Continuing Education for Water Operators

Mariana Islands
Water Operator Association

May 8, 2013
Pacific Islands Club, Saipan

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Today's Agenda

- About Continuing Education
- Current Events
  - Hurricane Sandy Follow-Up
- Main Events: Pipe for Water & Sewer
- Main Events: Sewer videos
- Association Business
  - Election of officer

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Continuing Education for Water Operators

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Is THIS training required?

- NO

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Why have continuing education?

- DEQ Regulations require certified operators to have 10 contact hours of continuing education per year (30 contact hours in 3 years) to maintain certification.
- DEQ is not required to offer training (and no longer offers training – no $$$)
- Where would operators get training?

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Other training options

- Professional training provided by your employer (safety, pump maintenance, lab procedures, etc.)
- College classes
- Conferences or workshops by professional organizations or agencies
- Correspondence courses
- On-line opportunities

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NOT continuing education

- Meetings with DEQ or EPA
- Surveys or inspections by DEQ or EPA
- Reading journal articles or textbooks by yourself
- Googling water operator stuff on the internet

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When should training be offered?

- DEQ surveyed all certified operators
- Results
  - One 3 hour session every 3 months
  - In morning
  - On a Wednesday
- First session September 6, 2006

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2006 – 2008 (DEQ)

- September 6, 2006: Chlorination
- November 8, 2006: Using a Pump Curve
- February 7, 2007: Cross Connection
- May 9, 2007: Regulations - CCR, PNR
- August 8, 2007: Sizing Pressure Tanks
- November 26, 2007: PWS workshop
- February 20, 2008: Fluoridation
- May 2008: Process Controls (Robert Brokate)
- August 2008: Slow Sand Filters
- November 12, 2008: TCR and Control Valves

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2009 MIWOA

- March 25, 2009: Security and Filters
- May 13, 2009: Alt. Energy, CCR, Compliance
- August 5, 2009: Geology of Saipan, GWR
- October 9, 2009: GWR Workshop
- December 2, 2009: Valves, Spills, Walkerton

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2010 MIWOA

- February 3, 2010: Safety, Haz Materials
- May 5, 2010: BEH & DEQ, Cross Connections
- August 11, 2010: Waste Water Collection/Treatment
- November 3, 2010: Response to disease outbreak

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2011 MIWOA

- February 2011: Chemical Injection Pumps (HRWA)
- May 2011: Radiation, Radionuclide Rule
- July 2011: Utility Policies & Procedures; Standard Operating Procedures (HRWA)
- November 2011: Leak detection

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2012 MIWOA

- February 2012: Bottled Water; Reverse Osmosis; Bottle Sanitation
- May 2, 2012: Inspecting Tanks, Water Meters
- August 8, 2012: Wastewater membrane filtration (Lau Lau Golf Hotel)
- November 2012: Metering and measuring flow

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2013 MIWOA

- February: Corrosion Control for Pb & Cu
- May: Pipe for Water & Sewer
- August: wastewater
- November: ??

- Sometime in 2013 – Backflow Assembly Tester Training (by Texas A&M Engineering Extension Service)

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THIS TRAINING IS FOR YOU!

We'll do what we can to make it what YOU want it to be!

Mariana Islands Water Operator Association

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Suggestions for training

- Possible topics for upcoming sessions:
  - Backflow prevention device testing
  - Rainwater
  - Local Water System
  - ~~How Reverse Osmosis Works~~
  - ~~Energy efficiency~~
  - Storm water and erosion control
  - ~~Introduction to waste water treatment~~
  - ~~Field trip~~
  - ~~Cleaning and handling bottles~~
  - ~~Leak detection~~

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Announcements

- Certificates from the last 7 classes are posted on the website (May 2011 – November 2012)
- New website design

www.MarianasOperators.org

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CE Credit

- Make sure to sign-in and pay to get credit for class
- Certificates made from sign in list (and receipt book).
- Name – as it appears on sign-in sheet
- Note e-mail address change on sign-in sheet

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Current Events

May 2013 OpFlow Magazine

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With proper preparations, swift response, steady leadership, and a ready support team, the Rockaway (N.Y.) Wastewater Treatment Plant weathered Hurricane Sandy to restore critical services in a timely manner. Others can learn from the experience to protect their utilities.

BY DOUGLAS REED, ROGER STEPHENSON, AND STEVEN HYLAND

RECOVERING FROM HURRICANE SANDY

COORDINATION, PLANNING BOLSTER STORM RESPONSE

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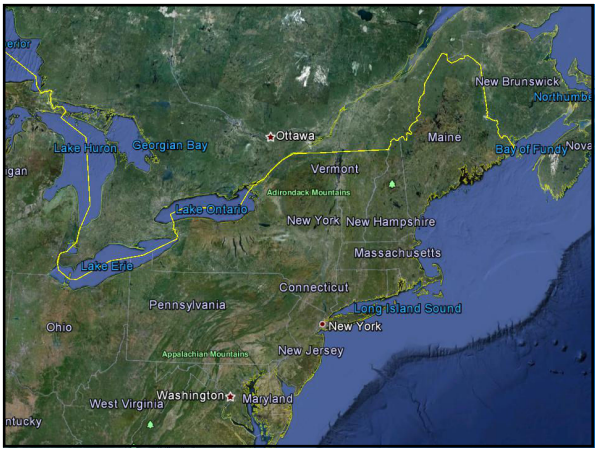

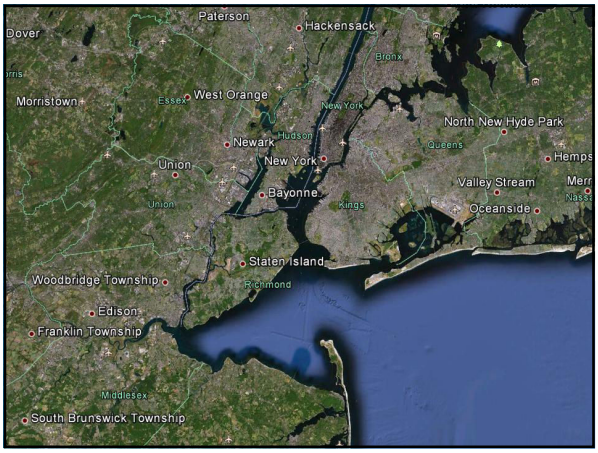

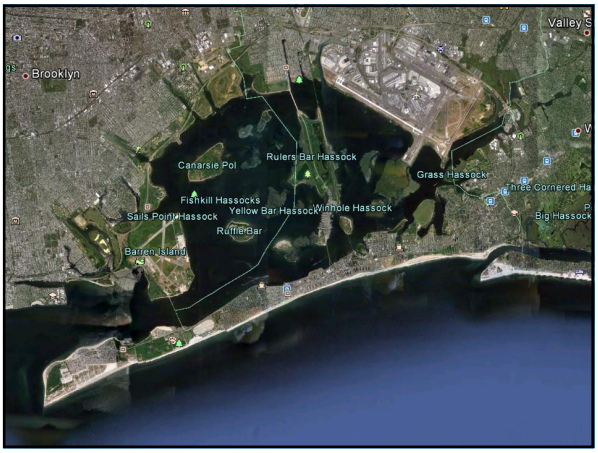

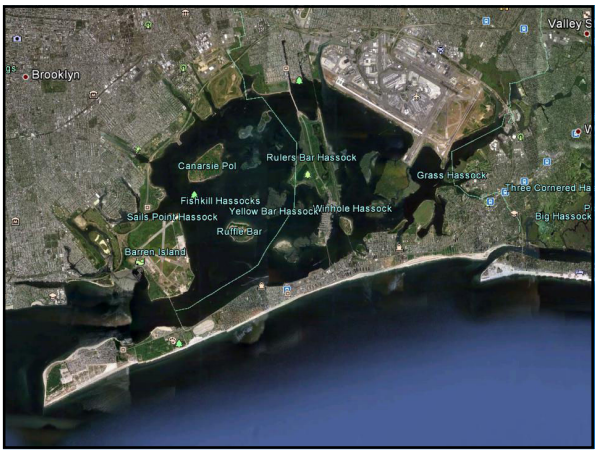

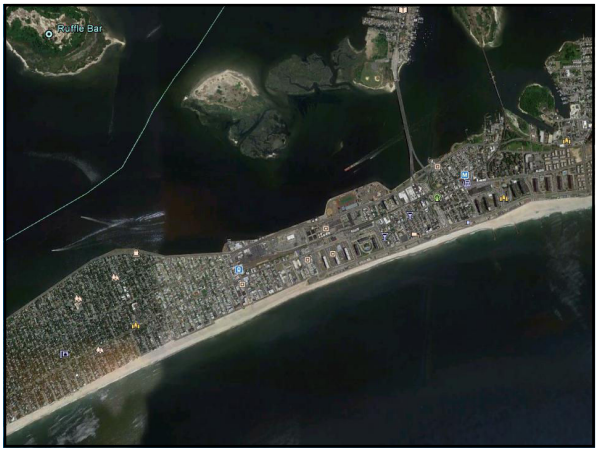

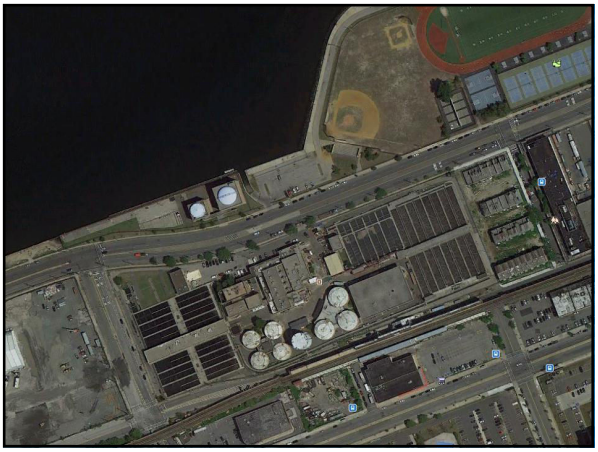

Rockaway WWTP

- Serves more than 100,000 residential and business customers
- Designed to produce disinfected secondary effluent

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Flooding from Jamaica Bay

- High tide & storm surge poured into plant's below-grade components
- Complete shutdown of the 45 MGD plant

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NYC – DEP responds

- Department of Environmental Protection
  - Employees, on-site engineering, construction management consultants, and construction contractor personnel
- Treating 99% of WW w/in 5 days
- 100% of WW w/in 2 weeks.

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Damage

- Flooded areas below 11-12 ft MSL (2-3 ft above existing grade), including:
  - Influent screening
  - Main sewage pump station
  - Primary sludge-pumping equipment
  - Waste-activated & return activated pumps
  - Sludge transfer pumps
  - Heating systems
  - Employee locker rooms, spare parts, records

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Above Flood Level

- Standby generators
- Utility transformers
- Distribution switchgear
- Motor control centers
- Aeration blowers
- Operations & control
- 2nd story mech/chem storage
- Feed equipment

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Response

- Needed external sourcing of materials + temp on site base for employees
- DEP established Incident Command Center (ICC)
  - Mobilized the team of engineers/construction managers/contractors.
  - Assessing, prioritizing, & initialing repairs

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Returning to Operations

- 1st priority: health and safety of workers on site
  - Air monitoring
  - Dewatering
  - Cleaning
  - Disinfecting
  - Power restoration
- Temporary lights installed to allow repairs to below grade infrastructure

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Achieving Primary Treatment

- Temporary raw sewage pumps installed to dewater headworks
- Restoring screening
- Raw sewage pumping
- Disinfection
- Primary sedimentation basins

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Secondary Treatment

- Restoring and recovering aeration basins
- Secondary sedimentation basins
- Ancillary treatment components

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Lessons Learned

- Assess all treatment-related systems that may be subject to flooding to determine the potential effect on operations if these systems were rendered inoperative
- Analyze the effect of failure of non-treatment related systems

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Lessons learned cont…

- Evaluate the availability of external resources (repair services, temporary equipment, power, fuel)
- Consider how the facility could be run manaually – determine procedure and necessary staff

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Lessons learned cont….

- Following a catastrophic event, conduct a post recovery assessment of the sequence of events that led to the problem to determine what could have been prevented.

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Lessons Learned cont…

- Consider civil of structural improvements (seawalls?)
- Civil/structureal too expensive – consider other options (relocating some systems above flood grade)

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WARN - AAR

- Water/Wastewater Agency Response Network – issued After-Action Report
  - Intrastate/Interstate mutual aid was successful
  - Giving priority to water/wastewater infrastructure needs improvement
  - “Loss of power was the single greatest factor affecting water sector operations”
  - Site access for utility workers not always recognized by law enforcement
  - Back-up communications systems needed

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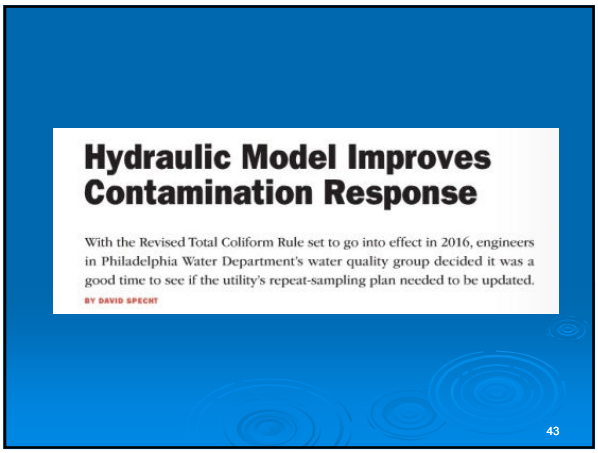

Philadelphia Water Department

- Distribution system
  - 225 MGD
  - 13 pressure districts
  - 3,100 miles of water mains
  - 87 grab sampling stations
  - 480 samples collected per month
  - 74 TCR monitoring locations

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TCR Monitoring

- 2003 through 2012
  - Average 5,800 samples tested
  - Average of 14 + for coliforms (0.24 %)
  - +'s came from different locations
  - Repeat sampling plan used about 14 times per year in response to + results

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Repeat monitoring

- If there is a + coliform -> repeat w/in 24 hours of initial lab notification
  - 1 from same location
  - 1 from w/in 5 connections upstream
  - 1 from w/in 5 connections downstream
- Continue to sample until all repeats are (-)

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Current Repeat Plan

- Current plan developed in early 1990s
  - Looked at maps
  - Guessed water flow direction around each sampling site
  - Went door-to-door to establish contacts in buildings (upstream/downstream)
  - Submitted plan to state agency
  - Same plan still in use

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Hydraulic Model/GIS

- Revised TCR – decided to update plan
- Wanted for confirm upstream/downstream locations
  - Had hydraulic model used to identify valves to close for leak detection investigations
  - GIS layer for buildings around grab sample locations
  - Site visits to confirm locations of service lines for buildings

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Hydraulic Model

- Used average weekday operating conditions to identify flow directions in the mains around each TCR sample site.
- "Visualization tools" – drew in flow arrows
- Categorized sites flow reversal?
  - Unidirectional
  - Flow reversal at night
  - Flow reversal during the day

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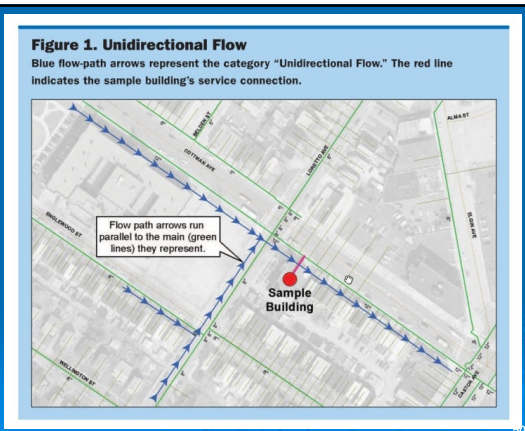

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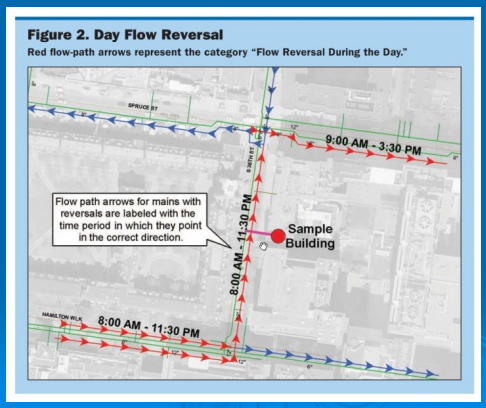

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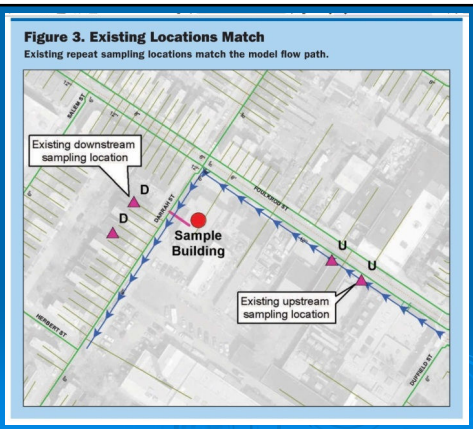

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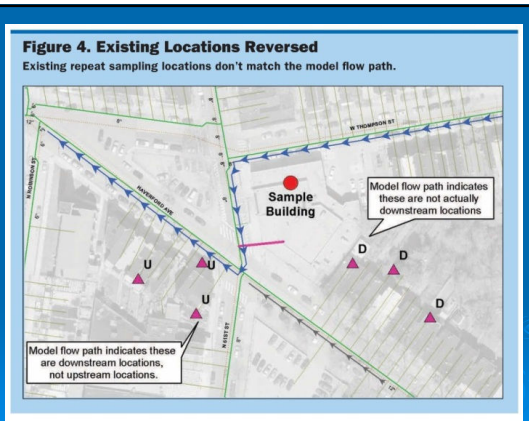

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New Plan

- Half of the existing upstream/downstream locations were not on the flowpath (as determined by the hydraulic model) though they were previously believed to be.
- The new repeat sampling plan will focus on identifying groups of buildings suitable for repeat sampling.

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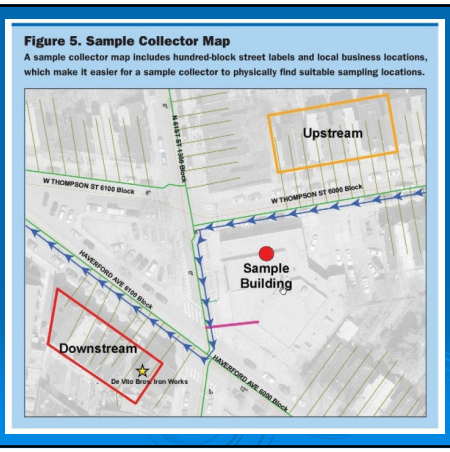

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Best Practices Guide Valve Selection for Pressure Zone Management

Consider these guidelines when choosing valves to optimize pressure zone functionality and performance. BY BRAD CLARKE

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Pressure Zones

- Control of pressure zones:
- Automatic control valves (ACVs)
  - Pressure-reducing valves (PRVs)
  - Pressure-sustaining valves (PSVs)
- AWWA offers 10 considerations for proper valve selection

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1. Correct PRV Sizing

- Common mistake – matching a valve to a pipe size.
- Oversized valves only open slightly at maximum flow – causes unstable pressures

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2. High & Low Flow Capabilities

- Understand the recommended flow range for any valve
- Max ranges often shown – minimum ranges sometimes not shown
- May need a smaller PRV on a bypass for low flow conditions

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3. Added Features

- Ability to add electronic position indicators in future
- Threaded body taps on both sides so the pilot system could be installed on either side.
- Pressure gauges installed two pipe diameters away for best measurement

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4. Top Serviceable

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5. Materials

- 316 stainless steel seat is twice as strong as 304 stainless (no brass or bronze)
- 18/9 stainless steel fasteners (not plated)
- Heat-fusion epoxy coating inside & outside
- Ductile iron body (not cast)

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6. Maintenance

- Well designed chamber or vault with enough maintenance room
- Lifting eyes on ceiling
- Hatches big enough

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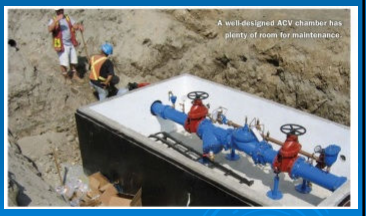
7. Air

- Correctly sized air-release valve upstream
- Combination air vacuum valve downstream



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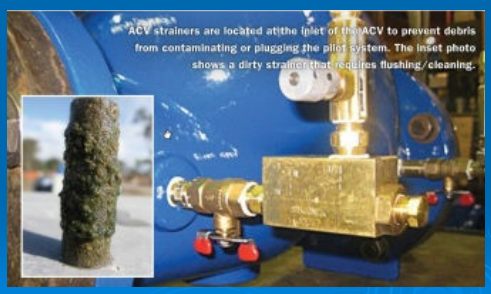
8. Pilot System Strainer



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9. Upstream Line Strainer

- Strainer upstream of valve to collect debris
- Common to find wood, rocks, boots, or animals in a valve
- Strainer should have a blow-down port to flush smaller debris without disassembling the entire strainer

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10. Isolation valves & bypass

- Isolation valves important upstream and downstream (ACV can't be serviced unless whole line is drained)
- Bypass – if using smaller bypass, service large valve in off-peak hours

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End Current Events

Opflow

PRACTICAL IDEAS FOR WATER OPERATORS

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Break - 10 minutes

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Main Event

Pipe for Water & Sewer

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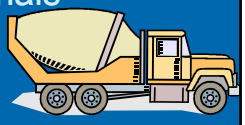
Pipe Materials

- Plastic
- Metal
- Wood
- Mineral



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Plastic Pipe

- PVC
- HDPE
- ABS

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