

## Book Reviews

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- Planning for Groundwater Protection*, edited by G. William Page, Academic Press, 1250 Sixth Ave., San Diego, CA 92101, U.S.A., 1987, ISBN 0-12-543615-7, 381 pp., US \$45.00.

I recommend this book to public officials and private citizens concerned with protecting groundwater. Technical information is largely presented at an introductory level and the case histories are not sufficiently detailed to provide meaningful classroom discussion in science or engineering, but I would consider its use as the text in a college-level science seminar for liberal arts majors.

Chapter 1 by Mary P. Anderson is an excellent summary of hydrogeology that establishes the conceptual framework necessary for subsequent chapters. Dr. Anderson's contribution is highly readable, technically accurate and made more relevant by integrating policy issues and warnings regarding methodological limitations and groundwater myths into her essay. I consider Chapter 1 or its equivalent essential background for anyone charged with responsibility for decisions regarding groundwater. Chapter 2 by Timothy R. Henderson of the U.S. E.P.A. is an equally important outline of perhaps an even more complex field — the institutional and legal setting for groundwater protection. Henderson specifies 4 general protection techniques: "standards implemented through permits; facility design requirements; well construction and use restrictions; and land use controls." He then fleshes out his contribution with a brief history of groundwater law and recent changes in the ways courts, lawmakers and regulators have dealt with groundwater protection. Despite considerable improvement in the institutional framework, well illustrated by concise examples, significant problems remain. Henderson balances the discussion by commenting on limitations regarding protection techniques, institutional obstacles that remain to be overcome and disagreements regarding some E.P.A. policies. This section provides information useful not only to decision makers but also to citizens involved with disputes over groundwater contamination or protection. While some planners bemoan lack of detailed hydrogeologic knowledge that, if available, would ease their decision-making responsibility, we can observe institutional and political obstructions to rational groundwater protection at all levels of government. I will be looking for other articles written by Mr. Henderson.

Chapter 3 on "Drinking Water and Health" by G.W. Page, the editor of this book, falls far short of the informative and concise tone set by the first two authors. Page uses the term "toxic" far too often and never defines what he really means. After all, any chemical can be "toxic" if the dose is sufficiently large. There is useful information in this chapter but the impact is minimized

by poor organization and uneven style. Some paragraphs are crisp and precise, others ramble after an opening cliché. It appears that this chapter was written by a political scientist about topics best understood by health professionals or research scientists.

Chapter 4 on “Removing Toxic Contaminants” seems a bit out of place in this book because it departs from the theme of protecting groundwater in discussing methods for “alternatives for supplying drinking water to a municipality when its normal supply is contaminated.” The author first spends 10 pages discussing routine techniques for improving water quality that have nothing to do with removing “toxic” contamination (again, the term is used far too carelessly). Sections on the removal of organics by activated carbon and air stripping are relatively detailed and informative but nothing is said about reverse osmosis, chemical precipitation or other methods for reducing the concentration of heavy metals in drinking water. Ion exchange is briefly discussed but in a disturbingly vague manner. This chapter does provide the reader with information regarding the costs of treating water contaminated by volatile organic chemicals but is by no means an adequate presentation on “Removing Toxic Contaminants”.

Chapter 5 on “Data and Organizational Requirements for Local Planning” outlines technical information needed in order for a local agency to make rational decisions regarding groundwater protection. Martin Jaffe, the author, also proposes a phased approach to gathering this information in a cost-effective manner. He correctly points out the need for professional involvement from geologists due to the “hidden degree of difficulty that may be encountered”. He also suggests public outreach, information and education as an integral part of a groundwater protection program. If there is one area in which this chapter should be strengthened, it would involve some clue as to how a community might determine how much expert involvement is required and how to select a satisfactory, cost-effective consultant. As Dr. Anderson warns in Chapter 1, “some persons in related areas in the physical sciences have begun to practice groundwater hydrology. Some of these professionals have managed to acquire the skills necessary to address groundwater problems effectively while others have not.” The eight case studies comprising the remainder of this book do little to assist the reader in this critical decision.

The remainder of the book describes the response to water quality crises in 8 communities. I find the Long Island study reported by Lee Koppelman technically the most complete. This and the Dade County case study that follows are the only 2 of these 8 that really illustrate a comprehensive, institutionalized planning by local agencies to protect groundwater quality. The Austin, Texas example comes close but remains incomplete because it lacks certain hydrogeologic data — still, Austin’s decision to protect a sensitive aquifer recharge zone is the rational and probably cost-effective option. Other case studies relate the response of municipalities to contamination of their wells by hazard-

ous chemicals. The scenario is familiar: contamination discovered in municipal water, new water sources are sought, a search for responsible parties, new legislation restricting certain industrial activities in sensitive areas. Perhaps the most important element common to these case studies is contamination from industries commonly considered “clean” and from nonpoint sources. Public officials in towns served by groundwater should read these case studies with the realization that “it could happen here” and implement plans to protect their drinking water before it becomes contaminated. Experience has shown that, compared to aquifer restoration, prevention is cost-effective.

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*Hazardous and Toxic Materials*, by H.H. Fawcett, John Wiley and Sons, New York, NY, 1988, ISBN 0-471-62729-1, 514 pp., US \$59.95.

Several years ago, I reviewed *Safety and Accident Prevention in Chemical Operations* by Fawcett and Wood. I said it was a good book, but I like this one better. In his new book Fawcett, a member of the editorial board of the *Journal of Hazardous Materials*, has given the reader the benefit of a long career in safety operations — many of those years were spent working for General Electric Research Laboratories as a consulting engineer in safety, health, fire protection and radiation protection.

In addition to chapters written by Fawcett himself, 13 other experts report on the currently important topics of the Toxic Substance Control Act (TSCA), Superfund Amendments Reauthorization Act (SARA), long-term toxicity, the Delaware River Pollution Problem, medical care and surveillance for hazardous waste workers, oil spills, aqueous foams, remediation of contaminated sites, facility siting and safe transport of dangerous goods.

In the chapters, he personally edited, Fawcett utilizes an almost homespun conversational style giving the reader the benefit of his long career. The first six chapters are his and make some most interesting reading — but besides being interesting, they are full of good information and safety advice. The titles of those chapters are:

- The ABCs of Chemical Safety
- Clichés
- Effective Presentations, The Key to Successful Hazardous Communications
- Emergency Planning and Community Right-To-Know
- Legal Cost/Benefits and Ethical Aspects
- Fires and Explosions

In addition to the above noted chapters, there are 19 other chapters discussing topics from Superfund, to Vapour Suppression of Volatile Chemical Spills and finally Fawcett’s personal observations of the recent Rhine River pollution as