The Metropolitan District
water supply · environmental services · geographic information

WATER BUREAU
SPECIAL MEETING
TUESDAY, JUNE 13, 2023
4:00 PM

Location
Board Room
District Headquarters
555 Main Street, Hartford

Dial in #: (415)-655-0001
Access Code: 43808661#
Meeting Video Link

Commissioners

Adil (VC)	Lewis
Anderson	Mandyck
Buell	Pane (C)
Desai	Petoskey
DiBella (Ex-Officio)	Salemi
Gardow	Taylor
Holloway	

Quorum: 7

1. **CALL TO ORDER**
2. **PUBLIC COMMENTS RELATIVE TO AGENDA ITEMS**
3. **APPROVAL OF MEETING MINUTES OF APRIL 24, 2023**
4. **REPORT RE: RAW WATER MASTER PLAN**
5. **OPPORTUNITY FOR GENERAL PUBLIC COMMENTS**
6. **COMMISSIONER REQUESTS FOR FUTURE AGENDA ITEMS**
7. **ADJOURNMENT**

WATER BUREAU
SPECIAL MEETING
555 Main Street, Hartford
Monday, April 24, 2023

Present: Commissioners Peter Gardow, Jean Holloway, Diane Lewis, Dominic Pane, Alvin Taylor, and District Chairman William DiBella (6)

Remote Attendance: Commissioners Andrew Adil and Jacqueline Mandyck (2)

Absent: Commissioners Kyle Anderson, Clifford Avery Buell, Dimple Desai, Jon Petoskey, Pasquale Salemi and Michael Carrier (5)

Also Present:
Commissioner John Avedisian
Commissioner Richard Bush
Commissioner Donald Currey (Remote Attendance)
Commissioner Joan Gentile
Commissioner Bhupen Patel (Remote Attendance)
Commissioner David Steuber (Remote Attendance)
Scott W. Jellison, Chief Executive Officer
Christopher Stone, District Counsel
John S. Mirtle, District Clerk
Christopher Levesque, Chief Operating Officer
Kelly Shane, Chief Administrative Officer
David Rutty, Director of Operations
Robert Schwarm, Director of Information Systems (Remote Attendance)
Tom Tyler, Director of Facilities
Michael Curley, Manager of Technical Services
Julie Price, Executive Assistant
David Baker, IT Consultant (Remote Attendance)
Wayne Brelsford, IT Consultant (Remote Attendance)
Dylan Pecego, IT Consultant (Remote Attendance)
Joseph Szerejko, Independent Consumer Advocate (Remote Attendance)

CALL TO ORDER

The meeting was called to order by Chairman Pane at 4:03 PM.

PUBLIC COMMENTS RELATIVE TO AGENDA ITEMS

No one from the public appeared to be heard.

APPROVAL OF MEETING MINUTES

On motion made by Commissioner Gardow and duly seconded, the meeting minutes of March 1, 2023 were approved.

VETERAN'S TERRACE PHASE 3, EAST HARTFORD
ABANDONMENT OF WATER MAIN

To: Water Bureau for consideration on April 24, 2023

On March 3, 2023, the District received a letter from Salvatore R. Carabetta of Veteran's Terrace Communities III LLC, Owner and Developer of Veteran's Terrace Phase 3, requesting that the Metropolitan District abandon a portion of the existing water mains within the former Columbus Street Extension right of way and Michael Avenue in East Hartford, as shown on the accompanying map. The purpose of the request is to enable the construction of a new residential development known as Veteran's Terrace Phase 3. The Owner will in turn build new public water mains to service the development.

The proposal submitted includes the abandonment of approximately 400 feet of 8-inch cast iron water main, as shown on the aforementioned map. The existing water mains were originally constructed in a public roadway; therefore, no easements exist. The existing water mains were built in 1957 by the East Hartford Housing Authority under a Developer's Permit-Agreement with the Metropolitan District.

From an engineering standpoint, the abandonment of the existing water mains will not have a negative impact on the District's water distribution system, and no hardship or detriment would be imposed on others. The proposed new water mains will be constructed within the subject parcel within easements under a new Developer's Permit-Agreement.

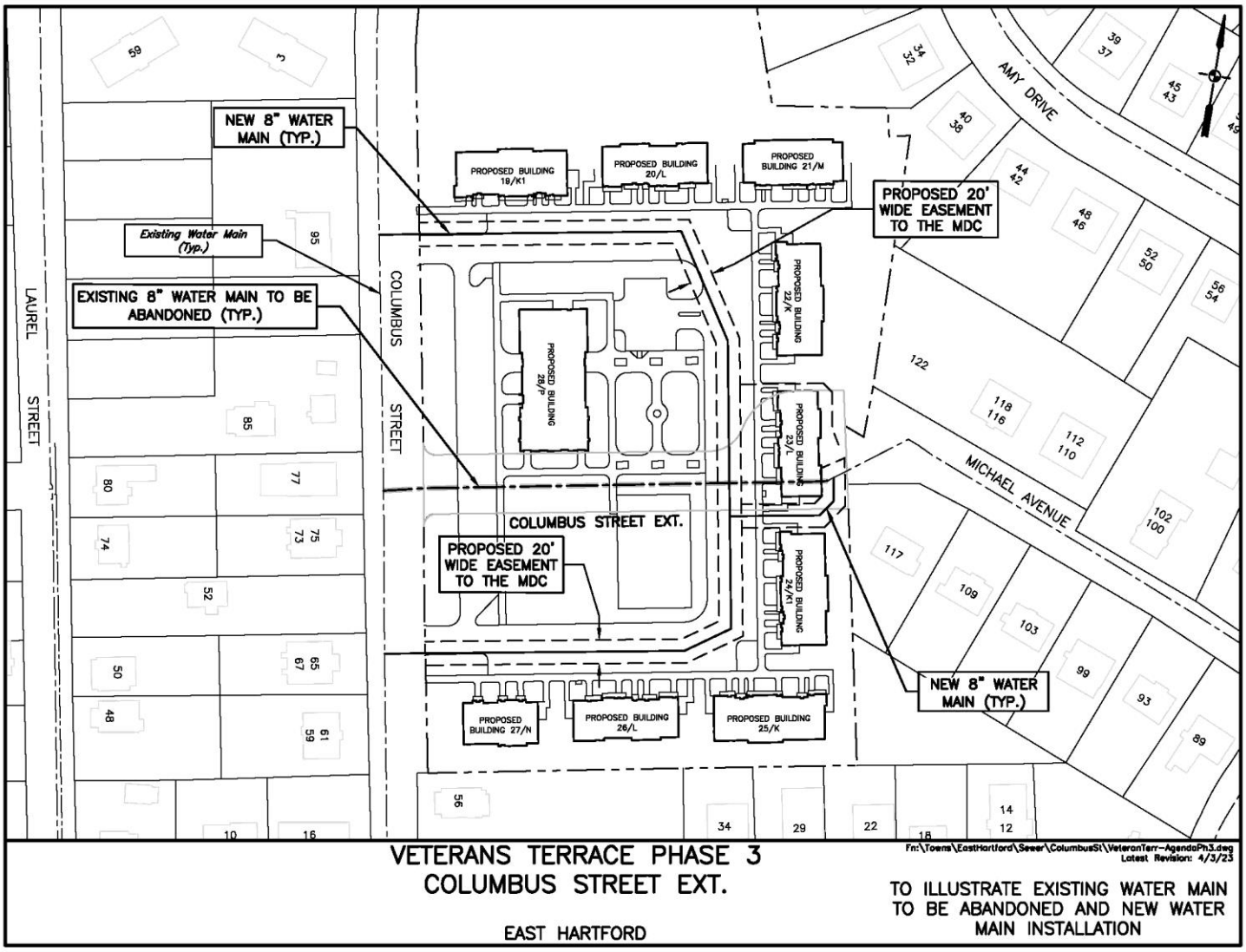
It is therefore RECOMMENDED that it be

VOTED: That the Water Bureau recommends to the District Board passage of the following resolution:

RESOLVED: That the Chairman or Vice Chairman of the District Board be authorized to execute the abandonment of the existing water mains within the former Columbus Street Extension right of way and Michael Avenue in East Hartford, as shown on the accompanying map.

Respectively submitted,

Scott W. Jellison
Chief Executive Officer


NEW 8" WATER MAIN (TYP.)
Existing Water Main (Typ.)
EXISTING 8" WATER MAIN TO BE ABANDONED (TYP.)
LAUREL STREET
COLUMBUS STREET
AMY DRIVE
MICHAEL AVENUE
COLUMBUS STREET EXT.
PROPOSED 20' WIDE EASEMENT TO THE MDC
PROPOSED BUILDING 19/K1
PROPOSED BUILDING 20/L
PROPOSED BUILDING 21/M
PROPOSED BUILDING 22/K
PROPOSED BUILDING 23/L
PROPOSED BUILDING 24/K1
PROPOSED BUILDING 25/K
PROPOSED BUILDING 26/L
PROPOSED BUILDING 27/N
PROPOSED BUILDING 28/P
PROPOSED 20' WIDE EASEMENT TO THE MDC
NEW 8" WATER MAIN (TYP.)
VETERANS TERRACE PHASE 3
COLUMBUS STREET EXT.
EAST HARTFORD
Fn:\Towns\EastHartford\Sewer\ColumbusSt\VeteranTerr-AgendaPh3.dwg
Latest Revision: 4/3/23
TO ILLUSTRATE EXISTING WATER MAIN TO BE ABANDONED AND NEW WATER MAIN INSTALLATION

The Metropolitan District
555 Main Street
Hartford CT, 06103

March 3, 2023

Re: Veterans Terrace Extension
Request to Abandon Water Main
Michael Ave to Columbus Circle

To whom it may concern,

The undersigned is the anticipated owner of the improvements to be known as Veterans Terrace Phase 3. In partnership with the East Hartford Housing Authority, we will be demolishing all structures and a select number of existing site utilities as part of a state funded rehabilitation of the property to provide quality affordable apartments to low-income residents.

The rehabilitation will include the demolition and removal of all (8) existing buildings and the new construction of (9) new residential buildings and (1) community center. In order to facilitate the aforementioned rehabilitation, the existing Columbus Circle Extension will be abandoned, and a the existing 8" water main will be abandoned to allow re-routing of the main to service the project (reference attached drawings C-1.0 & MDC water main as-built drawing 22-241A).

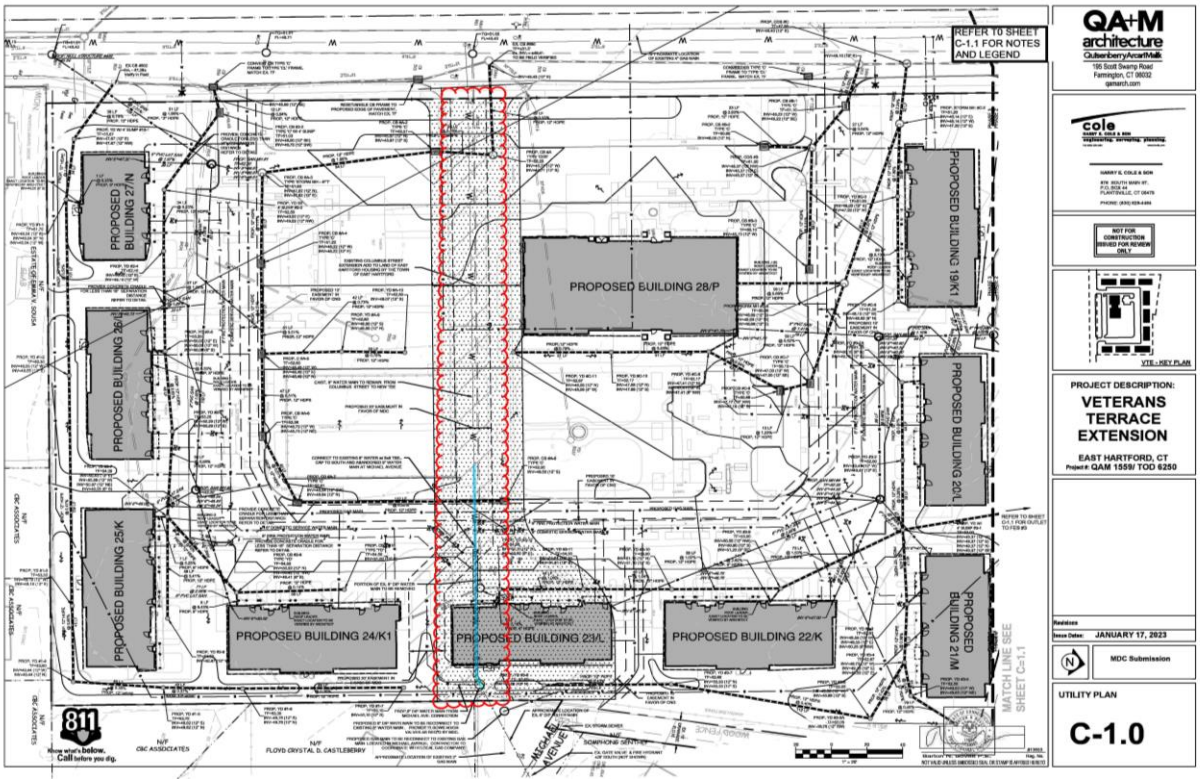
This letter shall serve as our official request to abandon a select portion of the above-referenced existing 8" water main.

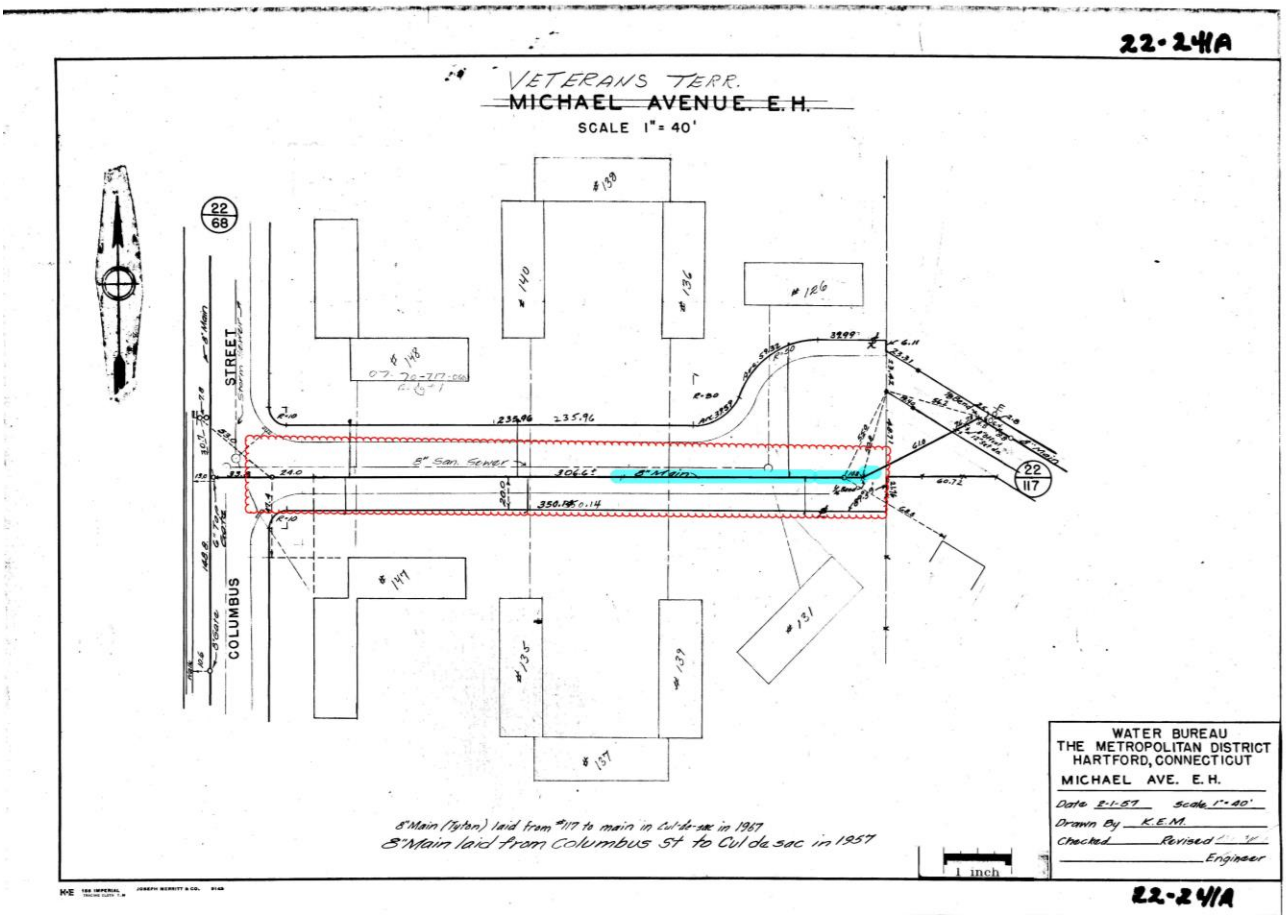
Thank you for your attention to this issue. And should you have any questions or concerns, please do not hesitate to contact us.

Very Truly Yours

Veterans Terrace Communities III LLC
Veterans Terrace MM III LLC
Its Managing Member
Investors Network LLC
A Managing Member

By: _____
Salvatore R. Carabetta



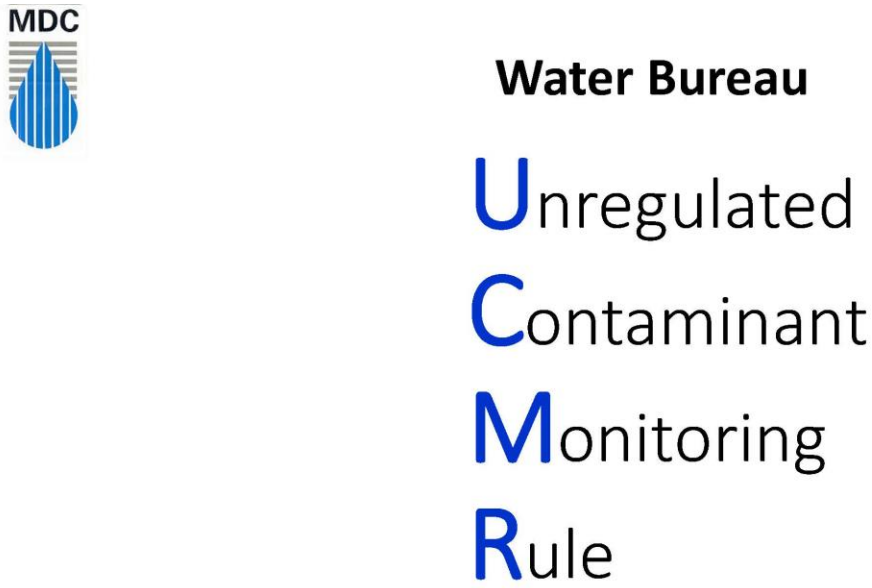


On motion made by District Chairman DiBella and duly seconded, the report was received and resolution adopted by unanimous vote of those present.

Commissioner Lewis entered the meeting in person at 4:16 PM after originally joining virtually.

FIFTH UNREGULATED CONTAMINANT MONITORING RULE

Director of Facilities Tom Tyler presented to the Water Bureau on the recent testing under the fifth unregulated contaminant monitoring rule, noting that the testing in January 2023 indicated no detectable FPAS or Lithium in any of the samples.



Background

- EPA uses the Unregulated Contaminant Monitoring Rule (UCMR) to collect data for contaminants that are suspected to be present in drinking water and do not have health-based standards set under the Safe Drinking Water Act (SDWA).
- Basic elements of program:
  - Every five years EPA develops a new list of priority unregulated contaminants in drinking water
  - 30 is maximum number of contaminants that ca be included
  - 100% of all large public drinking water systems serving more than 10,000 people must participate, 4 quarterly samples
  - Sample every "point of entry" – where treated drinking water enters distribution system
  - Results are stored in a national database
  - EPA used the data to determine whether to regulate particular contaminants in the interest of protecting public health

How does EPA determine which contaminants are selected?

1. Identify contaminants that:
   1) Were not monitored under prior UCMR cycles
   2) May occur in drinking water
   3) Are expected to have a completed, validated drinking water method in time for rule proposal.
2. Considerations:
   1) Availability of health assessments or other health-effects information
   2) Public interest
   3) Active us
   4) Availability of occurrence data.
   5) Consider stakeholder input
   6) Cost-effectiveness of the potential monitoring approaches
   7) Implementation factors (e.g., laboratory capacity)
   8) Further evaluates health effects, occurrence, and persistence/mobility data

UCMR 5

- The 5th iteration of the UCMR program is underway.
- Published on December 27, 2021 .
- Analyze for 30 chemical contaminants:
  - 29 PFAS compounds
  - Lithium (a metal)
- 4 quarterly samples must be taken between January 2023 and December 2025.
  - The District decided to begin as early as possible, collecting samples January, April, July & October 2023.
- Laboratories must use approved analytical methods developed by EPA & be approved by EPA to conduct testing.
  - The District uses Eurofins for PFAS testing & reporting.

NOTE: the UCMR 5 list is not the same as EPA's Proposed Maximum Contaminant Levels for 6 PFAS compounds

Results

- Sample results from January 2023 sampling of the District's three points of entry (2 WHF basins and 1 RES 6) indicate ***no detectable PFAS or Lithium in any of the samples***.
- Samples will be collected at each entry point on April, July & October 2023.
- The contract lab still cannot upload the results into EPA's database due to EPA problems.
- The lab can detect to the 'parts per trillion' level.

What is a part per trillion?

- One part per trillion (ppt) denotes one part per 1,000,000,000,000 (12 zeros) parts.
- Equal to one second in 31,700 years *(one year has 31,536,000 seconds).*
- Equal to about ***thirty seconds out of every million years***, or 0.0024 seconds in a 75 year lifespan.
- Equivalent of **one drop of water in 23,100,000 gallons of water.**
- Traveling **6 inches out of a 93 million-mile** journey.
- A stack of one trillion dollar bills would reach nearly **68,000 miles** into space
- The average distance between the earth and the moon is approximately 240,000 miles. One trillionth of this distance is 15 thousands of an inch, about the diameter of a human hair.

Note: all comparisons found on internet – not verified

EPA vs. CT DPH PFAS Levels

- EPA proposed draft Maximum Contaminant Levels (MCL) in March 2023. Results from UCMR 5 will be used to support development of new water quality standards.
- CTDPH previously published "Action Level", but these are recommendations, not legal requirements that must be met.

Analyte	EPA Draft MCL (parts per trillion, ppt, ng/L)	CT Action Level (parts per trillion, ppt, ng/L)
Perfluorooctanoic acid (PFOA)	4	16
Perfluorooctane sulfonic acid (PFOS)	4	10
Perfluorononanoic acid (PFNA)	1.0 (unitless) Hazard Index*	12
Perfluorohexane sulfonic acid (PFHxS)	1.0 (unitless) Hazard Index*	49
Perfluorobutanesulfonic acid (PFBS)	1.0 (unitless) Hazard Index*	-
Hexafluoropropylene oxide dimer acid (HFPO-DA / GenX)	1.0 (unitless) Hazard Index*	-

*The Hazard Index is a tool used to evaluate potential health risks from exposure to chemical mixtures. For more information, please see EPA's Fact Sheets.

Summary

- The Districts 1st quarterly test results were excellent – no detectible PFAS or lithium.
- These results are no guarantee that the other three 2023 sampling events will produce similar results.
- Additional sample test results will be shared with Water Bureau.
- The District's active management of our 30,000 areas of watershed lands for many decades is evident in the test results.

Supporting info on all UCMRs & Contaminants

UCMR 1 - 26 contaminants between 2001 and 2003

- 2,4-dinitrotoluene
- 2,6-dinitrotoluene
- Acetochlor
- DCPA mono-acid degradate
- DCPA di-acid degradate
- 4,4'-DDE
- EPTC
- Molinate
- MTBE
- Nitrobenzene
- Perchlorate
- Terbacil
- 1,2-diphenylhydrazine
- 2-methyl-phenol
- 2,4-dichlorophenol
- 2,4-dinitrophenol
- 2,4,6-trichlorophenol
- Diazinon
- Disulfoton
- Diuron
- Fonofos
- Linuron
- Nitrobenzene
- Prometon
- Terbufos
- Aeromonas

UCMR 2 - 25 contaminants between 2008 and 2010

- Dimethoate
- Terbufos sulfone
- 2,2',4,4'-tetrabromodiphenyl ether (BDE-47)
- 2,2',4,4',5-pentabromodiphenyl ether (BDE-99)
- 2,2',4,4',5,5'-hexabromobiphenyl (HBB)
- 2,2',4,4',5,5'-hexabromodiphenyl ether (BDE-153)
- 2,2',4,4',6-pentabromodiphenyl ether (BDE-100)
- 1,3-dinitrobenzene
- 2,4,6-trinitrotoluene (TNT)
- Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)
- Acetochlor
- Alachlor
- Metolachlor
- Acetochlor ethane sulfonic acid (ESA)
- Acetochlor oxanilic acid (OA)
- Alachlor ethane sulfonic acid (ESA)
- Alachlor oxanilic acid (OA)
- Metolachlor ethane sulfonic acid (ESA)
- Metolachlor oxanilic acid (OA)
- N-nitroso-diethylamine (NDEA)
- N-nitroso-dimethylamine (NDMA)
- N-nitroso-di-n-butylamine (NDBA)
- N-nitroso-di-n-propylamine (NDPA)
- N-nitroso-methylethylamine (NMEA)
- N-nitroso-pyrrolidine (NPYR)

UCMR 3 - 30 contaminants between 2013 and 2015

1,2,3-trichloropropane	perfluorooctanesulfonic acid (PFOS)
1,3-butadiene	perfluorooctanoic acid (PFOA)
chloromethane (methyl chloride)	perfluorononanoic acid (PFNA)
1,1-dichloroethane	perfluorohexanesulfonic acid (PFHxS)
bromomethane (methyl bromide)	perfluoroheptanoic acid (PFHpA)
chlorodifluoromethane (HCFC-22)	perfluorobutanesulfonic acid (PFBS)
bromochloromethane (halon 1011)	17-β-estradiol
1,4-dioxane	17-α-ethynylestradiol (ethinyl estradiol)
vanadium	16-α-hydroxyestradiol (estriol)
molybdenum	equilin
cobalt	estrone
strontium	testosterone
chromium3	4-androstene-3,17-dione
chromium-6	enteroviruses
chlorate	noroviruses

UCMR 4 - 30 chemical contaminants between 2018 and 2020

total microcystin (total of next 6)	oxyfluorfen
microcystin-LA	profenofos
microcystin-LF	tebuconazole
microcystin-LR	total permethrin (cis- & trans-)
microcystin-LY	tribufos
microcystin-RR	HAA5
microcystin-YR	HAA6Br
nodularin	HAA9
anatoxin-a	1-butanol
cylindrospermopsin	2-methoxyethanol
germanium	2-propen-1-ol
manganese	butylated hydroxyanisole
alpha-hexachlorocyclohexane	o-toluidine
chlorpyrifos	quinoline
dimethipin	total organic carbon (TOC)
ethoprop	bromide

UCMR 5 - 30 chemical contaminants between 2023 and 2025

1 of 2

11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)
4,8-dioxa-3H-perfluorononanoic acid (ADONA)
hexafluoropropylene oxide dimer acid (HFPO DA)
nonafluoro-3,6-dioxaheptanoic acid (NFDHA)
perfluorobutanoic acid (PFBA)
perfluorobutanesulfonic acid (PFBS)
1H,1H, 2H, 2H-perfluorodecane sulfonic acid (8:2FTS)
perfluorodecanoic acid (PFDA)
perfluorododecanoic acid (PFDoA)
perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)
perfluoroheptanesulfonic acid (PFHpS)
perfluoroheptanoic acid (PFHpA)
1H,1H, 2H, 2H-perfluorohexane sulfonic acid (4:2FTS)
perfluorohexanesulfonic acid (PFHxS)

UCMR 5 - 30 chemical contaminants between 2023 and 2025

2 of 2

perfluorohexanoic acid (PFHxA)
perfluoro-3-methoxypropanoic acid (PFMPA)
perfluoro-4-methoxybutanoic acid (PFMBA)
perfluorononanoic acid (PFNA)
1H,1H, 2H, 2H-perfluorooctane sulfonic acid (6:2FTS)
perfluorooctanesulfonic acid (PFOS)
perfluorooctanoic acid (PFOA)
perfluoropentanoic acid (PFPeA)
perfluoropentanesulfonic acid (PFPeS)
perfluoroundecanoic acid (PFUnA)
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)
perfluorotetradecanoic acid (PFTA)
perfluorotridecanoic acid (PFTrDA)
lithium

LAKE McDONOUGH RECREATION

Chief Operating Officer Chris Levesque reported on recreation for the upcoming season at Lake McDonough. He reported that there had been zero applications submitted for lifeguard

positions so the beach will not be open in 2023. Boating and passive recreation will be available.

Commissioner DiBella moved the following resolution:

Season passes for non-residents will be $100. Season passes for residents will be $40. For those using a season pass, two boats/kayaks can be used on one season pass.

Day passes for non-residents will be $20. Day Passes for residents will be $10.

The resolution passed by unanimous vote of those present.

COMMISSIONER REQUESTS FOR FUTURE AGENDA ITEMS

Commissioner Gardow requested there be a discussion regarding the industrial rate. He previously asked for this information at the March Water Bureau meeting and would like it to be included on the agenda for the regular meeting of Water Bureau in May.

OPPORTUNITY FOR GENERAL PUBLIC COMMENTS

No one from the public appeared to be heard.

ADJOURNMENT

The meeting was adjourned at 4:43 PM

ATTEST:

John S. Mirtle
District Clerk

_____
Date of Approval

Special Water Bureau Meeting

June 13, 2023

Agenda

- Master Planning Project
  - Objective
  - Team
  - Timeline
  - Overview & History of the MDC Raw Water System
  - Overview & History of MDC Water Treatment Facilities
- System Priorities & Limitations
- Transmission Main Alternatives
- Treatment Plant Alternatives
- Condition Assessments
- Final Evaluation of Alternatives
- Recommendation:
  - Implementation Plan

Objective

To efficiently plan and prioritize the next 30+ years of capital spending based on raw water transmission, treatment, and distribution systems needs and our long-term goals.

Master Planning Project

Team

- Engineering & Planning
- Water Treatment & Supply
- AECOM (consultant)

Master Planning Project

2017-2018

-Hired Consultant
-Workshops
-Site Visits
-Initial Plan

2019

Condition Assessments

2020-2021

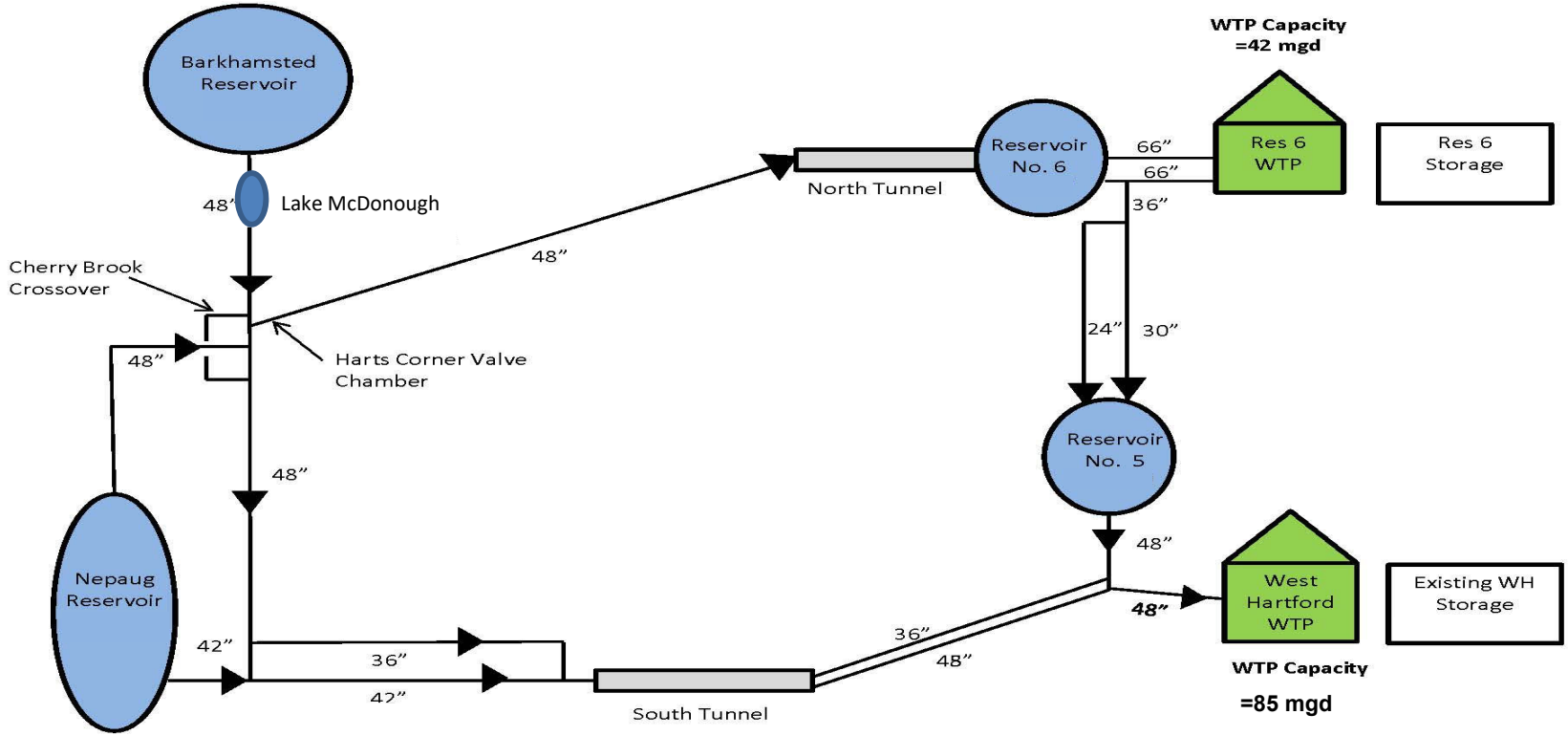
-AECOM Presentations

-AECOM Revised Reports

2022-2023

-Risk Matrix
-Project Phasing
-Financial Analyses
-Final Alternative Selection

MDC Raw Water System Overview



Nepaug 1 Pipeline (1913)

Barkhamsted-Nepaug Pipeline (1940)

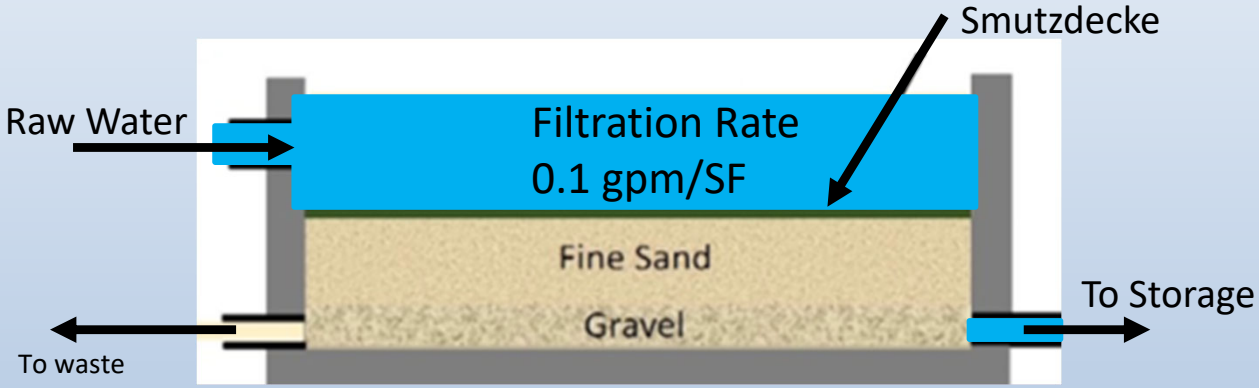
South Talcott Mountain Conduit (1913)

West Hartford Water Treatment Plant Filter Beds 1-8 (1917)

Master Planning Project

Treatment Plants - Existing Conditions

WH WTP - SLOW SAND FILTERS



Actual Capacity: 74 MGD

Harrow a filter every 6-8 wks

Recondition a filter every 11 yrs

Downtime 30-60 days

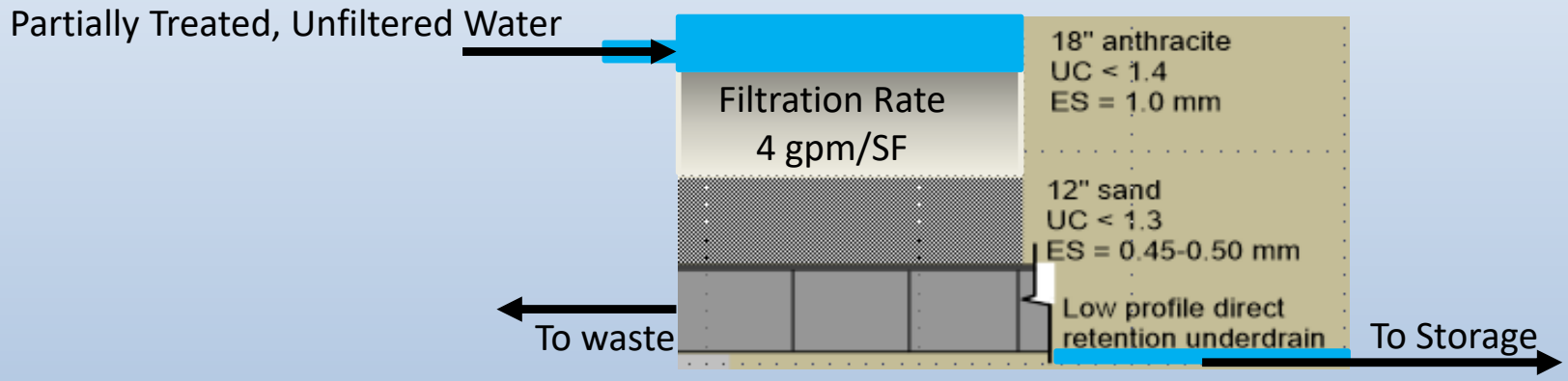
Recent Max Production: 62.5 MGD

Typical Usage: 36 MGD, about 70% of MDC consumption

Master Planning Project

Treatment Plants - Existing Conditions

RES6 WTP - RAPID FILTRATION



Design Capacity: 42 MGD

Backwash filter every 72-96 hours (seasonal)

Downtime 15-30 minutes

Recent Max Production: 30 MGD

Typical Usage: 8-15 MGD, about 30% of MDC consumption

System Priorities & Limitations

Transmission - Pipelines under bodies of water

- Farmington River Crossings (Nepaug Upper & Lower, Cherry Brook Upper & Lower)
- Lake McDonough Crossing

*Expensive and/or disruptive failures

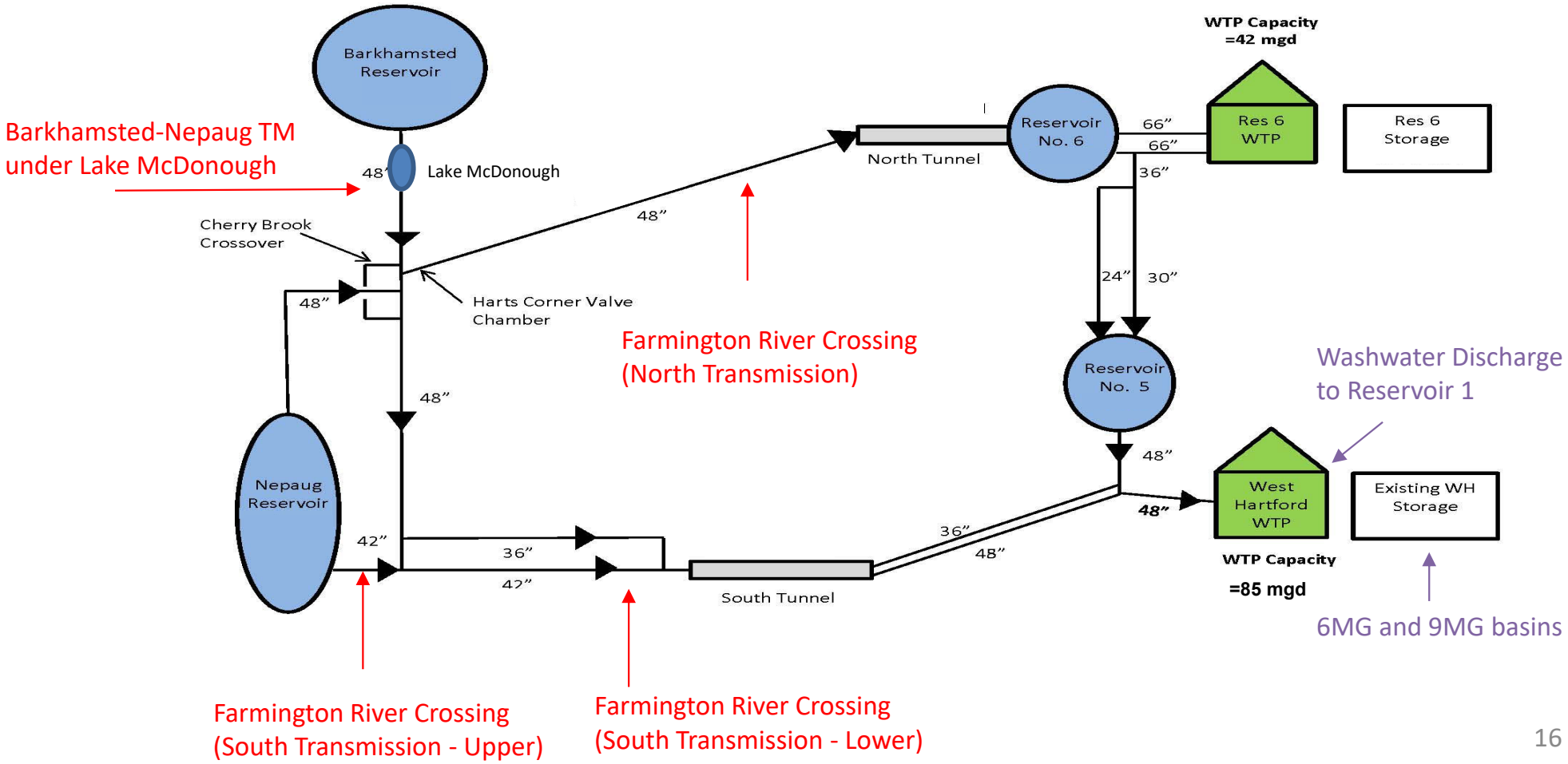
Farmington River Crossing

System Priorities & Limitations

Treatment – West Hartford WTP

- Requires large footprint
- Requires extensive labor for cleaning and harrowing beds
- Future Regulatory compliance
  - Treatment Process Limitations (organics → DBPs, Chlorine Residuals)
  - Filter washwater discharge
  - 6 & 9 MG Basins at West Hartford WTP

MDC Raw Water System



Transmission Decisions:

1. No Action (Maintain Status Quo)
2. Rehabilitate
3. Replace
4. Abandon

Treatment Decisions:

1. No Action (Maintain Status Quo)
2. Rehabilitate
3. Replace on same site
4. Replace in new location

Transmission Main Alternatives

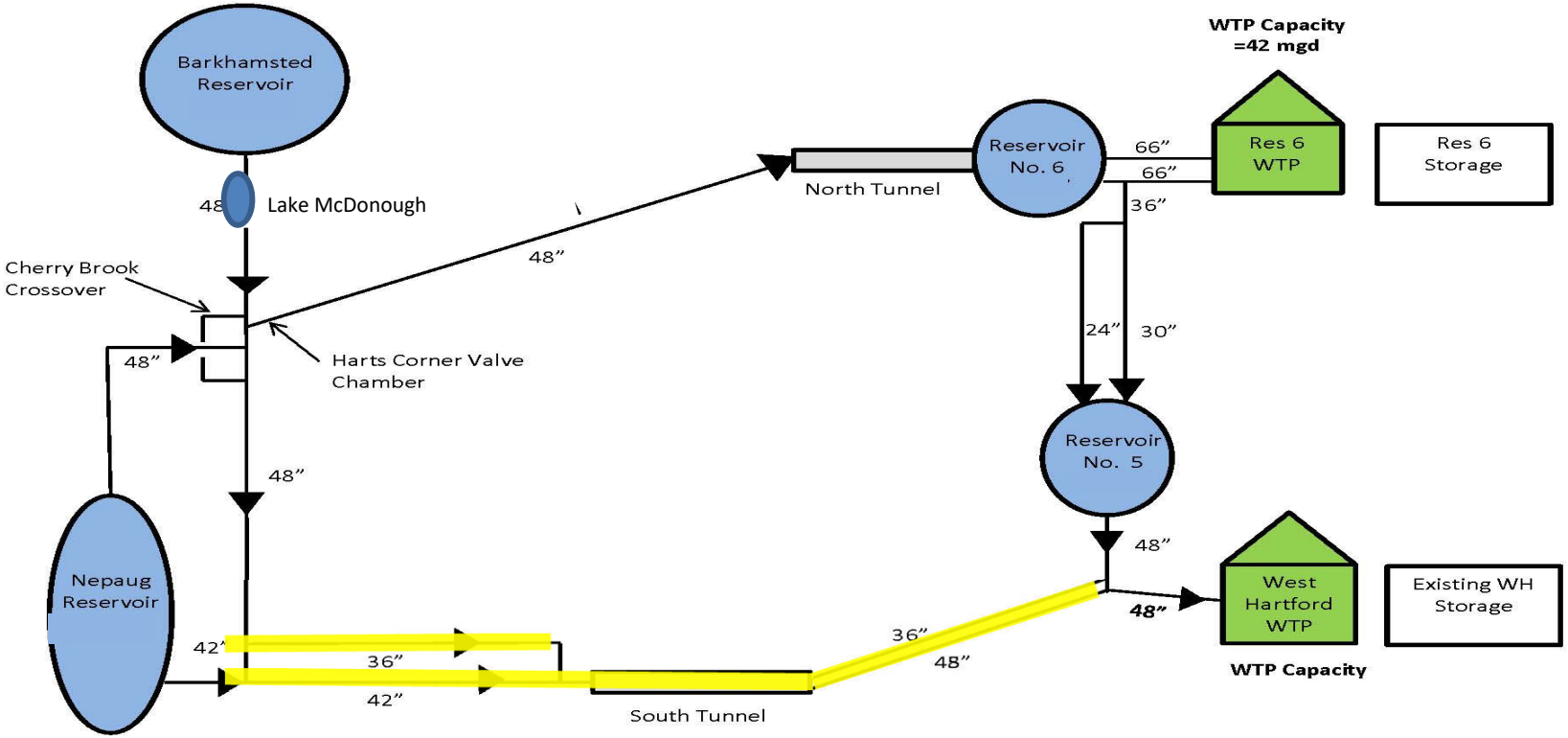
1) **No Action** (Maintain Status Quo)

   Repair leaks and breaks as needed

   *N/A if building a plant in Reservoir 6 – capacity restraints

2) **Rehabilitate** via trenchless technology
3) **Replace** all transmission mains
4) **Abandon** transmission mains in place

MDC Raw Water System



Treatment Plant Alternatives

1) **No Action** (Maintain Status Quo)
2) **Rehabilitate** (Structurally) to Extend Useful Life

   Technology stays the same
3) **Replace** – Build a new plant on West Hartford site
4) **Replace** – Build a new plant at Reservoir 6 site

   Treatment solely in the north

   → Transmission requires capacity upgrades

   → Transmission requires pump station

	A = Upgrades All* Transmission		B = Abandon Southern Transmission	
Rehab WHF Plant	1A	• Structural Upgrades to WH Water Treatment Plant • Upgrade All Existing Transmission	1B	• Structural Upgrades to WH Water Treatment Plant • New Northern Transmission • Abandon Southern Transmission
New Plant Res 6	2A	• New Water Treatment Plant at Res 6 • Abandon WH Water Treatment Plant • New Raw Water Pump Station • New Treated Water Pump Station • Upgrade All Existing Transmission	2B	• New Water Treatment Plant at Res 6 • Abandon WH Water Treatment Plant • New Raw Water Pump Station • New Northern Transmission Mains • Abandon Southern Transmission
New Plant WH	3A	• Replace WH Water Treatment Plant • Upgrade All Existing Transmission	3B	• Replace WH Water Treatment Plant • New Northern Transmission Mains • Abandon Southern Transmission

*For comparison purposes. Later slides will evaluate more transmission options

Next Steps

Condition Assessments

- Transmission Mains
  - Barkhamsted-Nepaug Pipeline
  - Lake McDonough
- South Talcott Mountain Tunnel and Conduits
- West Hartford Water Treatment Plant

Condition Assessments
Barkhamsted-Nepaug Pipeline

- Visual Inspection
- Ultrasonic Thickness Testing
  - Underground piping
  - Accessible pipes
- Interior Pipe Inspection

Photo: Exposed Dresser Coupling

Condition Assessments
Barkhamsted-Nepaug Pipeline

Photo: Steel Mains within Saville Dam Gatehouse

Condition Assessments

Barkhamsted-Nepaug Pipeline

Condition Assessments

Barkhamsted-Nepaug Pipeline

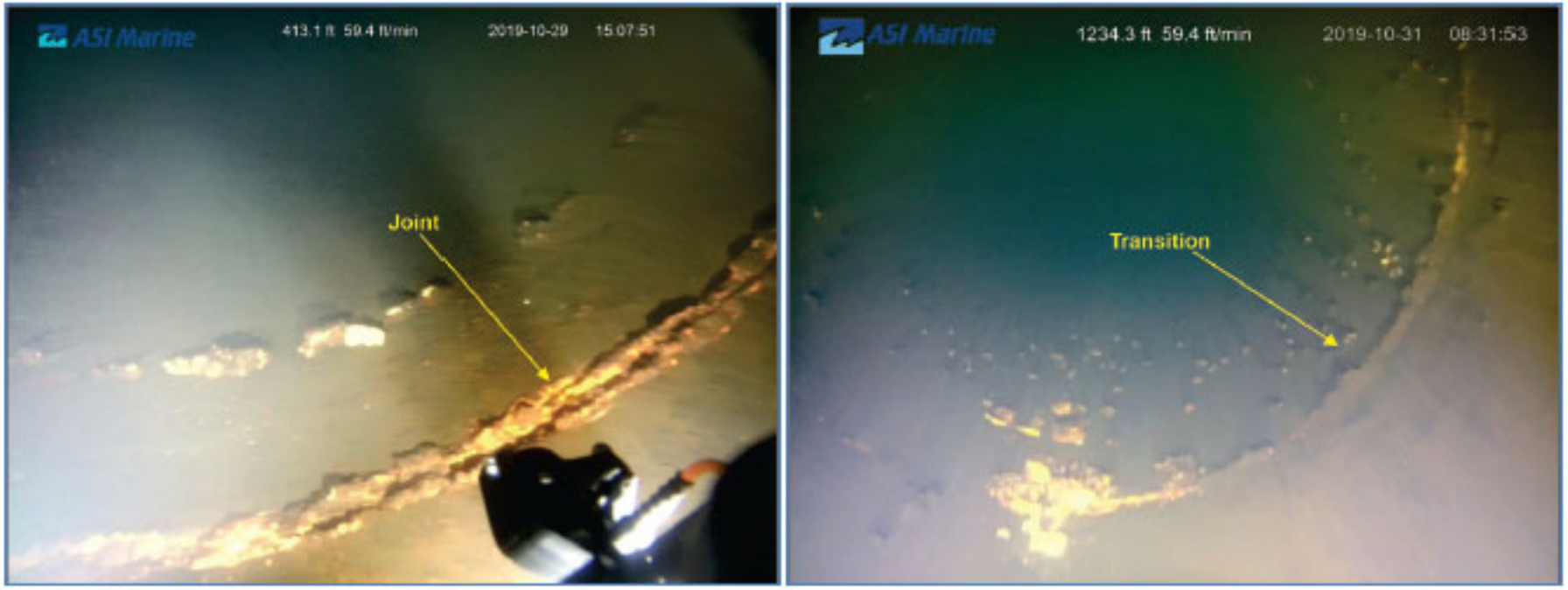


Figure 19: Image of joint at Station 03+41 (left); Image of transition at Station 12+17 (right)

Condition Assessments
South Talcott Mountain Tunnel & Conduits

<u>Manned Inspection</u>

- Visual inspections and concrete core testing

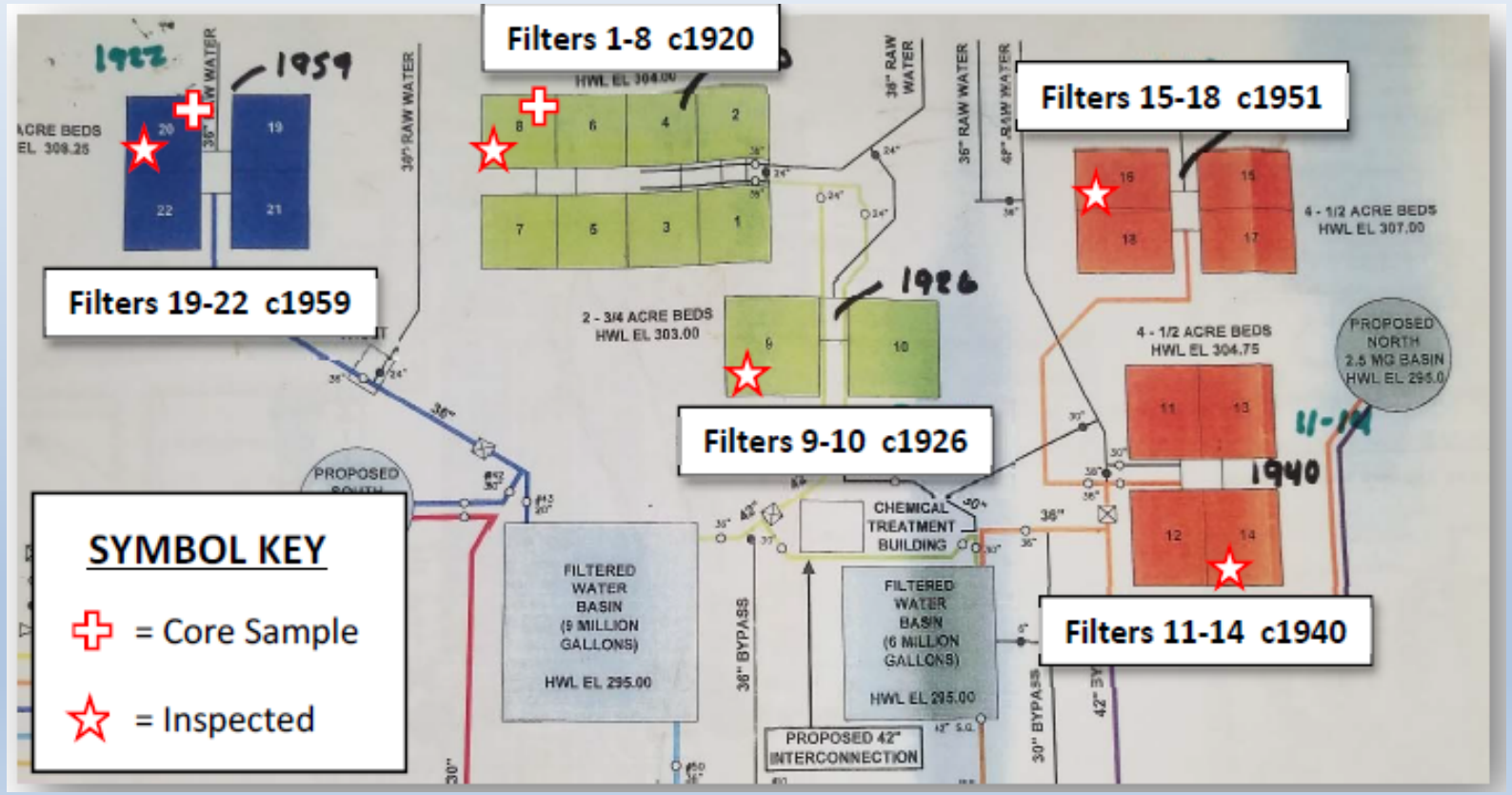
Photos: Sampling and Inspecting within Tunnel

Condition Assessments
WH Water Treatment Plant

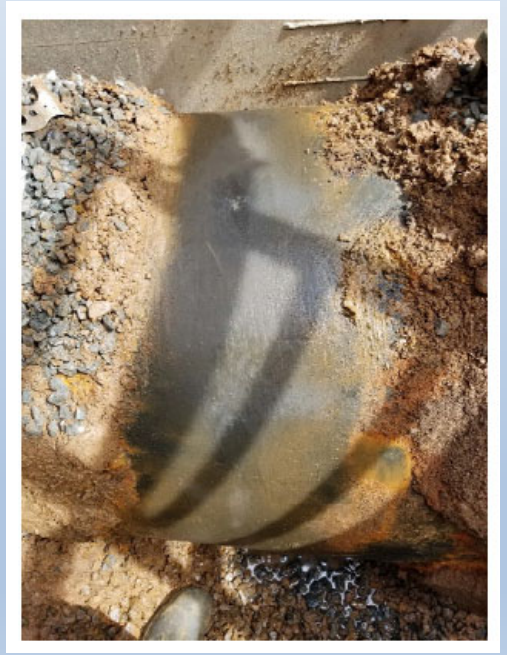
- Concrete cores
- Visual inspections
  - pipe gallery
  - slow sand filter beds
- Ultrasonic Thickness Testing
  - Accessible pipes within gallery
  - Underground piping

Photo: Corroded Pipe

Condition Assessments
WH Water Treatment Plant



Condition Assessments
WH Filters Water Treatment Plant



Photos: Test Pit Location Map; Exposed Yard Piping

Condition Assessment Conclusions

Transmission Mains

Photo: Damaged Exterior Coating

Defects Discovered

- Exterior coating on dam piping
- Known aging appurtenances

Recommended Improvements

- Remove & replace coating (abatement involved)
- Continued assessments
- Appurtenance replacements/modifications

Extend Useful Life 20-30 Years: ± $2.5 Million

Condition Assessment Conclusions

Tunnel & Conduits

Defects Discovered

- Damaged overflow weir deck
- Minor root intrusion

Recommended Improvements

- Repair overflow weir deck
- Monitor & Assess

Photo: Rotted Wooden Protective Deck at Weir

Extend Useful Life 20-30 Years : ± $200,000

Condition Assessment Conclusions

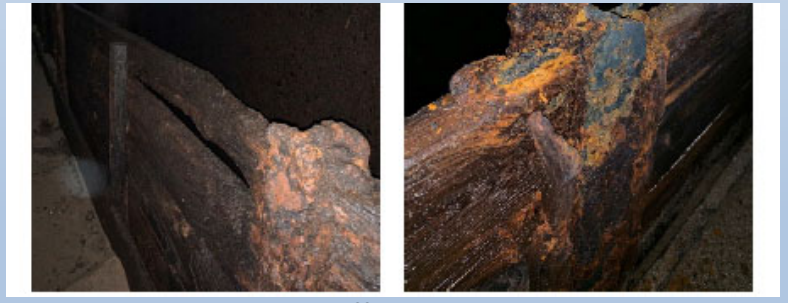
West Hartford Water Treatment Plant

Defects Discovered

- –Treatment process for filter wash-water
- –Pipe gallery fixtures (corroded and tuberculated), aging valves, non-compliant tanks and aging filter beds

Recommended Improvements

- –New treatment process
- –Replacement/repairs
- –Continued assessments



Photos: Baffle deterioration

Extend Useful Life 20-30 Years : ± $90 Million

Final Evaluation - Priority Projects

- Design & Construct 5MG tank at WH WTP
- Reservoir 6 WTP Upgrades & Maintenance
- Design & Construct New and/or Redundant Pipelines
  - Farmington River Crossing - Upper
  - Elizabeth Park Transmission Main within the distribution system
- Lake McDonough By-pass System
- Transmission Appurtenances
- New Water Treatment Facility
  - Preliminary Study & Pilot Design

	A = Upgrades All* Transmission	B = Abandon Southern Transmission
Rehab WHF Plant	ELIMINATED	
New Plant Res 6	ELIMINATED	2B • New Treatment Plant at Res 6 • New Raw Water Pump Station • New Northern Transmission Mains • Abandon Southern Transmission
New Plant WH	3A • Replace WH Water Treatment Plant • Upgrade All Existing Transmission	ELIMINATED

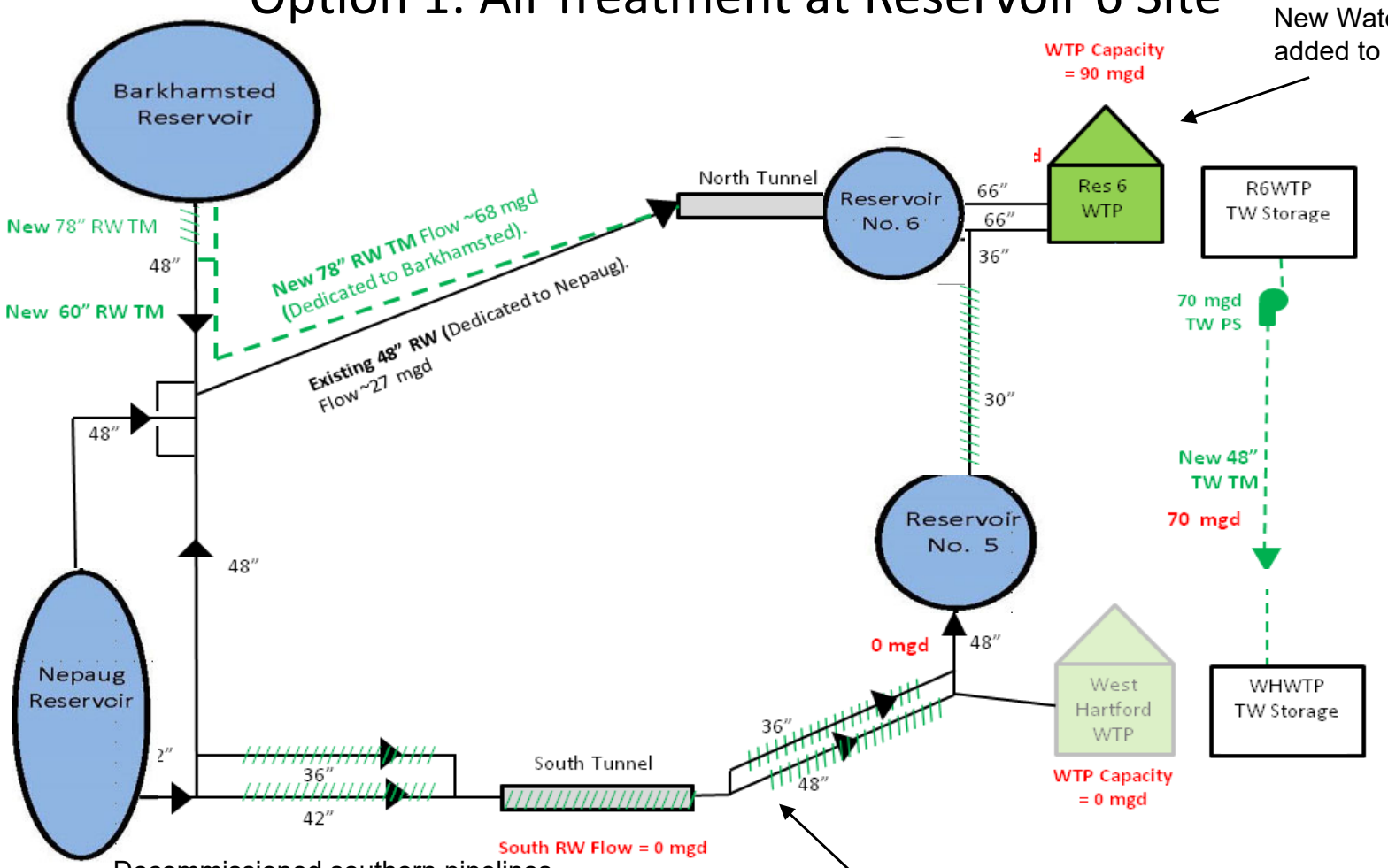
*For comparison purposes. Later slides will evaluate more transmission options

Final Evaluation

Option 1 (2B)	Option 2 (3A)
Install a new water treatment plant at **Reservoir 6 site**	Replace the treatment plant at **West Hartford site**
Abandon Southern Transmission Mains	Upgrade Southern Transmission Mains
Install new Transmission Mains w/ increased capacity to the north	Upgrade remaining Transmission Mains
Install New Pump Station & Force Mains	

Alternative Evaluation

Option 1: All Treatment at Reservoir 6 Site



Alternative Evaluation

Option 1: All Treatment at Reservoir 6 Site

Treatment Upgrades

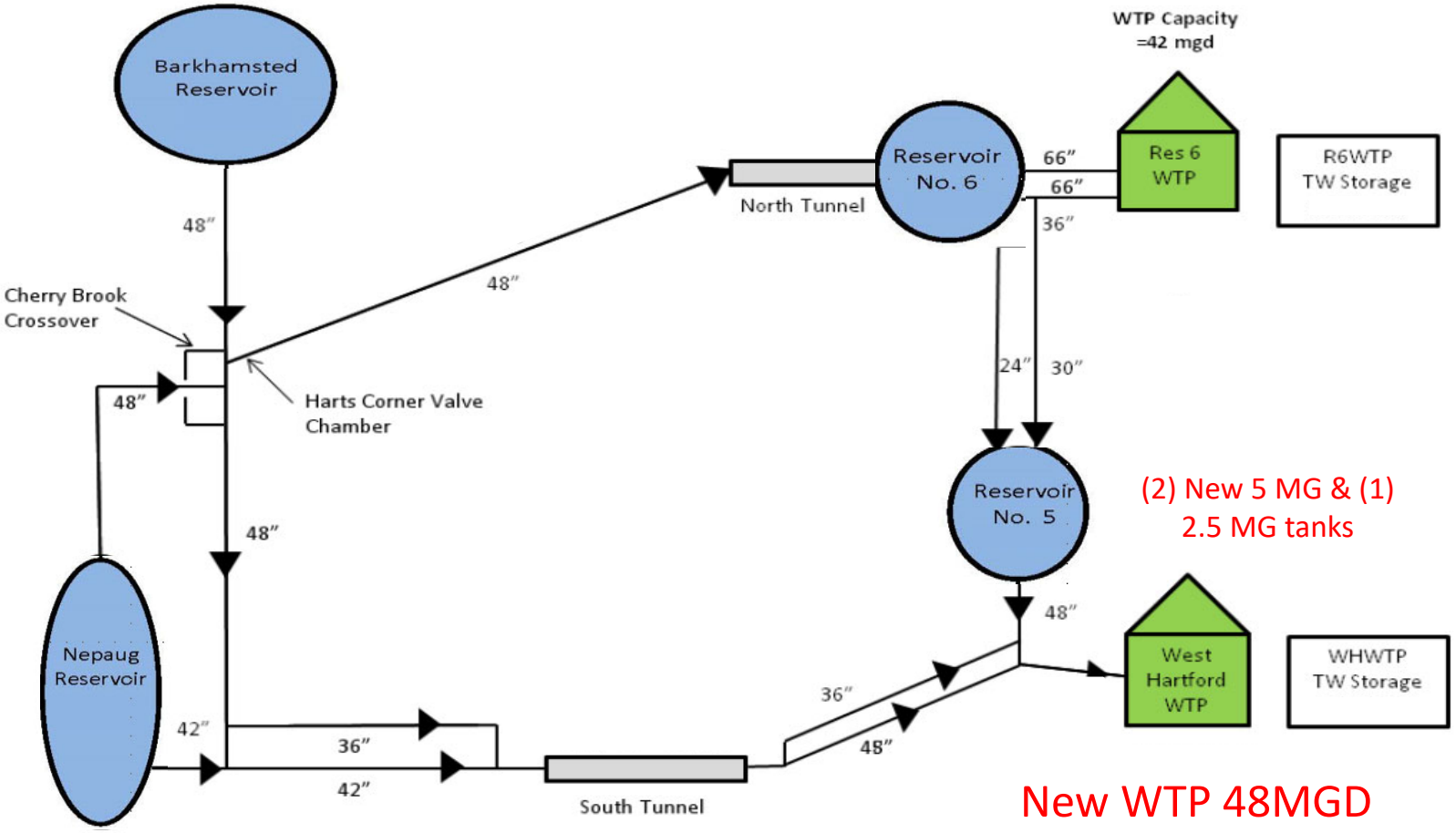
- New 48 MGD plant (@ Res6)
  - (2) 1.45 MG chlorine contact storage tanks
  - Backwash pump station
  - Electrical and chemical buildings
  - DAF sludge holding tank
  - Spent wash water equalization tank and pump station
- WH WTP Improvements:
  - 2.5 MG tank
  - (2) 5 MG tanks
  - Demolish slow sand filters, buildings, & piping

Transmission Upgrades

- New Transmission Main Installations:
  - 78-in Barkhamsted to Lake
  - 60-in to Harts Corner
  - 78-in to North Talcott Mountain Tunnel
- New Treated Water Pump Station
  - 4 turbine pumps (1 standby) 900 HP 23.2MGD @160' TDH variable speed drive
- New 48-in force main from Res6 WTP to WH storage
- Abandon Southern Transmission

Alternative Evaluation

Option 2: Treatment at both WHF and Reservoir 6



New WTP 48MGD

(Decommission existing WTP)

Alternative Evaluation

Option 2: Treatment at both WH and Reservoir 6

Treatment Upgrades

- New 48 MGD plant (@ WH)
  - 2 (5) MG tank
  - (3) residual lagoons
  - Backwash pump station
  - Electrical and chemical buildings
  - Decant/recycle pump station
  - 2.5 MG tank
  - (2) spent wash water ponds
  - Demolish filters

Transmission Upgrades

- New Transmission Main Installations:
  - 36-in & 48 in Supply Lines
  - River Crossings
  - 42-in Nepaug 3
  - 48-in Barkhamsted-Nepaug
  - 48-in Cherry Brook
  - 36-in Cherry Brook crossover
  - 48-in Collinsville Bypass

As-needed Upgrades

Alternative Evaluation

Reservoir 6 Existing Water Treatment Facility
Recommended Upgrades

- Underdrain Replacement
- Main filter building generator & HVAC
- Decant building valve replacement
- Flocculator & Sluice gate replacements
- Intake house sluice gate replacement
- Raw Water Vault butterfly valve replacement
- Misc. yard piping rehab

Treatment Alternative Locations

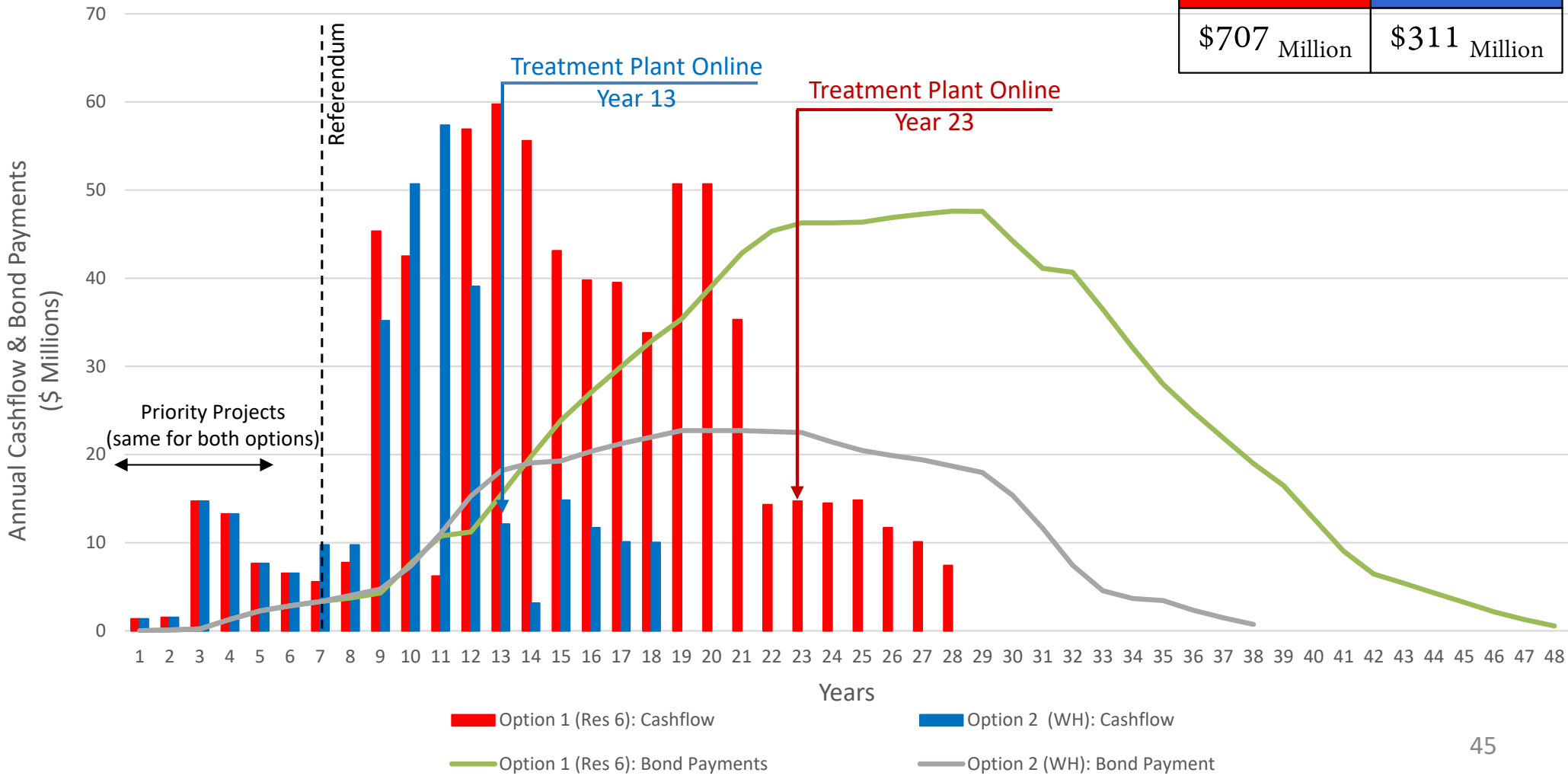
Option 1: Reservoir 6 WTP Site	Option 2: West Hartford WTP Site
Required before WTP operational • increased capacity • pump station	N/A – changes to transmission layout not required
New plant by Year 2046	New plant by Year 2036
Centralized treatment location	Multiple treatment locations

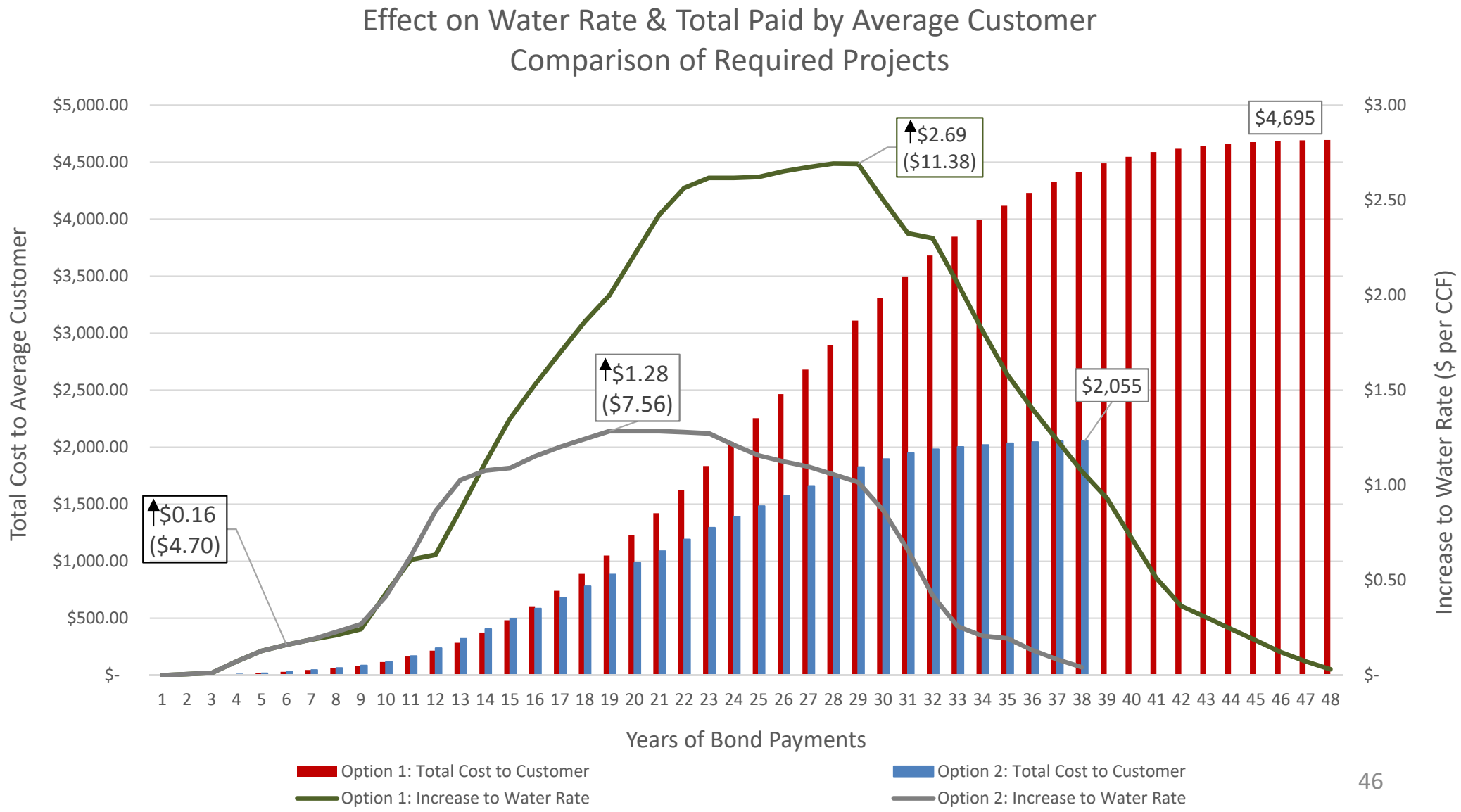
Cost Comparison
Priority & Required Projects

Option 1 Reservoir 6 WTP Site		Option 2 West Hartford WTP Site	
Priority Projects (Years 0-6)	$47M	Priority Projects (Years 0-6)	$47M
Required Projects (Years 7-28) Plant & Tanks Remaining River Crossings Interim WH WTP Upgrades Increased Transmission Capacity *Referendum up to $600M*	$660M	Required Projects (Year 7-18) Plant & Tanks Remaining River Crossings *Referendum up to $200M*	$264M
Subtotal: Required Projects	$707M	Subtotal: Required Projects	$311M

Annual Cashflows & Bond Payments
Comparison of Required Project Costs

Option 1	Option 2
$707 Million	$311 Million



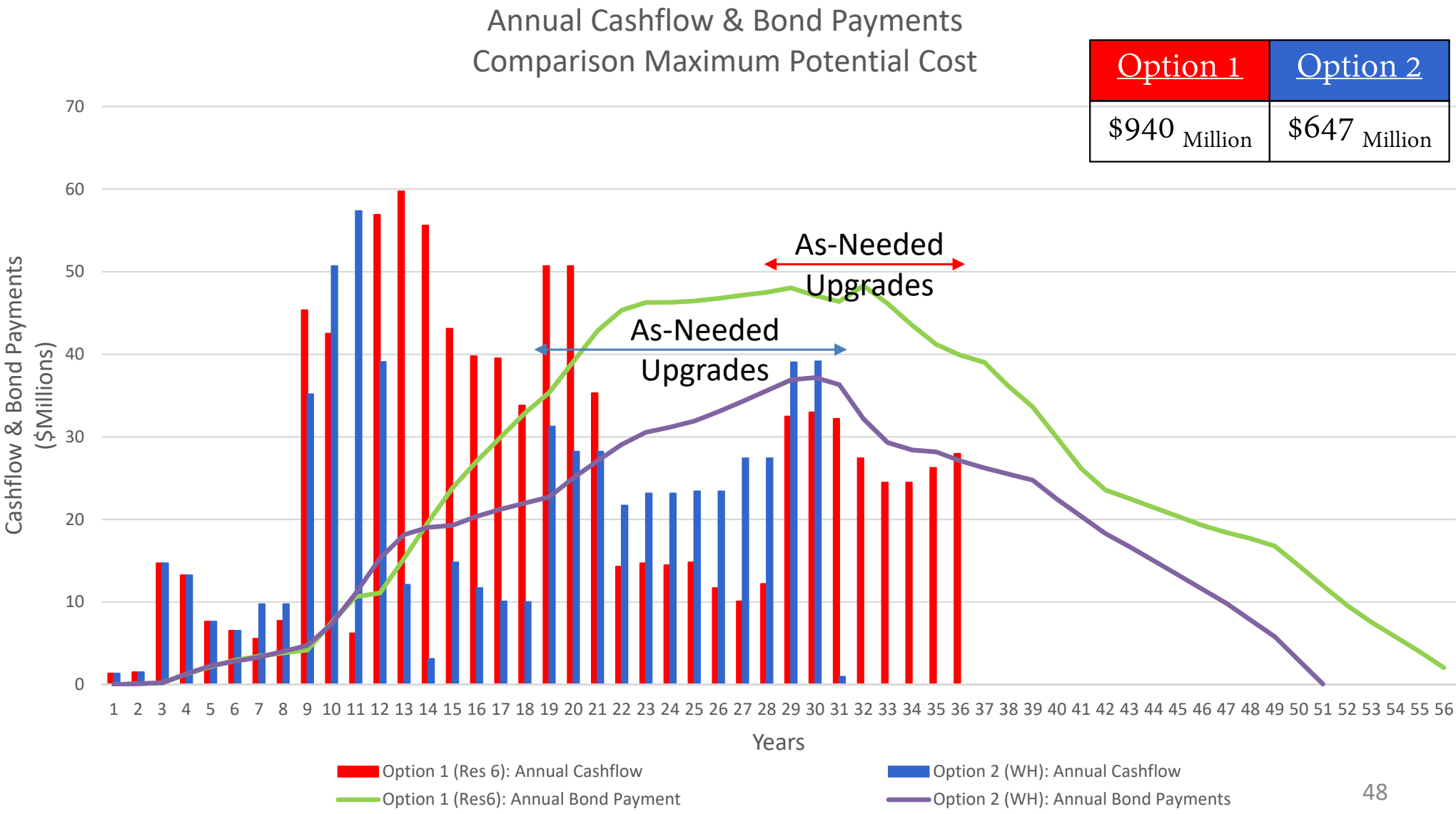

Effect on Water Rate & Total Paid by Average Customer
Comparison of Required Projects
Total Cost to Average Customer
Increase to Water Rate ($ per CCF)
$5,000.00
$4,500.00
$4,000.00
$3,500.00
$3,000.00
$2,500.00
$2,000.00
$1,500.00
$1,000.00
$500.00
$-
$3.00
$2.50
$2.00
$1.50
$1.00
$0.50
$-
↑$0.16
($4.70)
↑$1.28
($7.56)
↑$2.69
($11.38)
$2,055
$4,695
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
Years of Bond Payments
Option 1: Total Cost to Customer
Option 2: Total Cost to Customer
Option 1: Increase to Water Rate
Option 2: Increase to Water Rate

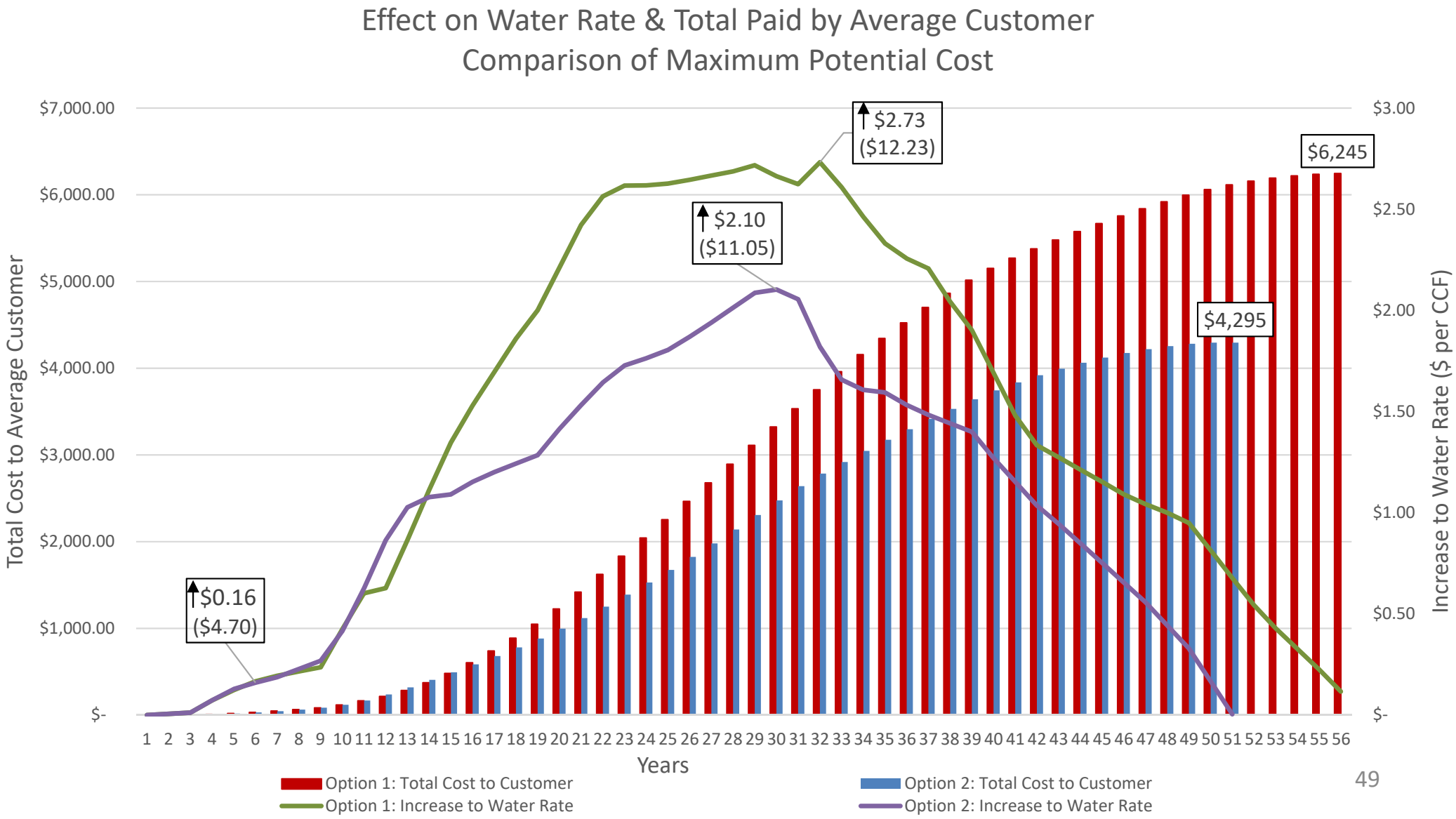
Cost Comparison

Required & Priority Projects

Plus Condition-Dependent Projects

Option 1 Reservoir 6 WTP Site		**Option 2 West Hartford WTP Site**	
Subtotal: Required Projects	$707M	Subtotal: Required Projects	$311M
Condition-Dependent Transmission Upgrades (Years 29-35)	$0-233M	Condition-Dependent Transmission Upgrades (Years 19-30)	$0-336
Maximum Total: All Projects	Up to $940M	Maximum Total: All Projects	Up to $647M


Annual Cashflow & Bond Payments
Comparison Maximum Potential Cost
Option 1
$940 Million
Option 2
$647 Million
As-Needed
Upgrades
As-Needed
Upgrades
Cashflow & Bond Payments
($Millions)
Years
Option 1 (Res 6): Annual Cashflow
Option 2 (WH): Annual Cashflow
Option 1 (Res6): Annual Bond Payment
Option 2 (WH): Annual Bond Payments


Effect on Water Rate & Total Paid by Average Customer
Comparison of Maximum Potential Cost
Total Cost to Average Customer
Increase to Water Rate ($ per CCF)
$7,000.00
$6,000.00
$5,000.00
$4,000.00
$3,000.00
$2,000.00
$1,000.00
$-
$3.00
$2.50
$2.00
$1.50
$1.00
$0.50
$-
$0.16
($4.70)
$2.10
($11.05)
$2.73
($12.23)
$4,295
$6,245
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56
Years
Option 1: Total Cost to Customer
Option 2: Total Cost to Customer
Option 1: Increase to Water Rate
Option 2: Increase to Water Rate

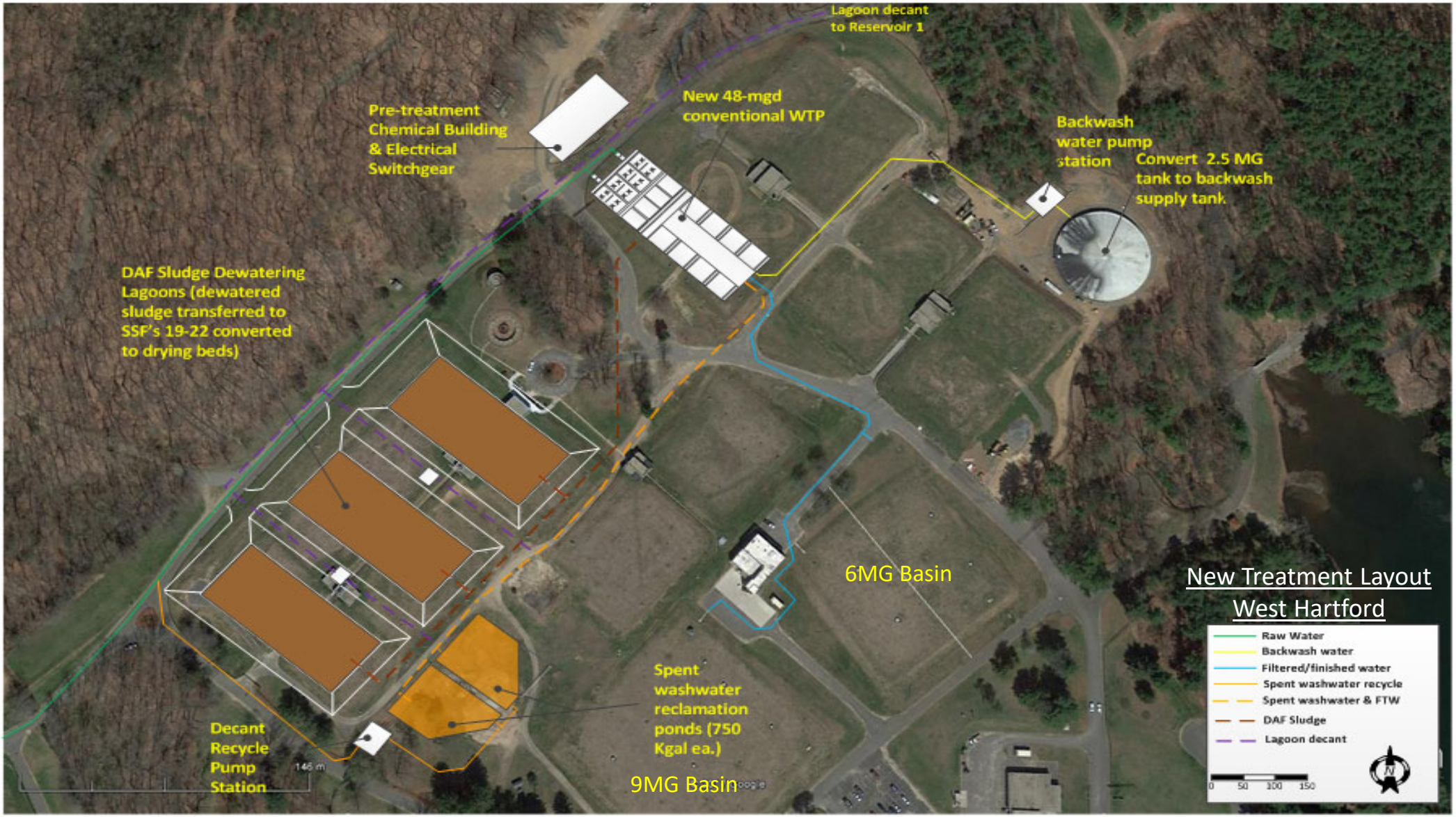
Annual Operating Costs

Plant	Existing Operations	Option 1	Option 2
West Hartford WTP			
Energy, Labor, Chemicals, Equipment	$3.0M	<$0.5M	$2.8M
Reservoir 6 WTP			
Energy, Labor, Chemicals, Equipment	$1.5M	$5.3M	$1.7M
Total	$4.5M	$5.8M	$4.5M

Recommendation

Install a new Water Treatment Plant in **West Hartford**.

- ✓ Lower cost
- ✓ Flexibility of schedule
- ✓ Address priorities sooner


Lagoon decant to Reservoir 1
Pre-treatment Chemical Building & Electrical Switchgear
New 48-mgd conventional WTP
Backwash water pump station
Convert 2.5 MG tank to backwash supply tank
DAF Sludge Dewatering Lagoons (dewatered sludge transferred to SSF's 19-22 converted to drying beds)
6MG Basin
Spent washwater reclamation ponds (750 Kgal ea.)
9MG Basin
Decant Recycle Pump Station
146 m
New Treatment Layout
West Hartford
Raw Water
Backwash water
Filtered/finished water
Spent washwater recycle
Spent washwater & FTW
DAF Sludge
Lagoon decant
0
50
100
150
N

Implementation Plan
Phase 1: 2023-2029

$47M

Project	Year
Design & Construct 5MG tank at WH WTP	2023-2025
Reservoir 6 WTP Upgrades & Maintenance	2023-2024
Design & Construct “Upper” River Transmission Main X-ing	2024-2026
Design & Construct Lake McDonough By-pass	2024-2026
Design & Construct Elizabeth Park Transmission Main	2025-2027
Transmission Appurtenances	2025-2027
Referendum	*2028*
New Water Treatment Facility (Preliminary Design)	2024-2029

Implementation Plan

Phase 2: 2030-2043

Project	Year
Construct New Treatment Plant & Abandon ex.	2029-2035
Design & Construct Supply Lines	2031-2034
Design & Construct Storage Tanks	2035-2038
Design & Construct “Lower” River Crossing	2036-2040
Reservoir 6 WTP Upgrades	2035-2040
Planning – Transmission Mains*	2041-2043

*35 miles of Transmission Mains remaining after river crossings are built

Recommended Plan

Future Phases: 20+ Years

Remaining 35 miles of Transmission Mains

- Continue condition assessments to determine:
  - No action (status quo)
  - Replacement
  - Trenchless structural lining
  - Combination of options

Conclusion

Proceed with Option 2 as follows:

- Complete priority projects
- Prepare for a future referendum
- Design & build a new plant in West Hartford
- Address remaining priority infrastructure
- Continue to assess aging infrastructure

Thank you!