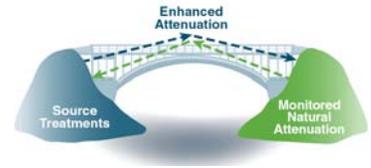


### **Enhanced Attenuation of Chlorinated Organics (EACO): A Decision Framework for Site Transition**

This guidance includes a Decision Flowchart that provides a systematic approach for reviewing, planning, and evaluating site-specific conditions, which may lead to enhancement technologies in the saturated subsurface contaminated with chlorinated organics. In addition, it describes remedial strategies for enhanced attenuation (EA) processes, by either increasing the attenuation capacity of the aquifer or decreasing the flux of contaminants. This guidance contains the following:

- Current Limitations of Monitored Natural Attenuation (MNA)
- Description of Mass Loading, Mass Flux, and Aquifer Attenuation Capacity
- Enhanced Attenuation Benefits
- Decision Flowchart
- Enhancement Technologies and Options
- Regulatory Considerations
- Challenges and Solutions



## Background

Chlorinated organic contamination exists nationwide and worldwide. There is little guidance available regarding when to transition from active remedies, such as source control, to an MNA remedy and from an MNA remedy to active remediation. The use of EA does not require any alternative regulatory considerations.

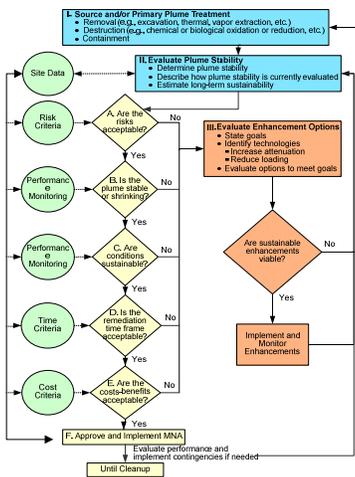
## Benefits

- ▶ Facilitates transition of contaminated sites through the remediation process
- ▶ Provides scientific documentation for remedy change
- ▶ Complements MNA and expands remediation opportunities
- ▶ Integrates source zone treatment and MNA
- ▶ Encourages a systematic approach to total site remediation
- ▶ Helps streamline/expedite review process

## Actions

ITRC requests that you use this guidance and associated resources to

- ▶ Understand EACO concepts and use
- ▶ Understand the benefits of EACO and MNA
- ▶ Understand the limitations of EACO and MNA
- ▶ Report to ITRC any use of EA practices for chlorinated organic contamination (Go to [www.itrcweb.org](http://www.itrcweb.org))
- ▶ Report to ITRC (see contacts below) any successes or concerns related to this guidance



## Resources

### Documents

- ▶ *Enhanced Attenuation: A Solution to a Common Groundwater Remediation Problem*, 2005 (fact sheet)
- ▶ *National Survey of State Regulators: A National Overview of Monitored Natural Attenuation and Enhanced Attenuation—Results of an Interstate Technology and Regulatory Council Survey*, 2005
- ▶ *A Decision Flowchart: The Decision Flowchart for the Use of Monitored Natural Attenuation and Enhanced Attenuation at Sites with Chlorinated Organic Plumes*, 2007
- ▶ *Enhanced Attenuation of Chlorinated Organics: Electronic Resource Guide*, 2007
- ▶ *Enhanced Attenuation: Chlorinated Organics, EACO-1*, 2008

### Links

For more information and useful links about enhanced attenuation of chlorinated organics, go to [http://www.itrcweb.org/teampublic\\_EACO.asp](http://www.itrcweb.org/teampublic_EACO.asp).

## Training on Enhanced Attenuation of Chlorinated Organics

ITRC has developed a FREE Internet-based training course for *Enhanced Attenuation: Chlorinated Organics*. This training describes the transition (the bridge) between aggressive remedial actions and MNA and vice versa. EA is a protocol and strategy which includes the application of technologies that minimize energy input and are sustainable to reduce contaminant loading and/or increase the attenuation capacity of a contaminated plume to progress sites towards established remedial objectives. Contaminant loading and attenuation capacity are fundamental to sound decisions for remediation of groundwater contamination. This training explains how to use a decision framework which, when followed, allows for a smooth transition from more aggressive remedial technologies to sustainable remedial alternatives and eventually to MNA.

ITRC's Internet-based training courses assist potential users of the ITRC guidance document to understand when and how to use the document and the associated technology and/or approach. Participants can take the training "live" from the comfort of their own office or access archives of past classes at their convenience. Through ITRC's partnership with U.S. EPA's Technology Innovation Program, ITRC delivers training courses via the Internet to reach a geographically dispersed audience of regulators, consultants, and other members of the environmental community. The training sessions last approximately 2 hours, cover technical and regulatory information specific to environmental technologies and innovative approaches, and are supported by consensus-based ITRC guidance documents.

**Cost:** Sponsored by ITRC and EPA with no cost for the participant

**Registration:** <http://clu-in.org/studio/seminar.cfm> (opens 4–6 weeks prior to class date)

**Associated guidance documents:** Available from [www.itrcweb.org](http://www.itrcweb.org)

If you have questions after completing the on-line registration, call (402) 201-2419 or send an e-mail to [training@itrcweb.org](mailto:training@itrcweb.org).

### Contacts

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## Regulatory Acceptance for New Solutions

Documents, free Internet-based training, contact information

[www.itrcweb.org](http://www.itrcweb.org)