



TechDirect, January 1, 2018

Happy Holidays and may you have a prosperous new year!



Welcome to TechDirect! Since the December 1 message, TechDirect gained 44 new subscribers for a total of 39,632. 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

15th Annual P3 Awards: A National Student Design Competition Focusing on People, Prosperity and the Planet. This collegiate design competition promotes the use of scientific and engineering principles in creating innovative projects to address challenges and develop real world solutions. This Phase I Request for Applications (RFA) is seeking applications in the research areas of air quality, clean and safe water, land revitalization, and safer chemicals in the marketplace. P3 was developed to foster progress by achieving the mutual goals of improved quality of life, economic prosperity, and protection of the planet - people, prosperity and the planet. EPA's P3 Program offers technical solutions to implement while supporting education in Science, Technology, Engineering and Mathematics (STEM). The P3 program is a two-phase team competition. For the first phase, interdisciplinary student teams submit proposals to compete for \$15,000 grants for project ideas addressing environmental solutions. Recipients use the funding to research and develop their design projects during the academic year. In the spring, teams compete for P3 Phase II grant funding of up to \$75,000 to implement their projects in a real world setting. The application deadline is February 7, 2018. For more information and application instructions, see <https://www.epa.gov/P3/how-apply-p3-grant>.

> Internet Seminars

ITRC Remedy Selection for Contaminated Sediments - January 9, 2018,

1:00PM-3:15PM EST (18:00-20:15 GMT). ITRC developed the technical and regulatory guidance, *Remedy Selection for Contaminated Sediments (CS-2, 2014)*, to assist decision-makers in identifying which contaminated sediment management technology is most favorable based on an evaluation of site specific physical, sediment, contaminant, and land and waterway use characteristics. The document provides a remedial selection framework to help identify favorable technologies, and identifies additional factors (feasibility, cost, stakeholder concerns, and others) that need to be considered as part of the remedy selection process. This ITRC training course supports participants with applying the technical and regulatory guidance as a tool to overcome the remedial challenges posed by contaminated sediment sites. Participants learn how to: identify site-specific characteristics and data needed for site decision making, evaluate potential technologies based on site information, and select the most favorable contaminant management technology for their site. For more information and to register, see <http://www.itrcweb.org> or <http://clu-in.org/live>.

ITRC Long-term Contaminant Management Using Institutional Controls - January 11, 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 <http://clu-in.org/live>.

ITRC Groundwater Statistics for Environmental Project Managers - January 23, 2018, 1:00PM-3:15PM EST (18:00-20:15 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>.

ERTP Presents...Pragmatic Approaches to Remedial Investigation, Technology Selection, and Remediation Success - January 24, 2018, 1:00PM-3:00PM EST

(18:00-20:00 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 Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management - January 25, 2018, 1:00PM-3:15PM EST (18:00-20:15 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 <http://www.itrcweb.org> or <http://clu-in.org/live>.

ITRC Geospatial Analysis for Optimization at Environmental Sites - January 30, 2018, 1:00PM-3:15PM EST (18:00-20:15 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 <http://clu-in.org/live>.

ITRC Issues and Options in Human Health Risk Assessment - A Resource When Alternatives to Default Parameters and Scenarios are Proposed - February 1, 2018, 1:00PM-3:15PM EST (18:00-20:15 GMT). After participating in this ITRC training course, the learner will be able to apply ITRC's Decision Making at Contaminated Sites: Issues and Options in Human Health Risk (RISK-3, 2015) document when developing or reviewing site-specific risk assessments by: identifying common issues encountered when alternatives to default parameters and scenarios are proposed during the planning, data evaluation, toxicity, exposure assessment, and risk characterization and providing possible options for addressing these issues; recognizing the value of proper planning and the role of stakeholders in the development and review of risk assessments; and providing information (that includes links to additional resources and tools) to support decision making when alternatives to default approaches, scenarios and parameters are proposed. For more information and to register, see <http://www.itrcweb.org> or <http://clu-in.org/live>.

Highlight from the CLU-IN Seminar Archives. Starting this year, each edition of TechDirect will highlight a previously recorded internet seminar from our archives that may be of interest to our reader. We welcome your feedback on this new addition to TechDirect.

Borehole Geophysics Applied to Bedrock Hydrogeologic Evaluations, Sponsored by US EPA Environmental Response Team, Archive of Sep 29, 2014 Seminar (1 Hour, 15 Minutes). This presentation introduces the viewer to borehole geophysical tools commonly used in hydrogeologic investigations. These tools include gamma, temperature, conductivity, caliper, borehole video, acoustic and optical televiwers, heat-pulse flowmeter, and borehole deviation.. Examples and case studies follow illustrating the usefulness of data obtained through the utilization of these tools, especially when used to design packer tests and multi-level discrete-zone sampling strings. In addition, borehole tools commonly used in shallow oil/gas well abandonment are presented. For more information or to replay, visit https://clu-in.org/conf/tio/ERTPBoreholeGeophysics_092914/.

> New Documents and Web Resources

ITRC Characterization and Remediation of Fractured Rock. This ITRC guidance addresses significant advances in skills, tools, and lessons-learned in understanding contaminant flow and transport in fractured rock environments. If the unique characteristics of fractured rock sites are understood, then modern tools and approaches can be applied to successfully set and meet characterization and remediation goals at these sites (December 2017). View and use at <http://fracturedrx-1.itrcweb.org>.

Comparison of Radiation Risk and Dose Assessment Models for Outside Hard Surfaces and Inside Buildings (2017). 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 has produced two research documents on risk and dose assessment models for investigating radioactively contaminated outdoor surfaces and buildings: Overview of Radiation Risk Assessment

Models for Radioactively Contaminated Outdoor Surfaces (SPRG/SDCC, RESRAD-RDD and ERMIN) and Comparing Radiation Risk Assessment Models for Radioactively Contaminated Buildings (BPRG/BDCC and RESRAD-BUILD).

Overview of Radiation Risk Assessment Models for Radioactively Contaminated Outdoor Surfaces (SPRG/SDCC, RESRAD-RDD and ERMIN). The release of radioactive materials to the atmosphere can result in surface contamination on streets, building surfaces such as walls and roofs, and any other external surface. The released radioactive contaminated dust particles deposit on the surface and can pose risk to people through external exposure, ingestion, and inhalation. Radiation assessment models for contaminated surfaces have been developed by many agencies to support decision making processes. These models have been developed for different main purposes but tackle the same issue, surface contamination. This paper addresses a review of the following models that are used to assess radioactively contaminated surfaces: 1) the U.S. Environmental Protection Agency (U.S. EPA): SPRG/SDCC, 2) the U.S. Department of Energy (U.S. DOE): RESRAD-RDD, and 3) the European Approach to Nuclear and Radiological Emergency Management and Rehabilitation Strategies (EURANOS): ERMIN. View or download at

https://epa-sprg.ornl.gov/sprg_comparison.html. Comparing Radiation Risk Assessment Models for Radioactively Contaminated Buildings (BPRG/BDCC and RESRAD-BUILD): Different agencies have developed models to assess the human health cancer risk from radioactively contaminated buildings that can be used by decision makers. The U.S. EPA and the U.S. DOE have developed models for both contaminated soil and contaminated buildings. The U.S. EPA has developed the Preliminary Remediation Goals for Radionuclides in Buildings calculator (BPRG) and the Dose Compliance Concentrations for Radionuclides in Buildings calculator (BDCC). The two calculators were developed for different regulatory requirements. The BPRG calculator is for risk-based regulations while the BDCC calculator is for dose-based regulations. The U.S. DOE developed RESRAD-BUILD. The two agencies modeling approaches and input parameters are different. This study shows the methodology for the different tools, including exposure scenario and pathways, building descriptions, source descriptions, outputs, and default input parameters. View or download at https://epa-bprg.ornl.gov/bprg_comparison.html.

Superfund Research Program Research Brief 276: Novel Cobamide Structure May Hold Clues for More Effective Biological Degradation of Chlorinated Compounds. Researchers at the University of Tennessee have discovered a crucial compound that helps specific bacteria degrade pollutants like tetrachloroethene (PCE). This compound, called purinyl-cobamide, assists enzymes during degradation reactions. These helper molecules are part of a larger group of chemical structures known as cobamides. For more information, see

https://tools.niehs.nih.gov/srp/researchbriefs/view.cfm?Brief_ID=276. 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>.

New CL:AIRE Technical Bulletin TB16 Complete Continuous Monitoring in Underfloor Voids (2017). Post construction monitoring of passively ventilated underfloor voids is not routinely required. The design and performance of passive venting systems for ground gas follows well established principles and has been proven to be effective over the past twenty five years. There are however occasions when there is value in carrying out monitoring of underfloor voids to help provide a more robust assessment of the risk posed by ground gas on a site. In such cases this bulletin explains a best practice approach using complete continuous monitoring. View or download at <https://www.claire.co.uk/home/news/773-new-cl-aire-technical-bulletin>.

New DoD Fact Sheets on Vapor Intrusion (2017). A series of fact sheets has been prepared by the Department of Defense (DoD) Tri-Service Environmental Risk Assessment Workgroup (TSERAWG) to update and supplement the DoD Vapor

Intrusion Handbook (2009). These six fact sheets cover sampling and assessment techniques that allow for an improved understanding of vapor intrusion given temporal variability and the potential for the presence of background sources of volatile organic compounds (VOCs). View or download at <http://www.denix.osd.mil/irp/vaporintrusion/>.

EPA Office of Research and Development Journal Article: Evaluating Relationships Between Total Dissolved Solids (TDS) and Total Suspended Solids (TSS) in a Mining-Influenced Watershed. Measurement of total suspended solids (TSS) and total dissolved solids (TDS) loadings in streams is often used to assess potential impacts from mining on surface water quality within a drainage basin. It has been suggested that TSS could be used as an indicator to estimate TDS loading through the use of a TDS/TSS ratio. The reliability of this approach was tested by examining empirical linear relationships between TSS and TDS loads at three locations within a mining-influenced watershed in Colorado. View at <http://rdcu.be/vcio>.

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:

- Providing Additional Support for MNA by Including Quantitative Lines of Evidence for Abiotic Degradation and Co-Metabolic Oxidation of Chlorinated Ethylenes
- Cost-Effective and High-Resolution Subsurface Characterization Using Hydraulic Tomography
- Evidence of a Sewer Vapor Transport Pathway at the USEPA Vapor Intrusion Research Duplex
- In Situ Treatment Train for Remediation of Perfluoroalkyl Contaminated Groundwater: In Situ Chemical Oxidation of Sorbed Contaminants (ISCO-SC)
- Review and Synthesis of Evidence Regarding Environmental Risks Posed by Munitions Constituents (MC) in Aquatic Systems
- Groundwater and PFAS: State of Knowledge and Practice
- Contaminant Flux Reduction Barriers for Managing Difficult-to-Treat Source Zones in Unconsolidated Media: Technical Guidance Manual
- CO₂ Sparging: Phase 3 Full-Scale Implementation and Monitoring Report, LCP Chemicals Site, Brunswick, GA
- Technical Memorandum: ISB Phase I and ISCO Phase II Results and Downgradient Area Pilot Study Work Plan, Georgetown Facility, Seattle, Washington

EUGRIS Corner. New Documents on EUGRIS, the platform for European contaminated soil and water information. More than 32 resources, events, projects and news items were added to EUGRIS in December 2017. 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:

Derivation and Use of Soil Screening Values for Assessing Ecological Risks (2017). This UK Environment Agency report adapts Soil screening values (SSVs) which were first proposed by the Environment Agency as part of a broader framework for ecological risk assessment (ERA) for historical soil contamination, for use in a different purpose, setting out their use in the technical assessment of the recovery of waste and waste-derived materials to land. It updates their scientific basis, taking into account recent developments in international methods on assessing and characterizing the terrestrial ecotoxicity of chemicals published by the European Chemicals Agency. It expands the coverage of chemicals for which an SSV is proposed to include a wider

range of common trace elements and persistent organic pollutants that are relevant to wastes applied to land. View or download at

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/657723/

[Soil screening values for assessing ecological risk - report.pdf](#)

> Conferences and Symposia

Groundwater High-Resolution Site Characterization (HRSC), Tallahassee, FL, January 30-31, 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.

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