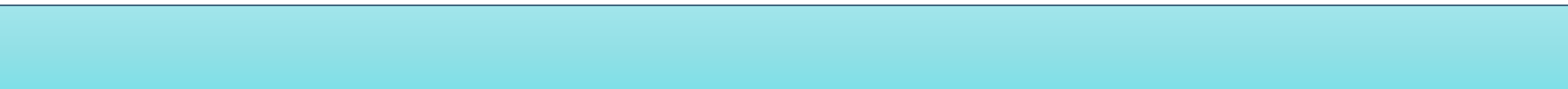




Bethlehem's Water Quality & Quantity

George S. Kansas, P.E.
Commissioner of Public Works

March 9, 2016



Concerns over THMs

- Trihalomethanes (THMs) are in all chlorinated water systems
- This is not the same scenario as Hoosick Falls, Flint, etc.
- THM exposure concern is long-term, not short-term

* * *

- Bethlehem has openly discussed and disclosed DBP issues since 2010
- We have been and continue to work on reducing THMs
- System flushing, hydraulic modeling and valve operation, Improvements at New Salem Water Treatment Plant (WTP) and Clapper Road WTP
- Systemwide THM levels in Bethlehem have already declined and improvements in process should fully address THM issue

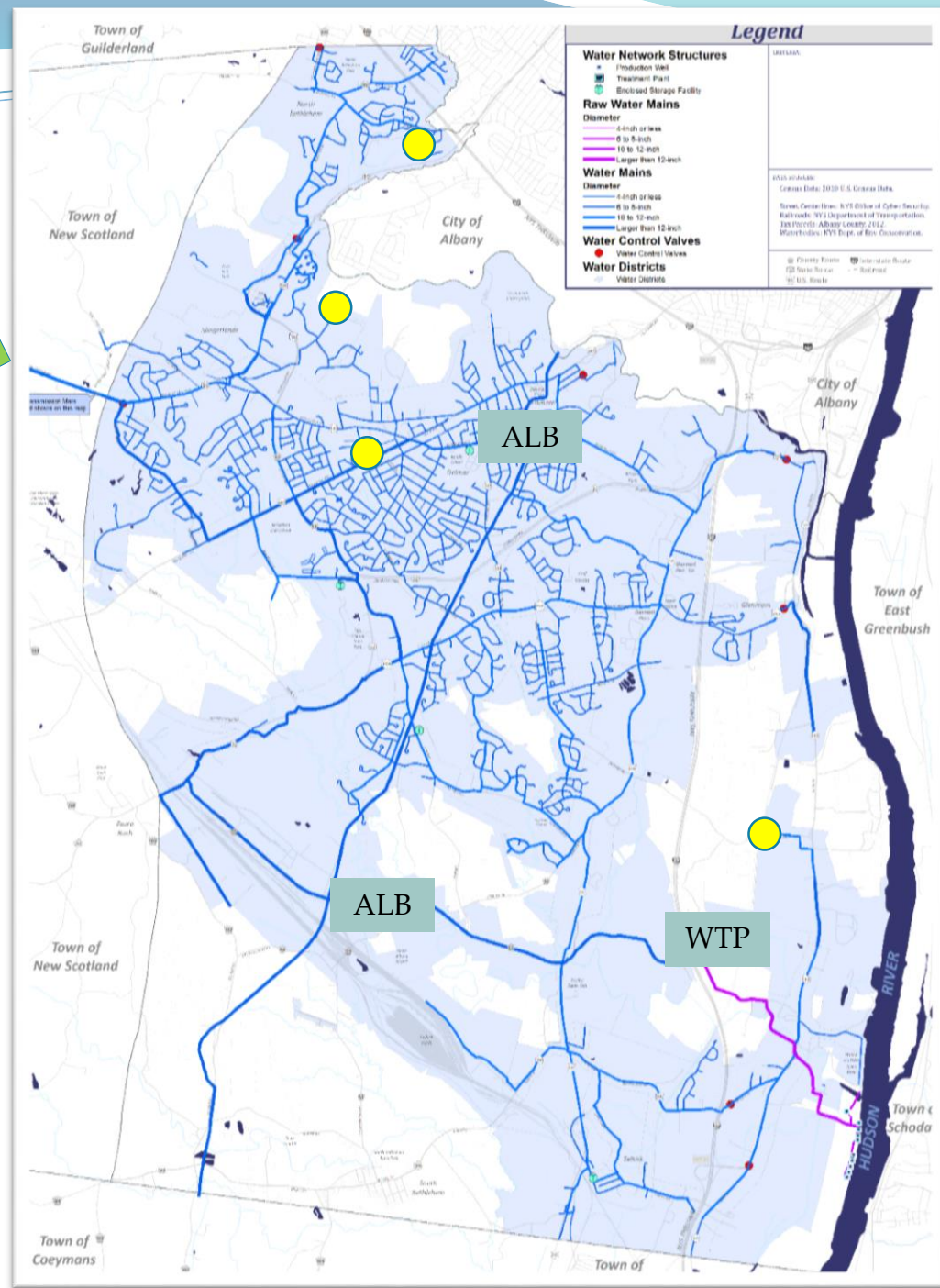
What are THMs?

- Trihalomethanes (THMs) are **disinfection byproducts** (DBPs) that form when chlorine is added to drinking water in the presence of natural organic materials (decomposing plants, algae, etc.)
 - Chlorine first used in a water supply in 1908 to fight waterborne illnesses
 - THMs weren't discovered until 1974
 - Formation begins as soon as chlorine is added, but THMs continue to form in the distribution system
- THMs are formed in all chlorinated public water supplies, but we must minimize them
- THMs vary with seasons, water system circulation, other factors; levels go up and down, which is why we look at annual averages

DBP Regulation History

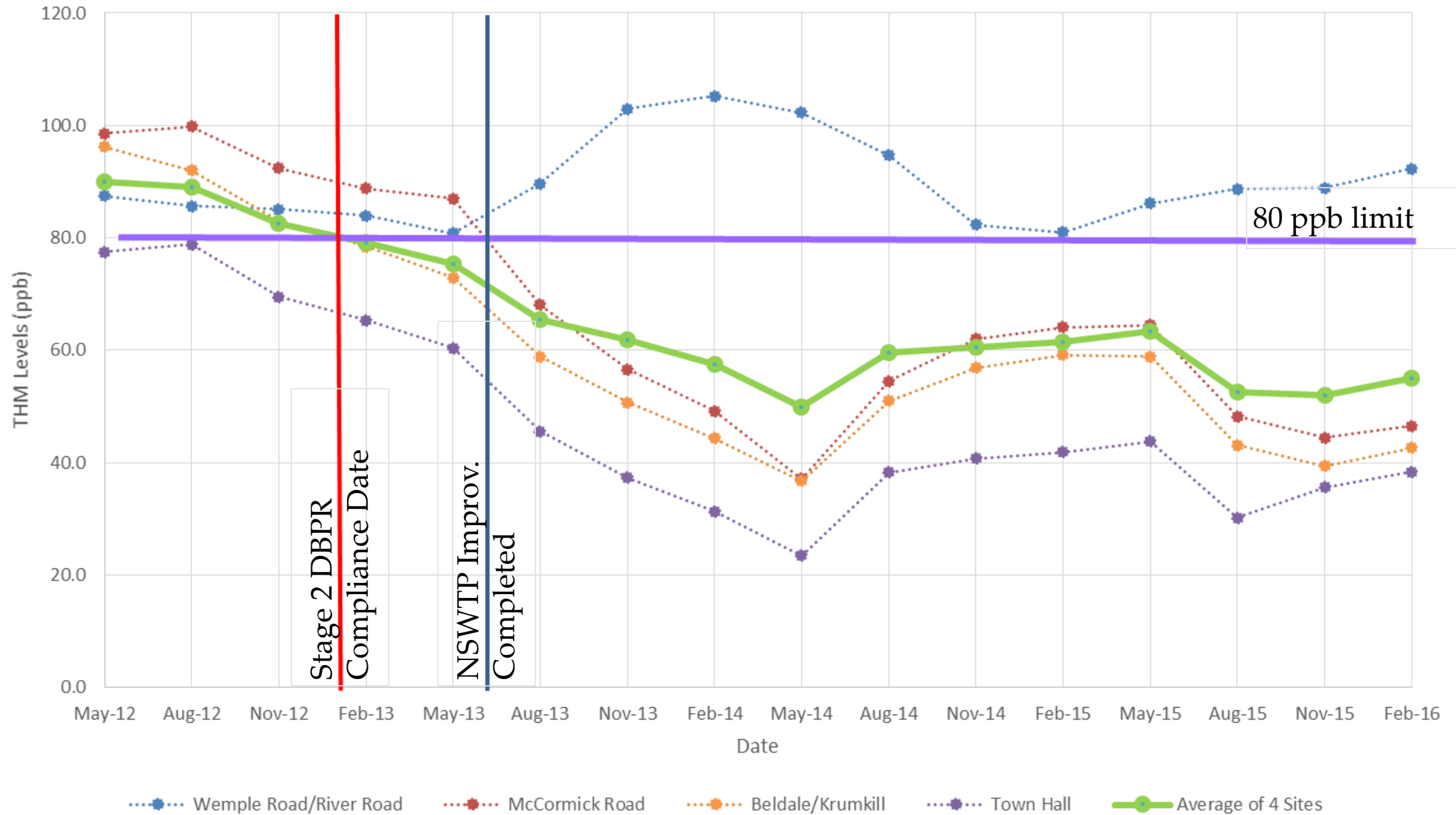
- 1979 – 2002: Standard of 100 ppb for THMs
- Stage 1 Rule aimed at reducing exposure to DBPs (2002)
- Stage 2 Rule (took effect 2013)
 - More stringent – each sampling location had to meet the 80 ppb limit
 - Required 4 sampling sites in areas with highest likely DBP presence
 - We have slightly exceeded the limit since February 2013
 - 2 sampling sites over limit first two quarters of 2013
 - 1 sampling site remains over limit (Wemple Road/River Road)
 - Overall system numbers have been improving due to work we've done

WTP

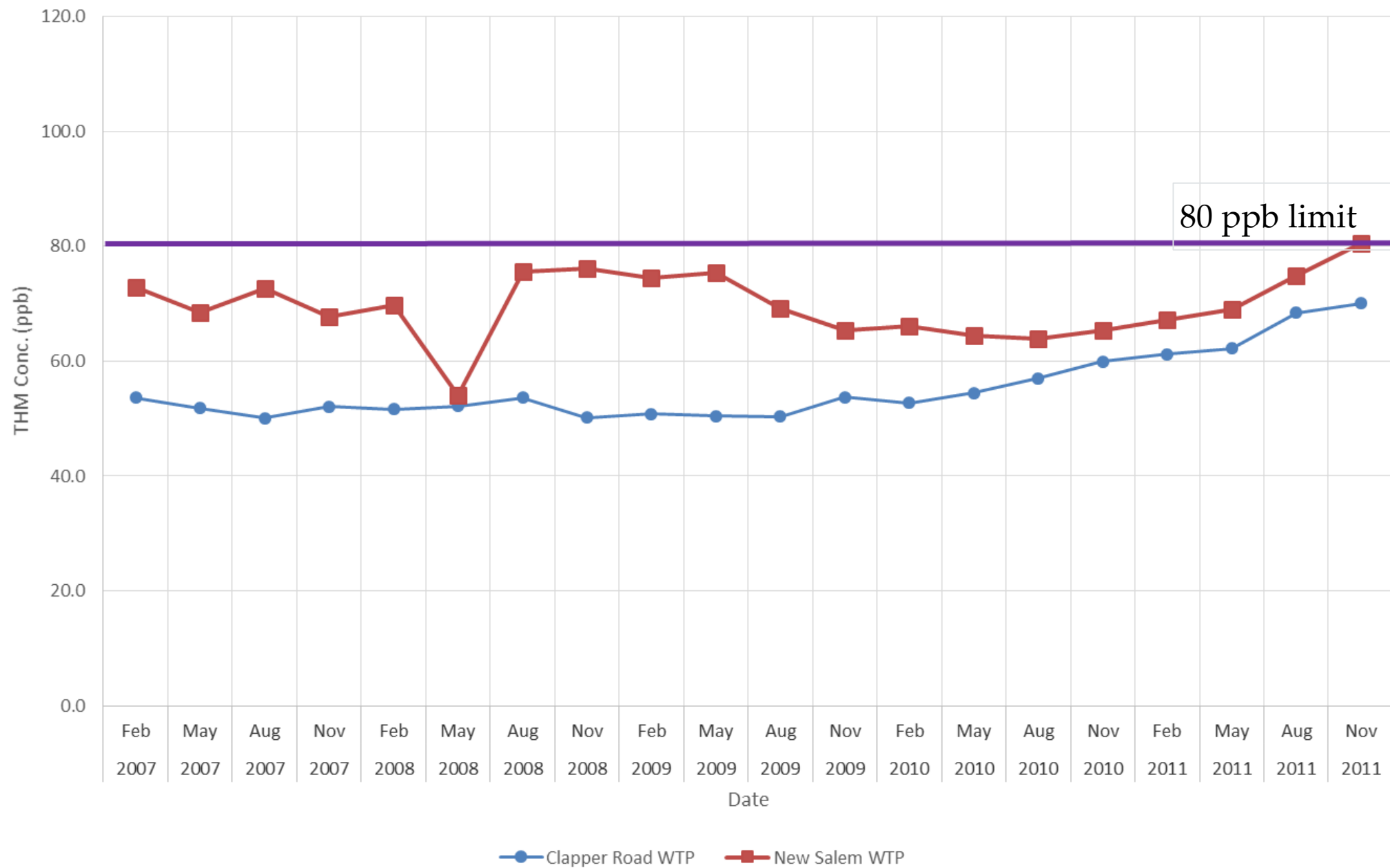


● Stage 2 DBPR Sampling Points

Stage 2 DBPR Average THMs By Site and Systemwide



Clapper Road and New Salem WTPs Stage 1 DBPR THM Data



THM Exposure Concerns

- Risk based on long-term or lifetime exposure
- EPA stat: drinking 1/2 gallon of water with 100 ppb THMs every day for 70 years has an assumed risk of 3 extra cases of cancer for every 10,000 people
- Regulatory limits are conservative, as they should be because our priority is public safety
- Albany County Department of Health Commissioner:

(<http://www.timesunion.com/local/article/Bethlehem-taking-steps-to-address-drinking-water-6852199.php>)

“A person would have to drink water containing the THMs at twice the regulatory limit for several decades to present any potential risk.”

Town's Approach to DBPs

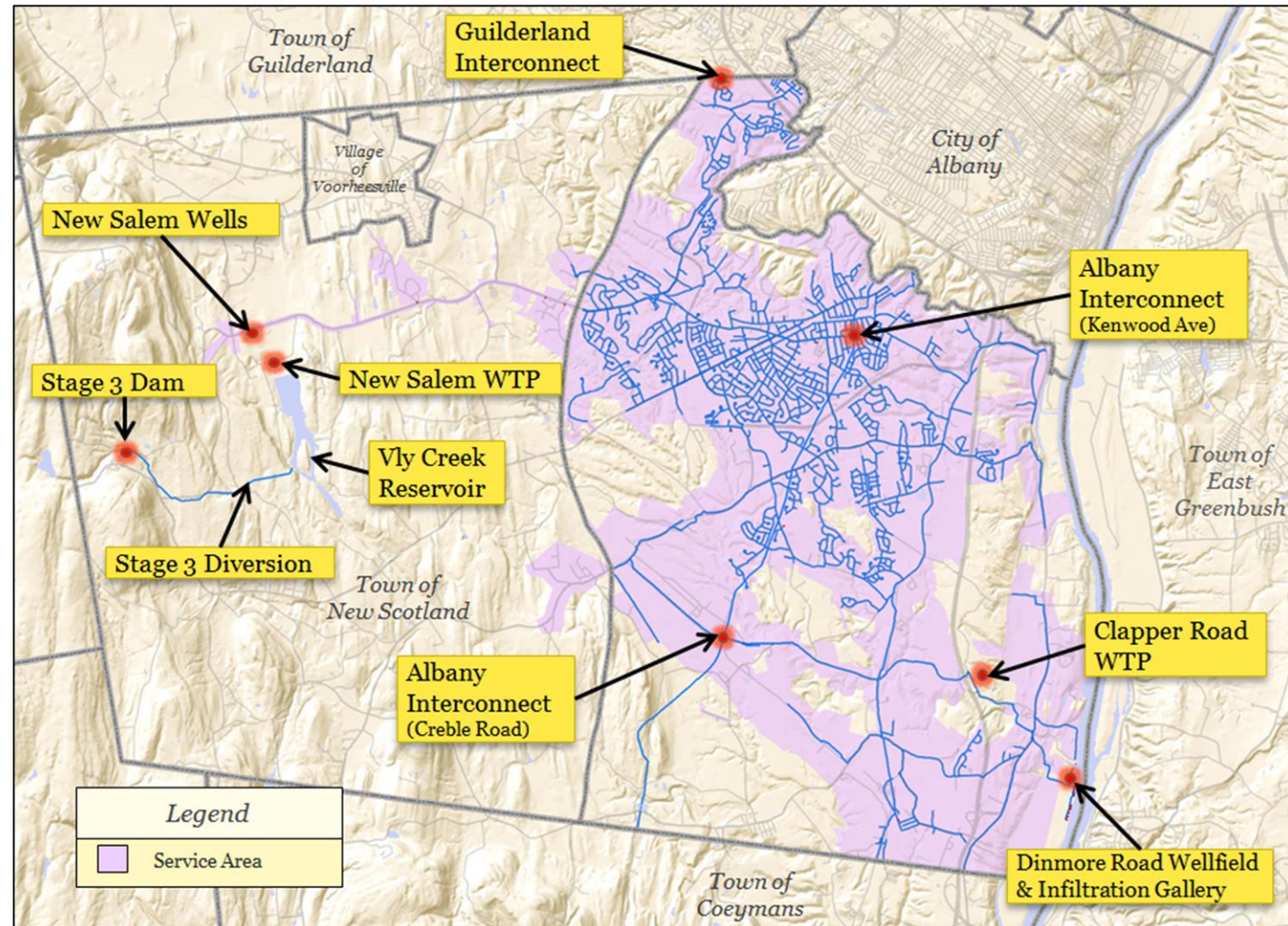
- Historically, the water from the New Salem WTP had higher THM levels than that at the Clapper Road WTP
- Improvements at New Salem WTP completed in June 2013 significantly improved the DBP levels
- Distribution system efforts
 - Water main flushing
 - Hydraulic modeling to identify & address problem areas
 - Valves in system used to improve water age
- Improvements at the Clapper Road WTP
 - Planning began in 2010, capital commitment in 2012, design underway
 - Construction scheduled to be completed in 2019
- Identify & evaluate additional options

Conclusion on THMs

- This is an issue we are taking very seriously
- The water is safe to drink, cook with, bathe in, etc.
- The Town has been and continues to work on reducing the formation of these compounds in our distribution system
- Major capital improvement program in place to address
- Money already committed, \$24M five-year plan for capital improvements associated with Water Fund

Bethlehem's Water System

- Four main water sources
 - Vly Creek Reservoir System
 - New Salem Wells
 - Dinmore Road Wellfield
 - City of Albany
- Water treated at the New Salem and Clapper Road WTPs



Water Supply

- Water produced by our system limited by two parameters:
 - Availability from our water sources (e.g. safe yield from reservoir)
 - Treatment capacity at the WTPs
- Water sources:
 - Vly Creek Reservoir = 3.0 MGD
 - New Salem Wells = 0.85 MGD
 - Dinmore Road Wellfield = 6.0 MGD
 - City of Albany = 1.23 - 2.5 MGD
 - TOTAL = 11.08 - 12.35 MGD

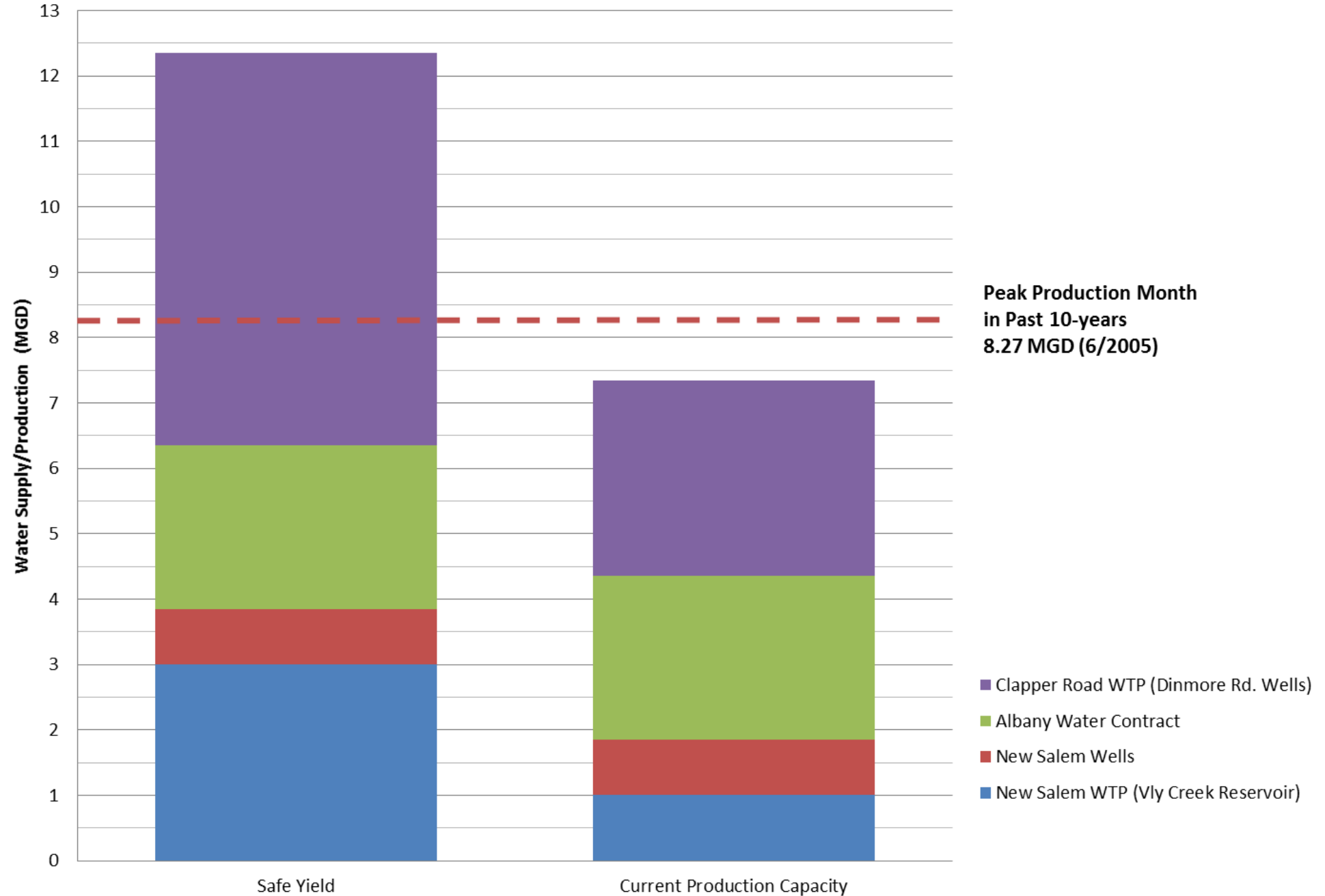
Issues We're Facing

- Aging infrastructure – both treatment facilities and distribution system
 - 200 miles of water pipelines
 - New Salem WTP built in the 1950s, Clapper Road WTP built in the 1990s
- Full compliance with DBP regulations
- Current water resources limited, system upgrades needed
 - New Salem WTP filters
 - Clapper Road WTP wellfield and treatment processes
- Long-term supply adequate, Albany water contract excessive

Water System Capacity

- New Salem WTP
 - Treatment capacity = 3 MGD (can peak near 5 MGD)
 - Currently limited to only 1 MGD due to filter media/housing
- Clapper Road WTP
 - Design capacity = 6 MGD (expandable to 12 MGD)
 - Current pretreatment limits production to 3 MGD
- Wells are subject to restrictions due to water levels
- Albany water is expensive, and we have to be concerned about potential interruptions

Safe Yield & Current Production

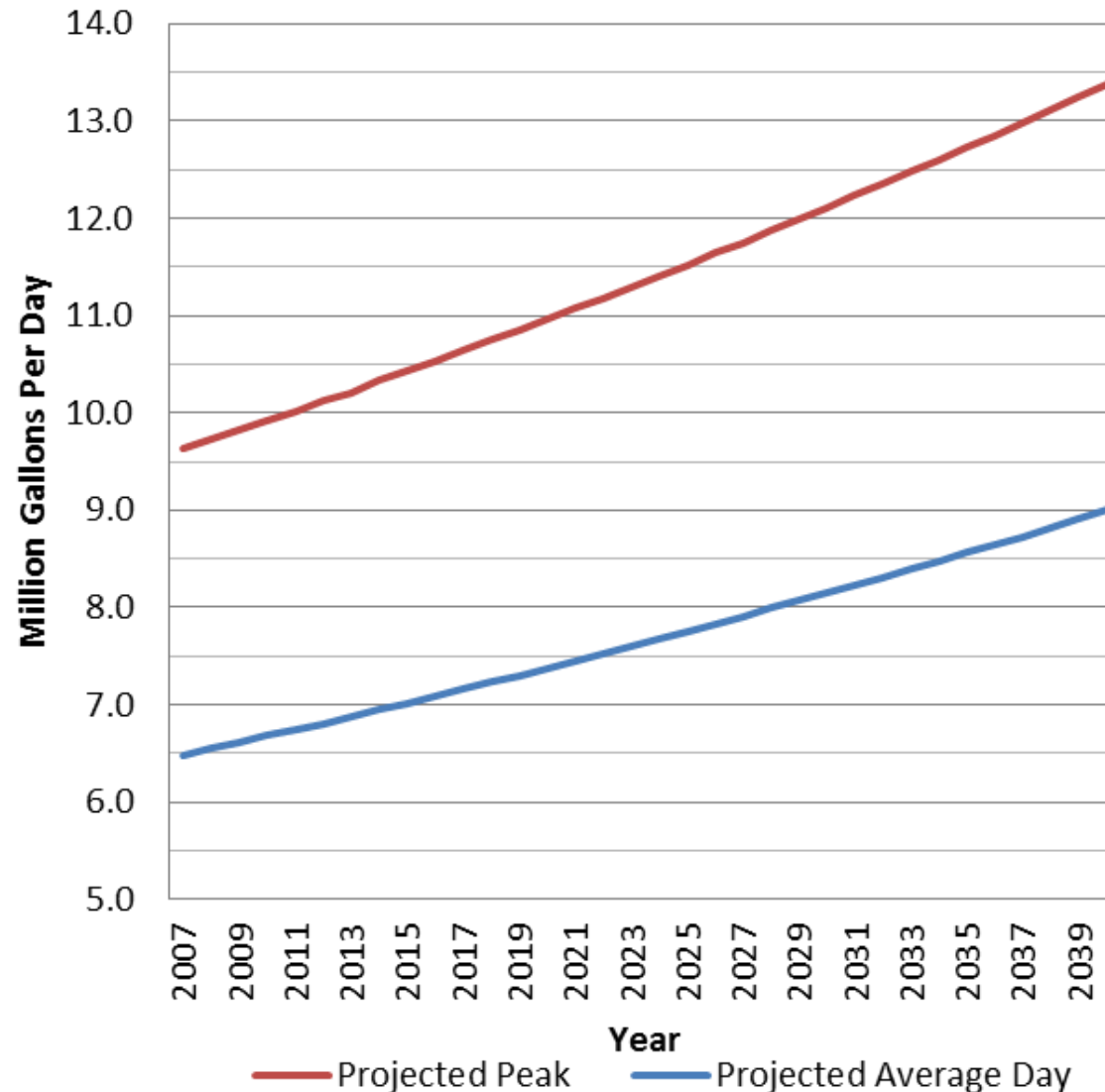


Water Need Projection

- Last analysis was done in 2007
 - Was conservative in peak and average day demand calculations
 - Should be revisited in order to get a sense of true future water needs
- Current treatment capacity (total) = approx. 4-5 MGD, with purchase of Albany water making up any shortfalls we may experience

Peak & Average Demand Projections

Year	Average Day Demand (MGD)	Peak Day Demand (MGD)
2007	6.48	9.63
2008	6.55	9.73
2009	6.61	9.83
2010	6.68	9.92
2011	6.74	10.02
2012	6.81	10.12
2013	6.88	10.20
2014	6.95	10.33
2015	7.02	10.43
2016	7.09	10.53
2017	7.16	10.64
2018	7.23	10.75
2019	7.30	10.85
2020	7.38	10.96
2021	7.45	11.07
2022	7.52	11.18
2023	7.60	11.29
2024	7.67	11.41
2025	7.75	11.52
2026	7.83	11.64
2027	7.91	11.75
2028	7.99	11.87
2029	8.07	11.99
2030	8.15	12.11
2031	8.23	12.23
2032	8.31	12.35
2033	8.39	12.48
2034	8.48	12.60
2035	8.56	12.73
2036	8.65	12.85
2037	8.73	12.98
2038	8.82	13.11
2039	8.91	13.24
2040	9.00	13.38



NYS Public Health Law and Recommended Standards for Water Works (10-State Standards) require consideration of:

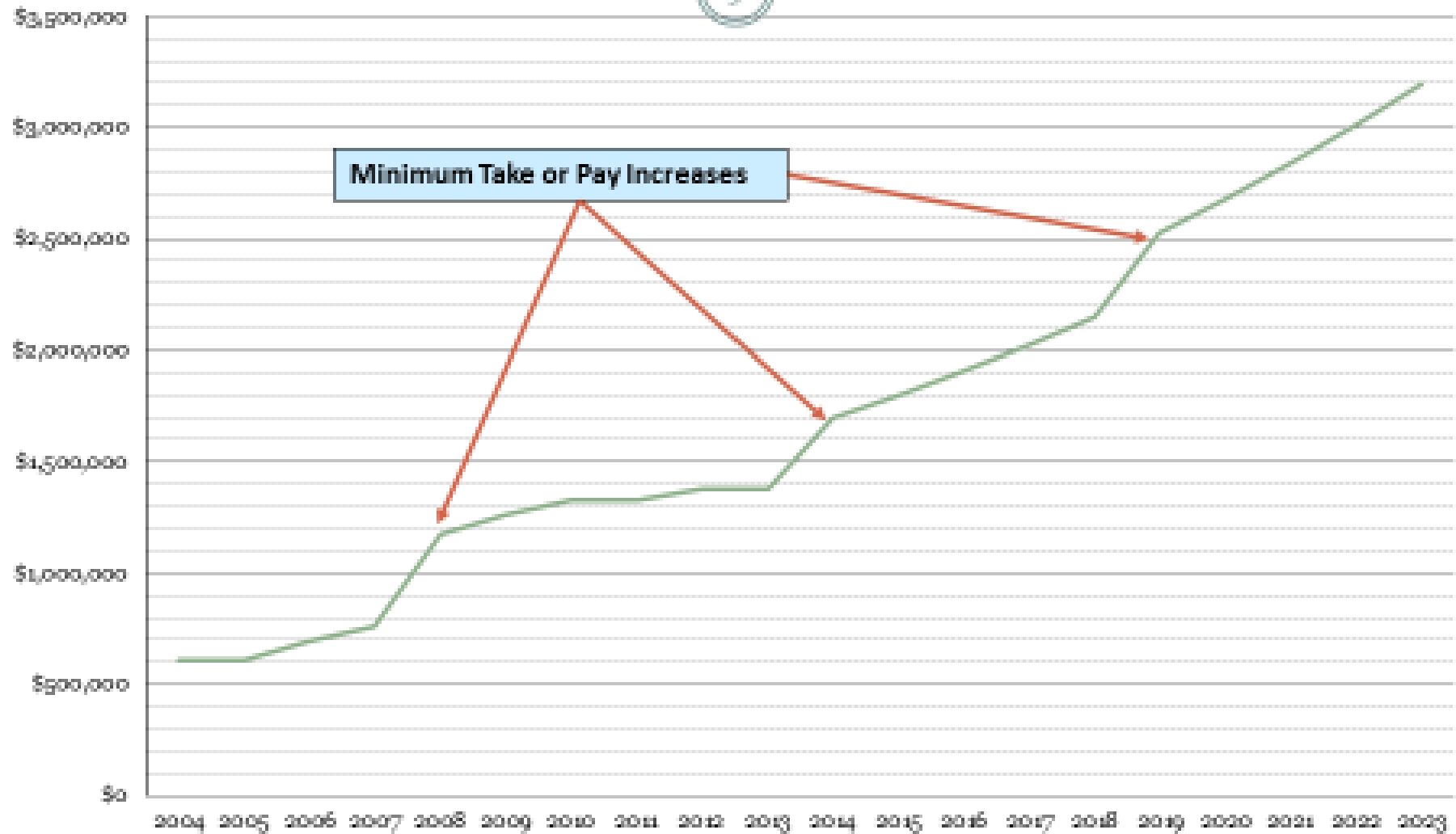
- Existing water consumption data
- Fire flow demand
- Existing population and 20-year growth projections
- Reasonable surplus for anticipated future growth

Albany Water Contract

- 20 year agreement ending 2023
- Current minimum purchase requirement = 450 MGY (1.23 MGD avg.)
- 2019 is next (and final) step increase for minimum water purchase
 - Minimum annual purchase jumps to 500 MGY (1.37 MGD avg.)
- Current water rate = \$3.78/1,000 gallons
 - Last rate increase was September 2012
 - If we go above 75 MG for a month, the rate jumps to \$7.79/1,000 gallons
- Bethlehem Water Treatment Costs
 - New Salem WTP = \$3.05/1,000 gallons
 - Clapper Road WTP = \$2.30/1,000 gallons

Albany Water Contract

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Planning & Key Decisions (2004 – 2012)

- 2004: 20-year water contract with City of Albany
- 2005: Major plant upgrade (\$17M) for New Salem WTP abandoned
- 2006 – 2010: Water supply planning & negotiations with other municipalities
- 2010: Decision to connect water distribution systems and invest in Clapper Road WTP
- 2011: Hurricane Irene
- 2012: Capital funds allocated for work at both WTPs

Immediate Needs at WTPs & System

- New Salem WTP Filters/Media
- Clapper Road WTP Wellfield and Pretreatment Facility
- Dam Safety Improvements
- Water storage tank painting/maintenance
- Already included in the Town's Capital Improvements Plan

Want More Information?

- Town Web Site has a section dedicated to Water Quality (www.townofbethlehem.org)
- Call or email me at (518) 439-4955 or gkansas@townofbethlehem.org
- Contact Town Board members (email addresses on town web site)