April 30, 2016

Location: Toronto, *Ontario, Canada*

Facility Type: *Multi-Residential Building – 352 unit building*

Overview

This case study details the findings on the installation of the H2minusO Flow Management Device (FMD) water saving technology located in Toronto, Ontario. The positive results demonstrate the value-add our device had 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!

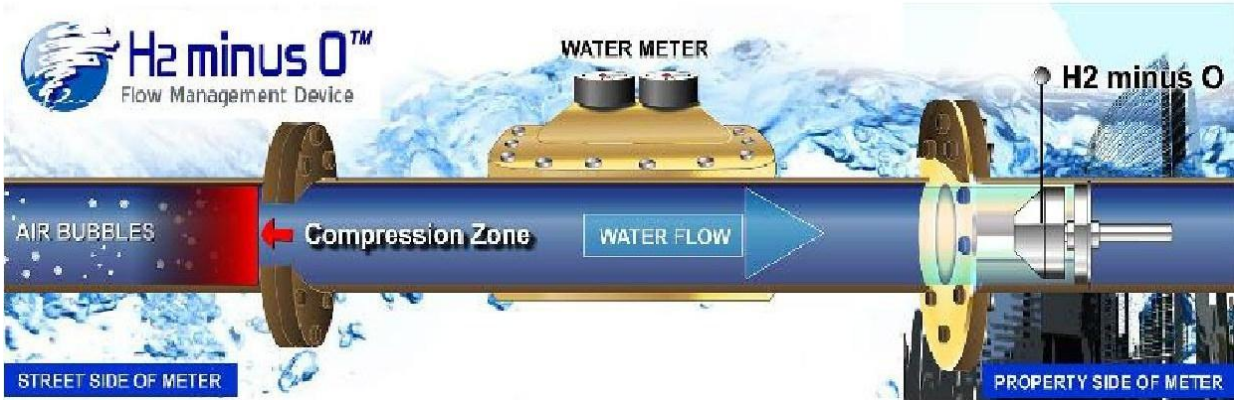
Water meters have changed little since their beginning and have a major fault in their design: air in your water lines is read as water by your meter. So for ALL end users, there is a very high probability your meter is billing you for water use, but not your actual consumption.

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 4-inch Valve. Because of the difficulty with the installation, additional time and materials were required, increasing the investment and thus the payback period. A standard install will usually take between 2-4 hours (this facility required more than 5 hours for the installation) 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 FMD. Encompass was provided billing details for 24 consecutive months from Dec 2013 to Dec 2015. We also took readings for 23 days prior to the install and then for an additional 21 days after the installation. The post installation data collected permitted us to apply our Measurement & Verification (M&V) analysis methodology. 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. For this facility, we observed a relatively consistent seasonal consumption pattern with no extraordinary fluctuation in consumption based on the data collected from all sources. However, it is important to note that the facility had major water saving toilet retrofits completed in Sept of 2015. This fact is extremely important when comparing year over year and month over month consumption levels and patterns. Such water saving retrofits can skew the data analysis exercise and thus can cause grossly inaccurate ROI analysis. However, this did not prevent us from establishing key metrics and measurements in order to determine the performance of the FMD relative to historical consumption benchmarks. So in order to do prior periods comparative analysis, the data sets were normalized.

Data set normalization methodology:
The data sets for prior year periods were normalized by applying a 30% reduction in the recorded consumption. The 30% figure was calculated by comparing the change in consumption for similar periods from 2014 (consumption with no toilet retrofits) and 2015 (consumption with toilet retrofits). The period from Sept 30, 2014 to Dec 1, 2014 had a recorded consumption of 343.28 m3/day or .975 m3/day/unit (see table 1 and 2; row 1 column 4 - "Actual Average Daily Consumption (m3)"); the period from Oct 1, 2015 to Dec 1, 2015 had a recorded consumption of 242.74 m3/day or .690 m3/day/unit (see table 1 and 2; row 2 column 5 - "Actual Average Daily Consumption (m3)"). So consumption in the prior year 62 day period recorded, on average, 100.54 m3/day more than the 61 day period post toilet retrofits. This represents a 30% reduction in consumption

1. 343.28 m3/day - 242.74 m3/day = 100.54 m3/day
2. (100.54 m3/day / 343.28 m3/day) *100% = 29.23%

Using the preceding analysis, we normalized consumption data sets, for prior time periods, by applying a 30% discount to the recorded consumption numbers. The normalized consumption data sets are identified in table 1 and 2 column 5 - "Normalized Average Daily Consumption (m3)" . Once the data sets were normalized, our analysis showed this facility exhibited consistent seasonal water consumption patterns before and after the toilet retrofits. So the installation of the H2minusO valve quickly demonstrated its impact by showing a deviation from this consistent consumption pattern.

The Results:
As shown in Table 1 and 2, rows 1 - 4, column 5 - "Actual Average Daily Consumption (m3)"; there was no significant deviation in the period analysis. We tried to match the prior year periods as close as possible given the nature of how water bills are delivered in summary format for a given billing period. Nevertheless, the results clearly demonstrate the effectiveness of the H2minusO FMD in reducing the facilities overall water consumption.

Rows 3 and 4 of table 1 and 2, show (normalized) consumption in the prior year. Row 3 shows the (normalized) consumption in the period before the valve was installed but in the prior year - 242.68 m3/day or .689 m3/day/unit. Row 4 shows the (normalized) consumption in the comparative period after the installation of the FMD - 245.49 m3/day or .697 m3/day/unit; but again in the prior year. Thus, the normalization of data sets, for prior periods, is required if we are to make specific relative comparisons of prior year period consumption to post H2minusO

installation. This also ensures our methodology establishes a consistent and accurate baseline in order to establish your confidence in our numbers.

Rows 5 and 6 of table 1 and 2 show the consumption in the current periods immediately before the FMD is installed - 229.52 m3/day or .652 m3/day/unit; and the consumption in the current period immediately after the FMD has been installed 211.92 m3/day or .602 m3/day/unit. These two measures provide insight into the current water consumption patterns relative to the historical consumption of the prior year periods.

Column 6 in table 1 and 2 shows the change in consumption from period to period. Column 7 shows the change in consumption for all periods when compared to the post H2minusO installation. So when comparing the normalized consumption for the 62 day period in Sep 2014 to Dec 2014 (see table 1 and 2, row 1) with the post install consumption (see table 1 and 2, row 6), we recorded an 11.81% reduction in consumption. Continuing down each row of the table we see that we record a reduction of 12.70%, 12.67%, 13.67%, and 7.67%. Row 4 of table 1 and 2, recorded a reduction in consumption for the period after the installation of the FMD but in the prior year. This shows that if the valve had been operational during the same period, but in 2015, this facility would have experienced a 13.67% reduction in water consumption.

Based on our analysis, we are confident that the immediate pre and post consumption numbers, representing the most conservative results of the analysis, showed this facility achieved a reduction in the average daily water consumption of 7.67% as shown in row 5 column 7 of table 1 and 2, clearly pointing to improved meter reading efficiency.

Table 1: Period Analysis – Daily Consumption (m3)

	Measurement Period - Start	Measurement Period - End	Actual Average Daily Consumption (m3)	Normalized Average Daily Consumption (m3)	Change in Water Consumption Reading (Period to Period)	Reduction in Water Consumption (all Periods) vs Post H2 Install
Consumption for - 62 days (pre H2 & toilet retrofits)	30-Sep-14	1-Dec-14	343.28	240.29	0.00%	11.81%
Consumption for - 61 days (pre H2 & post toilet retrofits)	1-Oct-15	1-Dec-15	242.74	242.74	-1.02%	12.70%
Consumption for Comparable Period- 31 days (pre H2 prior year)	1-Mar-15	1-Apr-15	346.68	242.68	0.03%	12.67%
Consumption for Comparable Period- 30 days (post H2 prior year)	1-Apr-15	1-May-15	350.70	245.49	-1.16%	13.67%
Consumption for - 23 days (pre H2 current year)	15-Mar-16	7-Apr-16	229.52	229.52	6.51%	7.67%
Consumption for - 21 days (post H2minusO retrofit)	7-Apr-16	28-Apr-16	211.92	211.92	7.67%	0.00%

Table 2: Period Analysis – Daily Consumption (m3/unit)

	Measurement Period - Start	Measurement Period - End	Actual Average Daily Consumption (m3/unit)	Normalized Actual Average Daily Consumption (m3/unit)	Change in Water Consumption Reading (Period to Period)	Reduction in Water Consumption (all Periods) vs Post H2 Install
Consumption for - 62 days (pre H2 & toilet retrofits)	30-Sep-14	1-Dec-14	0.975	0.683	0.00%	11.81%
Consumption for - 61 days (pre H2 & post toilet retrofits)	1-Oct-15	1-Dec-15	0.690	0.690	-1.02%	12.70%
Consumption for Comparable Period- 31 days (pre H2 prior year)	1-Mar-15	1-Apr-15	0.985	0.689	0.03%	12.67%
Consumption for Comparable Period- 30 days (post H2 prior year)	1-Apr-15	1-May-15	.996	0.697	-1.16%	13.67%
Consumption for - 23 days (pre H2 current year)	15-Mar-16	7-Apr-16	0.652	0.652	6.51%	7.67%
Consumption for - 21 days (post H2minusO retrofit)	7-Apr-16	28-Apr-16	0.602	0.602	7.67%	0.00%

Chart 1:

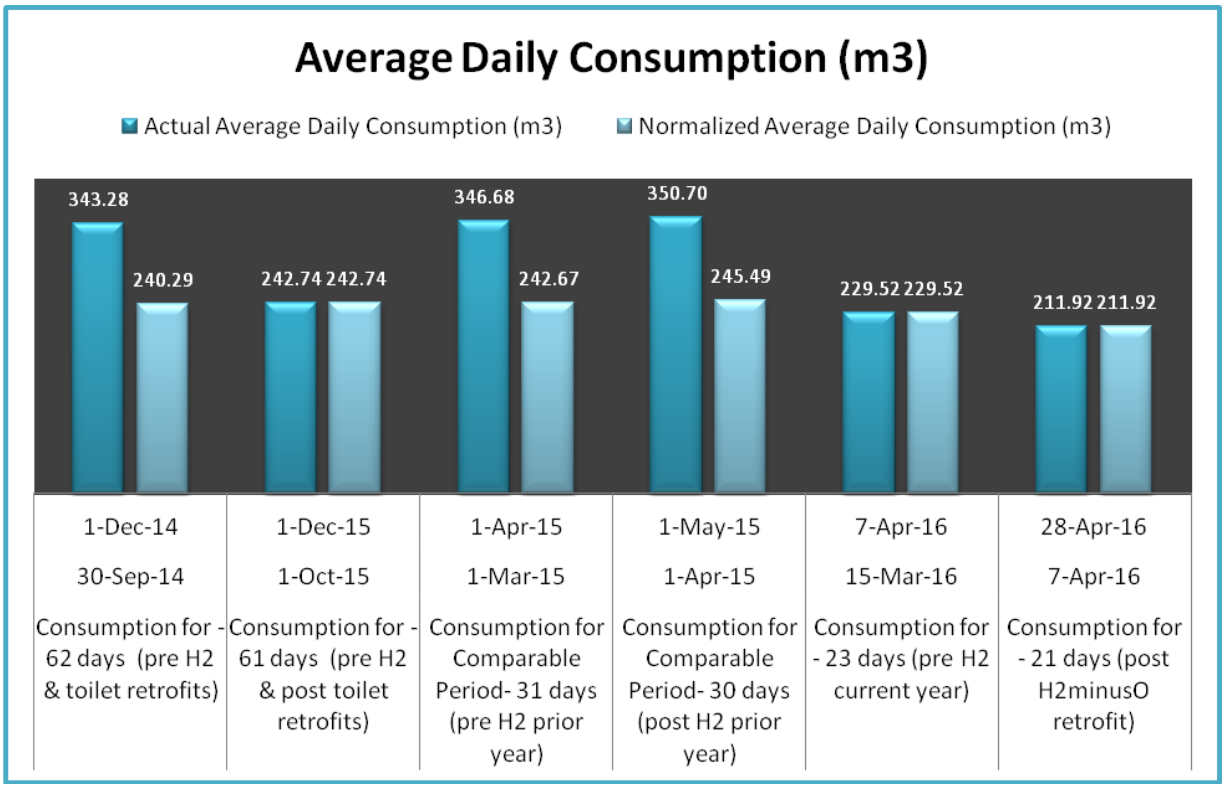


Chart 1 shows the daily water consumption recorded period over period based on water bills and actual meter readings.

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Chart 2

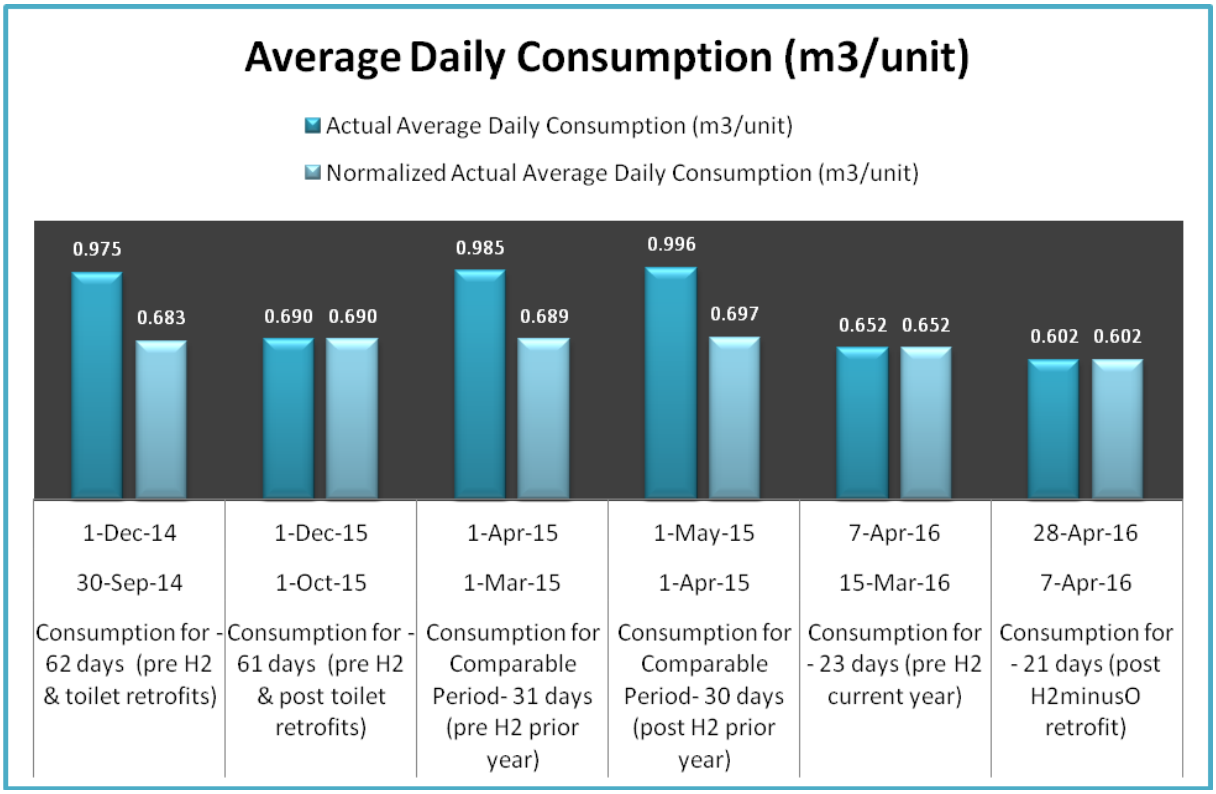

Chart 2 shows the daily water consumption per unit period over period based on water bills and meter readings.

Chart 3

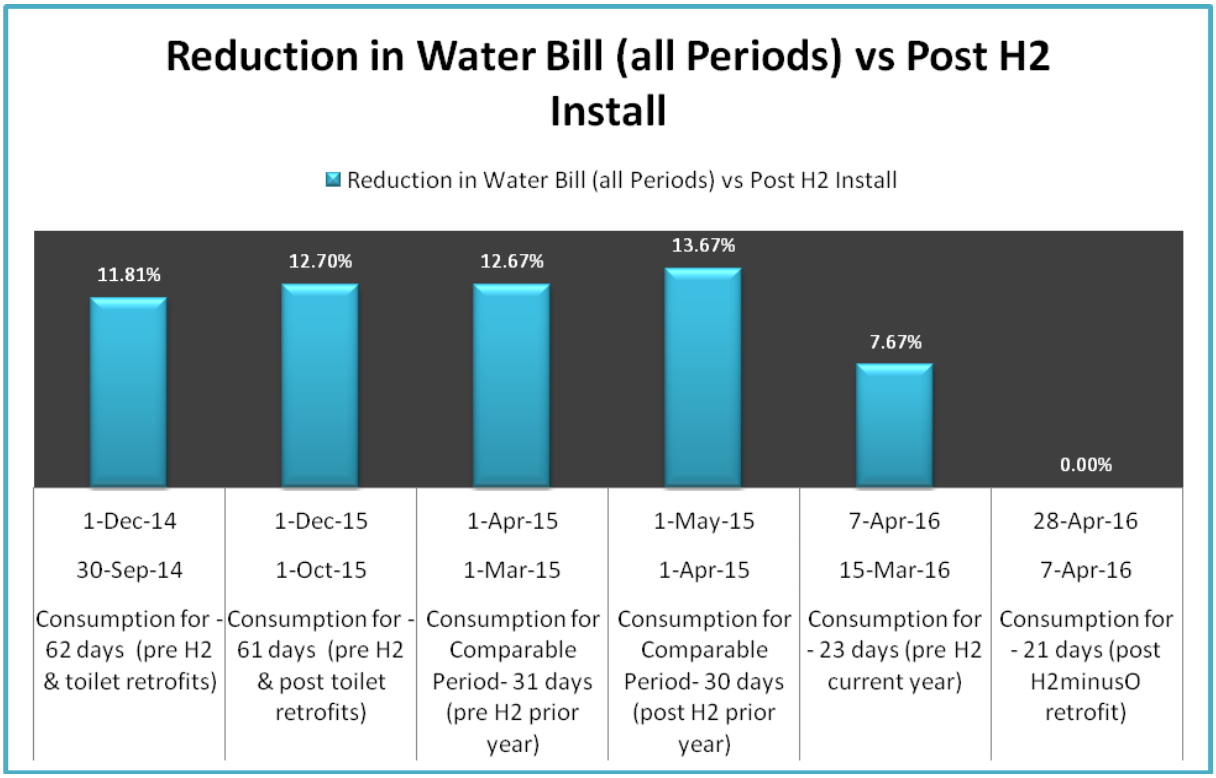

Chart 3 shows the impact on consumption post-H2minusO installation relative to all other periods.

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

Based on the initial audit of the facilities, analysis of 24 months of water bills; and factoring in the average 2014 and 2015 water rates; and projected reduction in consumption billing, this building had an expected payback of 1.24 years as shown in Table 2. The post installation results and analysis indicate the projected savings will yield a payback in ..633 years.

Table 3: Estimated vs measured results

	Estimated Payback (yrs)	Measured Payback (yrs)	Difference (yrs)
Projected Payback – 1577 Lawrence Ave	**1.24**	**.633**	**.607**

Summary

The installation of the 4-inch H2minusO FMD will generate a reduction in water consumption readings based on the current existing conditions. Because the device treats the entire volume of water entering the facility, regardless of changes in the buildings consumption patterns and history, this facility will continue to experience savings averaging 7.67% on their water consumption readings. Furthermore, the financial metrics and ROI are based on the average of 2014 and 2015 water rates, so the actual dollar savings on future consumption will increase provided water rates continue to increase.