

microbubble sparging, propane oxidizing bacteria, bioventing, and natural attenuation. The latter section of the book described above contains an abundance of site-specific information on (as noted) full-scale cleanup by a wide variety of processes.

The book ends with two appendices. The first appendix "... describes the occurrence of MTBE in surface and ground water including the last 10 years of sampling results for the United States Geological Survey (USGS) National Water Assessment (NAWQA) Program." The second appendix contains the names and addresses (both postal and e-mail) of the contributors to this book; this is an excellent section giving interested readers a means of contacting contributors.

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**Hari D. Sharma, Krishna R. Reddy, Geoenvironmental Engineering: Site Remediation, Waste Containment, and Emerging Waste Management Technologies, John Wiley & Sons Inc., Hoboken, NJ, 2004, 986 pp., US\$ 195.00, ISBN 0-471-21599-6.**

An area of environmental engineering that has emerged in the last several years (certainly since Love Canal) is that of geotechnical engineering, which is a discipline that addresses both the prevention and remediation of soil contamination. Sharma and Reddy cover the topic thoroughly in this book, which they note has had prior use in university courses. The authors, much to my liking, have included a discussion of "... basic principles, example problems, case histories and questions/problems with lists of comprehensive up-to-date references at the end of each chapter".

"The book is divided into four major parts: Part I, Basic Principles; Part II, Remediation Technologies; Part III, Landfills and Surface Impoundments; Part IV, Emerging Technologies."

In Part I, the authors discuss "... environmental laws and regulations, chemical and geochemistry background, geotechnical background, groundwater flow, and contaminant fate and transport. In Part II [they] discuss sources of contamination, contaminated site characterization, risk assessment, in situ waste containment, and soil and groundwater remediation technologies. In Part III [they] present information on design and evaluation of landfills and surface impoundments ... ." "Finally, in Part IV [they] outline various emerging technologies, such as beneficial uses of closed landfills,

recycling, bioreactors, and in situ capping subaquatic waste sediments."

The final section of the text contains some very up-to-date material with chapters entitled: Beneficial use of waste materials; recycling, end uses of closed landfills, bioreactor landfills and subaquatic sediment waste; in situ capping. I note that the last chapter on sediment waste is a very recent topic covered in the literature. Indeed, I very recently reviewed for the *Journal of Hazardous Materials* a Battelle Conference on the remediation of contaminated sediments.

Reviewing an almost 1000-page text is a daunting task, especially for a "general" environmental engineer who is familiar with but not an expert on geotechnical issues. I was, however, able to read and reasonably understand the material in the text even on topics unfamiliar to me. That is much to the credit of the authors' writing.

Each chapter I noted above ends with a relatively extensive list of questions and problems for student use. Readers of these reviews will know that is an inclusion I look for. Also, I note that the Table of Contents is very well developed. Covering 12 pages, the authors list, the titles of all sections, and subsections in the book.

I conclude the review with apologies to the authors for not being more specific about the contents. However, my evaluation is that this is an excellent text that may very well dominate this field for several years.

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**Lawrence K. Wang, Norman C. Pereira, Yung-Tse Hung (Eds.), Air Pollution Control Engineering, Humana Press, Totowa, NJ, 2004, ISBN 1-59259-778-5, 521 pp., US\$ 175.00.**

This book is the first of three to be published in a series entitled *Handbook of Environmental Engineering* whose goal is "... (1) to cover the entire range of environmental fields, including air and noise pollution control, solid waste processing and resource recovery, biological treatment processes, water resources, natural control processes, radioactive waste disposal, thermal pollution control, and physicochemical treatment processes; (2) to employ a multithematic approach to environmental pollution control since air, water, land, and energy are interrelated." I have not seen the other

two books in the series, but if they are as good as this one I will be delighted.

Wang et al. have written, in my opinion, one of the best texts I have reviewed recently (aside from a few minor problems noted below). Its 12 chapters (titles following) comprehensively cover the topic of air pollution control:

- Air Quality and Pollution Control
- Fabric Filtration
- Cyclones
- Electrostatic Precipitation
- Wet and Dry Scrubbing
- Condensation
- Flare Process
- Thermal Oxidation
- Catalytic Oxidation
- Gas-Phase Activated Carbon Adsorption
- Gas-Phase Biofiltration
- Emerging Air Pollution Control Technologies

The editors note that each chapter was contributed by authors who were given latitude in format and coverage. All chapters seem to have conformed reasonably well to a general format. However, I found the treatment of design costs to be somewhat different between the chapters. Some of the costs and cost update data are out of date. A minor suggestion would be for the next edition, and I hope there is one, would be to put updates for cost data in the Appendix to be referred to by all chapter authors.

A feature I like very much was the inclusion of numerous examples of the design principles discussed. That feature, however, was carried to excess in the chapter on "Wet and Dry Scrubbing" where 30 different examples were given. Given that Wang holds several patents in this area and has published numerous reports on the topics, this is not surprising.

I have four other minor concerns to note. (1) Since cyclones remove only the largest particles, it seems strange to me that the editors discuss their operation after the chapter on fabric filters which are very efficient in removing all particle sizes. (2) I am curious as to why gravitational collectors (ancient and relatively inefficient particle control devices) were discussed in the "Emerging Air Pollution Control Technologies" chapter. (3) My personal preference when quoting journal articles is to include the article title in the citation; this was not done here. (4) Problems for student assignment were not included.

The above minor concerns aside, I found the book to be excellent and strongly recommend its use as a text.

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**Henry J. McDermott, Air Monitoring for Toxic Exposures, Second ed., Wiley Interscience, Hoboken, NJ, 2004, USD 125.00, 700 pp., ISBN 0-471-45435-4.**

A concern in the United States as well as in many other industrial countries for terrorist attacks has spawned new chapters in many recent books I have reviewed. And that is so in this book, wherein Chapter 4 deals with "Air Monitoring at Emergencies Including Terrorist Events." The author writes:

"This chapter provides guidance on performing air monitoring at emergencies including spills, releases, terrorism events, and similar situations where airborne contaminants may present a risk to responders or the public. Terrorism events include release or potential release of chemical (both chemical warfare and toxic industrial chemicals), biological, or radioactive agents. Terrorism events and other types of emergencies are grouped together because the preplanning and other aspects of air monitoring are similar for both."

This chapter has two purposes. Its goal is to:

- Provide first responders and others with a defined role in terrorism or emergency response with detailed information on air monitoring that they can use in preparing response plans, developing liaisons with specialized response teams from other agencies, selecting and obtaining equipment, preparing procedures and training staff.
- Provide sampling practitioners without a formal role in incident response with enough background so that they can have an awareness of the topic and can plan for any response that might be an incidental part of their normal role in occupational or environmental monitoring."

Hazards discussed under the terrorist event category include chemical warfare agents (such as sulfur mustard, phosgene, and organic phosphate esters), toxic industrial chemicals, biological agents (such as anthrax and *Clostridium botulinum*), and radiological hazards. In the central of the chapter, the author discusses air sampling methods for chemical agents using military test kits, colorimetric detector tubes, direct reading instruments, and sample collection devices (followed by laboratory analysis).

Following this section is a short discussion of air sampling methods for biological agents and radioactive hazards. Of note in this discussion was the reference section wherein 16 of 23 references were to Aberdeen Proving Grounds reports.

In part two of the text entitled "Sample Collection Device Methods for Chemicals" there are the following four chapters: