

THE SOUTHWEST REGIONAL PIPELINE

Improving Supply Resilience in SW Fairfield County

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AGENDA

The Southwest Fairfield County Region (SWFCR)

Water Supply Need

Project Objectives

Alternatives Evaluated

Improvement Plan

Diversion Permitting

Lessons Learned

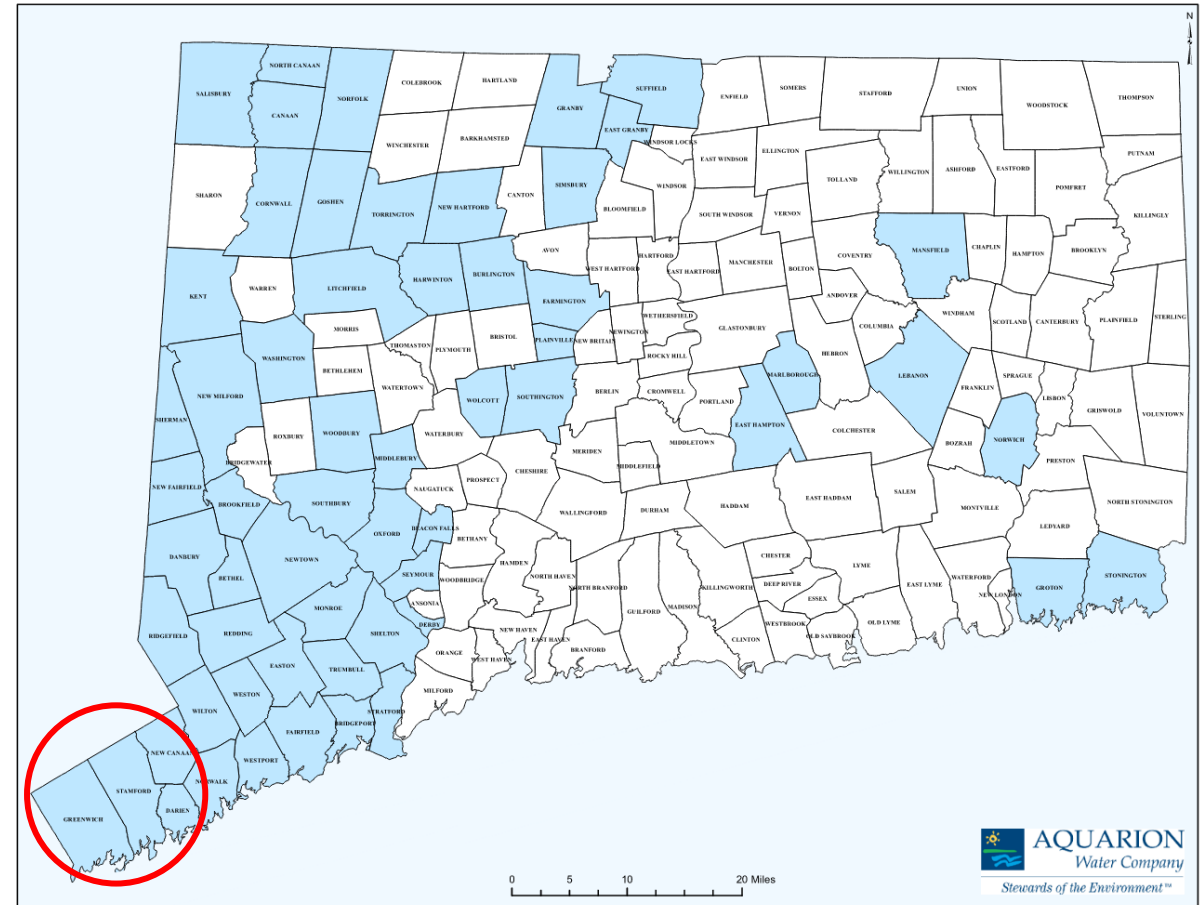
Implementation Status

Questions



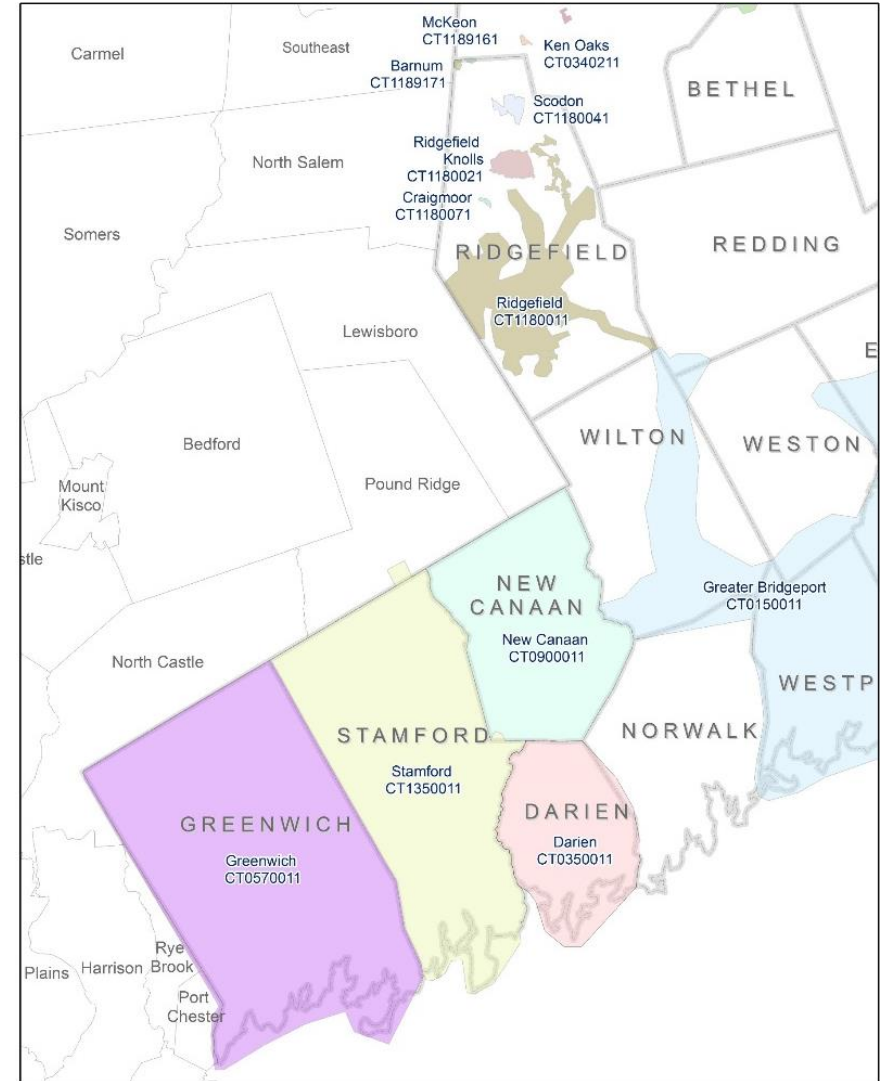
AQUARION WATER COMPANY OF CONNECTICUT

- **Founded in 1857**
- **73 Public Water Systems**
- **59 Communities**
- **>710,000 People Served**



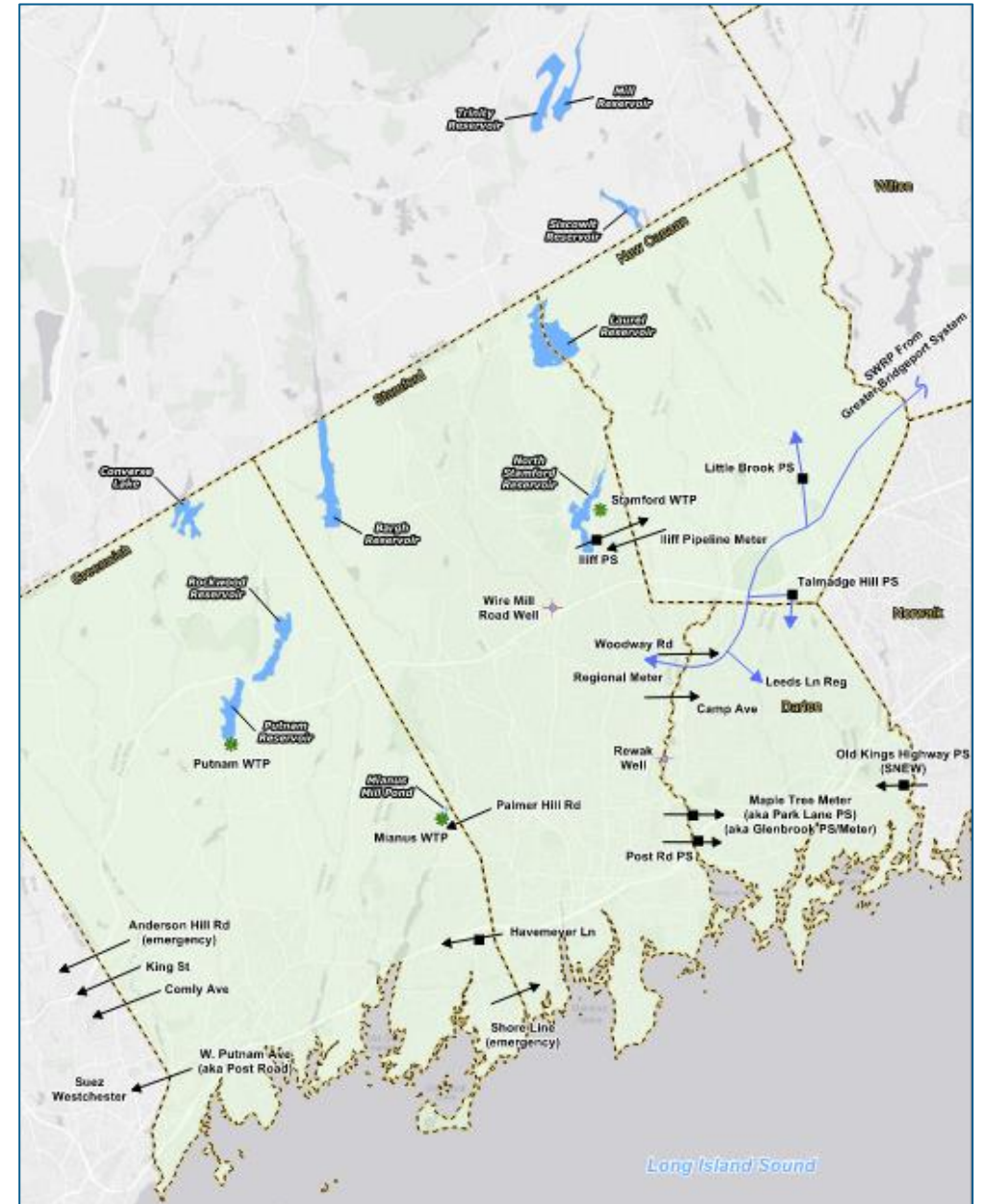
SOUTHWEST FAIRFIELD COUNTY REGION (SWFCR)

- **Four Towns**
- **Four Public Water Systems**
- **>200,000 People Served**
- **Water Usage**
 - Average Day ~ 33 mgd
 - Maximum Day ~ 50 mgd



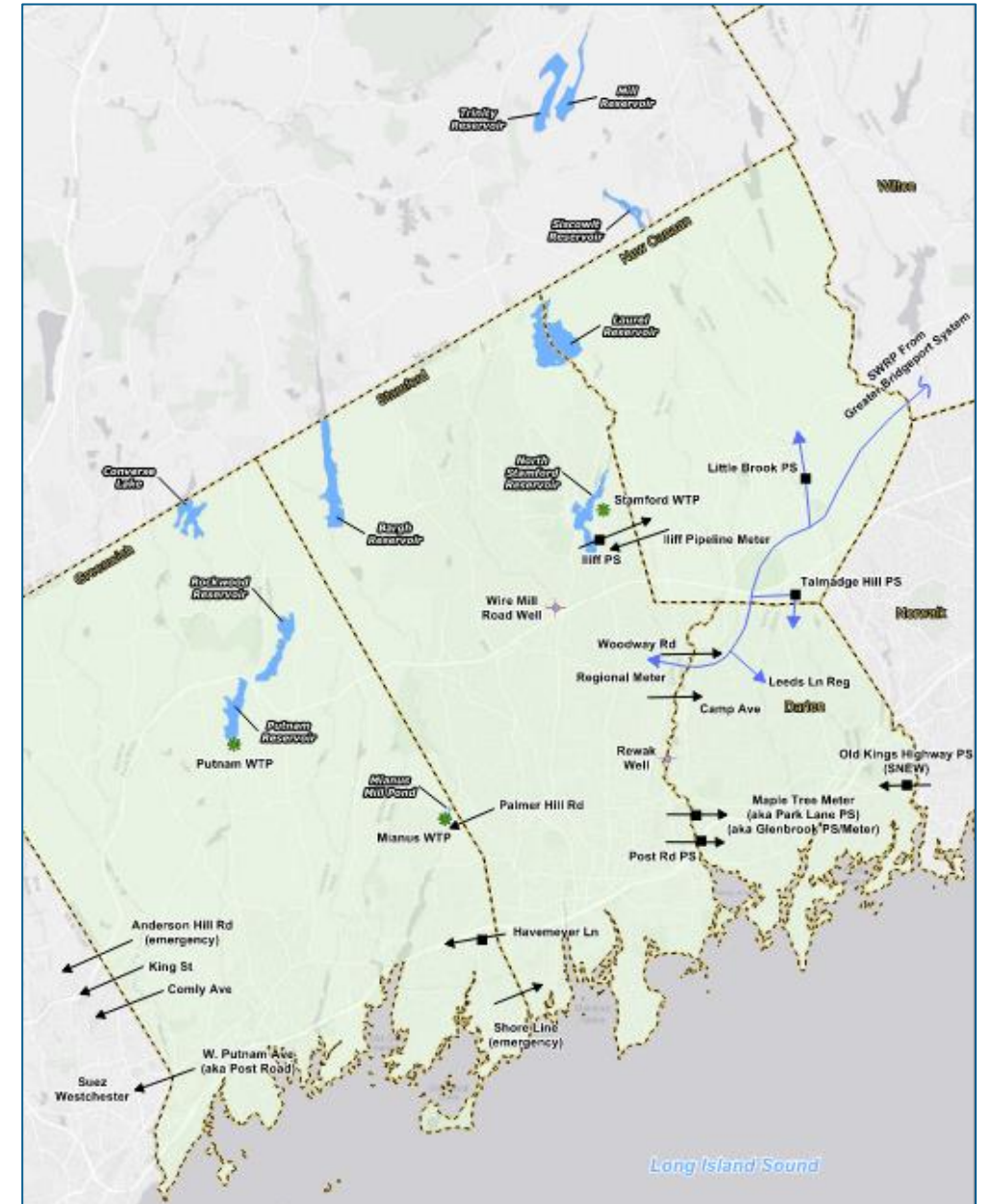
SWFCR SOURCES OF SUPPLY

- Greenwich Reservoir System
- Stamford Reservoir System
- Wire Mill Well (Stamford)
- Rewak Well (Darien)

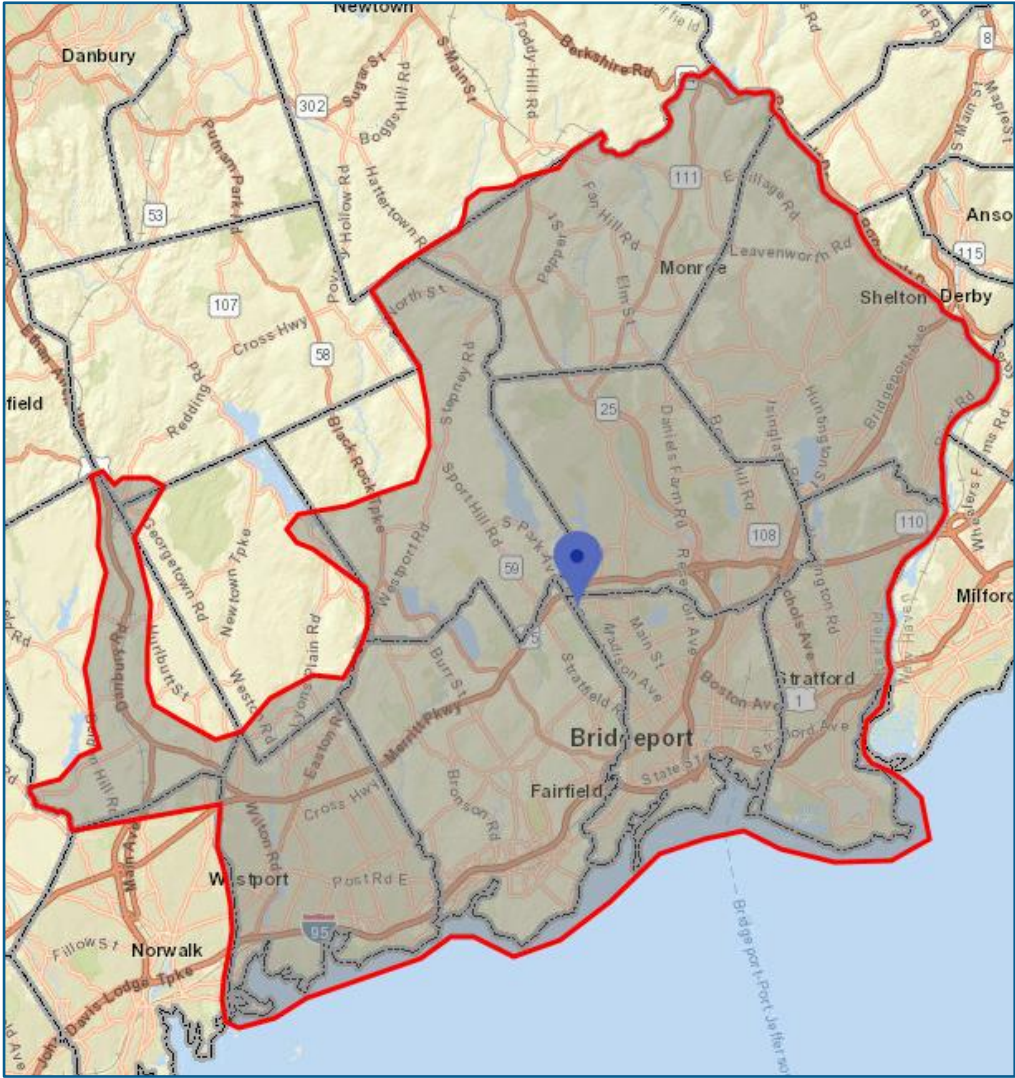


SOUTHWEST REGIONAL PIPELINE

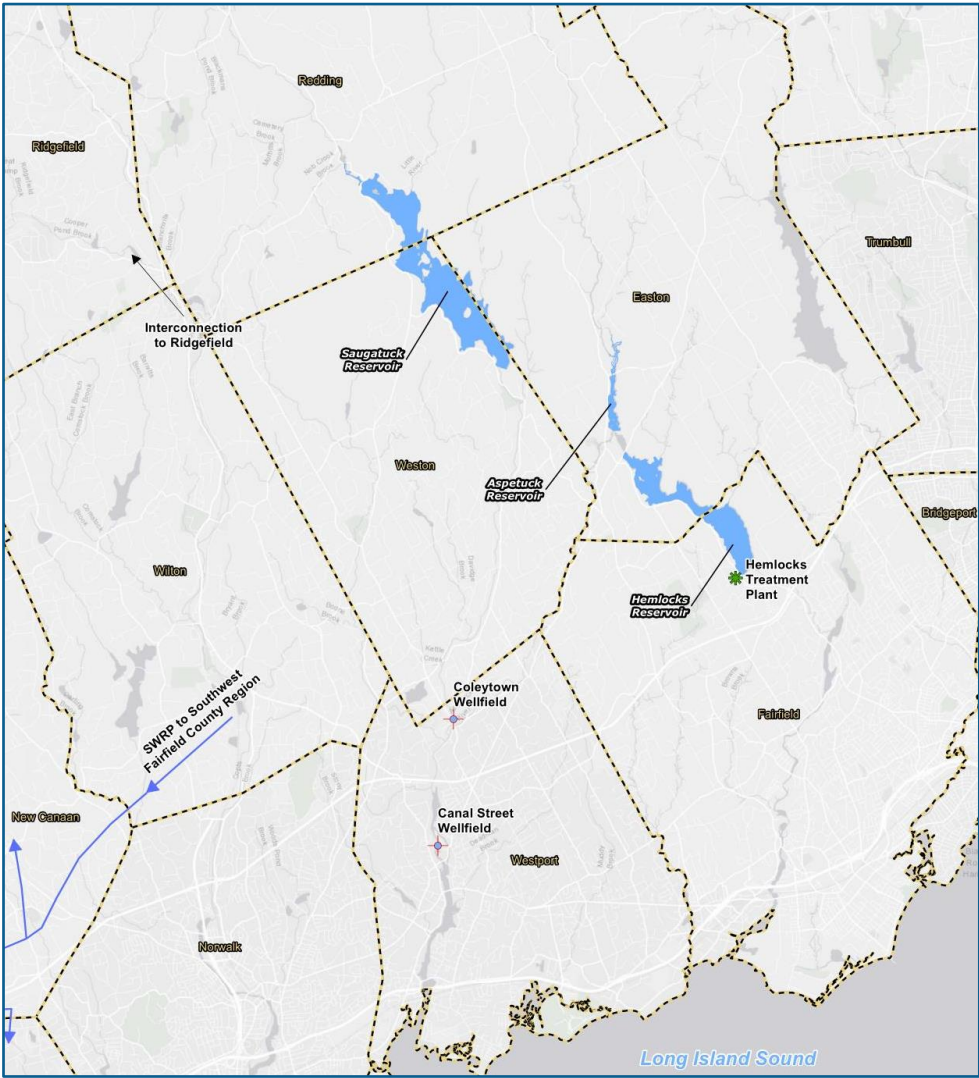
- From Greater Bridgeport System
- To Southwest Fairfield County Systems
 - Darien
 - New Canaan
 - Stamford
- In service since 1990
- Diversion Permitted



SOUTHWEST REGIONAL PIPELINE SUPPLIED BY GREATER BRIDGEPORT SYSTEM



Hemlocks Reservoir System



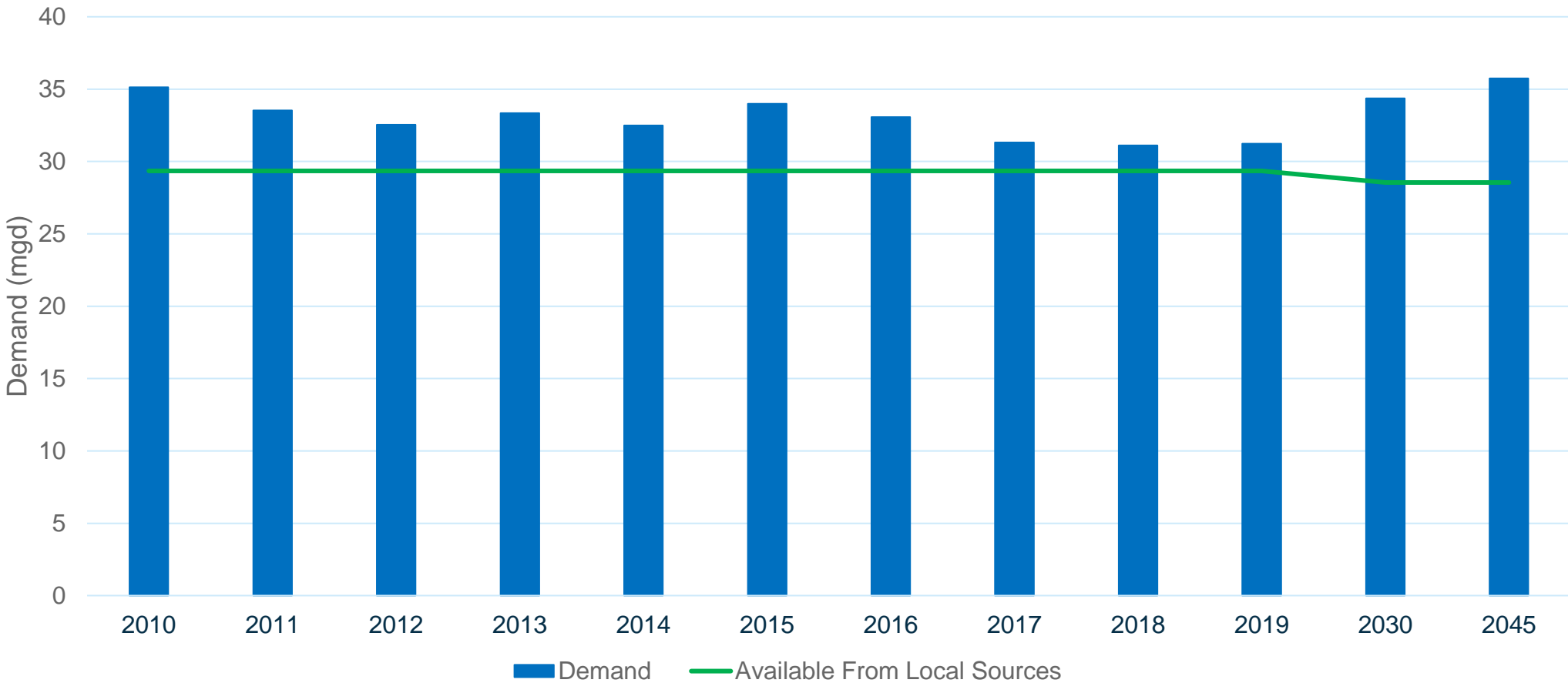
SWFCR AVAILABLE WATER FROM LOCAL SOURCES

ANNUAL AVERAGE

| Source | Available Water – Current (mgd) | Available Water >2029 ¹ (mgd) |
|--------------------------------|---------------------------------|--|
| Greenwich Reservoir System | 14.4 | 14.3 |
| Stamford Reservoir System | 14.3 | 13.6 |
| Wire Mill Well (Stamford) | 0.30 | 0.30 |
| Rewak Well (Darien) | 0.35 | 0.35 |
| Subtotal Local Sources: | 29.35 | 28.55 |

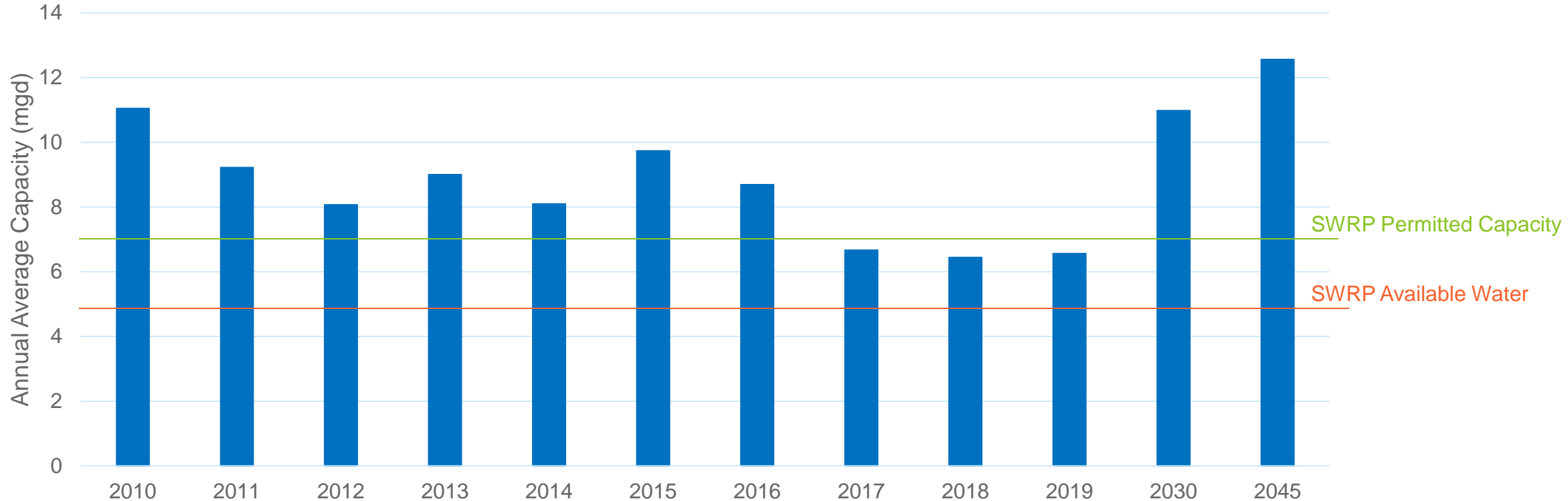
1. Following implementation of increased streamflow releases.

SWFCR DEMANDS – ANNUAL AVERAGE



SWFCR demands are projected to increase, but not significantly higher than in the past.
Demands cannot be met from local sources alone.

CAPACITY NEEDED IN ADDITION TO LOCAL SOURCES



1. Based on Margin-of-Safety (Supply/Demand) = 1.15

Annual average supply of 12–13 mgd is required from the SWRP to meet DPH target for adequate supply.

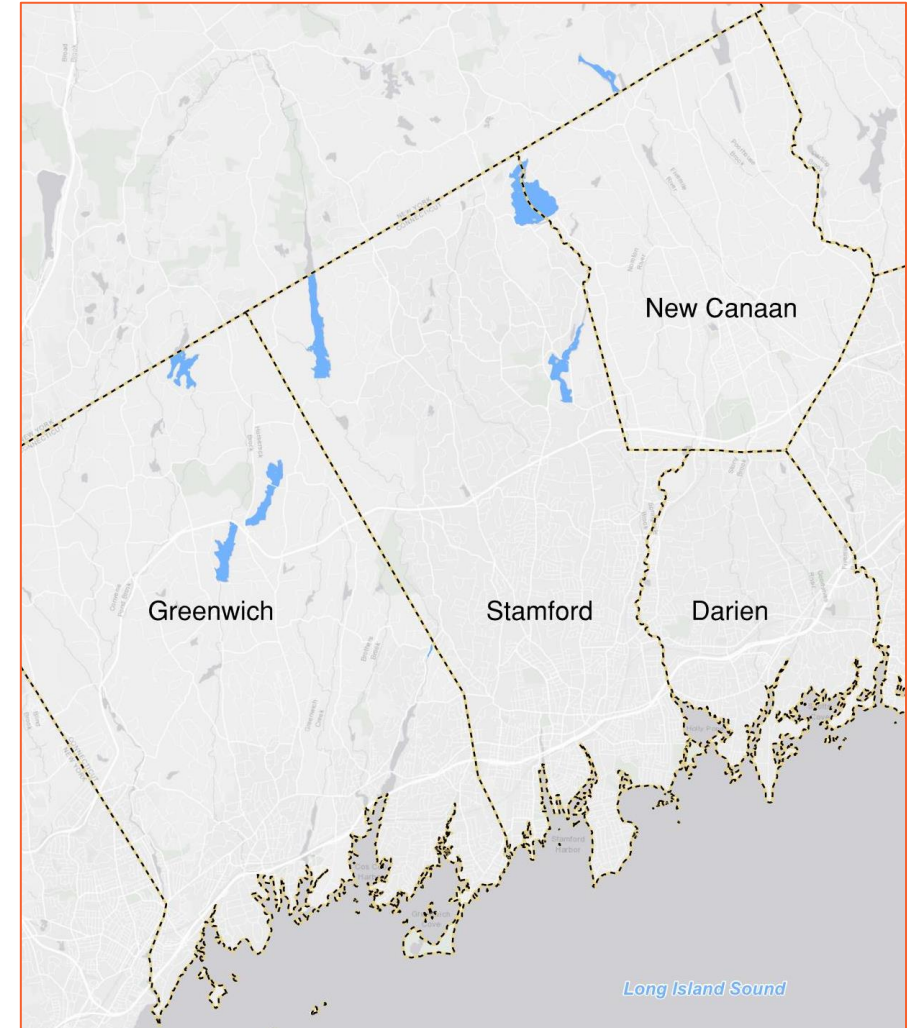
2016 DROUGHT

- **High Demands and Low Inflow**
- **Reservoir Storage (9/19/16)**
 - Greenwich 34%/49 days
 - Stamford 50%/112 days
- **Reservoir Forecasts (1%)**
 - Greenwich <10%
 - Stamford <25%
- **Public Water Supply Emergency**
- **Water Use Restrictions**
- **Emergency Supply**
 - 4 Pump Stations
 - ~30,000 ft temporary water mains



IMPROVEMENT OBJECTIVES

- Provide adequate public water supply
- Improve drought resilience
- Meet reservoir release requirements



IMPROVED DROUGHT TRIGGERS

Forecast Based

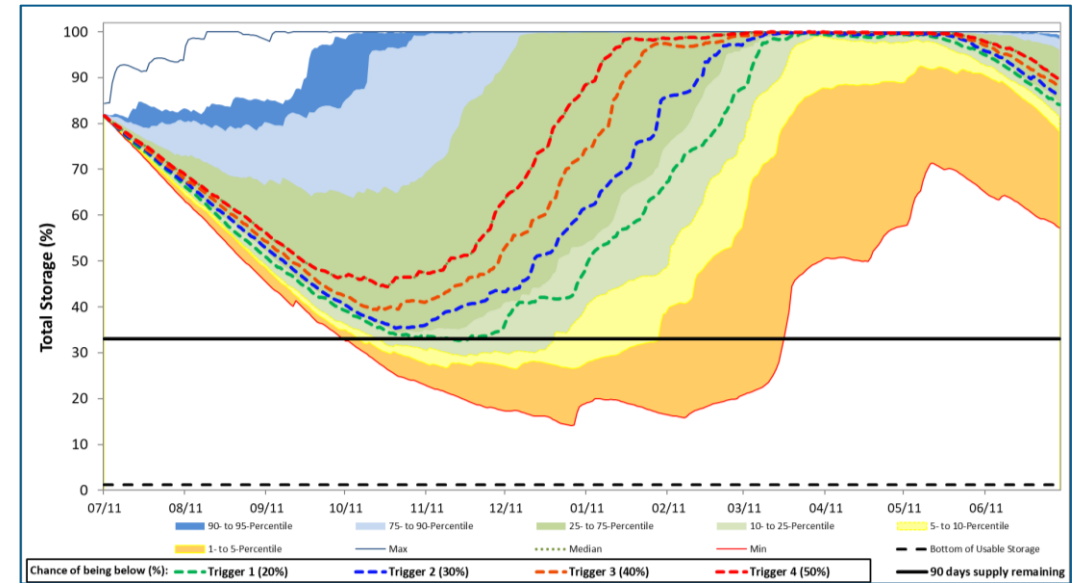
Advisory – 20% chance of hitting 90 days storage within 6 months

Watch – 30% chance of hitting 90 days storage within 6 months

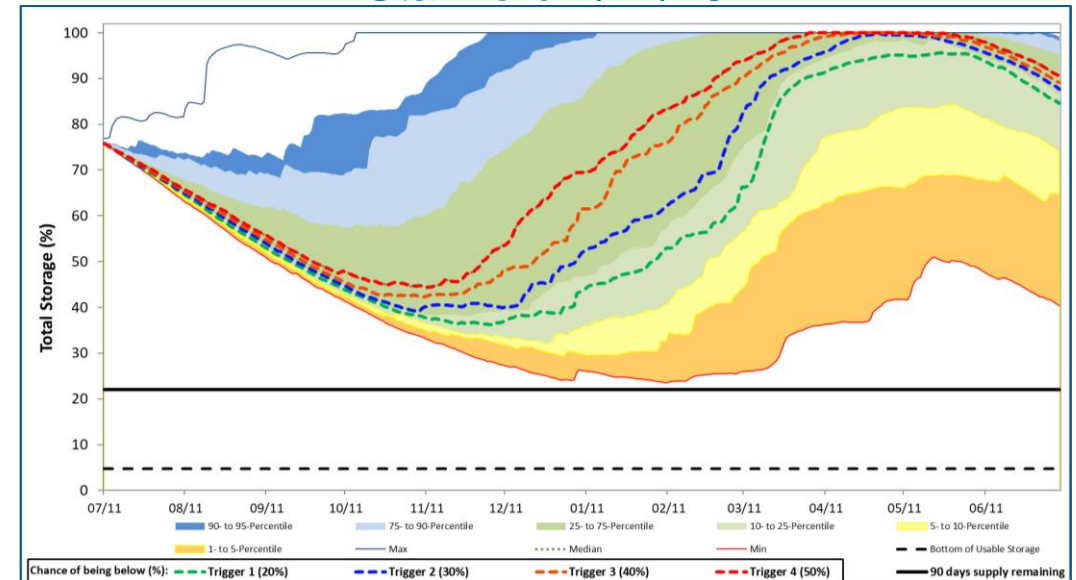
Warning – 40% chance of hitting 90 days storage within 6 months

Emergency – 50% chance of hitting 90 days storage within 6 months

Greenwich 7/11/23



Stamford 7/11/23



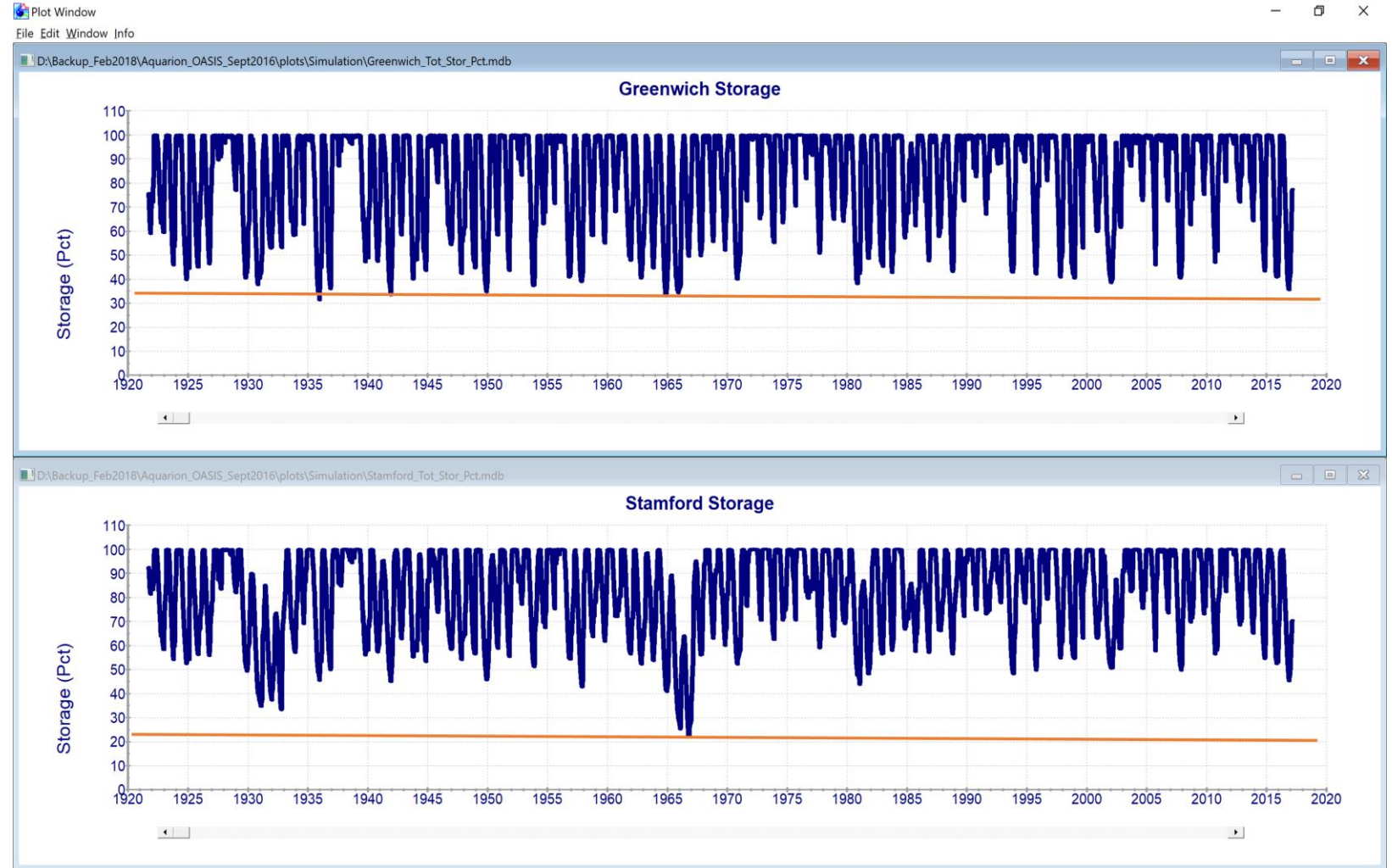
Hazen & Sawyer

Tighe & Bond

IMPROVED DROUGHT TRIGGERS

Tested

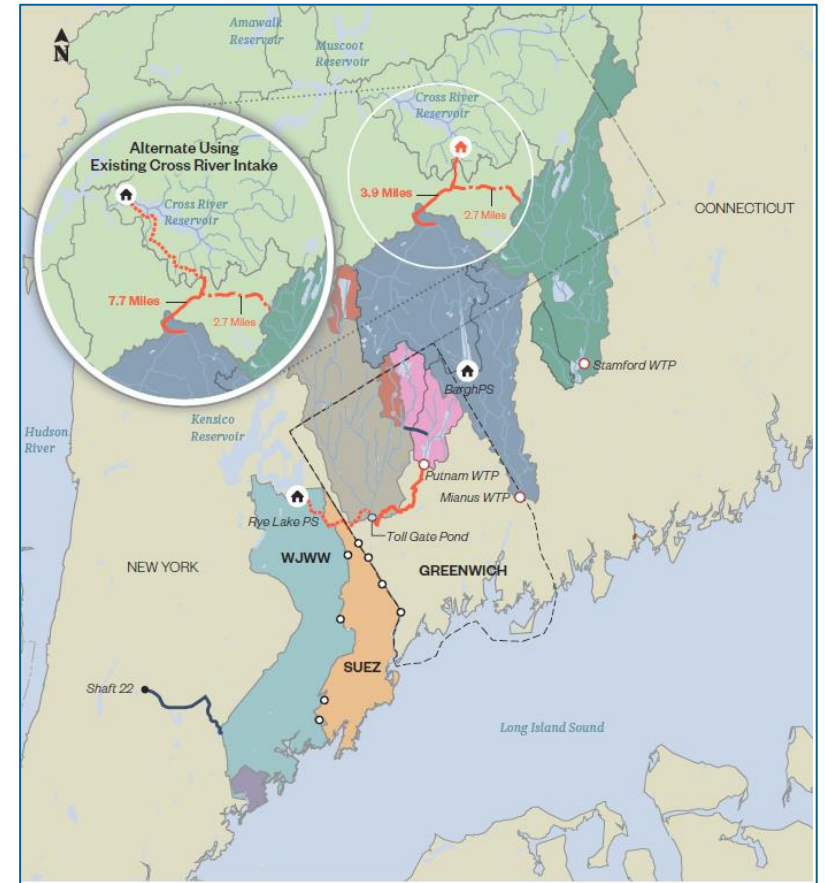
- Reservoir drawdown
- Trigger frequency



Hazen & Sawyer

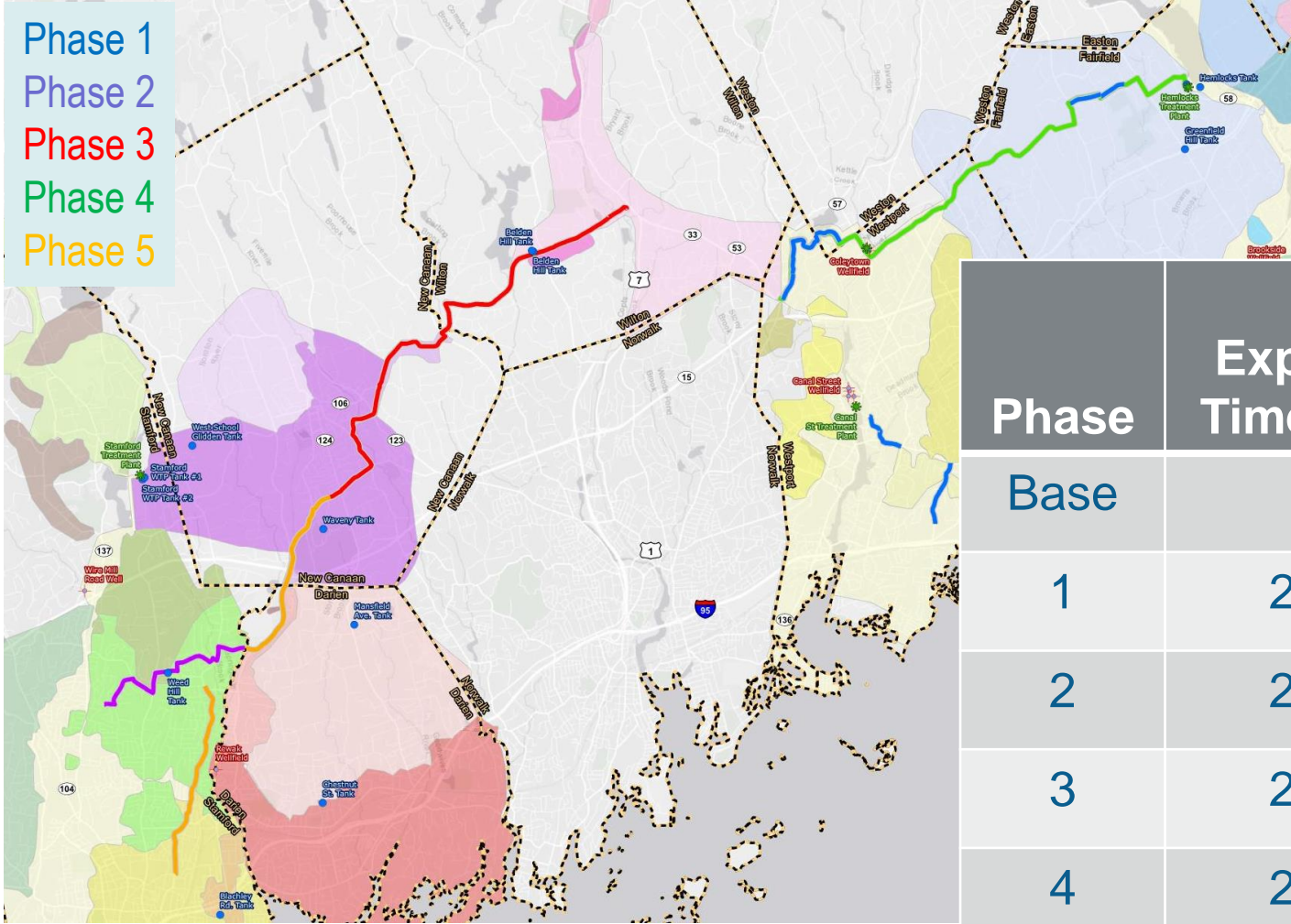
SUPPLY ALTERNATIVES CONSIDERED

- **Purchase water from New York City**
 - Treated
 - Raw
- **Increase reservoir storage**
- **Develop groundwater supply**
- **Increase Southwest Regional Pipeline Capacity**



Hazen and Sawyer

PHASED SWRP IMPROVEMENT PLAN



- Phase 1
- Phase 2
- Phase 3
- Phase 4
- Phase 5

| Phase | Expected Timeframe | Winter Capacity (mgd) | Summer Capacity (mgd) | Average Capacity (mgd) |
|-------|--------------------|-----------------------|-----------------------|------------------------|
| Base | | 5.3 | 4.2 | 4.8 |
| 1 | 2020 | 5.4 | 7.5 | 6.5 |
| 2 | 2020 | 7.0 | 7.8 | 7.4 |
| 3 | 2025 | 8.1 | 9.2 | 8.7 |
| 4 | 2029 | 11.9 | 14.2 | 13.1 |
| 5 | ≈2045 | 16.5 | 17.0 | 16.8 |

CONSERVATION IS KEY TO ALL ALTERNATIVES



Success Will:

- Reduce actual transfers through SWRP
- Delay phased improvements
- Increase drought resilience

Conservation Tips to Reduce Outdoor Water Usage

Responsible Watering Starts Here

For Aquarion Customers in Darien, Greenwich, New Canaan, Newtown, Stamford and Westport

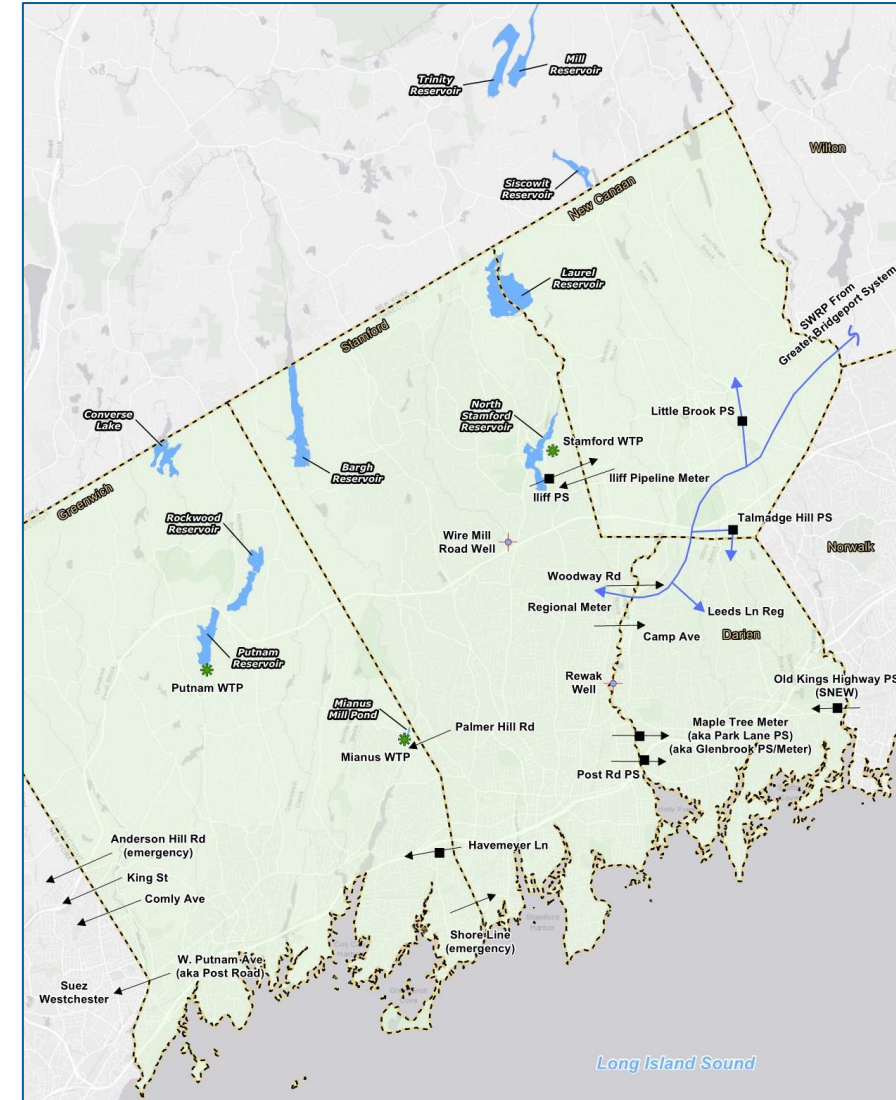
Efficient **Inefficient**

Mandatory, Maximum Twice-Weekly Sprinkler Irrigation Schedule

| Last Digit of Your Address Number | Please Water Only On: |
|-----------------------------------|---|
| 0, 2, 4, 6 or 8 (even numbers) | Sunday & Wednesday 12:01 am – 10:00 am, or 6:00 pm – Midnight |
| 1, 3, 5, 7 or 9 (odd numbers) | Saturday & Tuesday 12:01 am – 10:00 am, or 6:00 pm – Midnight |
| No address number | Sunday & Wednesday 12:01 am – 10:00 am, or 6:00 pm – Midnight |

SWRP DIVERSION PERMIT APPLICATION

- Greater Bridgeport to SWFCR service areas
- Maximum daily limit = 14.2 mgd
- Confirm four systems in SWFCR are one service area
- 25 Years



DIVERSION PERMIT APPLICATION PROCESS



DIVERSION PERMIT APPLICATION PROCESS

12/8/20

- Tentative Determination and Start of Public Comment Period
- Approves application with added 12.56 mgd annual average limit

1/6/21

- Public Comment Meeting

1/22/21

- End of Public Comment Period
- Petition for Public Hearing Received
 - Town of Fairfield Conservation Commission
 - Lake Hills Association
 - Mill River Wetland Committee
 - Fairfielders Protecting Land and Neighbors



PRIMARY ISSUES RAISED BY INTERVENORS

- **What will the impact of the diversion be on Cricker Brook and the Mill River downstream of Hemlocks Dam?**
- **What was the basis for the population and demand forecasts?**
- **Does the Greater Bridgeport System have adequate supply to provide additional demand?**
- **Can Housatonic Wellfield be relied on?**
 - Reactivation timeline
 - Water quality

DIVERSION PERMIT “PUBLIC HEARING” PROCESS



DIVERSION PERMIT “PUBLIC HEARING” PROCESS



DIVERSION PERMIT PROCESS

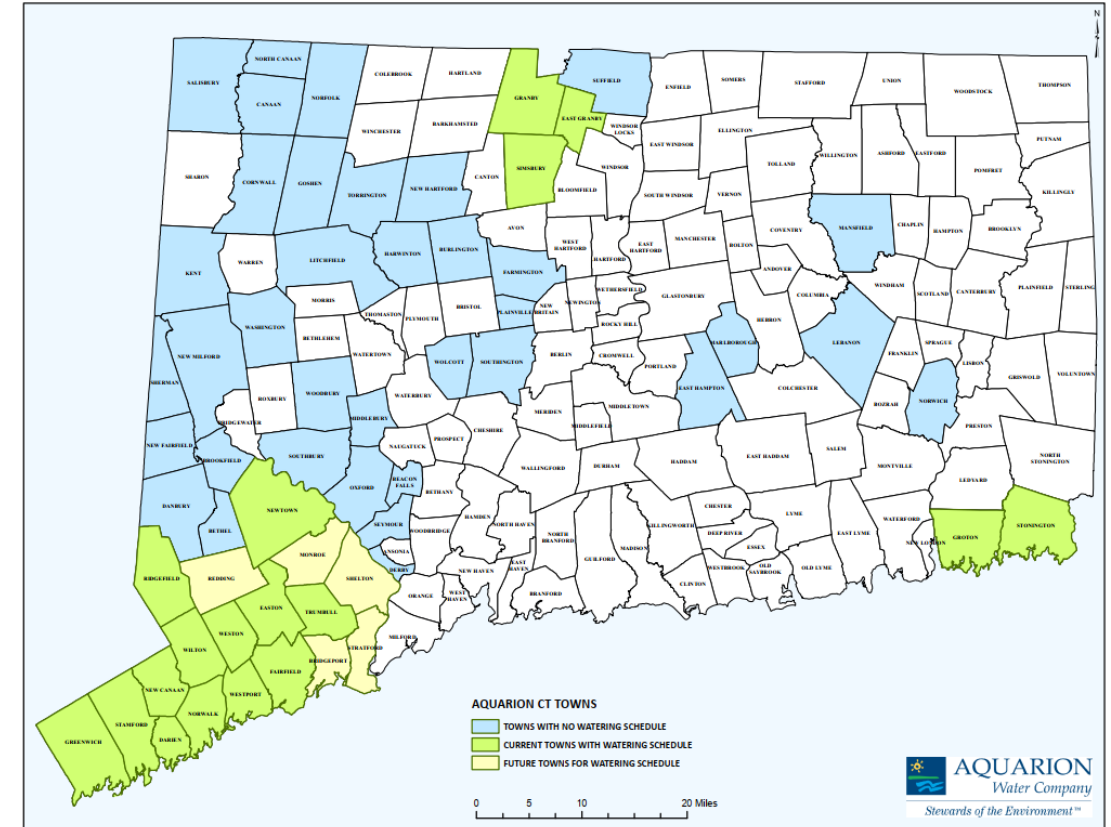


LESSONS LEARNED

- **It's not just margin-of-safety; drought planning is critical.**
- **Conservation is what we do every day, drought response is what we do in an emergency.**
- **2-day/week irrigation restrictions can be effective conservation or emergency response.**
- **Stream flow regulations define releases downstream of dams.**
- **Diversion permitted flows \neq anticipated flows.**
- **Diversion permit “public hearings” are a misnomer.**
- **Diversion permitting process can be long and expensive.**

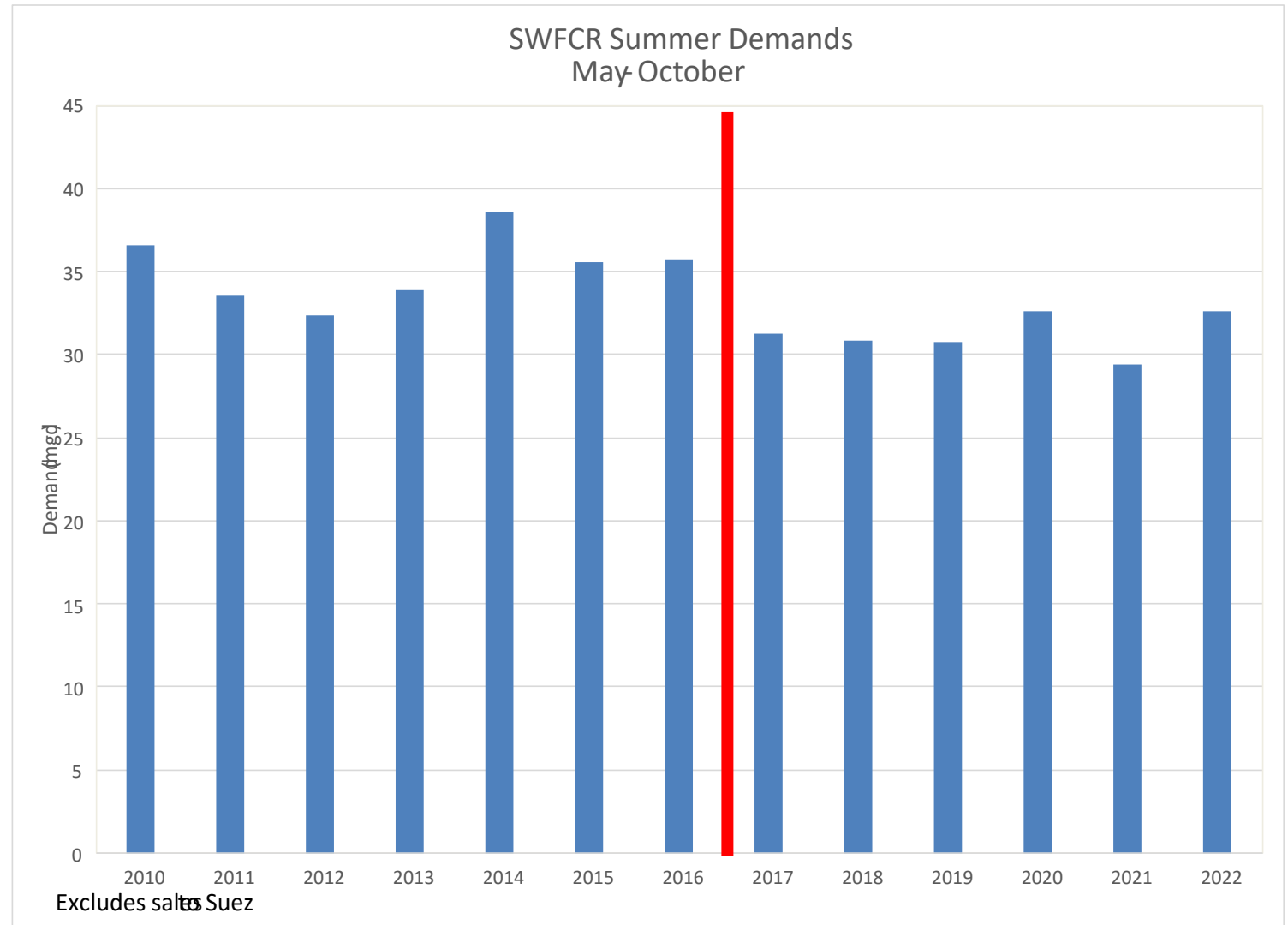
IMPLEMENTATION STATUS - CONSERVATION

- **2-day Irrigation Restrictions in place in SWFCR towns since 2016 drought.**
- **Rolling out to other communities with high outdoor water use.**



IMPLEMENTATION STATUS - CONSERVATION

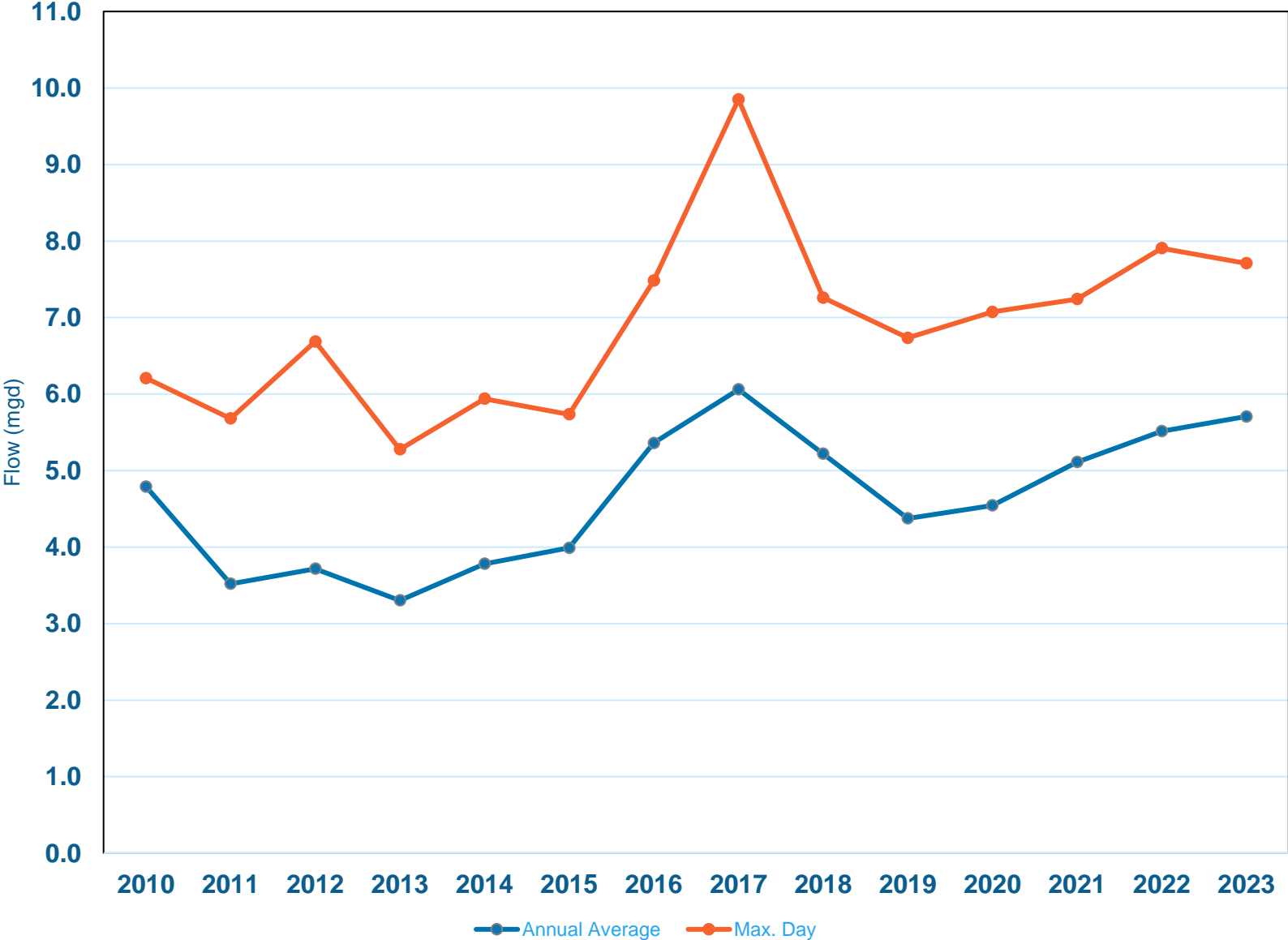
SWFCR summer demands reduced by 11% (~700 MG/yr) in six years since implementing irrigation restrictions compared to prior six years



IMPLEMENTATION STATUS – INFRASTRUCTURE IMPROVEMENTS

| Phase | Description | Cost Estimate (\$ million) | Status |
|--------------|--|-------------------------------|-----------------|
| 1 | Bridgeport System Distribution Improvements (25,000 ft 8 and 16" diameter) | \$6 | Complete |
| 2 | Stamford Transmission Main (14,000 ft of 24" diameter, 2 PRVs, and Meter Chamber) | \$12 | Complete |
| 3 | Parallel Transmission Main to High Point (19,000 ft of 36" diameter) | \$50 | In Construction |
| 4 | Pump Station and New Transmission Main (21 mgd pump station and 48,000 ft. of 36" main) | \$120 | In Design |
| 5 | Parallel 36" Transmission Main High Point to End (13,000 ft of 36" diameter main) | TBD | 2045? |
| Total | | \$188+ | |

SWRP FLOWS





QUESTIONS?