Technology Innovation News Survey

Entries for July 16-31, 2019

Market/Commercialization Inform

DECOMMISSIONING AND DISPOSAL ACTIVITIES FOR THE SM-1 REACTOR FACILITY, FORT BELVOIR, VA U.S. Army Corps of Engineers, USACE District, Baltimore, MD. Federal Business Opportunities, Solicitation W912DR18R0021, 2019

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MECHANISM FOR TIME-SENSITIVE RESEARCH OPPORTUNITIES IN ENVIRONMENTAL HEALTH SCIENCES DHHS, National Institutes of Health, Funding Opportunity RFA-ES-19-011, 2019

This funding opportunity is intended to support novel environmental health research in which an unpredictable event or policy change provides a limited window of opportunity to collect human biological samples or environmental exposure data. The primary motivation is to understand the consequences of natural and human-made disasters, emerging environmental public health threats, and policy changes in the U.S. and abroad. A distinguishing feature of an appropriate study is the need for rapid review and funding, substantially shorter than the typical INH grant review/award cycle, for the research question to be addressed and swithly implemented. See additional details at https://arants.nih.gov/grants/quide/fa-files/BEA-F5-19-011.html. The closing date for applications is October 3, 2022. http://www.grants.gov/web/grants/view-opport/unity.html?oppId=318986.

CONTAMINATED SITES, NATURAL DISASTERS, CHANGING ENVIRONMENTAL CONDITIONS & VULNERABLE COMMUNITIES: RESEARCH TO BUILD RESILIENCE U.S. Environmental Protection Agency, Funding Opportunity EPA-G2019-STAR-E1, 2019

EAS Science to Achieve Results (STAR) provide the scientific community to propose transdisciplinary research with an approach that integrates the following research questions: (1) How may certain natural disasters (e.g., wildfires, severe storms, flooding, hurricanes, tornadoes, volcanic eruptions, earthquakes or tsunamis) or changing environmental conditions (e.g., rising sea levels, higher average temperature or heat index) cause specific chemical contaminants to migrate from certain contaminanted or containment sites (e.g., hazardous waste sites), andfills, solid waste or wastewater storage or treatment facilities, industrial sites such as mines or refineries) to nearby communities and pose elevated exposure risks to vulnerable groups, especially the elderly and/or children under the age of five years? (2) What are the major contributing factors or effect modifiers (in addition to the contaminants and natural disasters or changing environmental conditions) that might exacerbate the impacts to these vulnerable groups in impacted communities site sites. A factor so reflect modifiers (la addition to the contaminants and natural disasters or changing eldentified above? This RFA is supported by EPA's Sustainable and Healthy Communities Program. Up to S awards are anticipated out of an estimated total program funding of \$4M. Closing date for applications is September 17, 2019. http://www.ena.out/sci.out/

CBFO TECHNICAL ASSISTANCE CONTRACT - REQUEST FOR INFORMATION (RFI) Department of Energy, EM Consolidated Business Center, Cincinnati, OH Federal Business Opportunities, Solicitation 89303319NEM000022, 2019

DDE's Office of Environmental Management (EM) is planning a new Technical Assistance Contract to perform support services on behalf of DDE-EM's Carlsbad Field Office (CBFO) in southeastern New Mexico. This RFI/Sources Sought solicits input from interested parties with the specialized capabilities necessary to perform all or part of the requirements. The CBFO requires a contractor to provide expert technical advice and assistance in the following areas: Waste Isolation Pilot Plant (WIPP) waste acceptance; chemical compatibility and acceptable knowledge; audits and assessments; security; program management; WIPP site operations; nervironmental and regulatory compliance; nuclear a metaditorin, TRU waste transportation and packaging; general business operations; information technology; document control; and exert exercise will assist DOE will dentifying interested and capable sources for developing its acquisition strategy. Capability statements must be submitted via email by 7:30 AM ET on Monday, September 16, 2019; <u>https://www.https.wttps://www.https://www.https://wwww.https.wttps://wwww.https.</u>

US EPA REGION 8, SUPERFUND TECHNICAL ASSESSMENT & RESPONSE TEAM Environmental Protection Agency, Office of Acquisition Solutions, Region VIII, Denver, CO. Federal Business Opportunities, Solicitation 68HE0819R0014, 2019

Cleanup News

TREES CAN DO THE DIRTY WORK OF WASTE CLEANUP Banegas, D. | USDA Forest Service Blog, 2019

With the Great Lakes Restoration Initiative, the Forest Service works in partnership with cities, counties, and corporations to install phytoremediation sites. The initiative is in its fourth year of annual funding, and altogether, about 20,000 trees have been planted at 16 phytoremediation sites in the Lake Michigan and Lake Superior watersheds. The trees are mostly fast-growing willows and poplars, which are ideal for phytoremediation because they grow quickly and have deep and extensive for to vectors. This country (new justa and normal/10/10/80/20/trees-rand-drift) work-vectors. The country of the sector site of the sector site

STATE SUPERFUND SITE RECLASSIFICATION NOTICE: CLASS 02 TO CLASS 04 New York State Department of Environmental Conservation (NYS DEC), 2 pp, 2019

The Jackson Steel manufacturing plant, located in the Vilage of Mineola, New York, has been officially downgraded from a Class 02 to a Class 04, meaning the vacant U.S. EPA Superfund site is no longer a significant threat to the public's health or the environment. Manufacturing of roll-form metal shapes was conducted at the facility 1970-1991, where spills of degreasers, including PCE, TCE, and 1,1,1-TCA, at the waste storage area contributed to contamination of the soil and groundwater. The site-wide remedy implemented at Jackson Steel included excavation of contamination and institutional only appr extraction system and groundwater treatment via in situ chemical oxidation. Any remaining contamination will be addressed under the site management plan, which consists of a vapor intrusion management plan and institutional control implementation and assurance plan. http://www.dec.nv.gov/idata/der/fac/sbee/130/195/idata/sbit3019.

Demonstrations / Feasibility Studies

A RIGOROUS DEMONSTRATION OF PERMEABILITY ENHANCEMENT TECHNOLOGY FOR IN SITU REMEDIATION OF LOW PERMEABILITY MEDIA Sorenson, K., D. Nguyen, R. Wymore, and N. Smith. ESTCP Project Re. 201430, 651 pp. 2019

A hybrid pneumatic permeability enhancement technology was pilot tested to facilitate amendment delivery and distribution at 3 sites with low-permeability lithologies: Marine Corps Base-Camp Pendleton (MCB-CP), Lake City Army Ammunition Plant (LCAAP) Site 17D, and the Grand Forks Air Force Base (GFAPB) site TU594. The overall objective was to compare the performance and cost benefits of hydraulic and hybrid pneumatic permeability enhancement for in situ treatment at low-permeability sites. Advanced geophysics routioning tools evaluated the vertical and horizontal extent of a mendment distribution, and measurements were validated by conventional solid confirmation and groundwater performance monitoring. The technology achieved 99-100% of the target injection within the treatment areas at MCB-CP and GFAPB, and 70% at LCAAP despite challenging subsurface conditions. A cost comparison exercise indicated that permeability enhancement techniques can be more or significantly more competitive than conventional injection techniques. In technology achieved 99-100% of the target injection conventional injection techniques. In technology achieved 99-100% of the target injection conventional injection techniques. In these *Javaes carding content and constructional transcience and constructional injection techniques.* Integ. *Javaes carding content activational Ad* 3134270457/III.fER-0114304. Site 2016 and Site 2016 and

EFFECTIVENESS OF COLLOIDAL ACTIVATED CARBON AS AN IN SITU TREATMENT TO MITIGATE PFAS Wilson, S., K. Thoreson, and P. Lyman. | The PFAS Management, Mitigation, and Remediation Conference, 19-20 June, Westerville, Ohio, 2019, abstract only

The Michigan Department of Military and Veteran Affairs (DMVA) have been remediating chlorinated solvents in groundwater from historical operations at the Grayling Army Airfield facility since the 1990s. In 2016, the DMVA found PFAS commingled with a PCG plume that was marking toward the property boundary. The DMVA plut tested as in a stor reason to barrier application of collocal activated at the case of the expected rapid reductions of PFAS by removal historical operations, selected because of the expected rapid reductions of PFAS by removal historical operations in the commission of the case of the expected rapid reductions of PFAS by removal historical operations in the commission of the commission of the case of the expected rapid reductions of PFAS by removal historical operations in the commission of the commission of the case of the expected rapid reductions of PFAS by removal historical operations in the commission of the case of the expected rapid reductions of PFAS by removal historical operations of the case of the expected rapid reductions of PFAS by removal historical operations at the case of the expected rapid reductions of PFAS by removal historical operations at the case of the expected rapid reductions of PFAS by removal historical operations at the case of the expected rapid reductions of PFAS by removal historical operations at the case of the expected rapid reductions of PFAS by removal historical operations at the case of the expected rapid reductions of PFAS by removal historical operations at the case of the expected rapid reductions of PFAS by removal historical operations at the expected rapid reductions of PFAS by removal historical operations at the expected rapid reductions of PFAS by removal historical operations at the expected rapid reductions of the e

FIELD DEMONSTRATION OF SOLAR-POWERED ELECTROCOAGULATION WATER TREATMENT SYSTEM FOR PURIFYING GROUNDWATER CONTAMINATED BY BOTH TOTAL COLIFORMS AND ARSENIC On, C., S. Pak, Y.-S. Han, N.T.H. Ha, M. Hong, and S. JI. Environmental Technology (Published online 19 June prior to print)

An electrocoagulation reactor water treatment system using Fe electrodes and a filtration tank was designed to treat complex coliform and As-contaminated groundwater near the Red River in Vietnam. The water treatment system reduced 10.3 CFU/mL of total coliform and 376 µg/L of As(III) in the groundwater to 0 CFU/mL and 6.68 µg/L respectively. Total coliforms were attenuated by Fe(III) infiltration or enmeshed during Fe precipitate formation. Of the total As, 43% formed As(III) complexation with the Fe precipitates and the other 57% was oxidized to As(V) and then adsorbed to Fe precipitates. The Fe precipitates that contained coliforms and As were separated from the discharge water in the filtration tank. The system required 49 W of power to operate, or 423 kWh/year, to continuously purify 0.5 t water/day. This requirement was powered by a 380-750 W solar panel, without external energy supply.

HEXAVALENT CHROMIUM TREATMENT TECHNOLOGIES Korak, J., A. Kennedy, and M. Anas-Paic. U.S. Department of the Interior, Bureau of Reclamation, Research and Development Office, Final Report ST-2018-9085-01, 105 pp, 2018

The Bureau of Reclamation partnered with two water districts, one in California and one in Oklahoma, to improve treatment process efficiency and reduce the cost for Cr(VI) removal in groundwater used as drinking water, with a treatment goal of 10 µg/L. In California, a pilot-scale strong-base ion exchange (SBA) process was installed at one of the system points of entry. Columns with SBA resin were loaded until exhausted for Cr and then were returned to the Bureau for regeneration and waste minimization process development. A pilot-scale strudy of stannous coloride reduction-coagulation-filtration was conducted at two wells in California and one well in Oklahoma. All results from this project were publis peer-reviewed journals, and each of the three chapters is a stand-alone study and a reprint of the published article <u>https://www.ushr.gov/research/projects/download_product.fm2id=2746</u>.)r ihlished in

PFAS SUMMARY Horsham Water & Sewer Authority, April 2019

Since July 2014, the Horeham Water and Sever Authority (HWGA) has been responding to the discovery of PEOS and PEOA in local groundwater, sourced from the nearby Naval Air Settion Joint Reserve Base Willow (To July and Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow (Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow (Willow Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow (Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow (Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow (Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow (Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow (Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow (Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow (Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Base Willow (Air Settion Joint Reserve Base Willow Air Settion Joint Reserve Ba

Research

A GIS SOLUTION TO EVALUATING REMEDIAL ALTERNATIVES IN SEDIMENT REMEDIATION AND RECOVERY Delwiche, L.M. | 2018 Salish Sea Ecosystem Conference, 4-6 April, Seattle, Washington, 16 slides, 2018

A GIS-based sediment remediation/recovery model was designed using ESRI ArcGIS Model Builder that incorporates the SEDCAM sediment attenuation model and analytical results derived from field samples to produce various cleanup scenarios. These scenarios were then further evaluated as remedial alternatives. On a chemical-by-chemical basis, the model determined active remediation footprints required to meet sediment cleanup levels at the end of a defined natural recovery period. Post-remediation natural recovery was incorporated through site-specific parameters such as sedimentation attent evaluated as remedial alternatives. On a chemical-by-chemical basis, the model determined active remediation footprints required to meet sediment cleanup levels at the end of a defined natural such test the site-specific sensitivity to model input parameters. Such information can potentially identify data gaps required for the accurate prediction of future sediment conditions.

PASSIVE SAMPLING OF PFAS: TECHNOLOGY DEVELOPMENT AND APPLICATIONS TO SITE AND RISK ASSESSMENT Kaltenberg, E., K. Dasu, F. Pala, S. Marconetto, B. McDonald, and A. Dindal. 2019 Real Property Institute of Canada (RPL) Federal Contaminated Stres Regional Workshop, 4-5 June, Halifax, Nova Scotia, 20 slides, 2019

This study aimed to develop passive samplers to detect PFAS in the field. Preliminary tests identified a suitable medium, which was then run through a series of adsorption experiments for 15 PFAS analytes. Equilibrium was achieved in http://mic-lbic.ca/images/2019_FCSRW/presentations/Passive_Sampling_of_PFAS-Technology_Development_and_Applications_to_Site_and_Risk_Management_apfLonger abstract available by clicking on Stream 4a at http://mic-lbic.ca/images/2019_FCSRW/presentations/fisc-fisc-ginages/2019_FCSRW/presentations/abstracts/2019_FCSRW/presentational-index-fisc-ginages/2019_FCSRW/presentatio

INNOVATIVE TREATMENT OF WOOD WASTE IMPACTED SEDIMENTS USING REACTIVE AMENDMENTS AND DGT PASSIVE POREWATER SULPHIDE TESTING TECHNIQUES Berlin, D., D. Ulassopoulos, M. Kanematsu, J. Dunay, E. Malczyk, and T. Wang. 2019 Real Property Institute of Canada (RPIC) Federal Contaminated Stres Regional Workshop, 4-5 June, Halifax, Nova Scotia. 20 slides, 2019

Public Services and Procurement Canada is conducting risk management studies on sediments within Esquimalt Harbour that contain wood waste deposits from historical activities. Innovative passive porewater samplers using a diffusive-gradient-in-thin-films (DGT) method were deployed for 30 min-24 hrs to quickly and accurately measure porewater sulfide concentrations. Measured concentrations ranged from 200 mg/L. An innovative bench-scale testing program was conducted to assess the effectiveness of sand cover mixed with a range of treatment amendments to reduce boavailable porewater sulfide concentrations in sediments containing wood wastes. Treatmendments included the effectiveness of the reactive amendments. The results are being used to design an in situ field points tuy. *Bitu*/(*microince/anagementations*). *Plassive Derewater* sulfide enternets. An other state sediments containing wood wastes. Treatmender to assess the effectiveness of the reactive amendments. The results are being used to design an in situ field points tuy. ndf Longer abstract available by

BIODEGRADATION OF 1,4-DIOXANE IN CO-CONTAMINANT MIXTURES Zhang, S., Master's Thesis, University of California Los Angeles, 109 pp, 2017

This research aimed to measure and model the effects of chlorinated solvents on 1.4-diovane metabolic biologradation, elucidate the mechanism of the inhibition, and test the effects of mixtures of co-contaminants and exact level of the inhibition and test the effects of mixtures of co-contaminants and exact level of the inhibition and test the effects of mixtures of co-contaminants and exact level of the inhibition and test the effects of mixtures of co-contaminants and exact level of the inhibition and test the effects of mixtures of co-contaminants and exact level of the inhibition and test the effects of mixtures of co-contaminants and exact level of the inhibition and test the effects of mixtures of co-contaminants and exact level of the inhibition and test the effects of mixtures of co-contaminants and exact level of the inhibition and test the effects of mixtures of co-contaminants of the effects of mixtures of the inhibition and test the effects of mixtures of co-contaminants and exact level of the inhibition and test the effects of mixtures of the inhibition and test the effects of mixtures of the inhibition and test the effects of mixtures of the inhibition and test the effects of mixtures of the inhibition and test the effects of mixtures of the inhibition and test the effects of mixtures of the inhibition and test the effects of mixtures of the inhibition and test the effects of mixtures of the inhibition and test the inhibition and test the effects of mixtures of the inhibition and test the effects of mixtures of the inhibition and test the effects of mixtures of the inhibition and test the effects of mixtures of the inhibition and test the effects of mixtures of the inhibition and test the inhibition and test the effects of mixtures of the inhibition and test the effects of mixtures of the inhibition and test the effects of mixtures of the inhibition effects of mixtures of the inhibition and test the effects of mixtures of the effects of mixtures of the effects of mixtures of the effects of mixture

ARSENIC RELEASE AND ATTENUATION PROCESSES IN A GROUNDWATER AQUIFER DURING ANAEROBIC REMEDIATION OF TCE WITH BIOSTIMULATION Smith, S., R.R. Dupont, and J.E. McLean. Groundwater Monitoring & Remediation 39(3):61-70(2019)

Lab tests were conducted to measure the amount of naturally occurring As released as a result of anthropogenic inputs of carbon used for TCE remediation. Large laboratory columns packed with TCE-contaminated aquifer solids from a site near Hill Air Force Base were fed with TCE-contaminated groundwater and biostimulated, bioaugmented, and monitored over 7.5 years. Columns were fed with either whey or 2 formulations of Newman Zone® emulsified oil, and a no-carbon addition control, to evaluate the biogeochemical changes that affect As solubilization. Columns were analyzed in 10.16-cm sections for pore water and sediment quality parameters. The why treatment resulted in 52.9% of the total As in the solids leaching from the columns. The oil treatments promoted loss of 20.9% of the total As Assence was attenuated with with either whey, resulting in the desired full dechlorination was associated with stronates. A consequence of adding whye, resulting in the desired full dechlorination of TCE in the addition control.

MODIFIED CLAY AS AN EFFECTIVE SOIL AMENDMENT TO REDUCE LEACHING OF CATIONIC, ANIONIC AND NEUTRAL PFAS FROM CONTAMINATED SANDY SOILS

Wang, C., B. Yan, and J. Liu. 2019 Real Property Institute of Canada (RPIC) Federal Contaminated Sites Regional Workshop, 4-5 June, Halifax, Nova Scotia. 26 slides, 2019

Modified clays were evaluated as a soil amendment to reduce PFAS mobility and/or leachability in contaminated soils. PFAS-contaminated sandy soils were characterized for the presence of anionic, cationic and neutral PFAS. A modified batch test determined the effect of sorbent dosage, equilibration time, and potential microbial activities using heavily contaminated soil. A significant reduction (95-99%) of anionic PFAS from the soil leachate, including PFOS, PFHAS, and PFOA, was achieved in 1-3 days with a dosage as low as 0.5% were were well with a higher dose of clay. The presentation covers a comparative assessment conducted between the modified clays performance using a long-term unstanted soil source of clay. The presentation covers a comparative assessment conducted between the modified clays performance using a long-term unstanted soil source of clay. The presentation covers a comparative assessment conducted between the modified clays performance using a long-term unstanted soil source of clays. The presentation covers a comparative assessment conducted between the modified clays performance using a long-term unstanted soil source of clays. The presentation covers a comparative assessment conducted between the modified clays performance using a long-term unstanted soil source of clays. The presentation covers a comparative assessment conducted between the modified clays and performance using a long-term unstanted soil source of clays. The presentation covers a comparative assessment conducted between the modified clays and performance using a long-term unstanted soil source of clays. The presentation covers a comparative assessment and heat and heat action and neutral effective for advantation of the performance using a long-term unstanted soil source of clays. The presentation covers a comparative assessment and heat action and neutral effective for advantation of the performance and heat and heat action anot advantation and heat action and Sandy Soils ...ndf Longer abstract available by clicking

ASSESSMENT OF PUMP-AND-TREAT SYSTEM IMPACTS ON 200 WEST AQUIFER CONDITIONS: INTERIM STATUS REPORT Demirkanli, D.I., N.P. Qafoku, D.L. Saunders, A.R. Lawter, M.M. Snyder, C. Bagwell, et al. PNNL-28063, 107 pp, 2018

The 200 West Area pump-and-treat (P&T) system is a key component of the final remedy selected for the 200-ZP-1 Operable Unit (OU), and the interim remedial action selected for the 200-UP-1 OU at the Hanford Site. The facility also receives perched water, groundwater, and leachate from several other contaminates, can be added areas within the Hanford Site. Since the use of the P&T system evolved to support remediation activities in other OUs, a study was conducted to determine abundancies, by extractable determines the determine to the support remediation activities in other OUs, a study was conducted to determine abundancies, by extractable determines the determine abundancies, by extractable determines that in a duration of the support remediation activities in other OUs, a study was conducted to determine abundancies, by extractable determines the determine abundancies, by extractable determines that the injection of P&T effluent. Hanned future testing includes column experiments and reactive transport modeling to quantitatively assess aquifer impacts and system performance under the current and predicted future confilions. <u>Hitter Javane</u> participation (Javane) (Javani Javani J

General News

PFAS AND OTHER EMERGING CONTAMINANTS CONFERENCE American Council of Engineering Companies and Ground Water Professionals of North Carolina, 23-24 April, Raleigh, NC, 2019

The 2-day workshop featured presentations on PFAS chemistry, occurrence, fate, remediation, toxicology, and risk assessment and communication as well as emerging contaminants, including 1,4-dioxane. See day 1 presentations at http://www.com/PFAS.Day Conference Presentations.at/

GREEN REMEDIATION BEST MANAGEMENT PRACTICES: SITES WITH LEAKING UNDERGROUND STORAGE TANKS U.S. EPA Office of Land and Emergency Management, EPA 542-F-19-001, 4 pp, 2019

This fact sheet covers the concepts and tools for using best management practices to reduce the environmental footprint of activities associated with assessing and remediating contaminated sites. https://www.ama.ou/sites/configuration/files/contaminate/sites/contaminated/contaminate

PERFLUOROALKYL AND POLYFLUOROALKYL SUBSTANCES (PFAS) METHODS AND GUIDANCE FOR SAMPLING AND ANALYZING WATER AND OTHER ENVIRONMENTAL MEDIA U.S. EPA Technical Brief, EPA 600-F-17-022f, 2 pp, 2019

EPA is working to develop and validate analytical methods for PFAS chemicals in groundwater, surface water, wastewater, and solids, including soils, sediments, and biosolids. This updated fact sheet summarizes progress made in this effort since 2017 https://www.ena.gov/sites/production/files/2019-02/documents/nfas_methods_tech_brief_28feb19_update.pdf

GEOPHYSICAL METHODS FOR CHARACTERIZATION AND MONITORING AT GROUNDWATER REMEDIATION SITES Naval Facilities Engineering Command, 8 pp, 2018

Geophysical methods have the potential to improve characterization and monitoring at sites where groundwater remediation is planned or underway. This fact sheet focuses on the application of geophysical tools in support of environmental remediation. The following topics are discussed: Why use geophysical theory is a valiable? When where do different geophysical methods work?

ENVIRONMENTAL APPLICATIONS OF ELECTROCHEMICAL TECHNOLOGY. WHAT IS NEEDED TO ENABLE FULL-SCALE APPLICATIONS? Lacasa, E., S. Cotilia, C. Saez, J. Lobato, P. Canizares, and M.A. Rodrigo. Current Opinion in Electrochemistry 1:149-156(2019)

A short review is provided that includes a brief description of the current state of electrochemical technologies at a low technology readiness level, highlighting barriers that must be removed to achieve full-scale applications in industry.

ENT ADVANCES IN HEXAVALENT CHROMIUM REMOVAL FROM AQUEOUS SOLUTIONS BY ADSORPTIVE METHODS ade, V.E., N.T. Tavengwa, and L.M. Madikizel. Advances 9:26142(2019)

Recent advances, insights, and project future directions for adsorbents used for Cr(VI) removal are summarized in this article. It also compares and contrasts the performances achieved by natural adsorbents and their variants.

1,4-DIOXANE AS AN EMERGING WATER CONTAMINANT: STATE OF THE SCIENCE AND EVALUATION OF RESEARCH NEEDS Pollitt, K.J.G., J.-H. Kim, J. Peccia, M. Elimelech, Y. Zhanga, G. Charkoftaki, B. Hodges, et al. Science of the Total Environment 690: 853-866(219)

This review highlights the current state of knowledge, key uncertainties, and data needs for future research on 1,4-dioxane.

ADVANCED NANOSTRUCTURED MATERIALS FOR ENVIRONMENTAL REMEDIATION Naushad, M., S. Rajendran, and F. Gracia (eds), Springer International Publishing, ISBN: 978-3-030-04477-0, ISBN: 978-3-030-04476-3, 391 pp, 2019

Within 13 chapters, this book provides a wide-ranging exploration of ongoing research and developmental events in environmental nanotechnology. Included are experimental studies of various nanomaterials along with their design and applications, with specific attention to chemical reactions and their challenges for catalytic systems. *Were the table of contents and abstracts at the chemical reaction and their challenges* for catalytic systems. *Were the table of contents and abstracts at the chemical reaction and abstracts at the chemical reaction and reactio*

INTEGRATED ELECTROKINETIC PROCESSES FOR THE REMEDIATION OF PHTHALATE ESTERS IN RIVER SEDIMENTS: A MINI-REVIEW Yang, G.C.C. | Science of the Total Environment 659:963-972(2019)

This mini-review introduces 4 recently reported novel integrated electrokinetic (EK) processes for the remediation of phthalate ester contamination in river sediments: the EK/advanced oxidation process and EK/biological process. The provides a comprehensive summary of these remediation processes including test results and key findings.

TU REMEDIATION OF SUBSURFACE CONTAMINATION: OPPORTUNITIES AND CHALLENGES FOR NANOTECHNOLOGY AND ADVANCED MATERIALS ng, T. G. V. Lowry, N.L. Capiro, J. Chen, W. Chen, Y. Chen, D.D. Dionysiou, et al. rommental Science: Nano 6:1283-1302(2019)

Opportunities for nanotechnology-enabled in situ remediation technologies to address soil and groundwater contamination are discussed in this publication. The discussion covers candidate nanomaterials, applications of nanomaterials to complement existing remediation approaches and address emerging contaminants, as well as the potential barriers for implementation and strategies and reserve here sto overcome these barriers.

THE OCCURRENCE AND FATE OF PER- AND POLY-FLUOROALKYL SUBSTANCES (PFAS) IN THE ENVIRONMENT Brusseau, M.L., University of Arizona, 20 February, Tuczon, Arizona, 50 slides, 2019

This presentation discusses the nature, sources, and properties of PFAS, as well as their transport and fate in the environment. The presentation includes case studies. https://wrrr.arizona.edu/sites/wrrr.arizona.edu/files/PFAS%20Seminar_Eeb%202019_Brusseau.pdf

SUSTAINABLE REMEDIATION OF CONTAMINATED SOIL AND GROUNDWATER Hou, D (ed)., Butterworth-Heinemann Publishing, ISBN 9780128179826, 352 pp, 2019

Within 17 chapters, this book integrates green materials, cleaner processes, and sustainability assessment methods for planning, designing and implementing a more effective remediation process in soil and groundwater projects. The book discusses greener remediation materials that render a smaller environmental lootprint, cleaner processes that minimize secondary environmental impact, and sustainability assessment methods that can be used to guide the development of materials processes. Rev features include addressing materials, processes, and assessment needs for implementing a suscessful sustainability assessment methods that can be used to guide the development of materials, processes, and sustainability assessment needs for implementing a successful sustainability assessment methods that can be used to guide the development of technologies, such as green materials, cleaner processes, and sustainability assessment; and case studies based on full-scale commercial soil and groundwater remediation projects. *View the table of contents at thesiver, com/honks/sustainable: remediation of contantistate of contents at 2012, 2012*

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 <u>adam michael@epa.gov</u> or (703) 603-9915 with any comments, suggestions, or corrections. Mention of non-EPA documents, presentations, or papers does not constitute a U.S. EPA endorsement of their contents, only an acknowledgment that they exist and may be relevant to the Technology Innovation News Su