

Member Agencies of the Federal Remediation Technologies Roundtable (US EPA, US DoD, US DoE, US DoI, US NASA), Abstracts of Remediation Case Studies, vol. 8, June 2004 (102 pp., US\$ gratis).

I have, in the past, reviewed US Government publications including earlier versions of this series on remediation. This book is one of a number of excellent US EPA-published books (I might note that somewhere in the past, a librarian at my university noted that the most prolific publisher in the world was the US Government; included in the above comment was the US EPA which has published a large number of reports). In recent years, however, the use of electronic media for information transfer has decreased the flow of paper volumes in favor of electronic access (see below).

The book is "...a collection of abstracts summarizing 19 new case studies of site remediation applications" that cover "...a wide variety of technologies including full-scale remediations and large-scale field demonstrations of soil, groundwater, and sediment treatment technologies".

"The case study abstracts in this volume describe a wide variety of ex situ and in situ soil treatment technologies for both soil and groundwater. Contaminants treated included chlorinated solvents; petroleum hydrocarbons and benzene, toluene, ethylbenzene, and xylenes; polycyclic aromatic hydrocarbons; pesticides and herbicides; metals; and radioactive materials".

In addition to providing information about the treatment technology used, contaminants and media treated and project duration, cost data for the 19 technology applications are given.

"Appendix A to this report provides a summary of key information about all 361 remediation case studies published to date by the Roundtable". All case studies are available on a CD-ROM.

Included in the package that contained the above-mentioned review book were two information sheets that describe other US EPA projects. The first of these projects was the "Field Analytic Technologies Encyclopedia (FATE)" which is an on-line encyclopedia developed jointly by the US EPA and the US Corps of Engineers. It provides information on many tools that are now available to streamline site investigation and cleanup. It can be accessed through the worldwide web at FATE.CLU-IN.ORG. Categories of data include analytics (such as gas chromatography, immunoassay, X-ray fluorescence), direct-push technologies, explosives, geophysics (such as ground penetrating radar and magnetics for environmental applications), sampling (such as passive diffusion bag samplers) and sampling design. This site is regularly updated with new information related to the field of analytic techniques.

The second sheet in this mailing describes the US EPA's technical seminars which were originally presented as 2 h live events. They are now archived and are available at <http://clu-in.ora/studio/>. Topics include:

- Advanced Techniques for Iron Based Permeable Reactive Barriers and Non-Iron Treatment Material;
- Field-Based Analytical Methods for Explosive Compounds;
- Field Analytical Technologies for VOCs in Groundwater;
- Dynamic Data Collection Strategy Using Systematic Planning;
- Enhanced In Situ Bioremediation of Solvents in Ground Water;
- Geophysical Characterization Techniques and Data Uses;
- Historical Case Analysis of Chlorinated Volatile Organic Compound Plumes;
- In Situ Chemical Oxidation;
- Natural Attenuation of Chlorinated Solvents in Groundwater: Principles and Practices;
- Passive Diffusion Bag Samplers for Volatile Organic Compounds in Ground Water;
- Permeable Reactive Barriers for Chlorinated Solvent, Inorganic, and Radionuclide Contamination;
- Phytotechnologies.

Gary F. Bennett

*Department of Chemical and Environmental Engineering
University of Toledo, Mail Stop 305
Toledo, OH 43606-3390, USA
Tel.: +1 419 531 1322; fax: +1 419 530 8086
E-mail address: gbenett@eng.utoledo.edu*

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Daniel A. Vallero, Environmental Contaminants: Assessment and Control, Elsevier Academic Press, Burlington, MA, 2004, ISBN 0-12-710057-1 (820 pp., US\$ 79.95).

The first section of the preface of this book has a question as its title: "Why a book on environmental contaminants?" Vallero answers his own question thusly:

"My principle objective in writing this book is to help the environmental professional, professor, student, and citizen to apply the science, engineering, and technology for assessing environmental risks and cleaning up environmental problems in air, water, soil, sediment, and living systems. I do so by introducing a key topic related to environmental risk assessment or methods to control or reduce risks and, when appropriate, follow it with examples of problems and solutions. Each solution includes a discussion of the basic and applied sciences as well as other considerations, such as when the equations and applied principles may not work, where uncertainties may exist, and how these applications may or may not work in the 'real world'."

The book, the author notes, has four parts which he describes thusly:

“The first gives the policy context for environmental risk assessment and introduces the reader to how environmental science and engineering are used in decision making. The second introduces the reader to the fundamental principles underlying environmental assessment and response actions. The third introduces risk assessment and environmental toxicology, with guidance on how hazards and dose responses are determined, how exposures can be estimated, and techniques for calculating risks under a number of realistic scenarios. . . . The book’s fourth part shows how the practitioner can put these fundamental principles to work to clean up environmental problems, and introduces environmental management considerations and the expectations of environmental professionals.”

Very early, Vallero caught my attention with a discussion of problems faced by the Great Lakes. Contamination of these magnificent bodies of water has caused a number of locations to be designated as Areas of Concern and Remediation Action Plans are being developed for each. An excellent discussion of why this contamination is of concern is given under the sub-heading of “Beneficial Use Impairments”, i.e., degradation of fish populations, benthos, phytoplankton, zooplankton, and esthetics.

Following this section is a key discussion on “Understanding Policy by Understanding Science”. Vallero notes, “Too often, it seems we are asked to manage or lead without an adequate understanding of what it is we are managing or leading. To assess and address environmental issues and problems appropriately and thus make sound environmental decisions require at least a basic understanding of the scientific principles affecting those issues, problems, and decisions.” To which I say, “Amen”.

Among other topics discussed in this chapter are US laws dealing with the environment. Included are short discussions of the National Environmental Policy Act (NEPA), the Clean Air Act, and water quality legislation.

The second major section of the book deals with risk assessment which the author notes is “. . . a multifaceted and complex mix of science, engineering, and technology”. Risk assessment, he notes, “. . . must follow the prototypical rigors of scientific investigation and interpretation”. Chapter titles in this section include:

- Fundamentals of environmental physics.
- Applied contaminant physics: fluid properties.
- Environmental equilibrium, partitioning, and balances.
- Movement of contaminants in the environment.
- Fundamentals of environmental chemistry.
- Chemical reactions in the environment and biological principles of environmental contamination.

Section three is entitled “Contaminant Risk”. Thoroughly discussed are the hazards posed by chemicals. Vallero goes from the past to the present by first quoting Paracelsus’ definition of a poison. In his definition, Paracelsus notes that the dose is the major aspect of importance as it differentiates be-

tween a poison and a remedy. From the past, Vallero enters the future by discussing the US Resource Conservation and Recovery Act (RCRA). He cites the four physical/chemical classes by which a waste is classed as being hazardous: corrosivity, ignitability, reactivity and toxicity. Included in this chapter is a section entitled “Contaminant Exposure and Risk Calculations”. Cancer risk calculations are discussed here among other topics.

The fourth and final major section of the book is entitled “Interventions to Address Environmental Contamination”. The first chapter in this three-chapter section is entitled “Contaminant Sampling and Analysis”. The subsequent two chapters discuss how to manage risk and conduct environmental decision making. Key to this analysis is a list of 19 questions to be answered on the important topic of how to communicate scientific information.

The book has a plethora of basic information on waste treatment. For example, there is a good discussion of both incineration and biological waste treatment.

There were two interesting writing techniques used by the author. He puts much information in “shaded boxes” throughout the book to highlight discussion topics. For example, a box entitled “Bioremediation Example 1” asks the question “What is the difference between biostimulation and bioaugmentation in biological treatment of hazardous chemical contaminants? Which approach do hazardous waste remediation engineers prefer?” Then he goes on to answer the questions in the same box.

Finally, I note, each chapter ends not with a normal list of references but with an extensive section entitled “Notes and Commentary”. Included in his discussion are reference citations but more importantly the author discusses the meaning and ramifications of many of his statements in the book.

Gary F. Bennett

*Department of Chemical and
Environmental Engineering*

Mail Stop 305, Toledo, OH 43606-3390, USA

Tel.: +1 419 531 1322; fax: +1 419 530 8086

E-mail address: gbennett@eng.utoledo.edu

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Kenneth W. Oldfield (Ed.), *Emergency Responder Training Manual for the Hazardous Materials Technician, Second Edition*, John Wiley & Sons, Inc., Hoboken, NJ, 2004, ISBN 0-471-21387-X (641 pp., US\$ 89.95).

This book, the editor notes, “. . . is designed to address the training needs of personnel who respond to emergencies involving hazardous materials.” In my opinion, that goal is fulfilled and fulfilled very well. This, the second edition, has new material that includes: