

Leakage Analysis Methodology

1.0 INTRODUCTION

This procedures describes the methodology used to calculate leakage.

2.0 SCOPE

Calculation performed within Netbase to report the volume of water lost in the network and covers the following functions of the process:



3.0 REFERENCES

Netbase - software commercially available to calculate and report on leakage

4.0 **DEFINITIONS**

None

5.0 PROCEDURE

The method of calculating non-household usage when billing data does not exist consists of considering the daily demand profile entering the district meter area. By considering the night flow and assuming a minimum non-household use at night and an assumed household legitimate use it is possible to calculate the leakage. Then by considering the number of household properties (unmetered and metered) it is then possible to calculate the household demand profile.

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By deducting the household demand profile and the leakage profile from the total demand profile it is then possible to determine the remainder, in effect the unmeasured non household water. Although it is an automated process the calculation must be performed using 15 minute readings for the whole year each of the district meter areas (35040 readings for each district meter area with data errors being corrected if necessary). Although it provides a consistent method of calculating leakage and unmeasured non household water delivered there are a number of assumptions:

- Accuracy of metered flows into district meter areas (red line below)
- Household demand and legitimate night usage (green line below)
- Leakage calculated from minimum night flow (blue line below)
- Non-households water use demand profile (10 or 24 hour) (brown / purple lines below)

This is a complicated assessment hence the need to automate the process using Netbase.

The following graph is included to help communicate the general principle for a single daily assessment:



Knowledge of the demand profile, household use and demand profile, leakage (night use against theoretical use at 1.7 litres / hour for a household) allows non-household use to be determined if billing data is not available.

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The method of determining the type of non-household type (10 hour or 24 hour) is to consider the Standard Industrial Classification (SIC) code.

Leakage is further corrected using a day / night adjustment multiplying factor (default value of 22 / 24) because the night time pressure is higher than in the day and so leakage is being calculated at the minimum night flow period when the pressure is at the highest. Therefore to determine the average leakage over the 24 hour period it is necessary to correct the reported leakage by this factor.

6.0 DOCUMENTATION

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