TechDirect, June 1, 2015

Welcome to TechDirect! Since the May 1 message, TechDirect gained 193 new subscribers for a total of 34,808. If you feel the service is valuable, please share TechDirect with your colleagues. Anyone interested in subscribing may do so on CLU-IN at http://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.

> Upcoming Live Internet Seminars

Remedial Action, Remedy Performance, and Long-Term Land Management at the Anaconda Smelter NPL site - June 4, 2015, 1:00PM-3:00PM EDT (17:00-19:00 GMT). Nearly 100 years of copper smelter operations and emissions at the Anaconda Smelter Superfund site left approximately 10,000 acres barren or sparsely vegetated, leaving dust problems and transport of contaminants of concern (COCs) to surface water and groundwater receptors. Early on in the planning process, it was recognized that whole-scale removal of the COCs (arsenic, copper, lead, zinc, and cadmium) was impracticable and infeasible. In situ treatment of soils and wastes, using alkaline amendments to raise pH and immobilize metals, was developed to re-establish vegetation. Methods to assess ecological dysfunction and assign remedial actions, treatability studies and demonstration plots were all developed in the 1980s and 1990s, resulting in remedial actions beginning in the late 1990s. As work is completed, more information was gained from the results. While much of the revegetation work was successful, other areas were not, particularly in those areas close to the former smelters where COC concentrations in soil were much higher. EPA identified phytotoxicity concerns in certain areas during the 2010 Five Year Review. EPA and the responsible party collaboratively conducted a study evaluating plant growth in remediated areas while looking at several factors such as COC levels in soil. This evaluation led to development of a total metal index for soil based on the probable success of reclamation grass species. Using this information, EPA and the responsible party revised the existing vegetation management plan for the site to allow for voluntary remediation to achieve higher levels of cleanup to allow unrestrictive land use (e.g., with no long-term O&M requirements). This represents a "win-win" for the landowner, the responsible party, and the regulatory agencies. This webinar will review the results of over 20 years of remedial activities at the Anaconda Smelter site, and how the knowledge gained from this work has been used to develop a better cleanup that satisfies all party involved. For more information and to register, see http://clu-in.org/live.

An Introduction to Green and Sustainable Remediation: What, Who, Why, and How - June 10, 2015, 1:00PM-3:00PM EDT (17:00-19:00 GMT). Provides an introductory overview of Green and Sustainable Remediation that consolidates concepts, definitions, and answers the following questions: What is it? Who does it? Why do it? How to implement it? and, What are the benefits gained? The webinar will also provide resources and case studies to illustrate GSR concepts. For more

information and to register, see http://clu-in.org/live.

ITRC Environmental Molecular Diagnostics: New Tools for Better Decisions - June 16, 2015, 1:00PM-3:15PM EDT (17:00-19:15 GMT). Environmental molecular diagnostics (EMDs) are a group of advanced and emerging analytical techniques used to analyze biological and chemical characteristics of environmental samples. Although EMDs have been used over the past 25 years in various scientific fields, particularly medical research and diagnostic fields, their application to environmental remediation management is relatively new and rapidly developing. The ITRC Environmental Molecular Diagnostics Fact Sheets (EMD-1, 2011), ITRC Environmental Molecular Diagnostics Technical and Regulatory Guidance (EMD-2, 2013) and this companion Internet-based training will foster the appropriate uses of EMDs and help regulators, consultants, site owners, and other stakeholders to better understand a site and to make decisions based on the results of EMD analyses. At the conclusion of the training, learners should be able to determine when and how to use the ITRC Environmental Molecular Diagnostics Technical and Regulatory Guidance (EMD-2, 2013); define when EMDs can cost-effectively augment traditional remediation data sets; and describe the utility of various types of EMDs during remediation activities. For more information and to register, see http://www.itrcweb.org or http://clu-in.org/live.

ITRC Biochemical Reactors for Treating Mining Influenced Water - June 18, 2015, 1:00PM-3:15PM EDT (17:00-19:15 GMT). Mining influenced water (MIW) includes aqueous wastes generated by ore extraction and processing, as well as mine drainage and tailings runoff. MIW handling, storage, and disposal is a major environmental problem in mining districts throughout the U.S. and around the world. Biochemical reactors (BCRs) are engineered treatment systems that use an organic substrate to drive microbial and chemical reactions to reduce concentrations of metals, acidity, and sulfate in MIWs. The ITRC Biochemical Reactors for Mining-Influenced Water technology guidance (BCR-1, 2013) and this associated Internet-based training provide an in-depth examination of BCRs; a decision framework to assess the applicability of BCRs; details on testing, designing, constructing and monitoring BCRs; and real world BCR case studies with diverse site conditions and chemical mixtures. At the end of this training, you should be able to complete the following activities: describe a BCR and how it works; identify when a BCR is applicable to a site; use the ITRC guidance for decision-making by applying the decision framework; improve site decision-making through understanding of BCR advantages, limitations, reasonable expectations, regulatory and other challenges; and navigate the ITRC Biochemical Reactors for Mining-Influenced Water technology guidance (BCR-1, 2013). For more information and to register, see http://www.itrcweb.org or http://clu-in.org/live.

Military Munitions Support Services - Decision Making for a Munitions Project - June 23, 2015, 1:00PM-4:30PM EDT (17:00-20:30 GMT). This will be a Military Munitions Support Services seminar with subject matter experts discussing the strategies and tools used to enable sound remediation decisions at munitions properties. For more information and to register, see http://clu-in.org/live.

Integrating Data from Multidisciplinary Research, Session I: Introducing the Big Picture - June 24, 2015, 1:00PM-3:00PM EDT (17:00-19:00 GMT). This webinar series, sponsored by the National Institute for Environmental Health Sciences Superfund Research Program (SRP), explores challenges and opportunities for integrating datasets to solve complex environmental health problems. Speakers will introduce the concept of big data as it relates to environmental health science and provide examples of current initiatives. William Suk, Ph.D., director of the SRP, will describe data diversity within the program and the prospect of integrating multidisciplinary research data to better understand human exposure and health outcomes, and to reduce hazardous exposures. Allen Dearry, Ph.D., director of the Office of Scientific Information Management at NIEHS, will discuss moving biomedical

research toward a digital enterprise, including the trans-NIH Big Data to Knowledge (BD2K) initiative and steps being taken by NIEHS. Steven F. DiMarco, Ph.D., Professor of Oceanography and Ocean Observing Lead at Texas A&M University, will present how international initiatives in Ocean Observing Systems are producing global data at unprecedented rates in the Geoscience disciplines. He will also describe how these data are being used to address ocean impacts on human health and society like harmful algal blooms, coastal hypoxia, ocean acidification, oil spill response, and hurricane preparedness. David Kaeli, Ph.D., director of the Computer Architecture Research Laboratory at Northeastern University, will describe his work to manage and integrate data from the Puerto Rico Testsite for Exploring Contamination Threats (PRoTECT) to study the transport, exposure, health impact, and remediation of contaminants. For more information and to register, see http://clu-in.org/live.

SRI Webinar Series: Bringing Alternative Energy Projects to Superfund Sites - June 25, 2015, 2:00PM-4:00PM EDT (18:00-20:00 GMT). As communities, towns and businesses across the United States are looking for ways to reduce greenhouse gas emissions, lower utility bills and use alternative energy sources, Superfund sites and other contaminated properties have continued to garner interest. Nationally, Superfund sites have been put back into beneficial use producing energy from solar, wind, hydro-electric, biomass, and landfill gas-to-energy projects. This webinar will share several site-specific case study examples detailing how the potential for alternative energy was assessed, steps that had to be taken to facilitate the reuse in a way that would also be compatible with the remedy, and any economic or environmental incentives used to make these projects fiscally possible. For more information and to register, see http://clu-in.org/live.

SERDP and ESTCP Webinar Series. The series continues during the Summer with monthly webinars providing cutting-edge and practical information from sponsored research and technology demonstrations in an easily accessible format for target audiences including end users such as practitioners, the regulatory community and researchers. Webinar topics include characterization and remediation in fractured rock environments, replacement of perchlorate oxidizers from pyrotechnic flare compositions, resource conservation and climate change, and remote methods for water conservation. For more information and to register for a free webinar, please visit the http://www.serdp-estcp.org/Tools-and-Training/Webinar-Series .

> New Documents and Web Resources

Integrated DNAPL Site Characterization and Tools Selection. This guidance document reviews the current knowledge of DNAPLs and their subsurface behavior. Using an integrated site characterization (ISC) approach that emphasizes adequate data resolution to fully characterize a site, this document describes how to align data on contaminant distribution, geology, and groundwater flow at a spatial resolution appropriate to the site-specific remedial objectives. With improving understanding of subsurface contaminant behavior, both existing and new tools and techniques can be used to measure physical, chemical, and hydrologic subsurface parameters to better characterize the subsurface. This document synthesizes the knowledge of DNAPL site characterization and remediation and provides guidance on simultaneous characterization of contaminant distributions, hydrogeology, and attenuation processes to allow for improvements in the following areas: assessment of ongoing contaminant exposures; quantification of contaminant transport, storage, and attenuation patterns; prediction of future exposures that would occur without intervention; prediction of changes in future exposures that would occur in response to remedial actions; and selection and design of remedial actions (May 2015, 381 pages). View or download at

http://www.itrcweb.org/DNAPL-ISC_tools-selection. For more information on the corresponding Internet-based training course on July 23, see http://www.itrcweb.org or http://clu-in.org/live.

Enhanced Reductive Dechlorination (ERD) Design Considerations. This document provides a framework for ERD design submittals, including a summary of best practices for bioremediation design, sustainable design considerations, tips for appropriate quality assurance and quality control (QA/QC) measures, and a listing of useful standards and references. Lessons learned from Navy sites are shared related to the design, implementation, and performance of ERD systems (March 2015, 49 pages). View or download at http://clu-in.org/EXWC-EV-1501.

In Situ Chemical Oxidation Design Considerations. This document provides a framework for in situ chemical oxidation (ISCO) design submittals. Best practices for ISCO design are outlined including sustainable design and operational approaches, appropriate QA/QC measures, and useful standards and references. Lessons learned and performance issues at ISCO sites are also addressed (March 2015, 42 pages). View or download at http://clu-in.org/EXWC-EV-1502.

Promoting Nanoremediation Using Nanoscale Zerovalent Iron (nZVI): Risk-Benefit and Markets Appraisal, Initial Exploitation Strategy and Consultation. NanoRem (Taking Nanotechnological Remediation Processes from Lab Scale to End User Applications for the Restoration of a Clean Environment) is a research project, funded through the European Commission's Seventh Framework Programme. NanoRem focuses on facilitating practical, safe, economic and exploitable nanotechnology for in situ remediation of polluted soil and groundwater. Part of the project is to understand the future promise of iron nanoparticles/nanoscale zero valent iron (nZVI) use in remediation as a remediation technology and to understand more about stakeholders thoughts and knowledge of the technology and its future opportunities. NanoRem has recently produced an interim "Risk-Benefit and Markets Appraisal, Initial Exploitation Strategy and Consultation" on the use of nZVI. This short report summarizes NanoRem's initial findings. NanoRem is interested to collect additional opinions from different practitioners and stakeholders about the issues raised in this report and its interim findings. In order to do this NanoRem has created a short questionnaire where they would greatly value your input. View or download the report and complete the questionnaire at: http://www.nanorem.eu/Displaynews.aspx?ID=810

Research Brief 245: Using Lead Isotopes to Identify Sources of Metal and Metalloid Contaminants. By sampling wind-blown dust and aerosol, researchers from the University of Arizona Superfund Research Program have measured airborne metal and metalloid contaminant dispersion patterns from mining operations. While using an existing technique in a new way, the UA SRP researchers measured the extent of soil contamination near a mine and smelter while verifying the use of lead isotope analysis to identify contaminant sources. For more information, see http://tools.niehs.nih.gov/srp/researchbriefs/view.cfm?Brief_ID=245. 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.

Workshop Report: Informal Workshop on Burial and Mobility Modeling of Munitions in the Underwater Environment. The objectives of the informal workshop were to enable SERDP project teams to 1) collaboratively share research progress with peers; 2) identify needs for integration of observations and modeling efforts; 3) comprehend the concerns of DoD site managers; 4) define a pathway forward; and 5) clearly state the product expected to culminate from all relevant project efforts. Quite often, underwater environments can be dynamic locations where munitions are more likely subject to mobility, burial, and re-exposure when compared to terrestrial environments. One of the goals of the burial and mobility modeling aspect of the SERDP Munitions Response (MR) program is the development of predictive models to

quantify both the short- and long-term behavior of the distribution of unexploded ordnance (UXO) present at each underwater site. These predictive models must be probabilistic in nature such that they not only make predictions, but also simultaneously estimate the uncertainty of the predictions to allow site managers to make the most informed decisions with regards to remediation and risk. This report summarizes the results and discussion from the informal workshop, identifies areas and topics for future research, and may be used as a guide for future proposals (December 2014, 23 pages). View or download at https://www.serdp-estcp.org/content/download/32772/319768/version/3/file/MR+Workshop+Report+-+Dec+2014.pdf.

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 http://clu-in.org/products/tins/ . The following resources were included in recent issues:

- Mitigation of PCB Using Permeable Reactive Barrier Technology at Resolution Island, Nunavut from 2005 to 2013
- Uranium Sequestration During Biostimulated Reduction and in Response to the Return of Oxic Conditions in Shallow Aquifers
- Transfer Factors for Contaminant Uptake by Fruit and Nut Trees
- Membrane Interface Probe Protocol for Contaminants in Low-Permeability Zones
- Enhancing Bioremediation of Groundwater by Microbial Interaction with a Solid State Electrode: Proof-of-Concept
- Passive Sampling for Groundwater Monitoring: Technology Status
- Guidance for Conducting Technical Analyses for Low-Level Radioactive Waste Disposal: Draft Report for Comment
- In-Situ Solidification of Contaminated Sediments: A Technology Demonstration Project
- Groundwater Treatment Pilot Study Report: Lone Elk Market Corrective Action, Spray, Oregon
- Scale-Up Information for Gas-Phase Ammonia Treatment of Uranium in the Vadose Zone at the Hanford Site Central Plateau

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 May 2015. 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:

International Survey of Emerging Contaminants. An inventory has been initiated on the awareness and policy on emerging contaminants in Europe, commissioned by Commissioned by the Dutch Ministry of Infrastructure and Environment (I&M) and the OVAM (Flanders). This inventory aims to wrap up available information, knowledge and experience related to legislation, governance and policy . The focus is on the presence in contaminated land and river basins, and will explore on the curative policy for emerging contaminants in soil, groundwater and sediments. View at http://www.emergingcontaminants.eu/

> Conferences and Symposia

2015 Environmental Measurement Symposium - Big Data: Environmental Measurement and Monitoring Data in the 21st Century, Chicago, IL, July 12-17, 2015. The 2015 Environmental Measurement Symposium, which is the combined

meeting of the Forum on Laboratory Accreditation and the National Environmental Monitoring Conference (NEMC), is co-sponsored by The NELAC Institute (TNI) under a cooperative agreement with the U.S. EPA. Some of the highlights for the week include: a special half-day general session focused on the conference theme; over 160 oral and poster presentations on a variety of cutting-edge environmental monitoring issues; meetings of TNI Committees to further TNI efforts on environmental laboratory accreditation, proficiency testing, and accreditation of field sampling and measurement organizations; an exhibit program showcasing the latest innovations in environmental monitoring; five special keynote presentations on topics of general interest; and an open meeting of U.S. EPA's Environmental Laboratory Advisory Board. For more information and to register, see http://www.envmeasym.org.

Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management - ITRC 2-day Classroom Training, Raleigh (area), NC, August 31 - September 1, 2015. This 2-day ITRC classroom training is based on the ITRC Technical and Regulatory Guidance Web-Based Document, Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management (PVI-1, 2014) and led by internationally recognized experts. The class will enable you to develop on-the-job skills to screen-out petroleum sites based on the scientifically-supported ITRC strategy and checklist; focus the limited resources investigating those PVI sites that truly represent an unacceptable risk; communicate ITRC PVI strategy and justify science-based decisions to management, clients, and the public; understand the essential principles of biodegradation and the fundamentals of vapor movement through the vadose zone; and appreciate the important role of modeling in the investigation of petroleum sites. Interactive learning with classroom exercises and Q&A sessions will reinforce these course learning objectives. You will also have the opportunity to network with other environmental professionals. For local, state, and federal government; students; community stakeholders; and tribal representatives, ITRC has a limited number of scholarships (waiver of registration fee only) available. For more information and to register, see http://www.itrcweb.org/training.

2015 National Brownfields Training Conference, Chicago, IL, September 2-4, 2015. Brownfields 2015 promises something for all levels of stakeholders and practitioners. The conference program includes speakers, discussions, mobile workshops, films, and other learning formats that are calibrated to provide you with case study examples, program updates, and useful strategies for meeting your brownfield challenges head on. For more information and to register, see http://www.brownfieldsconference.org/en/registerinfo.

LNAPLs: Science, Management, and Technology - ITRC 2-day Classroom Training, Seattle (area), WA, September 15-16, 2015; Austin, TX, November 18-19, 2015. Led by internationally recognized experts, this 2-day ITRC classroom training will enable you to develop and apply an LNAPL Conceptual Site Model (LCSM), understand and assess LNAPL subsurface behavior, develop and justify LNAPL remedial objectives including maximum extent practicable considerations, select appropriate LNAPL remedial technologies and measure progress, and use ITRC's science-based LNAPL guidance to efficiently move sites to closure. Interactive learning with classroom exercises and Q&A sessions will reinforce these course learning objectives. For local, state, and federal government; students; community stakeholders; and tribal representatives, ITRC has a limited number of scholarships (waiver of registration fee only) available. For more information and to register, see http://www.itrcweb.org/training.

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 http://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 Jeff Heimerman at (703) 603-7191 or heimerman.jeff@epa.gov. Remember, you may subscribe, unsubscribe or change your subscription address at http://clu-in.org/techdirect at any time night or day.

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