



TechDirect, March 1, 2018

Welcome to TechDirect! Since the February 1 message, TechDirect gained 62 new subscribers for a total of 39,536. 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.

> Upcoming Live Internet Seminars

Mining Webinar Series: Ecological Revitalization at the Henry's Knob Former Mining Site - March 6, 2018, 2:00PM-3:30PM EDT (19:00-20:30 GMT). An innovative remedy at the Henry's Knob Superfund Alternative site is protecting public health and the environment while also serving as vital native habitat for pollinators and other species. The remedy was designed by Amec Foster Wheeler Environment and Infrastructure (Amec Foster Wheeler) for a Confidential Client who was one of the sites responsible parties. A collaborative working relationship between the responsible party, Amec Foster Wheeler, EPA, and the South Carolina Department of Health and Environmental Control (SCDHEC) made revitalization of the former mine site possible. For more information and to register, see <https://clu-in.org/live>.

ITRC Integrated DNAPL Site Characterization - March 8, 2018, 1:00PM-3:15PM EST (18:00-20:15 GMT). The Integrated DNAPL Site Characterization Team has synthesized the knowledge about dense nonaqueous phase liquid (DNAPL) site characterization and remediation acquired over the past several decades, and has integrated that information into a new document, Integrated DNAPL Site Characterization and Tools Selection (ISC-1, 2015). This guidance is a resource to inform regulators, responsible parties, other problem holders, consultants, community stakeholders, and other interested parties of the critical concepts related to characterization approaches and tools for collecting subsurface data at DNAPL sites. After this associated training, participants will be able to use the guidance to develop and support an integrated approach to DNAPL site characterization, including: identify what site conditions must be considered when developing an informative DNAPL conceptual site model (CSM); define an objectives-based DNAPL characterization strategy; understand what tools and resources are available to improve the identification, collection, and evaluation of appropriate site characterization data; and navigate the DNAPL characterization tools table and select appropriate technologies to

fill site-specific data gaps. For more information and to register, see <https://www.itrcweb.org> or <https://clu-in.org/live>.

ERTP Presents...Pragmatic Approaches to Remedial Investigation, Technology Selection, and Remediation Success - March 15, 2018, 1:00PM-3:00PM EDT (17:00-19:00 GMT). This webinar will discuss high resolution site characterization using direct-sensing and data visualization tools to rapidly build the conceptual site model in an adaptive process. We strive for timeframes of months, not years, by starting with the end in mind and employing a collaborative team approach, including our state, tribal, industrial and community counterparts. Goal one is to gain a confident understanding of the spatial and matrix distribution of contaminants of concern. Goal two is to rapidly gather information essential to informing potential remedy choices focused on root causes. Goal three is to minimize mobilizations and transaction costs by evaluating data and identifying data gaps in real-time while the investigation team is still in the field. By including all project stakeholders in the investigation and decision-making process, the report becomes a reflection of the team's findings, interpretations and decisions, rather than one party's opinion piece subject to debate. This presentation will briefly describe the approach and focus on recent work at sites of different scales to showcase the process and workflows that demonstrate its effectiveness. For more information and to register, see <https://clu-in.org/live>.

ITRC Geophysical Classification for Munitions Response - March 22, 2018, 1:00PM-3:15PM EDT (17:00-19:15 GMT). This training class and supporting guidance document explain the process of geophysical classification, describe its benefits and limitations, and discuss the information and data needed by regulators to monitor and evaluate the use of the technology. This document and training also emphasize using a systematic planning process to develop data acquisition and decision strategies at the outset of a munitions response effort, as well as quality considerations throughout the project. Stakeholder issues that are unique to munitions response are also discussed. After this training class, participants will: understand the technology and terminology, be ready to engage in the planning process to address quality considerations throughout a project, find tools to transfer knowledge within organizations and to stakeholders, and start to transition mindset to decisions that leave non-hazardous items in the ground. An audience who understand current munitions response tools and procedures (for example, geophysical surveys, sensors, data analysis) will benefit most from this document and training. For more information and to register, see <https://www.itrcweb.org> or <https://clu-in.org/live>.

Comparison Studies on Radiation Risk and Dose Assessment Models for Radioactively Contaminated Soil, Inside Buildings and Outside Surfaces - March 26, 2018, 1:30PM-3:00PM EDT (17:30-19:00 GMT). A participant for the Oak Ridge Institute for Science and Education Research Participation Program, Nasser Shubayr, while at EPA's Office of Superfund Remediation and Technology Innovation (OSRTI) has worked on five research projects on risk and dose assessment models recommended by governmental agencies for investigating radioactively contaminated soil, inside buildings and outside surfaces. These research projects studied 17 models and look-up that are used nationally and internationally. This webinar presents: overview for 9 of the models and the look-up table, NCRP 129 that address contaminated soil, review of selected default input parameters used by each models addressing soil, radiation and chemical assessment methodological consistency between US EPA and UK Environmental Agency, overview of 4 models used to assess contaminated outdoor surfaces, and comparison between EPA's 2 models and DOE model for indoor contaminated buildings. The objective of these research projects is to make recommendations on technical and practical issues to the U.S. EPA OSRTI, facilitating better understanding of each agency's modeling approach and identifying the similarities and differences between these agencies in the risk and dose assessment of radioactively contaminated sites. For more information and to register, see

<https://clu-in.org/live>.

ITRC Groundwater Statistics for Environmental Project Managers - March 27, 2018, 1:00PM-3:15PM EDT (17:00-19:15 GMT). Statistical techniques may be used throughout the process of cleaning up contaminated groundwater. It is challenging for practitioners, who are not experts in statistics, to interpret, and use statistical techniques. ITRC developed the Technical and Regulatory Web-based Guidance on Groundwater Statistics and Monitoring Compliance (GSMC-1, 2013) and this associated training specifically for environmental project managers who review or use statistical calculations for reports, who make recommendations or decisions based on statistics, or who need to demonstrate compliance for groundwater projects. The training class will encourage and support project managers and others who are not statisticians to: use the ITRC Technical and Regulatory Web-based Guidance on Groundwater Statistics and Monitoring Compliance (GSMC-1, 2013) to make better decisions for projects; apply key aspects of the statistical approach to groundwater data; and answer common questions on background, compliance, trend analysis, and monitoring optimization. ITRC's Technical and Regulatory Web-based Guidance on Groundwater Statistics and Monitoring Compliance (GSMC-1, 2013) and this associated training bring clarity to the planning, implementation, and communication of groundwater statistical methods and should lead to greater confidence and transparency in the use of groundwater statistics for site management. For more information and to register, see <http://www.itrcweb.org> or <https://clu-in.org/live>.

FRTR Presents...Remediation Technologies for Radionuclides and Heavy Metals in Soil, Ground Water and Sediments, Session 2 - March 28, 2018, 1:00PM-3:00PM EDT, (17:00-19:00 GMT). This webinar is part of a series featuring presentations delivered at the November 2017 FRTR Meeting. This meeting focused on remediation technologies for radionuclides and heavy metals in soil, ground water and sediments. More information about the meeting can be found at <https://frtr.gov/meetings1.htm>. This webinar will discuss incremental sampling methods for remediation of heavy metals. The webinar will also describe the specific application of an in situ activated carbon amendment for sediment and soil mercury remediation. For more information and to register, see <https://clu-in.org/live>.

ITRC Geospatial Analysis for Optimization at Environmental Sites - March 29, 2018, 1:00PM-3:15PM EDT (17:00-19:15 GMT). The purpose of ITRC's Geospatial Analysis for Optimization at Environmental Sites (GRO-1) guidance document and this associated training is to explain, educate, and train state regulators and other practitioners in understanding and using geospatial analyses to evaluate optimization opportunities at environmental sites. With the ITRC GRO-1 web-based guidance document and this associated training class, project managers will be able to: evaluate available data and site needs to determine if geospatial analyses are appropriate for a given site; for a project and specific lifecycle stage, identify optimization questions where geospatial methods can contribute to better decision making; for a project and optimization question(s), select appropriate geospatial method(s) and software using the geospatial analysis work flow, tables and flow charts in the guidance document; with geospatial analyses results (note: some geospatial analyses may be performed by the project manager, but many geospatial analyses will be performed by technical experts), explain what the results mean and appropriately apply in decision making; and use the project manager's tool box, interactive flow charts for choosing geospatial methods and review checklist to use geospatial analyses confidently in decision making. For more information and to register, see <http://www.itrcweb.org> or <https://clu-in.org/live>.

Environmental Sequence Stratigraphy and the new EPA Remediation Geology Paradigm - April 3, 2018, 12:00PM-1:30PM EDT (16:00-17:30 GMT). This webinar will highlight a recently released EPA Technical Issue Paper serving as a practical guide on the application of the geologic principles of sequence stratigraphy and facies

models to the characterization of stratigraphic heterogeneity at hazardous waste sites. This technology is applicable to sites underlain by clastic aquifers (intermixed gravels/sands/silts/clays). The scientific principles and methods presented in this document will help to bring clarity to the challenges posed by stratigraphic heterogeneity at complex contaminated sites thereby facilitating site management strategies. These methods can be applied to both new site investigations as well as reviewing existing site data and updating the Conceptual Site Model (CSM). High resolution site characterization (HRSC) is EPA's preferred approach for characterizing sites and developing a detailed CSM. The application of Environmental Sequence Stratigraphy (ESS) allows the practitioner to place high resolution data and other environmental subsurface data in a geologic and hydrogeologic context. This advanced geologic approach evaluates subsurface site information in the context of the sites geologic depositional and erosional history. Application of ESS benefits groundwater remediation projects by improving the ability to: define groundwater flow paths and preferential contaminant migration pathways, map and predict contaminant mass transport and storage zones, identify data gaps to conduct high resolution site characterization, determine appropriate locations for monitoring and remediation wells, determine appropriate well construction design (e.g., screened intervals), improve efficiency of remediating and monitoring contaminated groundwater, and focus your site strategy to save significant time and money. For more information and to register, see <https://clu-in.org/live>.

ITRC Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management - April 5, 2018, 1:00PM-3:15PM EDT (17:00-19:15 GMT). Chemical contaminants in soil and groundwater can volatilize into soil gas and migrate through unsaturated soils of the vadose zone. Vapor intrusion (VI) occurs when these vapors migrate upward into overlying buildings through cracks and gaps in the building floors, foundations, and utility conduits, and contaminate indoor air. If present at sufficiently high concentrations, these vapors may present a threat to the health and safety of building occupants. Petroleum vapor intrusion (PVI) is a subset of VI and is the process by which volatile petroleum hydrocarbons (PHCs) released as vapors from light nonaqueous phase liquids (LNAPL), petroleum-contaminated soils, or petroleum-contaminated groundwater migrate through the vadose zone and into overlying buildings. The ITRC Technical and Regulatory Guidance Web-Based Document, Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management (PVI-1, 2014) and this associated Internet-based training provides regulators and practitioners with consensus information based on empirical data and recent research to support PVI decision making under different regulatory frameworks. The PVI assessment strategy described in this guidance document enables confident decision making that protects human health for various types of petroleum sites and multiple PHC compounds. This guidance provides a comprehensive methodology for screening, investigating, and managing potential PVI sites and is intended to promote the efficient use of resources and increase confidence in decision making when evaluating the potential for vapor intrusion at petroleum-contaminated sites. By using the ITRC guidance document, the vapor intrusion pathway can be eliminated from further investigation at many sites where soil or groundwater is contaminated with petroleum hydrocarbons or where LNAPL is present. 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.

ITRC Soil Sampling and Decision Making Using Incremental Sampling Methodology - Part 1, Sponsor: Interstate Technology and Regulatory Council, Archive of Jan 5, 2017 Seminar (2 Hours, 15 Minutes). This 2-part training course along with ITRC's web-based Incremental Sampling Methodology Technical and

Regulatory Guidance Document (ISM-1, 2012) is intended to assist regulators and practitioners with the understanding the fundamental concepts of soil/contaminant heterogeneity, representative sampling, sampling/laboratory error and how ISM addresses these concepts. For more information or to replay Part 1, visit

https://clu-in.org/conf/itrc/ISM_010517/.

> New Documents and Web Resources

Brownfields Road Map to Understanding Options for Site Investigation and Cleanup, Sixth Edition (EPA 542-R-17-003). The Brownfields Road Map 6th Edition breaks down Brownfields site investigation and cleanup into an easy to understand, step-by-step process that provides valuable and up-to-date information to a wide range of Brownfields stakeholders involved in or affected by the redevelopment of Brownfields sites. It introduces readers to a range of considerations and activities, and provides links to online technical resources and tools. The Road Map also highlights ten important issues, processes and initiatives commonly encountered by Brownfields stakeholders through "spotlights." These focus areas provide a quick look at topics currently relevant to Brownfields projects and provide links to additional information (November 2017, 86 pages). View or download at

<https://www.epa.gov/brownfields/brownfields-road-map>.

Best Practices for Environmental Site Management: A Practical Guide for Applying Environmental Sequence Stratigraphy to Improve Conceptual Site Models (EPA 600-R-17-293). The purpose of this issue paper is to provide a practical guide on the application of the geologic principles of sequence stratigraphy and facies models to the characterization of stratigraphic heterogeneity at hazardous waste sites. Application of the principles and methods presented in this issue paper will improve Conceptual Site Models (CSM) and provide a basis for understanding stratigraphic flux and associated contaminant transport. This is fundamental to designing monitoring programs as well as selecting and implementing remedies at contaminated groundwater sites. EPA recommends re-evaluating the CSM while completing the site characterization and whenever new data are collected. Updating the CSM can be a critical component of a 5 year review or a remedy optimization effort (September 2017, 62 pages). View or download at

<https://nepis.epa.gov/Exe/ZyPDF.cgi/P100TN2C.PDF?Dockey=P100TN2C.PDF>.

Ecological Revitalization of Contaminated Sites Case Study: Henry's Knob Site, South Carolina (EPA 542-R-18-001). This case study highlights ecological revitalization outcomes at the Henry's Knob Superfund Alternative Approach site in York County, South Carolina. Working with state and federal regulatory agencies, ABB Inc., a proactive responsible party is using an adaptive management approach to address environmental impacts from decades of kyanite mining. This case study is part of a series focused on ecological revitalization as part of contaminated site remediation and reuse. The purpose of these case studies is to provide site managers with ecological reuse information, including principles for implementation, recommendations based on personal experiences, a specific point of contact and a network of sites with an ecological reuse component (December 2017, 10 pages). View or download at

<https://semsub.epa.gov/src/document/11/100000929>.

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:

- Lead and Antimony Speciation in Shooting Range Soils: Molecular Scale Analysis, Temporal Trends and Mobility
- Commingled Plume Technical Guidance Document
- Steps Needed to Operate and Maintain the Sub-Slab Depressurization System Installed by EPA at the Chem-Fab Property
- Demonstration and Validation of Enhanced Monitored Natural Recovery at DoD Sites
- Transitioning Fund-Financed Site Remedies from EPA to the States: A Guide for Project Managers
- Ensuring Environmental Protection of Closed Federal Facility Sites
- Public Preferences Related to Radioactive Waste Management in the United States: Methodology and Response Reference Report for the 2016 Energy and Environment Survey
- European Achievements in Soil Remediation and Brownfield Redevelopment

EUGRIS Corner. New Documents on EUGRIS, the platform for European contaminated soil and water information. More than 13 resources, events, projects and news items were added to EUGRIS in February 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.

> Conferences and Symposia

Best Practices for Site Characterization Throughout the Remediation Process, Dallas, TX, July 23-26, 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>.

Incremental Sampling, Philadelphia, PA, May 3-4, 2018. This training course focuses on the theory and application of ITRC's Incremental Sampling Methodology (ISM), composite sampling designs, and hybrids of the two. IS hybrid designs are useful to address multiple project goals simultaneously. Since "representativeness" is a key aspect of data quality and ISM/IS data are demonstrably more representative than most discrete data, it will be argued that IS data are indeed "better" than non-IS data. The course will answer questions such as: what is the difference between ITRC's ISM and EPA's Incremental Sampling (IS) strategies? Is there written EPA guidance? What features should an ISM or IS design have? Can IS give project risk assessors the data they want, while simultaneously meeting the RPM's own data needs for characterization or remedial design? How are background concentrations determined and comparisons to background handled using IS? Do we know whether IS "worked" for the project? For more information and to register, see <https://trainex.org/offeringslist.cfm?courseid=1621>.

Groundwater High-Resolution Site Characterization (HRSC), Kansas City, MO,

June 5-6, 2018. 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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