

Evaluation Of the Effectiveness of Water Treatment and Management Practices in Wupa Water Treatment Plant, Federal Capital Territory, Abuja, Nigeria

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Abstract

The assessment of water treatment and management practices is crucial in ensuring the delivery of safe and clean drinking water to population. This study evaluates the effectiveness of water treatment practices at the Wupa Water Treatment Plant (WWTP), located in the Federal Capital Territory (FCT), Abuja, Nigeria. The research aims to identify the quality of treated water, the challenges faced during water treatment, and the overall efficiency of the management practices in the plant. Data were collected from water samples taken at various stages of the treatment process, including raw water, pre-treatment, post-treatment, and final distribution points. Key parameters analyzed include turbidity, pH, total dissolved solids (TDS), residual chlorine, and microbial contamination. The results indicate that while the treatment processes significantly reduced turbidity and microbial content, there were occasional failures in maintaining adequate chlorine residuals, which led to inconsistencies in water quality. Furthermore, operational challenges such as equipment malfunction, inconsistent power supply, and inadequate maintenance were identified as major impediments to optimal treatment performance. Despite these challenges, the study highlights the plant's ability to meet national water quality standards most of the time. The findings suggest that improving operational efficiency, enhancing staff training, and investing in more sustainable energy sources could significantly improve the performance of the WWTP. This research provides insights into the challenges and opportunities for improving water treatment processes and management practices, which can contribute to ensuring access to safe drinking water for the population in the Federal Capital Territory, Nigeria.

Keywords: Challenges; Efficiency; Malfunction; Maintenance; Quality