HEALTH & ENVIRONMENT COMMITTEE

COMMITTEE MEETING

~ MINUTES ~

Wednesday, October 12, 2022 **2:00 PM** **Sullivan Chamber**
795 Massachusetts Avenue
Cambridge, MA 02139

The Health and Environment Committee will conduct a public meeting to discuss the issue of water quality from the Cambridge water supply including PFAS levels, and comparison with the MWRA system, the long-term strategy for ensuring water quality standards for all users and all other water quality related issues and concerns.

Attendee Name	Present	Absent	Late	Arrived
Patricia Nolan	☑	☐	☐	
Burhan Azeem	☑	☐	☐	
Dennis J. Carlone	☑	☐	☐	
Marc C. McGovern	☑	☐	☐	
Quinton Zondervan	☑	☐	☐	

HEALTH AND ENVIRONMENT COMMITTEE MEMBERS
Councillor Nolan, Chair
Councillir Azeem
Councillor Carlone
Councillor McGovern
Councillor Zondervan

A public meeting of the Cambridge City Council's Ordinance Committee was held on Wednesday, October 12, 2022. The meeting was Called to Order at 2:00 p.m. by the Chair, Councillor Nolan. Pursuant to Chapter 20 of the Acts of 2022 adopted by Massachusetts General Assembly and approved by the Governor, this public meeting was hybrid, allowing participation in person, in the Sullivan Chamber, 2nd Floor, City Hall, 795 Massachusetts Avenue, Cambridge, MA and by remote participation via zoom.

City Clerk LeBlanc called the roll.
Councillor Azeem – Present/Remote
Councillor McGovern – Present/Remote
Councillor Nolan - Present
Councillor Toner – Present/Remote
Councillor Zondervan – Present/Remote
Present- 5 Absent – 0. Quorum established

Also present at the meeting were Councillor Carlone, Vice Mayor Mallon, Mayor Siddiqui, along with City Staff which included administration from the City Manager's Office, administration from the Water Department, and Sam Lipson from the Cambridge Public Health Department.

Chair Nolan made opening remarks about why the meeting was called, which was to discuss the water quality from the Cambridge water supply including PFAS levels, and comparison with the MWRA system, the long-term strategy for ensuring water quality standards for all users and all

other water quality related issues and concerns. In her opening statement the Chair pointed out that the reason for the change to MWRA water was due to the levels of PFAS in Cambridge water being very close to the state limits and that public health impacts of PFAS are unknown and of growing concern across the country. Some recent evidence is that no level of PFAS is safe. The chair also noted that small businesses and some residents have expressed concerns over the years of overall water quality, and attributes that affect appliance life span. The chair also noted that the combined rates paid by Cambridge for water and sewer was about equivalent to the rates paid by Boston and some other citeis that rely exclusively on MWRA water.

Deputy City Manager Owen O'Riordan provided an update on behalf of the City.

Sam Corda, Managing Director for Cambriodge Water Department introduced his team, Julie Greenwood Torelli, David Kaplan, Mark Gallagher, and Fred Centanni. Sam Corda presented the Committee a presentation titled "Watershed, Distribution, Treatment, Water Quality, Costs, The Future" (**ATTACHMENT A**). They summarized how Cambridge has been providing a clean and reliable supply of drinking water.

David Kaplan reviewed watershed supplies in Cambridge, watershed operations, and the Cambridge Water system. They also made comments about the Fresh Pond Reservation and improvement/restorations projects that are taking place to improve raw water quality. (Attachment A)

Mark Gallagher spoke on the water distribution system. (Attachment A)

Julie Greenwood Torelli reviewed the water treatment process. They also spoke about Cambridge water quality for both State and Federal regulations, which Cambridge meets. They noted that Cambridge offers free water quality testing for all residents and mentioned that The Water Department is in the process of being certified to be able to test for PFAS in the Cambridge water supply. (Attachment A)

Sam Lipson spoke on PFAS and the most common sources of PFAS exposure. They noted that PFAS are considered a water repellant used in many everyday products. They reviewed data on the health effects of PFAS and studies done on humans and animals, and the outcome of the studies. (Attachment A)

Julie Greenwood Torelli spoke again on water quality. They noted that in 2020 MassDEP adopted among the strictest PFAS standards in the US and spoke about the EPA proposed regulatory schedule. They showed that by December 2022 there will be a complete filter changeout, making it 6 filters total. They reviewed the operation plan that will have to take place when filters are changed out. (Attachment A)

Fred Centanni summarized costs and budgets involving the Cambridge Water System. (Attachment A)

The Chair, Councillor Nolan raised several questions regarding the presentation. Questions concerning comparisons with current MWRA rates for PFAS, why PFAS rates are seasonal, and why do we have higher PFAS rates then MWRA. The Chair also noted that the cost for water and sewer system should be addressed.

Sam Corda and The Chair, Councillor Nolan discussed the questions that were raised.

The Chair, Councillor Nolan opened discussion to other members of the City Council.

Councillor Zondervan raised questions about the budget and costs with the Cambridge Water System and had questions regarding MWRA water versus Cambridge water, to which Sam Corda, Owen O'Riordan, and Julie Greenwood Torelli responded. Councillor Zondervan noted that he would like to see a zero PFAS level in the future.

Vice Mayor Mallon made comments about health concerns she receives from Cambridge residents regarding PFAS levels in Cambridge water and how the Water Department is reaching out to members of the community about FAQs and PFAS in Cambridge. Sam Corda noted that a FAQ was recently posted on the website and Owen O'Riordan mentioned that the City will use all platforms to help educate the community on PFAS. Sam Lipson also spoke on PFAS and the quality of water.

Vice Mayor Mallon noted that businesses have mentioned how difficult the water is on their systems and asked if new systems will help filter water better. Sam Corda responded that the new water filters will not help chlorine levels. Owen O'Riordan and Julie Greenwood Torelli noted that there are other options out there for businesses and that manufacturer recommendations need to be followed. Vice Mayor Mallon suggested that the Water Department work with the Economic Development team to ensure that small business owners, large developers, residents, and affordable housing builders to help inform, educate, and support them when it comes to water supply and costs.

The Chair, Councillor Nolan agreed with Vice Mayor Mallon's suggestion on working with the Economic Development team.

Councillor Azeem added that they have also heard from residents and businesses about concerns regarding the water supply. They questioned the hardness of the Cambridge water supply versus other communities. Sam Corda responded by mentioning that there are solutions to all these problems regarding the hardness of water. They mentioned that working with other City Staff, like ISD, to help inform residents and businesses can help. Owen O'Riordan wanted to acknowledge that Cambridge does have a different water system then other communities and the City needs to help residents and businesses know more about the water supply in Cambridge.

Councillor Zondervan mentioned that they think we should switch back to MWRA until we have a greater assurance. They noted that the lack of evidence is not the same thing as lack of danger, and that it's hard to not be concerned.

The Chair, Councillor Nolan noted that she hopes whatever medium the City decides to use, PFAS will be eliminated. They also mentioned that results from the Water Department regarding PFAS will be shared with the community as soon as results are known. The Chair, Councillor Nolan also noted the importance of the FAQs to be highlighted and more prominent on the water department website. The Chair also reiterated the request from the councillors present at the

meeting for the Water Department to work with ISD to inform all contractors and plumbers and any people pulling building permits and interfacing with the department to understand the specific attributes of Cambridge water, which may affect the appliances installed and the work done in the city's buildings. Further, that the water department should reach out to the Economic Development team and plan for a communication on water quality and water attributes to all businesses in the city to ensure that businesses in the city understand how the profile of the water might affect their operations. The city staff present agreed to work on those requests.

Owen O'Riordan reiterated that from the City's perspective it is important that members of the community have confidence in the water they are using. And noted that the costs of the infrastructure being built by the city as part of the sewer system and combined stormwater sewage control systems are one reason for the costs of the overall system, and have led to vast improvements in water management during flood events. Deputy City Manager O'Riordan further stated that a future meeting on those costs and the system improvements as a whole and what the investments have meant would be a welcome topic.

Sam Corda noted that the Water Department will keep the City updated on all the items requested.

A motion was made by The Chair, Councillor Nolan to adjourn.
Councillor Azeem – Yes
Councillor McGovern – Absent
Councillor Nolan – Yes
Councillor Toner Absent
Councillor Zondervan – Yes
Yes – 3 No – 0 Absent – 2
Motion to adjourn passed at 3:58 p.m.

Attachment A: Presentation titled: "Watershed, Distribution, Treatment, Water Quality, Coasts, The Future".

Clerk's Note: The City of Cambridge/22 City View records every City Council meeting and every City Council Committee meeting. This is a permanent record.

The video for this meeting can be viewed at:
https://cambridgema.granicus.com/player/clip/333?view_id=1&redirect=true&h=3c2c75636a63ed9c1a274daa49b6274f

A communication was received from Managing Director Cambridge Water Department, Sam Corda, transmitting a presentation regarding Watershed, Distribution, Treatment, Water Quality, Costs, the future.

CAMBRIDGE WATER DEPARTMENT

WATERSHED, DISTRIBUTION, TREATMENT, WATER QUALITY, COSTS, THE FUTURE

"Provide a safe, uninterrupted water supply of the highest quality to the citizens of Cambridge"

City Council: HEALTH and ENVIRONMENT COMMITTEE

OCTOBER 12, 2022

AGENDA

- CAMBRIDGE WATER SYSTEM
  - HISTORY
  - WATERSHED, DISTRIBUTION and TREATMENT
- WATER QUALITY
  - PFAS (Per and Polyfluoroalkyl substances)
  - LEAD
  - DISINFECTION BY-PRODUCTS
  - CHLORIDES
  - HARDNESS
  - TOTAL DISSOLVED SOLIDS (TDS) - minerals
- WATER SYSTEM COSTS vs. MWRA (Massachusetts Water Resources Authority)
- FUTURE - GO FORWARD STRATEGY

CAMBRIDGE WATER SYSTEM

PROVIDING A CLEAN and RELIABLE SUPPLY OF DRINKING WATER

- IN THE MID 1800s IT BECAME APPARENT THAT THERE WAS NOT AN ADEQUATE LOCAL SUPPLY OF FRESH DRINKING WATER TO MEET THE RAPIDLY GROWING POPULATION AND COMMERCIAL DEVELOPMENT
- CAMBRIDGE'S GOVERNING BODY WERE PROACTIVE AND WANTED TO PROVIDE A CONSISTENT AND RELIABLE SOURCE OF FRESH CLEAN DRINKING WATER TO MEET THE DEMANDS OF THE CITY'S OWN GROWING POPULATION AND HELP STRENGTHEN AND ENCOURAGE ITS ECONOMIC GROWTH INITIATED THE CENTURIES LONG COMMITMENT TO CREATE AN INDEPENDENT WATER SYSTEM TO MEET THOSE NEEDS
- ACQUIRED LAND/EASEMENTS:
  - FROM MULTIPLE TOWNSHIPS AND BUILT DAMS TO CREATE THE HOBBS BROOK AND STONY BROOK RESERVOIRS THAT NOW MAKE UP CAMBRIDGE'S INDEPENDENT SOURCE WATER SUPPLY
  - WITHIN WALTHAM AND WATERTOWN ALLOWING THE CONSTRUCTION OF THE STONY BROOK CONDUIT TO CONVEY WATER TO FRESH POND
- CONSTRUCTED A WATER TREATMENT PLANT IN 1923 TO CLEAN AND DISINFECT THE RAW WATER REMOVING ORGANICS AND ADDING CHLORINE TO KILL COMMON WATER BORNE DISEASES SUCH AS CHOLERA, TYPHOID AND HEPATITIS

CAMBRIDGE WATER SYSTEM

CONTINUOUS COMMITMENT to CLEAN and RELIABLE DRINKING WATER

- ACQUIRED LAND IN BELMONT CREATING THE PAYSON PARK RESERVOIR TO STORE A LARGE VOLUME OF TREATED WATER TO SUPPLY BY GRAVITY AN UNINTERRUPTED ON DEMAND SOURCE OF CLEAN DRINKING WATER AND FIRE PROTECTION TO THE CITY
- CONTINUED LAND ACQUISITION TO BETTER PROTECT THE SOURCE WATER SUPPLY FROM URBAN DEVELOPMENT AND ENCROACHMENT
- CONTINUOUS MONITORING OF THE UP-COUNTRY RESERVOIRS AND FRESH POND RESERVATION AS SOURCE WATER PROTECTION
- CONTINUOUS UPGRADES TO THE DISTRIBUTION SYSTEM PIPING ENSURING RELIABLE SUPPLY FOR ADEQUATE FIRE PROTECTION AND DOMESTIC WATER AT EVERY TAP
- BECAME A FULL MEMBER/CONNECTED TO THE MDC (NOW MWRA) WATER SUPPLY FOR FULL REDUNDANCY
- CONSTRUCTION OF THE STATE-OF-THE-ART WJ SULLIVAN PLANT IN 2001 AS A SAFEGUARD AGAINST INCREASING REGULATORY REQUIREMENTS AND NEW EMERGING CONTAMINANTS OF CONCERN

CAMBRIDGE WATER SYSTEM

- THE CAMBRIDGE WATER SYSTEM IS A VERY ROBUST SYSTEM
- MULTIPLE BARRIERS AND PROTECTION SYSTEMS via TREATMENT OPTIONS
  - WATERSHED PROTECTION
  - FILTRATION, PRE AND POST TREATMENT and MULTIPLE DISINFECTION STEPS
- RESILIENCY and REDUNDANCY
  - MWRA AS A BACK-UP SUPPLY
- MAINTAIN CONTROL OF OUR FUTURE
- LOWEST COST OPTION FOR RESIDENTS AND BUSINESSES

CAMBRIDGE WATER SYSTEM

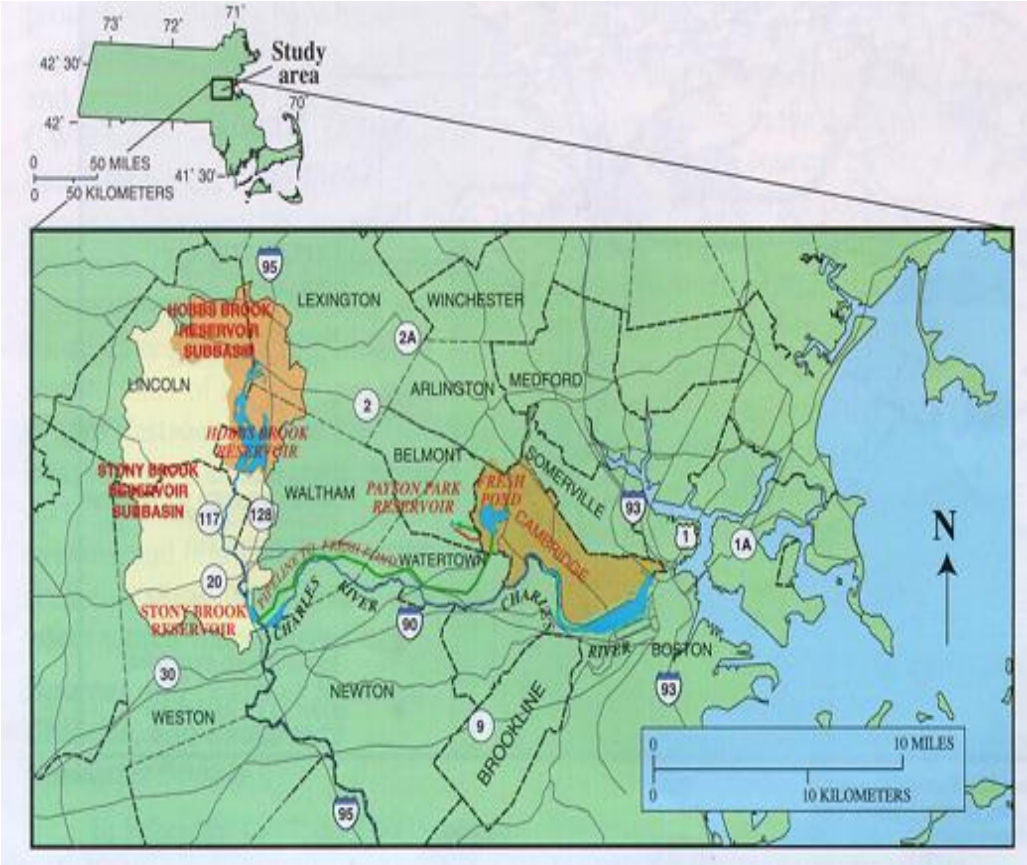
- CAMBRIDGE WATER DEPARTMENT is an ENTERPRISE FUND
  - WATER RATES PAY FOR ALL OPERATIONS AND CAPITAL EXPENDITURES INCLUDING DEBT SERVICE
  - $8.7M WATER FUND BALANCE AS OF 6/30/2022 (FY22)
  - $19M ANNUAL BUDGET
    - 3 DIVISIONS, 59 POSITIONS
- FULL MEMBER OF MASSACHUSETTS WATER RESOURCES AUTHORITY (MWRA)
  - PERMANENT CONNECTIONS' TO MWRA WATER SYSTEM
  - FOLLOW MWRA DROUGHT MANAGEMENT PLAN vs. STATE PLAN
  - ACCESS TO THE MWRA SYSTEM PROVIDES A LEVEL OF REDUNDANCY and RESILIENCY UNIQUE IN THE METROPOLITAN BOSTON AREA

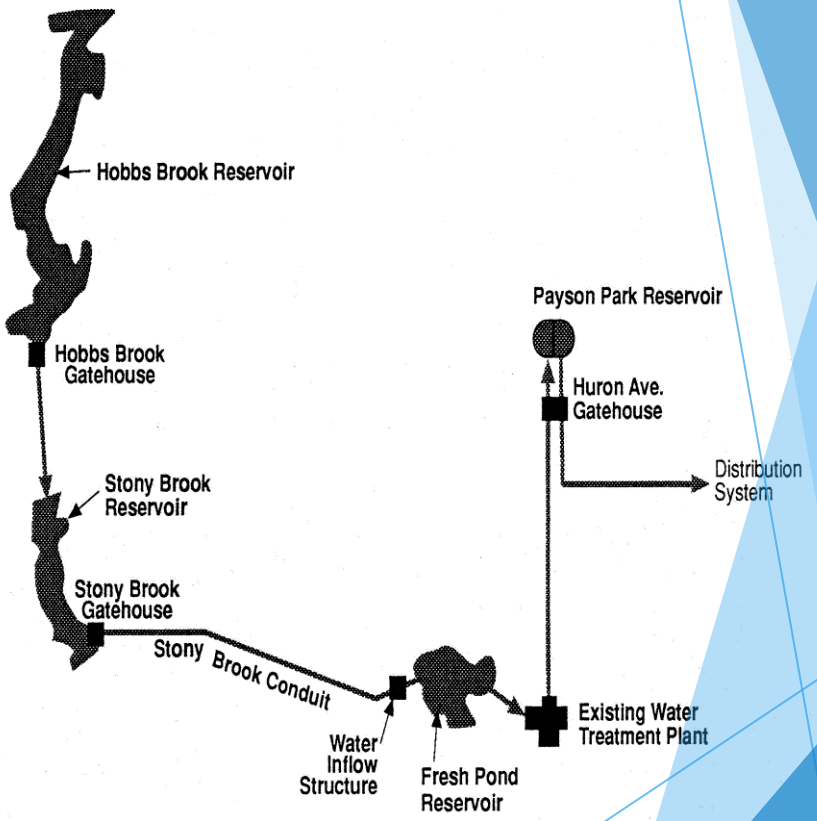
A MULTI-BARRIER APPROACH MAKES THE CAMBRIDGE WATER SYSTEM VERY ROBUST

Cambridge Water Supply and Treatment

MWRA Water Supply and Treatment

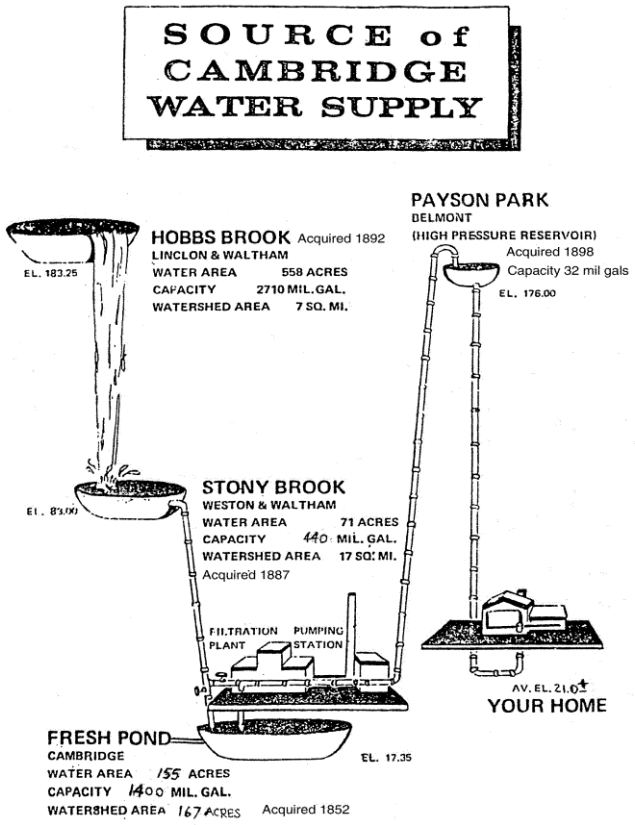
CAMBRIDGE WATER SYSTEM





"SIGNIFICANT LOCAL ENVIRONMENTAL BENEFIT TO THE WATERSHED COMMUNITY BY MANAGING OUR 24 SQUARE MILE WATERSHED AS A "CLASS A" WATER"

CAMBRIDGE WATER SYSTEM



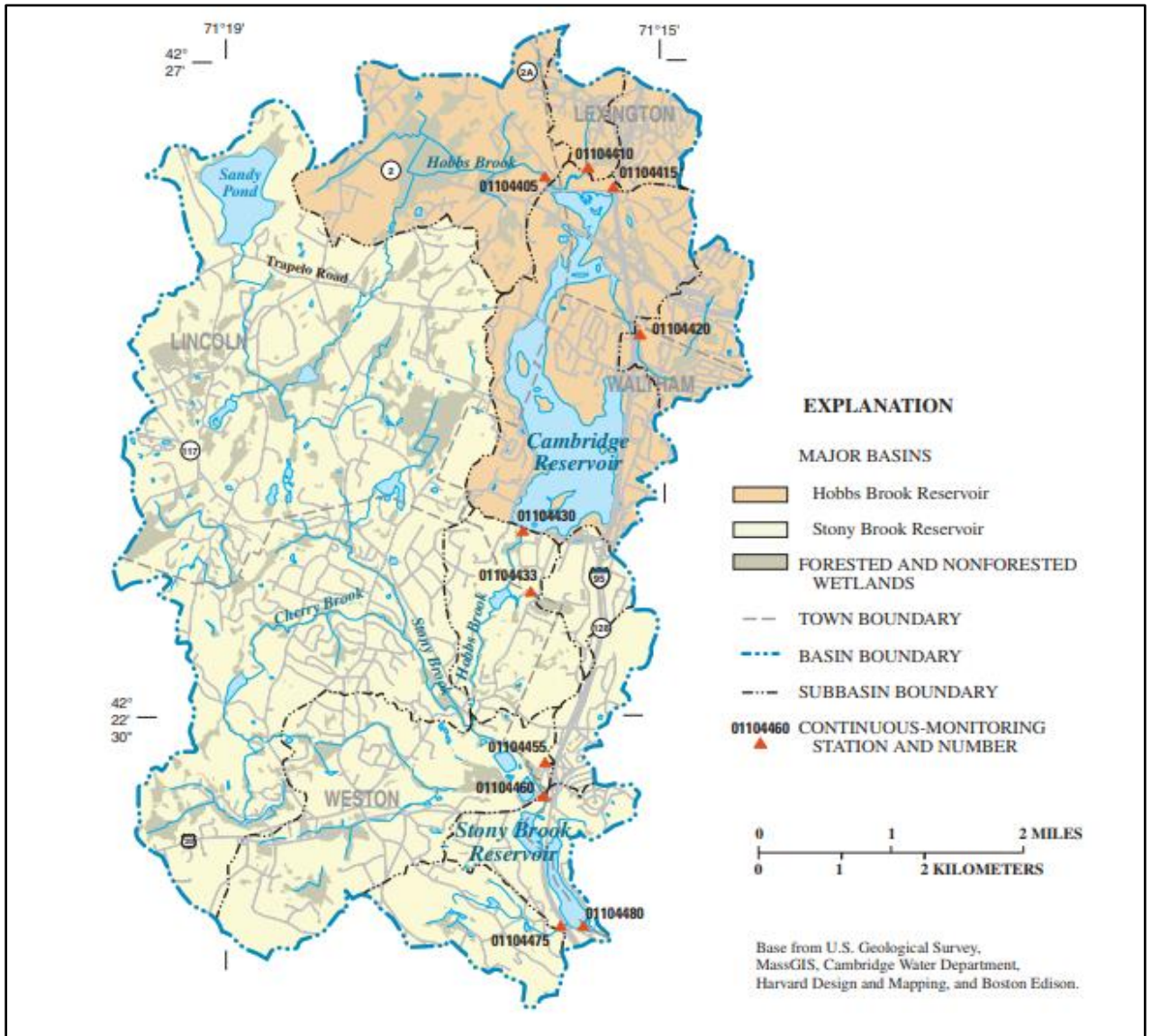
STORAGE VOLUMES

- HOBBS BROOK: ~2.5 BILLION GALLONS
- STONY BROOK: ~ 400 MILLION GALLONS
- FRESH POND: ~1.4 BILLION GALLONS
- PAYSON PARK: ~32 MILLION GALLONS

CONDUIT

- ~ 7 MI IN LENGTH
- 63” DIAMETER CONCRETE

CAMBRIDGE WATERSHED



- ~24 SQUARE MILE (SM) TOTAL WATERSHED
- ~17 SM - Stony Brook
- ~7 SM Hobbs Brook
- 13 USGS Gauging Stations (continuous)
- 21 Manual Monitoring Stations (reservoirs and tributaries)

CAMBRIDGE WATERSHED

HOBBS BROOK RESERVOIR

STONY BROOK RESERVOIR

CAMBRIDGE WATERSHED

Fresh Pond Reservation

- WATER QUALITY OF FRESH POND, BLACK'S NOOK, LITTLE FRESH POND, AND NORTH POND
- GROUNDWATER MONITORING
- RESERVATION MONITORING
- IMPROVEMENT/RESTORATION PROJECTS – TO IMPROVE RAW WATER QUALITY

Examples: TREATMENT FACILITY, LITTLE FRESH POND, NORTHEAST SECTOR, GLACKEN SLOPE AND PERIMETER PATH

- STORMWATER MANAGEMENT and CONTROL
- EROSION CONTROL
- WETLAND VEGETATION
- NATIVE LANDSCAPE

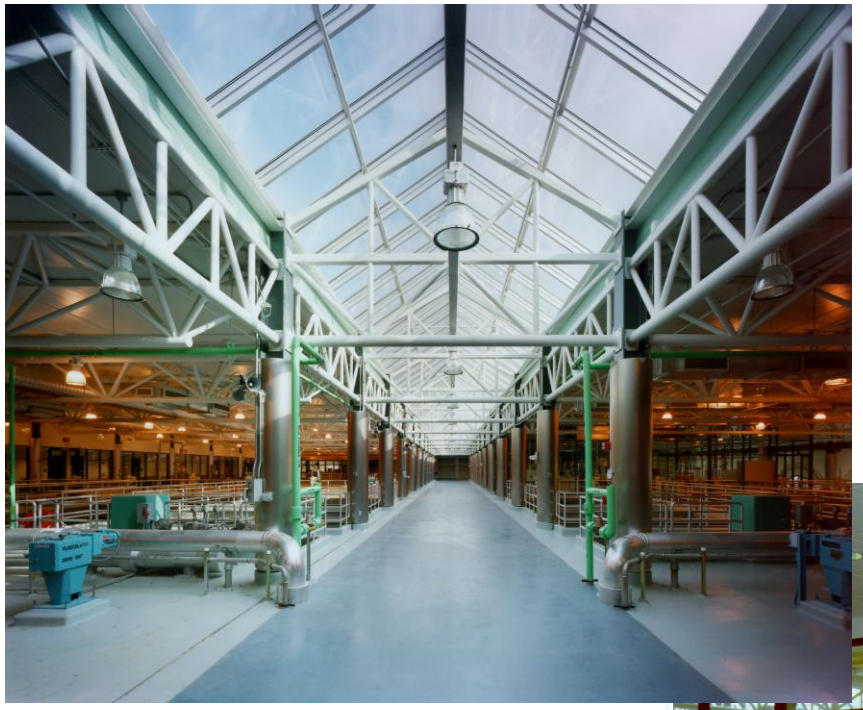
DISTRIBUTION SYSTEM

- ~ OVER 200 MILES OF UNDERGROUND WATER MAINS
  - 6 THRU 63 INCHES IN DIAMETER
  - CAST AND DUCTILE IRON, CONCRETE
- ~15,000 SERVICES, ~4500 VALVES, 1750 HYDRANTS
- AVERAGE OF 1.75 MILES OF PIPE REPLACED ANNUALLY
- ~ 17 MILES OF NEW WATER MAIN INSTALLED IN THE PAST DECADE
- CURRENT CAPITAL IMPROVEMENT PLAN (CIP) - APPROXIMATELY 2.5 MILES OF WATER MAIN REPLACEMENT CURRENTLY ON GOING OR UNDER CONTRACT TO BEGIN IN FY23

DISTRIBUTION SYSTEM

- INITIATED LEAD SERVICE LINE REPLACEMENT IN EARLY 90s
  - STARTED WITH ~11,000 LEAD SERVICE LINES
  - CURRENTLY 1,935 LEAD SERVICE LINES
  - ON-LINE DATA BASE
- IN 2000 INITIATED PURCHASING "NO LEAD" WATER WORKS MATERIALS
  - < 0.25% LEAD CONTENT BY WEIGHT
- MassDEP DID NOT PASS "LEAD FREE" REGULATORY LIMIT UNTIL 2014

CAMBRIDGE TREATMENT

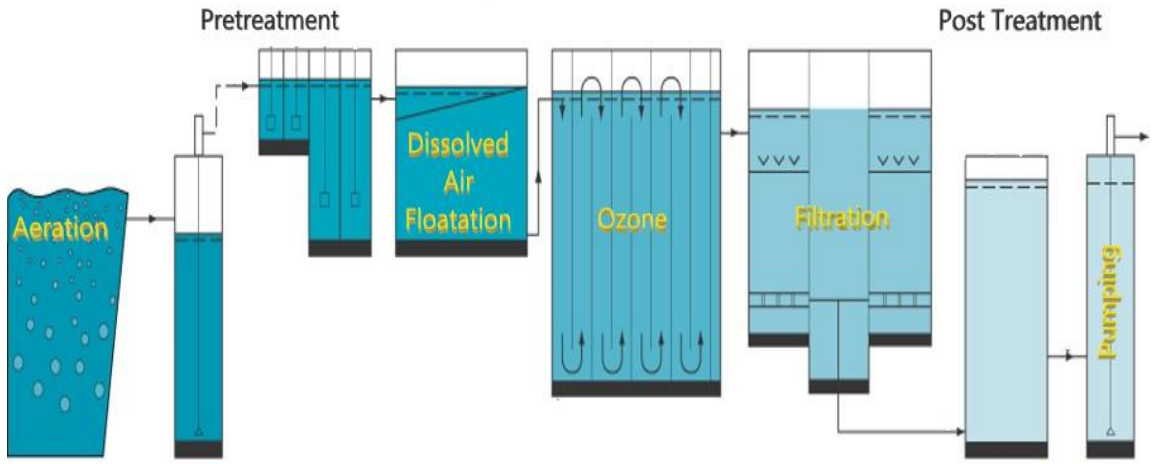


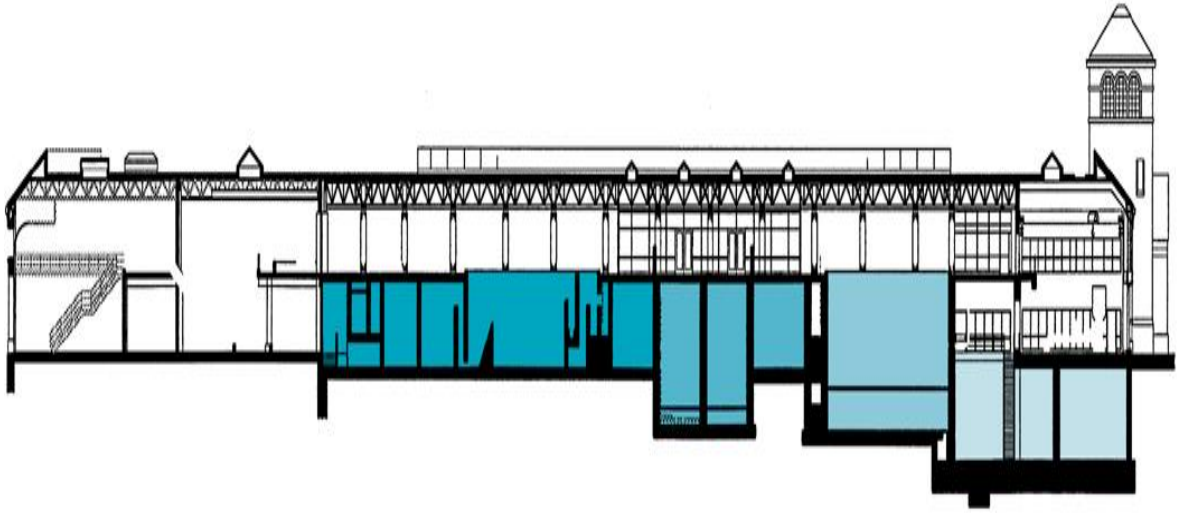
Main Process Floor

- ~119,000 RESIDENTS (2020 Census)
- Treatment Capacity: 24 Million Gallons/Day (MGD)
- AVERAGE DAILY CONSUMPTION: 12.1 MGD (2021)
- PER CAPITA WATER USAGE: ~39 GPD/P (gallons per day per person) 2021

Control Room

CAMBRIDGE TREATMENT



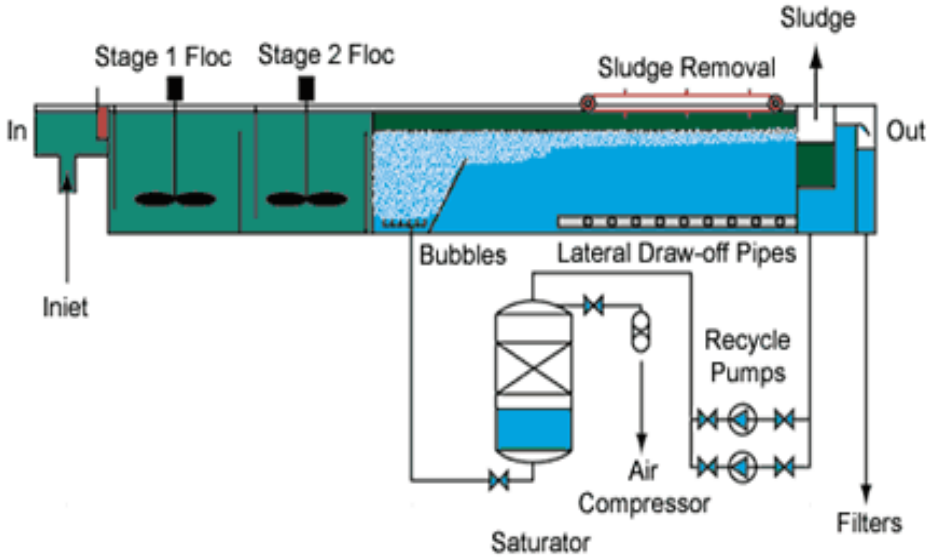


TREATMENT PROCESS TRAIN

- Fresh Pond Aeration
- Pretreatment:
  - Pre-Ozonation
  - Dissolved Air Flotation
- Disinfection: Ozone and Free Chlorine
- Filtration: GAC Filter media
- Post Treatment:
  - pH Adjustment/Chloramination
- Pumping
- Finished Water Storage: Payson Park

CAMBRIDGE TREATMENT

TYPICAL DAF INSTALLATION



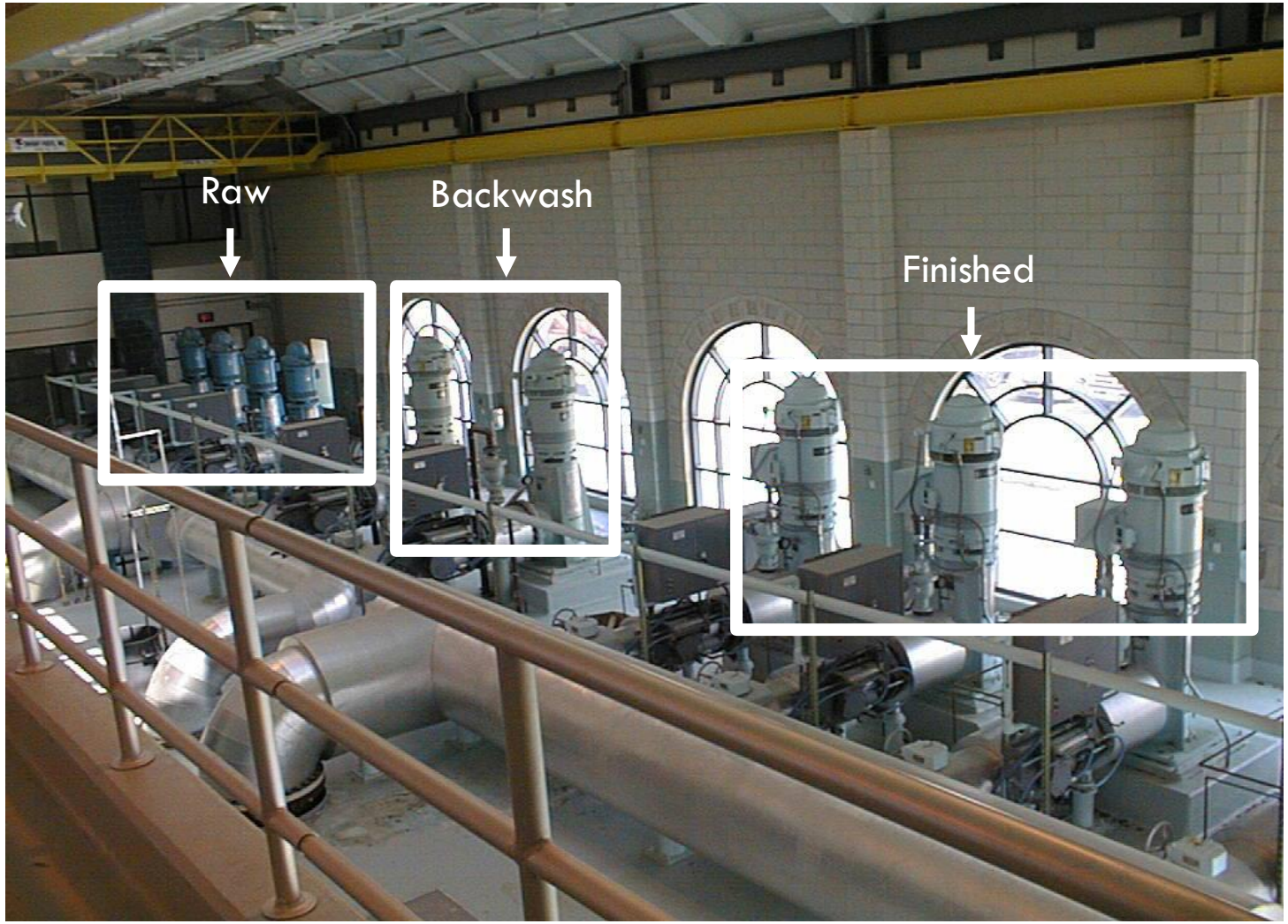
Dissolved Air Flotation - PRETREATMENT

CAMBRIDGE TREATMENT

FILTRATION: Filters

- Granular Activated Carbon (GAC) Filter Media

CAMBRIDGE TREATMENT



PUMPS:

- Raw Water
- Backwash Water
- Finished Water

CAMBRIDGE WATER QUALITY

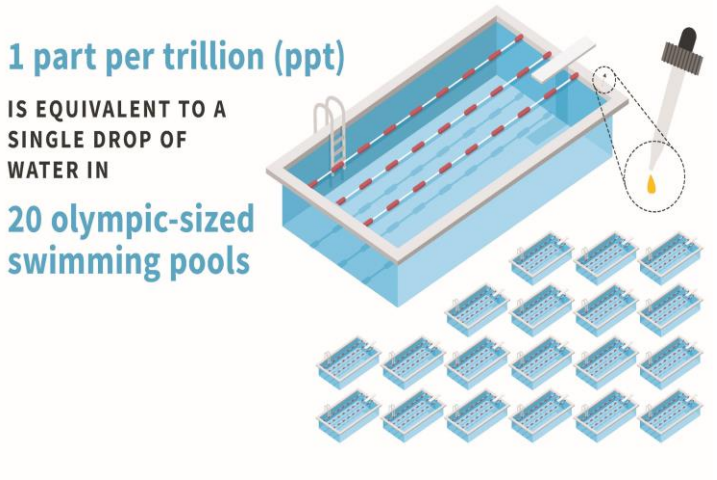
- THE CAMBRIDGE WATER SYSTEM QUALITY SURPASSES ALL MassDEP and USEPA REGULATIONS
- STATE CERTIFIED LABORATORY for Microbiology and Chemistry
  - FREE CAMBRIDGE WATER QUALITY TESTING – Lead Testing Most Frequent Request
  - RAPID TURNAROUND FOR "REAL TIME" RISK IDENTIFICATION AND PROCESS OPTIMIZATION
- PARTICIPATE IN EPAs "UNREGULATED CONTAMINANT MONITORING RULE" (UCMR) PROGRAM

WATER QUALITY:
PFAS (Per and Polyfluoroalkyl Substances)

- PFAS IS A "WATER REPELLANT" USED IN MANY EVERYDAY PRODUCTS

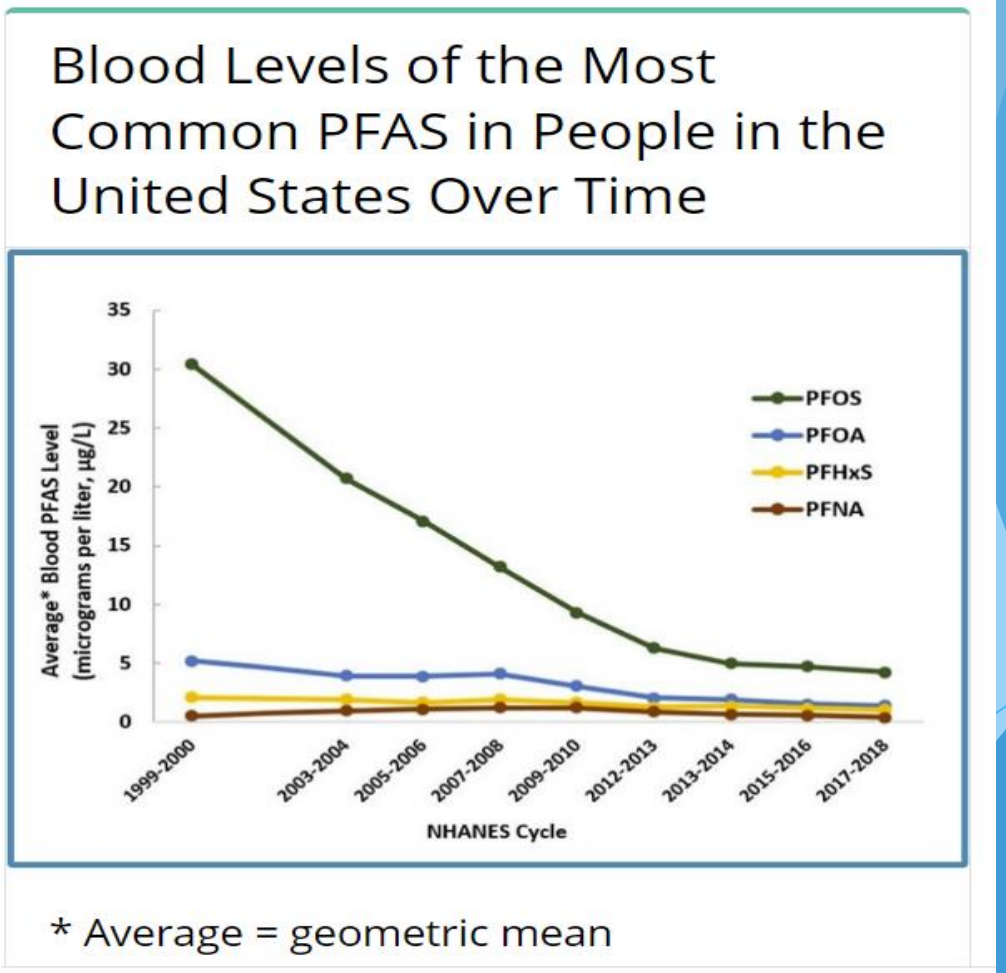
WATER QUALITY: PFAS

- MassDEP REGULATION EFFECTIVE JANUARY 1, 2021 FOR 6 PFAS COMPOUNDS
  - 1) PFOA, 2) PFOS, 3) PFNA, 4) PFDA, 5) PFHxS and 6) PFHpA
    - QUARTERLY AVERAGE NOT TO EXCEED 20ppt
- USEPA HEALTH ADVISORY (HA) – JUNE 2022
  - PFOS: HA – 4 parts per quadrillion (ppq) INTERIM
  - PFOA: HA – 0.002 ppq INTERIM
  - NOT A REGULATION and is NOT ENFORCEABLE
- CANNOT ANALYTICALLY TEST TO THE LEVELS PROPOSED – PARTS PER QUADRILLION
  - TESTING CAPABILITIES: 2 ppts (parts per trillion) for PFAS compounds



WATER QUALITY: PFAS

- MOST COMMON SOURCES OF PFAS EXPOSURE
  - FISH
  - FOOD PACKAGING
  - TREATED UPHOLSTERY
  - NON-STICK COOKWARE
  - FOOD CHAIN (PLANTS/ANIMALS)
  - DIRECT CONTACT W/ CONTAMINATED SOIL
  - DRINKING WATER
- MOST HAZARDOUS PFAS PHASED-OUT IN U.S. 2000-2015 (SUBSTITUTES BEING EVALUATED)
- KEY PFAS LEVELS IN US RESIDENTS HAVE DROPPED SIGNIFICANTLY SINCE 2000



ATSDR, 2022

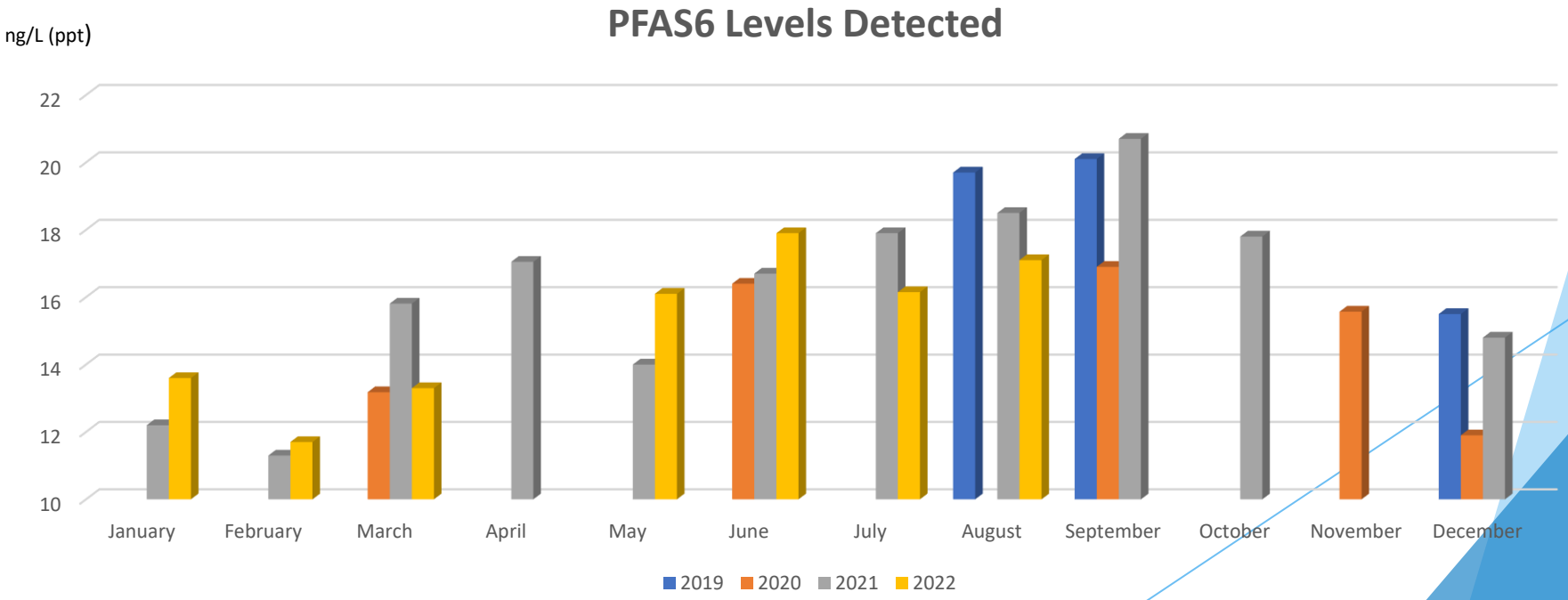
WATER QUALITY: PFAS

MassDEP LIMITS AND USEPA HEALTH ADVISORIES ARE HIGHLY PRECAUTIONARY

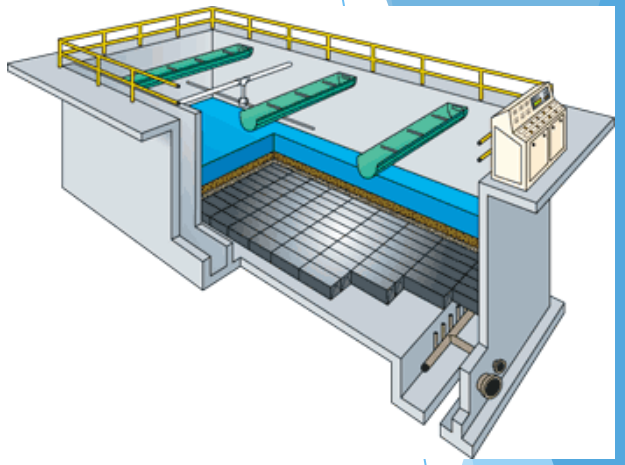
- HUMAN AND ANIMAL STUDIES PROVIDE A STARTING POINT FOR DETERMINING SAFE LIMITS
  - NO OBSERVED EFFECTS LEVEL (NOEL)
  - LOWEST OBSERVED EFFECTS LEVEL (LOEL)
  - DOSE-RESPONSE CURVE AT RELEVANT EXPOSURE LEVELS
- GAPS IN PUBLISHED HEALTH EFFECTS DATA LOWER LIMITS BY **1,000 AS A SAFETY BUFFER**
  - MISSING OR INCOMPLETE MECHANISTIC MODEL (METABOLIC PATHWAYS, METABOLISM, DISTRIBUTION, ELIMINATION RATES IN SPECIFIC TISSUES)
  - DIFFERENCES BETWEEN EFFECTS SEEN IN SUBJECT ANIMALS VS. HUMANS
  - VARIATION IN POPULATION RISKS: PREGNANCY, YOUNG AGE, IMMUNE STATUS
- HEALTH ADVISORIES DO NOT INCLUDE ALL MITIGATING FACTORS, SO ARE OFTEN LOWER

WATER QUALITY: PFAS

- IN 2020 MassDEP ADOPTED AMONG STRICTEST PFAS STANDARDS IN THE US
- MassDEP WILL REVIEW USEPA HEALTH ADVISORY LIMITS
- EPA PROPOSED REGULATORY SCHEDULE
  - PROPOSE REGULATION BY 12/2022
  - PROMULGATE A REGULATION BY 12/2023



WATER QUALITY: PFAS



- AUGUST 2019 thru SEPTEMBER 2022
  - JANUARY 2021: NEW PFAS6 REGULATIONS IN EFFECT
    - ACTION REQUIRED FOR PFAS6 QUARTERLY AVERAGE ABOVE 20ppt
  - IN FULL COMPLIANCE WITH MassDEP GUIDELINES AND REGULATIONS
  - PILOT STUDY PERFORMED, COMPLETED AND APPROVED (2020)
  - DEVELOPED BID SPECIFICATION, BID OUT AND AWARDED CONTRACT FOR CHANGEOUT OF GRANULAR ACTIVATED CARBON (GAC) FILTER MEDIA
- OCTOBER 2022: CHANGEOUT OF GAC FILTER MEDIA TO START OCTOBER 11, 2022 – 2 Filters
- NOVEMBER 2022: CHANGEOUT CONTINUES – 2 more Filters
- DECEMBER 2022: COMPLETE FILTER CHANGEOUTS (Last 2 Filters/Total of 6)

WATER QUALITY: PFAS

- OPERATING PLAN:
  - AFTER 2 FILTERS CHANGED OUT – CONFIRM PFAS REMOVAL via TESTING
    - INITIATE WTP PRODUCTION TO REDUCE MWRA WATER QUANTITY
  - AFTER 2ND SET OF FILTERS CHANGED OUT – CONFIRM PFAS REMOVAL via TESTING
    - INCREASE WATER PRODUCTION TO REDUCE or ELIMINATE MWRA WATER USAGE
  - AFTER ALL FILTERS CHANGED OUT – CONFIRM PFAS REMOVAL via TESTING
  - TERMINATE MWRA WATER USAGE IF NOT ALREADY DONE SO
- PERFORM ROUTINE PFAS TESTING TO CONFIRM/DETERMINE GAC FILTER MEDIA CHANGEOUT FREQUENCY – ANTICIPATED TO BE 12 MONTHS

WATER QUALITY:

LEAD

- NO LEAD IN RAW WATER
- INITIATED CORROSION CONTROL PROGRAM IN 1991
  - pH OF WATER: 9.0-9.5 and USE CHLORAMINES AS SECONDARY DISINFECTANT
- 90TH PERCENTILE CONTENT IS 4 ppb 2020 (action level 15 ppb)

DISINFECTION BY-PRODUCTS

- SIGNIFICANTLY BELOW REGULATORY STANDARDS
  - TRIHALOMETHANES (THMs/2021): 17 ppb (LIMIT 80 ppb)
  - HALOACETIC ACIDS (HAAs/2021): 12 ppb (LIMIT 60 ppb)

WATER QUALITY:

CHLORIDES: SODIUM, CALCIUM and MAGNESIUM

- AESTHETIC LEVEL 250 ppm (Secondary MCL)
- W/MassDOT TO UPDATE 1984 SALT STUDY – ON GOING
  - IN 1984 STUDY ~70% OF SALT WAS FROM MassDOT DEICING TREATMENT OF HIGHWAYS
  - WORKING WITH MassDOT, TOWNS AND BUSINESSES TO BETTER CONTROL DEICING PRACTICES
- HARDNESS: 68 ppm (Calcium and Magnesium)/ 4 GRAINS PER GALLON
- TOTAL DISSOLVED SOLIDS (TDS)/MINERALS - AESTHETIC LEVEL 500 ppm (Secondary MCL)
- HOT WATER SYSTEMS:
  - NEED TO DESIGN YOUR HOT WATER SYSTEM BASED ON WATER QUALITY
  - FLUSH/DRAIN/CLEAN HOT WATER HEATER AT LEAST ANNUALLY per manufacturers recommendation

CAMBRIDGE WATER SYSTEM COSTS

<u>COSTS BASED on FY23 WATER DEPARTMENT BUDGET: **$19.5M**</u>

- OPERATING: $13.5M, CAPITAL: $6M

- COST TO PRODUCE WATER: $7.4M OR $1,593.53/MILLION GALLONS (MG)
- COST OF MWRA WATER in FY23: $4,628.12/MG (~2.9 times our cost)
- FY23 BUDGET IF PURCHASING 100% OF MWRA WATER: **$37.4M**

FY23 Adopted Budget	$19.5 m
Reduction in operating expenses (ENERGY, CHEMICALS and MAINTENANCE) and staff	($3.5 m)
Cost to purchase MWRA water	$21.4 m
Total revised budget	$37.4 m

- **91.6%** INCREASE IN WATER RATE TO CUSTOMERS

CAMBRIDGE WATER SYSTEM COSTS

- BASIS: FY23 WATER DEPARTMENT BUDGET/WATER RATES
- **91.6%** WATER RATE INCREASE IF PURCHASING 100% OF WATER FROM MWRA

	FY23/UNIT	FY23/UNIT (w/MWRA)	INCREASE/UNIT (91.6%)
BLOCK 1:	$3.11	$5.96	$2.85
BLOCK 2:	$3.33	$6.38	$3.05
BLOCK 3:	$3.54	$6.78	$3.24
BLOCK 4:	$3.76	$7.21	$3.45
BLOCK 5:	$4.08	$7.82	$3.74

	FY22 Average	FY23 projected	FY23 projected w/MWRA water	Difference	
single family	$ 200.48	$ 204	$ 391	$ 187.16	91.6%
two family	$ 257.08	$ 262	$ 502	$ 240.10	91.6%
three family	$ 379.08	$ 387	$ 741	$ 354.05	91.6%

FUTURE - GO FORWARD STRATEGY

- THE CAMBRIDGE WATER SYSTEM IS A VERY ROBUST SYSTEM by DESIGN
- MULTIPLE BARRIERS via WATERSHED PROTECTION, TREATMENT and DISTRIBUTION
- ABILITY TO REMOVE **PFAS** AND OTHER POTENTIAL FUTURE CONTAMINANTS
- RESILIENCY and REDUNDANCY
  - MWRA AS A BACK-UP SUPPLY
- MAINTAIN CONTROL OF OUR FUTURE AND DESTINY
- LOWEST COST OPTION FOR RESIDENTS, BUSINESSES, INSTITUTIONS AND UNIVERSITIES