

Not Your Typical Tank Painting Project Operating Tankless

**Presented by: Stephen C. Olson, P.E.
NEWWA Spring Conference and Exhibition 2019**



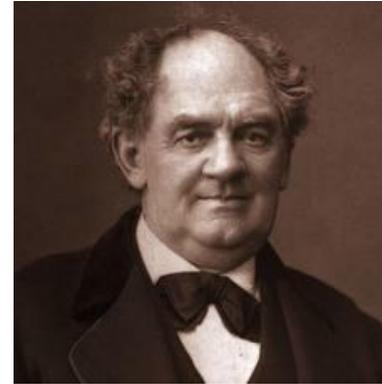
Presentation Overview

1. Background
 - a. Aquarion
 - b. Project Need
2. Planning and Preparations
 - a. Communication and Action Plan
 - b. Existing and New Facilities
3. Implementation and Operation
 - a. Inspections and Testing
 - b. Operations
4. Tank Rehabilitation



Aquarion Water Company

- Private Water Company Founded by PT Barnum in 1857, Bridgeport, CT.
- More than 300 employees with diverse experience in a range of fields including drinking water, environmental, engineering, sustainability.
- Largest water company in New England provides water to >700,000 people, managing and operating all aspects of water supply, treatment, distribution, and service.
- 3 Water Systems in Massachusetts
 - ❑ Hingham/Hull/Cohasset (H/H/C)
 - ❑ Millbury
 - ❑ Oxford

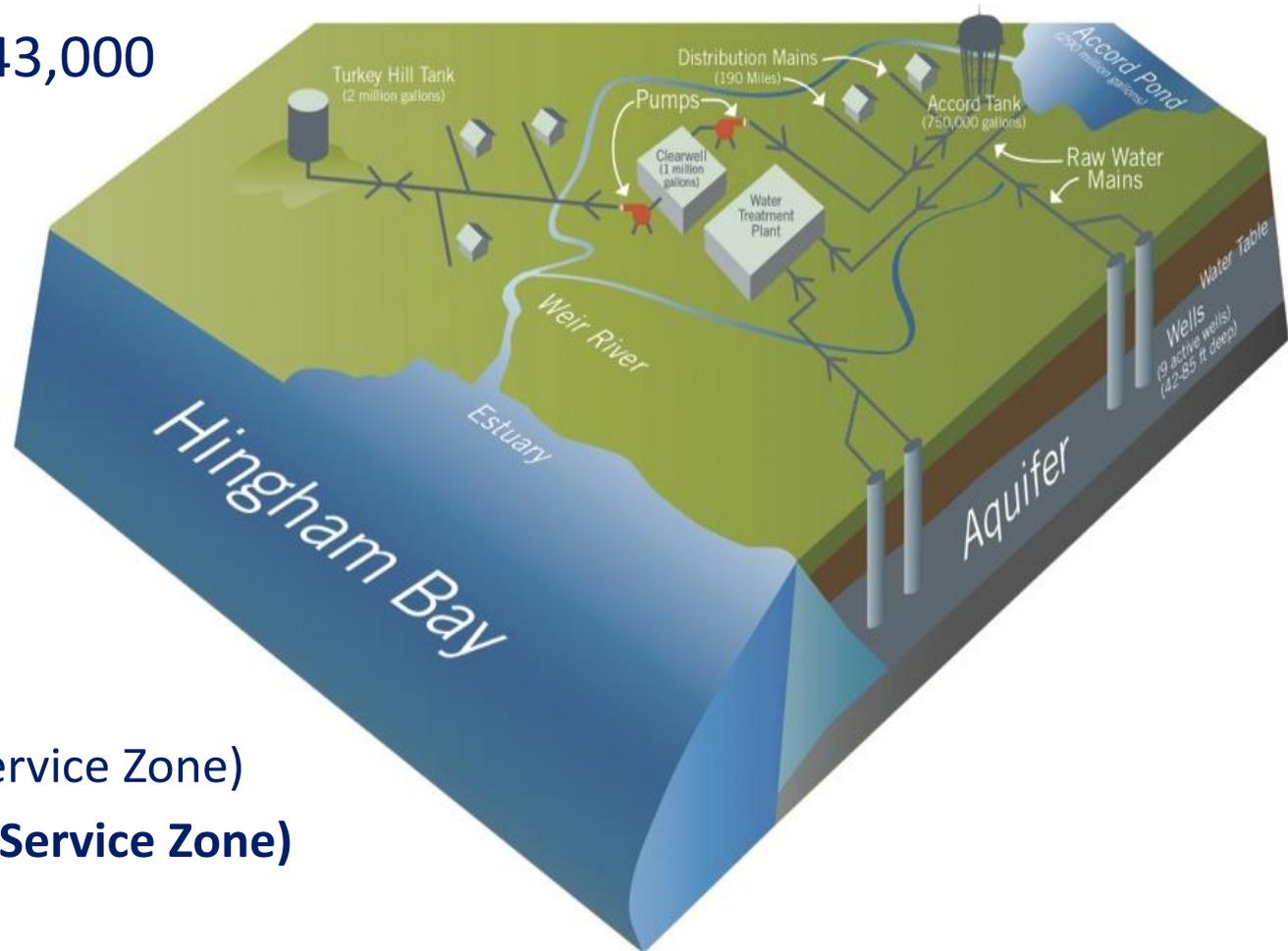


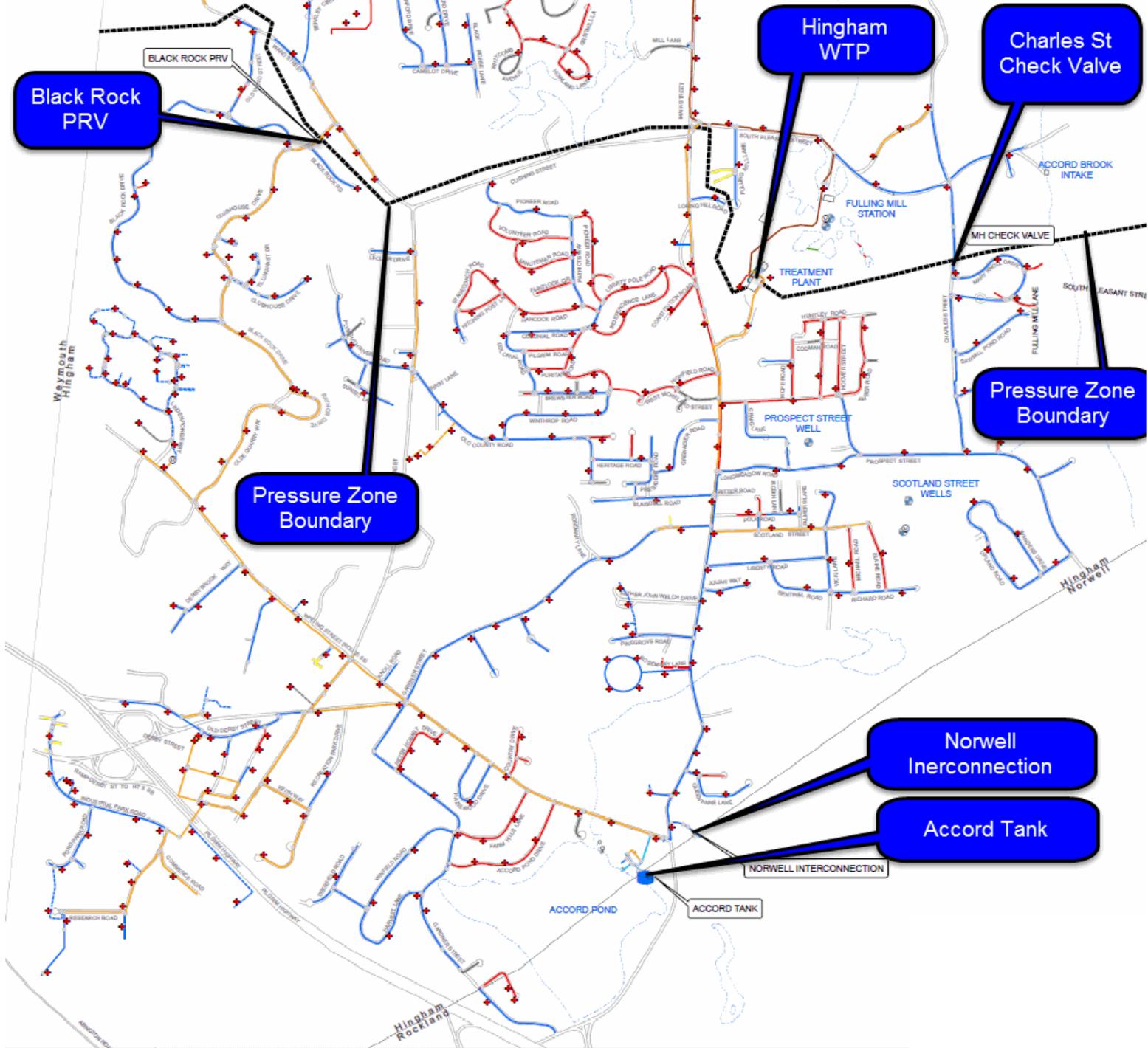
PT Barnum



Aquarion Water System – H/H/C

- 3 Communities: Hingham, Hull, N. Cohasset
- Population Served: 43,000
- Services: 13,200
- 12 Wells (11 Active)
- Surface Water
- 1 WTP
- 192 Miles of Pipes
- 2 Pressure Zones
- 2 Two Storage Tanks
 - ❑ Turkey Hill (Main Service Zone)
 - ❑ Accord Pond (High Service Zone)





Project Need

Accord Tank

- High Service Zone
- Built 1967
- 0.75 MG
- Last Painted 1996
- 2nd Tank on this Site



the perforated metal vent screen is in poor condition with medium rusting, and with heavy rust on the retention bolts.



Shows heavy rusting present along bottom of bowl.

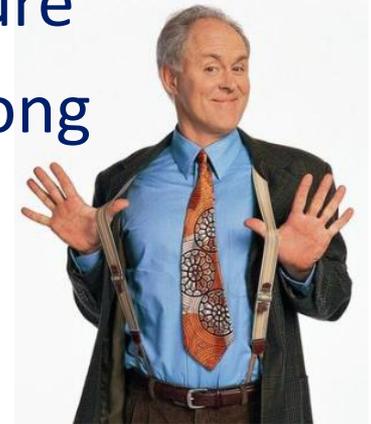


Shows riser manhole in very poor condition with heavy rusting.

Can We Operate the High Service Zone Tankless?

Answer: Yes, but with the Following -

- 💧 Comprehensive Communication & Action Plan
- 💧 VFDs for High Service Pumps
- 💧 Pressure Transmitter for High Service Zone
- 💧 SCADA Programming to Run on Pressure
- 💧 Pressure Relief Valves in case of High Pressure
- 💧 Belt and Suspenders if Something Goes Wrong
 - 💧 Ability to Pump if Power Failure
 - 💧 Ability to Pump if High Service Pump Failure
 - 💧 Ability to Supply Water if all Pumps Fail



Implementation – Let's Do It!

- Communication and Action Plan (Written Document)
 - Meetings – Critical customers, Fire Department, DPW, Neighboring water systems, Aquarion Staff
 - Get the Word Out – newspaper, mailer, website, Facebook, monthly newsletter, Code Red
 - Emergency Response – notifications, pumps, interconnection
- Design/Construction of VFDs (summer/fall 2017)
- SCADA Programming – Pressure (fall/winter 17/18)
- Evaluate Existing Infrastructure (fall/winter 17/18)
- Full Scale Testing (winter 2018)



A hand-drawn diagram of an action plan table. The title 'ACTION PLAN' is written in blue at the top. Below it are four columns labeled 'WHO', 'WHAT', 'WHEN', and 'HOW' in red. The table is drawn with green lines and has two red dots at the top corners, suggesting it's a sticky note or a page from a binder.

WHO	WHAT	WHEN	HOW

Communication and Action Plan Excerpts

2.0 Dates and Times for Scheduled Work

SCADA Test:	February 15, 2018 (tank on-line)
Set Hydrant PR Valves:	March 5, 2018
Deploy Hydrant PR Valves:	March 7, 2018
Full System Test:	March 8, 2018 (tank off-line)
Accord Tank Off-Line:	March 26, 2018 (valve 3018)
Operate in Pressure Mode:	March 26, 2018 – May 25, 2018
Accord Tank Back On-Line:	May 25, 2018
Return to Normal Operations:	May 25, 2018

3.0 Customer Impacts

Under normal operations, there should be no reduction in pressure or flow. However, under an emergency situation, all customers may be affected by a reduction in either water pressure or flow. Several customers in the High Service Zone have been identified as critical customers:

1. Linden Ponds
2. S.S. Bone Center
3. Derby Street Shops
4. Queen Ann Nursing
5. S.S. Orthodontics
6. Schools (NDA, Middle School, South Elementary)

Communication and Action Plan Excerpts

4.0 Personnel Actively Involved in Project

<u>Name</u>	<u>Project Role</u>	<u>Mobile Phone No:</u>	<u>E-mail Address</u>
Stephen Olson	Technical Director	(781)-588	olson@norwellwater.com
Dan Lawrence	Technical Advisor	(203) 223	dlawrence@norwellwater.com
Ben Levesque	Technical Advisor	(774) 331	blevesque@norwellwater.com
Lisa Goyer	Technical Advisor	(617) 794	lgoyer@norwellwater.com
Ronit Goldstein	Communications Mgr	(781) 635	rgoldstein@norwellwater.com
Dave Beck	General Foreman	(774) 222	dbeck@norwellwater.com
Darren Dearth	Sr. Chief Operator	(781) 789	ddearth@norwellwater.com
John Walsh	Operations	(781)-413	jwalsh@norwellwater.com
Donna Parlatore	Operations	(203) 496	dparlatore@norwellwater.com
Don Smith	Hydratech	(508) 326	dsmith@norwellwater.com
Helder Barroso	Aqualine	(774) 644	hbarroso@norwellwater.com
Paul Gratta	HUB Construction	(617) 719	pgratta@norwellwater.com
Chris Cederholm	Annese Electric	(781) 858	ccederholm@norwellwater.com
Ross Loeb	NIC	(860) 384	rloeb@norwellwater.com
Steve Gatanti	Norwell Water	(781) 983	sgatanti@norwellwater.com
Eric Laframboise	Norwell Water	(781) 561	elaframboise@norwellwater.com

Refer to Appendix A - Communications Plan for Customer Contact Information.

Communication and Action Plan Excerpts

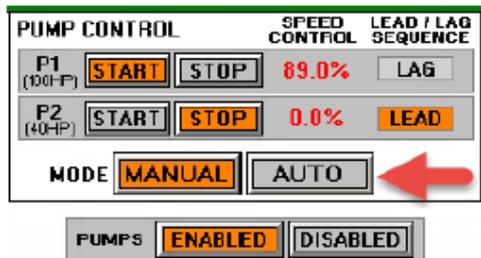
5.0 System Operations – Pressure Control

a) Infrastructure:

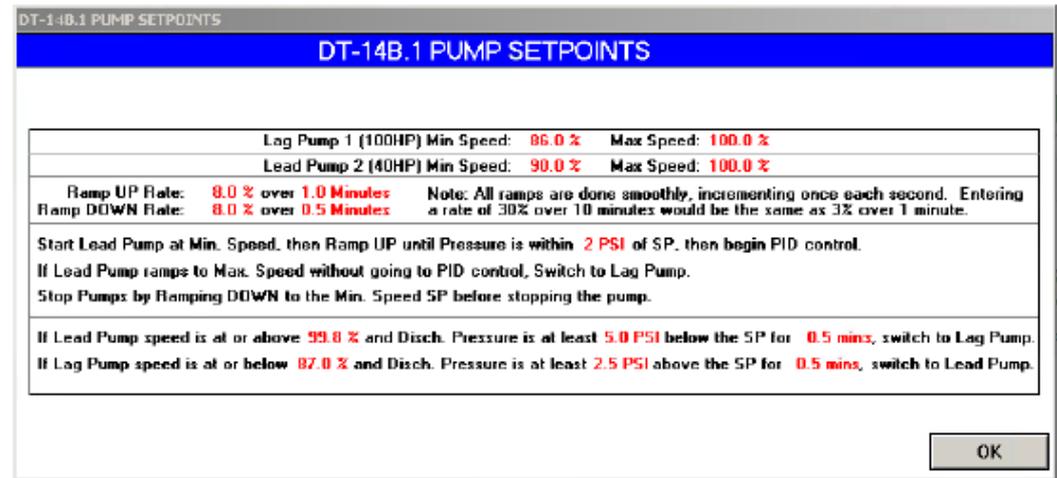
- High Service Pump #1: 1,000 gpm @ 210 ft.
- High Service Pump #2: 525 gpm @ 180 ft.
- The High Service Pumps pump directly into the High Service Zone (HGL 282)
- Hingham WTP SCADA System

b) Supply/Treatment Operations:

- Under normal operating conditions the High Service Pumps will be kept in the Automatic mode.



- Both High Service Pumps are available and programmed with SCADA to adjust VFD speed to meet target pressure set points. The Sr. Chief Operator, Alan Allen, and Dave Nista will be able to change the target pressure set points and the response time between changes.



Communication and Action Plan Excerpts

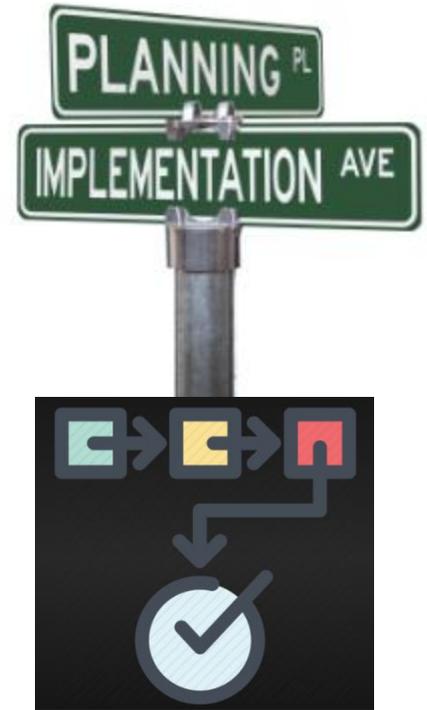
Emergency Response Procedures

- Fire
- Main Break
- Loss of Power
- Loss or Failure of High Service Pumps
- Pressure Dropping, Pumps @ 100% Speed

4) Loss or failure of High Service Pumps

- a. WTP Operator shall contact Sr. Chief Operator. Sr. Chief Operator shall report to the WTP and provide assistance.
- b. WTP Operations staff shall contact Annese Electric.
- c. WTP Operator shall call the Technical Director.
- d. Technical Director will contact the Norwell Water Department and inform them that activation of the interconnection is needed and that Aquarion staff is on the way to open the interconnection.
- e. Technical Director shall contact the On-Call Utility Operator. The On-Call Utility Operator shall immediately report to the Norwell interconnection and open the interconnection.
- f. Technical Director shall contact the Communications Manager and apprise them of the situation.
- g. WTP Operator and Sr. Chief Operator shall operate the Main Service Pump by-pass valve and pump water from the Main Zone to the High Zone.
- h. Technical team shall work on restoring operation of the High Zone pumps, monitor operation of the Main Zone pumps, and monitor WTP discharge pressure. Coordinate closing the WTP by-pass valve first, then closing the Norwell interconnection once operation of the High Service pumps is restored.

Implementation (cont.)



- Inspections and Testing of Infrastructure
 - Norwell Interconnection
 - Charles Street Check Valve
 - Hydrant Pressure Relief Valves
 - Full Scale SCADA Pressure Control Test
 - Simulate Hydrant Usage
- Meetings: Staff, Fire Department, Norwell, DPW, Critical Customers
- Customer Communications - neighborhood meeting, mailer, newspaper, website, Facebook, newsletter
- Water Restrictions

Norwell Interconnection

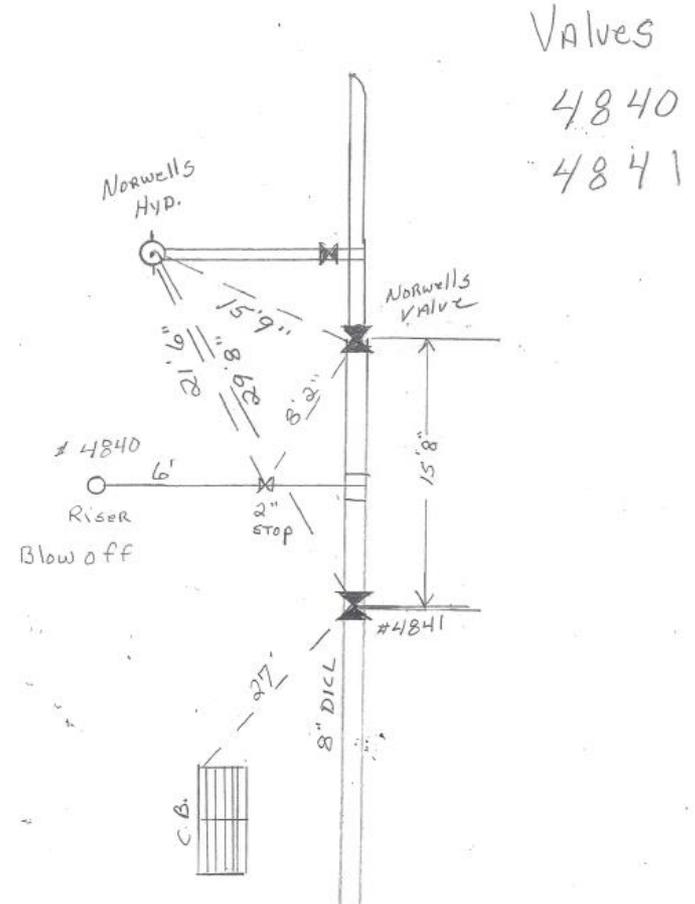


Annual Emergency Response Meeting and Training

Date: December 5, 2017

Emergency Interconnection Training and Coordination

Aquarion/Norwell



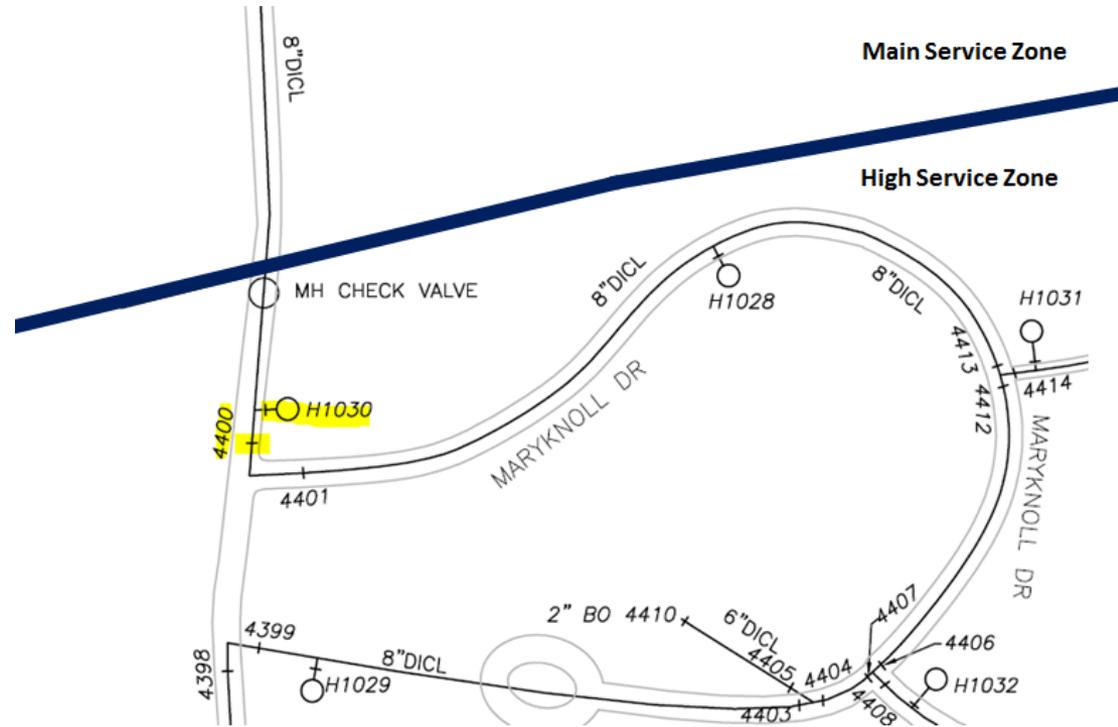
Valves
4840
4841

1. Introductions
2. Exchange of contact information (cell phones, e-mail addresses)
3. Review of infrastructure (valves, hydrants, blow offs)
 - o Aquarion valves – Open Right
 - o Norwell valves – Open ##

4. Measure system pressure: Aquarion _____ Norwell _____
Date, time, tank level _____

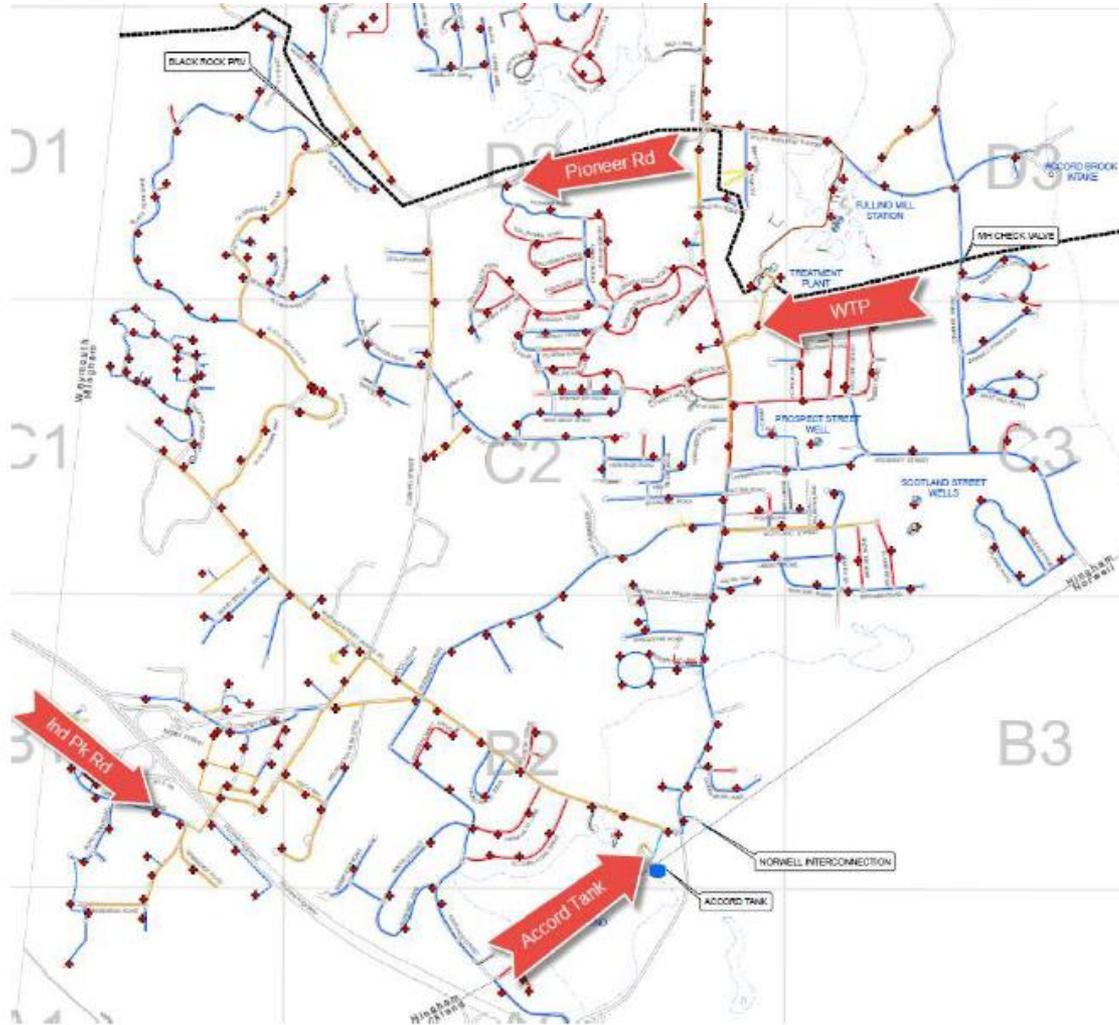
5. Review of Action/Response Plan

Charles Street Check Valve

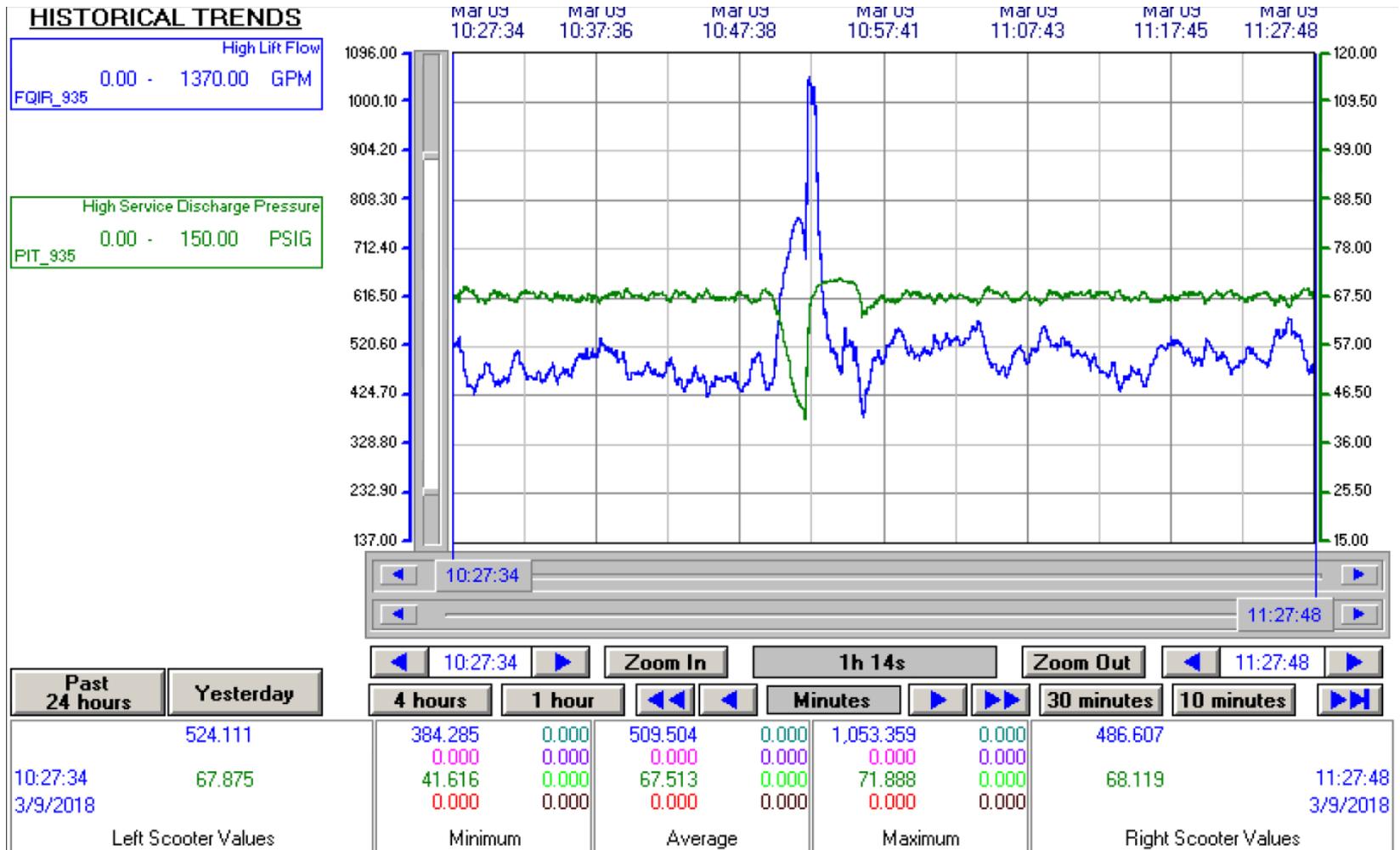


1. Verify customers served by Charles Street: #60, #66, #70, #74 (review tap cards)
2. Clean out/Pump out the vault
3. Obtain and record a pressure reading from hydrant 1030 (under normal conditions)
4. Notify customers that they may notice a temporary drop in water pressure
5. Once Brad has inspected the check valve, perform a test
 - a. Close valve 4400
 - b. Open hydrant 1030 (observe flow 50 to 100 gpm for 5 to 10 minutes)
 - c. Confirm with Brad on the operation of the check valve
 - d. Once Brad confirms check valve movement, close hydrant 1030, obtain and record a pressure reading
 - e. Re-open valve 4400 and obtain and record another pressure reading from hydrant 1030

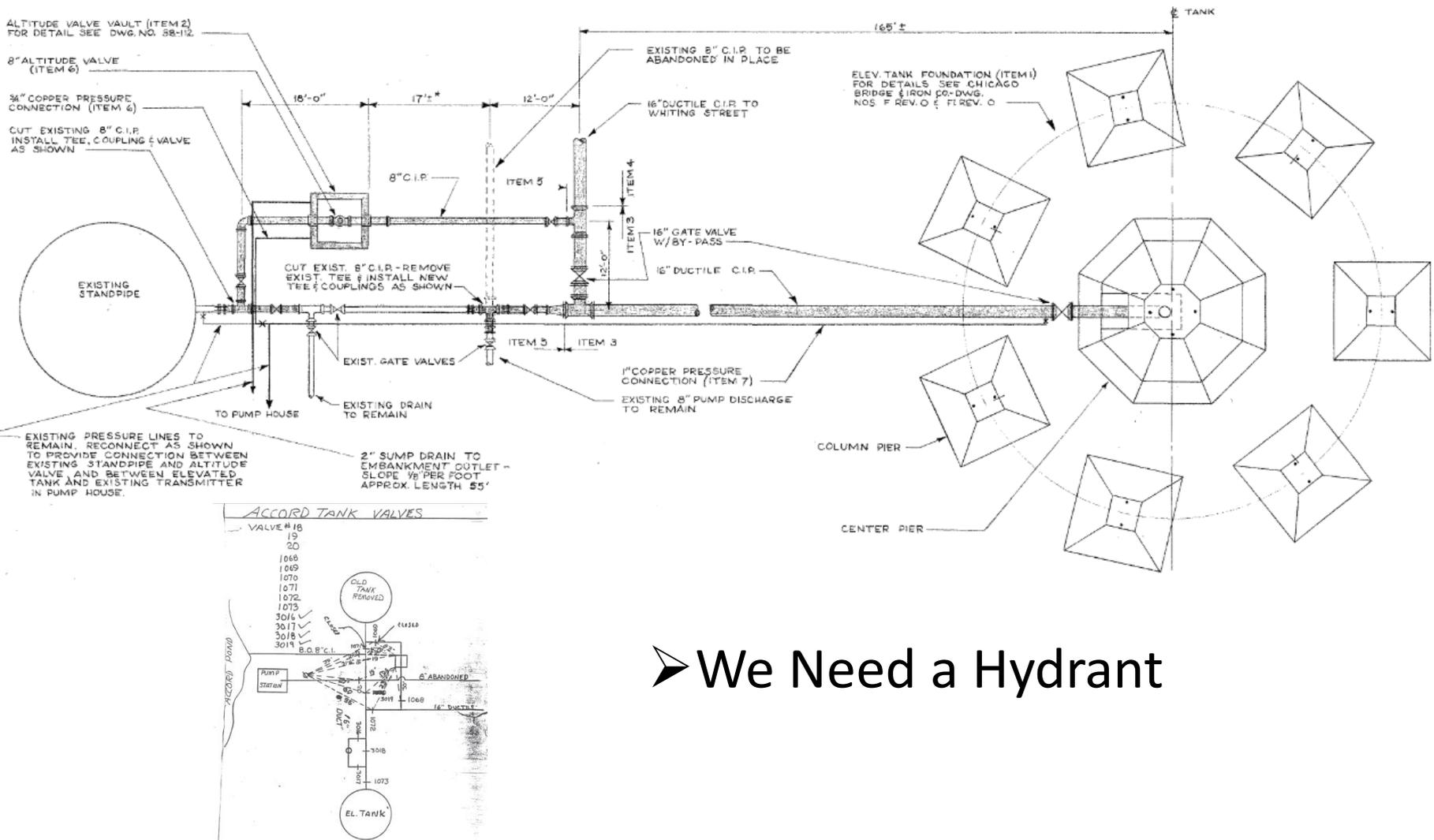
Hydrant Pressure Relief Valves



Full System SCADA Test (3/9/18)

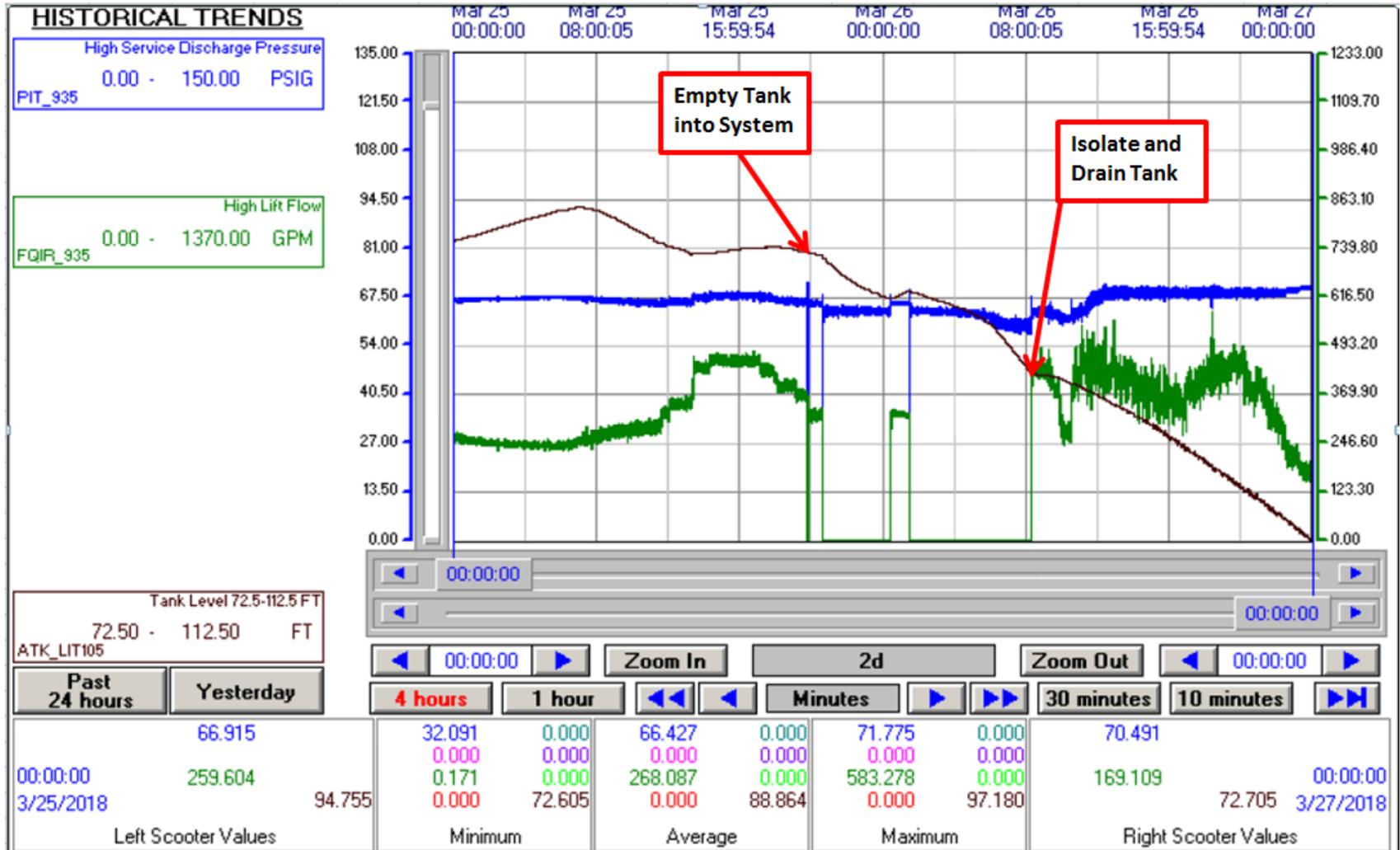


Let's Drain the Tank?

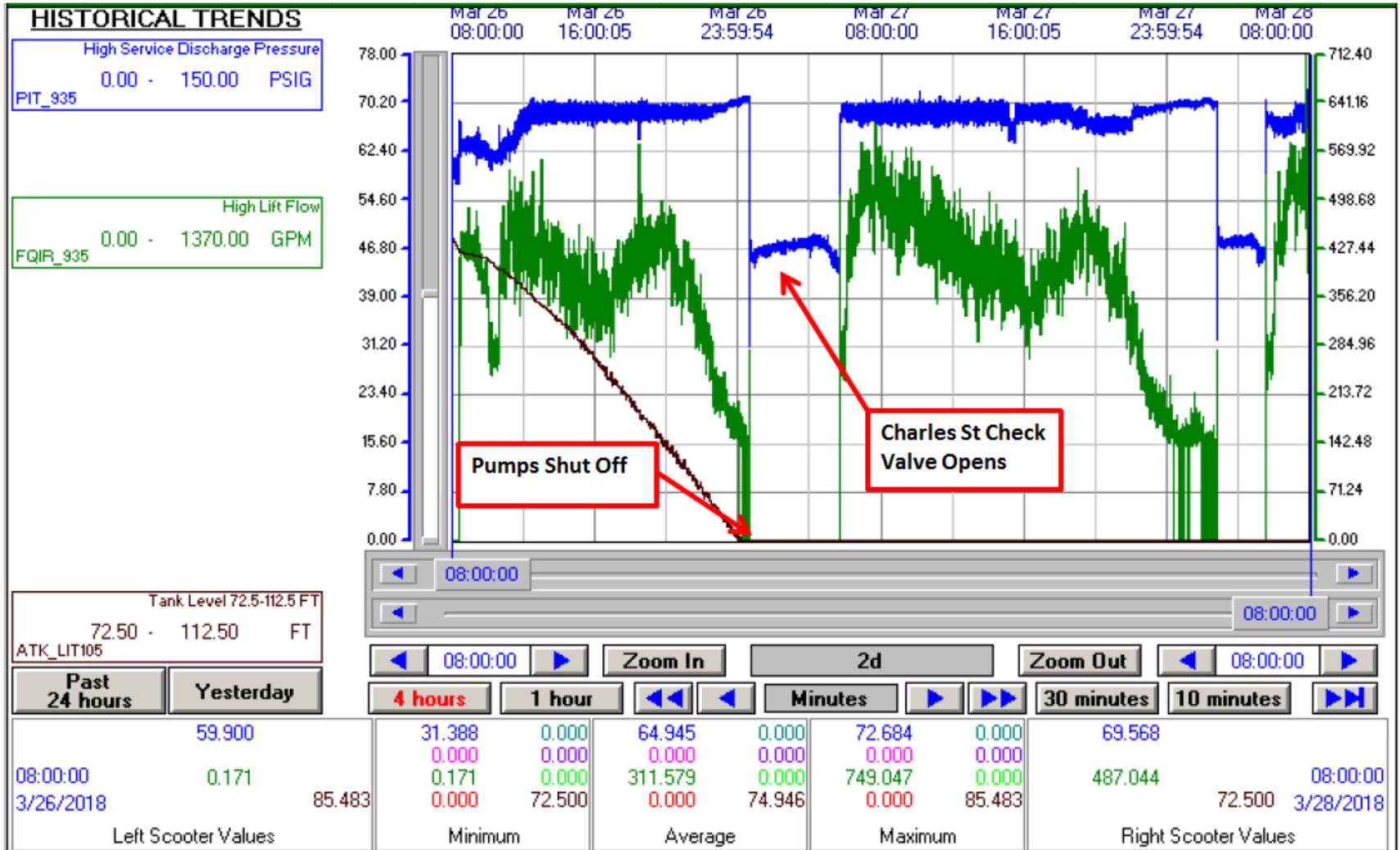


➤ We Need a Hydrant

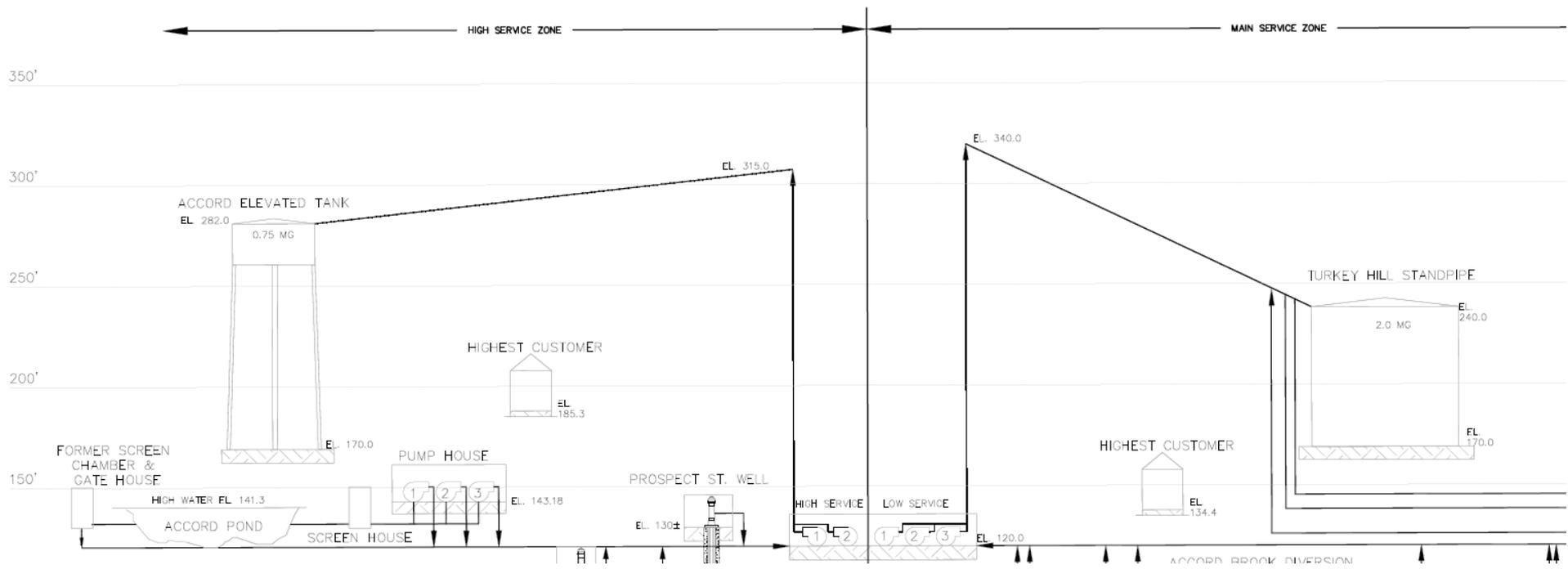
Operations – “Go Time”



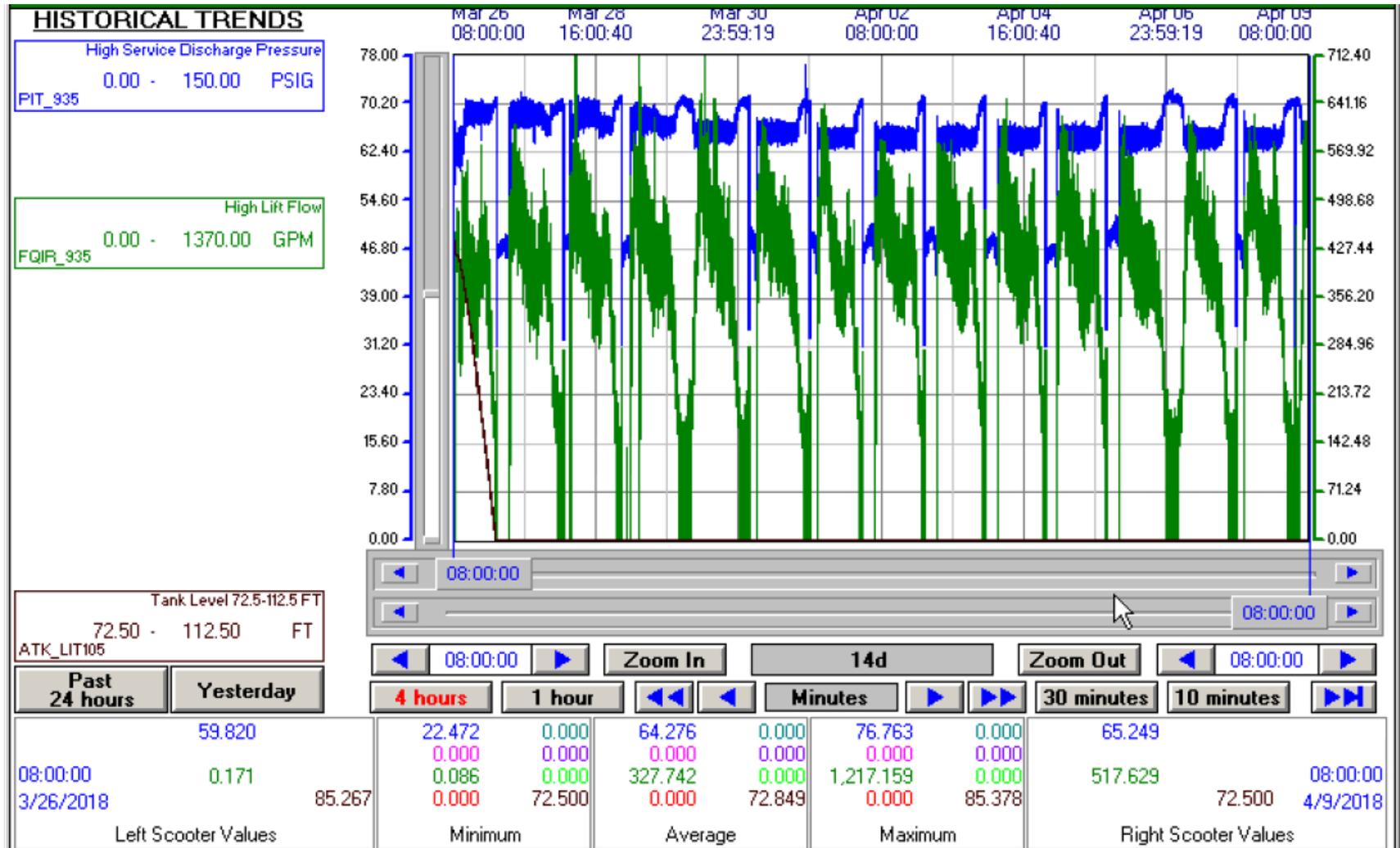
Operations – First Night



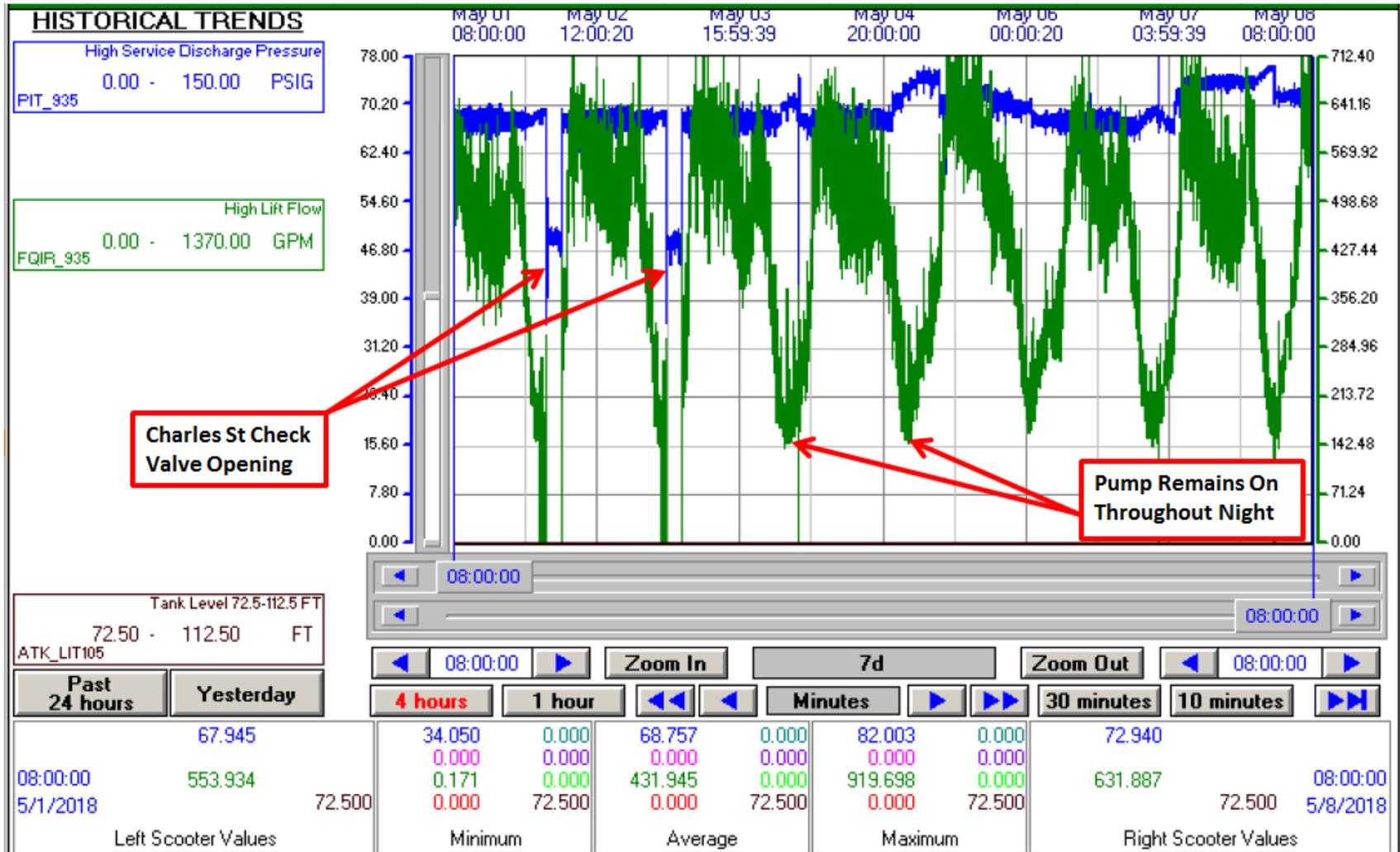
Operations – First Night



Operations – Routine



Operations – Demand Increase in May



Operations – Back On-Line



Tank Rehabilitation - Shrouding



Tank Rehabilitation - Shrouding

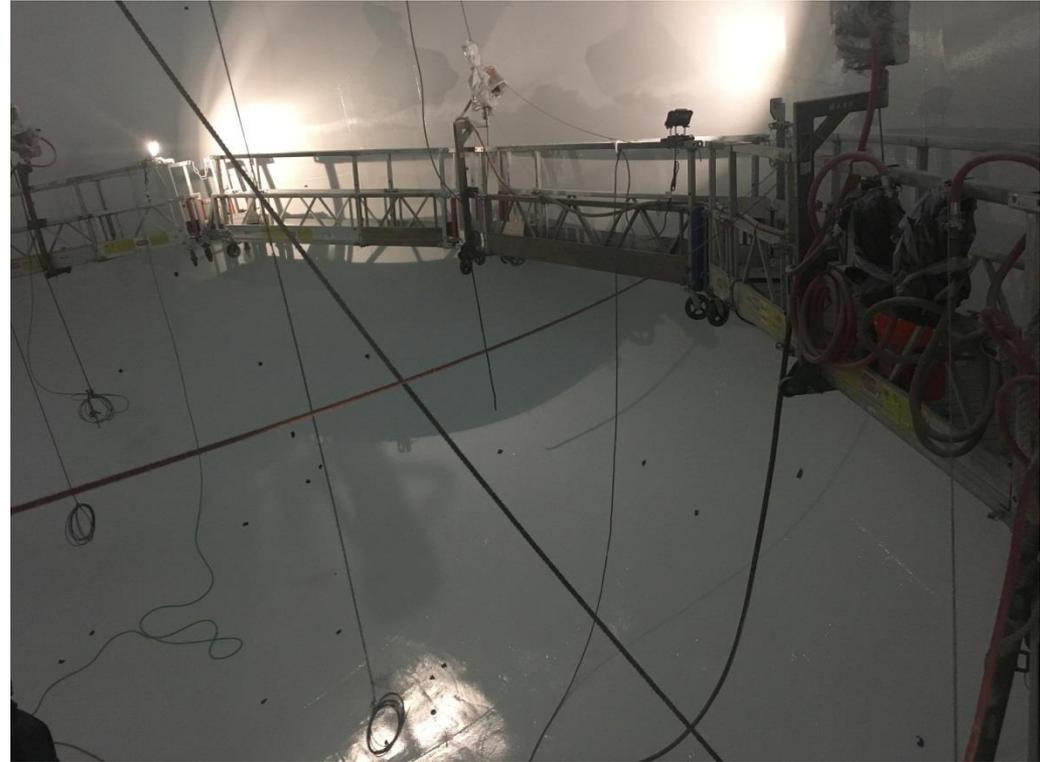


Tank Rehabilitation – Steel Repairs



Tank Rehabilitation - Painting

Interior First



Tank Rehabilitation - Painting

Exterior









Thank you to all of our staff, Consultants, and Contractors for making this possible.

Lessons Learned

- Do your homework
- Plan, plan, plan
- Communicate and coordinate
- Execute the plan – be ready for changes
- Believe

Questions?

Stephen C. Olson, P.E.