U.S. ENVIRONMENTAL PROTECTION AGENCY

TechDirect, November 1, 2018

Welcome to TechDirect! Since the October 1 message, TechDirect gained 55 new subscribers for a total of 38,922. If you feel the service is valuable, please share TechDirect with your colleagues. Anyone interested in subscribing may do so on CLU-IN at https://clu-in.org/techdirect . All previous issues of TechDirect are archived there. The TechDirect messages of the past can be searched by keyword or can be viewed as individual issues.

TechDirect's purpose is to identify new technical, policy and guidance resources related to the assessment and remediation of contaminated soil, sediments and groundwater.

Mention of non-EPA documents or presentations does not constitute a U.S. EPA endorsement of their contents, only an acknowledgment that they exist and may be relevant to the TechDirect audience.

> Funding Opportunity

FY 2020 Strategic Environmental Research and Development Program (SERDP) Solicitations. The Department of Defense's SERDP is seeking environmental research and development proposals for funding beginning in FY 2020. Projects will be selected through a competitive process. The Core Solicitation provides funding opportunities for basic and applied research and advanced technology development. Core projects vary in cost and duration consistent with the scope of the work proposed. The Statements of Need (SON) referenced by this solicitation request proposals related to the SERDP program areas of Environmental Restoration (ER), Munitions Response (MR), Resource Conservation and Resiliency (RC), and Weapons Systems and Platforms (WP). The SERDP Exploratory Development (SEED) Solicitation provides funding opportunities for work that will investigate innovative environmental approaches that entail high technical risk or require supporting data to provide proof of concept. Funding is limited to not more than $200,000 and projects are approximately one year in duration. This year, SERDP is requesting SEED proposals for the Munitions Response and Weapons Systems and Platforms program areas. All Core pre-proposals are due January 8, 2019. SEED proposals are due March 5, 2019. For more information and application instructions, see https://www.serdp-estcp.org/Funding-Opportunities/SERDP-Solicitations.

> Upcoming Live Internet Seminars

ITRC Connecting the Science to Managing LNAPL Sites a 3 Part Series - November 6 and 13, 2018 (Part 1 presented on October 30) . The newly updated LNAPLs (Light Non-Aqueous Phase Liquids) 3-part training course series is based on

the ITRC guidance: LNAPL Site Management: LCSM Evolution, Decision Process, and Remedial Technologies (LNAPL-3, 2018) and focuses on connecting the science to managing LNAPL sites and helping you: build upon your understanding of LNAPL behavior in the subsurface (Part 1), develop your LNAPL conceptual site model and LNAPL remedial goals (Part 2), and select/implement LNAPL technologies (Part 3).
After this training series, the expectation is that you will have the skills and understanding to use ITRC science-based resources to improve decision making at your LNAPL sites. For regulators and other government agency staff, this improved understanding can hopefully be incorporated into your own LNAPL programs. It is expected that participants will attend this 3-part training series in sequence. For more information and to register, see https://www.itrcweb.org or https://clu-in.org/live.

NARPM Presents…Introduction to Near Surface Environmental Geophysics Webinar - A Practical Guide for Commonly Used Methods and Applications - November 8, 2018, 1:00PM-3:00PM EST (18:00-20:00 GMT). This webinar will present a general overview of several geophysical methods which are commonly used at environmental waste sites. The primary focus will be keyed to practical applications of each method. Geophysical tools will be presented in a manner so that the participant will be able to identify each tool by its physical appearance, what properties are measured, how information is collected and processed, method detection limits, how to select the most effective method, methods that complement each other, and situations where some methods will not work. Also presented are details on how to plan or manage a geophysical survey which include gathering information to properly customize a survey to detect alleged targets. A brief introduction will also be given for a few basic borehole geophysical tools specifically for shallow two-inch diameter monitoring wells to optimize information gathering during well construction and for long term monitoring. Examples of surface and borehole information will conclude the webinar. For more information and to register, see https://clu-in.org/live.

Chlorinated Solvent Bioremediation: Fundamentals and Practical Application for Remedial Project Managers - November 14, 2018, 1:00PM-2:30PM EST (18:00-19:30 GMT). Anaerobic reductive dechlorination (ARD) can be used to cost-effectively remediate chlorinated solvent sites. In ARD, microbial communities use substrates to sequentially degrade chlorinated solvents such as trichlorethylene (TCE). Depending on conditions at a site, remediation may involve adding substrates (biostimulation) and/or dechlorinating organisms (bioaugmentation). This presentation will discuss the biological and chemical principles of this technology and is geared toward remedial project managers. Key considerations for site specific application will be covered. In addition, case studies will provide examples of data from sites displaying ARD as well as sites with poor performance or insufficient data. For more information and to register, see https://clu-in.org/live.

Groundwater/Surface Water Interactions: Developing Conceptual Site Models of Organism Exposures in Hyporheic Systems - November 16, 2018, 11:30AM-6:30PM EST (16:30-23:30 GMT). This training workshop will present an overview of the relationships and interactions between groundwater and surface water bodies, giving participants a greater understanding of potential exposure scenarios. Discussions will focus on developing effective conceptual site models and how to collect useful data from the hyporheic zone, with case study examples. The training will end with a panel discussion and direction to EPA resources. This workshop's content is directed toward Federal, State, Tribal, and University-level scientists, particularly hydrogeologists, ecologists, risk assessors, remedial project managers (RPMs), National Environmental Policy Act (NEPA) project reviewers, Tribal Specialists, EPA Superfund Technical Liaisons (STLs), EPA Regional Science Liaisons (RSLs), EPA Regional Science Councils (RSCs), and those involved with underground storage tanks. For more information and to register, see https://clu-in.org/live.

Effectiveness of Point of Entry Systems to Remove Select Per- and Poly-fluoroalkyl Substances from Drinking Water - November 26, 2018, 1:00PM-2:30PM EST (18:00-19:30 GMT). Per- and poly-fluoroalkyl Substances (PFAS) contamination of groundwater sources in the U.S. is a widespread problem for the drinking water industry. Well water supplies in the municipalities of Fountain, Security, and Widefield, Colorado, contain Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) greater than U.S. Environmental Protection Agency (EPA) health advisory level of 70 nanograms/liter (ng/L). The source of PFAS in the well water has been associated with aqueous film forming foam (AFFF) at Peterson Air Force Base (AFB). Several public water systems and numerous private well owners use the impacted Widefield Aquifer as their sole source of drinking water. To assist property owners and limit exposure of PFAS in residential drinking water systems, treatability studies were conducted by EPA on the PFAS removal effectiveness of commercially available Point-of-Use (POU)/Point-of-Entry (POE) units using Reverse Osmosis (RO) treatment and Granular Activated Carbon (GAC) adsorbents. Household water systems were tested with a representative test water with the water quality characteristics and six PFAS contaminants found in Widefield Aquifer region groundwater samples. The study also documented the ease of use during installation, startup, and continuous/intermittent operation of the water systems. For more information and to register, see https://clu-in.org/live.

ITRC Bioavailability of Contaminants in Soil: Considerations for Human Health Risk Assessment - November 27, 2018, 1:00PM-3:15PM EST (18:00-20:15 GMT). The basis for this training course is the ITRC guidance: Bioavailability of Contaminants in Soil: Considerations for Human Health Risk Assessment (BCS-1). This guidance describes the general concepts of the bioavailability of contaminants in soil, reviews the state of the science, and discusses how to incorporate bioavailability into the human health risk assessment process. The target audience for this guidance and training course are: project managers interested in decreasing uncertainty in the risk assessment which may lead to reduced remedial action costs, and risk assessors new to bioavailability or those who want additional confidence and training in the current methods and common practices for using bioavailability assessment to more accurately determine human health risk at a contaminated site. As a participant in this training you should learn to: apply the decision process to determine when a site-specific bioavailability assessment may be appropriate, use the ITRC Review Checklist to develop or review a risk assessment that includes soil bioavailability, consider factors that affect arsenic, lead and PAH bioavailability, select appropriate methods to evaluate soil bioavailability, and use tools to develop site-specific soil bioavailability estimates and incorporate them into human health risk assessment. For more information and to register, see https://www.itrcweb.org or https://clu-in.org/live.

ITRC Long-term Contaminant Management Using Institutional Controls - Nov 29, 2018, 1:00PM-3:15PM EST (18:00-20:15 GMT). Institutional controls (ICs) are administrative or legal restrictions that provide protection from exposure to contaminants on a site. When ICs are jeopardized or fail, direct exposure to human health and the environment can occur. While a variety of guidance and research to date has focused on the implementation of ICs, ITRC's Long-term Contaminant Management Using Institutional Controls (IC-1, 2016) guidance and this associated training class focuses on post-implementation IC management, including monitoring, evaluation, stakeholder communications, enforcement, and termination. The ITRC guidance and training will assist those who are responsible for the management and stewardship of ICs. After attending the training, participants will be able to: describe best practices and evolving trends for IC management at individual sites and across state agency programs; use this guidance to improve IC reliability and prevent IC failures, improve existing, or develop new, IC Management programs, identify the pros and cons about differing IC management approaches; use the tools to establish an LTS plan for specific sites; and use the elements in the tools to understand the information

that should populate an IC registry or data management system. For more information and to register, see http://www.itrcweb.org or https://clu-in.org/live.

ITRC Characterization and Remediation of Fractured Rock - December 4, 2018, 1:00PM-3:15PM EST (18:00-20:15 GMT). The basis for this training course is the ITRC guidance: Characterization and Remediation of Fractured Rock. The purpose of this guidance is to dispel the belief that fractured rock sites are too complex to characterize and remediate. The physical, chemical and contaminant transport concepts in fractured rock have similarities to unconsolidated porous media, yet there are important differences. By participating in this training class, you should learn to use ITRC's Fractured Rock Document to guide your decision making so you can: develop quality Conceptual Site Models (CSMs) for fractured rock sites, set realistic remedial objectives, select the best remedial options, monitor remedial progress and assess results, and value an interdisciplinary site team approach to bring collective expertise to improve decision making and to have confidence when going beyond containment and monitoring -- to actually remediating fractured rock sites. For more information and to register, see https://www.itrcweb.org or https://clu-in.org/live.

Highlight from the CLU-IN Seminar Archives. Each edition of TechDirect highlights a previously recorded internet seminar from our archives that may be of interest to our readers. We welcome your feedback on this addition to TechDirect.

Mining Waste Treatment Technology Selection, Sponsor Interstate Technology and Regulatory Council, Archive of May 20, 2014 Seminar (2 Hours, 15 Minutes). ITRC's Mining Waste Team developed the ITRC Web-based Mining Waste Technology Selection site to assist project managers in selecting an applicable technology, or suite of technologies, which can be used to remediate mine waste contaminated sites. Decision trees, through a series of questions, guide users to a set of treatment technologies that may be applicable to that particular site situation. Each technology is described, along with a summary of the applicability, advantages, limitations, performance, stakeholder and regulatory considerations, and lessons learned. Each technology overview links to case studies where the technology has been implemented. In this associated Internet-based training, instructors provide background information then take participants through the decision tree using example sites. Project managers, regulators, site owners, and community stakeholders should attend this training class to learn how to use the ITRC Web-based Mining Waste Technology Selection site to identify appropriate technologies, address all impacted media, access case studies, and understand potential regulatory constraints. To replay the archived webinar, visit https://clu-in.org/conf/itrc/mwtts_052014/ .

> New Documents and Web Resources

New Mining Sites Issue Area Section on Developing a Watershed Partnership. The Characterization, Cleanup, and Revitalization of Mining Sites issue area has a new section devoted to creating and fostering partnerships to address mining sites on a watershed basis. Addressing sites separately could result in inefficient or incomplete cleanups. However, by developing a partnership among watershed stakeholders, a more holistic and comprehensive cleanup and restoration of the watershed can be achieved. The Federal Mining Dialogue, whose members represent 14 federal agencies, formed the Watershed and Partnerships Working Group to create and share materials that may be useful in developing and maintaining partnerships. These materials and other resources are available for download and links to example partnerships are provided. View and use at https://clu-in.org/mining/Watershed-Partnership.

Superfund Research Program Research Brief 285: Why Shallow Lake Food Webs May Have More Arsenic. Lake properties impact the amount of arsenic that transfers from sediments into the aquatic food web, according to a new Superfund Research Program (SRP) study. Researchers discovered high concentrations of arsenic in the water and plankton of well-mixed shallow lakes. The water in shallow lakes warms more uniformly that in deep, thermally stratified lakes, enabling these lakes to remain well-mixed with only brief periods of stratification. According to the study by University of Washington (UW) SRP Center researchers, this mixing leaves more of an opportunity for arsenic in the sediments to move up into the overlying water and enter the aquatic food web. For more information, see https://tools.niehs.nih.gov/srp/researchbriefs/view.cfm?Brief_ID=285. To get monthly updates on research advances from the SRP you can subscribe to their Research Brief mailing list at https://list.nih.gov/cgi-bin/wa.exe?SUBED1=SRP-BRIEF&A=1.

Technology Innovation News Survey Corner. The Technology Innovation News Survey contains market/commercialization information; reports on demonstrations, feasibility studies and research; and other news relevant to the hazardous waste community interested in technology development. Recent issues, complete archives, and subscription information is available at https://clu-in.org/products/tins/. The following resources were included in recent issues:

- Barbee Mill Groundwater Remediation Project: Performance Monitoring Report
- Closure Plan: Boomsnub/Airco Superfund Site, Hazel Dell, Washington
- In-Situ Chromium Treatability Study Results Report, Nevada Environmental Response Trust Site, Henderson, Nevada: Revision 1
- A Practical Approach for Remediation Performance Assessment and Optimization at DNAPL Sites for Early Identification and Correction of Problems Considering Uncertainty
- Demonstration of Fluorescent Magnetic Particles for Linking Sources to Sediments at DoD Sites
- Effect of Co-Contaminants Uranium and Nitrate on Iodine Remediation
- Evaluation of Iodine Remediation Technologies in Subsurface Sediments: Interim Status Report
- White Paper on Thermal Remediation Technologies for Treatment of Chlorinated Solvents: Santa Susana Field Laboratory, Simi Valley, California
- NEMC 2018: National Environmental Monitoring Conference, New Orleans, August 6-10, 2018
- Water Research Foundation: Hexavalent Chromium Projects
- Final Close-Out Report, Frontier Hard Chrome Superfund Site, WAD53614988, City of Vancouver, Clark County, Washington
- Validation of Passive Sampling Devices for Monitoring of Munitions Constituents in Underwater Environments: ESTCP Cost and Performance Report
- Validation of Stable Isotope Ratio Analysis to Document the Biodegradation and Natural Attenuation of RDX
- Financing Soil Remediation: Exploring the Use of Financing Instruments to Blend Public and Private Capital
- Green Finance Approaches to Soil Remediation: International Examples

EUGRIS Corner. New Documents on EUGRIS, the platform for European contaminated soil and water information. More than 17 resources, events, projects and news items were added to EUGRIS in October 2018. These can be viewed at http://www.eugris.info/whatsnew.asp . Then select the appropriate month and year for the updates in which you are interested. The following resource was posted on EUGRIS:

Conference Proceedings from REMEDIATE International Conference 2018. The REMEDIATE Innovative Training Network comprises eight beneficiaries from five EU

member states the UK, Ireland, Germany, Denmark, and Italyand 18 partner organizations. All participants in the project are committed to providing innovative research and training for more cost-effective and sustainable remediation of contaminated land. The network is a multidisciplinary collaboration between international research teams from academia and industry, each with complementary expertise in a wide range of site investigation and risk assessment technologies. The abstracts of this conference present the work across seven universities as organized in four themes: Contaminated Land Biology; Site Modeling, Risk Assessment and Risk Communication; Chemical Analysis, Monitoring and Prediction; and Advances in Land Management and Resource Recovery View or download from http://www.remediate.eu/RemediateFilestore/Conference2018/Filetoupload.835230.en.pdf .

> Conferences and Symposia

Registration Now Open! 3rd Western Symposium Design and Construction Issues at Hazardous Waste Sites, Denver, CO, November 5-7, 2018. This event is designed to encourage dialogue and information sharing on design and construction issues relevant to hazardous waste sites in the western United States. The applications of engineering and science associated with cleaning up hazardous waste sites continue to evolve rapidly. The goal of this symposium is to facilitate an interactive engagement between professionals from government and the private sector related to relevant and topical issues affecting our field. For more information and to register, see https://www.samedmp.org/dchws-west.

Best Practices for Site Characterization Throughout the Remediation Process, Boston, MA, December 3-6, 2018. This training course is based on best management practices (BMP) implemented by the U.S. EPA, partnership organizations, federal and state partners, and consultants. Participants will learn how to streamline projects in a legal, technically sound, and cost-effective manner. By taking the course, participants achieve the following objectives: integrate best practices into traditional project activities, effectively collect and communicate critical project information, design dynamic work strategies, recognize and overcome the challenges presented while implementing a dynamic work strategy, and use BMPs to support all phases of the environmental cleanup life cycle. For more information and to register, see https://trainex.org/offeringslist.cfm?courseid=1515.

Groundwater High-Resolution Site Characterization (HRSC), Chicago, IL, March 26-27, 2019. This training course focuses on groundwater characterization and discusses (1) the impacts of subsurface heterogeneity on the investigation and cleanup of groundwater and related media, (2) the need for scale-appropriate measurements and adequate data density, and (3) the tools and strategies that are available to overcome the impacts of subsurface heterogeneity. After taking this course, participants will be armed with information that will allow them to improve their subsurface investigation approaches and develop more realistic and comprehensive conceptual site models (CSM). CSMs developed based on HRSC strategies and tools will decrease site uncertainty, improve the remedy selection process for groundwater remedies, and better enable the evaluation, design, and implementation of targeted in situ and ex situ groundwater remedies. The Groundwater HRSC course is an advanced 2-day course. The recommended audience includes EPA, federal, state, tribal and private industry technical project managers, practitioners and other stakeholders involved in groundwater investigation and remediation. For more information and to register, see https://trainex.org/hrsc.

NOTE: For TechDirect, we prefer to concentrate mainly on new documents and the Internet live events. However, we do support an area on CLU-IN where announcement of conferences and courses can be regularly posted. We invite sponsors to input information on their events at https://clu-in.org/courses . Likewise, readers may visit this area for news of upcoming events that might be of interest. It allows users to search events by location, topic, time period, etc.

If you have any questions regarding TechDirect, contact Jean Balent at (703) 603-9924 or balent.jean@epa.gov. Remember, you may subscribe, unsubscribe or change your subscription address at https://clu-in.org/techdirect at any time night or day.

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