

Progress Meeting – MWRA / Long Term Water Supply Study

Town of Wayland Board of Public Works

December 21, 2021

Kirsten Ryan, PG, Senior Project Manager

Mike Sanders, PE, Senior Professional

Reed Allen, Staff Professional

Kleinfelder

1 Beacon Street, Boston MA



MWRA / Long Term Supply Study

- Project Scope & Approach
- Key Considerations / Decision Factors
- Perspective from Partial MWRA Communities
- Options & Assumptions – MWRA Only / Wheeled/
Local Only / Hybrid
- Risks & Decision Factors
- Cost Evaluation
- Discussion / Next Steps

MWRA /Long Term Supply Study

- Original Contract Scope:

Focus on fully supplied MWRA conversion; water quality / blending analysis by others; local sources costs by others.

- Scope Addition:

Evaluate hybrid solution which uses MWRA as supplemental source. Evaluate costs and feasibility for upgrades to local sources.

MWRA / Long Term Supply Study

Options & Approach

- MWRA – Fully supplied by MWRA Water System
 - Local – Upgrade & Maintain Town Supplies
 - Hybrid – MWRA to supplement Town Sources
-
- *Utilize a 50-year planning period for life cycle cost comparison at Net Present Value*
 - *Recurring capital upgrades over different time periods*
 - *Understand the end points and optimize a hybrid solution*
 - *Costs are still being refined*

Summary of Key Decision Factors to be Compared

- Feasibility / Capacity to supply current / future needs
- Uncertainties and Risk
- Capital improvements required
 - Near Term 0-5 years
 - Additional capital needs over 50 years
- Recurring operations and maintenance costs
- Permitting / Regulatory considerations
- Operational / Administrative burden
- Other Benefits or Concerns

MWRA Supply Option –

- ✓ Met with the MWRA to evaluate the Shaft L and Hultman Aqueduct connection alternatives
 - × The Hultman is not a reliable connection point for a full or partial supply due to the likelihood of it being put offline for extended periods of time
 - ✓ The Elm St Pump Station in Framingham, which connects to Shaft L, is an ideal connection because the existing pipe/fitting configuration can easily accommodate the addition of a new connection
- ✓ Evaluated distribution system upgrades
- ✓ Met with Framingham to discuss wheeling water

MWRA Full Supply Option

Infrastructure

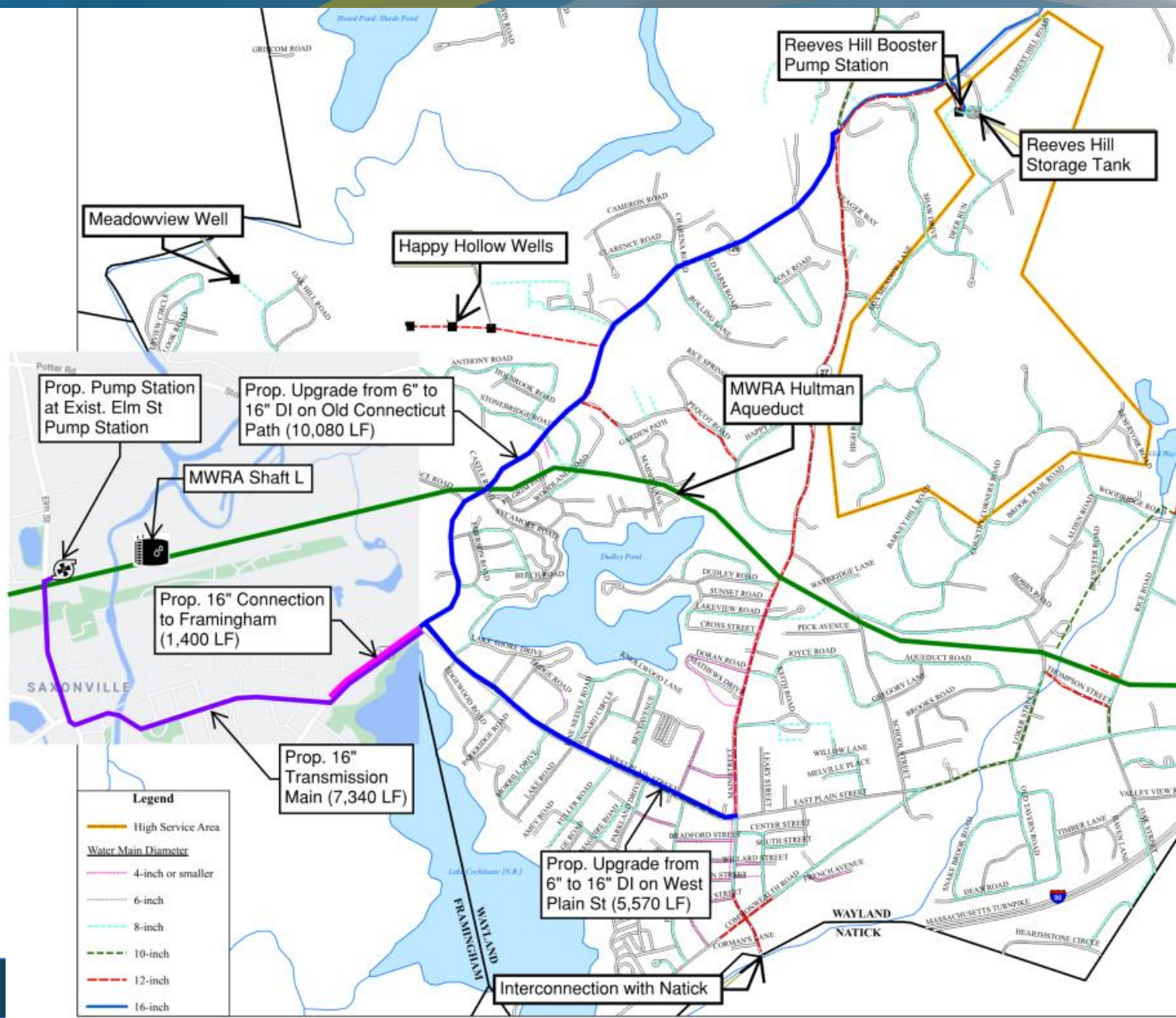
- 300 HP Pump Station*
- Pump Station O&M, upgrades every 25 years*
- 7,340 foot 16" Transmission Main*
- 15,490 feet of 16" Pipe upgrades in Wayland

*Pump Station and Transmission Main costs could be shared with the Town of Natick if they also choose to connect to the MWRA

MWRA Fees

- Entrance fee \$4M x 1.55 MGD interest free over 25 yr
- Wholesale water rate \$4,320/MG (3.9% escalation)

MWRA Supply – Discussion w/ Map



Wheeling Water through Framingham

- Kleinfelder met with Framingham's City Engineer and GIS Manager to discuss the feasibility of wheeling water

Infrastructure Requirements

- 300 HP Pump Station
- 1,400 feet 16" Transmission Main
- 15,490 feet of 16" Pipe upgrades in Wayland

Fees and Water Rates

- MWRA Entrance fee – same as full MWRA
- Framingham Wholesale water rate – Tier 5: \$17,058/MG

Partially Served Communities Interviews

- Interviewed 10 Communities: Ashland, Burlington, Marlborough, Needham, Northborough, Peabody, Wellesley, Winchester, Woburn, Wilmington
- Drivers: Inadequate supply to meet demand; redundancy, contamination issues
- Blending Considerations: Chloramines, corrosion control, pH, flushing
- Conservation restrictions: Varies by date of admission. Earlier entries have fewer restrictions. **Newer entries must meet 2018 MA Water Conservation Standards, including seasonal outdoor restrictions, demand management, education and conservation pricing, etc.**
 - Ashland ITA Conditions for Approval: *"WRC Staff will monitor Ashland's DEP ASRs for the first 5 years after the town begins to receive MWRA water, to determine if the programs in place are successful in reducing unaccounted-for water at or below 10% and rgpcd at 65 or less" "Ashland must not sell water..." "Ashland must not amend water use bylaw to be less restrictive.."*

Local Sources

- ✓ Reviewed available documentation
- ✓ Reviewed pumping data and demand data
- ✓ Reviewed water quality data
- ✓ Reviewed watershed GIS
- ✓ Toured facilities
- ✓ Developed costs for needed upgrades

Local Sources

Source	Source Needs / Complexities / Uncertainties	Age of existing source	Approved Max Withdrawal (MGD)	PFAS Levels
Happy Hollow wells (3) 1R, 2R, 3R	Upgrades have all been temporary. New permanent PFAS plant needed. Site has sufficient space	2015 repl wells	1.41	23-29
Baldwin Pond Wells	Treatment processes are complex. Requires 3T Operator license - difficult to staff. Components have supply chain issues. Site is very tight for future upgrades.	Replacement Wells 1R (2009), 2 (2009), 3 (2009)	1.51	3-6
Campbell Well	Yield is limited. Mn treatment needed.	1965	0.6	4- 8
Chamberlain Well	Yield is limited. PFAS treatment needed	1991	0.828*	14-18

Local Source Assumptions

High End / 'Conservative'

Happy Hollow

- PFAS Removal

Baldwin Pond

- Filter/Prefilter Upgrades
- Ozone Treatment
- Chemical Feed System
- **PFAS Removal**

Chamberlain

- Pump Station Upgrades
- PFAS Removal

Campbell

- Pump Station Upgrades
- Fe/Mn Removal
- **PFAS Removal**
- Second Storage Tank
- O&M and Labor increased 40%

Low End / 'Optimistic'

Happy Hollow

- PFAS Removal

Baldwin Pond

- Filter/Prefilter Upgrades
- Ozone Treatment
- Chemical Feed System

Chamberlain

- Pump Station Upgrades
- PFAS Removal

Campbell

- Pump Station Upgrades
- Fe/Mn Removal
- Second Storage Tank
- O&M and Labor increased 15%

Hybrid Supply Assumptions

0.55 MGD MWRA
1.0 MGD Local – Happy Hollow

Infrastructure

- PFAS treatment & Chloramine conversion at Happy Hollow
- Well replacement 2041
- ~~Redundant storage tank~~
- Recurring / foreseeable local supply upgrades for 50 years
- Connection work at MWRA
- Pump station for MWRA water
- Transmission main
- Upgrades to Wayland's mains

MWRA Fees

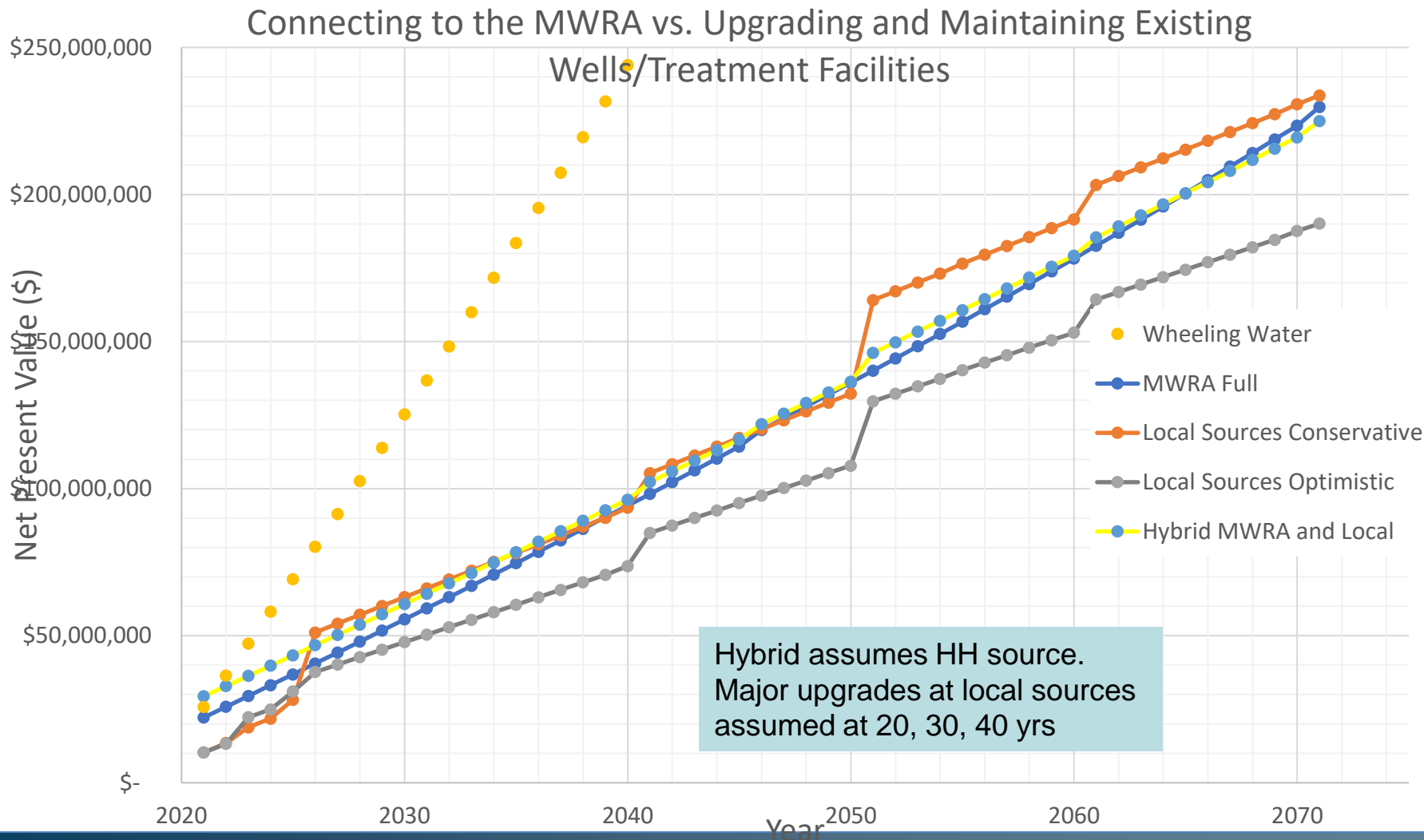
- Entrance fee \$4M x 0.55 MGD interest free over 25 yr
- Wholesale water rate \$4,320/MG (3.9% escalation)

Decision Factors

- Uncertainties and Risks: water quality, drought, labor / supply chain

	LOCAL SOURCES	FULL MWRA SUPPLY	HYBRID: LOCAL 1MGD / MWRA 0.55 MGD
Decision Factor	Discussion	Discussion	Discussion
Capacity to Supply Current & Future Needs	Local Source Treatment upgrades needed to meet demand; redundancy	Abundant Supply	Local Source Treatment upgrades needed to meet demand; redundancy
Recurring Maintenance & Investment	Well redevelopment, pump station & WTP repairs; distribution system upkeep and replacement	pump station; distribution system upkeep and replacement	Well redevelopment, pump station & WTP repairs; distribution system upkeep and replacement
Uncertainties and Risks	Changes in water quality; drought, declines in yield; change in regulations, staff availability and training, Supply chain issues	Supply risk passed to MWRA	Changes in water quality; declines in yield; change in regulations, staff availability and training
Conservation / Restrictions	All options require conformance with MA Water Conservation Standards		
Permitting	N/A	Interbasin Transfer Act / MEPA	Interbasin Transfer Act / MEPA
Regulatory Compliance	Complex & Labor intensive	Distribution system only	Reduced from full Local
Operation / Maintenance Considerations	Supply Sampling, WTP, PS, Well, Tank maintenance, distribution sampling	Distribution sampling, PS & Tank maintenance	Supply Sampling, WTP, PS, Well, Tank maintenance, distribution sampling
Other Benefits	No concerns about switch to chloramination	Technical Assistance; interest free loans for main upgrades & lead service replacement	Technical Assistance; interest free loans for main upgrades & lead service replacement
Other Concerns		Disruption due to water main construction ~ 4 miles	Disruption due to water main construction ~ 4 miles

Lifecycle cost comparison (Net Present Value)



Next Steps

- Refine / Finalize detailed cost assumptions
- Evaluate alternate Hybrid options?
- Finalize Draft Report