

# Managing Water Loss and Recovering Revenue: A Water Loss or Non-Revenue Water Policy Template for Local Adoption

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## **Managing Water Loss and Recovering Revenue: A Water Loss or Non-Revenue Water Policy for Local Adoption**

Infrastructure that delivers safe and reliable drinking water to our homes is aging and in need of considerable investment. That this might actually be news should come as no surprise: the network of pipes, water mains, connections, and valves is out-of-sight and largely out-of-mind for the general public. What's more, evidence suggests that the issue isn't discussed much, if talked about at all, between local water departments and both their elected officials and citizen rate-paying customers.

The US EPA's fifth national assessment of public water system infrastructure needs documents a 20-year capital improvement need of over \$384 billion between 2011 and 2030. This estimate of investment needed will address water treatment plants, storage tanks and other water supply assets in addition to thousands of miles of pipes of approximately 52,000 community water systems and many thousands more of noncommunity water systems.<sup>1</sup>

Lost water from aging infrastructure is also costing local governments and utilities lost revenue or unrecovered costs of production. Thus, taxpayer and ratepayer dollars are being wasted along with the commodity itself. A positive return on investment is almost certain for many systems, and tools are available for determining the economic level of loss for an individual water supply system – the level at which the cost of investing in water loss management is less than the value of the lost water.

Part of the solution to this management issue rests with good governance: local policies, codes, and ordinances that protect communities which elected officials serve. What follows is a water loss or non-revenue water policy that can be voluntarily adopted as a municipal ordinance with the format of this policy lending itself to such an approach in a resolution-type format.

However, in most cases this policy is more likely to be adopted as a water utility best practices policy as an addition to the water utility's Policy Manual, customized to the water utility's specific needs. But either way, adoption of this policy is a local commitment to best water infrastructure management practices that every community water system can adopt and should be able to implement.

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<sup>1</sup> US EPA, Office of Water. 2013. Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress. EPA 816-R-13-006.

## Policy Supporting the Recovery of Non-Revenue Water

**WHEREAS**, Non-revenue Water (NRW) is defined as drinking water that is produced but not sold because of leakage in the utility distribution system (i.e., real losses), unbilled authorized consumption (e.g., hydrant flushing, firefighting), and apparent losses that include unauthorized consumption, poorly functioning meters, and systematic data handling errors; and

**WHEREAS**, accurate metering, water auditing, and effective water loss control ensure an equitable recovery of revenue based on level of service and wise use of available water resources; and

**WHEREAS**, the lost revenue or unrecovered costs of production which occurs distorts data on customer consumption patterns, and thus must be corrected; and

**WHEREAS**, infrastructure that is relied on for the delivery of drinking water can also pose a threat to public health if in a state of disrepair; and

**WHEREAS**, it is poor public policy to lose drinking water to real losses as well as apparent losses in an amount that exceeds the sustainable economic level and thus wastes ratepayer investment for production and distribution of that volume of drinking water,

**NOW, THEREFORE, BE IT RESOLVED**, that the City/Town/Village of \_\_\_\_\_ adopts a policy, as outlined below, to address non-revenue water by controlling leakage, managing pressure, and correcting poor metering and accounting practices.

1. The water utility will employ the industry standard water audit and loss control program as part of an overall asset management strategy. Procedures to compile the annual water audit and remedial actions for recovering NRW have been developed jointly by the American Water Works Association (AWWA) and the International Water Association and encapsulated in the AWWA [M36 Manual](#) published by AWWA to ensure accountability and efficient use of valuable water resources.
2. The water utility will compile the water audit as defined by the M36 Manual on an annual basis and employ the AWWA Free Water Audit Software<sup>®</sup> available at <http://www.awwa.org/resources-tools/water-knowledge/water-loss-control.aspx>. Water audits evaluate the effectiveness of metering and meter reading systems, as well as billing, accounting, and loss control programs. Staff or a designed third party expert auditor will progressively validate the data inputs over time in accordance with the M36 Manual procedures, in order to strengthen the value of output from the water audit, verify the results, and promote a better understanding of the economic and operational implications of water loss and lost revenue occurring in the supplier's operations.
3. The annual water audit will be Level 1 validated, in accordance with Water Research Foundation Manual 4639 - Level 1 Water Audit Validation, available for free at <http://www.waterrf.org/Pages/Projects.aspx?PID=4639>. Advanced levels of validation will be employed as deemed necessary for audit reliability by the Level 1 validation.
4. The latest water audit results will be posted on the water utility's web site and regularly reported to the water utility board of directors or City/Town Council.
5. The water utility will establish and execute a plan for ongoing or periodic proactive leak detection work to identify hidden, unreported leaks occurring in the water distribution system. Documentation of findings and repair work will follow. A spreadsheet-based tool, Leak Repair Data Collection Guide, can be used for this purpose and is available for free from the Water Research

Foundation at [www.waterrf.org/Pages/Projects.aspx?PID=4372](http://www.waterrf.org/Pages/Projects.aspx?PID=4372). Another tool, Component Analysis Model: A Tool for Economic Water Loss Control, is also available at this same website and can be used to conduct a leakage component analysis that will assist in determining the highest priority leakage control actions that are most economical to pursue.

6. The goal of the water utility is to halt leakage within a 24-hour period from all emergency breaks and leaks coming to the surface on supplier-owned infrastructure, followed by conducting a durable repair in a timely manner. This is especially important in weather conditions where the water immediately will freeze upon contact with the road surface. For all other reported leaks, repairs will be conducted within a reasonable time frame.
7. The water utility shall establish a rational policy for customers to respond in a timely manner to arrange for repairs of leaks identified on the customer-owned section of service connection piping. The policy shall include appropriate mechanisms for the water utility to monitor the progress of repair activities and confirm that a repair ultimately occurs in a timely manner.
8. All customer user accounts will be metered or are under a plan to be metered. All customer meters will be read at an interval not longer than bi-monthly (monthly is preferred).
9. Customer water consumption meters will be tested for performance at a frequency that ensures they are working accurately to assess use and recover revenue, in accordance with the procedures outlined in the AWWA [M6 Manual](#). The water utility shall have an ongoing program for the replacement and/or upgrading of customer water consumption meters on an economically justified basis.
10. All source and/or water treatment plant production flowmeter installations shall be tested for accuracy at least annually if feasible and economically justified. The accuracy testing shall be of the primary metering device, and not merely the calibration of instrumentation related to the flowmeter installation. An action plan shall be prepared and executed to improve flowmeter installations that are less than 94% accurate on two consecutive meter accuracy tests in order to eventually achieve 97% or better.
11. Operational guidelines will be developed for proper processing of customer billing adjustments, evaluating and controlling customer water theft, implementing a utility distribution pressure management program, and developing a planning schedule for pipeline replacement. In developing these additional guidelines, the technical, operational and financial viability should be evaluated prior to implementing the approach.
12. To inform customer demand management efforts, water loss control programs, and long-term water supply planning, all service connections will be quantified by both type (e.g., single-family residential, multi-family residential, commercial, etc.) and size (e.g., > 1", < 1", etc.) in order to monitor water consumption patterns for varying categories and sizes of customer accounts.
13. A 48-hour notice will be provided for any emergency actions that must be undertaken with a customer.

Approved this day by members of the City Council/Town Council/Village Board, City/Town/ Village of \_\_\_\_\_.

\_\_\_\_\_, 201\_\_\_\_  
(Date)

\_\_\_\_\_  
(Mayor/President)