May 8, 2018

[redacted]

Car Wash Measurement & Verification Findings

Summary Findings

The following Measurement and Verification (M&V) analysis demonstrate the positive effect the H2minusO Flow Management Device (FMD) has had on the meter reading efficiency at [redacted]. We were provided data for water consumption and cars washed for 2016, 2017 and 2018 measurement periods. After analyzing the datasets, the meter reading efficiency showed a significant improvement. The water (liter) used per car washed decreased by an average of 21.89% with a payback in .42-years, well exceeding the ROI projections of 6.6% with a payback in 1.4-years.

Key Project Metrics

One time project investment: $13,420.00
Projected consumption 2017: 39,007m3
Cost per m3: $3.73
Install date: Nov 28, 2017

Pre-Installation

Projected Savings: $9,602.79
Projected Savings: 6.60%
Projected ROI (Yrs): 1.40 years

Post-Installation

Measured Savings ($): $31,849.25
Measured Savings (%): 21.89%
Measured ROI (yrs): 0.421 Years

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M&V Findings

The FMD was installed on Nov 28, 2017. Table-1 summarizes the consumption results for the FMD post-installation period from Jan-March 2018 relative to the same periods in 2016 and again in 2017 with no FMD. Column 7 shows the average water consumption (l) per car washed. This is based on the total cars washed (column 5) and total consumption (l) (column 6) for each of the start and end periods as indicated in columns 3 and 4. Rows 1 and 2, and column 8 shows the change in consumption relative to row 3 – the M&V period that the FMD was installed.

Table-1 indicates that although the number of cars washed was the highest after the FMD was installed (row-3 column-5 – 41,781), the average liter/car washed dropped to 313.71 liters (row-3 column-7). This is a significant decrease compared to the two prior periods from 2016 and 2017; row-1 and row-2 column-5 – 402 liters and 401.64 Liters respectively. This represents an improved meter reading efficiency of 21.96% (row-1 column-8) when measured against 2016 and 21.89% (row-2 column-8) when measured against 2017.

This is further supported by the detailed data contained in Annex I. In particular, when comparing the liters/car washed for each of the 3 periods (Jan, Feb, and Mar), average consumption ranged between 385-414 liters in 2016 and 397-406 Liters in 2017. During the same post-installation period of the FMD, average consumption ranged between 282-347 liters. So when considering even the highest monthly average for the post FMD installation, 347 liters/car washed, it was still significantly lower than the lowest monthly average from either of the comparative periods - 385 in 2016 and 397 in 2017.

As part of our detailed M&V approach, we also considered the need for data normalization. This is required in cases where we do not have sufficient data for dependent/independent variables that impact the results. In this case, we also considered 2 additional variables during our analysis - irrigation/outdoor water requirements and in-store traffic. Given the M&V period was during the winter months, there was no need to factor in irrigation/outdoor requirements. For in-store traffic, we assumed that there was a close correlation between the number of cars washed and in-store traffic. The higher the number of cars washed, then the higher the in-store traffic would be. This would, in general, translate to increased water consumption. Given the FMD post-installation period registered significantly more car washes, and yet consumption was significantly lower than the comparative periods, the need to normalize the data for in-store traffic was also negated.

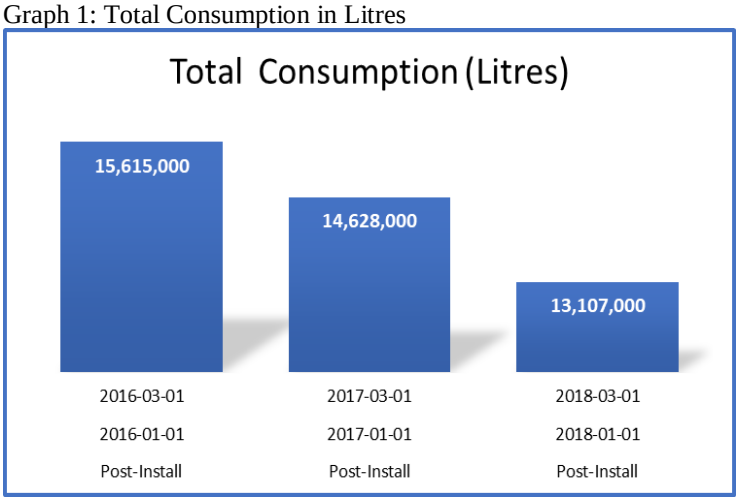
These measured results confirm the improved meter reading efficiency post-installation of the FMD, showing improved efficiencies of a minimum of 21.89%

Table 1: M&V Summary Results*

#	H2 Reference	Start Measurement Period	End Measurement Period	Total Cars Washed	Total Consumption (Liters)	Average Liters/Car	Change in Consumption (%)
1	Post-Install	2016-01-01	2016-03-01	38,843	15,615,000	402.00	21.96%
2	Post-Install	2017-01-01	2017-03-01	36,421	14,628,000	401.64	21.89%
3	Post-Install	2018-01-01	2018-03-01	41,781	13,107,000	313.71	0.00%

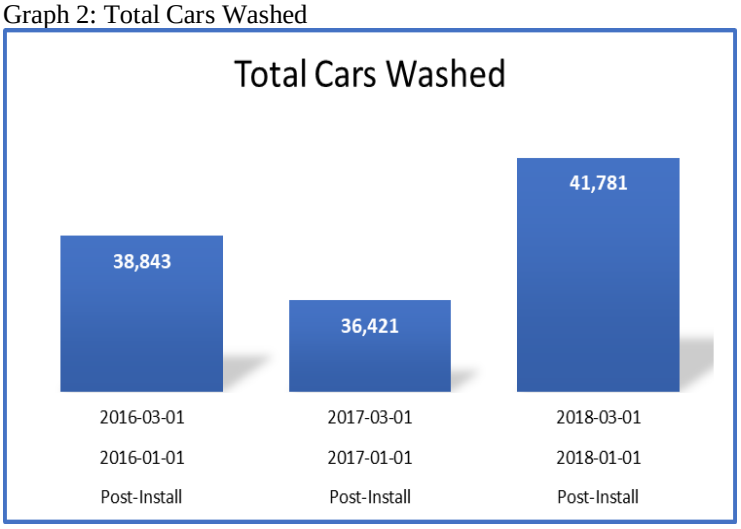
*Details for each of the periods identified in Table-1 can be found in Annex I

Graph 1: Total Consumption in Litres



Graph 1 shows the total consumption in liters based on water bills provided.

Graph 2: Total Cars Washed



Graph 2 shows the total number of cars washed during the same period.

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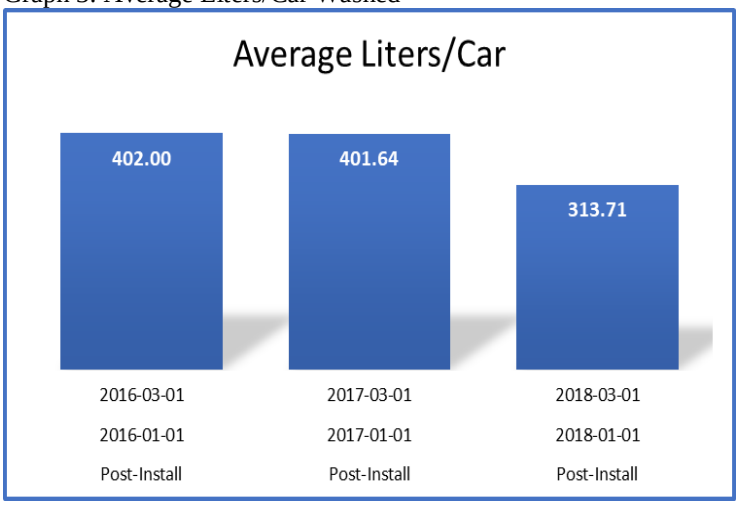
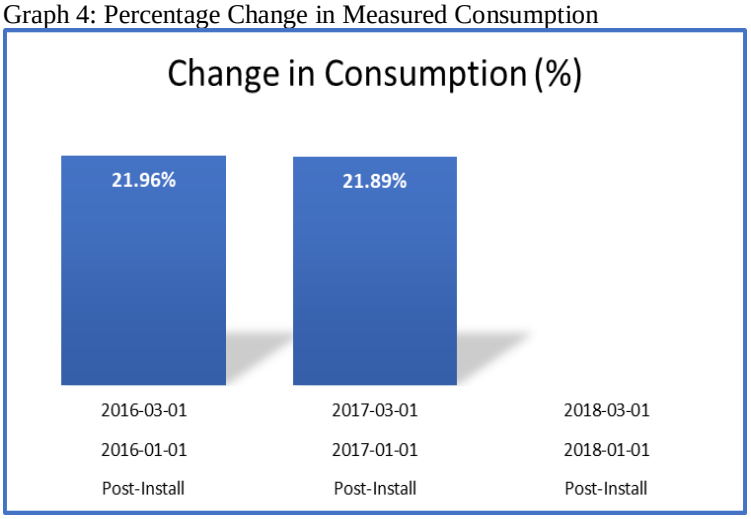
Graph 3: Average Liters/Car Washed



Graph 3 shows the average liters required for each car washed. This is a derived value based on the data in graph-1 and graph-2.

Graph 4: Percentage Change in Measured Consumption



Graph 4 shows the percentage change in consumption between the FMD post-installation period and the comparative periods in 2016 and 2017 with no FMD installed.

ANNEX I

Period	Cars Washed	M3 used	Liters Used	Avg Litres/Car
Jan-16	13,086	5,035	5,035,000	384.76
Feb-16	13,378	5,446	5,446,000	407.09
Mar-16	12,379	5,134	5,134,000	414.73
Totals	**38,843**	**15,615**	**15,615,000**	**402.00**
Period	**Cars Washed**	**M3 used**	**Liters Used**	**Avg Litres/Car**
Jan-17	10,864	4,416	4,416,000	406.48
Feb-17	13,755	5,472	5,472,000	397.82
Mar-17	11,802	4,740	4,740,000	401.63
Totals	**36,421**	**14,628**	**14,628,000**	**401.64**
Period	**Cars Washed**	**M3 used**	**Liters Used**	**Avg Litres/Car**
Jan-18	13,762	3,886	3,886,000	282.37
Feb-18	13,640	4,737	4,737,000	347.29
Mar-18	14,379	4,484	4,484,000	311.84
Totals	**41,781**	**13,107**	**13,107,000**	**313.71**

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