

# Town of Ayer

## Drinking Water Production Capacity Discussion

Ayer Select Board May 23, 2023



# Discussion

- Brief Supply System History
- What is the Concern
- Engineering Study
- Recommended Solution
- Estimated Costs and Funding Opportunities
- Strategy to Address Immediate Concern

# Brief Supply System History

- Authorized in 1887
- 3340 Service Accounts
- Two Supply Sources
  - Spectacle Pond (Merrimack River Basin)
  - Grove Pond (Nashua River Basin)
- Emergency Interconnections
  - Three with Devens (Barnum Rd., West Main St., Fitchburg Rd.)
  - One with Littleton (Willow Rd.)



# Grove Pond

- Well 1 was activated in 1943
- Well 2 was activated in 1952
- Primary water supply until 1975
- Initial Treatment Plant was completed in 1998
  - 2.0 MGD
  - Removal of Iron, Manganese, and Arsenic
  - Primary Producer for Town once again
- 2015 Wells 6, 7, and 8 replaced 1 and 2
- 2018 Temporary PFAS treatment with GAC for Well 8
- 2020 Permanent PFAS treatment with AIX became active



# Spectacle Pond

- Well 1 was activated in 1975
- Initial Treatment Plant was completed in 1984
  - 2.0 MGD
  - Removal of Iron and Manganese
  - Primary producer for Town until 1998
- Well 2 was activated in 1986
- Became primary producer again in 2020
- Wells 1 and 2 were replaced in 2021 and 2017 respectively
- PFAS treatment with GAC was activated July 2022

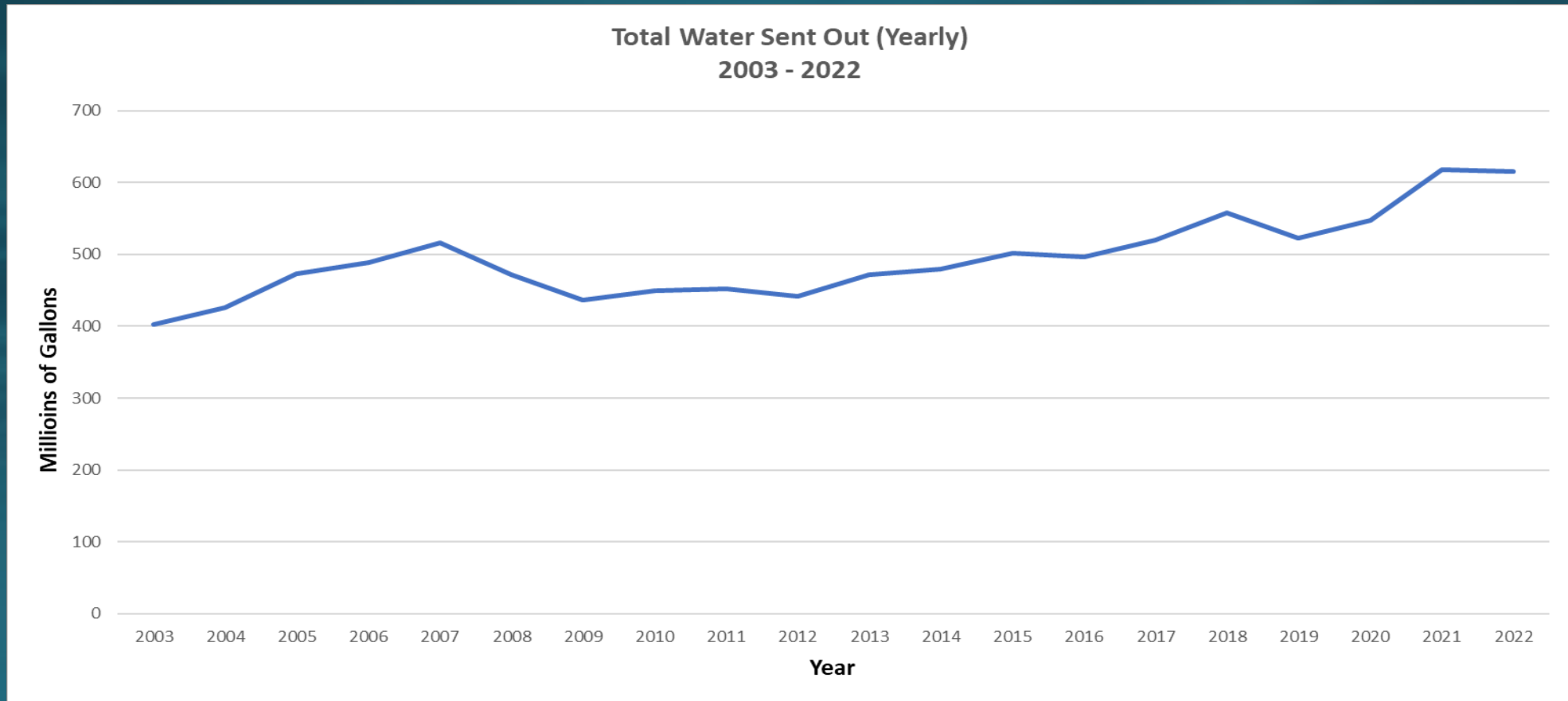




# What is the Concern

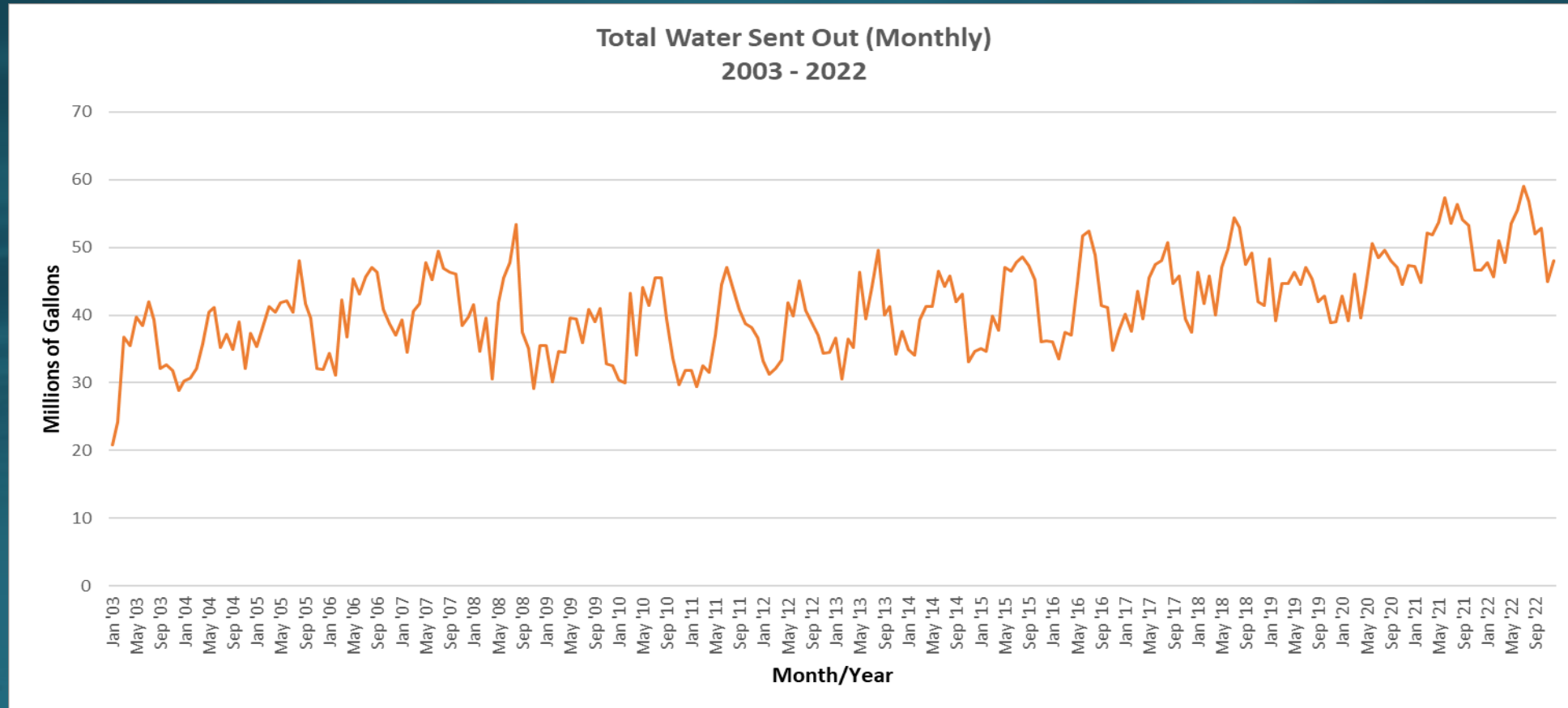
- Water Consumption has Increased
  - Concerns about being able to meet summer demands
  - Concerns about being able to meet future demands
- Production Capacity has Decreased
  - PFAS Treatment

# Water Consumption has Increased



# Water Consumption has Increased

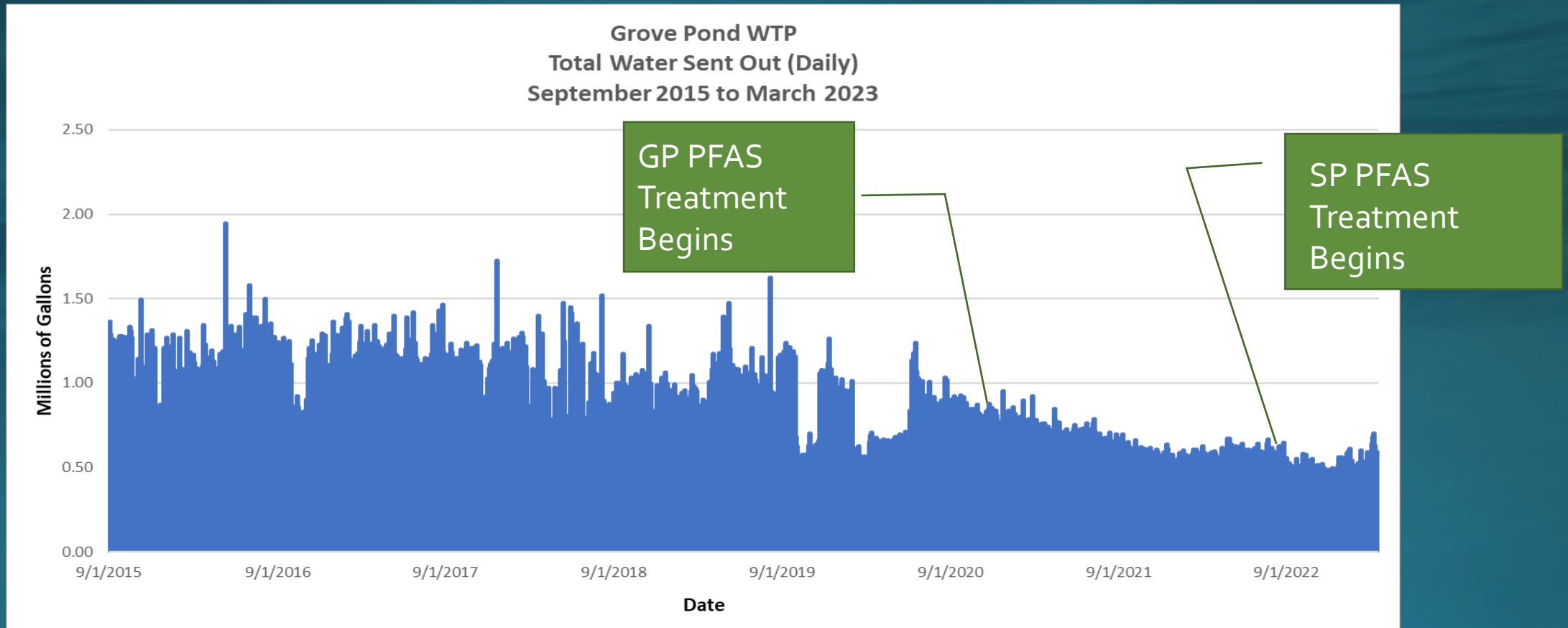
- Since winter of 2013 / 2014 winter consumption has increased
- Since 2018, overall consumption has increased





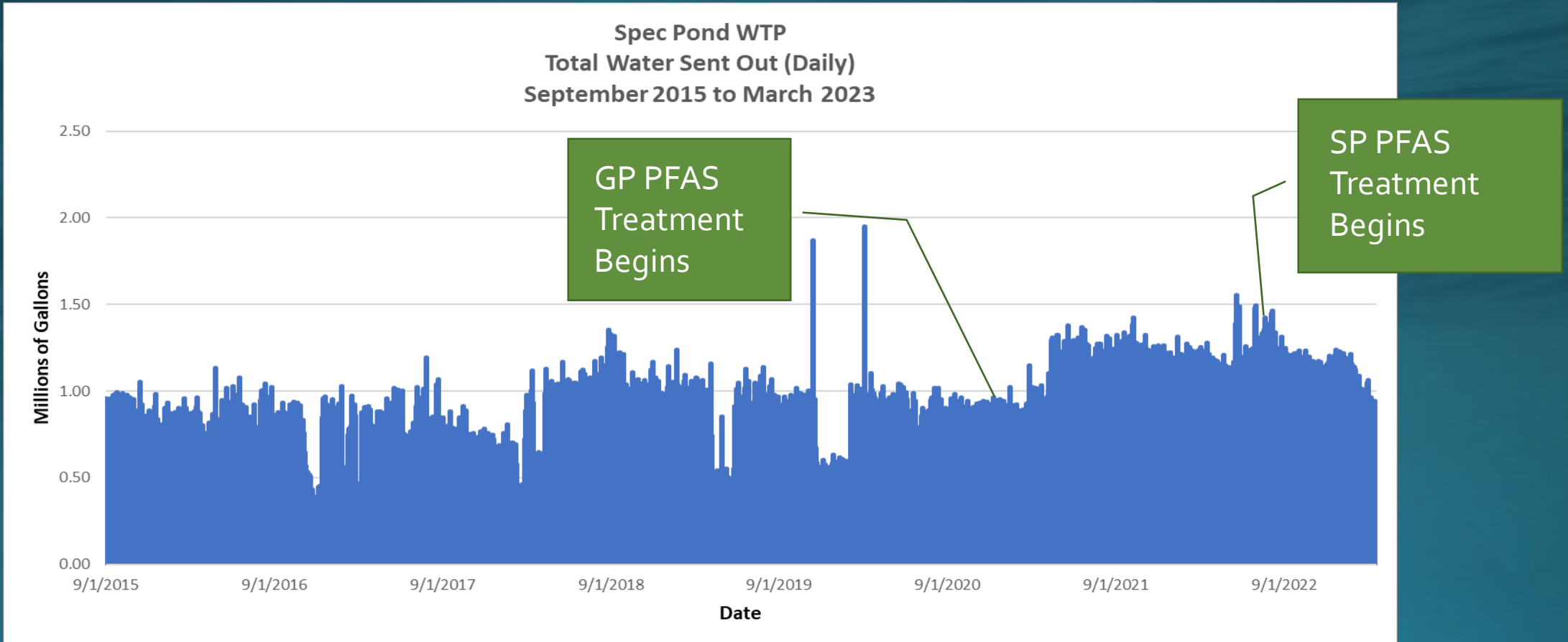
# Production Capacity has Decreased

- PFAS Treatment has created a production bottleneck: Grove Pond
- Production is hindered from ~1.2 MGD to ~0.6 MGD



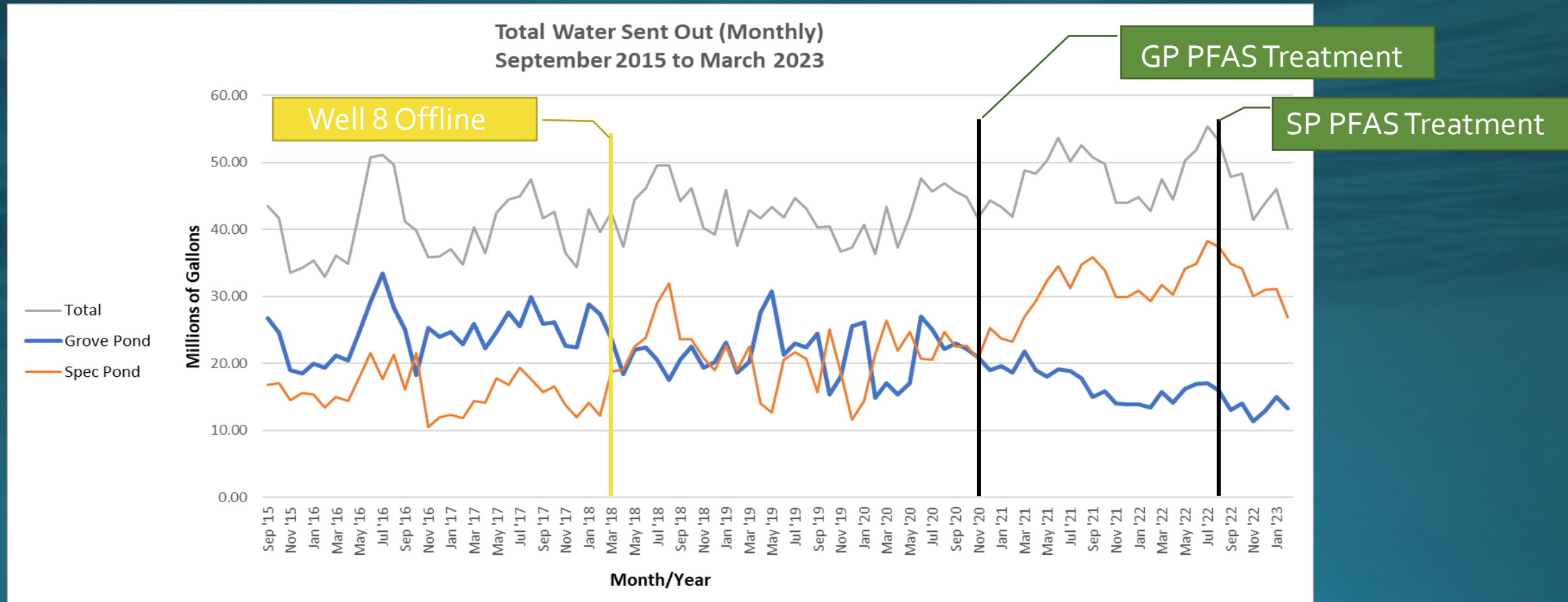
# Production Capacity has Decreased

- PFAS Treatment has created a production bottleneck: Spec Pond
- Spec Pond production increased in 2020
- Since PFAS treatment began, production is capped at 1.2 MGD



# Production Capacity has Decreased

- Primary producer has flipped from Grove to Spectacle





# Production Capacity has Decreased

- After PFAS Treatment began both facilities began to lose production capacity due to excessive head loss
  - Grove Pond is experiencing 43-49% decrease in production capability

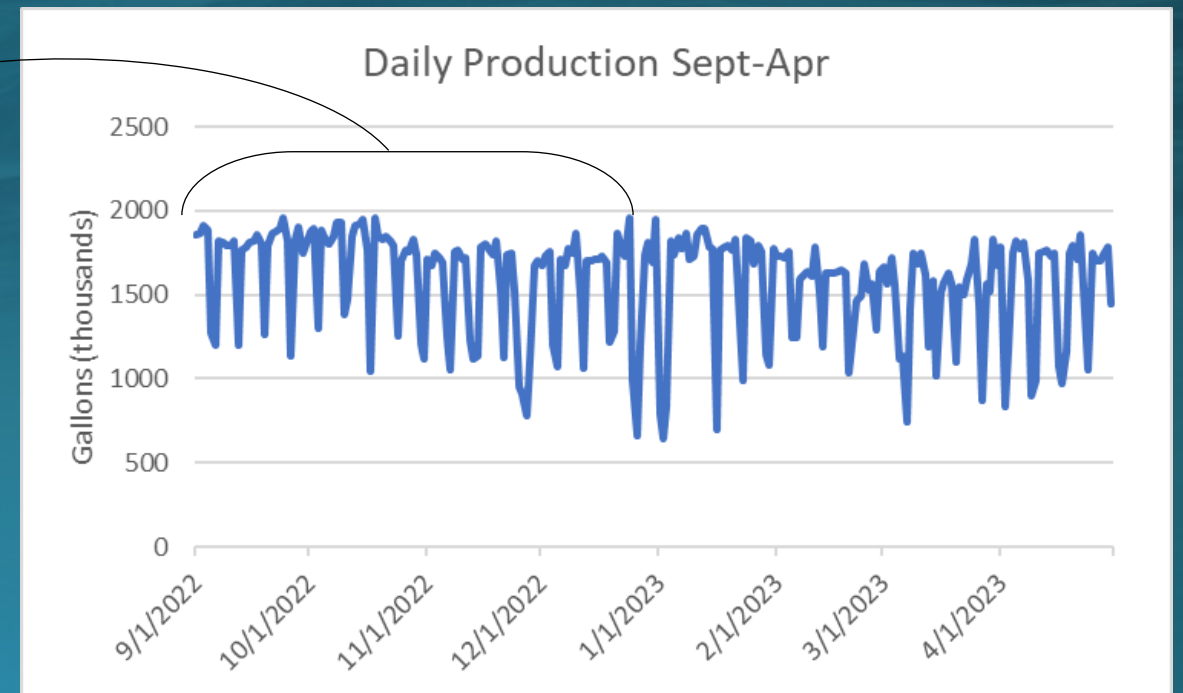
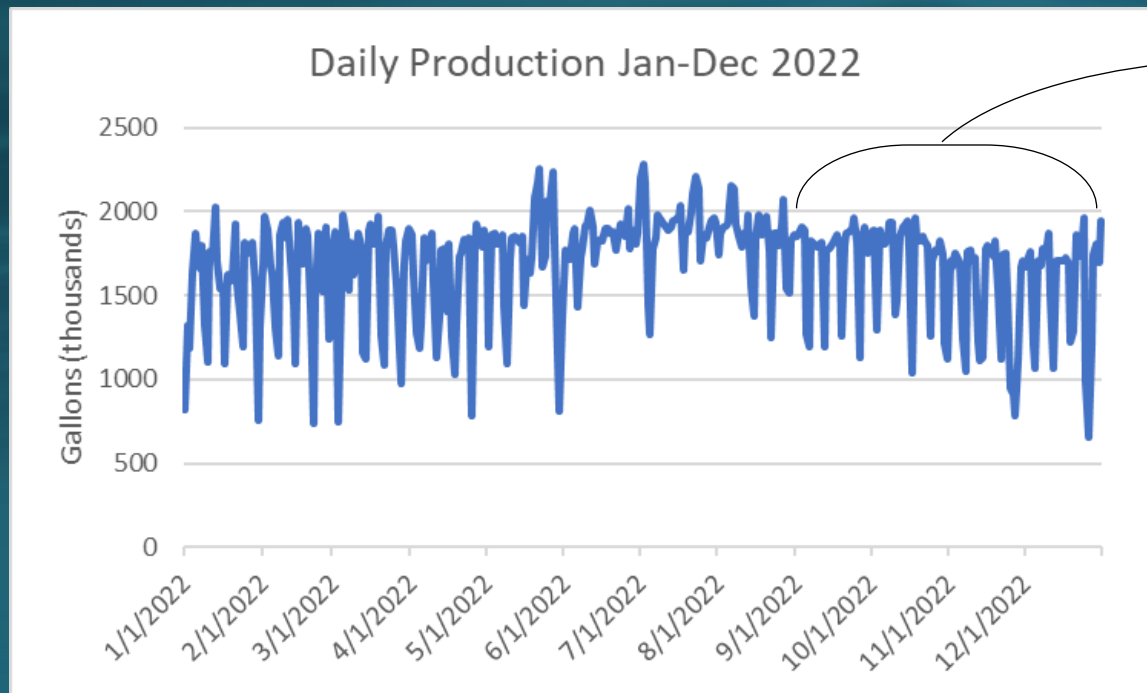
Grove Pond	April 2019	April 2022	Percent Decrease
Average	710 GPM	407 GPM	43%
Maximum	1,054 GPM	539 GPM	49%

- Spectacle Pond is experiencing 2-9% decrease in production capability

Spec Pond	Jan-Apr 2022	Jan-Apr 2023	Percent Decrease
Average	719 GPM	708 GPM	2%
Maximum	893 GPM	815 GPM	9%

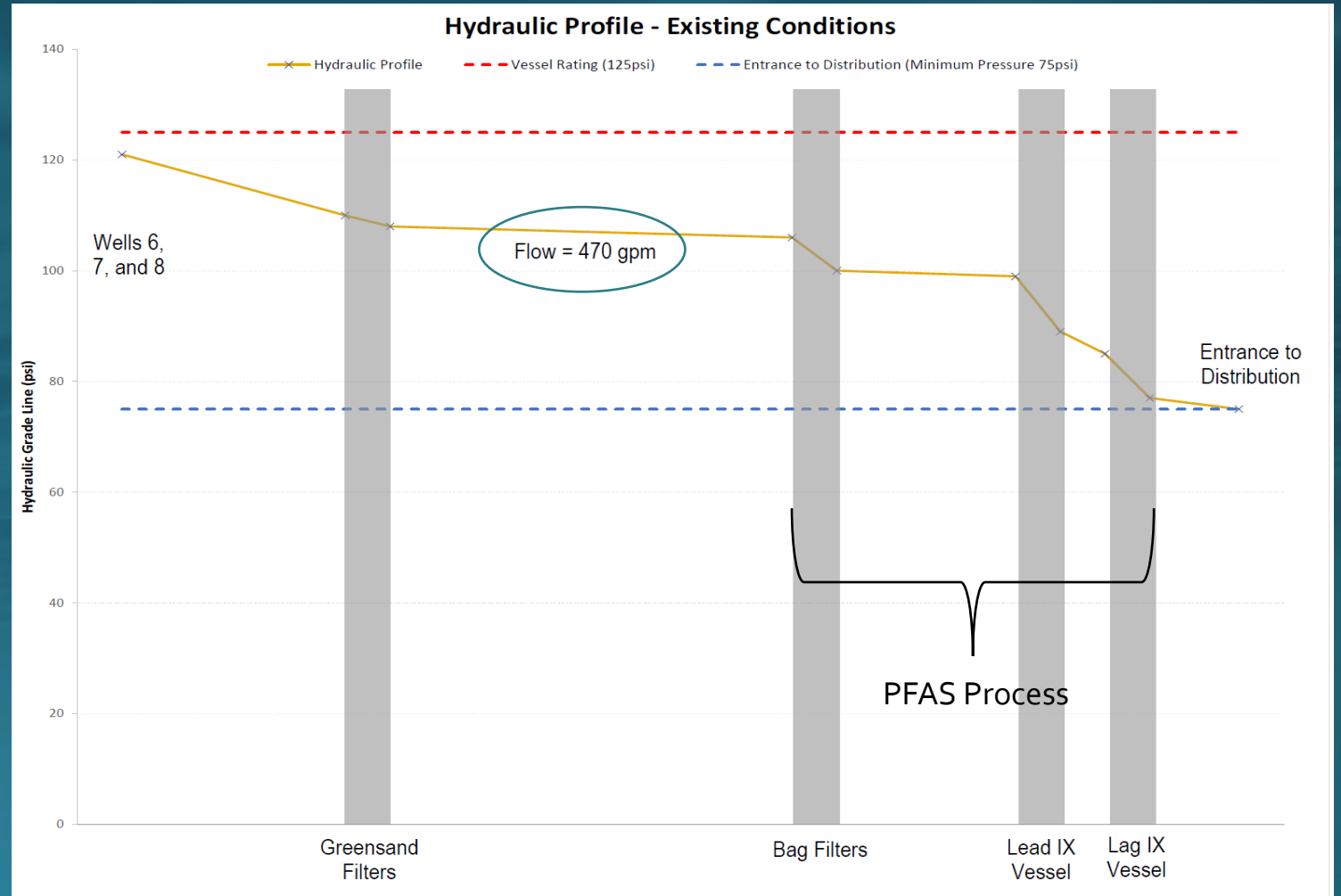
# Production Capacity has Decreased

- Currently pumping at full capacity
- Resiliency in cases of emergencies is hindered
- Projected spikes in Summer will be difficult to meet



# Engineering Study: Grove

- Firm hired to evaluate Grove Pond: Woodard and Curran
- Significant pressure loss through the PFAS system
- The wells are working at the max rate without damaging the facility with excessive pressure while still providing enough pressure to pump into the distribution system





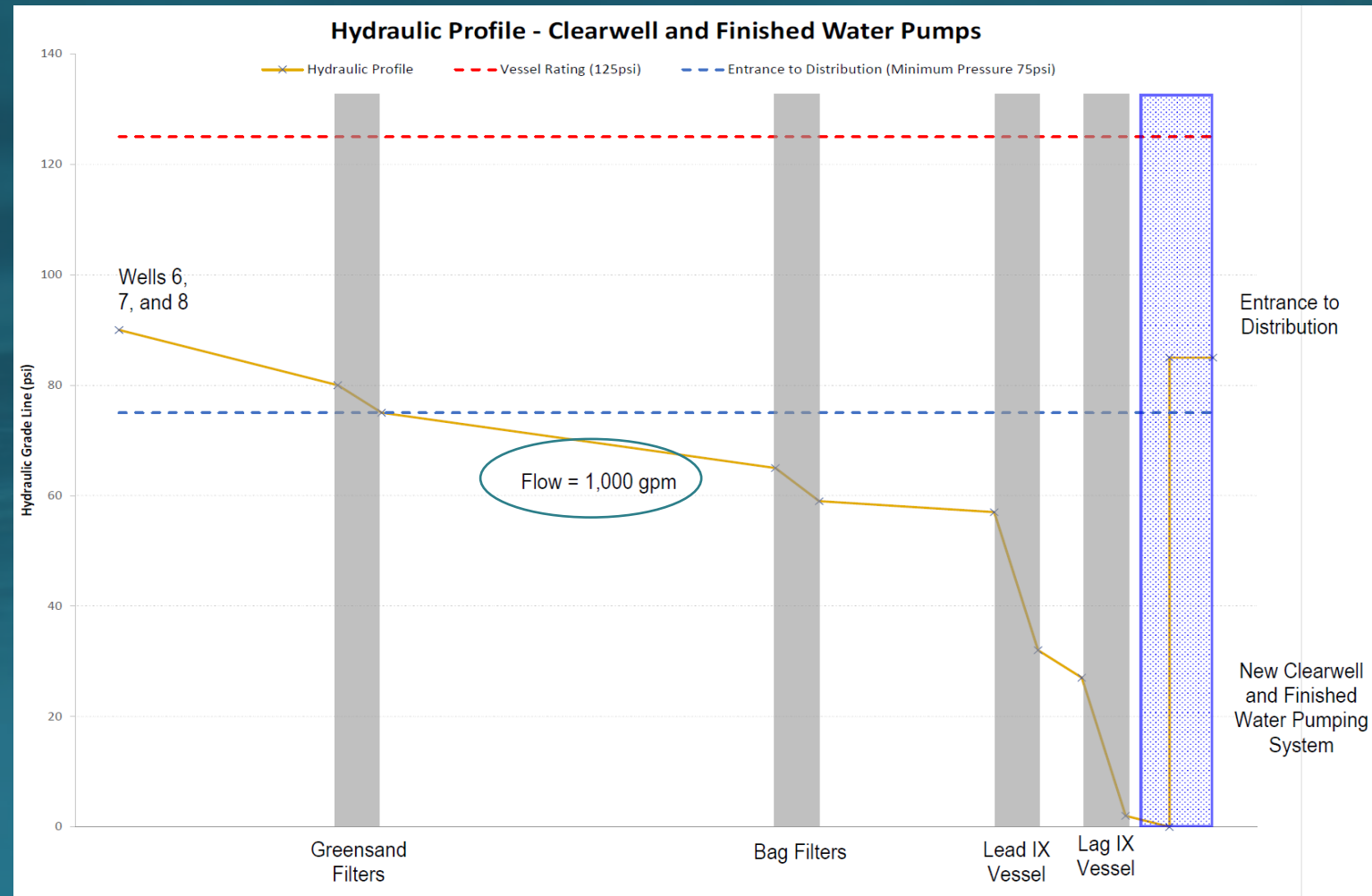
# Recommended Solution

## Install Clearwell and Finished Water Pumps

- A Clearwell is a storage tank that is at the end of the treatment process
- Creates a hydraulic break between the facility and the distribution system
- Allows the facility to operate at full capacity
- Finished Water Pumps to pump from the Clearwell to the distribution system
- Resizing the existing well pumps/motors to accommodate the new hydraulic conditions may be needed



# Potential Hydraulic Profile



# Estimated Costs and Funding Opportunities

Item	Unit	Quantity	Unit Cost	Total Cost
Administration	LS	1	\$ 150,000	\$ 150,000
Clearwell	LS	1	\$ 400,000	\$ 400,000
Yard Piping and Valving	LS	1	\$ 125,000	\$ 125,000
Pump Station Building	LS	1	\$ 475,000	\$ 475,000
Finish Water Pumps	EA	2	\$ 90,000	\$ 180,000
Electrical & Instrumentation	LS	1	\$ 150,000	\$ 150,000
Well Pump Replacement	EA	3	\$ 50,000	\$ 150,000
Earthwork	LS	1	\$ 200,000	\$ 200,000
Construction Subtotal				\$ 1,830,000
Contingency (30%)				\$ 549,000
Engineering Design, Bidding, Regulatory Approval and Construction Phase Services (20%)				\$ 366,000
Total				\$ 2,745,000

This is the engineer's preliminary cost estimate

- Army
- Emergency SRF
- Grant Opportunities



# Strategy to Address Immediate Concern

How we plan to get through this summer:

- Monitor the need to recommend State of Water Supply Conservation measures
  - Daily monitoring of tank levels, production, and operations
  - Updates to Select Board / Water Commissioners at a frequency TBD
- Work with our large customers
- Work with Devens and Littleton

# Thank you

Dan Van Schalkwyk, P.E., Director

Kimberly Abraham, Water and Sewer Superintendent

Matt Hernon, P.E., Town Engineer

