

# Design and Analysis of Water Supply System

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**Abstract:** *A well-designed and efficiently managed water supply system is crucial for ensuring sustainable and reliable water distribution in urban and rural areas. This research focuses on the design and analysis of a water supply system, incorporating hydraulic modeling, demand assessment, and optimization techniques. Key parameters such as water source selection, pipe network layout, pressure distribution, and treatment methods are evaluated to enhance system efficiency and minimize losses. Advanced simulation tools and GIS-based analysis are utilized to optimize network performance and ensure compliance with regulatory standards. The study provides insights into sustainable water management strategies, cost-effective design approaches, and resilience planning to address future challenges such as population growth and climate change. The findings contribute to improving water distribution infrastructure, enhancing service reliability, and promoting resource sustainability.*

**Keywords:** Water supply system, hydraulic modeling, demand assessment, pipe network design, pressure distribution, water treatment, GIS analysis, optimization, sustainable water management, resilience planning, infrastructure development

