



# Industrial Wastewater Treatment

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Imperial College Press

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*Discussion on the impact of industrial wastewater discharges on the environment with a focus on Asia.*

**Chapter 2 — Nature of Industrial Wastewaters** 12

*Discussion on a number of the key industrial wastewater characteristics which may impact on plant design and successful plant operation. Tables showing the characteristics of wastewaters arising from a variety of industries are included. A portion of this information is on wastewaters not usually found outside of tropical or sub-tropical regions. It is intended this chapter becomes a reference for professionals seeking information on wastewaters.*

**Chapter 3 — The Sewage Treatment Plant Example** 28

*Brief description of the possible treatment trains in a sewage treatment plant — based on the continuous-flow bioreactor and cyclic bioreactor. This is intended to provide a framework for comparison so that readers can more readily appreciate the differences and similarities between sewage treatment plants (STPs) and industrial wastewater treatment plants (IWTPs).*

**Chapter 4 — The Industrial Wastewater Treatment Plant — Preliminary Unit Processes** 42

*Discussion on the preliminary treatment required to prepare industrial wastewaters for secondary treatment. This chapter includes discussions on removal of suspended solids, O&G, inhibitory substances, pH adjustment, nutrients supplementation, and equalization.*

**Chapter 5 — The Industrial Wastewater Treatment Plant — Biological** **61**

*Discussion on the biological processes used for secondary treatment of industrial wastewaters to remove organics and nutrients (where necessary). Aside from discussion on aerobic processes such as the conventional activated sludge and the cyclic SBR, space is also devoted to anaerobic processes used as the first stage of a biological treatment train to reduce organic strength prior to aerobic treatment. The difficulties faced by biological processes in industrial wastewater treatment are highlighted.*

**Chapter 6 — The Industrial Wastewater Treatment Plant — Sludge Management** **99**

*The preliminary and secondary treatment stages generate sludges. These may be organic, inorganic, or a combination of the two. This chapter discusses sludge management approaches commonly adopted at IWTPs.*

*Chapters 4, 5 and 6 draw on experiences with actual wastewaters to illustrate points made in the discussions. These three chapters and Chapters 7–10 are provided with numerous photographs of plants, equipment, and site conditions so that the reader can develop a “feel” for the issues inherent in industrial wastewater treatment.*

**Chapter 7 — Chemicals and Pharmaceuticals Manufacturing Wastewater** **106**

*The pharmaceutical wastewater example provides a framework for discussion on the importance of segregation and blending, and the impact of inhibition.*

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*The piggery wastewater example provides a framework for discussion on the necessity to note the differences in wastewaters which may arise because of differences in industry practices (between Asia and Europe in this instance) and the approach taken to deal with high concentrations of SS in a highly biodegradable wastewater.*

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*The slaughterhouse wastewater example provides a framework for discussion on the importance of pretreatment to reduce a nitrogenous oxygen demand so that*

*total oxygen demand may be reduced. Failing this the strong nitrification may require alkalinity supplementation with attendant implications in terms of treatment chemicals and construction materials needed.*

**Chapter 10 — Palm Oil Mill and Refinery Wastewater** **134**

*The palm oil mill wastewater example provides a framework for discussion on the use of anaerobic processes to treat wastewaters and not as is usually encountered in STPs to treat sludges.*

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