (IHg), whereas polyethylene (PE) sorbed IHg but not MeHg. Polyoxymethylene (POM) and polyethersulfone (PES) films had low affinity for both Hg species. Uptake rates of Hg species into polymers were linear over 2 weeks and dissolved organic matter at natural levels had no effect on the partitioning of MeHg or IHg to the polymers. Sorption of MeHg to PS and PPS from three estuarine sediments correlated with uptake into diffusive gel-type samplers over time, and in PPS with accumulation by the estuarine amphipod *Leptocheirus plumulosus*. These polymers had lower MeHg adsorption rates but are simpler to assemble than diffusive gel-type samplers. Higher contaminant concentrations in polymer and gel-type samplers corresponded with porewater concentrations across sediments, suggesting they sample the dissolved MeHg pool. MeHg levels in amphipods were more elevated with higher bulk sediment MeHg, which may reflect feeding strategy.

INVESTIGATION AND ASSESSMENT FOR AN EFFECTIVE APPROACH TO THE RECLAMATION OF POLYCYCLIC AROMATIC HYDROCARBONS (PAHS) CONTAMINATED SITE: SIN BAGNOLI, ITALY

Guarino, C., D. Zuzolo, M. Marziano, B. Conte, G. Balamonte, L. Morra, D. Benotti, et al. Scientific Reports 9:11522(2019)

Native plant species were screened for their potential to remediate PAH-contaminated soil on the Bagnoli brownfield site in southern Italy. Soils contain every PAH congener at concentrations above contamination threshold limits established by Italian environmental legislation for residential/recreational land use. The concentration of 13 high molecular weight PAHs in soil rhizosphere, plant roots, and plant leaves were assessed to evaluate native plant suitability for remediation of the study area. Analysis of soil microorganisms provides important knowledge about bioremediation approach. Alphaproteobacteria, betaproteobacteria, and gammaproteobacteria were the main phyla of bacteria observed in polluted soil. Functional metagenomics showed changes in clovigenases, lacase, protocatechuate, and benzoate-degrading enzyme genes. Indoleacetic acid production, siderophores release, exopolysaccharides production, and ammonia production are the key to the selection of the rhizosphere bacterial production. Results indicated that the natural plant-bacteria partnership is a good strategy to remediate the PAH-contaminated soil. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6567622/pdf/41598_2019_Article_48005.pdf

BIO-RESTORATION OF METAL-CONTAMINATED SOIL USING BIOCHAR TO ENHANCE THE PRODUCTIVITY OF MARGINAL LAND

Soria, R.I., S. Thiffault, CL:AI:RE (Contaminated Land: Applications in Real Environments), London, UK. INSPIRATION bulletin IB8, 4 pp, 2019

This bulletin describes how the mechanistic properties of biochar influence its performance for the restoration of heavy metal-polluted soil. It aims to provide guidance for biochar selection and use in soil restoration processes. <https://www.claire.org.uk/component/attachments/download/16?category=56&inspiration=bulletin?download=692108&bio-remediation-of-metal-contaminated-soil-using-biochar-to-enhance-the-productivity-of-marginal-land-2019>

MODEL PREDICTS PAH LEVELS IN IMPORTANT TRIBAL FOOD SOURCE

U.S. EPA National Institute of Environmental Health Sciences, 2 pp, 2019

A sediment passive sampling model can be used to accurately predict the concentration of PAHs in butter clams, according to a recent Superfund Research Program study. In Puget Sound, PAHs are found in the sediment where butter clams are harvested. Butter clams are an important food source and component of cultural practices for local tribes, but PAHs can accumulate in the edible portion, posing a health risk to the communities who rely on them. A research team worked closely with tribal leaders to better predict PAH levels in butter clams while having a minimal impact on this important resource. https://nrihs.niehs.nih.gov/srpr/1/ResearchBrief/nrihs/SRP_ResearchBrief_295_508.pdf

General News

GUIDANCE FOR ASSESSING THE ECOLOGICAL RISKS OF PFAS TO THREATENED AND ENDANGERED SPECIES AT AQUEOUS FILM FORMING FOAM-IMPACTED SITES

Corder, P., J. Arblaster, E. Larson, J. Brown, and C. Higgins. SERDP Project ER18-1614, 177 pp, 2019

This guide provides key recommendations and information to support quantitative ecological risk assessment for threatened and endangered species exposed to 18 PFASs commonly found at AFFF sites. <https://www.serdp-estcp.org/content/download/49887/491435/file/ER18-1614%20Guidance%20Document.pdf>

PLUMESSEKER AND PBMO TECHNOLOGIES FOR OPTIMIZATION OF SITE CHARACTERIZATION AND REMEDIATION

Guvanasen, V. and L.M. Deschaine. | Interagency Steering Committee on the Performance & Risk Assessment Community of Practice (P&RA CoP) Webinar, 27 slides, 17 Jan 2019

An overview of the PlumeSeeker and Physics-Based Management Optimization (PBMO) technologies were presented in this webinar. PlumeSeeker integrates site hydrogeology, geostatistics, contaminant fate and transport, and operational history to conduct stochastic simulations to identify plausible plume configurations, increase confidence in plume delineation, evaluate existing well networks, and determine optimal new well locations. PBMO is an efficient computational optimization technology used for managing environmental remediation projects and programs by reducing remediation design analysis timeframes and costs. The talk includes case studies where the technologies were used to assist site characterization and remediation. https://www.energy.gov/sites/nrd/files/2019/01/HSE/PlumeSeekerPBMO_DDFE_Webinar_20190117.pdf
See YouTube 8:31 min video on PlumeSeeker: https://www.youtube.com/embed/SW7_3a1vE8
See poster for model on PBMO: https://www.hpl.com/newsroom/2017/06/20/AAEES_PBMO_Poster_V4.pdf
More information on PBMO at Fort Ord: <https://www.baees.org/3330competition/2017/ordanddmsmallprojects.nhh>

EMERGING SUSTAINABLE TECHNOLOGIES FOR REMEDIATION OF SOILS AND GROUNDWATER IN A MUNICIPAL SOLID WASTE LANDFILL SITE: A REVIEW

Yea, J., X. Chen, C. Chen, and B. Bate. | Chemosphere 227: 681-702(2019)

Existing technologies, including permeable reactive barriers (PRBs), electrokinetic remediation, microbial remediation, and injection of either solubilizing agents or micro or nanobubbles, are reviewed in this article. Emphasis is placed on removal efficiency based on existing projects at lab, pilot or field scales. The article features a design chart tailored for the remediation of a landfill contaminated site, verified by several case studies that supplement the chart. Future trends of technical innovation, such as multi-layer PRBs, are identified. <https://nerson.zju.edu.cn/nerson/zlzhcments/2019-07/01-1562907501-828650.pdf>

TECHNOLOGY GUIDE: IN-SITU AIR SPARGING

Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE), Australia. 40 pp, 2018

The purpose of this guideline is to provide information on in situ air sparging as a treatment technology to remediate contaminated sites and assist with the selection of remediation options. The document contains information to help with remediation planning and aid in compiling remediation action plan. It is primarily intended to be utilized by remediation practitioners and those reviewing practitioner's work but can be utilized by other stakeholders within the contaminated sites industry, including site owners, proponents of works, and the community. See this guide and others that CRC CARE is developing as part of a National Remediation Framework to provide practical guidance to practitioners and regulators in Australia. The files are posted near the bottom of <https://www.crccare.com/knowledge-sharing/national-remediation-framework>

MITIGATION OF ENVIRONMENTAL POLLUTION BY GENETICALLY ENGINEERED BACTERIA: CURRENT CHALLENGES AND FUTURE PERSPECTIVES

Liu, L., M. Bial, X. Duan, and H.M.N. Iqbal. Science of the Total Environment 667:444-454(2019)

Advantages of genetically engineered bacteria and their application in the treatment of a wide variety of environmental contaminants, such as synthetic dyes, heavy metal, petroleum hydrocarbons, PCBs, phenazines and agricultural chemicals, are summarized in this article. Challenges and limitations associated with the application of recombinant bacteria on contaminated sites are also discussed that consider the risk of genetic material exchange when using genetically engineered bacteria. An integrated microbiological, biological and ecological acquaintance accompanied by field engineering designs are the desired features for effective in situ bioremediation of hazardous waste polluted sites by recombinant bacteria.

NAVSEA DRAFT SPECIFICATIONS AND STANDARDS

Naval Sea Systems Command, NAVSEA HQ, Washington Navy Yard, DC. Federal Business Opportunities, Solicitations N0002419SN070 / N0002419SN071, 2019

Naval Sea Systems Command is drafting specifications and standards to accommodate a variety of design solutions and processes and to encourage a broad vendor base. NAVSEA currently is preparing two draft documents: A-A-XX722, *Spill Kit, Hazardous Material and Oil* (<https://www.fbo.gov/spo/DON/NAVSEA/NAVSEAFHQ/N0002419SN070/listing.html>), and A-A-59759A, *Sorbent, Hazardous Material (HM)* (<https://www.fbo.gov/spo/DON/NAVSEA/NAVSEAFHQ/N0002419SN071/listing.html>). Copies of these documents may be requested by sending an email to commandstandards@navy.mil with the document number in the subject line and a brief message. The review period for these documents ends October 28, 2019. When the final documents have been completed, those interested can check ASSIST online at <https://muckssearch.dla.mil> for a copy.

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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