Treatment Process Section for Particle Removal [Project #423]

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Objectives: The objective of this joint project with the International Water Supply Association (IWSA) was to develop a comprehensive source book providing criteria that should be used in the selection of water treatment processes and treatment trains to achieve specific water quality goals and objectives.

Background: Recent waterborne disease outbreaks caused by *Cryptosporidium* and other pathogens have often been attributed to inadequate treatment processes for particle removal. Many water utility managers are considering upgrading or adding treatment processes to ensure inactivation or removal of pathogens, and to achieve other water quality goals. Authored by a committee of international experts, this book provides a wealth of information on both theory and practice for optimization of particle removal.

Highlights: This book shows how to:

- Select the best particle removal process if building a new water treatment plant
- Enhance particle removal if upgrading and existing water treatment plant
- Estimate construction and operation/maintenance cots
- Choose appropriate pilot tests and data analysis techniques
- Ensure compatibility with other treatment processes and goals
- Evaluate the newest particle removal techniques.

Approach: The IWSA and AWWARF established a panel of experts knowledgeable in theory, design, piloting, and full-scale application of particle removal processes. This book provides information the state-of-the-art and emerging particle removal technologies that will be of interest to managers, regulatory agencies, designers, operators, water quality specialists, and educators and their students. It is intended to provide practical criteria and guidance for the design and optimization of particle removal processes, integrated with fundamental science, to allow advancement in the state-of-the-art, and cost effectiveness to best meet water quality goals.

Results/Findings: The table of contents for this 375-page book includes:

- Introduction
- Regulatory Considerations
- Properties and Measurements of Particle Contaminants in Water
- Particle Alteration and Particle Production Processes
- Particle Separation Processes
- Testing Techniques for Process Selection and Optimization
- Performance Data Analysis
- Cost Considerations
- Interactions Between Particle Removal and Other Treatment Objectives
- New Trends and Technologies.

Impact: Given the enormous cost of adding or upgrading water treatment processes as well as the inherent uncertainty in selecting specific processes that will meet current and future regulations, this book provides the reader with theory, practices for optimization, and piloting protocols to help in the selecting these processes. Because of the high variability of source water quality, this book provides a special emphasis on piloting potential processes that will generate data useful in identifying which combination of processes is most efficient and cost-effective.

Participating Utilities: None