Technology Innovation News Survey

Entries for October, 2013

Market/Commercialization Information

COOPERATIVE TRAINING PARTNERSHIP IN ENVIRONMENTAL HEALTH SCIENCES RESEARCH

U.S. Environmental Protection Agency, Funding Opportunity EPA-G2014-ORD-T1, 2013

The objectives of the cooperative agreements to be awarded under this funding opportunity are to administer and conduct the training of postdoctoral fellows, graduate students, and undergraduate students in areas of environmental research as they work with senior scientists at one of EPA's premier environmental laboratories in the Raleigh, Durham, and Chapel Hill locations in North Carolina. In the partnership between a successful institution and EPA's Office of Research and Development, cooperative training experience might include problem and hypothesis formulation; experimental design; experiments conducted in the field or at the EPA laboratory facilities; data analysis; and quality assurance, reporting, presenting results, and manuscript development and publication. Graduate students and postdoctoral researchers would be expected to present their research results in at least one regional or national scientific conference. EPA will accept applications until January 14, 2014 http://www.epa.gov/ncer/rfa/2014/2014_nheerl.html

STATISTICAL & TECHNICAL SUPPORT FOR THE ASSESSMENT OF TOXIC SUBSTANCES

U.S. EPA, Office of Acquisition Management, Washington, DC.
Federal Business Opportunities, FBO-4379, Solicitation SOL-DC-14-00002, 2013

EPA is conducting market research to identify parties having an interest in and the resources to support its requirement for statistical and technical support for the assessment of toxic substances under NAICS code 541620, Environmental Consulting Services. The results of this research will contribute to determining the method of procurement, either set-aside for small or disadvantaged businesses or procured through full and open competition. The anticipated requirements are detailed in a draft statement of work posted athttp://www.epa.gov/oamhpod1/admin_placement/1400002/index.htm. Responses to this sources sought are due no later than December 18, 2013. https://www.fbo.gov/spg/EPA/OAM/HQ/SOL-DC-14-00002/listing.html

AFICA ENVIRONMENTAL SERVICES ES-USAFE AND ES PACAF RFI #1

Air Force Installation Contracting (AFICA), Wright Patterson AFB, OH.
Federal Business Opportunities, FBO-4379, Solicitation FA8903-14-R-ES-USAFE-PACAF, 2013

The Air Force is conducting market research under a single RFI to identify parties having an interest in and the resources to support either of its separate requirements for environmental services (ES) and environmental construction (ESC) for the United Air Forces Europe (USAFE) and ES-ESC for Pacific Air Forces (PACAF) under NAICS code 562910. Details are posted in the RFI notice, questionnaire, and performance work statements attached to the notice at FBO.gov. Responses to this sources sought are due no later than December 19, 2013. [NOTE: According to the notice at https://www.fbo.gov/notices/6b5eb950907be6e02c6bed2ec4cd552, the acquisition for Solicitation FA8903-13-R-0071, ESG AFCEC Environmental Services RFI#2, originally issued July 24, 2013, is suspended indefinitely.]https://www.fbo.gov/notices/abc3f392f43b922c0585878ff06b3d11

FY 2015 SERDP SOLICITATIONS

Strategic Environmental Research and Development Program (SERDP) News Release, 2013

SERDP is seeking environmental R&D proposals to fund in FY 2015. Projects will be selected through a competitive process, with pre-proposals due January 9, 2014. The Core Solicitation identifies the following needs areas for basic and applied environmental R&D:

- **ERSON-15-01** - Improved understanding of long-term natural attenuation processes on contaminants in groundwater.
- **MRSON-15-01** - Detection, classification, and remediation of military munitions underwater.
- **RCSON-15-01** - New paradigms for managing species and ecosystems in a non-stationary world in response to climate change.
- **RCSON-15-02** - Adapting to changes in the hydrologic cycle under non-stationary climate conditions.

The SEED Solicitation provides funding opportunities for work to investigate innovative environmental approaches that entail high technical risk or require supporting data to provide proof of concept. Proposals are due March 11, 2014. SEED funding is limited to not more than $150,000 for projects ~1 year in duration for the following needs areas:

- **ERSEED-15-01** - Improved measurement and assessment of off-site contaminant influx and potential recontamination of aquatic sediment sites.
- **ERSEED-15-02** - Development of passive sampling methodologies to measure contaminant bioavailability in aquatic sediments.

Details are available at http://www.serdp-estcp.org/Funding-Opportunities/SERDP-Solicitations.

PEER REVIEW PANEL

Department of Energy, Navarro Nevada Environmental Services LLC, North Las Vegas, NV.
Federal Business Opportunities, FBO-4381, Solicitation NI14CA011, 2013

Navarro-Intera, LLC, in the performance of Prime Contract DE-AC52-09NA28091 with DOE's National Nuclear Security Administration/Nevada Field Office (NNSA/NFO), requests proposals to participate on a panel to review the groundwater flow and transport modeling studies for the Yucca Flat Corrective Action Unit and answer review questions developed by NNSA/NFO. The purpose of the peer review is to determine the adequacy of the model as a decision tool to implement the Underground Test Area closure strategy under federal requirements. The panel will consist of independent experts in the fields of geology/geophysics, hydrogeology, geochemistry/radiochemistry, unsaturated zone hydrology, and groundwater flow and transport modeling. The panel will be chosen from nationally recognized experts in these fields. Resumes, due by December 11, 2013, should not exceed 20 pages total, including three references. https://www.fbo.gov/spg/DOE/SNJV/NNSANV/NI14CA011/listing.html

ORCR RISK ASSESSMENT SUPPORT

U.S. EPA, Office of Acquisition Management, Washington, DC.
Federal Business Opportunities, FBO-4365, Solicitation SOL-HQ-13-00010, 2013

The purpose of the environmental and risk analysis staff risk assessment acquisition is to obtain advisory and assistance type services for the assessment of potential risks and other impacts associated with the generation and management of materials originating in households and businesses, industrial process materials and residues, and management of municipal and industrial solid wastes. The technical support requirements for the resulting contract are designed to help the Office of Resource Conservation and Recovery (ORCR) meet resource conservation, protection, and corrective action goals as indicated in the draft performance work statement posted at http://www.epa.gov/oamsrpod/hcsc/ORCR-Risk%20Assessment-SOL-HQ-13-00010dex.htm. The anticipated duration of this contract will consist of a 3-year base period, a 2-year option period, and a 2-year award term for a total of seven years. The anticipated contract type will be indefinite-delivery, indefinite-quantity, with work ordered through the issuance of task orders on a time-and-materials and/or firm-fixed-price basis. This acquisition will be conducted on a full and open basis, NAICS code 541620. The solicitation likely will be released some time after November 2013https://www.fbo.gov/spg/EPA/OAM/HQ/SOL-HQ-13-00010/listing.html

GEOTECHNICAL A&E SERVICES IN SUPPORT OF OSM'S ABANDONED MINE LAND (AML) PROGRAM

Department of the Interior, Office of Surface Mining, Washington, DC.
Federal Business Opportunities, FBO-4375, Solicitation S14PS00002, 2013

The Office of Surface Mining is seeking licensed/registered geotechnical architecture and engineering firms to submit an SF330 in support of its AML Program. NAICS code 541330 applies to this full and open procurement. All work is directly related to hazards associated with abandoned coal mines. Most of the sites are located in Washington State, with some in California and Oregon. Geographic proximity to the Washington project sites is a major consideration in the selection process. The government anticipates awarding one indefinite-delivery, indefinite-quantity contract on or about April 1, 2014, consisting of a base year plus four 1-year options. The complete solicitation package will be posted on FBO.gov around December 2, 2013, with responses due to OSM on or about January 6, 2014. https://www.fbo.gov/spg/DOI/OSM/1438/S14PS00002/listing.html

TESTING AND EVALUATION OF HOMELAND SECURITY AND ALL-HAZARDS TECHNOLOGIES

U.S. EPA, Office of Acquisition Management, Cincinnati, OH.
Federal Business Opportunities, FBO-4375, Solicitation SOL-CI-13-00038, 2013

EPA's National Homeland Security Research Center has a requirement under NAICS code 541712 for technical support for the testing and evaluation of homeland security and all-hazards technologies for the measurement, sampling, removal, and decontamination of chemical, biological, and radiological (CBR) agents. EPA anticipates issuing the solicitation in December 2013 athttp://www.epa.gov/oam/cian_cnd. Support shall be provided for research efforts in the detection and decontamination of CBR contamination introduced into drinking water distribution systems, ambient (indoor and outdoor) air, buildings, and other surfaces. Using full and open competition, EPA anticipates awarding up to three contracts as indefinite-delivery, indefinite-quantity, multiple-award contracts with firm-fixed-price and cost-plus-fixed-fee task orders over a 5-year ordering period.https://www.fbo.gov/spg/EPA/OAM/OH/SOL-CI-13-00038/listing.html

NNSA NEVADA FIELD OFFICE, ENVIRONMENTAL PROGRAM SERVICES (EPS) DRAFT RFP

U.S. Department of Energy, NNSA/Nevada Field Office, Las Vegas, NV.
Federal Business Opportunities, FBO-4383, Solicitation DE-SOL-0005982, 2013

The Environmental Program Services contract (NAICS code 562910) encompasses environmental characterization and remediation services at corrective action sites at the Nevada National Security site and parts of the Nevada Test and Training Range, including Tonopah Test Range and radioactive waste acceptance services at generator sites across the country. A draft RFP and other information can be located through the search interface at https://www.fedconnect.net/. The EPS procurement will be a total small business set-aside. https://www.fbo.gov/spg/DOE/PAM/HQ/DE-SOL-0005982/listing.html

ENVIRONMENTAL, PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES

Department of the Army, U.S. Army Corps of Engineers (USACE), USACE District, Omaha.
Federal Business Opportunities, FBO-4332 and 4347, Multiple Solicitations, 2013

To meet its small business participation and subcontracting goals, the USACE Northwestern Regional Business Center (NWD-RBC) seeks to develop an inventory of small businesses interested and capable of executing environmental, professional, scientific, and technical services (NAICS 562910) for the Northwestern Division's districts (i.e., Kansas City, Seattle, Portland, Walla Walla, and Omaha) at locations within and outside the continental United States. Although separate notices have been posted for small business subcategories, NWD-RBC encourages all small business firms able to demonstrate recent, specialized experience and technical competence in providing the desired services to fill out the survey posted athttps://www.surveymonkey.com/s/LB6PD9R, with responses accepted through September 30, 2014.

- **W9128F-14-SB002 (Total Small Business)** https://www.fbo.gov/spg/USA/COE/DACA45/W9128F-14-SB002/listing.html
- **W9128F-14-SB004 (Emerging Small Business)** https://www.fbo.gov/spg/USA/COE/DACA45/W9128F-14-SB004/listing.html
- **W9128F-14-SB007 (Small Disadvantaged Business, including Section 8(a))** https://www.fbo.gov/spg/USA/COE/DACA45/W9128F-14-SB007/listing.html
- **W9128F-14-SB010 (Woman-Owned Small Business)** https://www.fbo.gov/spg/USA/COE/DACA45/W9128F-14-SB010/listing.html
- **W9128F-14-SB013 (HUBZone Firms)** https://www.fbo.gov/spg/USA/COE/DACA45/W9128F-14-SB013/listing.html
- **W9128F-14-SB0016 (Service-Disabled, Veteran-Owned Small Business)** https://www.fbo.gov/spg/USA/COE/DACA45/W9128F-14-SB0016/listing.html
- **W9128F-14-SB019 (Historically Black Colleges and Universities and Minority Institutions)** https://www.fbo.gov/spg/USA/COE/DACA45/W9128F-14-SB019/listing.html

Cleanup News

NATURAL ZEOLITE PERMEABLE TREATMENT WALL FOR REMOVING SR-90 FROM GROUNDWATER

Seneca, S.M. and A.J. Rabideau.
Environmental Science & Technology, Vol 47, 1550-1556, 2013

Experimental and modeling studies were completed to investigate the potential performance of a sorbing permeable treatment wall consisting of natural zeolite. The barrier was installed to remove strontium-90 from groundwater at the West Valley Demonstration Project near Buffalo, New York. First conceived as a pilot in the late 1990s and installed at full scale at the end of 2010, the system promotes ion exchange, chiefly by means of the zeolite mineral clinoptilolite in which the divalent Sr-90 replaces the monovalent cation of potassium or sodium within the mineral's lattice structure. Results from two years of testing indicate the viability of the natural zeolite barrier for in situ removal of Sr-90 from groundwater at this and potentially other affected sites. http://www.academia.edu/3811750/seneca_rabideau_2013

REMEDIAL CHARACTERIZATION: FILLING THE GAPS AND REFINING THE CSM AND CASE STUDIES

Johnston, B.
American Institute of Professional Geologists (Kentucky Section), 22 slides, Apr 2013

This presentation offers lessons learned during remediation of LNAPL and dissolved-phase petroleum hydrocarbons at sites located in Kentucky: the Budget Rental Car site in Louisville, and the Miller Oil Company in Sacramento. Pressurized injections of BOS 200®—a blend of activated carbon, sulfate reduction media, micronutrients, and facultative microbes—were conducted at both sites to effect cleanup via in situ bioremediation. http://www.ky.aipg.org/PDF/Session3.pdf A detailed discussion of the Budget cleanup is available in an 8-page case study at http://www.trapandtreat.com/wp-content/uploads/2013/04/RPI-Budget-Case-Study.pdf.

DATABASE OF GROUNDWATER PUMP-AND-TREAT SYSTEMS

Sepulveda, P. and K. Gerdes.
DOE-FIU Science & Technology Workforce Development Program, 38 pp, 2013

Within DOE's Office of Environmental Management (EM), the Office of Soil and Groundwater (EM-12) provides integration, planning, analysis, and guidance for ensuring safe and effective management and remediation of contaminated soil and groundwater with the goal of reducing risk and the life-cycle cost of remediation. Expanding upon a database previously completed for EM-12, this report contains data for 12 DOE sites that employ pump and treat and other technologies (e.g., bioremediation) for groundwater remediation. The database identifies specific locations within the 12 sites, contaminants present, current and past remediation strategies, cost of each strategy, and current remediation progress. The data will be used to update the end-states analysis and in future strategic planning.http://fellows.fiu.edu/doc/Summer13Reports/2013%20Summer%20Internship%20Tech%20Report-Paola%20Sepulveda.pdf

KENTUCKY SUCCESS STORY

Guilfoil, D.
Proceedings of the 24th National Tanks Conference and Expo, Denver, Colorado, September 16, 2013. 25 slides, 2013

A systematic in situ injection approach is being implemented in Kentucky to overcome clay and tight silt constraints in remediation of leaking underground storage tank sites. The systematic approach includes 1) high-resolution sampling to fill data gaps and refine the conceptual site model (CSM); 2) use of the refined CSM to develop an in situ injection design; and 3) installing the BOS 200® product to achieve the greatest distribution in the subsurface. High-density (tightly spaced injection points and intervals), high-flow, and high-pressure injections are necessary to achieve effective product distribution in clays and silts. The injection fluid is used to create separations in tight media and develop an intertwined network of separations connected to existing microfractures. This systematic technique has been used on 17 in situ injection projects in Kentucky, of which ~95% achieved the remedial goal within one month after a single injection event. https://www.neiwpcc.org/tanksconference/presentations/monday/Innovative%20Clean-up/Innovative%20Tech_Guilfoil_2013_Monday.pdf
The project matrix lists the project size, remedial goals, and estimated cost for each of the 17 sites:
https://www.neiwpcc.org/tanksconference/presentations/monday/Innovative%20Clean-up/Innovative%20Tech_Guilfoil_Handout_2013_Monday.pdf.

HOT SPOT ANALYSIS: LCA OF AN IN SITU THERMAL REMEDIATION PROJECT

Fisher, A.
LCA XII, 25-27 September 2013, Tacoma, Washington. American Center for Life Cycle Assessment, 26 slides, 2013

A detailed life-cycle analysis of the impacts of in situ Electro-Thermal Dynamic Stripping Process (ET-DSP™) technology implementation for the treatment of two chlorinated solvent source areas included raw materials, water, and energy; installation of thermal electrodes in the subsurface; resources and equipment necessary source subsurface heating and dual-phase extraction/treatment of liquid and vapors; decommissioning and wastes; and performance monitoring. LCA helps provides a more holistic view of all the inputs and emissions to consider when evaluating the environmental impacts of remediation technologies. Results of this analysis for 180 days of operation identified electricity consumption during active subsurface heating and diesel fuel (transport and equipment operation) needed to install the remedy as having the largest impacts. Potential opportunities for minimizing the environmental footprint are discussed.
http://lcacenter.org/lcaxii/final-presentations/515.pdf

EVOLUTION OF A PUMP AND TREAT REMEDIATION SYSTEM AT THE SLAC NATIONAL ACCELERATOR LABORATORY, MENLO PARK, CALIFORNIA
Umezaki, C.D., M. Moes, A. Ng, and D. Harbaugh.
SLAC-PUB-14574, 8 pp, 2013

Beginning in 2001, pump-and-treat operations were conducted to address historical releases of VOCs and SVOCs from the former solvent underground storage tank area located at the SLAC National Accelerator Laboratory, Menlo Park, California. In 2007, the system was converted to dual-phase extraction by adding simultaneous soil vapor extraction. With the increase in contaminant mass removal rates, total VOC-SVOC concentrations in some source area wells decreased over 99%. This paper presents operational and performance data for the two systems as related to attainment of remedial action objectives; observations on system limitations; and a discussion of the unexpected destruction of 1,4-dioxane in the granular activated carbon groundwater treatment system. http://www.osti.gov/scitech/servlets/purl/1098107

REMOVAL OF PCE DNAPL FROM TIGHT CLAYS USING IN SITU THERMAL DESORPTION
Heron, G., J. Lachance, and R. Baker.
Groundwater Monitoring & Remediation, Vol 33 No 4, 31-43, 2013

Full-scale remediation of a brownfield site near San Francisco, California, was conducted using in situ thermal desorption (ISTD) for treatment of chlorinated solvents in a tight clay below the water table. Contaminant concentrations indicated the presence of mainly PCE DNAPL. A target volume of 5,097 m^3 of subsurface material to a depth of 6.2 m was treated via energy delivered through 126 thermal conduction heater borings. A combination of vertical and horizontal vacuum wells extracted the vapors for recovery of ~2,540 kg of contaminants by the end of treatment. The PCE concentration in the clay was reduced from as high as 2,700 mg/kg to an average concentration of 0.012 mg/kg within 110 days of heating (a reduction of >99.999%). Similar effectiveness was documented for TCE, cis-1,2-DCE, and vinyl chloride. Of the 2.2 million kWh of electric power used to heat the site, ~45% was used to heat the subsurface to the target temperature, while 53% was necessary to boil ~41% of the groundwater within the treatment zone, creating roughly 600 pore volumes of steam by the end of treatment. *Additional information:* http://www.terratherm.com/pdf/white%20papers/paper3-11-6-09.pdf

Demonstrations / Feasibility Studies

SYSTEM FOR PERCHLORATE IN GROUNDWATER DEMONSTRATED
Desalination & Water Reuse Quarterly, June 2013

A demonstration system for the degradation of perchlorate has been installed at Aerojet General Corporation's site near Rancho Cordova, California. The demonstration system is designed to treat 175,000 gpd of perchlorate-contaminated groundwater. MB-P™ consists of a single-pass, single-step process that degrades perchlorate in the feed water into harmless oxygen and chloride ions with no buildup of intermediates and minimal production of secondary waste. The contract for the demonstration system was awarded after successful completion of a 2012 pilot study at the site indicated the feasibility of installing MB-P™ to degrade dissolved perchlorate. Retrofitted to Aerojet's existing biological fluidized-bed reactor system, the new technology also has the potential to reduce operating costs. http://www.desalination.biz/news/news_story.asp?id=7097

"NORTHPESTCLEAN": A LARGE-SCALE DEMONSTRATION PROJECT ON IN SITU ALKALINE HYDROLYSIS
Bondgaard, M.
AquaConsoil 2013, 16-19 April 2013, Barcelona. 31 slides, 2013

A demonstration project (www.northpestclean.dk) was initiated in September 2010 to evaluate the efficacy of using in situ alkaline hydrolysis for oxidizing parathion, an organophosphorus pesticide. The project was conducted in three sheet-pile test cells on the heavily contaminated stretch of coast at Groyne 42. At pH ranges above pH 11, alkaline hydrolysis plays a significant role in the breakdown of some organic compounds. The contaminated soil in the test cells was infiltrated with diluted sodium hydroxide, which raised the pH in the remaining groundwater to 12. Over a period of 3 to 6 months, the alkaline hydrolysis process oxidized the parathion to two water-soluble and less toxic substances, which were removed from the soil by pumping. The treatment cycle was repeated several times. Results will be used to generate a decision basis for full-scale remediation of the Groyne 42 site.
http://www.aquaconsoil.org/AquaConSoil2013/Pres_Theme_D_files/D1.14_Bondgaard.pdf **Additional information:** http://nordicrs.org/wp-content/uploads/2012/09/Session-III-onsdag-1-Jorgensen-Short-paper.pdf **AND** http://www.eng.northpestclean.dk/files/Subsites/Northpestclean/Publikationer/2010/2010-09%20Remediation%20of%20pesticide%20contamination%20by%20in%20situ%20alkaline%20hydrolysis%20-%20a%20new%20soil%20remediation%20t

THIRD FIVE-YEAR REVIEW REPORT FOR BOOMSNUB/AIRCO SUPERFUND SITE, HAZEL DELL, WASHINGTON
U.S. EPA Region 10, 141 pp, 2013

Cr(VI) and TCE were released to soil and groundwater at this Superfund site during historical activities of commercial chrome plating (Boomsnub) and pressurized gas production (Airco). In September 2006, the U.S. Army Corps of Engineers initiated a toe-of-plume pilot study for in situ reduction of residual contamination located near extraction well MW-41. This area is believed to be located in the low-permeability silt layer at a depth of ~80 to 90 ft bgs. EHC-M™, a combination of controlled-release carbon and zero-valent iron particles, was injected into the alluvial aquifer to stimulate reductive dechlorination of TCE and chemical reduction/precipitation of chromium. Post-remediation monitoring indicates that EHC-M™ was effective at reducing TCE and chromium concentrations below cleanup levels. http://www.epa.gov/region10/pdf/sites/boomsnub_airco/boomsnub_3rd_fyr_091313.pdf For additional information, see the work plan for in situ treatment of areas of residual contamination: https://fortress.wa.gov/ecy/gsp/DocViewer.ashx?did=9977

ARSENIC REMEDIATION FIELD STUDY USING A SULFATE REDUCTION AND ZERO-VALENT IRON PRB
Beaulieu, B. and R.E. Ramirez.
Groundwater Monitoring & Remediation Vol 33 No 2, 85-94, 2013

A permeable reactive barrier (PRB) utilizing sulfate reduction was coupled with zero-valent iron (ZVI) to remediate the leading edge of a dissolved arsenic plume in a wetland area near Tacoma, Washington. EHC-M®, a commercially available product that contains ZVI, organic carbon substrate, and sulfate, was injected into a reducing, low-seepage-velocity aquifer elevated in dissolved arsenic and iron from a nearby slag-containing landfill. Results show that induced sulfate reduction and ZVI are capable of attaining a regulatory limit of 5 µg/L total arsenic, capturing of 97% of the arsenic entering the PRB, and sustaining decreased arsenic concentrations for ~2 years. Removal effectiveness was strongly correlated with sulfate concentration, and was coincident with temporary redox potential (Eh) reductions, consistent with arsenic removal by iron sulfide precipitation.

COMBINING ADSORPTION WITH ANODIC OXIDATION AS AN INNOVATIVE TECHNIQUE FOR REMOVAL AND DESTRUCTION OF ORGANICS
Brown, N.W. and E.P.L. Roberts.
Water Science & Technology, Vol 68 No 6, 1216-1222, 2013

Arvia™ is a novel technology that couples adsorption with electrochemical oxidation to destroy organics in water. Water containing organic compounds is mixed with adsorbent material (trade name Nyex™), followed by a settling stage and then regeneration of the adsorbent material using electrolysis, all within a single treatment unit. Successful scale-up of the process (in both continuous and batch operation) has been achieved for the polishing of two separate groundwaters, one containing relatively simple diesel and degradation products and the other a range of more complex organics. Energy consumption for electrochemical regeneration is relatively low (down to 0.5 kWh/m^3). **Additional information:**

- *Demonstration of the Arvia™ Process of Adsorption Coupled with Electrochemical Regeneration for the On-Site, Ex Situ Decomposition of Organic Contaminants in Groundwater* (2013) — available to CL:AIRE members only (with free registration) at http://www.claire.co.uk/index.php?option=com_resource&controller=article&article=374&category_id=6&Itemid=61
- *Disinfection of Water by Adsorption with Electrochemical Regeneration* (2012) https://www.waset.org/journals/waset/v72/v72-178.pdf
- *Formation of Byproducts during Regeneration of Various Graphitic Adsorbents in a Batch Electrochemical Reactor* (2013) https://www.waset.org/journals/waset/v81/v81-92.pdf
- Patent information: http://ip.com/patfam/en/36589924
- Petrol trial: http://www.geo2.co.uk/documents/ENDS%20Report%20Online%20-%20Geo2%20&%20Arvia%2029.06.11.pdf
- Paper mill trial: http://cen.acs.org/articles/88/i16/British-StartArvia-Tests-Technology-Recycled.html
- Arvia™ demonstration for DOE: treatment of industrial radioactive waste containing furans and dioxins: http://www.stfc.ac.uk/2879.aspx

ELECTROKINETIC-ENHANCED BIOREMEDIATION (EK-BIO) OF A PCE SOURCE IN LOW PERMEABILITY MATERIALS
Cox, E.
AquaConsoil 2013, 16-19 April 2013, Barcelona. 26 slides, 2013

Hydraulic advection is not practical for delivery in clays, but with electrokinetic (EK) technology, transport of ionic substances such as lactate in an electric field is relatively independent of hydraulic properties and fluid flow. An EK-BIO field application was completed at a former industrial site—Hot Spot IV in Skudelev, Denmark—to address PCE DNAPL source materials in interbedded deposits of sand and clay till. The field application consisted of a network of electrode wells spaced at ~9 ft by 6 ft. Evidence indicated that *Dehalococcoides* and vinyl chloride reductase (vcrA) levels increased significantly across the test area compared to baseline levels, along with significant reductive dechlorination of PCE to cis-1,2-DCE, VC, and ethene. Field results show that EK can facilitate the transport of amendments (lactate and bioaugmented microbial culture) through clay soils. Developed under a CRADA, this pilot test project won a Green Innovation Award of Excellence with the U.S. Army Corps of Engineers. Full-scale EK-BIO implementation is currently underway at Hot Spot IV. http://www.aquaconsoil.org/AquaConSoil2013/Pres_Theme_D_files/D1.15_Cox.pdf

Research

THE IMPACT OF DNAPL SOURCE-ZONE ARCHITECTURE ON CONTAMINANT MASS FLUX AND PLUME EVOLUTION IN HETEROGENEOUS POROUS MEDIA
Brusseau, M.
SERDP Project ER-1614, 128 pp, Aug 2013

In bench- and field-scale investigations, investigators employed contaminant mass discharge as an integrative measure of the performance and effectiveness of remediation efforts. The standard approach of characterizing discharge at the source-zone scale was expanded to provide characterization at the plume scale, which was evaluated by examining the change in contaminant mass discharge associated with plume-scale pump and treat. This approach allows linking the impacts of source-zone remediation to effects on site-wide risk. Portions of the project comprised long-term studies conducted at the Tucson International Airport Area federal Superfund site in southern Arizona.
http://www.serdp-estcp.org/content/download/21973/227153/file/ER-1614-FR.pdf

MOLECULAR BIOMARKERS FOR DETECTING, MONITORING AND QUANTIFYING REDUCTIVE MICROBIAL PROCESSES
Spormann, A. and L. Semprini.
SERDP Project ER-1588, 164 pp, July 2013

In this project, scientists worked to develop and test quantitative molecular biomarkers for the hydrogen-producing and hydrogen-consuming microbial population present in groundwater and sediment material; correlate the quantitative data obtained by molecular biomarkers with experimentally determined transformation rates; and then test and refine a mathematical model with the data. The project demonstrated for the first time the proof of concept of using semi-quantitative monitoring of key genes and their expression. Used in conjunction with selecting a more efficient electron donor, such as formate, this modeling approach has the potential to support more efficient and less expensive bioremediation of chloroethene-contaminated sites. http://www.serdp-estcp.org/content/download/21986/227223/file/ER-1588-FR.pdf

TEN YEARS OF POPLAR RESEARCH AT NMSU'S AGRICULTURAL SCIENCE CENTER AT FARMINGTON
O'Neill, M.K., R.F. Heyduck, S.C. Allen, K.A. Lombard, D. Smeal, and R.N. Arnold.
New Mexico State University, Bulletin 805, 16 pp, May 2013

Research on hybrid poplar adaptation to the Four Corners region of the southwestern United States began at the New Mexico State University (NMSU) Agricultural Science Center at Farmington in 2002 with the establishment of a clonal trial consisting of 10 entries of various poplar species, with further trials installed in 2003, 2005, and 2007. The NMSU poplar projects include installations at an abandoned oil refinery site for phytoremediation research. http://aces.nmsu.edu/pubs/research/horticulture/BL805.pdf Additional information on the phytoremediation project: http://www.lcsun-news.com/las_cruces-news/ci_24543053/nmsu-researchers-testing-whether-poplar-trees-will-help

NOVEL PILOT-SCALE WASHING PROCESS AND EQUIPMENT FOR REMOVING CR(VI) FROM CONTAMINATED SOIL
Lin, X., M. Gao, and H. Cao.
Journal of Material Cycles and Waste Management, Vol 15 No 4, 476-481, Oct 2013

Equipment for a novel horizontal rotating soil washing process was developed and tested for pilot-scale remediation of soils from a site contaminated with chromium ore process residue. The Taguchi method was used for the experimental design, and the standard L16 orthogonal array with four parameters and four levels was selected for optimizing the operating parameters. Optimal removal efficiency was achieved at cylinder rotational velocity of 2.5 rpm, cylinder tilt angle of 2.6°, heating temperature of 200°C, and a liquid-soil ratio of 8. A comparison of the efficiency of citric acid as an extractant with that of water showed that citric acid could remove 22.89% more Cr(VI) than water in one-stage washing. The residual Cr(VI) concentration in the soil after three-stage washing was as low as 26.16 mg/kg, which meets the 30 mg/kg screening levels for soil environmental risk assessment of sites in Beijing City.

SCALING-UP PARAMETERS FOR SITE RESTORATION PROCESS USING SURFACTANT-ENHANCED SOIL WASHING COUPLED WITH WASTEWATER TREATMENT BY FENTON AND FENTON-LIKE PROCESSES
Bandala, E.R., H. Cossio, A.D. Sanchez-Lopez, F. Cordova, J.M. Peralta-Herandez, and L.G. Torres. Environmental Technology, Vol 34 Nos 1-4, 363-371, 2013

The authors estimated the parameters for scaling up a surfactant-enhanced soil washing process followed by the application of advanced oxidation processes (Fenton and photo-Fenton) to treat the washing wastewater for pesticide (2,4-D) removal. An agitation speed of 1,550 rpm achieved the best pesticide removal from contaminated soil. More power was required at higher soil pesticide concentration. The best degradation conditions were for the photo-Fenton process using $[Fe(II)] = 0.3$ mM; $[H_2O_2] = 4.0$ mM, where complete 2,4-D and sodium dodecylsulfate removal was observed after 8 and 10 minutes of reaction, respectively.

PILOT-SCALE WASHING OF PB, ZN AND CD CONTAMINATED SOIL USING EDTA AND PROCESS WATER RECYCLING
Voglar, D. and D. Lestan.
Chemosphere, Vol 91 No 1, 76-82, 2013

Soil washing with EDTA chelating agent in batches at pilot scale removed metals at ranges of 69-84% Pb, 22-64% Zn, and 52-70% Cd. After soil washing, the solid phase and used washing solution were separated in a chamber filter press, and up to 71% of the EDTA was recycled with acid precipitation and alkaline pre-treatment of process solutions, which removed the metals (including all Fe) from the EDTA complex. Treating the washing solution by electrochemical advanced oxidation processes removed the remaining metals (up to 99.9% Pb, 98.9% Zn, and 99.4% Cd) and EDTA (up to 99.9%) in the solution with the electrodeposition of metals on the stainless steel cathode. The entire process solution was recycled and used for soil washing/rinsing, and no wastewater was generated. The material costs, electricity, and consumables were within the frame of currently available technologies.

A LOW-FOAMING AND BIODEGRADABLE SURFACTANT AS A SOIL-FLUSHING AGENT FOR DIESEL-CONTAMINATED SOIL
Lee, Y.-C., Moon-Hee Choib, Jong-In Hana, Yoo Lan Limc & Myunggin Leed
Separation Science and Technology, Vol 48 No 12, 1872-1880, 2013

A novel low-foaming and biodegradable surfactant, consisting of a nonionic head and acyl tail, was synthesized by the base-catalyzed additions of ethylene oxide and propylene oxide to oleic acid. Measured surface tension was ~35.1 mN/m, with a critical micelle concentration of 0.026 mM. Both the viscosity and the foaming tendency were relatively low compared to the reported values of similar surfactants. Feasibility tests using diesel-contaminated soils demonstrated the surfactant's potential as a soil-flushing agent at a level comparable to that of nonionic commercial products.

LOW AND HIGH ACETATE AMENDMENTS ARE EQUALLY AS EFFECTIVE AT PROMOTING COMPLETE DECHLORINATION OF TRICHLOROETHYLENE (TCE)
Wei, N. and K.T. Finneran.
Biodegradation, Vol 24 No 3, 413-425, 2013

Experiments with TCE-contaminated aquifer material demonstrated that TCE, cis-DCE, and VC were completely degraded with concurrent Fe(III) or Fe(III)+sulfate reduction when acetate was amended at stoichiometric concentration; competing terminal electron accepting processes did not inhibit ethene production. Adding 10 times more acetate increased methane production without affecting the rate or extent of TCE reduction. Concurrent Fe(III) or Fe(III)+sulfate reduction in enrichment cultures degraded ~90 µM TCE or ~22 µM VC primarily to ethene within 20 days. Results suggest that adding low levels of substrate may be equally if not more effective as high concentrations without producing excessive methane and with substantial bearing on treatment cost.

FIELD-SCALE TRANSPORT AND TRANSFORMATION OF CARBOXYMETHYLCELLULOSE-STABILIZED NANO ZERO-VALENT IRON
Johnson, R.L., J.T. Nurmi, G.S. O'Brien Johnson, D. Fan, R.L. O'Brien Johnson, Z. Shi, A.J. Salter-Blanc, P.G. Tratnyek, and G.V. Lowry.
Environmental Science & Technology, Vol 47 No 3, 1573-1580, 2013

The fate of nano-scale zerovalent iron (NZVI) during subsurface injection was examined using carboxymethylcellulose (CMC)-stabilized NZVI in a very large 3-D physical model aquifer. To quantify the extent of NZVI transport directly, a spectrophotometric method was developed, and the results indicated that deployment of unoxidized NZVI for groundwater remediation likely will be difficult.

COMPOUND SPECIFIC ISOTOPE RATIO ANALYSIS IN VAPOUR INTRUSION STUDIES USING WATERLOO MEMBRANE SAMPLER (WMS)
Goli, Oana, Master's thesis, University of Waterloo, Waterloo, ON, Canada, 93 pp, 2013

In a study of the applicability of the Waterloo Membrane Sampler (WMS) for compound-specific isotope analysis (CSIA) in vapor intrusion studies, analyte amounts sufficient for CSIA were collected using thermal desorption to introduce the sample into the gas chromatography-isotope ratio mass spectrometry system (TD-GC-IRMS). The TD-GC-IRMS system was employed to determine the stable carbon isotopic composition of three model analytes—hexane, benzene, and TCE—contained in a standard gas mixture. The WMS-TD-GC-IRMS method was tested on sample gases collected during a gasoline biosparging treatment by exposing the samplers to the standard gas for 3, 6, 12, 24, 48, 96, and 192 hours. Variations of the isotopic carbon composition for each analyte were measured versus time, amount of analytes sorbed, and exposure temperature. When compared with solvent base-active sample collection and analysis, the study results obtained demonstrated good data reproducibility. http://uwspace.uwaterloo.ca/handle/10012/7295

REMEDIATION OF A MERCURY-CONTAMINATED INDUSTRIAL SOIL USING BIOAVAILABLE CONTAMINANT STRIPPING
Pedron, F., G. Petruzzelli, M. Barbafieri, and E. Tassi.
Pedosphere, Vol 23 No 1, 104-110, 2013

Using plants to remove bioavailable amounts of heavy metals from contaminated soil has been dubbed "bioavailable contaminant stripping" (BCS), a type of remediation phytotechnology. Pot trials carried out under greenhouse conditions were conducted to evaluate the ability of three common plant species, *Brassica juncea*, *Poa annua*, and *Helianthus annus*, to remove bioavailable amounts of mercury from a contaminated industrial soil containing 15.1 mg/kg Hg. The BCS remediation approach was enhanced by the addition of a strong mobilizing agent, ammonium thiosulfate, to increase mercury bioavailability. After one growth cycle, the plants had removed nearly all the bioavailable mercury (95.7%). The metal remaining in the soil was considered inert because it was neither extractable by ammonium thiosulfate nor taken up by plants during a second growth cycle. The enhanced BCS process removed the most dangerous metal forms while substantially shortening the cleanup time. Additional background on this study is available in a 2012 paper at http://www.aidic.it/cet/12/28/036.pdf

COMPARISON OF MINERAL-BASED AMENDMENTS FOR EX-SITU STABILIZATION OF TRACE ELEMENTS (AS, CD, CU, MO, NI, ZN) IN MARINE DREDGED SEDIMENTS: A PILOT-SCALE EXPERIMENT
Mamindy-Pajany, Y., C. Hurel, F. Geret, M. Romeo, and N. Marmier.
Journal of Hazardous Materials, Vols 252-253, 213-219, 2013

A pilot-scale experiment was performed to stabilize As, Cd, Cu, Mo, Ni, and Zn in contaminated sediment using hematite, zero-valent iron, and zeolite. Although zeolite proved unsuitable, the iron-based amendments were able to reduce the leaching and the bioavailability of trace elements in the sediment sample, potentially presenting a low-cost alternative to traditional stabilization methods involving chemical reagents.

DEVELOPMENT OF CHEMICAL REDUCTION AND AIR STRIPPING PROCESSES TO REMOVE MERCURY FROM WASTEWATER
Jackson, D., B. Looney, B. Craig, M. Thompson, and T. Kmetz.
SRNL-STI-2013-00409, 26 pp, July 2013

When the existing baseline air stripping process for removing organics from wastewater at the Savannah River site was ineffective in removing mercury at ~250 ng/L to a proposed limit of 51 ng/L Hg, a continuous dose of reducing agent (an acidified solution of tin(II) chloride dihydrate) was injected for 6 hrs at the inlet of the air stripper. This action resulted in the chemical reduction of mercury to Hg(0), a species that the existing unit operation can remove. A 94% decrease in Hg concentration was observed during the injection period, and the effluent satisfied proposed limits. A minimum dose of 6.65 mg/min (16X stoichiometry) was needed to initiate the reduction reaction that facilitates Hg removal. Results indicate that chemical reduction coupled with air stripping can treat large volumes of water to emerging parts-per-trillion regulatory standards for mercury. http://www.osti.gov/scitech/servlets/purl/1097601

THERMAL TECHNIQUES FOR THE IN-SITU CHARACTERIZATION AND REMEDIATION OF MERCURY: INSIGHTS FROM DEPLOYMENT OF THE MEMBRANE INTERFACE PROBE
Jackson, D., B. Looney, and C.A. Eddy-Dilek.
SRNL-STI-2013-00434, 30 pp, Aug 2013 [Presented at the 11th International Conference on Mercury as a Global Pollutant, Jul 28-Aug 2, 2013. Edinburgh, Scotland]

This presentation focuses on how thermal energy can be used to enhance characterization, promote remediation, and aid in delivering a sequestering agent to stabilize elemental Hg in subsurface soils. Using heat, sulfur can be deployed as a gas in the subsurface, where it reacts spontaneously with elemental Hg to form more recalcitrant mercury sulfides (cinnabar). See slides and speaker's notes at http://www.osti.gov/scitech/servlets/purl/1089550

NOVEL INSTRUMENTS FOR IN SITU CONTINUOUS RN-222 MEASUREMENT IN GROUNDWATER AND THE APPLICATION TO RIVER BANK INFILTRATION
Gilfedder, B.S., H. Hofmann, and I. Cartwright.
Environmental Science & Technology, Vol 47 No 2, 993-1000, 2013

Little is known about the short-term dynamics of groundwater-surface water exchange in losing rivers, but two new instruments now available for continuous in situ Rn-222 measurement in bores can be used to quantify the surface water infiltration rate into an underlying or adjacent aquifer. These instruments are based on Rn-222 diffusion through silicone tube membranes, either wrapped around a pole (MonoRad) or strung between two hollow end pieces (OctoRad). They are combined with novel, robust, low-cost Geiger counter Rn-222 detectors, which are ideal for long-term autonomous measurement. The down-hole instruments have a quantitative response time of about a day during low flow, but this decreases to Additional information and a comparison of measurement methods are available at http://www.hydrol-earth-syst-sci.net/17/3437/2013/hess-17-3437-2013.pdf

RE-INVERSION OF SURFACE ELECTRICAL RESISTIVITY TOMOGRAPHY DATA FROM THE HANFORD SITE B-COMPLEX
Johnson, T.C. and D.M. Wellman.
PNNL-22520, 40 pp, May 2013

This report documents the 3-D inversion results of surface electrical resistivity tomography (ERT) data collected over the B-Complex site at Hanford to image the subsurface distribution of electrically conductive vadose zone contamination resulting from both planned releases of contamination into subsurface infiltration galleries (cribs, trenches, and tile fields) as well as unplanned releases from tank farms and associated facilities. To provide additional detail concerning contaminated zones in terms of conductive anomalies, the ERT data were re-inverted using the E4D inversion code, which improved imaging resolution significantly and allowed a better understanding of vadose zone contamination distribution at the B-Complex. http://www.osti.gov/scitech/servlets/purl/1087277

CHARACTERIZATION AND POTENTIAL REMEDIATION APPROACHES FOR VADOSE ZONE CONTAMINATION AT HANFORD 241-SX TANK FARM
Eberlein, S.J., H.A. Sydnor, D.L. Parker, and D.R. Glaser.
WRPS-54371-FP, 14 pp, 2013 [Presented at WM2013: Waste Management, Phoenix, Arizona, 24-28 Feb 2013]

Evaluation of previous work on vadose zone desiccation (pore-water extraction) at the Hanford 241-SX Tank Farm using large-diameter (>4 in) boreholes combined with laboratory test results has led to the design of a field proof-of-principle test to remove water and possibly mobile contaminants at greater depths via small boreholes placed with direct push. The proof-of-principle test is being deployed during fiscal year 2013, with testing to be completed during fiscal year 2014. http://www.osti.gov/scitech/servlets/purl/1060387

JOINT GEOPHYSICAL MODELING OF CONDUCTIVE PLUMES IN HISTORIC SMELTER TAILINGS, BUTTE, MT
Bertete-Aguirre, H., C. Link, N. Tucci, A. Adewuyi, B. Rutherford, and G. Favi.
SAGEEP 2013: Symposium on the Application of Geophysics to Environmental & Engineering Problems, 17-21 March, Denver, CO. 10 pp, 2013

The size and extent of a shallow groundwater plume influenced by acid mine drainage along historic Silver Bow Creek in Butte, Montana, was characterized using DC electrical, electromagnetic, and seismic data collected along monitoring wells. The study also identified the possible presence of deeper confined groundwater plumes. Modeling of DC resistivity sounding and profile data was used to build a conductivity reference map that was correlated with the site hydrological conductivity. Resistivity data collected using electrode separations that ranged from 1-300 meters gave conductivity images associated with the distribution of contaminants with depth as well as a measure of the effects of the local electrical anisotropy. The electromagnetic data were acquired in a dense grid over the study area with inter-coil separations ranging from 3-20 meters. Seismic refraction tomography lines aided the resolution of the unresolved conductivity anomalies. The joint geophysical imaging techniques used in this work were able to provide an important characterization for the area of study.

A MODEL MANAGEMENT SYSTEM FOR NUMERICAL SIMULATIONS OF SUBSURFACE PROCESSES
Zachmann, D.
DOE-VCT-4661, 16 pp, Oct 2013

DOE and other federal agencies have committed significant resources to developing mathematical models for studying subsurface science problems, such as groundwater flow, fate of contaminants, and carbon sequestration. The Subsurface Science Resource Network website (http://subsurface.vistacomputational.com/home/) provides new tools to help decision-makers and stakeholders in subsurface science-related problems select an appropriate set of simulation models for a given field application. The website is designed to provide a gathering place for the subsurface science modeling community to share and discuss numerical models, data sets, and model results.
http://www.osti.gov/scitech/servlets/purl/1095616

PRELIMINARY DATA REPORT: HUMATE INJECTION AS AN ENHANCED ATTENUATION METHOD AT THE F-AREA SEEPAGE BASINS, SAVANNAH RIVER SITE
Millings, M., M.B. Amidon, M.E. Denham, and B.B. Looney.
SRNL-STI-2013-00514, 39 pp, Sep 2013

The groundwater plume at the F-Area field research site located in DOE's Savannah River facility contains many contaminants, including strontium-90, uranium isotopes, iodine-129, tritium, and nitrate. Groundwater remains acidic, with pH as low as 3.2 near the basins and increasing to the background pH of ~5at the plume fringes. Following three months of baseline monitoring, a potassium humate solution was injected in monitoring well FOB 16D. After 4.5 months of post monitoring, most of the humate that did not sorb to the sediments has flushed through the surrounding formation. Data indicate that the test was successful in loading a band of sediment surrounding the injection point to a point where pH could return to near normal during the study timeframe. http://www.osti.gov/scitech/servlets/purl/1096604

OPTIMAL FIELD APPROACHES FOR ELECTROKINETIC IN SITU OXIDATION REMEDIATION
Wu, M.Z., D.A. Reynolds, A. Fourie, and D.G. Thomas.
Ground Water Monitoring & Remediation, Vol 33 No 1, 62-74, 2013

Numerical simulations were used to identify and evaluate optimum electrode configurations and approaches for electrokinetic in situ chemical oxidation (EK-ISCO) remediation of low-permeability sediments. This paper is Open Access at http://onlinelibrary.wiley.com/doi/10.1111/j.1745-6592.2012.01410.x/full

General News

DRAFT GROUNDWATER REMEDY COMPLETION STRATEGY
U.S. Environmental Protection Agency, Oct 2013

EPA's Office of Superfund Remediation and Technology Innovation is seeking input on a draft groundwater remedy completion strategy. The 22-page document provides a strategy to help site teams focus resources on the information and decisions needed to complete groundwater remedies effectively. The strategy comprises recommended site-specific course(s) of action and decision-making processes to achieve groundwater remedial action objectives and associated cleanup levels using an updated conceptual site model, performance metrics, and data derived from site-specific remedy evaluations. Several related documents are posted with the strategy at http://epa.gov/superfund/gwcompletionstrategy. Comments on the strategy should be emailed to gwcompletionstrategy@epa.gov by December 20, 2013.

TOXICOLOGICAL REVIEW OF 1,4-DIOXANE (WITH INHALATION UPDATE) IN SUPPORT OF SUMMARY INFORMATION ON THE INTEGRATED RISK INFORMATION SYSTEM (IRIS)
Gillespie, P., E.D. McLanahan, R. Sams, J. Stanek, et al.
EPA 635-R-11-003F, 419 pp, Sep 2013

EPA has updated the 2005 toxicological review and final IRIS summary for 1,4-dioxane to provide scientific support and rationale for the hazard and dose-response assessment in IRIS pertaining to chronic exposure to the compound. http://www.epa.gov/iris/subst/0326.htm
Additionally, the Interagency Science Discussion Draft of the 1,4-dioxane IRIS assessment is available at http://cfpub.epa.gov/ncea/iris_drafts/recordisplay.cfm?deid=247493

TOXICOLOGICAL PROFILE FOR 1,4-DIOXANE
Agency for Toxic Substances and Disease Registry, 295 pp, 2012

This peer-reviewed profile identifies and reviews the key literature that describes 1,4-dioxane's toxicologic properties; chemical and physical information; production, import, use, and disposal; potential for human exposure; analytical methods; and regulations and advisories.http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=955&tid=199

MATRIX DIFFUSION TOOLKIT USER'S MANUAL
Farhat, S.K., C.J. Newell, T.C. Sale, D.S. Dandy, J.J. Wahlberg, M.A. Seyedabbasi, J.M. McDade, and N.T. Mahler
ESTCP Project ER-201126, 160 pp, 2012

A new spreadsheet-based tool helps site managers and consultants determine if matrix diffusion processes in groundwater will cause rebound of downgradient plume concentrations above remediation goals after plume remediation or isolation is complete. This information will assist stakeholders in selecting remedies and improving effective risk communication. The user's manual details the tools provided to calculate and evaluate matrix diffusion effects, including a discussion of key parameters built into the toolkit and frequently asked questions related to matrix diffusion. The project summary presentation provides an overview.

Manual: http://www.serdp.org/content/download/19988/213989/version/3/file/MatrixDiffusionToolkit_UsersManual.pdf
Project Summary Presentation: http://www.serdp.org/Tools-and-Training/Videos/ER-201126-Project-Summary-Presentation
Toolkit: http://www.serdp.org/content/download/19987/213979/version/1/file/ER-201126+Matrix+Diffusion+toolkit+March+2013.zip

EPA-EXPO-BOX (A TOOLBOX FOR EXPOSURE ASSESSORS)
U.S. EPA, Environmental Assessment Website, 2013

A new online toolbox is now available for exposure and risk assessors. EPA-Expo-box is a Web-based compendium of 800+ exposure assessment tools that provides links to exposure assessment databases, models, and references. The website is organized by the components of the exposure assessment process in a user-friendly format. It provides one-stop shopping for the latest exposure assessment tools and techniques that can be used by EPA and others to support scientifically defensible exposure and risk assessments.http://epa.gov/ncea/risk/expobox/.

RESIDUAL LNAPL IMPACTED SITES: CONCEPTUAL SITE MODELS AND EFFECTIVE REMEDIAL STRATEGIES
American Institute of Professional Geologists (Kentucky Section), 2013

On April 26, 2013, the Kentucky section of the American Institute of Professional Geologists held an all-day professional development course on LNAPL cleanup. Presenters discussed modeling, assessment, and remedial methods currently being used to achieve goals determined by site-specific environmental and regulatory requirements. The workshop provided examples of methodologies that have proven successful in attaining No Further Action letters from the state of Kentucky. PDF files of the seven course sections are available at http://ky.aipg.org/Articles.htm.

HAZARDOUS WASTE TREATMENT, STORAGE AND DISPOSAL FACILITY (TSDF) REGULATIONS: A USER FRIENDLY REFERENCE DOCUMENT FOR RCRA SUBTITLE C PERMIT WRITERS AND PERMITTEES
U.S. EPA, Office of Solid Waste and Emergency Response. EPA 530-R-11-006, 64 pp, Oct 2013

EPA has developed this third edition of the TSDF tool to facilitate stakeholder's understanding of RCRA's requirements. The tool gathers in one place all publicly available resources for easy access. The resources include permit appeals; proposed and final Federal Register notices for Parts 264, 265, 266, 268, 270, and 124; flow charts of the permitting process that show how the public can be involved; training modules; example permits; and links to the actual regulations. The usefulness of this reference document is maximized when it is viewed on a computer that is connected to the Internet, which allows immediate navigation to supporting information.
http://www.epa.gov/wastes/hazard/tsd/permit/tsd-regs/tsdf-ref-doc.pdf

NEW SPECTROMETRY STANDARD FOR HANDHELD CHEMICAL DETECTORS AIDS FIRST RESPONDERS
NIST Tech Beat, 24 Oct 2013

The recent publication of a new standard—a culmination of years of research at the National Institute of Standards and Technology—provides confidence that results from handheld chemical detectors can be compared, apples-to-apples. The new standard, published recently by ASTM International, is intended as a guide to correct the output from different handheld Raman spectrometers so that different instruments produce the same result for the same sample. Additional information on E2911-13, "Standard Guide for Relative Intensity Correction of Raman Spectrometers," is available at http://www.astm.org/Standards/E2911.htm. See the full NIST news release at http://www.nist.gov/oles/spectrom_standard_10242013.cfm.

NANOREM: TAKING NANOTECHNOLOGICAL REMEDIATION PROCESSES FROM LAB SCALE TO END USER APPLICATIONS FOR THE RESTORATION OF A CLEAN ENVIRONMENT

The 4-year NanoRem research project, funded under the European Commission FP7 from February 2013 through January 2017, will focus on facilitating practical, safe, economic, and exploitable nanotechnology for in situ remediation. This effort will be undertaken in parallel with developing a comprehensive understanding of the environmental risk-benefit for the use of nanoparticles, market demand, overall sustainability, and stakeholder perceptions in the EU environmental sector. Because the NanoRem website is still under construction, CL:AIRE has released the first NanoRem newsletter, which summarizes the project's ambitious objectives and the work undertaken in each of its 11 work packages. Download the newsletter at http://www.claire.co.uk/index.php?option=com_phocadownload&view=file&id=384:Other-CLAIRE-Documents&Itemid=61.

CATALYZED PERSULFATE FOR GROUNDWATER AND SOIL REMEDIATION
Wilson, S.
Pollution Engineering, June 2013

This paper outlines in situ chemical oxidation technologies employed in environmental remediation, discusses the traditional technologies employed to activate persulfate, and introduces PersulfOx™, a new catalyzed persulfate chemistry that has been demonstrated to degrade contaminants effectively in situ while reducing the need for activation chemicals. http://digital.bnpmedia.com/article/Catalyzed+Persulfate+For+Groundwater+And+Soil+Remediation/1411394/0/article.html
A longer version of this white paper is available at http://www.pollutionengineering.com/ext/resources/PE/2013/June/White_Paper_on_PersulfOx_Catalyzed_Persulfate_Advancing_In_Situ_Chemical_Oxidation_T.pdf.

SOIL REMEDIATION AND REHABILITATION: TREATMENT OF CONTAMINATED AND DISTURBED LAND
Meuser, H.
Springer, New York. ISBN: 9789400757509, Environmental Pollution Vol 23, 2013

In 2006, the Commission of the European Communities estimated the number of contaminated sites in the European Union at 3.5 million sites, affecting 231 million people and representing a market value of 57 billion Euros. This book presents an overview of the state of art of existing remediation technologies from a technical and practical perspective. The table of contents and chapter abstracts can be reviewed athttp://link.springer.com/book/10.1007/978-94-007-5751-6.

PROCESSES, ASSESSMENT AND REMEDIATION OF CONTAMINATED SEDIMENTS
Reible, D.D. (ed).
Springer, New York. ISBN: 978-1-4614-6726-7, SERDP ESTCP Environmental Remediation Technology Series, Vol 6, 462 pp, 2013

This book is designed to help identify and implement management approaches that provide solutions to sediment contaminant problems. Following an introduction to contaminated sediment management that summarizes the trade-offs between natural attenuation, containment, and active removal, the book offers (1) a series of chapters describing key sediment processes that separate sediment sites from contaminated soil sites, (2) a series of chapters describing sediment risk assessment approaches, and (3) a series of chapters describing sediment risk management (i.e., remedial approaches and their design). The final chapter identifies key uncertainties and resulting research and development needs. The table of contents and chapter abstracts can be reviewed athttp://link.springer.com/book/10.1007%2F978-1-4614-6726-7.

SUSTAINABLE REMEDIATION OF URBAN BROWNFIELDS: IMPROVING ENVIRONMENTAL OUTCOME THROUGH LCA
Sanscartier, D., S. MacWilliam, and M. Wismer.
LCA XII, 25-27 September 2013, Tacoma, Washington. American Center for Life Cycle Assessment, 17 slides, 2013

The applicability of life-cycle assessment (LCA) to site remediation is well documented in the literature. Three types of environmental impacts have been categorized for remediation: primary (those associated with the contaminants); secondary (those associated with the remediation activities); and tertiary (those associated with the future land use). While primary impacts are typically local, secondary and tertiary impacts can be local, regional, and global. Although focusing the LCA on secondary impacts is the most straightforward analysis, considering primary and tertiary impacts provides additional information to decision makers. This presentation introduces sustainable remediation, presents the application of LCA methodology to site remediation through case studies carried out by the authors and published in the literature, and notes lessons learned. http://lcacenter.org/lcaxii/final-presentations/652.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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