

Without the Labs, You're Only Guessing: Why Laboratory Data Is a Baseline for Water and Wastewater Treatment

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Abstract : Water municipalities are crucial to public and environmental health and safety. Historically, support labs have acted as a system of checks and balances for water and wastewater treatment plants. However, their contributions extend far beyond this role and often go unrecognized. The City of Baltimore Department of Public Works operates four labs: two for water treatment and two for wastewater treatment. Each lab supports its designated plant by employing subject matter experts (SMEs) in chemistry, biology, and quality control. These experts produce valid and precise data in a timely manner, reducing data uncertainty for both routine monitoring and special sampling. Beyond the plants, Baltimore City labs also analyze samples and produce data for several inter-agency divisions, including utility maintenance, solid waste, stormwater, the office of research management, sanitary pre-treatment, and special sampling requested by the Mayor, City Council, or consumers within the distribution area. Municipalities may not always fully appreciate the integral role labs play in urban water cycle management. As operations continually adjust their processes to maintain compliance, support labs must also adapt to these changes. High-ranking lab managers should be consulted for scientific advice in major utility changes or decisions, similar to consulting lawyers or other experts. Lab managers and scientific analysts are first responders in analyzing data trends and sample integrity. They provide analytical insights into biological and chemical changes in the processes, aiding in decision-making and problem-solving for operations. Engaging lab personnel at various levels to address impediments and discrepancies leads to effective solutions. Effective communication and consultation are imperative. Comprehensive sharing of pertinent information increases awareness and acts as a catalyst for optimal utility management. Fully utilizing lab management for scientific guidance and data analysis builds resilience across the utility's operations. The data produced by the labs, validated by their SMEs, forms the basis for regulatory reports that plant operations and other divisions submit to their regulators for permit purposes. Labs are on the front line, along with operations! This collaboration also helps personnel outside the labs understand outliers or trend changes in data without being forced to delve outside their areas of expertise.

Keywords : water, wastewater, wastewater treatment, water treatment

Conference Title : ICW 2025 : International Conference on Wastewater

Conference Location : Amsterdam, Netherlands

Conference Dates : November 04-05, 2025