The author concludes that "The combined evidence from employee observations, damage distribution, dust sample SEMs, and dust explosivity test data suggests that a great deal of the damage in this explosion was due to a secondary coal dust explosion in the powerhouse and in adjacent structures such as the coal conveyor gallery and the coal pulverizer building. The dust cloud was created by the blast wave emanating from the gas explosion in the Number 6 boiler".

Those engineers involved in safety programs for the chemical and other industries should find these proceedings very interesting.

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GARY F. BENNETT

Groundwater Contamination: Vol. 1. Contamination, Sources & Hydrology; Vol. 2. Management, Containment, Risk Assessment & Legal Issues

Chester D. Rail, Technomic Publishing Co., Inc., Lancaster, PA, 2000, US$ 174.95/two-volume set, Vol. 1: 187 pp. (8.5 in. × 11 in. format), Vol. 2: 174 pp. (8.5 in. × 11 in. format), ISBN: Vol. 1: 1-56676-870-5, Vol. 2: 1-56676-897-7

This two volume series on groundwater contamination was created by the author to provide "updated, integrated, interdisciplinary material in the form of bibliographic references and URL Internet WWW site information" on groundwater issues.

As one of the older generation of environmental engineers who uses (not as well as possible) Internet resources, I continue to be amazed by the amount of material accessible by computer. This book only enhances the awe. And that amazement reaches to the author. I wonder how he compiled all the data he did; the number of sites referenced is phenomenal. He provides information from more than 1300 literature references and 2300 URL Internet WWW sites information, 2300 Internet sites. These cited resources are the key contribution of these two books.

Rail's technique is best illustrated by reproducing a short section of the text:

"*Detergents* (URL Ref. no. 223): Detergent chemicals, which are broadly used in consumer products, are typically disposed of in domestic wastewater. In the United States, approximately 70% of domestic wastewater is treated in municipal wastewater treatment systems (URL Ref. No. 222), with the remaining 25–30% being treated by on-site systems (URL Ref. No. 217) (e.g. septic tanks, cesspools, etc.). Though low in volume, effluents from on-site systems (URL Ref. No. 218) can potentially impact GWSS systems since they are directly released to the subsurface environment. Municipal systems would naturally have a lesser impact primarily through land application of wastewater effluents or sludge to surface soils. These practices result in the entry of detergent chemicals into subsurface environments. The fate of these chemicals will depend upon the biodegradative activities of the indigenous microbial communities (URL Ref. No. 214) (Ventullo and Larson, 1998)."

One notes the prose (description) cites both URL sites and print material.

Volume 1, which has 129 pages of text and 54 of reference has the following chapters:

- Groundwater as a Resource — Movement, Usage, Yield, Contamination Potential, Disposal, Stabilization and Historical Aspects.
- Natural Quality of Water and Groundwater Contamination.
- On-Site Liquid Waste Disposal Systems.

- 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.

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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.