

Book reviews

The Membrane-Coupled Activated Sludge Process in Municipal Wastewater Treatment

Berthold Gunder (Ed.), Technomic Publishing Co., Inc., Lancaster, PA, 2001, US\$ 89.95, ISBN: 1-56676-959-0

This book represents a report on 15 years of research at Stuttgart University's Institute for Sanitary Engineering, Water Quality, and Solid Waste Management. I wholeheartedly agree with the statement (found in the advertisement for the book) that "This book represents a milestone. . . (being) the first overall presentation that summarizes the membrane-coupled activation sludge process in its entirety." In this system, membranes replace the secondary sedimentation basin by using membranes to remove the (liquid) effluent leaving the suspended solids in situ, thus concentrating and recycling the sludge (biosolids).

The research was performed by the university utilizing two plants with large-scale membrane modules. The plants were fed with presettled wastewater. Operating parameters and effluent quality were studied.

In the book, Gunder presents a new approach for calculating excess sludge production and oxygen consumption for the oxidation of carbonaceous compounds. The author also addresses the relationships between the alpha factor (for aeration) and the concentration of mixed liquor suspended solids (MLSS) as well as engineering issues such as membrane performance, energy requirements and the removal performance of membrane systems.

The results of using the process are improved effluent quality with the following impressively representative of remaining contaminant concentrations:

SS (mg/l)	0
COD (mg/l)	<30
$P_{(tot)}$ (mg/l)	<0.3

Microbiological quality — equivalent to bathing water

The process, it is noted, has higher operating costs than conventional plants, the cost increase resulting from the energy required for the cross-flow aeration of the membrane to supply the microbes. Other costs include periodic cleaning of the membrane and replacement after 8 years.

The theory underlying the process is well-developed, both in practice and in theory. Not presented however, are worked examples utilizing the equations developed. Nor was the manuscript (it appears) reviewed by an English-proficient technical editor. Though

well-written (in the main), the occasional “odd phrase” or “statement” slips in, resulting from the author’s non-English speaking background.

That minor criticism aside, I highly enjoyed the book and recommend it to all in the design and operational areas associated with both industrial and management of wastewater treatment plants.

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PII: S0304-3894(01)00203-5

In Situ Treatment Technology, 2nd Edition

E.K. Nyer, P.L. Palmer, E.P. Carman, G. Boettcher, J.M. Bedessem, F. Lenzo, T.L. Crossman, G.J. Rorech, D.F. Kidd (Eds.), Lewis Publishers, Boca Raton, FL, 2000, 536 pp., US\$ 69.95, ISBN: 1-56670-528-2

In reviewing books, the most difficult to review are very bad books and, conversely, very good books. This book by Nyer is one of the latter, but it is not just very good, it is excellent, being written by both an experienced consultant who has taught courses on groundwater cleanup and treatment techniques and who has written a column entitled “Treatment Technology” for *Groundwater Monitoring and Remediation* and authored four books. If memory serves me correctly, the number is now five with two of those being compilations of his column noted above. Nyer writes from experience, being a senior vice-president of a major consulting firm and having himself designed and installed more than 400 groundwater treatment systems. Given the pressure on industries and consulting engineers to “produce for the firm” and the oft-heard comment “I have not time for anything outside of work”, it is a pleasure to see a firm such as the one the author works for give him time and support to author a book.

The book has a dozen chapters (as noted below). All but one were written by members of Nyer’s firm. Nyer reviewed and rewrote each of the chapters, utilizing his excellent writing skills of which he describes as an “easy style of writing”. I describe it as excellent. As noted above there are 12 chapters which are divided into four sections.

1. Untitled

- Limitations of Pump and Treat Remediation Methods
- Lifecycle Design

2. Mass removal remediation technologies

- Vapor Extraction and Bioventing
- Vacuum-Enhanced Recovery
- In Situ Air Sparging
- Air Treatment for In Situ Technologies

3. Diffusion-controlled remediation technologies

- In Situ Bioremediation
- Reactive Zone Remediation
- Phytoremediation