Hooksett Village Water Precinct

System Overview Presentation – Feb. 3, 2020



HVWP System Overview



"*Water is the only drink for a wise man.*" – Henry David Thoreau

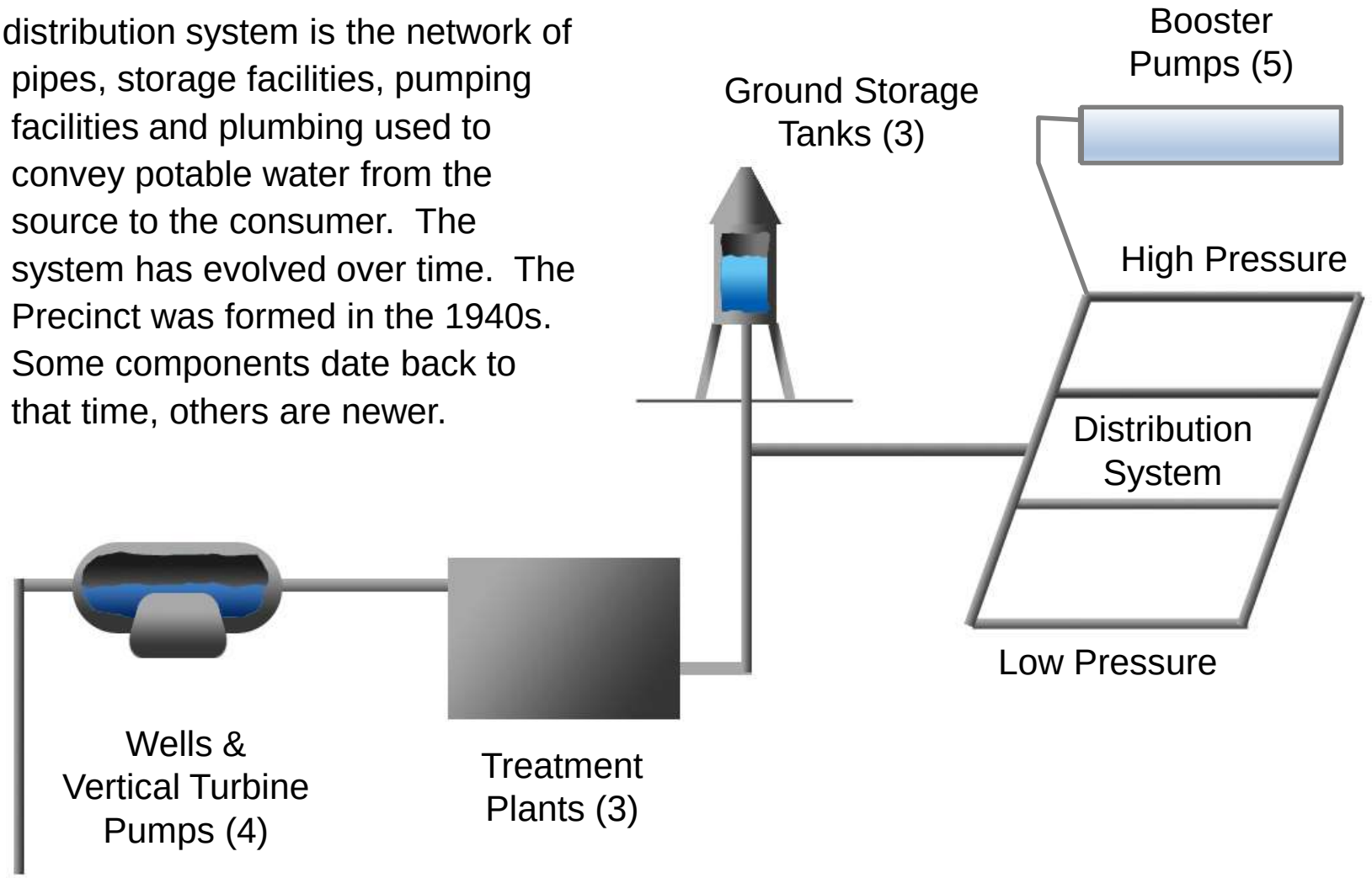
"A safe, reliable water supply is critical to the success of any community. It creates jobs, attracts industry and investment, and provides for the health and welfare of citizens in ways ranging from disease prevention to fire suppression. We often take water supply for granted until it is threatened, either by drought, water main breaks, or some other event. Water plays a vital role in our daily lives."

Adapted from: Springdale Water Utilities



HVWP System Overview

The distribution system is the network of pipes, storage facilities, pumping facilities and plumbing used to convey potable water from the source to the consumer. The system has evolved over time. The Precinct was formed in the 1940s. Some components date back to that time, others are newer.



HVWP Distribution System



HVWP Water Distribution

Basic Components:

30+ Miles of Water Main & Valves
189 Fire Hydrants & Valves
One Booster Pump Station
67+ Fire Sprinkler Systems
>1,100 Service Lines, Valves & Meters
One Emergency Interconnection
316 Backflow Protection Devices









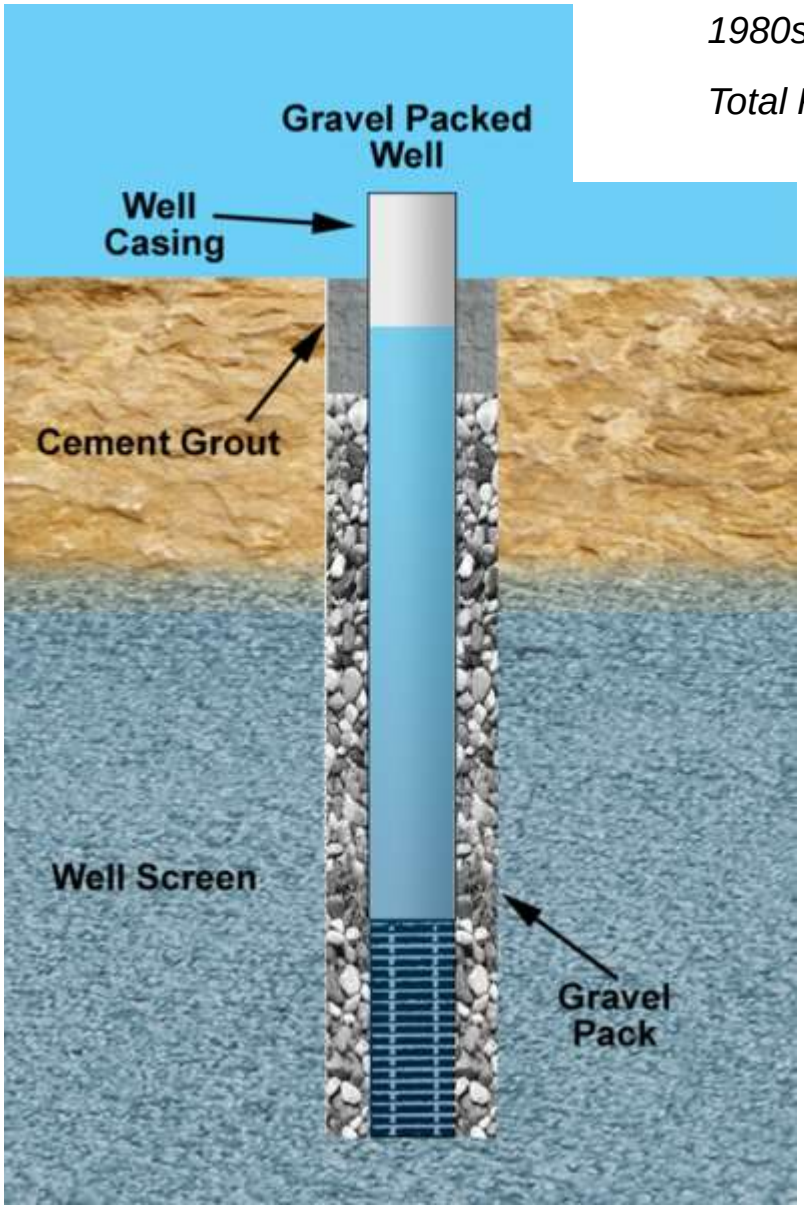


HVWP Water Sources

Four Large Gravel Wells

1980s (2) and 2000s (2)

Total Flow ~ 1,200 GPM





HVWP Water Accounting: The "Bottom Line"

ANNUAL SYSTEM INPUT VOLUME SUMMARY (gallons)

Hooksett Village Water Precinct, PWS ID#1181020, Jan. 2019 - Dec. 2019

SITE	SOURCE METER	SOURCE CORR.	TRMT. USAGE	STORAGE CHG.	INPUT VOLUME
EAST	42,470,000	424,700	101,076	0	41,944,224
NORTH	40,853,000	4,085,300	126,290	0	36,641,410
SOUTH	19,033,015	133,231	102,820	0	18,796,964
SOUTH BU	19,475,104	-77,900	0	0	19,553,004
CHWP	55,000	396	0	0	54,604

- CHANGE IN SYSTEM STORAGE:		740000	*(new tank filling April 2019)*
= TOTAL INPUT VOLUME:		116,250,206	
	-	108,689,700	*(billed metered)*
	-	1,791,999	*(unbilled metered)*
	=	5,768,507	
	% UAW ("Water Balance") =	**4.96%**	

HVWP Source Protection Area

Hooksett, NH

December 18, 2017

1 inch = 1500 Feet

0 1500 3000 4500

CAI Technologies

www.cai-tech.com



Data shown on this map is provided for planning and informational purposes only. The municipality and CAI Technologies are not responsible for any use for other purposes or misuse or misrepresentation of this map.

HVWP Water Treatment



Chemical Feed Systems

Disinfection (microbiological) - NaOCl

Corrosion Control (pH adjustment and sequestration) – Na_2CO_3 and PO_4

Iron/Manganese (color) Control – PO_4



HVWP Water Storage





Three Water Storage Tanks

- 1MG Glass-Fused Steel - 2019
- 1MG Pre-stressed Concrete - 2007
- 250K Welded Steel – 1950

HVWP Water Operations

Department Responsibilities:

- Chemical feed systems
- Corrosion control programs
- Cross-connection programs
- Regular & vigorous water main flushing programs
- Distribution system hydraulics
- Leak detection & repairs
- Planning, design & construction
- Funding & fiscal management
- Water rates & policies
- Public health & safety
- Water shortage/drought readiness
- Water quality testing & monitoring
- State/federal compliance & reporting
- Customer service & billing
- Facility operation & maintenance
- New development oversight
- Emergency response



HVWP Commitment to Professionalism



Water Commissioners:

- Five-member elected board
- Five-year terms
- Supported by elected Moderator, Treasurer and Clerk
- Decades of collective water utility, business and government experience

Water Employees:

- Five full-time professionals
- One PT summer position
- Supported by HVWP attorney, bookkeeper and consultants
- Licensed and certified for potable water distribution, potable water treatment, cross-connection surveys, backflow device testing, etc.

HVWP Staff



Historical Pump Station Issues



Historical Main & Hydrant Issues



Historical Tank Issues











2018-19 Improvements: South Station

After:

Before:









2018-19 Improvements: South Station

Before:





After:





2018-19 Improvements: Hydrant Program

Flushing:



2018-19 Improvements: Hydrant Program

Flow Testing:



Repair & Replacement:



Marking, Flagging & Inventory:







2018-19 Improvements: New Tank



2018-19 Improvements: New Tank



2018-19 Improvements: Recognition

NHWWA:

Supplying Power to a New Water Storage Facility in Hooksett, NH

When Utility Power is not an Option

Bruce W. Lewis, P.E.

Lewis Engineering, PLLC – Litchfield, NH

A recent observation relative to a familiar and well recognized term "water works facilities design" is that part of the opportunity from time to time often includes the need to be able to provide reasonable solutions to specific areas of difficulty that arise within a current project design.

Introduction

For the past number of years, the Hooksett Village Water Precinct, HVWP, and Superintendent Michael Heidorn have been working diligently to bring a new water storage facility with a connecting water transmission main to the west side of their system. The new water storage facility is located on Precinct property within the existing Pike crushed stone quarry located on the west side of the F.E. Everett Turnpike in Hooksett. The water storage tank is a new 1 million gallon (MG) tank installed by Statewide Aquastore, Inc. This is a bolted lap-joint design, glass fused to steel tank with a self-supporting geodesic dome roof. A new 12" diameter water transmission main was installed easterly from the tank site, directionally bored under the Turnpike, and connected into HVWP's existing distribution system located on Pinnacle Road.

The site includes a new utility control building adjacent to the tank. During the design process, it was discovered that although the quarry has electricity from the utility company, to have power extended to the

NEWWA:

Location, Location, Location

A water tank often becomes the symbol of a municipality, towering above the community on a hill or pedestal. Securing available land for new water storage tanks can be a challenge from word "go" but as we all know, location is everything. Several factors come into play when choosing where your new tank will call home. Site availability and access for both initial construction and future maintenance/inspections on the tank is a good place to start. Distance from a water transmission line, the nature of the pump systems and water age also play important roles. Though certain parallels can be drawn project to project, each project is unique.



The new Hooksett Village Water Precinct Glass Fused to Steel Tank

For the Hooksett Village Water Precinct in New Hampshire, the project began as a need to address the deteriorating conditions associated with the Precinct's rapidly aging 200,000-gallon 1950's water storage tank. The Precinct was formed in the 1940s and now serves over 3,000 people including a number of critical community facilities as well as the Exit 11 Rest Area off the Everett Turnpike. A new one million gallon tank would address a significant storage deficiency and provide increased system efficiency by reducing source well pump cycling.

Over a two year period, nearly a dozen potential tank sites in the Precinct were identified and discarded. One because the associated development project fell through, another because the hydraulics simply wouldn't work in the end. Seeking out a high point in the hilly terrain of Hooksett was made a priority and at last, a formerly active portion of the large active quarry in town presented itself as a great option. The scope of the project not only accommodated the water storage required to support future uses, it also included the installation of a new, dependable water main adjacent to an incredibly developable area. The potential for the area is so strong that a local builder and two landowners partnered with the Precinct to secure a critical project easement at no cost. This tank location also made storage available on the west side of the Merrimack River for protection in the event of a catastrophic failure. The innovative and publically beneficial re-use of a an environmentally degraded property for the new glass fused to steel water storage tank proved to be just what the Precinct needed.



Photo showing active portions of the quarry

The contract was awarded to Statewide Aquastore in July of 2018. Construction began in early December and the tank was brought online in April of this year. The new tank has helped alleviate serious capacity limitations, met the demand for rapidly growing domestic water use and bolstered fire protection that was previously lacking. The incredible and tireless dedication of the entire Hooksett Village Water Precinct staff to bettering not only their water system, but the health of their community as a whole is commendable to say the least.

While countless factors contribute to the success of a water storage tank construction project, if the tank's location is poorly chosen, the project may as well not exist. Taking the time to figure out how best to place your next tank could make all the difference.

2018-19 Improvements: Backflow

Before:





After:







2018-19 Improvements: Main/Service Repairs

Before:





After:



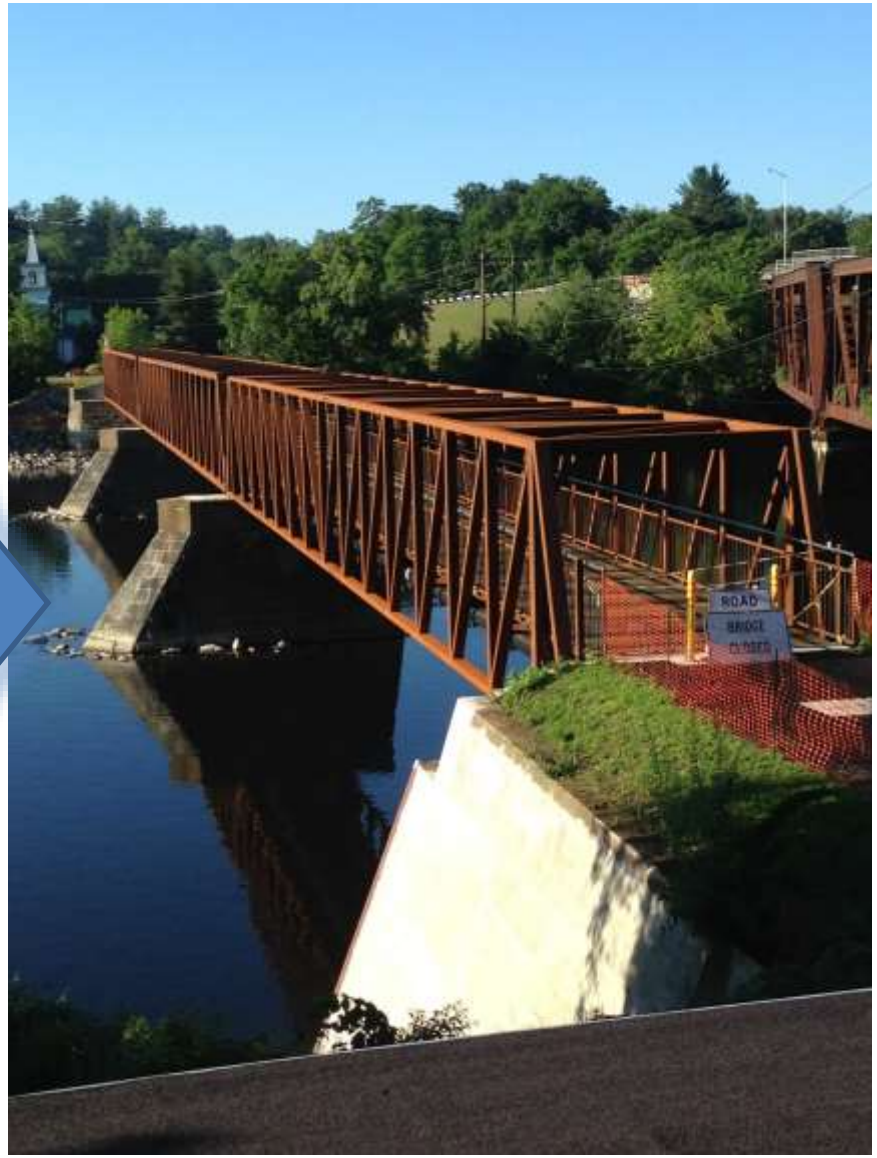


2018-19 Improvements: Lilac Bridge

Before:



After:



2018-19 Improvements: Lilac Bridge















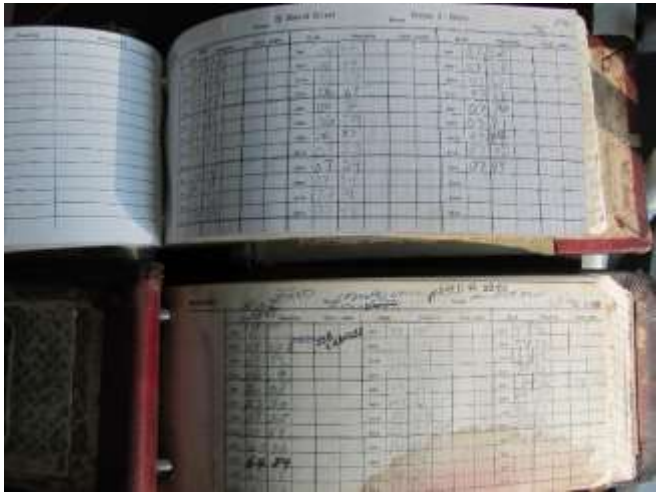




2018-19 Improvements: Metering

Old:





New:



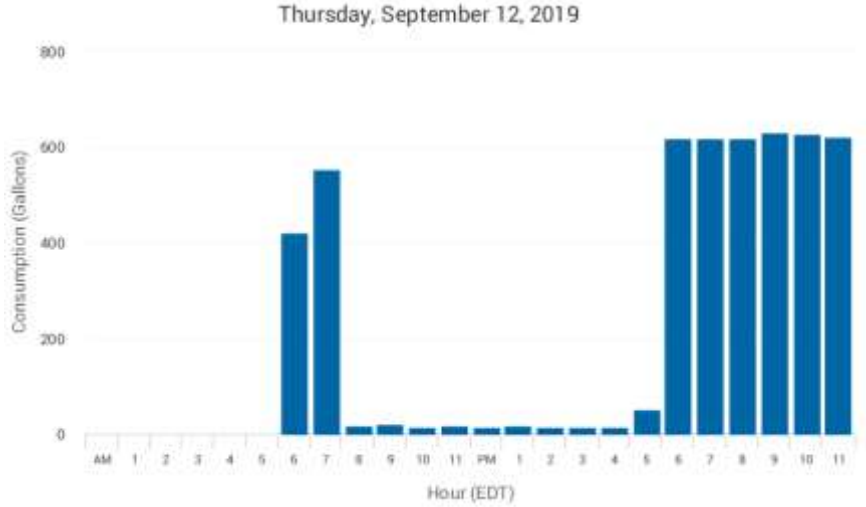


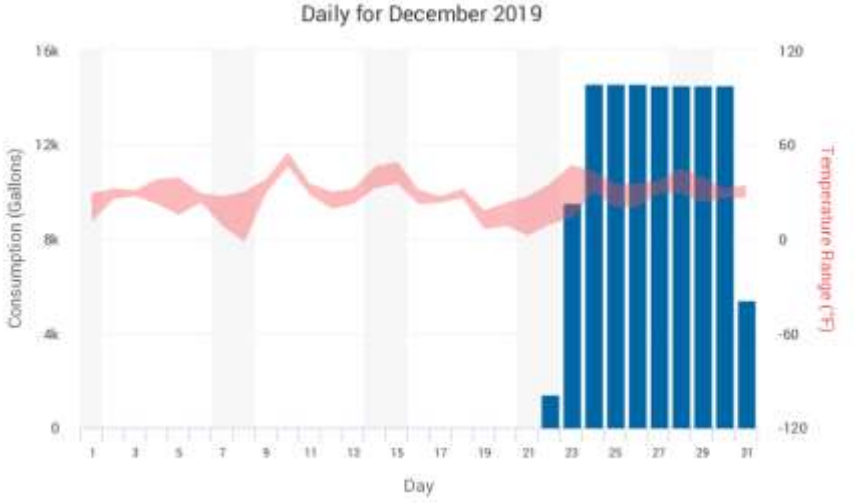
2018-19 Improvements: Metering



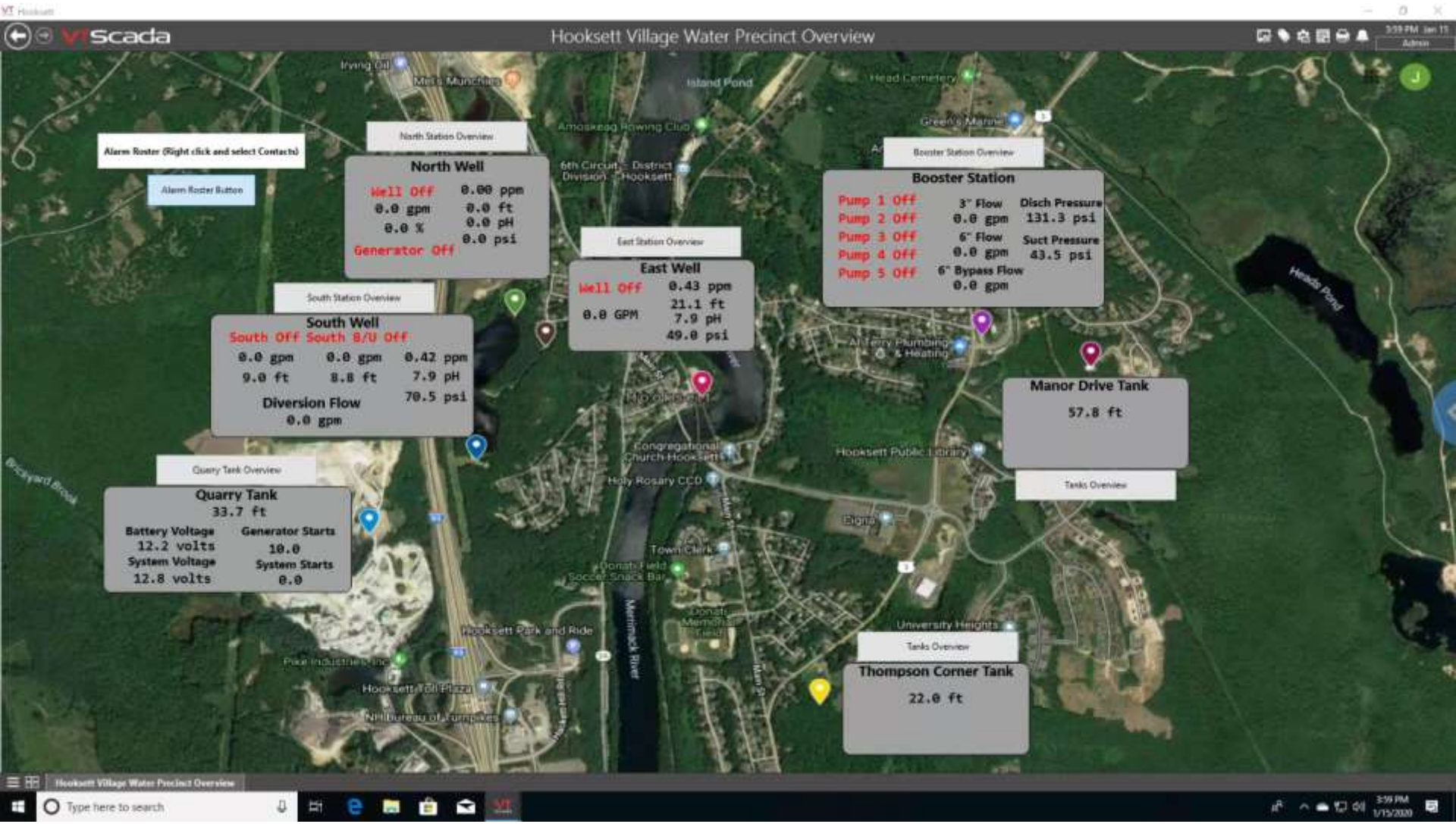








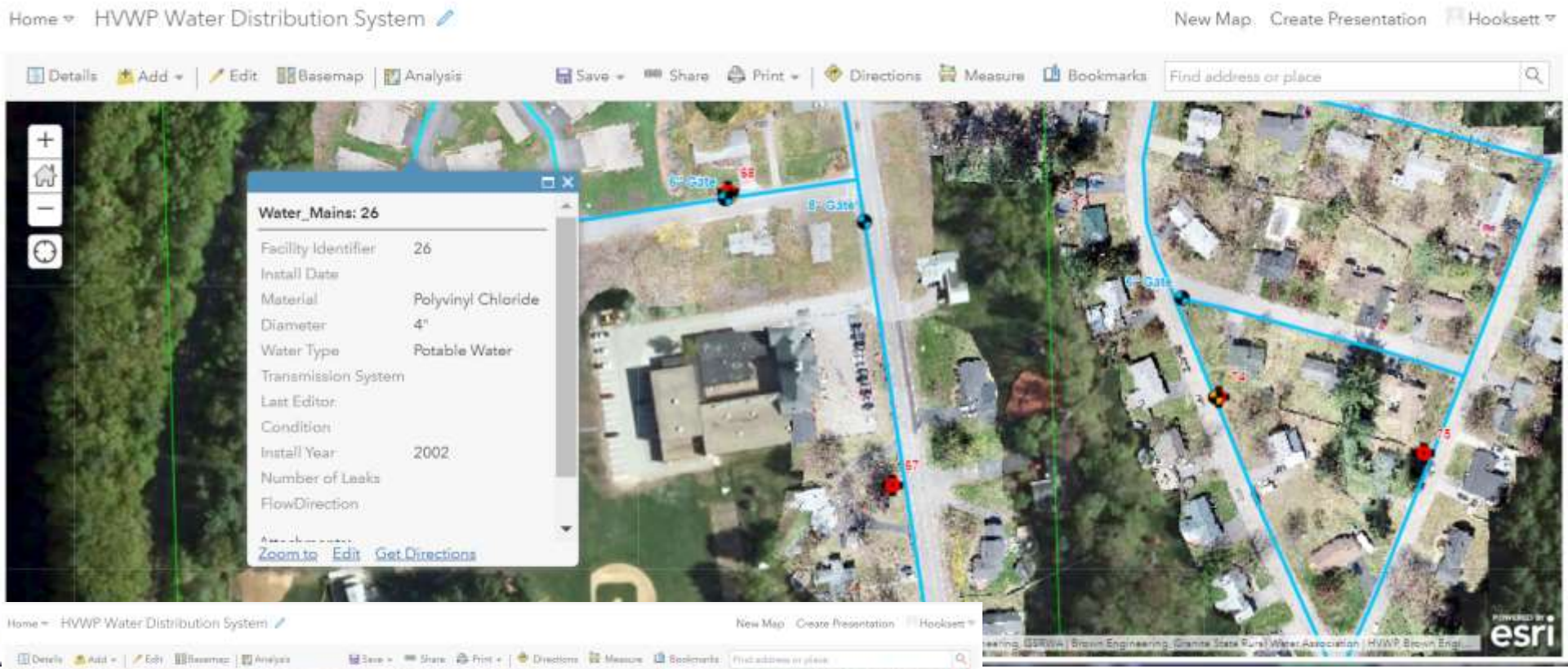
2018-19 Improvements: SCADA

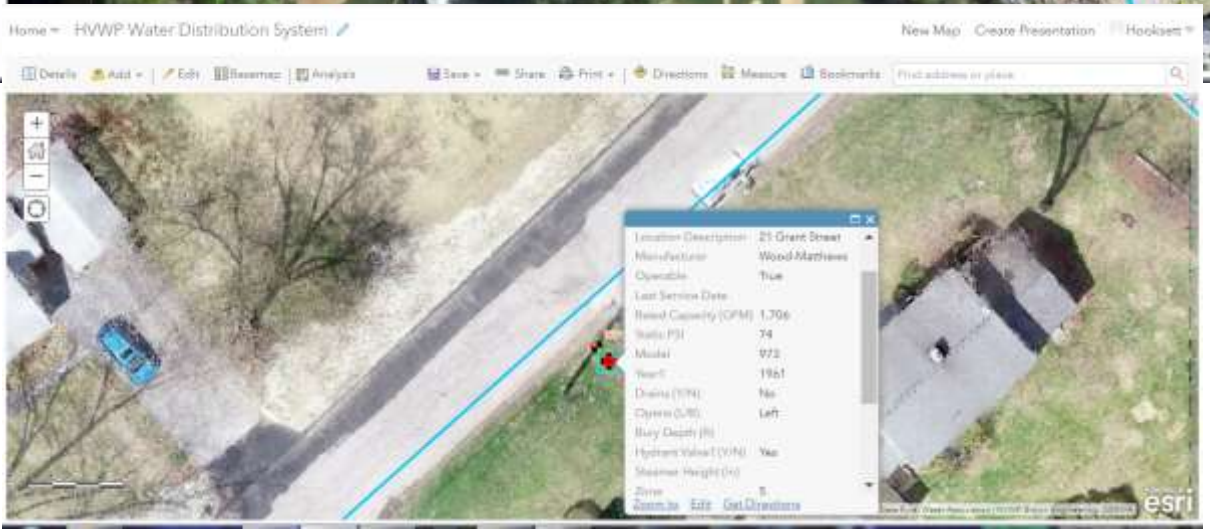


2018-19 Improvements: SCADA



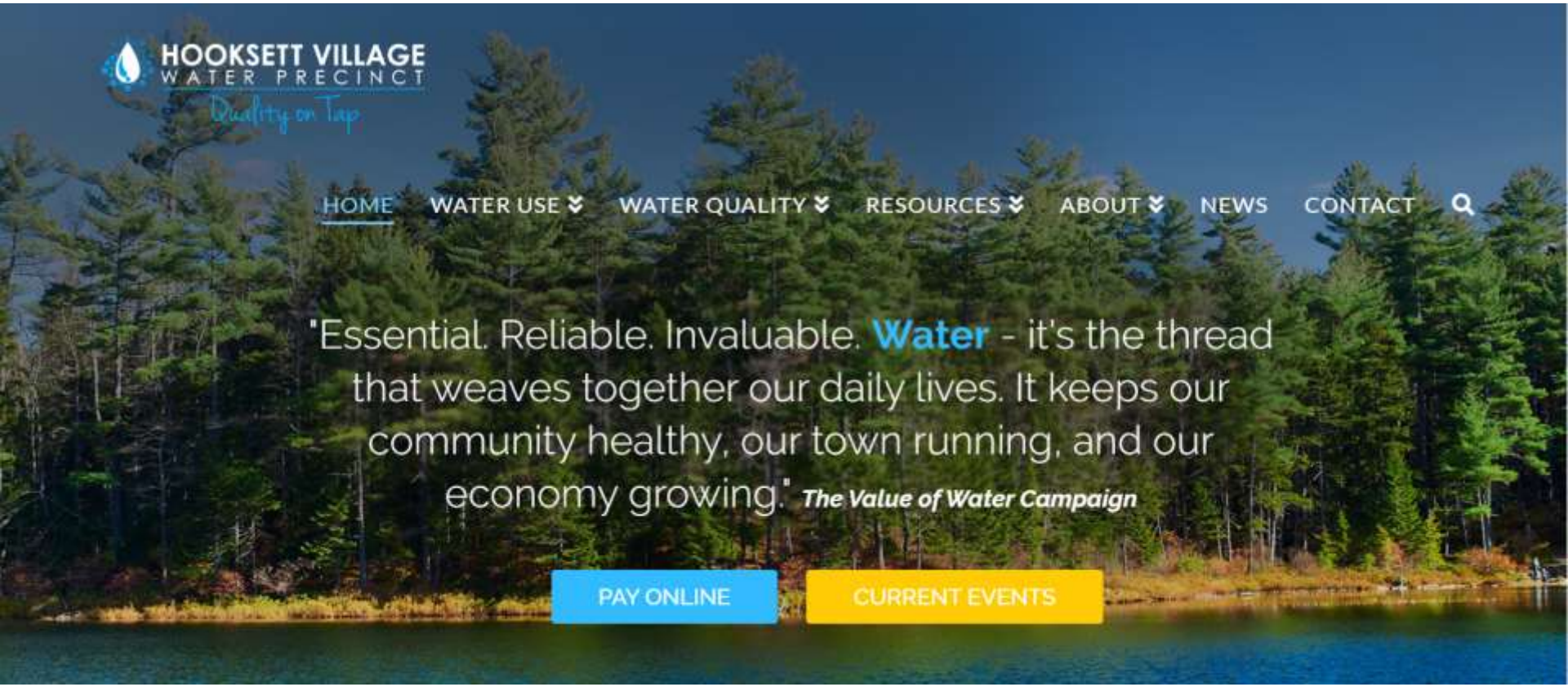
2018-19 Improvements: GIS







2018-19 Improvements: Web Site



WWW.HOOKSETTVILLAGEWATER.ORG

2020 Activities

- Asset Management Plan
- North Well Station Rehab
- Bow Interconnection Study
- RT3A Improvements Design
- Meter Replacements
- New Source Research
- GIS Improvements/Sharing
- Hydrant Repairs/Replacements
- RT3A Grant Application (Phase 2)
- Old Tank Evaluation
- Comprehensive Leak Survey
- Non-Compliant Services
- Triennial State Inspection
- Booster Pump Rebuild



… and all the "regular stuff"…



Future Improvements

Hooksett Village Water Precinct (HVWP)

10-Year Capital Improvement Plan for FY2020-29

12/3/2019

Long-Term Project Description	Year± of Last Purchase	Year± of Next Purchase	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	10-Year Project Cost	25-Year Project Cost
Tanks: (a) Installation of new correctly sized tank for Low Pressure Zone (LPZ) (via $1.8M loan in 2019-20)	2019	--	$110,119	$110,119	$110,119	$110,119	$110,119	$110,119	$110,119	$110,119	$110,119	$110,119	$1,101,195	$2,299,833
(b) Repair/re-purposing of old LPZ tank	1950	2021	$0	$200,000	$0	$0	$0	$0	$0	$0	$0	$0	$200,000	$200,000
(c) Repair/upgrade High PZ (HPZ) tank	2007	2022	$0	$0	$60,000	$0	$0	$0	$0	$0	$0	$0	$60,000	$60,000
New Source Installation: For drought-contamination protection and growth (estimated $1M loan in 2024)	2007	2023-24	$25,000	$25,000	$50,000	$50,000	$60,000	$60,000	$60,000	$60,000	$60,000	$60,000	$510,000	$1,350,000
Main Replacement/improvement: 30 miles pipe @ 1,000'/yr x $250/ft + $25K engr = $275K/yr (160-yr life cycle)	0 - 70 yrs±	Annual	$150,000	$0	$150,000	$240,000	$220,000	$255,000	$245,000	$205,000	$210,000	$210,000	$1,885,000	$5,380,000
Emergency Interconnection: Backup for west LPZ (estimated $1M loan in 2022)	1965±	2021-22	$25,000	$25,000	$60,000	$60,000	$60,000	$60,000	$60,000	$60,000	$60,000	$60,000	$530,000	$1,257,500
Meters/Transmitters: Routine upgrades/replacements (10-20 year cycle)	0 - 68 yrs±	2020-23	$60,000	$60,000	$60,000	$40,000	$5,000	$5,000	$5,000	$5,000	$35,000	$35,000	$310,000	$720,000
Pump Stations: Improvements for efficiency/safety/damage prev./SCADA	10-35 yrs±	2020	$65,000	$10,000	$10,000	$0	$0	$0	$0	$0	$0	$0	$85,000	$230,525
Vehicles: Routine replacement before major repairs (12-year cycle)	1-12 yrs	2021	$0	$45,000	$0	$0	$45,000	$0	$0	$35,000	$0	$0	$125,000	$350,800
Projected CIP totals:		*$346,269 (FY2019)*	***$435,119***	***$475,119***	***$500,119***	***$500,119***	***$500,119***	***$490,119***	***$480,119***	***$475,119***	***$475,119***	***$475,119***	***$4,806,195***	***$11,848,658***
Breakdown of CIP Sources: *Trust funds:*		*$101,000*	*$40,000*	*$40,000*	*$35,000*	*$25,000*	*$25,000*	*$15,000*	*$5,000*	*$0*	*$0*	*$0*	*$185,000*	*$286,000*
Prior year surplus:		*$0*	*$45,000*	*$20,000*	*$5,000*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$70,000*	*$70,000*
Taxes:		*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
Rates & fees:		*$245,269*	*$350,119*	*$415,119*	*$460,119*	*$475,119*	*$475,119*	*$475,119*	*$475,119*	*$475,119*	*$475,119*	*$475,119*	*$4,551,195*	*$11,492,658*
Projected Budget ▲ due to CIP:		*$152,456*	*$104,851*	*$65,000*	*$45,000*	*$15,000*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*		
Breakdown of Budget Needs: *CIP ▲:*		*$152,456*	*$104,851*	*$65,000*	*$45,000*	*$15,000*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*		
+ Routine O&M (inflation) ▲:		*$15,000*	*$15,000*	*$15,000*	*$15,000*	*$15,000*	*$15,000*	*$15,000*	*$15,000*	*$15,000*	*$15,000*	*$15,000*		
+ Planned trust fund deposit:		*$0*	*$0*	*$10,000*	*$25,000*	*$25,000*	*$25,000*	*$25,000*	*$25,000*	*$25,000*	*$25,000*	*$25,000*		
+ Water usage factor:		*$2,350*	*$2,350*	*$2,350*	*$2,350*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*		
Approx. add'l. revenue needs ▲:		*$169,806*	*$122,201*	*$92,350*	*$87,350*	*$55,000*	*$40,000*	*$40,000*	*$40,000*	*$40,000*	*$40,000*	*$40,000*		

THANK YOU!!

Todd Smith, Chair
Mike Heidorn, Superintendent

Please stop by our office at 7 Riverside Street or call anytime with water-related questions or concerns.

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