Flush based on Chlorine Residuals

Flush based on Temperature

Pressure monitoring via Cellular

Remote Meter Reading via cellular

Monitor Water Main Leaks

Pipeline Condition determines what pipes stay/go
Meshing Intelligent Water Technologies

- Remote Pressure Monitoring System (**Mueller Co.**)
  = real time ability to monitor pressure variations

- Automated Flushing Systems (**Hydro-Guard®**)
  = Program devices or proactive devices react to live conditions to flush water systematically until acceptable quality levels return

- Metering (**Mueller Systems®**)
  = AMI/AMR via advanced networks

- Leak Detection and Condition Assessments (**Echologics®**)
  = Monitor & locate leaks and know what pipes to replace before you dig
Will a water main leak flood the mayor’s house this year?
Why Monitor Pressure in a Water Line?

The Remote Pressure Monitor enables you to...

- Capture **critical system performance data** from points throughout distribution network.

  = **Prevent Damage** to water mains often caused by frequent drastic changes in pressure.
Why Monitor Pressure in a Water Line?

The Remote Pressure Monitor enables you to...

- Receive **data in the time frame they need it** so that system critical decisions can be made.

  = **Prevent Interruption** in service caused by pressure loss or catastrophic failure.
Why Monitor Pressure in a Water Line?

- **Monitor distribution activity** from even the most remote points in the system.

  = **Reduction of Energy Costs** through the utilization of pressure data thus allowing for more efficient pump operation.
Why Monitor Pressure in a Water Line?

- Improve **water quality** and **enhance service** response times.

  = Reduce **Customer Complaints** and boil water advisories related to low water pressure...avert a PR nightmare
Installation Option 1
Direct or Saddle Tap Installation

- The Pressure Monitoring System can be attached to a corporation stop directly inserted into the main or installed in a saddle. Opening the corp stop activates the pressure sensor.
Installation Option 1
Direct or Saddle Tap Installation

- Shoulder bolt
- Ductile Valve Box Upper
- Transducer Cable
- Pressure Sensor
- Composite Lid
- RTU unit
- Mueller Valve Box Lower
- Ball Valve Corp Stop FIP outlet
- Mueller BR2S Bronze Saddle

BREAKTHROUGH TO EXCELLENCE
Installation Option 2
Meter/PRV Vault Installation
Pressure Monitoring System

***Do not pave using the RTU cover

Antenna mounted in H20 rated cap

Transducer and Cable (0-250 psi / 17 bar)

BREAKTHROUGH TO EXCELLENCE
### Pressure Sensor

<table>
<thead>
<tr>
<th>Level</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical High</td>
<td>100.0 psi</td>
</tr>
<tr>
<td>High</td>
<td>90.0 psi</td>
</tr>
<tr>
<td>Normal</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>40.0 psi</td>
</tr>
<tr>
<td>Critical Low</td>
<td>35.0 psi</td>
</tr>
</tbody>
</table>

*WARNING LEVEL CONFIGURATIONS*

**NOTE:** Changing your custom settings is normal

---

**Mueller Co.**

**BREAKTHROUGH TO EXCELLENCE**
PRESSURE MONITORING: the St. John’s experience
Overview

• Applications
• Installation
• Results
• Future Projects
Pressure Monitoring

Where?

Monitor Pressure at Critical Locations

- Pressure Reducing Station
- Water Pumping Station
- High Elevation in Distribution System
- Low Elevation in Distribution System
- Areas of high break history, complaint history, sensitive customers
Pressure Monitoring

Installation

• Located in PRV Chamber
• Modified Existing Pressure Connection
• Connect Sensor and Mount Transmitter
Pressure Monitoring
Pressure Monitoring
Pressure Monitoring
Typical Readings

City of St John's

DEPARTMENT OF PUBLIC WORKS
WATER & WASTEWATER DIVISION
Pressure Monitoring
Examples of Alerts
Pressure Monitoring
Email Alerts

High Warning Condition
This change indicates that two consecutive measurement within limit of High Warning condition were taken.

Device ICCID: 89011704252304474063
Device Description: Craigdarlar Ave (PRV)

Current value: 117.8 psi (+2.8 from limit)

Device limits
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Warning</td>
<td>60.0 psi</td>
</tr>
<tr>
<td>Low Critical</td>
<td>50.0 psi</td>
</tr>
<tr>
<td>High Warning</td>
<td>115.0 psi</td>
</tr>
<tr>
<td>High Critical</td>
<td>125.0 psi</td>
</tr>
</tbody>
</table>

Mueller Intelligent Water Technology
2016-10-10 06:38:19 -0230

Critical Low Condition
This change indicates that two consecutive measurement within limit of Critically Low condition were taken.

Device ICCID: 89011704252304474063
Device Description: Craigdarlar Ave (PRV)

Current value: 40.9 psi (9.1 from limit)

Device limits
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Warning</td>
<td>60.0 psi</td>
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<tr>
<td>Low Critical</td>
<td>50.0 psi</td>
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<tr>
<td>High Warning</td>
<td>115.0 psi</td>
</tr>
<tr>
<td>High Critical</td>
<td>125.0 psi</td>
</tr>
</tbody>
</table>

Mueller Intelligent Water Technology
2016-10-19 17:09:51 -0230
Pressure Monitoring
Email Alerts

**Condition Returned To Normal**
This change indicates that two consecutive measurements within the limit of Normal condition were taken.

Device ICCID: 89011704252305474063
Device Description: Craigellar Ave (PRV)

Current value: 93.0 psi

<table>
<thead>
<tr>
<th>Device limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Warning</td>
</tr>
<tr>
<td>Low Critical</td>
</tr>
<tr>
<td>High Warning</td>
</tr>
<tr>
<td>High Critical</td>
</tr>
</tbody>
</table>

Mueller Intelligent Water Technology
2016-10-10 06:39:06 -0230

**Critical Condition Off**
This change indicates that two consecutive measurement within the limit of Normal condition were taken.

Device ICCID: 89011704252305474063
Device Description: Craigellar Ave (PRV)

Current value: 82.8 psi

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Low Warning</td>
</tr>
<tr>
<td>Low Critical</td>
</tr>
<tr>
<td>High Warning</td>
</tr>
<tr>
<td>High Critical</td>
</tr>
</tbody>
</table>

Mueller Intelligent Water Technology
2016-10-12 10:32:34 -0230
Pressure Monitoring
Text Alerts

Low Warning Condition!
Device: Craigmillar Ave (PRV). Pressure: 53.1 psi (-6.9 from limit)

Condition Returned To Normal!
Device: Craigmillar Ave (PRV). Pressure: 93.0 psi

Critical Condition Off!
Device: Craigmillar Ave (PRV). Pressure: 72.6 psi

Critical Condition Off!
Device: Craigmillar Ave (PRV). Pressure: 122.7 psi (+7.7 from limit)

Condition Returned To Normal!
Device: Craigmillar Ave (PRV). Pressure: 93.0 psi

Critical Low Condition!
Device: Craigmillar Ave (PRV). Pressure: 28.2 psi (-21.8 from limit)

Critical Condition Off!
Device: Craigmillar Ave (PRV). Pressure: 90.6 psi

Critical Low Condition!
Device: Craigmillar Ave (PRV). Pressure: 40.9 psi (-9.1 from limit)

Critical Condition Off!
Device: Craigmillar Ave (PRV). Pressure: 92.2 psi
Pressure Monitoring
Data Analysis

Pressure (psi)
Pressure Monitoring Data Analysis

Flow (m3/h)

1/31/17 12:00
2/1/17 0:00
2/1/17 12:00
2/2/17 0:00
2/2/17 12:00
2/3/17 0:00
2/3/17 12:00
2/4/17 0:00
2/4/17 12:00
2/5/17 0:00
2/5/17 12:00
2/6/17 0:00
2/6/17 12:00
2/7/17 0:00
2/7/17 12:00
2/8/17 0:00
2/8/17 12:00

ST. JOHN’S
DEPARTMENT OF PUBLIC WORKS
WATER & WASTEWATER DIVISION
Pressure Monitoring Data Analysis

Flow (m3/h)  Pressure (psi)
Pressure Monitoring
Data Analysis

- Each time pump starts it causes a low pressure event.
- Each time pump stops it causes a high pressure event.
- Current pump station will be upgraded to install soft start / stop controls.
Pressure Monitoring
Future Projects

- Low pressure complaints – monitor pressure at high point
- Install pressure monitor in PRV station
- Install pressure monitor on water main at high point.

ST. JOHN'S
DEPARTMENT OF PUBLIC WORKS
WATER & WASTEWATER DIVISION
Thank You