



TechDirect, September 1, 2018

Welcome to TechDirect! Since the August 1 message, TechDirect gained 64 new subscribers for a total of 39,033. 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.

> Request for Applications

Practical Methods to Analyze and Treat Emerging Contaminants (PFAS) in Solid Waste, Landfills, Wastewater/Leachates, Soils, and Groundwater to Protect Human Health and the Environment. The U.S. EPA, as part of its Science to Achieve Results (STAR) program, is seeking applications proposing research that will lead to: (1) better understanding and characterization of the types and quantities of current and historical per- and poly-fluoroalkyl substances (PFAS) and PFAS-containing waste associated with waste disposal (e.g., landfills), as well as media containing PFAS released from these activities (e.g., PFAS in leachate collected by landfills or PFAS leaching to subsurface soils and groundwater); (2) increased knowledge of the fate, transport, potential for degradation or other changes to PFAS, and their mobility during materials management (e.g., under different landfill conditions such as pH, temperature, moisture content) that facilitate or retard such transformation or movement; and (3) new or improved methods that are more effective, efficient (in cost, energy, etc.), and practical in controlling, treating, destroying, or removing PFAS in waste and wastewater, landfill leachates, biosolids, or environmental media. The main goal is to promote innovation in evaluating and managing PFAS in solid waste, landfills, and environmental media that will lead to improved decision making, management practices, and technical methods to minimize the risks to both humans and ecosystems. Applications are due by October 2, 2018. For more information and application instructions, see

<https://www.epa.gov/research-grants/practical-methods-analyze-and-treat-emerging-contaminants-pfas-solid-waste-landfills>.

> Upcoming Live Internet Seminars

Superfund Research Program Progress in Research Webinar Series - September 4, 10, and October 1. This Superfund Research Program (SRP) Progress in Research webinar series highlights promising research from SRP Centers awarded grants in 2017. In each of the remaining three sessions, awardees will describe their research projects, accomplishments, and next steps. The September 4 session will include presentations from the University of Louisville, University of New Mexico, and University of Washington. The September 10 session will include presentations from Columbia University, Massachusetts Institute of Technology, and University of Rhode Island. The October 1 session will include presentations from Boston University, Texas A&M University, and University of California, Davis. The first session on August 23 included presentations from Duke University and University of Arizona, and is available at <https://clu-in.org/live/archive/>. For more information and to register for the remaining three sessions, see <https://clu-in.org/live>.

NARPM Presents...Tools for Estimating Groundwater Contaminant Flux to Surface Water - September 5, 2018, 1:00PM-3:00PM EDT (17:00-19:00 GMT). Surface water bodies adjacent to sites with contaminated groundwater may receive impacts that impair otherwise functional ecosystems and create new exposure pathways, increasing human health risks. Optimizing site characterization protocols to improve the remedy design effort is best achieved by developing knowledge of the potential extent and magnitude of contaminated groundwater discharge into the surface water body. Through field-based research, EPA's Office of Research and Development has developed several approaches to more reliably characterize system hydrology and assess contaminant flux. A series of standard methods and spreadsheet-based calculation tools have been developed to facilitate data collection and analysis, and all in an affordable and consistent manner. A case study example will be used to highlight these novel approaches to improve understanding of the spatial and temporal dynamics of contaminant transport across the groundwater-surface water transition zone. For more information and to register, see <https://clu-in.org/live>.

ITRC Characterization and Remediation of Fractured Rock - September 11, 2018, 1:00PM-3:15PM EDT (17:00-19:15 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>.

ITRC Groundwater Statistics for Environmental Project Managers - September 13, 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>.

ITRC Geophysical Classification for Munitions Response - September 18, 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>.

ITRC Geospatial Analysis for Optimization at Environmental Sites - September 20, 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 life-cycle 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>.

ITRC Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management - September 25, 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 provide 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>.

FRTR Presents...Evolution of Subsurface Remediation: Lessons Learned from Technical Challenges to Achieving Cleanup Goals - Parts 1 and 2 - September 27 and October 17, 2018, 1:00PM-3:00PM EDT (17:00-19:00 GMT). This is a two-part webinar series featuring presentations delivered at the Spring 2018 FRTR Meeting. The meetings goals were to identify and discuss case studies where remediation technologies were successful for a variety of soil and groundwater systems; and to share experiences and lessons learned that contributed to the operation of these successful remediation technologies. For more information and to register, see <https://clu-in.org/live>.

Superfund Task Force - Adaptive Management Pilot Criteria Document Review for Stakeholders - October 2, 2018, 10:00AM-11:30AM EDT (14:00-15:30 GMT). A memorandum entitled "Superfund Task Force Recommendation #3: Broaden the Use of Adaptive Management" was completed by EPA on July 3rd, 2018 which provided Superfund's working definition of Adaptive Management and outlined an implementation plan to expand Adaptive Managements use at Superfund sites. Per the implementation plan, EPA is in the process of seeking input on the pilot criteria with separate input from EPA, States/Tribes, and other stakeholders. This webinar is to provide stakeholders an overview of the Task Force Adaptive Management Implementation Plan and pilot criteria to support their review of the pilot criteria out for comment. For more information and to register, see <https://clu-in.org/live>.

ITRC Integrated DNAPL Site Characterization - October 2, 2018, 1:00PM-3:15PM EDT (17:00-19:15 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>.

SERDP & ESTCP Webinar Series: Managing Groundwater Impacts at Chlorinated Solvent Sites - October 4, 2018, 12:00PM-1:30PM EDT (16:00-17:30 GMT). Dr. Andrea Lesson, Deputy Director of SERDP and ESTCP and the Program Manager for the Environmental Restoration program area, discusses contaminated aquifer: remedy optimization, fine scale delineation, post remediation performance, long-term attenuation, mixed contamination, and abiotic attenuation. Mr. Evan Cox is a senior principal remediation scientist at Geosyntec Consultants. He will be presenting findings from a successful ESTCP project that utilized electrokinetically enhanced amendment technology to treat a tetrachloroethene source area in clay. For more information and to register, see <https://www.serdp-estcp.org/Tools-and-Training/Webinar-Series>.

SERDP & ESTCP Webinar Series: Restoration of Chlorinated Solvent Contaminated Groundwater Sites: The Value of Information Challenge - October 18, 2018, 12:00PM-1:30PM EDT (16:00-17:30 GMT). This presentation will focus on the SERDP DIVER project (ER-2313). The DIVER project applies value of information (VOI) to outline a framework for the optimization of the site characterization process, such that the total cost of investigation, the cost of achieving remedial goals, and the risks of failure of remedial approaches are minimized. For more information and to register, see <https://www.serdp-estcp.org/Tools-and-Training/Webinar-Series>.

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.

Frequently-Asked Questions about Monitored Natural Attenuation in Groundwater, Sponsored by: Environmental Security Technology Certification Program (ESTCP), Archive of June 13, 2014 Seminar (2 hours). The talk highlighted a 2014 guidance document using the Frequently Asked Questions (FAQs) format to provide a concise overview of current knowledge regarding management of subsurface contaminant releases using monitored natural attenuation (MNA). The envisioned audience includes state regulators, federal regulators, industry, consultants, DoD staff, and members of the local community involved in selecting remedies for contaminated sites. The intended value of the document is to provide current knowledge in support of sound decisions. In the interest of brevity, the FAQs assume that the reader has a general understanding of hydrogeology, the movement of chemicals in porous media, remediation technologies, and the remedy selection process. For more information or to replay, visit https://clu-in.org/conf/tio/FAQMNA_061314/

> New Documents and Web Resources

Activated Carbon-Based Technology for In Situ Remediation Focus Area.

Activated carbon (AC)-based technology involves emplacement of AC-based amendments for in situ remediation of soil and groundwater. Besides AC, amendments typically include other reactive products commonly used with in situ remediation technologies, such as in situ chemical reduction (ISCR), in situ chemical oxidation (ISCO), and bioremediation. The technology is commonly referred to as "carbon-based injectate" (CBI), especially for remediation of petroleum hydrocarbons. AC-based amendments remove contaminant via two processes: adsorption by AC and degradation by reactive amendments. The coupling of adsorption and degradation makes this technology a promising remedial option for addressing persistent plumes emanating from contaminants sorbed on soil, residual non-aqueous phase liquid (NAPL), or mass stored in low-permeability zones. The technology might also be

applicable near or at the source area, especially when combined with other source treatment remedies, to limit contaminant mass flux out of source zones to downgradient plumes. View and use at <https://clu-in.org/ac>.

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:

- First Semester 2016 Remediation Progress and Horizontal Well Installation Report: 7-Eleven Store 23020, 1522 E Madison Street, Seattle, WA
- Voluntary Remediation Program Fourth Progress Report: Roper Pump Company, HSI No. 10901, Commerce, Georgia
- Pilot Test of Electrokinetically Delivered Thermally Activated Persulfate -- EK-TAP(TM) -- Final Report, Ballerup Denmark
- DyeLIF(TM): A New Direct-Push Laser-Induced Fluorescence Sensor System for Chlorinated Solvent DNAPL and Other Non-Naturally Fluorescing NAPLS
- Wastewater Treatment Using Microbial Fuel Cells with Peroxide Production
- Effective Treatment of Groundwater Pollution Using a System Utilizing Controlled Release Polymer Materials
- Practitioner Guide to Risk-Based Assessment, Remediation and Management of PFAS Site Contamination
- BISC Semi-Annual Monitoring and Performance Report, Rev. 1: July 1 to December 31, 2017, Perchlorate Bioremediation System, Henderson, Nevada
- SEREBAR: A Review of 11 Years of Operation
- Site-Wide Groundwater Progress Report for the Former Hoffmann-La Roche Inc. Facility, Nutley, New Jersey
- Using Frozen Barriers for Containment of Contaminants
- Methylmercury Screening Models for Surface Water Habitat Restoration: A Case Study in Duluth-Superior Harbor

EUGRIS Corner. New Documents on EUGRIS, the platform for European contaminated soil and water information. More than 16 resources, events, projects and news items were added to EUGRIS in August 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

Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management, Seattle (area), WA, October 10-11, 2018. 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. Within the training class, participants will hear about EPA's Technical Guide for Addressing Petroleum Vapor Intrusion at Leaking Underground Storage Tank Sites (June 2015). The ITRC guidance document and EPA guide are complementary documents with the ITRC training course providing the "how-to" knowledge and skills for screening, investigating, and managing the petroleum vapor intrusion pathway. The class will enable you to develop the 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; and

communicate ITRC PVI strategy and justify science-based decisions to management, clients, and the public. 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 fee waivers available. For more information and to register, see

<http://www.itrcweb.org/training>.

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>.

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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