

## Book reviews

### **Total environmental compliance: a practical guide for environmental professionals**

Bert P. Krages II, Lewis Publishers, Boca Raton, FL, 2000, US\$ 69.95, 197 pp., ISBN 1-56670-319-0

*Total Environmental Compliance*: A practical guide for environmental professionals is one of the most interesting, well-written and useful books I have reviewed in a long time. It was written by an attorney who is also an environmental engineer. (I might note parenthetically that at least four of the Chemical engineering students I taught went on to get a law degree as did the book's author.) Krages' book is full of excellent advice. Indeed, I had to restrain myself from quoting excessively (but I'll let the reader of this review make his/her own judgement as to whether or not I succeeded).

Having been an environmental consultant for more than 30 years, having filed permits, having been involved in regulatory enforcement actions and having served as an expert witness on numerous occasions, I have had enough contact with environmental laws (and their complexity) to recognize the need for legal assistance. Nowhere is this need better stated than in the introduction to Chapter 5, "Ascertaining Environmental Requirements",

Identifying the legal requirements that apply to particular operations is critical if organizations are to sustain compliance. In an ideal world, environmental laws would be clear and easily applied to all the activities they are intended to regulate. In reality, environmental laws are frequently ambiguous, complex, and poorly organized which can make ascertaining their meaning a daunting task. For example, federal and state governments frequently regulate the same conduct and draft requirements that often overlap and are sometimes inconsistent. Even ostensibly clear environmental requirements can defy ready interpretation when applied to individual situations. Moreover, government agencies are sometimes deliberately ambiguous when interpreting their regulations for fear of curtailing their flexibility.<sup>12</sup> Although all this uncertainty makes achieving total environmental compliance difficult, environmental professionals can overcome this problem by understanding the purpose behind environmental laws, how they are viewed by agencies and courts, and how to deal with uncertainty when applying laws to regulated activities.

Indeed, the US environmental laws are complex. None is more complex than the US Resource Conservation and Recovery Act about which Krages writes,

Legislators and regulators seem to delight in attributing unusual meanings to common words and phrases when drafting environmental laws. A notable example is the definition

of 'solid waste' in the Resource Conservation and Recovery Act (RCRA) which encompasses 'solid, liquid, semisolid, or contained gaseous material.' Laws that use common words to express contorted definitions impede the ability to achieve compliance because they lack the ambiguity that signals the need to obtain an expert opinion on what the law means.

To this point, I have been quoting from Chapter 5. Perhaps I should return to the beginning where the purpose of the book states,

Why is it important to achieve environmental compliance? The answer is simple. Organizations that consistently comply with environmental laws maintain control over their operations and finances. In addition, their employees will have more time to focus on activities other than environmental matters and need not fear the prospect of criminal liability. Achieving total environmental compliance will allow organizations and their employees to function more effectively and efficiently even though their activities are highly regulated.

looseness1 The fact that compliance is a wise course of action does not mean that it is easy to achieve. Organizations that want to reap the benefits of compliance not only must want to comply with environmental laws but also must come to understand the factors that make achieving compliance difficult. Once these factors are known, organizations can set-up a framework that help them avoid the pitfalls that prevent others from achieving total environmental compliance. This framework when combined with practices that promote communication, preparedness, and professionalism, will enable organizations to experience a synergism that makes achieving environmental compliance easier over time.

Krages goes on eloquently and in detail to describe the needed programs (and the pitfalls) of establishing and effectively operating such programs in eleven chapters entitled

- Compliance, Noncompliance, and the Enforcement Process;
- Legal Liability and Attitudes Toward Compliance;
- The Compliance-Oriented Attitude;
- Foundations for Environmental Compliance Ascertaining Environmental Requirements Communicating Compliance Information;
- Designing Facilities and Processes to Enhance Compliance;
- Promoting Compliance Through Careful Permitting;
- Measurements, Monitoring, and Their Implications for Compliance;
- Compliance Assistance;
- When Things Go Wrong.

Returning to the text, I note that Krages is thoroughly up-to-date for he writes about the pitfalls of electronic information transfer.

The use of electronic mail (e-mail) can be especially problematic in the environmental context because it encourages indiscretion. The ease of using e-mail creates an air of informality that leads many to incorporate off-the-cuff remarks and loose banter into their messages. Similarly, e-mail lends itself readily to quick responses which sometimes result in employees making replies to messages they later come to regret. Imprudent remarks are easily preserved and can create problems later if messages are encompassed by information requests or discovery in litigation. In addition, e-mail messages tend to exist in multiple

locations and can sometimes be resurrected electronically even when deleted by the sender and recipient. Organizations that provide their employees with e-mail access should take care to set and enforce guidelines for its appropriate use.

Even the design phase of plants is considered (Chapter 7). Facility design and permit applications are discussed with a view to cost limitation — good design can limit future regulatory costs. And permitting may itself be a significant cost. In considering permitting, Krages notes,

As a practical matter, permitting considerations have the greatest potential to affect the economics associated with a major design. Several environmental statutes and regulations prohibit owners or operators from commencing construction activities until they have obtained a permit. Other regulations impose stringent requirements on new sources that may increase permitting burdens. These permitting requirements are generally triggered by factors such as quantities of air emissions, new construction, and extensive refurbishment. Understanding how these requirements apply to proposed designs can avoid unexpected costs and expedite completion of the project.

There are many other topics discussed in a most interesting, useful and comprehensive fashion such as sampling and analysis for compliance, how to construct and use laboratory notebooks (and their importance in compliance), how to select, use and interact with consultants (and even a discussion of consultant integrity with respect to maintaining data confidentiality).

I was amused by the title of the last chapter and the last section in the prior chapter. The last chapter is entitled “When Things Go Wrong” and the prior section is (appropriately) “Attorneys.” In that section, the author wrote,

Environmental law is a complex specialty, and organizations should seek counsel on environmental matters from attorneys who specialize in environmental law. One reason to use specialists is that environmental matters are often regulated in ways that evade superficial rationality. Attorneys who rely on the uninformed application of commonsense principles to environmental legal analyzes can thus commit grave errors. Furthermore, many legal principles such as causation, equity, and the duty of disclosure can apply to environmental matters differently that they do in other legal contexts.

And a little further on,

Considering that environmental matters necessarily involve complex legal issues, it is obvious that environmental attorneys play an important role in helping organizations deal with compliance issues; however, many organizations do not fully understand how to use legal counsel effectively or efficiently. Because the objective of sustaining total environmental compliance is to avoid the problems that stem from violations, organizations should emphasize using legal services preventively rather than consulting attorneys only when problems arise. Preventive legal services consist of advising clients on regulatory issues and helping them to avoid exposure to liability.

In conclusion, I can only re-iterate my opening statement that this was the most interesting book I have reviewed in a long time. This is a must read for engineers, environmental professionals, and management.

**NAPL Removal: Surfactants, Foams, and Microemulsions**

Stephanie Fiorenza, Clarence A. Miller, Carroll L. Oubre and C. Herb Ward (Eds.); CRC Press, Boca Raton, FL, 2000, 552 pp., US\$ 87.95, ISBN 1-56670-467-7

This book (project report) is one of the work products of the Department of Defense research projects guided by C. Herb Ward of Rice University (Houston, Texas). Several of the previous monographs produced by Dr. Ward and his colleagues have been reviewed in previous issues of this journal.

This book, the longest one in the series I have seen yet, is divided into three major sections:

1. Field demonstration of the surfactant/foam process for remediation of a heterogeneous aquifer contaminated with DNAPL.
2. Field demonstration of single-phase microemulsions for aquifer remediation.
3. Design and evaluation of a full-scale implementation of the single-phase microemulsion process.

The problem addressed by this innovative technology is as the title suggests; non-aqueous phase pollutants, e.g. trichloroethane (TCE) as well as other chlorinated solvents whose removal by the conventional pump-and-treat process has proved unsuccessful. To enhance removal, researchers have turned to surfactants that may enhance removal by solubilization and/or mobilization of the contaminant yielding a more effective, uniform sweep of the contaminated soil. The first chapter of the book reports on a field demonstration of the process.

The second major section of the book documents laboratory and field investigations on the use of surfactants/alcohol mixture to solubilize a complex NAPL as a single-phase microemulsion. The aforesaid mixture was evaluated both in the laboratory and in the field.

The third major effort for the project was a field demonstration of the surfactant/foam technology. The process involved the injection and extraction of a surfactant solution into the subsurface to solubilize and mobilize the NAPL. The process was enhanced by the injection of air into the injection wells after the surfactant was added. This section summarizes the laboratory and field pilot-scale demonstration results.

As usual with the previous reports, there are extensive data-containing appendices reporting on analytical procedure and scale-up drawings and cost estimates.

Together, these project reports will provide a valuable repository of hazardous waste site cleanup information.