

WATER LOSS CONTROL IN THE SYSTEM

SECTION 5

5.0 INTRODUCTION

In section 4, this plan addressed the use of water by consumers under the area typically referred to as the discipline of water conservation. In this section, the plan will cover water losses that are controlled in the distribution system and the production plants of the Water Authority of Great Neck North.

These losses can occur as real losses or as apparent losses. Real losses result when water is lost in the distribution system through leaks, tank overflows, system blow-offs, fire-fighting and periodic drills.

Apparent losses result when water is actually used by a consumer, but is not properly accounted for. This typically results from a faulty water meter or inaccurate accounting.

These two losses usually fall under the discipline of water accountability. Water losses cannot be avoided, but they can be managed to keep them at a minimum. The advantages of managing these losses include improving water supply operation by reducing treatment cost and energy cost as a result of the reduction in the volume of water, which must be supplied. The apparent losses affect the revenue stream and managing these can recover lost revenue, thereby helping to control water rates.

5.1 Defining Acceptable Water Losses

In our day-to-day operation, the Water Authority of Great Neck North follows sound water supply management, which includes minimizing water losses, both real and apparent. This section will codify those practices that the district adheres to. The first step in this process is to understand what level the Authority's "unaccounted for water" is and how it compares to standards. This is the benchmark, which is used to determine how well a water supplier tracks its

water use and controls its water losses. For many years it was considered that an unaccounted for water of 10 to 15 percent was a good goal for a well-run water system. Recently, the American Water Works Association, Leak Detection, and Accountability Committee recommended that water systems should strive to keep their unaccounted water below 10 percent. The Water Authority of Great Neck North unaccounted for water remains below 10 percent. The committee also recommended that while reflecting unaccounted for water, as a percent is a good benchmark, this number should also be reflected as a volume so that the true cost of unaccounted for water can be understood.

Two questions should be answered here. First, how do we quantify “unaccounted for water?” and second, what is the range of cost of 1 percent of unaccounted for water for the Water Authority of Great Neck North?

5.2 *Calculating Unaccounted For Water*

Calculating unaccounted for water starts by taking the difference between total water pumped less total water billed. That volume represents water, which falls into three areas, non-account water, lost water, and unaccounted for water. Non-account water includes bulk water sales, municipal uses such as street sweeping, sewer cleaning, fire fighting, and other Authority permitted uses. Lost water comes from known leaks, tank drainage, storage tank overflow, blow-off water, and hydrant flushing.

This leaves unaccounted for water, which is made up of unidentified leaks, meter inaccuracies, theft, underestimated accounts, meter reading errors, accounting errors, and improperly typed and sized meters.

5.3 *The Cost of Unaccounted for Water*

What is the range of variable cost of 1 percent of the Water Authority’s total volume pumped? Using the Authority’s average annual pumpage over the last ten years of 1,570,000,000 gallons per year, 1 percent represents 15,700,000 gallons. First, the minimum cost would be if all

this loss were due to leakage and system loss. This would be the cost of the chemicals used for treatment and the cost of energy required to pump this volume of water into the system. Using an incremental cost of \$ 0.049/1,000 gals for treatment and \$0.42/1,000 gals of energy, the minimum cost would be as follows:

Chemicals 15,700 x \$0.049	=	\$769
Energy 15,700 x \$0.42	=	<u>\$6,600</u>
Total	=	\$7,369

The maximum cost would be if all the unaccounted for water was on the consumers' side, inaccurate meters, theft, etc., water used but not billed. Convert 15,700,000 gallons into 20,989 CCF. The maximum cost would be as follows:

$$20,989 \times \$3.95 = \$82,907$$

With a range of cost between \$7,369 and \$82,907 for 1% unaccounted for water on an annual basis, it is easy to understand why the Water Authority strives to keep the unaccounted for water as low as possible.

5.4 Control of Water Loss at Water Authority Stations

There are many users of water in the daily operation of a water system. Some water consumption is necessary to maintain integrity of the station and high water quality. These include the following:

- Wells are pumped to waste for several minutes prior to pumping to the system to remove air and turbidity, which can occur from the empty casing when the well is off-line.
- Water is used to lubricate bearings, on well pumps and distribution pumps.
- Water is used in continuous water quality monitoring analyzers.
- Water is used for sampling purposes.

Water can also be lost at water plants if proper maintenance and checks are not performed at various plants. Water Authority personnel continually check that water is not lost during plant operations. The following areas are checked daily:

- Check valves to blow off are checked to ensure water is not lost during the operation of a well pump.
- Well pump check valves are checked to ensure system water does not recharge into the well casing when the well pump is off-line.
- Water lubrication systems are checked to ensure they only operate when called for prior to a pump turning on.
- The system is managed in a manner that avoids overflow of water storage tanks.
- Check air release valves on well discharge for leaks.

5.6 *Controlling Apparent Losses*

Apparent losses of water are that water which is used by the consumer but were not billed. This results in lost revenue. The majority of apparent water loss comes from consumer water meters that under-register, are stopped or are inaccurately read or estimated.

Apparent losses are controlled by the following actions:

- Production meter testing;
- Sales meter testing;
- Correct meter sizing;
- Scheduled meter replacement;

- Accurate meter readings;
- Minimizing estimated readings;
- Adherence to billing procedures and periodic billing audits;
- Control of service theft, whether unintentional or deliberate.