

July 16, 2015

Location: Toronto, Ontario, Canada

Facility Type: Multi-Residential Building – 263units

Overview

This case study details the findings on the installation of the H2minusO Flow Management Device (FMD) water saving technology at a Multi-residential site located in Toronto, Ontario. The positive results demonstrate the value-add our device continues to have on this facility and will continue to have. Virtually any facility that consumes water can benefit from our technology.

Background

Good water management requires accurate water measurement!

Water meters have changed little since their beginning and have a major fault in their design: air in your water lines is read as water by your meter. So for ALL end users, there is a very high probability your meter is billing you for water use, but not your actual consumption.

In a variety of ways, air can enter the water supplied by your water utility. Our H2minusO Flow Management Device (FMD) valve acts to minimize the air that would otherwise travel through your water meter and inflate the volume of water you ultimately pay for. All water pipes intermittently carry air along with water. As water travels from the water company to a home or business, air builds up in the water pipelines via internal and external processes. Since all water meters measure total volume, including both air and water, the blades in the meter turn faster than they would with just water alone. As a result, if you don't have our H2minusO valve, you pay more than necessary for your water.

What are the benefits for your business/organization/facility?

- Lower water bills
- Rapid return on investment
- Increased net operating income

The Technology: H2minusO - Water Flow Management Device





The Installation

The installation at this facility was for a 3-inch Valve that took approximately 4 hours. A typical install will usually take between 2-4 hours and in most cases, if there is a by-pass, water services will still be available to the facility. Once the installation is complete the water savings will start immediately.

The Project Analysis: *Pre and Post Water Consumption Analysis*

This measurement & verification analysis is based on actual billing information as well as daily readings pre and post installation of the H2minusO valve. Encompass was provided billing details for 24 months up to the Aug 1st, 2013 billing period. We also took detailed daily readings for 69 days prior to the install and then for an additional 36 days after the installation. The post data collection allowed us to conduct a detailed comparative Measurement & Verification (M&V). The analysis explored such things as consumption patterns, abnormal or suspicious periods of consumption, comparison of same period consumption year to year, consumption trending and impact off variables contributing to increased consumption.

Our analysis showed this facility exhibited consistent water consumption patterns year over year relative to any water retrofits completed. So the installation of the H2minusO valve would quickly demonstrate its impact by showing a deviation from this consistent consumption pattern. As shown in Table 1 rows 1 to 3, the pre-installation period established the baseline we used to measure the post installation results against. Row one in Table 1 establishes the baseline to be used for the analysis period. Rows 2 and 3 establishes a trend showing consumption increasing – 4% from year 1 to year 2 and then an additional 8.2% during 69 day pre-installation measurement period. This represented over 12 % increase in water consumption from year 1 to the day of the H2minusO valve installation.

Row 4 shows a 36-day post-installation consumption average of 154.15 m³, which represents a decrease in consumption of 6.05% compared to the 69 day pre-installation period. However, the post H2minusO consumption measure includes a period that water work was being conducted in the building. During this period consumption increased to an average of 169 m³ per day. This was the second highest m³/day consumption for any period during the pre and post installation period. This increased the average daily consumption from 148.25 m³/day to 154.15 m³/day – an increase of 3.59% (see table 1 rows 4 and 5). When the post-installation period is normalized the results show a reduction in consumption of 15.82 m³/day compared to the 69 day pre-installation period, clearly pointing to improved meter reading efficiency.

Table 1: Period Analysis – Consumption

	Measurement Period - Start	Measurement Period - End	Average Daily Consumption (m3)	Average Daily Consumption Per Unit (m3)	Reduction in Water Consumption Reading
Consumption for - 365 days	1-Aug-11	31-Jul-12	145.81	0.565	0.00%
Consumption for - 365 days	1-Aug-12	31-Jul-13	151.64	0.588	-4.00%
Consumption for - 69 days (pre H2minusO retrofit)	1-May-14	9-Jul-14	164.07	0.636	-8.20%
Consumption for - 36 days (post H2minusO retrofit)	9-Jul-14	14-Aug-14	154.15	0.597	6.05%
Consumption for - 36 days (post H2minusO retrofit) but normalized for 10 day period from July 18 - July 28	9-Jul-14	14-Aug-14	148.25	0.575	9.64%

The Project Analysis: Follow- up Analysis

This follow-up Measurement & Verification analysis is based on meter reading data for 247 days post installation of the H2minusO valve. The unadjusted savings shows that this facility is experiencing a reduction in consumption by 10.07% (see table 2 row 4). When adjusted for the 10-day periods (see table 2 row 5), that work was being completed in the facility, the savings increase by over 4% to 14.25%. Prior to the installation of the valve this building was showing an increasing consumption pattern. Since the installation of the valve, the consumption has dropped below the levels of 2012. It is clear that the H2minusO valve has performed consistently and has provided a significant ROI on investment.

Table 2: Follow-up Analysis – 247 days post installation

	Measurement Period - Start	Measurement Period - End	Average Daily Consumption (m3)	Average Daily Consumption Per Unit (m3)	Reduction in Water Consumption Reading
Consumption for - 365 days	1-Aug-11	31-Jul-12	145.81	0.565	0.00%
Consumption for - 365 days	1-Aug-13	31-Jul-14	151.64	0.588	-4.00%
Consumption for - 69 days (pre H2minusO retrofit)	1-May-14	9-Jul-14	164.07	0.636	-8.20%
Consumption for - 247 days (post H2minusO retrofit)	9-Jul-14	13-Mar-15	147.54	0.572	10.07%
Consumption for - 247 days (post H2minusO retrofit) but normalized for 10 day period from July 18 - July 28	9-Jul-14	13-Mar-15	140.68	0.545	14.25%

The Project Analysis: One Year Follow- up Analysis

This follow-up Measurement & Verification analysis is based on meter reading data for 372 days post installation of the H2minusO valve. The unadjusted savings shows that this facility is experiencing a reduction in consumption by 10.85% (see table 2 row 4). When adjusted for the 10-period (see table 2 row 5), that work was being completed in the facility, the savings increased to 13.63%. Prior to the installation of the valve this building was showing an increasing consumption pattern. The H2minusO valve has now been installed for over 1 year and since the installation of the valve, the consumption has dropped below the levels of 2012. It is clear that the H2minusO valve has performed consistently and has provided a significant ROI on investment, achieving better than our projected payback.

Table 3: Follow-up Analysis – 372 days post installation

	Measurement Period - Start	Measurement Period - End	Average Daily Consumption (m3)	Average Daily Consumption Per Unit (m3)	Reduction in Water Consumption Reading
Consumption for - 365 days	1-Aug-11	31-Jul-12	145.81	0.565	0.00%
Consumption for - 365 days	1-Aug-13	31-Jul-14	151.64	0.588	-4.00%
Consumption for - 69 days (pre H2minusO retrofit)	1-May-14	9-Jul-14	164.07	0.636	-8.20%
Consumption for - 372 days (post H2minusO retrofit)	9-Jul-14	16-Jul-15	146.26	0.566	10.85%
Consumption for - 372 days (post H2minusO retrofit) but normalized for 10 day period from July 18 - July 28	9-Jul-14	16-Jul-15	141.71	0.549	13.63%

Chart 1:

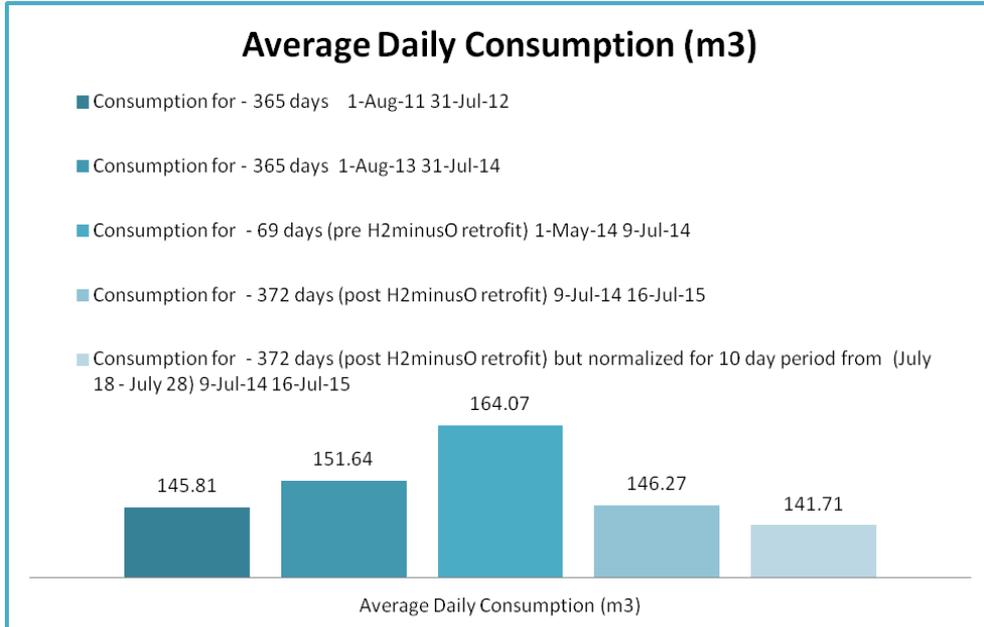


Chart 1 shows the daily water consumption recorded period over period based on water bills and actual meter readings.

The Project Analysis: *Estimated vs Measured Water Consumption and ROI Analysis*

Based on the initial audit of the facility and analysis of 24 months of water bills, we determined that this building would yield a payback savings of approximately 9.0%. Factoring in the average 2012 and 2013 water rates and projected reduction in consumption billing, this building had an expected payback at .71 years. The post installation results and analysis indicate the projected savings will be 13.63%. So based on the actual 1-year results, the payback was .46 years. Based on the blended increase of 6.5% (2013 and 2014 water rates), the 2015 savings is nearly \$28,000 dollars.