



# Natural and Enhanced Attenuation for Chlorinated Solvents: New Developments and Tools Agenda and Speakers

**January 14, 2009**

**Morning Session (8:30 am—10:15 am)**

**Introduction and History:** *Karen Vangelas, Savannah River National Laboratory, Project Manager*

**Technical Overview of Project and Introduction of the Decision Framework:** *Brian B. Looney, Savannah River National Laboratory, Project Technical Manager*

**Preview of Workshops:** *Brian B. Looney*

**10:15 am—10:30 am**      **Break**

**Workshops Begin**

**10:30 am—11:30 am**      **Field Tools** - *Maggie Millings, Savannah River National Laboratory*

**11:30 am—12:30 pm**      **Molecular Biological Tools (MBTs)** - *Chris Yeager, Savannah River National Laboratory*

**12:30 pm—1:15 pm**      **Lunch (on your own)**

**1:15 pm—2:15 pm**      **cVOC Decision Analysis Tool** - *Dawn Kaback, Geomatrix Consultant, Inc.*

**2:15 pm—3:15 pm**      **Hands-on Introduction to the cVOC Decision Analysis Tool** - *Dawn Kaback*

**3:15 pm—3:30 pm**      **Open Discussion**

**3:30 pm**      **Adjourn for the Day**

**January 15, 2009**

**Workshops Continue**

**8:30 am—9:30 am**      **Scenarios** - *Chuck Newell, GSI Environmental Inc. and Mike Truex, Pacific Northwest National Laboratory*

**9:30 am—10:30 am**      **BIOBALANCE** - *Chuck Newell and Brian Looney*

**10:30 am—10:45 am**      **Break**

**10:45 am—11:45 am**      **Numerical Modeling and Flux Calculation for MNA and Enhanced Attenuation** - *Mike Truex*

**11:45 am—12:30 pm**      **Lunch**

**12:30 pm—1:30 pm**      **Hands-on Introduction to the BIOBALANCE model** - *Brian Looney and Chuck Newell*

**1:30 pm—2:00pm**      **Closing Statements**

**2:00 pm**      **Adjourn**



**We Put Science To Work**



**We Put Science To Work**

The Department of Energy's Office of Environmental Management's Office of Groundwater and Soil Remediation and the Savannah River National Laboratory invite you to attend a seminar that introduces the processes and tools developed by a national team of scientists challenged to identify and then develop the "next generation" tools to support the implementation of attenuation based remedies at chlorinated solvent contaminated sites. Attendees will be introduced to the latest information related to attenuation based remedies for sites contaminated with chlorinated solvents. By attending this meeting you will get ahead of the curve on topics being incorporated into upcoming technical regulatory guidance by the Interstate Technology Regulatory Council. Though many of the new tools are specific for chlorinated solvents, the three main technical concepts that were the basis for selecting the research studies are transferable to metals and radionuclides.

---

### January 14, 2009

The first day of the seminar will provide an overview of the main concepts developed and technology advancements followed by three workshops that provide detailed information on new field tools and a decision analysis tool. The day concludes with a hands-on introduction to the decision analysis tool. Emphasis is on practical application of these tools.

*Topics to be presented in the overview session are:*

- Review of Seminar Objectives and Goals
- Summary of Collaborative Work with ITRC and ITRC Products
- Overview of New Processes, Tools, and Products
- Examples and Case Studies that emphasize the relevance to waste unit characterization and remediation actions and decisions (How the new processes, tools, and products can be integrated into a site's remediation process.).

---

### January 15, 2009

The second day of the seminar continues with workshops. These workshops provide detailed information on a tool very similar to a taxonomic key that guides the user in planning an evaluation of a site where MNA is being considered and on two mathematical tools. The seminar officially ends at noon. However, there will be two additional sessions held in the afternoon that will provide interested attendees with the opportunity to participate in a hands-on session with two of the new mathematical tools. Example problems will be worked. These sessions will be led by the developers of these tools.

See Page 2 for Workshop Descriptions

---

#### Location and Date

US EPA Region 10  
1200 Sixth Avenue, Suite 900  
Office of Environmental Cleanup  
(ECL-113)  
Seattle WA 98101

January 14 and 15, 2009

Attendance is limited to the first  
40 registrants.

For information and registration,  
contact:

Kira Lynch at  
E-mail @ [Lynch.Kira@epamail.epa.gov](mailto:Lynch.Kira@epamail.epa.gov)  
or Phone: 206-553-2144

There is no registration fee. However,  
participants are requested to register.  
Please indicate the days on which you  
plan to attend.

#### Who Should Attend

Environmental technical professionals, regulators, managers responsible for site remediation efforts, and parties interested in the use of attenuation based remedies.

## Workshop Descriptions

**Field Tools** – This workshop will present several of field tools for measuring key parameters used in selecting and evaluating Monitored Natural Attenuation and Enhanced Attenuation. Included will be push-pull aquifer tests used for estimating attenuation rates, an oxygen sensor that was developed for oceanographic purposes and is an improvement over the current methods for long-term measuring of dissolved oxygen, and a method to measure contaminant flux in a groundwater monitoring well called the “passive flux meter”.

**Molecular Biological Tools (MBTs)** – This workshop will present a summary of the developments associated with MBTs, both in this project and by other programs. There will be discussions occurring around MBTs that provide information on *Dehalococcoides* species associated with the reductive dechlorination of tetrachloroethene and trichloroethene. In addition, progress being made by researchers on developing MBTs and associated probes for other biological mechanisms, such as aerobic and cometabolic processes will be reported. Participants will engage in several scenario-based exercises designed to illustrate the advantages and limitations of MBT data. How information gained from MBT analyses can be integrated into the overall MNA/EA decision making/implementation process will be emphasized.

**cVOC Decision Analysis Tool** – A tool based on a structured analytic approach for comparing alternative remedial approaches at sites containing groundwater contaminated with cVOCs. The analytic approach is based on multiple-attribute utility analysis, which balances competing objectives through application of value judgments reflecting tradeoffs the decision-maker is willing to make between those objectives. The tool was designed as a user-friendly spreadsheet that will be useful at sites with any type of ongoing treatment and will give fair consideration to Enhanced Attenuation and MNA alternatives. Some inputs to this tool will be the outputs from analytical (e.g., BIOBALANCE) or numerical (e.g., RT3D) models. **A hands-on training session will be held the afternoon of January 14 using this tool.**

**Scenarios** - A guide to provide practitioners with an appropriate level of site specificity to assist in planning/supporting characterization, modeling, and implementation of MNA and Enhanced Attenuation. The tool consists of a user's guide and 13 scenarios built around site geochemical and hydrogeologic conditions. The Scenarios package contains a significant amount of up-to-date information to support evaluation and implementation of MNA and Enhanced Attenuation.

**Numerical Modeling and Flux Calculation for MNA and Enhanced Attenuation** - A reactive transport model applied as a tool for evaluation and implementation of MNA and Enhanced Attenuation. The materials developed include reaction modules for complex chlorinated solvent reactions and a software utility designed to provide modeling results in terms of mass flux to support mass balance evaluations. Documentation provides guidance and information for using numerical models for MNA and Enhanced Attenuation. The workshop will include applying the tools to a case study. The specific tools are for the MODFLOW-based RT3D reactive transport code, but much of the numerical modeling information could also be applied on other modeling platforms.

**BIOBALANCE** – A model based on the BIO-CHLOR model. This model provides users a tool that calculates plume growth over time, providing an estimate of when a plume will reach its greatest length. For reductive degradation, this model also evaluates how much electron donor is needed to overcome competing electron acceptors in the system to sustainably degrade the contaminant of interest. BIOBALANCE supports early choices of potentially viable MNA and biostimulation options. **A hands-on training session will be held the afternoon of January 15 using this tool.**