



2017 ITRC Teams

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PFAS - NEW

Leads: Bob Mueller (bob.mueller@dep.nj.gov) and Ginny Yingling (virginia.yingling@state.mn.us)

Project: The goal of this project is to produce concise technical resources that will help regulators and other stakeholders improve their understanding of the current science regarding PFAS compounds. Per- and polyfluoroalkyl substances (PFASs) such as perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) are a large and complex class of anthropogenic compounds whose prevalence in the environment have become an emerging, worldwide priority in environmental and human health. Certain compounds are believed to be environmentally persistent, and bioaccumulative, and pose human health risks. Recent high-profile cases involving human exposure in the United States have further focused both public and regulatory scrutiny on PFASs. The scientific community's understanding of PFAS sources, site characterization, environmental fate and transport, analytical methods, and remediation is growing rapidly. However, there is no central clearinghouse available that presents this information in a manner conducive to those other than subject-matter experts. As a result, there is a gap in the broad technical understanding necessary for informed and expedited decisions by regulators and policy makers. The project will produce a series of six Fact Sheets, each synthesizing key information for one of the following core subjects: (1) History and Use of Environmental Sources, (2) Nomenclature Overview and Physicochemical Properties, (3) Fate and Transport, (4) Site Characterization Tools, Sampling Techniques, and Laboratory Analytical Methods, (5) Remediation Technologies and Methods, and (6) Regulatory Summary. Following these will be the release of a detailed technical-regulatory guidance document and an internet-based training course, which will provide links to pertinent scientific literature, stakeholder points of view, technical challenges and uncertainties, and the necessary breadth and depth not given by the Fact Sheets.

LNAPL Update

Leads: Erik Gessert (erik.gessert@state.co.us) and Randy Chapman (randy.chapman@deq.virginia.gov)

Project: Since 2007, ITRC has been a national leader in producing technical and regulatory guidance documents and training courses focused on the assessment and remediation of light non-aqueous phase liquids (LNAPL) contaminated sites. With the advancement of science and lessons learned, the curriculum of the classroom training course has reached a point such that there is more new science presented than what was captured in the original ITRC LNAPL documents. The project team proposes to develop a comprehensive up-to-date web-based guidance document that captures relevant historic information for the assessment and management of LNAPL contaminated sites as well as lessons learned and will also incorporate cutting edge new science developed in recent years. This information based on the science of LNAPL, LNAPL Conceptual Site Model (CSM) development, transmissivity, and natural source zone depletion will form the basis of a comprehensive, one-stop LNAPL guidance document and online training that will serve ITRC's target users to support improved decision making at LNAPL sites and support states in basing regulatory guidance on the state of the science.

Evaluation of Innovative Methane Detection Technologies

Leads: Lisa Dorman (ldorman@pa.gov) and Timothy Taylor (timothy.taylor@state.co.us)

Project: The methane team is working to produce a web-based Technical and Regulatory Guidance Document that will establish a national consensus for evaluating and comparing the effectiveness of methane-detection and characterization technologies. Several states have passed or are considering regulations of methane emissions related to oil and natural gas production and distribution. Moreover, the U.S. Environmental Protection Agency (EPA) has finalized regulations for methane leaks at new sources and is gathering information for proposed regulation of methane at existing sources. Historically, gas detection technologies used to regulate fugitive emissions in the oil and gas sector had to comply with EPA's Method 21 Requirements. With the advent of optical gas imaging (OGI) technologies, EPA established an alternative work practice (AWP) to allow inclusion of manually operated infrared cameras, which provide visual evidence, in most environmental conditions, of a gas plume when a leak is present. EPA's finalized amendments to New Source Performance Standards (NSPS) on methane and volatile organic compounds (VOC) for oil and gas sources include Method 21 and OGI technologies as approved compliance methods. States like Colorado and Pennsylvania also allow use of Method 21 and OGI technologies for methane and VOC detection, and also have the option for approving new detection technologies. The team will assess the performance of state-of-the-art methane detection technologies, as well as regulatory barriers that might hinder the use of a standardized evaluation methodology.



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Quality Considerations for Multiple Aspects of Munitions Response Sites

Leads: Roman Racca (roman.racca@dtsc.ca.gov) and William Harmon (harmonw@michigan.gov)

Project: ITRC recently completed the Technical and Regulatory guidance document titled “Geophysical Classification for Munitions Response Sites” (GCMR-2). The document and companion internet-based training rely heavily on the Project Planning and Quality Assurance components of Geophysical Classification, using state of the art advanced sensor technology. Information in the previous ITRC documents “Geophysical Provenouts for Munitions Response Projects” (UXO-3) and “Quality Considerations for Munitions Response Projects” (UXO-5) will not be applicable in the transition of geophysical classification technology. Technological advancements in geophysical detections systems, and process improvements in geophysical surveys, have rendered UXO-3 and components of UXO-5 outdated or obsolete. The team will produce a separate document which will update the ITRC UXO-3 and UXO-5 documents to reflect technical and procedural advances. The document will provide guidance to regulators concerning the process and integration of Quality Control/Quality Assurance programs to support geophysical classification objectives. The guidance will empower regulators and stakeholders to quickly assess the quality of work performed, thereby minimizing rework, speeding up munition cleanup projects, and reducing their cost. The primary deliverables will be 1) an updated technical and regulatory guidance document, and 2) revised internet-based training.

TPH Risk Evaluation at Petroleum-Contaminated Sites

Leads: Thomas Booze (Thomas.Booze@dtsc.ca.gov) and Mike Kwiecinski (mike.kwiecinski@state.co.us)

Project: ITRC will review, update, and develop guidance on methods and procedures used for evaluating risk and establishing cleanup requirements at TPH contaminated sites. A lot of this information has been published by states and other entities over the past 20 years (e.g., TPH carbon range chemistry and toxicity, methods to develop weighted toxicity factors and screening levels for different fuel types, models and approaches to develop screening levels for direct exposure, vapor intrusion, drinking water and aquatic toxicity, gross contamination, etc.). The ITRC document will primarily be a compilation of this existing information presented in an easy-to-use manner for regulators and consultants. This document will also incorporate updated TPH information currently being collected by the American Petroleum Institute (API). A comprehensive state guidance document based on making scientific, risk-based decisions at petroleum-contaminated sites will be developed by the team.

Stormwater BMP Performance Evaluation Team

Leads: Rebecca Higgins (Rebecca.Higgins@state.mn.us) and Allison Dunaway (allison.dunaway@deq.virginia.gov)

Project: The goal of this project is to identify best methods for evaluating the pollution-reduction capabilities and verifying the performance of stormwater best management practices (BMPs) for Clean Water Act compliance purposes (to see full project proposal, [click here](#)). Facing a diversity of stormwater management laws, regulations and other mandates, regulators have no national consensus on how best to determine the pollution-reduction capabilities of Best Management Practices (BMPs) that reduce the flow of stormwater and associated pollutants into the nation's waterbodies. In addition to ensuring appropriate design and effectiveness, regulators must ensure that stormwater practices are properly installed, maintained and reducing pollution loading over their lifetime. Federal and state environmental regulators, DoD installations, agricultural entities, other large land owners, municipalities, builders, businesses, and a host of stakeholders share a strong interest to develop and implement such a consensus.

Bioavailability in Contaminated Soil

Leads: Claudio Sorrentino (Claudio.Sorrentino@dtsc.ca.gov) and Kathryn Durant (Kathryn.Durant@state.de.us)

Project: Research has shown that the potential risk and hazard associated with contaminants in soil are often less than if the contaminant is directly provided to organisms. Contaminants may be tightly bound to soil or sequestered within particles, greatly reducing the potential uptake by people (and other receptors) that are exposed to the soil. Consequently, if soil bioavailability is not considered, the remediation could be larger than necessary to achieve the desired level of protection. Lack of understanding, high cost of *in vivo* (whole organism) testing and the uncertainty



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associated with *in vitro* (test tube) assays are among the most common reasons why relative bioavailability is not considered. In the last decade, the cost of *in vitro* assays has decreased and their correlation to *in vivo* studies has improved. This team will bring together the leaders in soil bioavailability testing for inorganic (e.g., arsenic, lead) and organic contaminants (e.g., polycyclic aromatic hydrocarbons) to develop consensus-based regulatory and technical guidance on soil bioavailability. The goal of the project is to help regulators and practitioners select and properly use site-specific bioavailability testing, understand the pros and cons of different *in vivo* and *in vitro* methods, and determine which method is most appropriate for site conditions. An Internet-based training course will also be developed.

Characterization and Remediation in Fractured Rock

Leads: [Naji Akladiss \(naji.n.akladiss@maine.gov\)](mailto:naji.n.akladiss@maine.gov) and [Michael Smith \(michael.b.smith@state.vt.us\)](mailto:michael.b.smith@state.vt.us)

Project: Many challenging remediation sites have contamination present in fractured and weathered crystalline and sedimentary bedrock. Characterizing and conducting environmental remediation in fractured bedrock is difficult because fate and transport is complex, especially as compared to the better understood fate and transport in typical soil and groundwater systems. The goal of this project is to provide technical and regulatory guidance and internet-based training for regulators, the regulated community, remediation practitioners, and other stakeholders that will aid in the selection of appropriate characterization tools and techniques (e.g., geologic, hydraulic, and chemical) and remediation technologies to remediate common and emerging contaminants in fractured bedrock.

Remediation Management of Complex Sites

Leads: [Carl Spreng \(carl.spreng@state.co.us\)](mailto:carl.spreng@state.co.us) and [John Price \(john.price@ecy.wa.gov\)](mailto:john.price@ecy.wa.gov)

Project: Achieving restoration goals by applying conventional remediation approaches has been difficult at many contaminated sites. For example, remediation of groundwater to a condition allowing for unlimited use and unrestricted exposure remains a significant challenge at some sites. A variety of existing approaches can be applied at these challenging sites and a guidance describing the elements, tools, and options for successful remediation at complex sites is needed. Success at complex sites may ultimately depend on being able to integrate multiple remediation approaches, risk management strategies, and long-term monitoring and management. This project will produce a guidance document that provides a technical foundation for predictive analyses, for progressive remedy implementation, and for defining and achieving a successful remediation strategy at complex sites. Case studies will be included to help define complex sites. This document, along with an associated Internet-based training course, will help regulators and site managers develop protective approaches that have a strong scientific and technical foundation.