



Leveraging the PI System in Water Loss Control

Presented by **Carl Yates, M.A.Sc., P.Eng.**
General Manager



The Power of Data

CHANGE



OSIsoft Users Conference 2013 Paris, France

September 16, 2013

Leveraging the PI System in Water Loss Control





History of Halifax Water

- **Halifax Water was originally formed as the Public Service Commission of Halifax in 1945.**
- **Municipal Amalgamation in 1996 merged three water utilities to form Halifax Regional Water Commission.**
- **In 2007, Halifax Regional Municipality transferred its wastewater and stormwater assets to HRWC to form Halifax Water.**
- **As a result, Halifax Water is the first regulated water, wastewater and stormwater utility in Canada.**





Water Assets

- 2 large water treatment plants
- 6 community plants (small systems)
- 17 water pumping stations
- 16 water reservoirs
- 1,600 km of water mains
- 70 District Metered Areas (DMAs)
- 8,000 hydrants
- 83,000 water service connections





Wastewater Assets

- 7 large wastewater treatment facilities
- 8 community plants (small systems)
- 175 wastewater pumping stations
- 1,400 km of wastewater sewers
- 75 CSO's



So how do we monitor and control all of this equipment?



OSIsoft.



HW SCADA

- **HW's RF based SCADA system is used to monitor and control all treatment facilities and 365+ remote sites**
- **HW's PI System is the repository for process data from all HW SCADA systems**
 - Single Server: PI 2010
 - 5000 Tag system
 - 10 PI Interfaces (OPC)
 - PI ProcessBook, PI DataLink and PI WebParts
 - Archives going back to 2002





Water Loss Control Challenge

- The PI System has enabled HW to implement key programs to improve efficiency and system operations
- Although there were several, water loss control was the first initiative where the PI System was the centre piece
- Following the 1996 amalgamation, began looking at best practices for all business processes
- Water loss control became lead priority as a result of a new water treatment plant constructed in Dartmouth [a shame to continue to waste expensive water!]





Water Loss Control Challenge

- Began looking internationally for best practices in water loss control
- Found the methodologies promoted by the IWA to be the best practice; included methods and strategies to measure and reduce losses
- After completing the IWA water audit, we found we were not doing as well as we thought.
- A key tactic which supports the IWA methodology is the creation of **District Metered Areas (DMAs)** [leak awareness to minimize runtime]





Water Loss Control Challenge

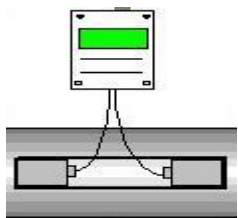
- Fortunately, Halifax was well suited for DMA development
- Developing DMA's required adding instrumentation to existing zones and establishing new zones with system reconfiguration and additional instrumentation



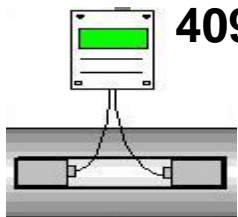


DMA Installations East Region

**East Region Total Pipe
Length 576 KM**

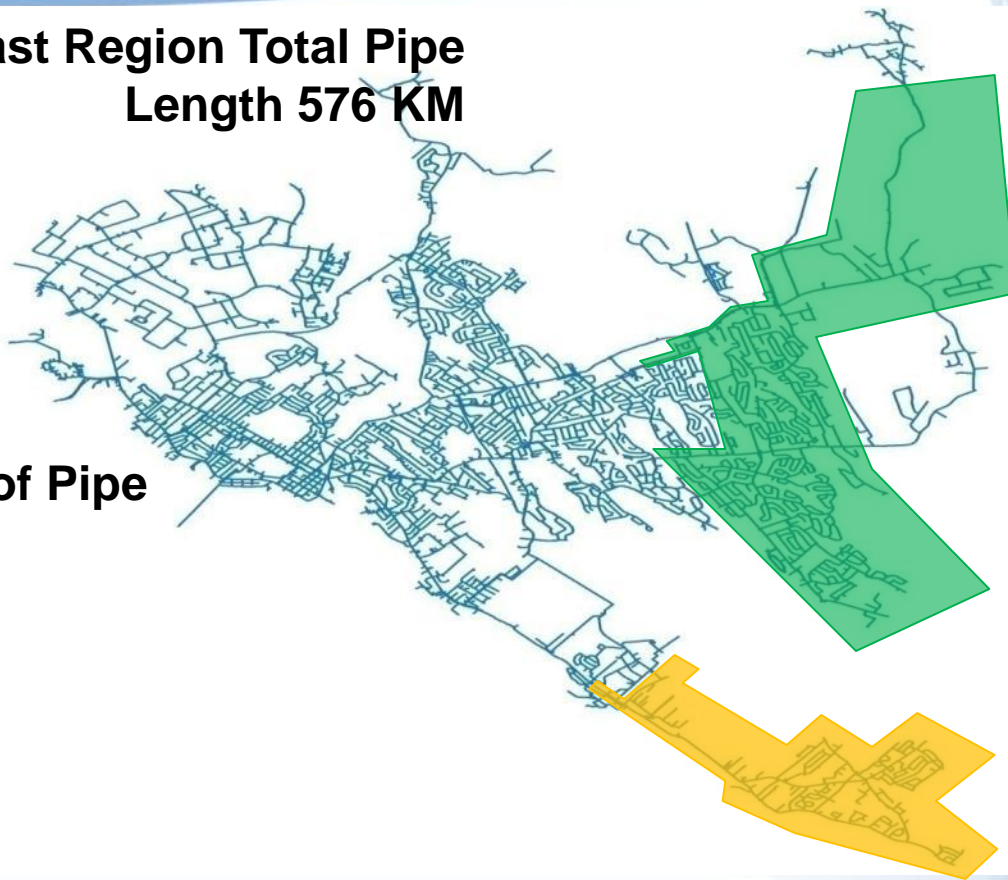


**24" Transit Time
Flow Meter**



409 KM of Pipe

**Transit Time
Flow Meter**

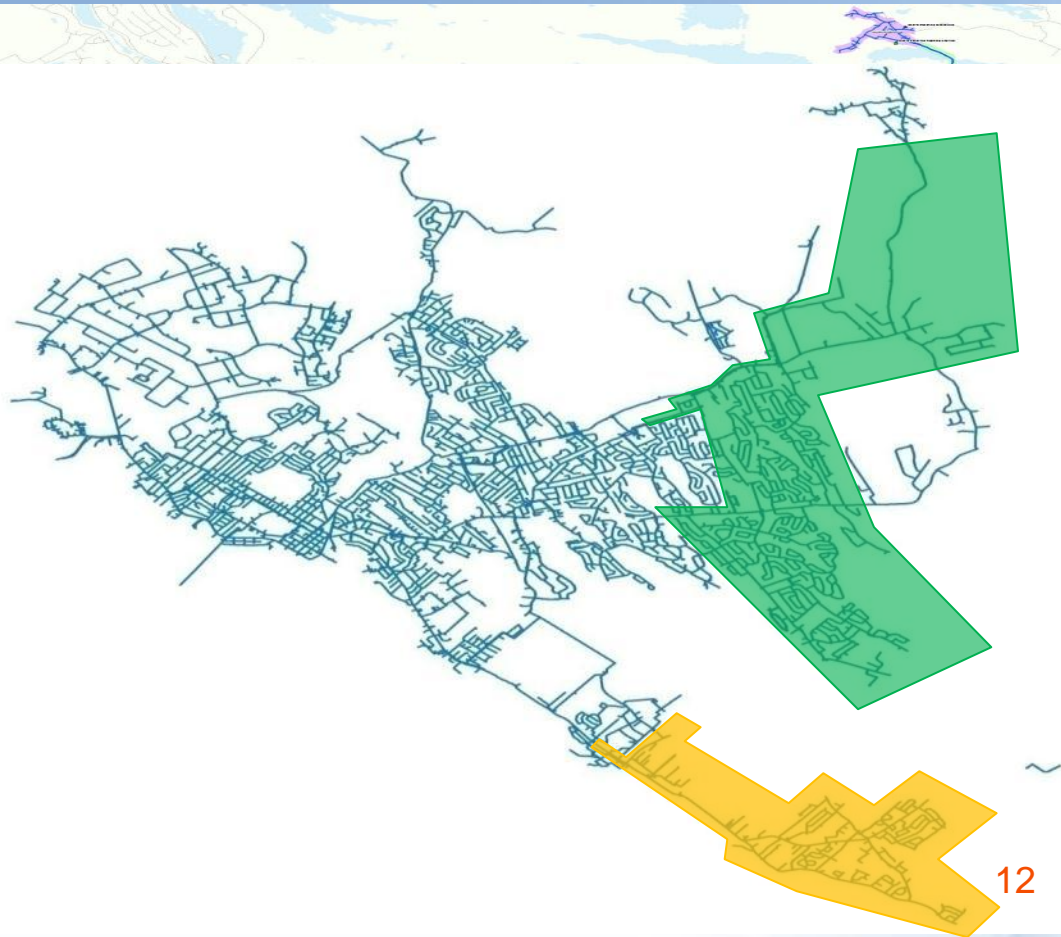


125 KM of Pipe

42 KM Of Pipe



HW DMA Map





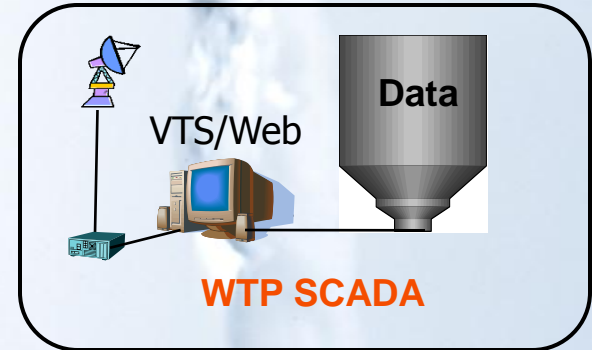
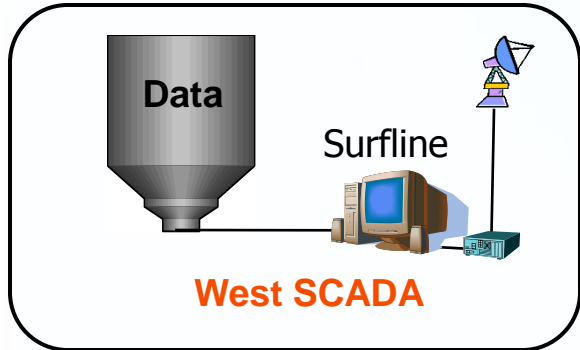
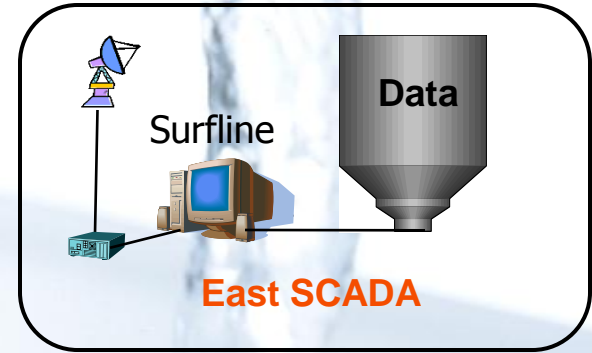
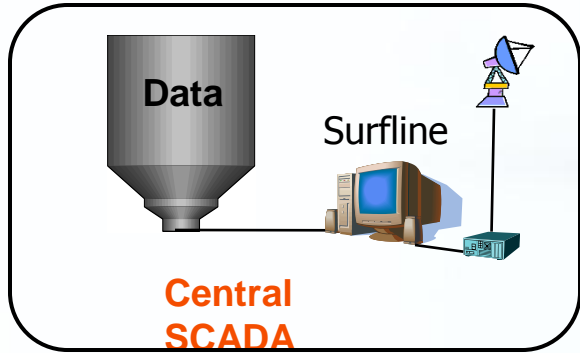
Challenge

- The challenge then was how to manage and get value from all this DMA data considering the former municipalities did not have SCADA systems which could support the program
- This is how the PI System became the centre piece for water loss control



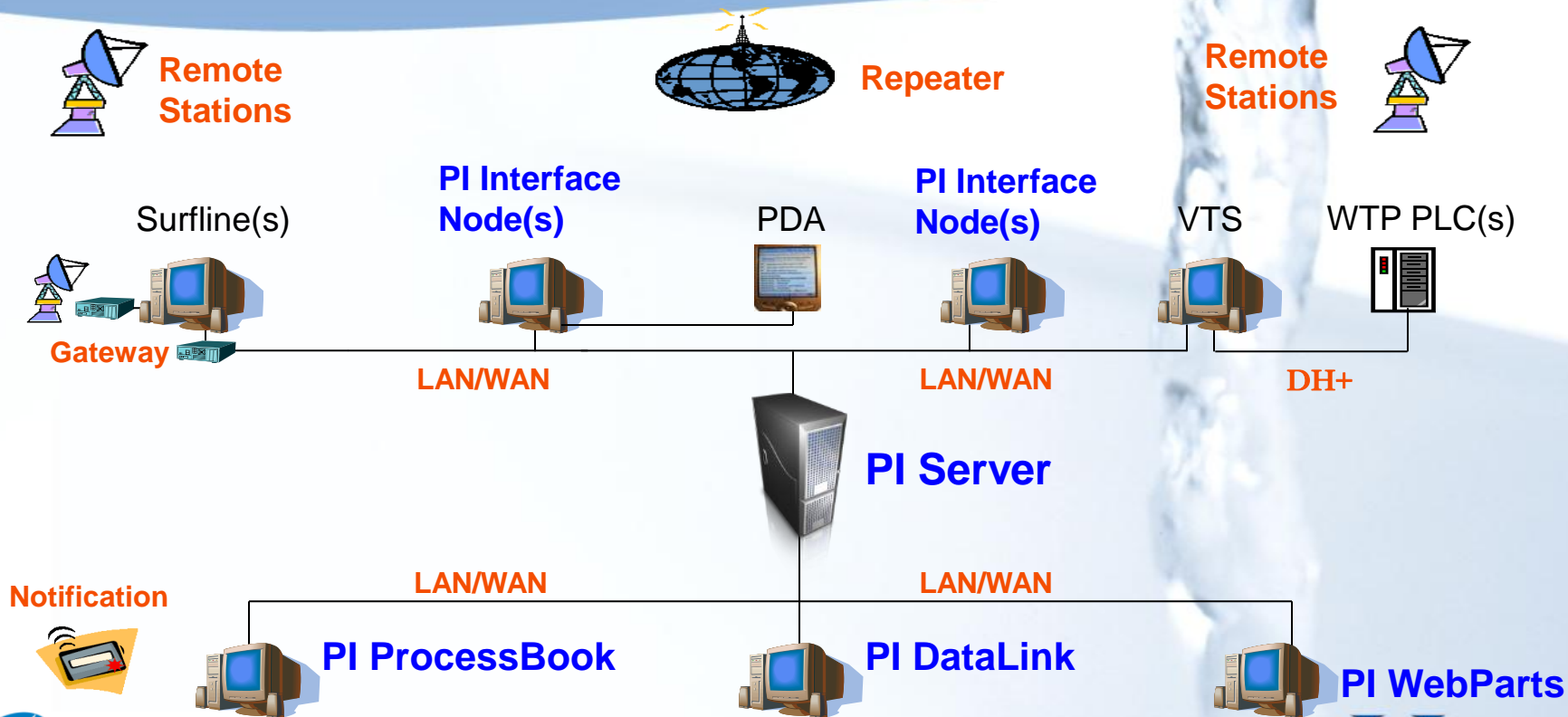


System Overview





Solution – PI Installed





Water Loss Control

- The data was now accessible to those who needed it
- Water loss control was now in the hands of management [a new perspective]
- The first tool developed for management was the automated “White Boards” developed using PI DataLink and posted on our Intranet site





Water Loss Control Support Operations Staff

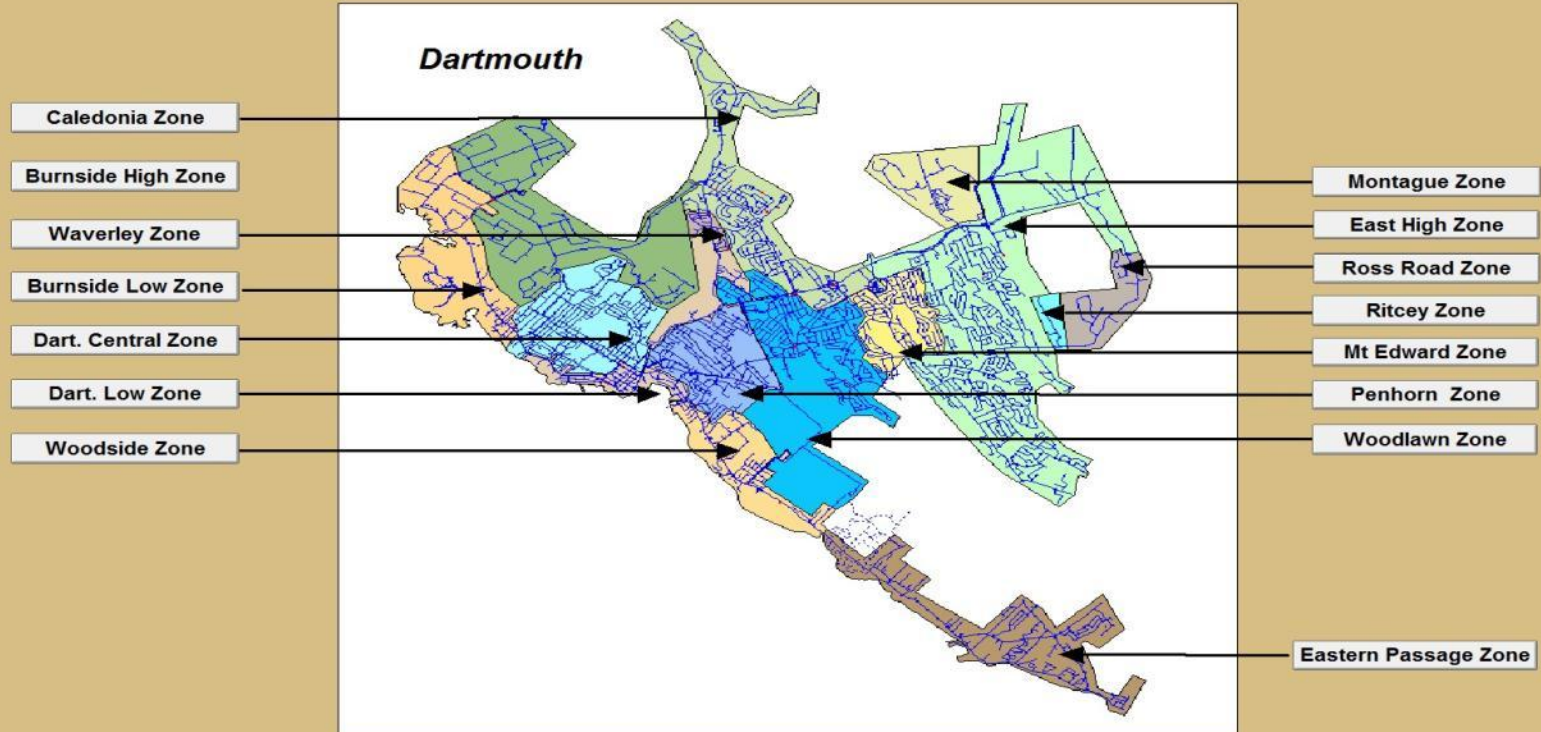
Central Region Zone Night Flows (m3/h)							
District Metered Area	Benchmark	14-Jul	13-Jul	12-Jul	11-Jul	10-Jul	Diff
Bedford Core	7.1	16.2	10.5	19.0	17.9	18.4	+ 9.1

Central Region Zone Night Flows (m3/h)							
District Metered Area	Benchmark	14-Jul	13-Jul	12-Jul	11-Jul	10-Jul	Diff
Bedford Core	7.1	16.2	10.5	19.0	17.9	18.4	+ 9.1
Sackville Green	144.0	166.3	170.6	168.2	156.5	155.6	+ 22.3
Sackville Core	37.0	42.8	42.8	42.3	43.3	46.7	+ 5.8
Blue Mtn	2.7	3.4	3.5	3.5	3.5	3.5	+ 0.7
Giles	0.0	0.0	0.0	0.0	0.0	0.0	+ 0.0
Moncton	1.3	3.0	3.0	4.2	4.1	3.0	+ 2.8

* Information posted automatically to HRWC Intranet



PI ProcessBook DMA Overview





Eastern Passage DMA

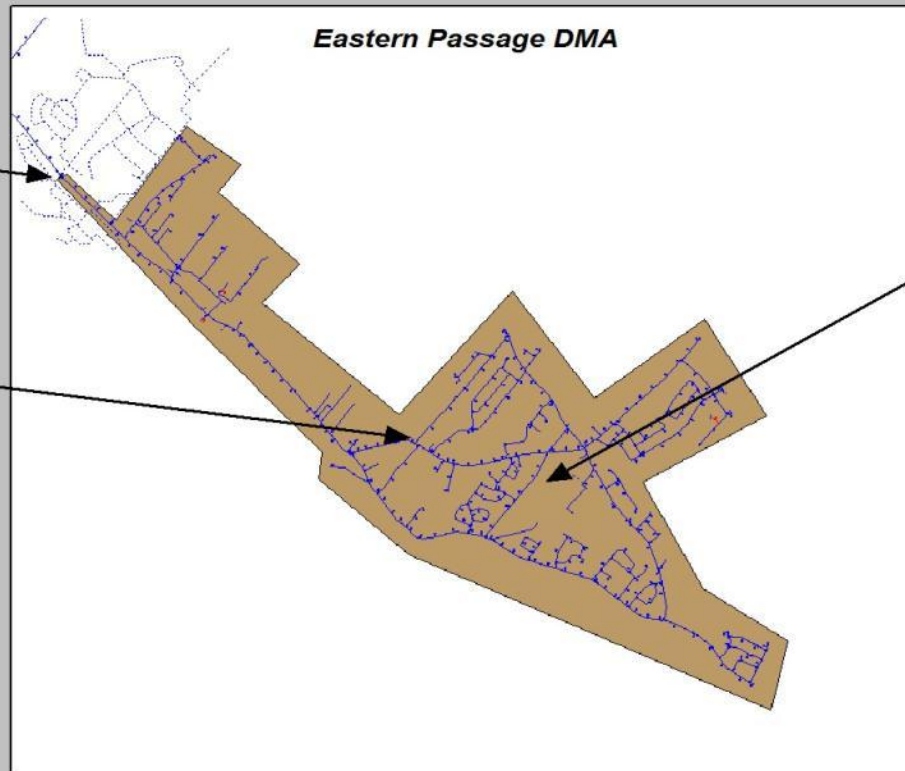
Click Value To Trend

Eastern Passage
Flowmeter

93.00 m³/h

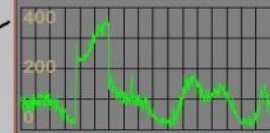
Shearwater - Hines Rd
Flowmeter

2" - 0.00 m³/h
8" - 0.00 m³/h



Eastern Passage
Zone Flow

93.00 m³/h



Calculated Minimum
Night Flow

17 m³/h

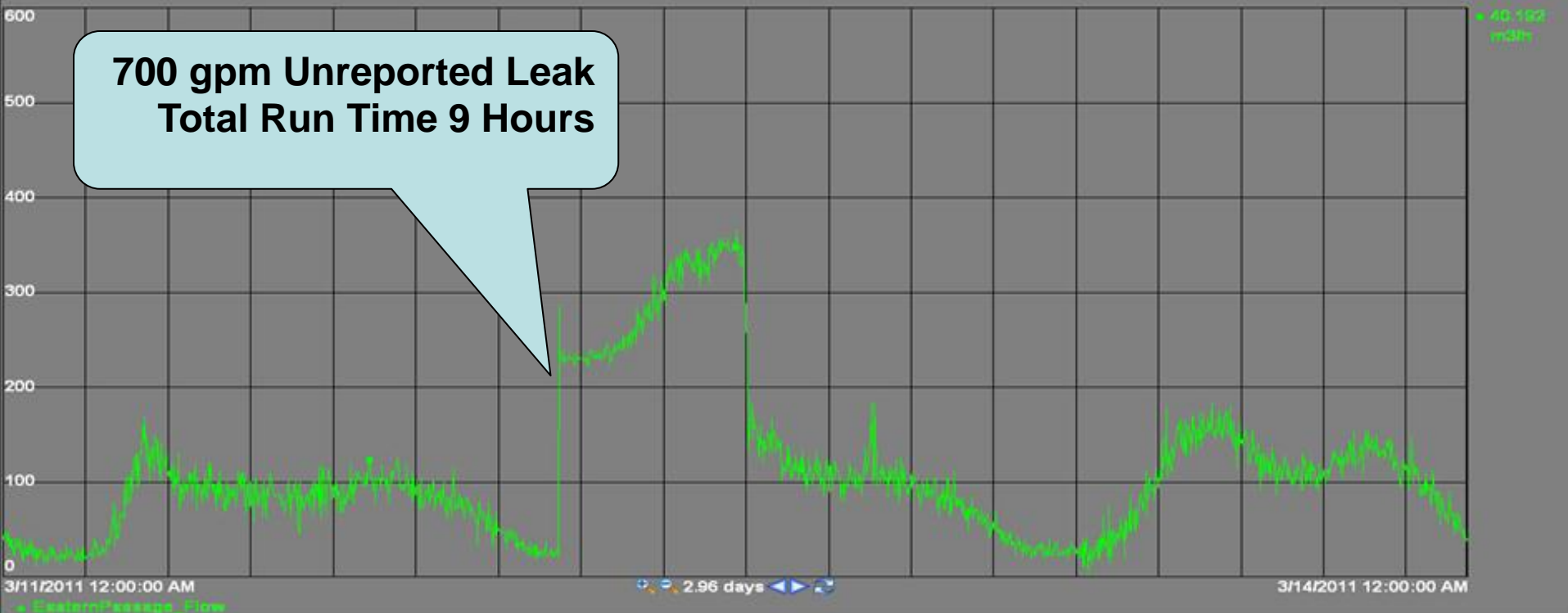
System Attributes

Length of Pipe - 42.6 km
Public Hydrants - 241
Private Hydrants - 8
Service Connections - 2473
Sprinklers - 13
Average Pressure - 61 M
Density - 58 Conn./km



Eastern Passage Water Break

Eastern Passage Flow



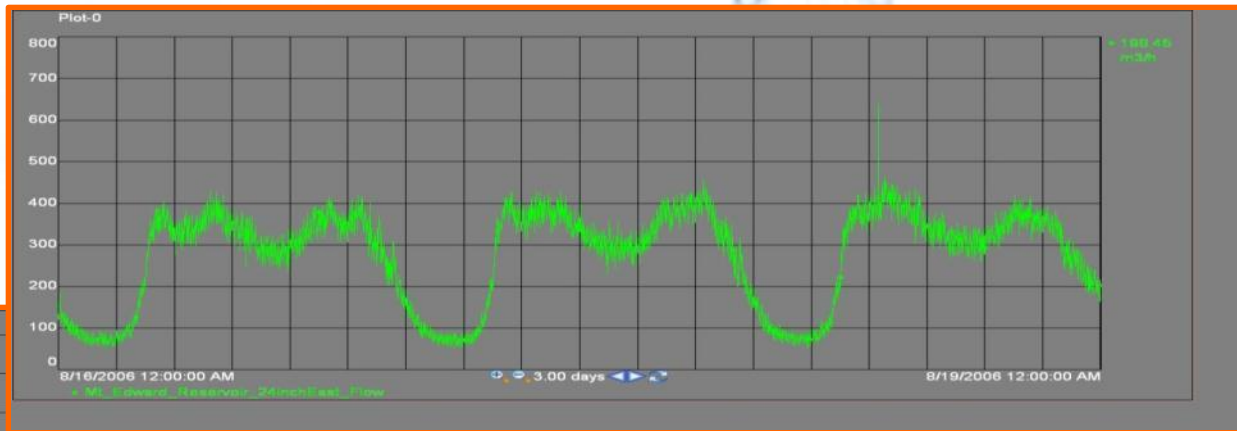
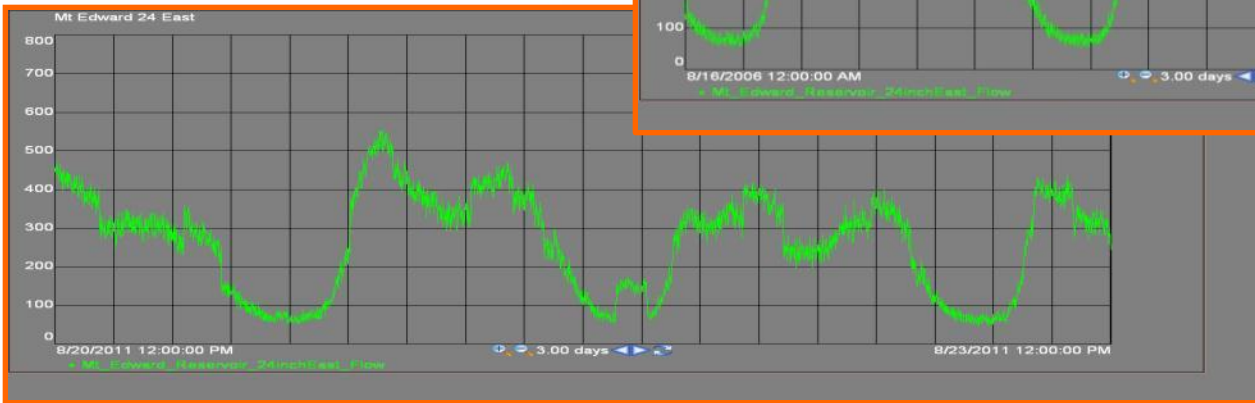
OSIsoft.

Managing leakage with the PI System

- With the PI System, DMA flows over long periods are now available to identify gradual increases in night flows and examine the effectiveness of the leak detection program

Managing leakage with the PI System

**2006 Minimum Night
Flow 70 m³/hr**

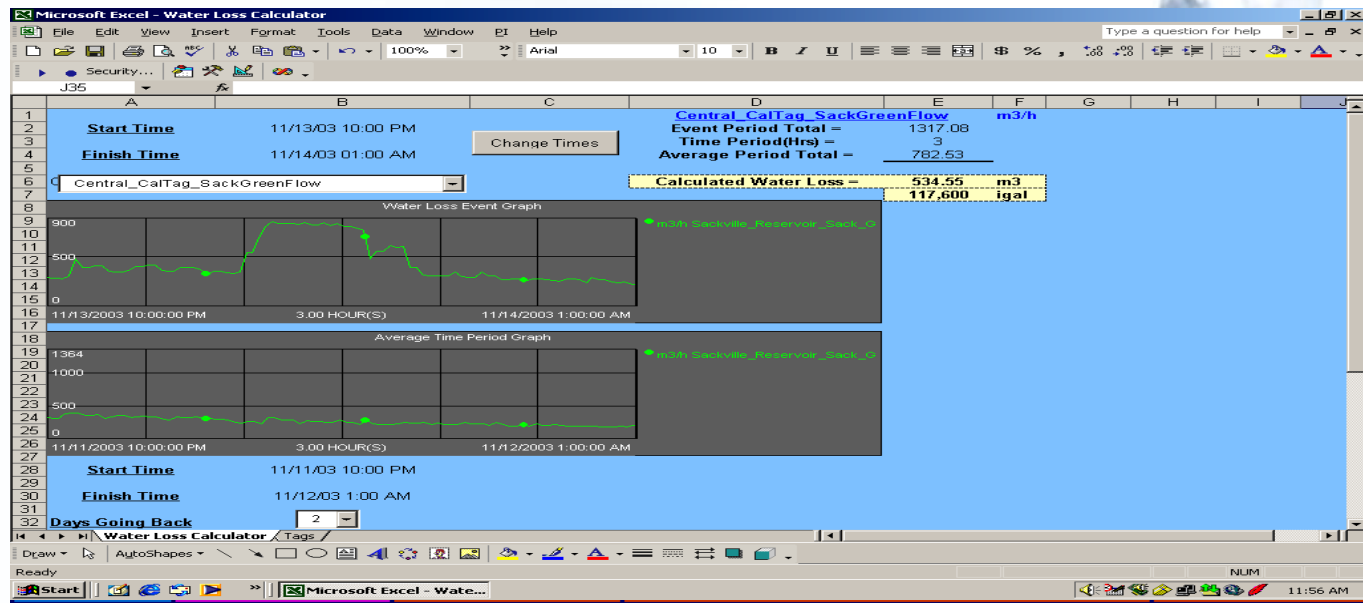


**2011 Minimum Night
Flow 60 m³/hr**



Managing water accountability with the PI System

Accounting for all water usage is also important in managing your water loss control program....



OSIsoft.



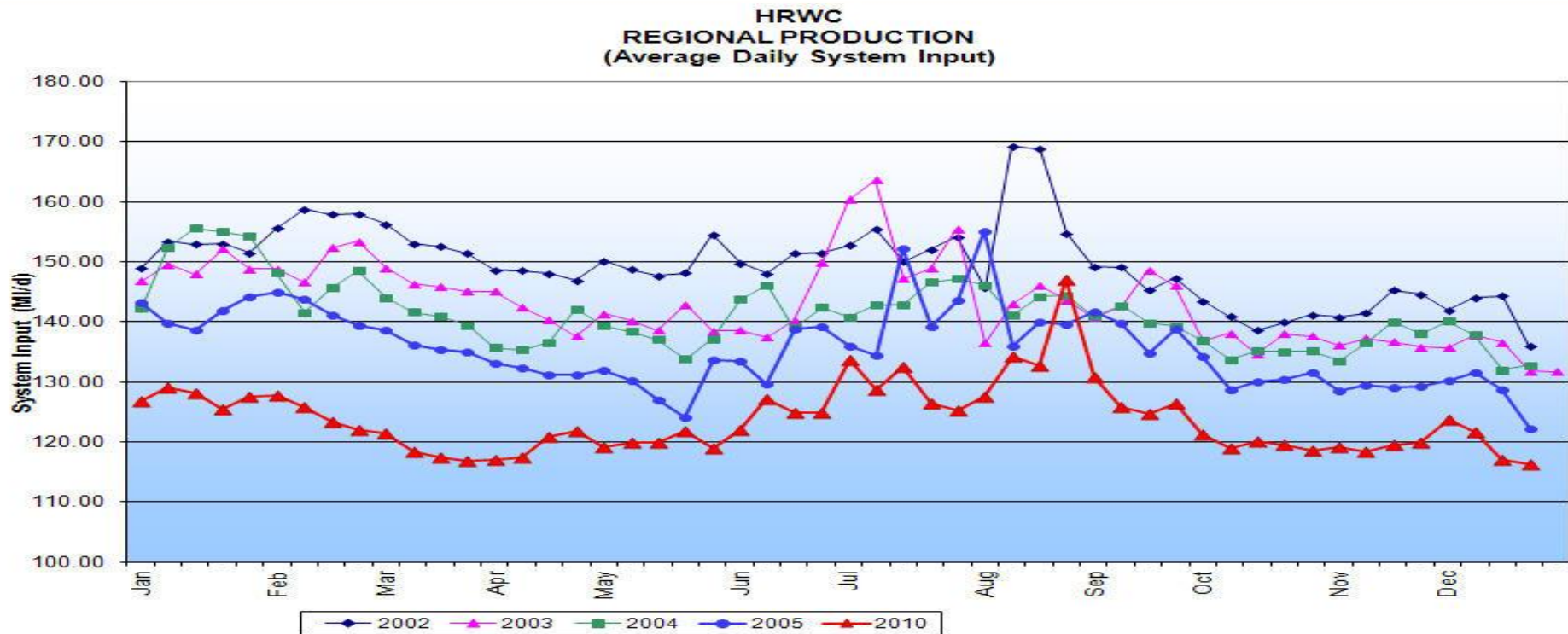
Benefits

So how did we do after installing the PI System and implementing the program? [Central, East, West]





Benefits





Unexpected Benefits.... Customer Partnerships



Port Authority of Halifax
40ips3 fake bomb watered by on
Halifax Port Authority

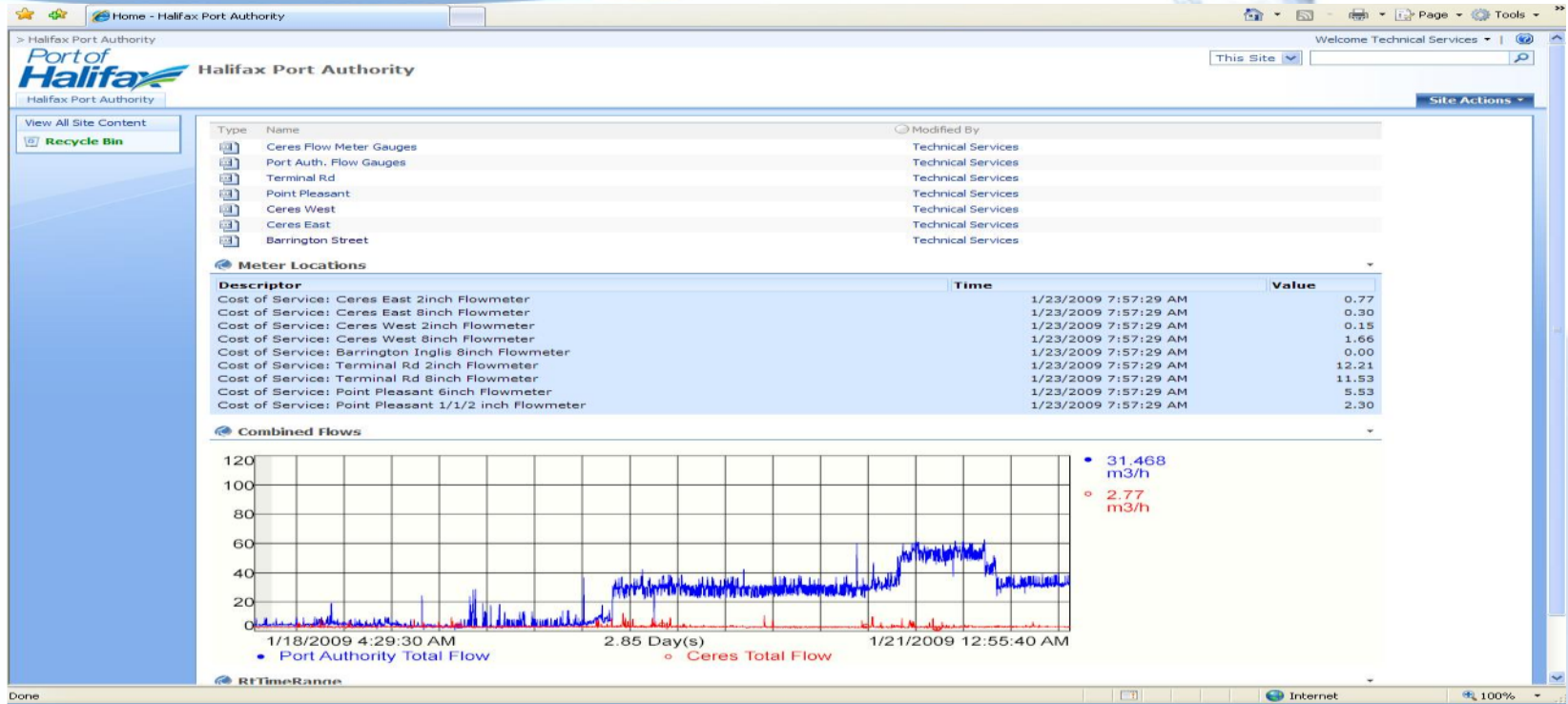
Monitoring for charged for early
detection of leakage



OSIsoft.



Customer Partnership

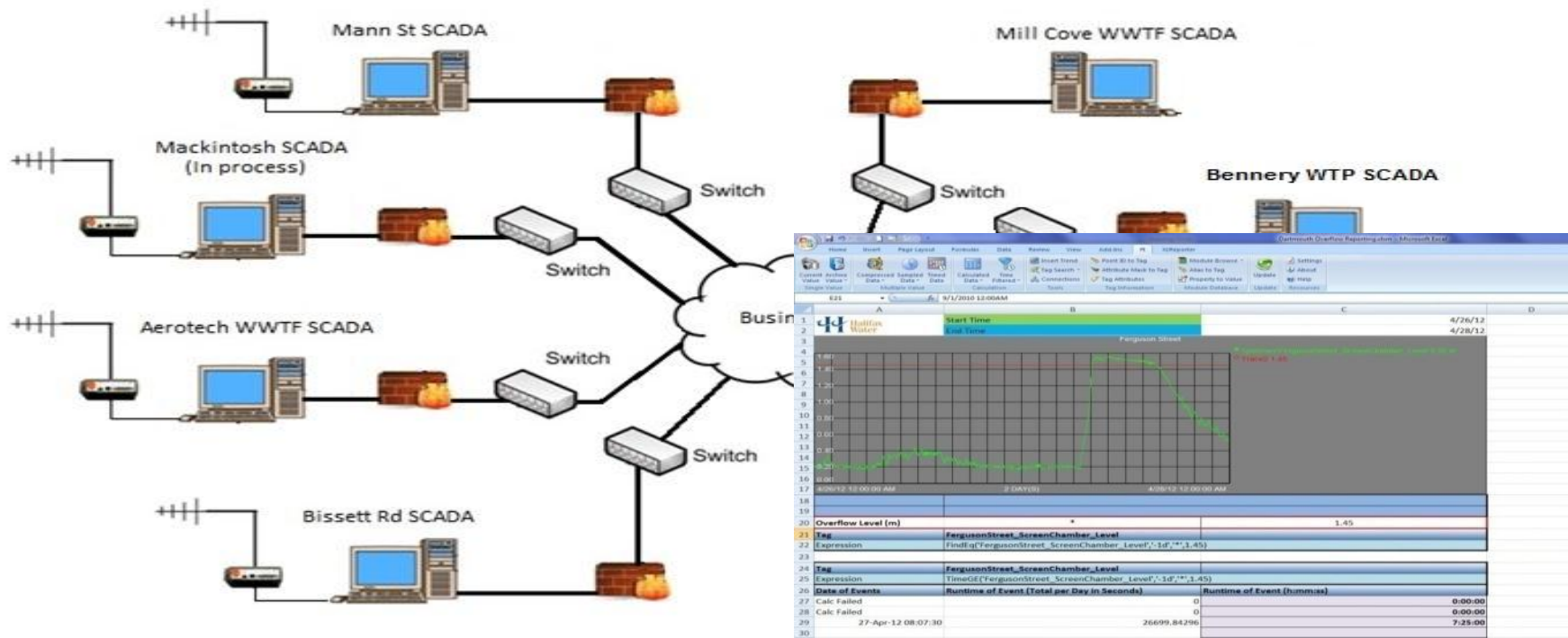


OSIsoft.



Future Steps

PI System wastewater expansion





Key Points to Take Home

- A small PI System can yield big results!
- There is huge value in bringing process data from all sources into a single environment
- The more people with access to data, the more value you will get



**Questions or
Comments?**

Graham MacDonald, Superintendent

grahamm@halifaxwater.ca

(902) 869-4338

Carl Yates

General Manager

Halifax Water

carl.yates@halifaxwater.ca

[902] 490-4840

Please don't forget to.....

Complete the Online Survey
for this session



Eventmobi.com/emeauc13

Share what you saw with
friends on Twitter, Facebook
or LinkedIn!

#UC2013





THANK

YOU

Brought to you by

