Anne Arundel County Clean Water Program

Our wAAter Public Advisory Group Meeting

December 14, 2022

Agenda

01 Purpose and Objectives

02 Managed Aquifer Recharge Overview

03 Pilot System

04 Site Tour

05 Discussion

01 Purpose and Objectives

Meeting Purpose

- To provide an overview of Managed Aquifer Recharge and the County's current pilot facility
- To inform advisory group members about the key successes and challenges of implementing this technology
- To receive feedback on indirect and direct potable water reuse

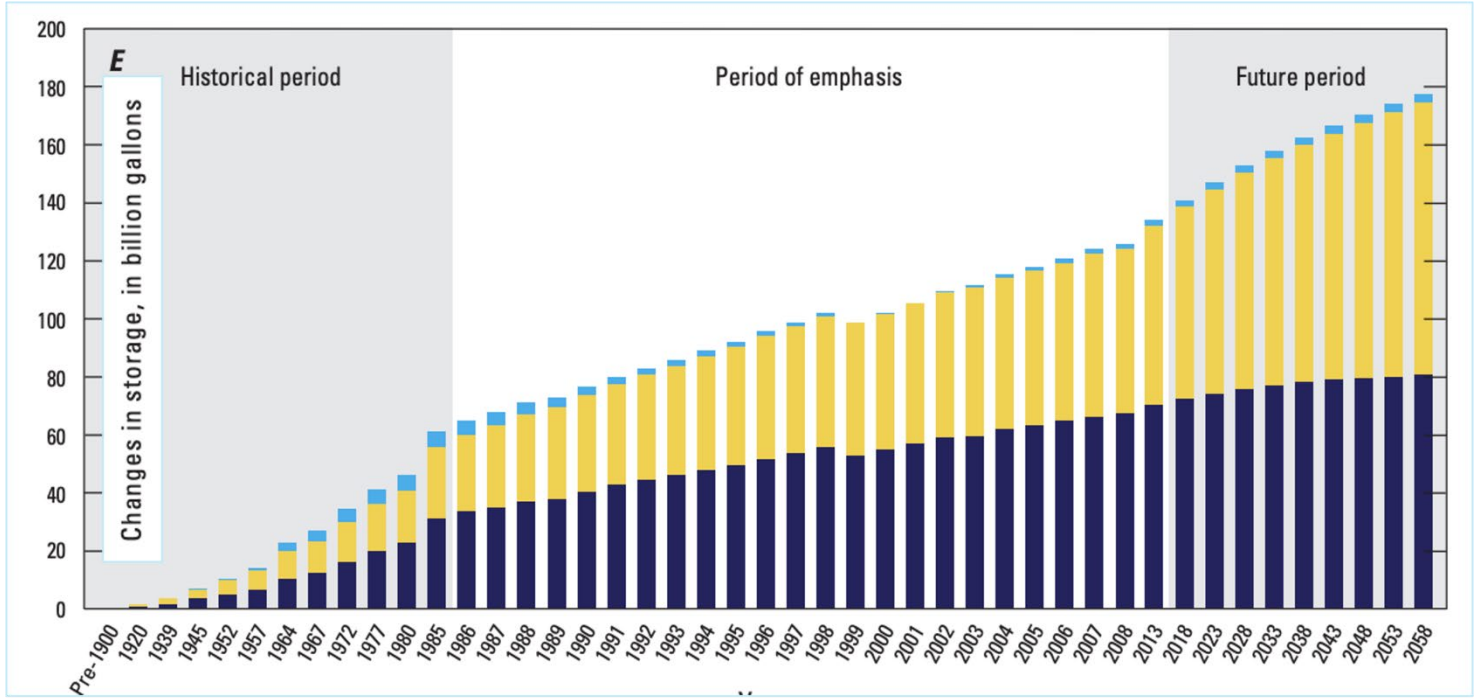
The Clean Water Program

5 initiatives | one strategy

02 Managed Aquifer Recharge Overview

Why is County Concerned About Long-Term Water Sustainability?

- All water use in AA County is groundwater – water withdrawals greater than recharge (all treated wastewater is returned to surface waters)
- AA County is largest user of groundwater in the State
- Other jurisdictions are experiencing groundwater shortages
- Confining unit is being depleted
- Protection from land subsidence



Source: Assessment of Groundwater Availability in the Northern Atlantic Coastal Plain Aquifer System From Long Island, New York, to North Carolina, Professional Paper 1829, USGS, 2016

County Aquifers

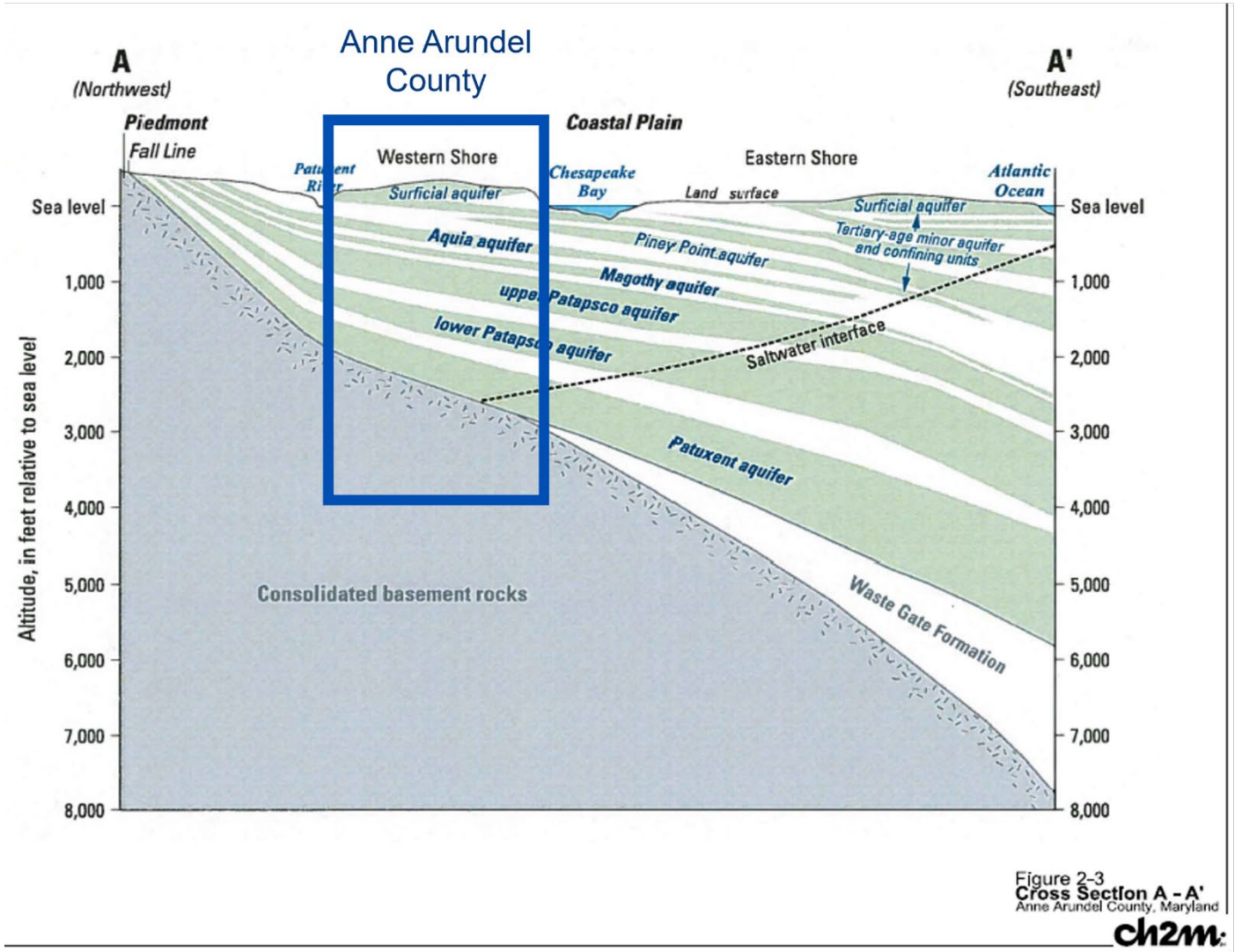


Figure 2-3
Cross Section A - A'
Anne Arundel County, Maryland

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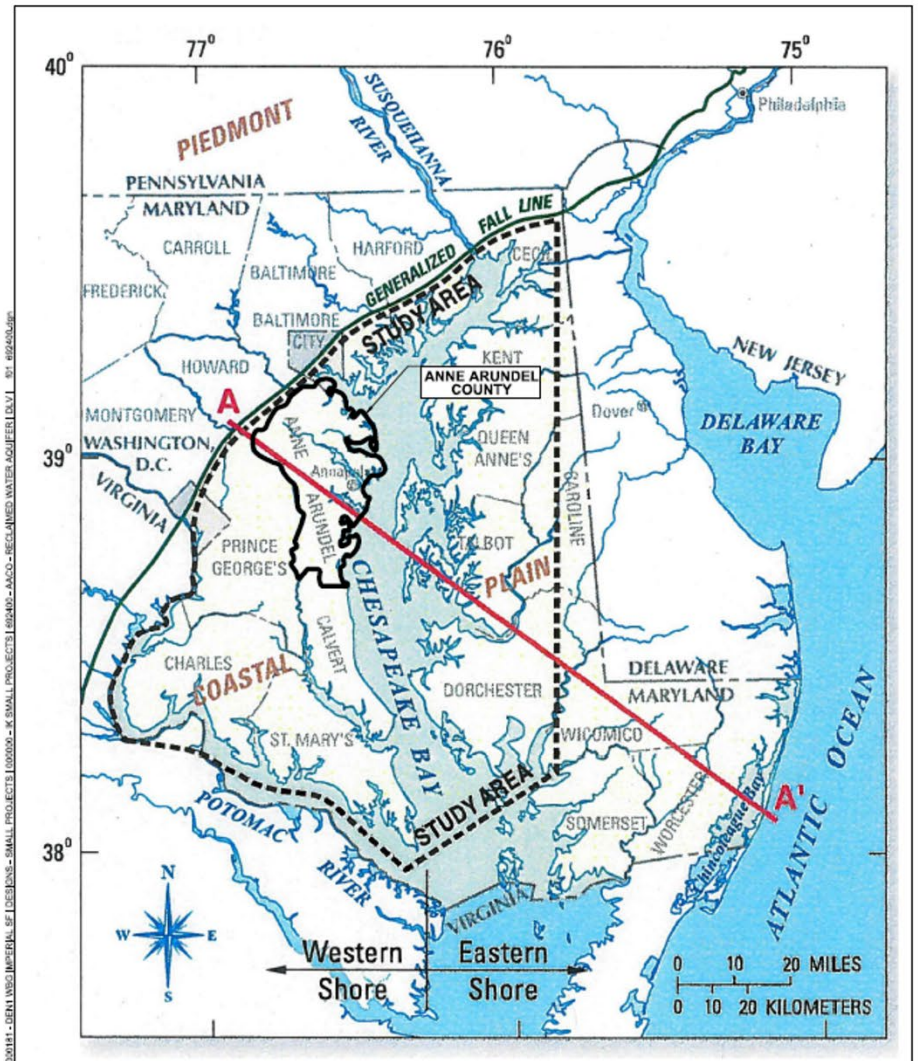

Figure 2-1
Location Map Showing Anne Arundel County and Section Line A - A'
Anne Arundel County, Maryland

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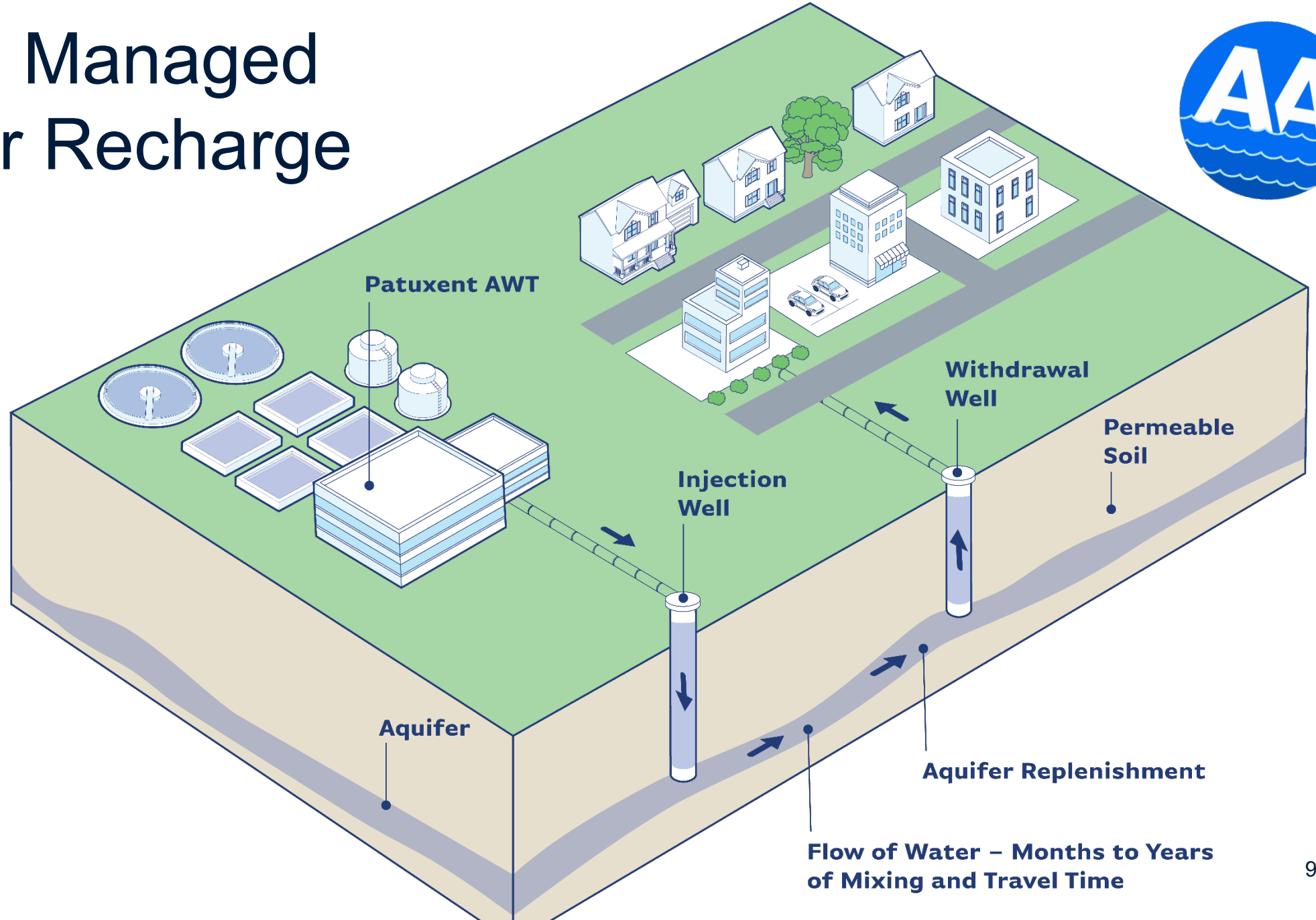
Future Managed Aquifer Recharge



Drivers for Managed Aquifer Recharge

Program Drivers:

Water Quality

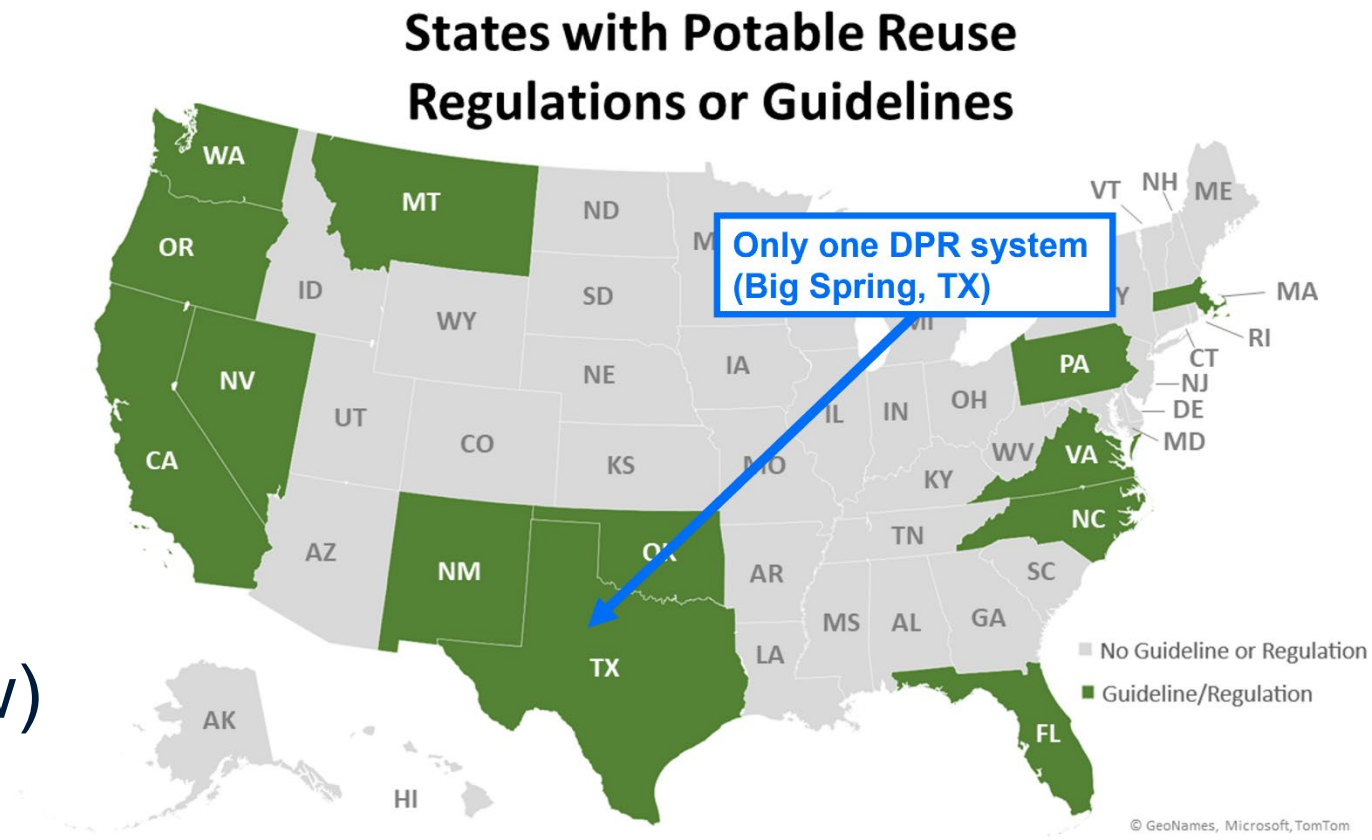
- Nutrient reduction in Chesapeake Bay
- Water quality improvement locally
- Develop a long-term plan for maintaining or reducing nutrient levels

Water Supply

- Groundwater replenishment
- Long-term water supply resiliency and sustainability

Key States with Indirect Potable Reuse Regulation

- California
- Washington
- Arizona
- New Mexico
- Florida
- Massachusetts
- Texas (Case-by-case Review)



Source: EPA

SWIFT Program (Hampton Roads, VA)

- Pilot testing began in 2016
- Current demonstration scale (1 MGD)
- Add advanced treatment processes to several HRSD facilities to produce water that meets drinking water standards
- SWIFT will be added to the Potomac Aquifer, the primary source of groundwater throughout eastern Virginia

Managed Aquifer Recharge Investigation

Aquifer Recharge

- Hydrogeological compatibility
- Injection rates & travel times
- Monitoring program

Initial investigations to be done with conditioned potable water

Advanced Treatment

- Identify constituents of concern
- Current effluent characteristics
- Additional treatment steps
- Critical control points

Initial investigations with pilot scale treatment system

03 Pilot System

Our wAAter Treatment Goals for Piloting

Safe Drinking Water Act Compliance

End Use Requirements
(Total Organic Carbon, Turbidity, Aquifer Compatibility, Corrosion Control, Microbial Risk)

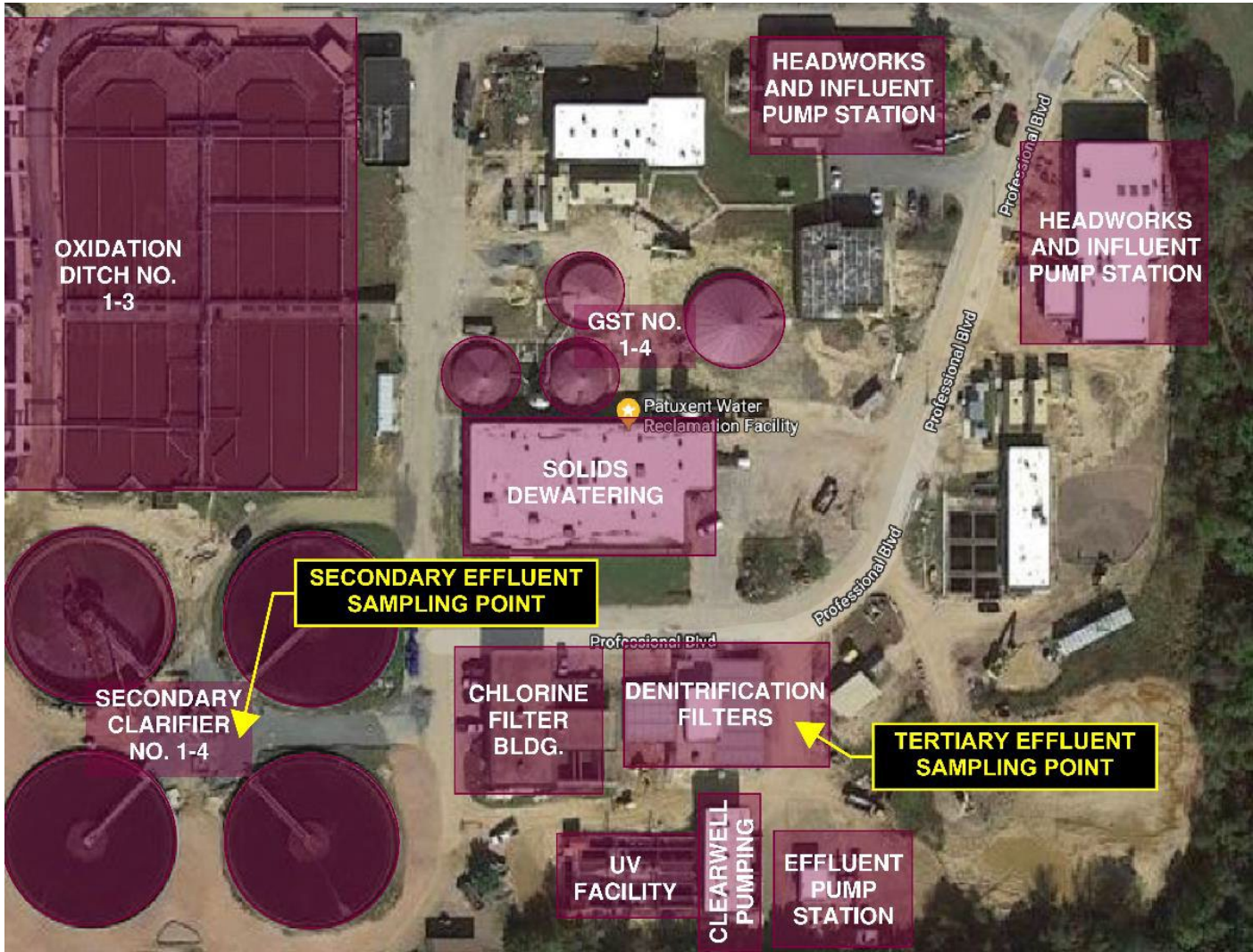
Potable Reuse Monitoring

Pathogens
(Giardia, Crypto, Viruses)

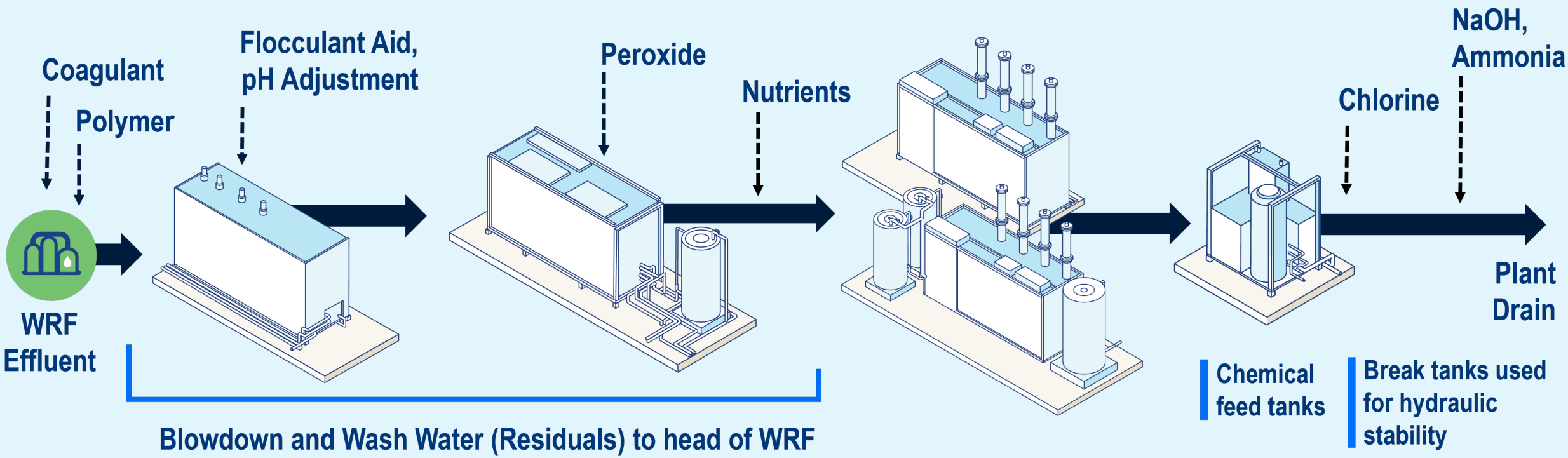
Constituents of Emerging Concern

Patuxent WRF Overview and Effluent Sampling Effort

- Focus on characterizing tertiary effluent (post-denitrification filter, pre-UV)
  - Patuxent Water Reclamation Facility
- Additional periodic sample of secondary effluent (post-secondary clarification)
- Sampled over 100 constituents
- Summary focuses on tertiary effluent sampling

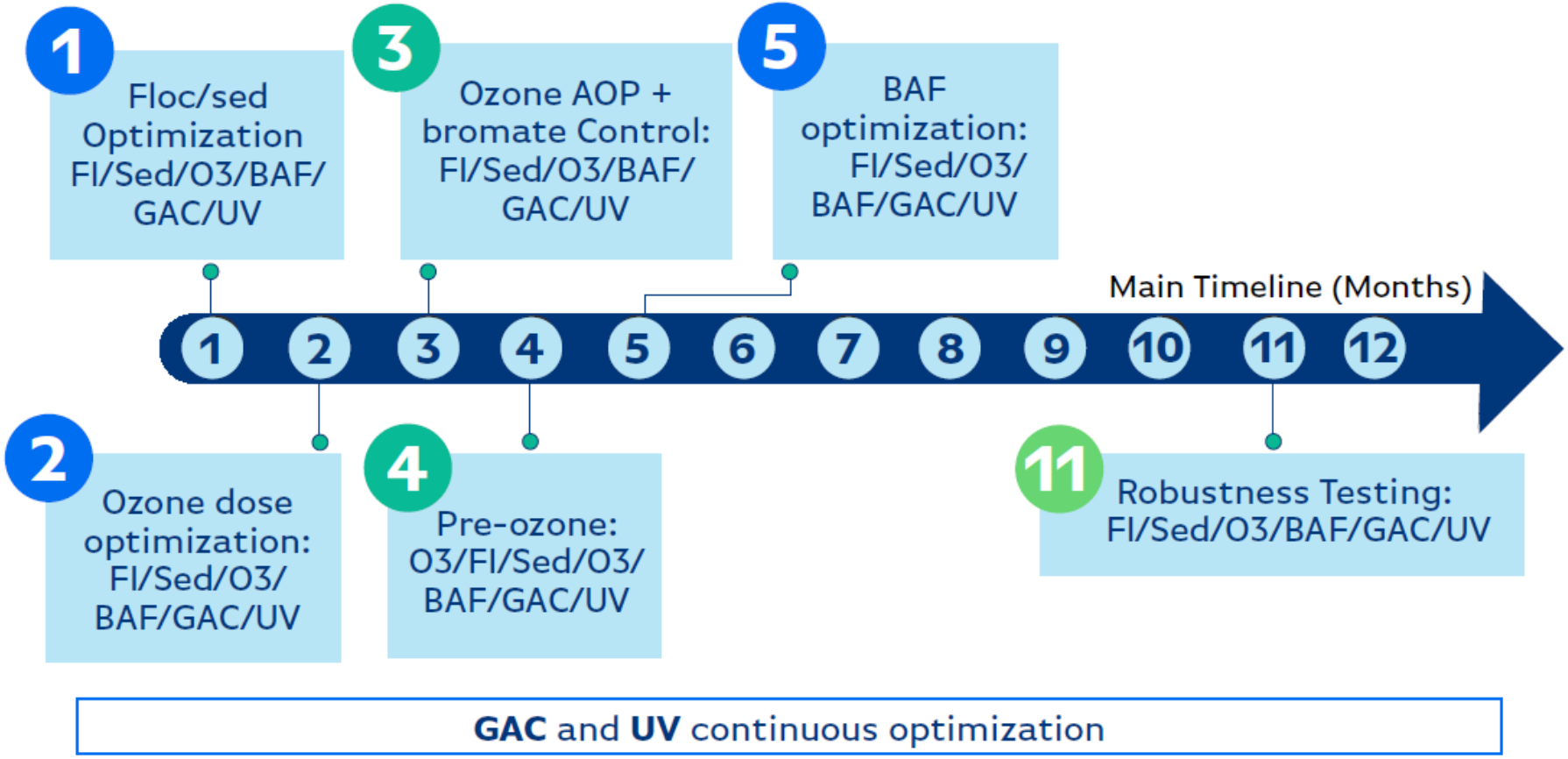


Pilot Treatment Train Selection



Coagulation/Flocculation/ Sedimentation	Ozone/Ozone Advanced Oxidation Processes	Biological Aerated Filter/Granular Activated Carbon	UV

Pilot Operation Critical Path



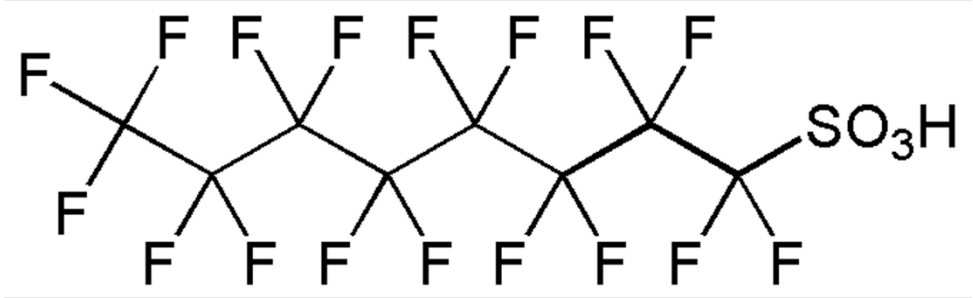
PFOS and PFOA are the most well-known PFAS

Hydrophobic and hydrophilic properties

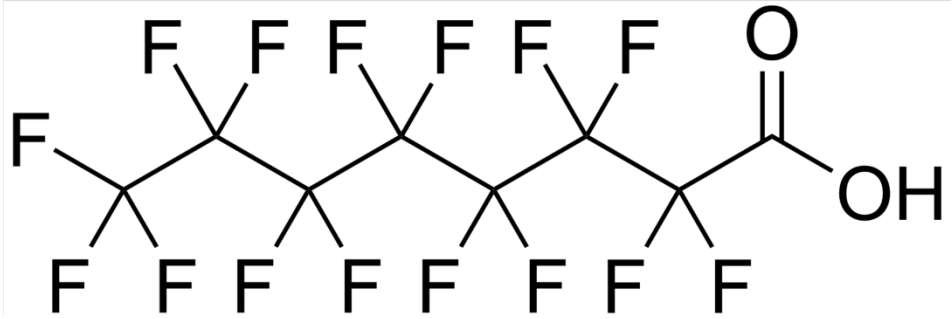
Highly soluble and stable in water

Not easily removed from water

PFOS



PFOA



There are Multiple Routes for PFAS to Enter the Environment

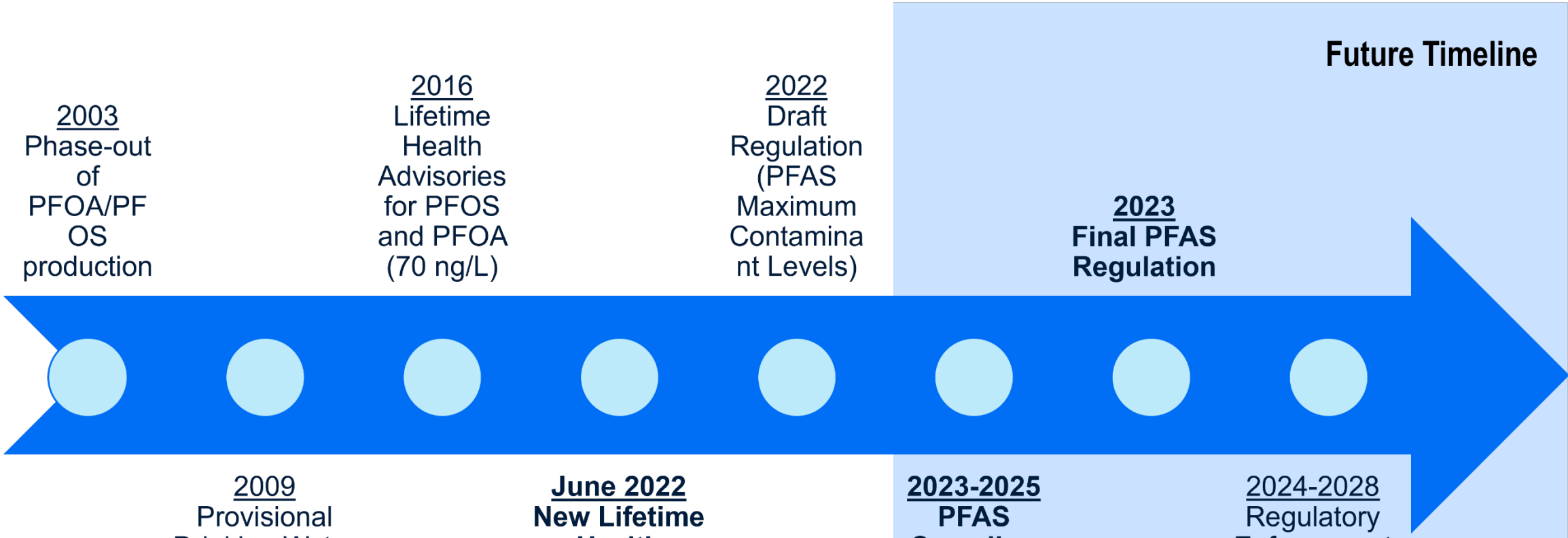
Use of aqueous film-forming foam (AFFF)

Landfills and leachates

Industrial discharge

Land application of wastewater treatment plant biosolids

PFAS Regulatory LANDSCAPE



PFAS Management Strategies

Biosolids Management

Source Tracking

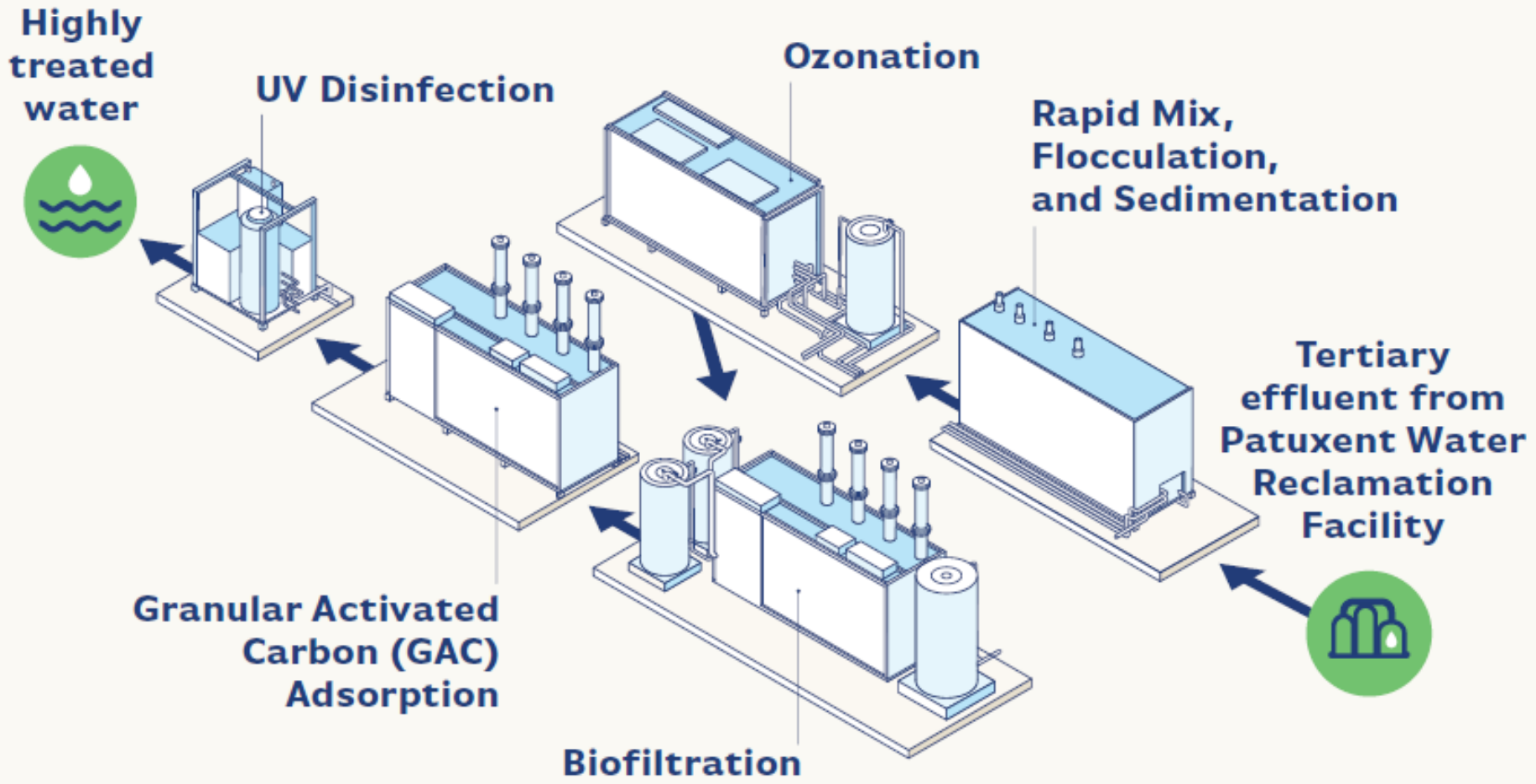
Landfill Leachate Treatment

AWT (GAC)

PFAS Monitoring

04 Site Tour

MAR Pilot


Highly treated water
UV Disinfection
Ozonation
Rapid Mix, Flocculation, and Sedimentation
Tertiary effluent from Patuxent Water Reclamation Facility
Granular Activated Carbon (GAC) Adsorption
Biofiltration

Pilot Tours and Community Outreach

05 Discussion

Thoughts?

Next Steps

- Initiate contract for designs
- Public Outreach
- Review information on website and provide feedback

Potential Issues

- Public interest in pilot tour?
- Concerns from the public?

Next Steps: Meeting Series Overview

	Date	Location	Topic
Meeting 2	November 16, 2022	Heritage Complex-Independence Room	Septic-to-Sewer and Small Systems
Meeting 3	December 14, 2022	Patuxent Water Reclamation Facility	Site visit to MAR pilot demonstration and MAR discussion
Meeting 4	**January 25, 2023**	**Heritage Complex-Independence Room**	**Project Prioritization Exercise**
Meeting 5	February 22, 2023	Heritage Complex-Independence Room	Present Updated IMP

Our wAAter.

THE ANNE ARUNDEL CLEAN WATER PROGRAM

Thank you!