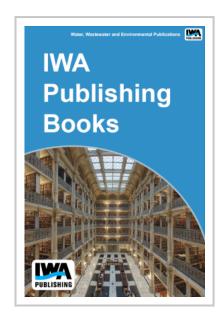


## Efficient Redundancy Design Practices

The design of wastewater treatment plants with redundancy to assure a quality end product may be in conflict with efforts to assure effectiveness. Redundancy of major system components is to assure compliance with regulations and protection of the environment and the health and safety of the public and treatment plant staff. However, the capital costs and maintenance associated with redundant equipment does not necessarily enhance facility performance.

There are a number of forces driving the level of redundancy in plant designs. Federal and state compliance regulations and the design engineer?s past experiences will influence the plant design. To some extent the plant staff may also provide input into the plant design and, therefore, contributes to the redundancy.



This report determines alternative methods to address treatment plant redundancy, including examples of methods currently in place and, ideally, insight on the premises leading to these applications. A secondary objective is to identify the similarities and differences in redundancy requirements associated with federal and state regulatory agencies.

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Publication Date: 01/02/2003 ISBN13: 9781843396413 eISBN: 9781780404011

Pages: 117

**Print:** 

**Standard price:** £29 / €36 / \$44 **Member price:** £22 / €27 / \$33

eBook:

**Standard price:** £29 / €38 / \$50 **Member price:** £22 / €29 / \$38