- Land Disposal of Solid Wastes and Groundwater Contamination.
- Municipal, Industrial, Oil Field Wastes, Creosote, and Their Effects on Groundwater.
- Groundwater Contamination Due to Agricultural Wastes.
- Contamination of Groundwater from Disposal and Injection Wells.
- Other Wells as Sources of Contamination.
- Underground Tanks and Pipeline Leakage.
- Groundwater Contamination by Surface Waters (Including Airports), Atmospheric Precipitation, Salt, and Salt Intrusion.
- Groundwater Contamination in Urban/Suburban Areas, Including Land Surfaces, Diversion of Flow Structures, by Military Toxics, and Transportation.
  Volume 2 has 117 pages of text and 43 pages of references. Its chapters are entitled:
- Groundwater Management, Including Legal Concepts That Relate to Prevention of Contamination.
- Ecotoxicological Risk Assessment (Risk Assessment Strategies) and Groundwater Contamination.
- Nonradioactive Hazardous Waste and Groundwater Contamination Interactions.
- Radioactivity, Including Occurrence/Fate/Transport and Remediation/Restoration Groundwater with Case History Example From U.S. DOE Facilities.
- Technical Evaluations of Groundwater and Groundwater Protection Plans Related to Contamination Groundwater Protection Laws, Regulations, Statutes, and a Case Study Groundwater Protection Plan for Bernalillo County, New Mexico.

GARY F. BENNETT

Computer Simulated Plant Design for Waste Minimization/Pollution Prevention
Stan Bumble, Lewis Publishers, Boca Raton, FL, 2000, 178 pp., US\$ 76.95 (812 in. × 11 in. format), ISBN 0-56670-352-2

This book is the second in the publisher's "Computer Modeling for Environmental Management Series." The first book in the series was also authored by Bumble, and is titled *Computer Generated Physical Properties*.

Computer Simulated Plant Design for Waste Minimization/Pollution Prevention discusses several paths to pollution prevention and waste minimization by using computer simulation programs. It tackles the solutions within an economic structure and industrial framework, and highlights the role economics play in the solution of environmental problems. The author combines mathematics with computers and the environment, along with electrical engineering, chemical engineering, and physics to achieve the desired results. He covers advanced concepts with a focus on practical outcomes.

Herein lies the problem (openly admitted) for this reviewer. In the conclusion, Bumble states, "It appears as if the successful work to determine analytically global solutions for pollution prevention and waste minimization, while simultaneously engaged in plant design or simulation, has begun. Here we are not concerned with heuristic methods but in designs that are necessary and sufficient."

This requires a new kind of engineer; one that is very adept in three subjects; chemical engineering, computer science, and mathematics. It requires yet another prerequisite: the engineer must be very creative.

Unfortunately, although I claim to be the former, I am not the latter (two) and that deficiency inhibits my ability to critically evaluate this innovative text.

The book is divided into five parts and each part has a number of sections. The first part is entitled Pollution Prevention and Waste Minimization. It begins with descriptions of process flowsheets and block-flow diagrams. It then describes pollution prevention, cost, and energy. It describes control of exhausts from processes or, in other words, reduction of emissions. There is then a very brief description of the design or simulation of a plant so the reader can get the flavor of it before pollution prevention is discussed more thoroughly. Reaction systems and separation systems appropriate for waste minimization are then introduced.

Following this very interesting (for the most part non-mathematical) chapter are the chapters entitled (a) Mathematical Methods, (b) Computer Programs for Pollution Prevention and/or Waste Minimization, (c) Computer Programs for the Best Raw Materials and Products of Clean Processes and (d) Pathways to Prevention.

This book charts the way to a new era in design, and should immensely assist those engineers dedicated to the P2 concept.

GARY F. BENNETT

Remediation of Firing Range Impact Berms
Donald F. Lowe, Karen L. Duston, Carroll L. Oubre, C. Herb Wards (Eds.), Lewis Publishers, Boca Raton, FL, 2000, pp. 379, US$ 99.95, ISBN 1-56670-462-6

This book is one of a series of ten books reporting the results of projects designed to attack the Department of Defence's most serious site pollution projects. Reviews of several of the books have appeared in the journal (and hopefully reports on all projects will, in time, be printed).

In introducing the book, the author wrote:

"The soil within firing ranges across the US has been heavily contaminated with lead bullets that hit the ground and impact berm. The lead bullets can be found as whole bullets or fragments. Lead smears on soil particles and lead oxide also exist. Consequently, there is a growing need to treat these firing range soils to prevent public exposure to the lead-laden soil and the leaching of the lead into the ground water. The US Army alone has over 3000 small arms firing ranges. In addition to military facilities, there are numerous firing ranges that are used by law enforcement agencies and by private groups and organizations.

The primary objective of the soil washing demonstration was to provide reliable, detailed performance data that would help evaluate the feasibility and cost of implementing full-scale treatment systems. An important secondary objective was to demonstrate the effectiveness of the technology in producing a "clean" soil based on analytical results.

The project included the following steps:
- Bench scale treatability studies of prospective firing range soils.
- Selection of the demonstration site.
- Pilot plant flowsheet development and equipment selection and installation.
- Execution of the demonstration at the selected DOD (Department of Defense) site,
- Data evaluation and report preparation.