

# UFR COMPARISON PILOT GUIDELINES

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In order to determine the contribution of the Unmeasured-Flow Reducer (UFR) to a given water system when a suitable location for a bulk metered pilot is not available, a comparison trial is a viable alternative.

We encourage you to utilize the experience of the A.Y. McDonald engineering, product management and sales team to assist with your UFR pilot project. It is our intent that as a result of successfully executing a UFR pilot project, you will have sufficient data to show the UFRs potential actual contribution specific to your water system. Scheduling an on-site meeting to discuss your pilot project prior to implementation is recommended. Contacts are as follows:

Daryl Gilreath (UFR Product Manager)	(563) 583-7311, Ext. 344
Brad Haas (Senior Project Engineer)	(563) 583-7311, Ext. 331

In order to prevent the inclusion of corrupted data into the analysis, the following guidelines and the use of the accompanying Excel spreadsheet are suggested.

## Methodology:

1. Determine an area in which to perform the pilot study considering the following:
  - a. An install of at least 100 UFRs and a control group of equal size or greater is suggested.
  - b. Locations with easy access to the meter are preferred.
  - c. Monthly meter reads and read dates will be necessary for both groups for at least 4 months prior to the install month and for the duration of the study (at least 4 months).
  - d. The meters in the install group and control group should be of similar age, size and manufacturer. Meters that are at least a few years old are suggested.
  - e. The age and type of homes in the install group and control group should be similar.
  - f. Accounts with a stable usage history should be chosen when possible.
2. Record the addresses or services numbers of both groups.
3. Install UFRs and record the install date considering the following:
  - a. In order to prevent a change in behavior, residents should not be informed that a device is being installed that will increase their meter's ability to register low-flows such as leaks.
  - b. If possible, all UFRs should be installed during the same month in order to minimize the duration of the pilot project. Month or months of install will be excluded from the data.
4. Record the monthly reads and read dates for the previous 4 months for both groups, excluding data for both groups from the month or months of install.
5. Record the monthly reads and read dates for the duration of the pilot project for both groups considering the following:
  - a. Any service showing anomalous data should be investigated and possibly removed from the study. Discussion with A.Y. McDonald staff is suggested.
  - b. Any service that changes ownership should be removed from the study.
  - c. Any service that is disconnected for any period of time should be removed from the study.
  - d. Any service requiring a meter change-out should be removed from the study.

## The Spreadsheet:

The spreadsheet analyzes the data as follows:

1. Converts the monthly reads to average daily reads to compensate for possible differentiations in durations between reads.
2. Compares the total usage in the install group after UFR installation to the total usage prior to installation.
3. Compares the total usage in the control group after UFR installation to the total usage prior to installation in order to establish a trend.
4. Based on the trend, provides a calculation of increased usage in the install group as a result of the UFR installation.