



NON-REVENUE WATER (NRW) HAS AN ESTIMATED VALUE OF **OVER \$18 BILLION** PER YEAR WORLDWIDE.

There are more than 700 water main breaks every day in North America, according to the U.S. Environmental Protection Agency (EPA), and the cost to acquire, treat and distribute water to customers increases every year. Federal and state allocations of grants and low interest loans are decreasing while water pipes are failing at increased rates and installed water meters are becoming less accurate with age. As a result, many utilities are faced with excessive NRW levels that are responsible for more than \$18 billion in lost revenue worldwide.

Leveraging its own non-invasive leak detection and condition assessment technologies and more than 100 years of water infrastructure expertise of Mueller Co., Mueller Systems, Mueller Service Co. and other companies that are part of the Mueller Water Products family, Echologics' comprehensive NRW service can help utilities realize and capture these lost revenues and focus on increasing ROI.

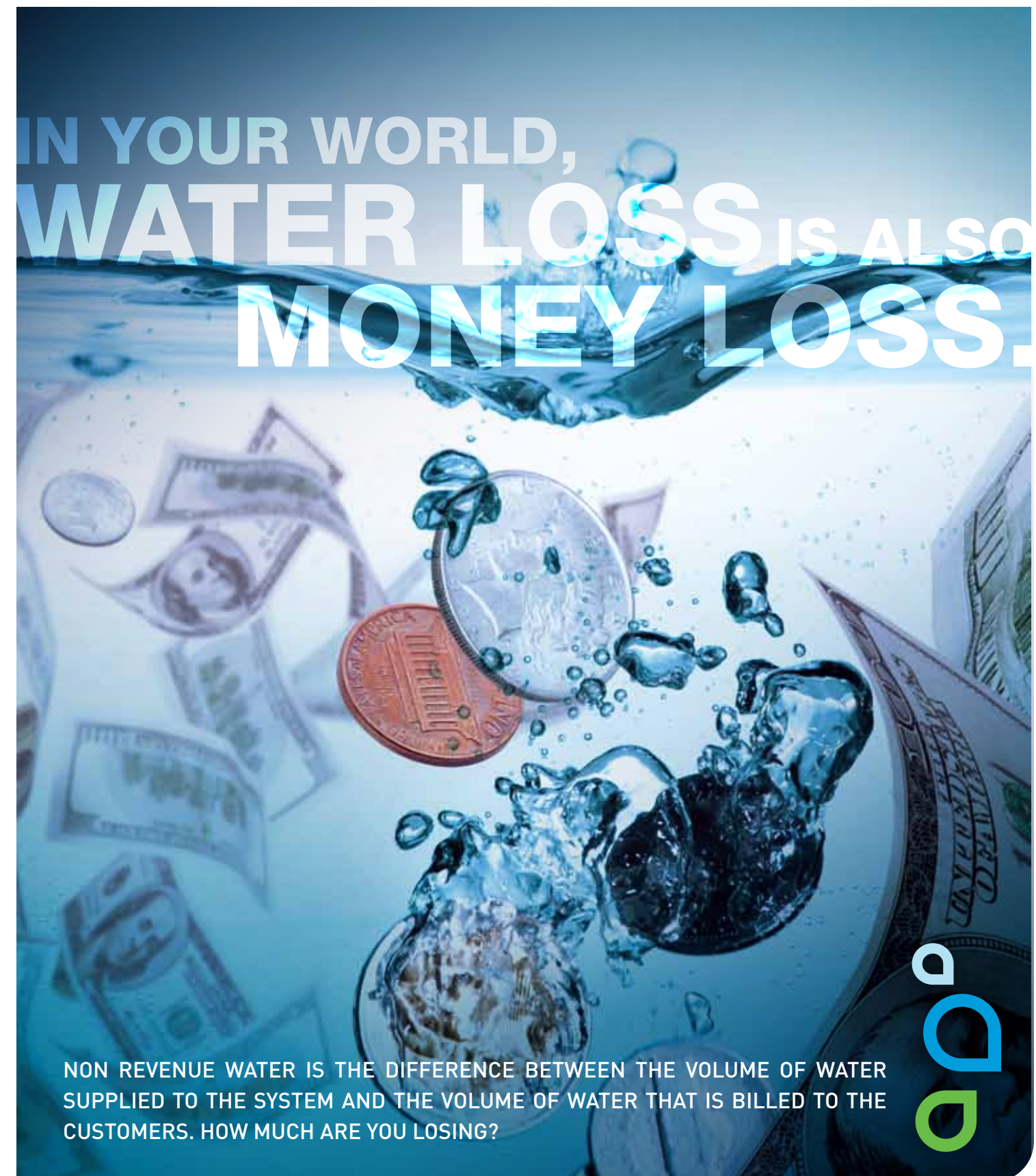
Find out more about our complete NRW solutions.
www.echologics.com
1 866 ECHOLOG (324-6564)

Mueller Co.

Mueller SYSTEMS

Mueller Service Co.

Mueller Water Products, Inc.



INTRODUCING ECHOLOGICS REVENUE ENHANCEMENT SERVICES

Non Revenue Water (NRW) according to the American Water Works Association (AWWA) and International Water Association (IWA) is the difference between the volume of water supplied to the system and the volume of water that is billed to the customers. Or simply put, it’s the water loss for which the utility receives zero revenue.

GETTING REVENUE BACK FROM NON REVENUE WATER

When looking for a partner to help you address non-revenue water (NRW), you need someone who understands water infrastructure, has developed innovative solutions to assess the condition of the infrastructure, and has practical experience in helping municipalities and utilities stem the tide of water loss. You need Echologics.

Echologics is proud to be part of Mueller Co., the recognized leader in water infrastructure products and services. Since 1857, utilities have depended on Mueller Co. for quality water infrastructure products including hydrants, valves; metering systems from Mueller Systems; field services through Mueller Service Co. and, with the addition of Echologics in 2010, pipe condition assessment and leak detection. No other company can match

our breadth of products, services and experience - all of which can be leveraged to help you recover revenue from NRW.

A leading innovator and provider of acoustic-based technologies for water loss management, leak detection, and pipe condition assessment, Echologics can help you efficiently reduce NRW in ways that help improve operational efficiency, recover lost revenue and conserve what is perhaps the world’s most precious natural resource—clean water.

Our specialists have conducted more than 150 water audits and have helped hundreds of municipalities and utilities across North America and around the globe to improve their operations and reduce water loss. We are ready to put this expertise to work for you.

THE ECHOLOGICS SOLUTIONS

Echologics has tested methods for identifying and quantifying NRW that follows a proven set of tasks to maximize the return on investment of time, labor and money. These tasks are sequenced so that the most important and critical items are completed first. The results drive the rest of the water audit and can identify the root causes of NRW prior to conducting the additional tasks that are part of the solution. Here is what we can provide:

1) Top-Down – Prescreening Audit Tasks

This type of water audit follows the recommended first step method from the AWWA and IWA. Minimal field work is needed for this study. Extensive historical record searches and analysis are completed. The end result is a set of performance indicators that suggest where further in-depth analysis and field work may be required. All data is entered into the free AWWA WLCC Water Audit Software which is turned over to the utility at the end of this phase of the project.

2) Water Production Review

Establishing the historic baseline of water input to the system is the first step in developing the core figure to determine the level of potential NRW loss. Echologics

visits all relevant facilities to become familiar with procedures, facilities, sources, distribution, and staff. We review the record keeping processes and analyze historic data from the treatment plants, as well as data that is imported and exported from meters for a minimum period of twelve months. This develops the baseline figures for the Prescreen Audit and the Comprehensive Water Audit.

3) Distribution System Confirmation

This task involves gathering and reviewing existing records, reports, plans, GIS data, maps, SCADA information and prior studies of the distribution system to develop an understanding of the hydraulics and operating conditions. Interviews are performed with selected personnel who have knowledge of the day-to-day operation of the system. Limited field investigations are also completed.

4) Source Meter Accuracy Tests

The single most important task that any utility can complete is verifying the accuracy of the master meters at the treatment plants as well as any wholesale export meters. Errors in these meters will have the largest impact on the validity of the water audit. Echologics is able

to provide the right equipment to test the accuracy of any master meter based on the requirements of the site and type of meter.

5) Customer Meter Billing Analysis

A thorough analysis of the historical meter reading and billing data is also completed to establish the initial volume of NRW loss. This will determine the volume of water ultimately assigned to the Real Loss category. Since Echologics was formed in 2003, it has been completing billing system analysis to understand how data is collected from meter readers and billing departments for revenue generation.

Our many specialized statistical routines analyze this data for the engineering functions needed to complete a NRW study and identify Apparent Losses associated with this data and the Revenue Losses that occur. Additionally, the results of this task are used to develop the core data for a Meter Right Sizing Analysis.

6) Non Metered Usage Analysis

Authorized unmetered water use occurs in water systems across North America. We compile data for all non-metered water usage. We will conduct interviews with appropriate City departments and stakeholders to identify the unmetered or unbilled water use categories and the volume of water attributed to each category.

7) Initial Water Balance

Compiled data from these tasks will be used to provide the initial water balance using the current AWWA Water Loss Control Committee – Water Audit Software. Current Performance Indicators including financial and operational efficiency will be calculated. The software also calculates a water audit validity score and grading matrix that can be used to identify components where further refinement to the input figures need to be completed.

AWWA WLCC Water Audit Software: Water Balance				Water Audit Report:	Report Yr:
				Hamden	2010
Own Sources (Adjusted for known errors) 5,756,878	Water Exported 0,000	Authorized Consumption 9,859,713	Billed Water Exported		
	Water Supplied 10,537,357		Billed Authorized Consumption 9,87,385	Billed Metered Consumption (inc. water exported) 9,847,385	Revenue Water 0,000
			Billed Unmetered Consumption 0,000		
			Unbilled Authorized Consumption 12,328	Unbilled Metered Consumption 0,000	Non-Revenue Water (NRW) 0,000
Water Imported 4,780,479	Water 677	Apparent Losses 305,472	Unbilled Unmetered Consumption 12,328	Unauthorized Consumption 26,343	
			Customer Metering Inaccuracies 274,329		
			Systematic Data Handling Errors		
PERFORMANCE INDICATORS					
Financial Indicators					
Non-revenue water as percent by volume of Water Supplied:					6.5%
Non-revenue water as percent by cost of operating systems:					3.0%
Annual cost of Apparent Losses:					\$1,311,685
Annual cost of Real Losses:					\$68,603
Operational Efficiency Indicators					
Apparent Losses per service connection per day:					18.43
Real Losses per service connection per day*:					22.42
Real Losses per length of main per day*:					N/A
Real Losses per service connection per day per meter (head) pressure:					0.30
Unavoidable Annual Real Losses (UARL):					284,06:
From Above, Real Losses = Current Annual Real Losses (CARL):					371.97
Infrastructure Leakage Index (ILI) (CARL/UARL):					1.31

8) Products, Services, Training and Studies

Products:



Services:

Pipeline Condition Assessment
Transmission Main Leak Detection
Permanent Leak Detection Monitoring
Asbestos Cement Pipe Condition Assessment

Training:

Leak Detection Essentials
Leak Detection Listening
Water Leak Detection
AWWA/IWA Water Loss

Studies:

Water Loss Control Studies
Revenue Enhancement Studies
Pressure Management Studies

WHAT MAKES UP NON REVENUE WATER?

Apparent Loss – Meter error, under-estimation of meter reads, incorrect size/type water meter, bypassed meters, use from unmetered fire lines and theft.

Real Loss – Leakage from transmission and distribution lines, storage tank overflows, customer meter leaks, unavoidable leakage.

*The potential revenue loss from these components are calculated at different rates; Apparent Loss is calculated at the retail cost (water and sewer rate structure) and Real Loss is calculated based on the variable cost to produce the water, unless it is purchased.