

Course Description

The use of natural attenuation as a potential remediation approach, also known as intrinsic remediation and a host of other terms, is widely accepted for organic solute plumes in ground water. Widely accepted in the United States and actively encouraging risk-based approaches to remediation and the consideration of natural attenuation as a remedy and also increasingly applied in Australia as a site management option. Although many US State and Federal agencies recognise natural attenuation as a viable remediation approach, this alternative must be supported by sufficient evidence of its effectiveness. Such evidence requires adequate site characterization to determine solute plume behavior, make realistic estimates of attenuation rates and source decay rates, and design an adequate monitoring program to show that natural attenuation is occurring as expected.

This unique short course is presented by one of the world's leading experts in the field and provides the practical information needed to effectively evaluate natural attenuation as a remediation alternative at sites with petroleum hydrocarbons, chlorinated solvents, and other contaminants in ground water. It stresses the underlying concepts of natural attenuation and practical guidelines for evaluating and applying natural attenuation as a remediation approach. It also provides in-depth discussions of the mechanisms of natural attenuation, data collection and analysis, quantification of contaminant transport and fate processes, and regulatory considerations involved in implementing natural attenuation as a remedy and management option for ground water contamination. A variety of class exercises are integrated into the course that are designed to enhance the participant's understanding of the material and provide opportunities to work with real-world data.

This three-day course includes expanded coverage of:

- An in depth presentation of theory, concepts and application of monitored natural attenuation for remediation and management of groundwater
- A mix of theory and practical application, using industry relevant examples and case studies.
- Graphic and quantitative methods for evaluating concentration time series data, trends, and plume behavior
- Computer visualization techniques
- Long-term monitoring approaches.
- Additionally, there is coverage of natural attenuation of:
 - o PAHs
 - o Chlorinated aromatics
 - o Nitroaromatics
 - o Inorganic constituents.

Course Location

Holmesglen Conference Centre
Auditorium
Cnr Warrigal and Batesford Rds
CHADSTONE VIC 3148
T 9564 1500

Contact Info

For more information contact Louisa Nicholls of ACLCA Victoria on 9509 5949.

Course Background

This course has been designed specifically by the Australian Contaminated Land Consultants Association (Victoria) for local conditions and follows on from courses held two years ago. Please note that the previous 2-day course has been modified to 3-days in duration to allow for more comprehensive coverage of the material. This course aims to improve proficiency at looking for, measuring, assessing and reporting on natural attenuation and enhanced bioremediation in groundwater and thus enabling higher quality and more rigorous submissions to clients, auditors and regulators. Todd Wiedemeier is a leading expert in this field and an experienced and engaging presenter.

"I found Todd Wiedemeier to be an extremely knowledgeable and authoritative expert on MNA. Although a lot of material was covered it was always entertaining. The course notes are an excellent resource and I feel I now have a much better understanding of the processes occurring on my remediation sites and how to optimise them" (Remediation Consultant – Melbourne, October 2007 ACLCA MNA Course).

Education Level

Intermediate to advanced – assumed that participants hold senior/principal level positions within the industry and/or have attended the 1-day Introductory Course.

Attendees Need to Provide

- A calculator

Fees

Non-members:
Non-members — **AUS\$1,700**

ACLCA members - Early bird rate
(for registrations received with payment prior to Friday 25th September 2009)
— **AUS\$1,300**

ACLCA members - Standard rate
— **AUS\$1,450**

The course fee includes attendance of the course, course notes and full catering for the duration of the course.

Refunds will only be provided for cancellations received at least ten business days prior to the commencement of the course. No refunds will be offered to registrants failing to attend any part of the course once it has commenced.

To register:
www.aclca.org.au

Click on Events

Select event from calendar and click 'register now'

Confirmed registrations will be accepted by Visa or

Mastercard

Pending registrations will be accepted by EFT or cheque



Monitored Natural Attenuation for Groundwater Remediation and Management

27th – 29th October 2009 (3 days)
Melbourne, Victoria
Holmesglen Conference Centre

A short course offered by ACLCA Victoria
and presented by Todd Wiedemeier, PG
and W. Zachary Dickson, PG

Course Outline and Schedule

Day 1 – 27th October 2009

- 7:30 – 8:00 **Registration**
- 8:00 – 10:00 **Overview of Natural Attenuation as a Remediation Approach**
- ◆ Overview of natural attenuation
 - ◆ Geochemistry and microbiology
 - ◆ Basic components of natural attenuation as a remediation approach
- 10:00 – 10:15 **Break**
- 10:15 – 12:00 **Sources Zones**
- ◆ Sources and nature of releases
 - ◆ Relation of solute plumes to hydrogeology
 - ◆ Dynamics of solute plumes in groundwater
 - ◆ Strength and duration of NAPL sources
- 12:00 – 1:00 **Lunch**
- 1:00 – 2:00 **Non-Destructive Natural Attenuation Mechanisms**
- ◆ Transport processes – advection, diffusion, dispersion
 - ◆ Sorption and volatilization
- 2:00 - 3:00 **Introduction to Destructive Natural Attenuation Mechanisms – Degradation and Transformation Processes**
- ◆ Basics of chemical reaction mechanisms and rates
 - ◆ Abiotic reactions
 - ◆ Microbially mediated reactions – biodegradation
- 3:00 – 3:30 **Break**
- 3:30 – 5:00 **Biodegradation of Petroleum Hydrocarbons**
- ◆ Hydrocarbon oxidation
 - ◆ Aerobic and anaerobic biodegradation

Course Outline and Schedule

Day 2 – 28th October 2009

- 8:00 – 10:00 **Degradation of Chlorinated Solvents**
- ◆ Biological degradation
 - ◆ Reductive dechlorination
 - ◆ Patterns of chlorinated solvent biodegradation
 - ◆ Abiotic degradation
- 10:00 – 10:15 **Break**
- 10:15 – 12:00 **Natural Attenuation of Other Contaminants**
- ◆ Inorganic contaminants
 - ◆ Other organic contaminants (chlorobenzenes, chlorophenols, etc.)
- 12:00 – 1:00 **Lunch**
- 1:00 – 3:00 **Lines of Evidence for Evaluating Natural Attenuation and MNA**
- ◆ Contaminant data
 - ◆ Geochemical indicators
 - ◆ Specialized data – microbiological, stable isotopes, etc.
- 3:00 – 3:30 **Break**
- 3:30 – 5:00 **Site Characterization for Evaluating Natural Attenuation**
- ◆ Approaches to site characterization
 - ◆ Field parameters and methods
 - ◆ Laboratory parameters and methods
 - ◆ Data interpretation
 - ◆ Evaluating evidence of natural attenuation
- 5:00 – 5:30 **Questions and Answer Session**

Course Outline and Schedule

Day 3 – 29th October 2009

- 8:00 – 9:00 **Evaluation of Contaminant and Daughter Product Data**
- ◆ Plots of concentration versus time and distance
 - ◆ Isopleth maps
 - ◆ Molar fraction plots
- 9:00 – 10:30 **Use of Isotopes to Evaluate Natural Attenuation**
- ◆ Introduction to isotope geochemistry
 - ◆ Why isotopes provide unequivocal evidence of degradation
- 10:30 – 10:45 **Break**
- 10:45 – 12:00 **Evaluation of Mass Flux**
- ◆ Overview of mass flux calculations
 - ◆ Types of mass flux calculations
 - ◆ Uses of mass flux Calculations
- 12:00 – 1:00 **Lunch**
- 1:00 – 2:30 **Using Models to Evaluate Natural Attenuation**
- ◆ Introduction to models
 - ◆ Types of models
 - ◆ Applicability to the evaluation of natural attenuation
- 2:30 – 3:15 **Selecting and Implementing an MNA Remedy**
- ◆ Considerations for selecting a natural attenuation remedy
 - ◆ Defining remedial goals and exit strategies
 - ◆ Interaction with other remedial options
 - ◆ Regulatory perspectives
- 3:15 – 3:45 **Break**
- 3:45 – 5:00 **Developing Long-Term Monitoring Plans for Monitored Natural Attenuation**
- ◆ Components of a natural attenuation monitoring plan
 - ◆ Locating long-term monitoring wells
 - ◆ Selecting monitoring parameters and frequency

