



# 2016 ITRC PROJECT PROPOSAL

## Remediation Projects Only

### Integrated DNAPL Site Strategy Training

**Instructions:** The Interstate Technology and Regulatory Council (ITRC) requests proposals for ITRC projects **in the remediation area only** for a 2015 start. Proposals should be submitted according to the process outlined in the [2015 ITRC Request for Proposals - Remediation Projects](#) and [2015 ITRC Project Selection Process and Criteria – Remediation Projects](#), which are also available on the ITRC website ([www.itrcweb.org](http://www.itrcweb.org)) under About ITRC – Planning.

Proposals must be prepared using this proposal template. The page limit for the proposal is 5 pages, and the proposal must be printable on a standard black and white laser printer. Only one Microsoft Word file containing the proposal will be accepted (other formats or attachments will not be considered). The file size must be less than 5 MB. Proposers are reminded to present a proposal with a well-focused scope that ITRC can address (e.g. the proposal should be technical in nature and not policy-oriented; research or demonstration projects are not valid). Receipt will be acknowledged by email within one business day of proposal receipt. It is the responsibility of the proposer to follow up, if receipt confirmation by ITRC is not received.

Questions can be addressed to Christophe Tulou, ITRC Director, [ctuloucontractor@ecos.org](mailto:ctuloucontractor@ecos.org), 202-266-4933.

*Please use brief statements or bullet items to input the requested information*

#### PROPOSAL DATE:

August 7, 2015

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## Proposals Topical Area

2-day Classroom Training Curriculum – ITRC Integrated DNAPL Site Strategy - a collaborative process for developing an effective and integrated strategy to manage remediation of sites contaminated with DNAPL and associated compounds.

Training curriculum based on ITRC DNAPL related documents including:

- Integrated DNAPL Site Strategy (IDSS-1) Nov-11
- Integrated DNAPL Site Characterization and Tools Selection (ISC-1) Apr-15
- Use and Measurement of Mass Flux and Mass Discharge (MASSFLUX-1) Aug-10
- In Situ Bioremediation of Chlorinated Ethene: DNAPL Source Zones (BIODNAPL-3) Jun-08
- Characterization and Remediation of Fractured Rock [expected in 2017]

## Proposal Summary

### Problem Statement:

For decades DNAPL contaminated sites have presented environmental challenges to regulators and practitioners alike. DNAPLs, as a contaminant category (dense nonaqueous phase liquids), display a number of characteristics that influence their behavior in the subsurface. Additionally each characteristic, such as solubility, has a wide range of values specific to the type of DNAPL. DNAPL also is frequently impure, and mixed with other contaminants, making its physical characteristics even more uncertain. DNAPL's complex behavior due to the physical characteristics of the compound is exacerbated by the heterogeneities of the subsurface in both porous medium and fractured bedrock systems. Characterizing these sites, let alone remediating these sites, may require state of the art and often unfamiliar investigative tools, a dynamic investigative approach, and a detailed understanding of the site geology and its role in controlling groundwater and contaminant flow. Additionally, establishing SMART remedial objectives using multiple and sequential remedial approaches with a collaborative team will improve performance and support completion.

Mastering the state of the science and the skills required to solve these environmental challenges and apply the ITRC guidance documents requires practice. That is where ITRC classroom training can play a critical role to support ITRC's target users to improve their on-the-job performance when working on DNAPL sites and build their confidence in using ITRC documents. Guiding ITRC's target users in the use of our guidance documents will foster efficient change that is required for regulator and practitioners to work together to improve decision making at DNAPL sites.

This Integrated DNAPL Site Strategy training will provide learners with the knowledge and skills to understand the importance of the physical and chemical characteristics of the DNAPL compound as it contacts and interacts with porous medium and fractured bedrock systems and is transported physically and hydraulically throughout the subsurface. Using the practical understanding of DNAPL characteristics, along with aqueous and vapor phase plume dynamics, the students will learn a process to develop and update a conceptual site model, and develop a plan for objectives based data collection. An interactive ITRC

worksheets will help the user discriminate among over 100 characterization tools to focus tools selection and application on the most appropriate tools for the site. Through this training course students will gain 1) a working knowledge of the ITRC interactive tools selection worksheets, and 2) a broad understanding of DNAPL site characterization methodologies and tools, their proper application, and interpretation of data.

Having learned the process of collecting and interpreting characterization data and developing a representative conceptual site model (CSM), students will select and evaluate appropriate remedies based on the CSM, SMART remedial objectives, as well as time and cost. The students will learn to measure progress against achievable metrics within realistic time frames. They will also learn to reassess remedies and adjust their performance or adjust the remedy in order to optimize remedial progress toward site cleanup objectives.

This Integrated DNAPL Site Strategy Classroom training is a hands on, practical, and comprehensive course merging five separate ITRC guidance documents developed by the ITRC DNAPL and Fractured Rock Teams in the last 6 years. It is up-to-date, interactive and taught by the leading practitioners and state regulators on the North American Continent. Learning to remediate DNAPL sites outweighs efforts to claim it is impractical to remediate DNAPL sites. Time is better spent learning to solve the problems than admitting defeat.

### **Approach:**

Using the ITRC DNAPL documents as the basis and gaining input from target learners, a smaller group (10-15) of ITRC DNAPL team members, will work together with ITRC Program Advisors (Technical Team Support and Training Program Support) and the ITRC Training Program Coordinator to develop and test this classroom training curriculum in preparation for public delivery.

### **Schedule:** (Approximately 18 months, with Dry Run scheduled for April 2017)

- Confirm and prepare trainers (subset of DNAPL and Fractured Rock Teams) [1<sup>st</sup> Qtr 2016]
- Provide target user assessment data to drive objective setting, curriculum design, content development, and support delivery planning [1<sup>st</sup>/2<sup>nd</sup> Qtr 2016]
- Establish course objectives and develop curriculum outline; train-the-trainer in adult learning principles to support curriculum design and content development [2<sup>nd</sup> Qtr 2016 and on-going – including in-person meeting (April) potentially as a part of the ITRC Spring Meeting]
- Design curriculum content and delivery strategies [2<sup>nd</sup>/3<sup>rd</sup> Qtr and on-going]
- Develop 1<sup>st</sup> content draft at 50% and partial trainer delivery practice and coaching, design interactive exercises to support learner retention and on-the-job application [Late Aug./early Sept. 2016 in-person meeting]
- Assess state readiness for hosting training class [3<sup>rd</sup>/4<sup>th</sup> Qtr 2016 and ongoing]
- Develop 2<sup>nd</sup> content draft – 75% - full trainer delivery practice/coaching [late Oct./early Nov. 2017, in-person meeting]

- Develop 3<sup>rd</sup> content draft – 90% - full trainer delivery practice/coaching with small audience (approximately 10-12 learners) [late Jan./early Feb. 2017 potentially in-conjunction with ITRC Kick-Off Meeting]
- Develop 4<sup>th</sup> content draft – Dry Run: full trainer delivery practice/coaching with target audience representatives (approximately 50 learners) [April 2017, in-person meeting, potentially in conjunction with ITRC Annual Meeting]
- Revise content based on Dry Run input [2<sup>nd</sup>/3<sup>rd</sup> Qtr] to prepare for 1<sup>st</sup> public offering [expected Fall 2017, with 3-4 offerings per year for 3-5 years]

### **Proposed Personnel**

State Leaders/Trainers: Michael Smith (VT), David Scheer (MN) in partnership with ITRC Training Program Coordinator (Tom Higgins). In addition, Naji Akladiss (ME) will assist with project start-up – trainer selection and soliciting funding.

Trainers from ITRC DNAPL and Fractured Rock teams include representatives from state and federal agencies, consulting firms, industry, and academia. Over the years and within the DNAPL topic area we have identified several very high quality trainers available to support this effort.

### **Summary of Deliverables (primary project product(s))**

2-day training curriculum to be delivered to in-person audiences expected to range from 150-200 participants. Curriculum will be based on ITRC DNAPL related documents as noted above in the “Proposals Topical Area” section.

Note: Although this proposal is for a traditional 2-day classroom training proposal. There may be opportunities to integrate learning transfer strategies in conjunction with the work being done in the Training Program Advancement Initiative.

### **Targeted Users (who will use products generated by this project?)**

This training is intended for regulators, remedial project managers, and remediation engineers responsible for sites contaminated by chlorinated solvents.

The level of interest in DNAPL related topics covered by ITRC guidance documents have been significant over the years and continues to be strong both in the public and private sectors. Over 8000 participants have taken ITRC Internet-based training promoting the DNAPL guidance documents, which are included as the basis for proposed classroom training curriculum. The Internet-based training provides an introduction to these topics but the classroom training would provide the practice to support the application of the knowledge and skills required to efficiently apply the ITRC documents and build ITRC success. There is strong state interest in the ITRC DNAPL topics with over 30 states providing members on ITRC DNAPL teams and an additional 15 states contributing by providing survey input, document review and training dry run participants.

## Potential Funding Sources

The following companies and agencies have not been approached but were very active during the development of one or more of the guidance documents that will constitute this training and may be potential funding sources for this project.

For instance:

### Industry

- GSI Environmental
- Geo-cleanse International
- Geosyntec Consultants Inc.
- Kleinfelder
- Battelle AMEC Foster Wheeler Environment & Infrastructure Tetra Tech
- CDM-Smith
- CH<sup>2</sup>M Hill
- Geoprobe
- Trihydro
- GZA GeoEnvironmental, Inc
- Langan Engineering and Environmental Services
- Porewater Solutions
- EPRI
- Environmental Resource Management Anchor QEA
- Burns and McDonnell Engineering Company, Inc
- BP
- SERDP / ESTCP
- Stone Environmental
- InfraSUR LLC

### Federal

- USEPA OSRTI
- USEPA Region 10
- NAVFAC
- USDOE-EM-12