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The Road to PFAS Compliance – Vancouver’s Approach to Widespread Source Detections

Mehrin Selimgir

Senior Civil Engineer

Public Works - Water Engineering

May 8, 2025





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Yellow Brick

The ^ Road to PFAS Compliance – Vancouver’s Approach to Widespread Source Detections

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IN THE LAND OF OZ THERE'S A TOWN CALLED VANCOUVER...

- 3rd largest utility in state, serves about 277,000 people, 78,000 connections
- Supplied by three regional groundwater aquifers
- Includes 9 Wellfields (water stations), 40 wells, 50 booster pumps, and 1,100 miles of pipes
- ADD of 27 MGD
- 25% of service area outside City limits



Per- and Polyfluoroalkyl Substances (PFAS)

- Family of several thousand human-made chemicals
- Used widely since the 1940s to make products resistant to water, grease, or stains, as well as firefighting foam
- Proactive testing determined Vancouver's primary concern are PFOS and PFOA



Probably
due to
PFAS



**Stain- & water-
resistance
treatments**



**Nonstick
cookware**



**Waterproof
apparel**



**Cleaning
products**



**Firefighting
foam**



**Takeout
containers**



**Carpets &
textiles**

Resources: ecology.wa.gov/pfas



Scientists are still studying potential health effects

Exposure to high levels of certain PFAS **may** lead to:



Increased cholesterol levels



Changes in liver enzymes



Small decreases in infant birth weights



Decreased vaccine response in children



Increased risk of high blood pressure or pre-eclampsia in pregnant women



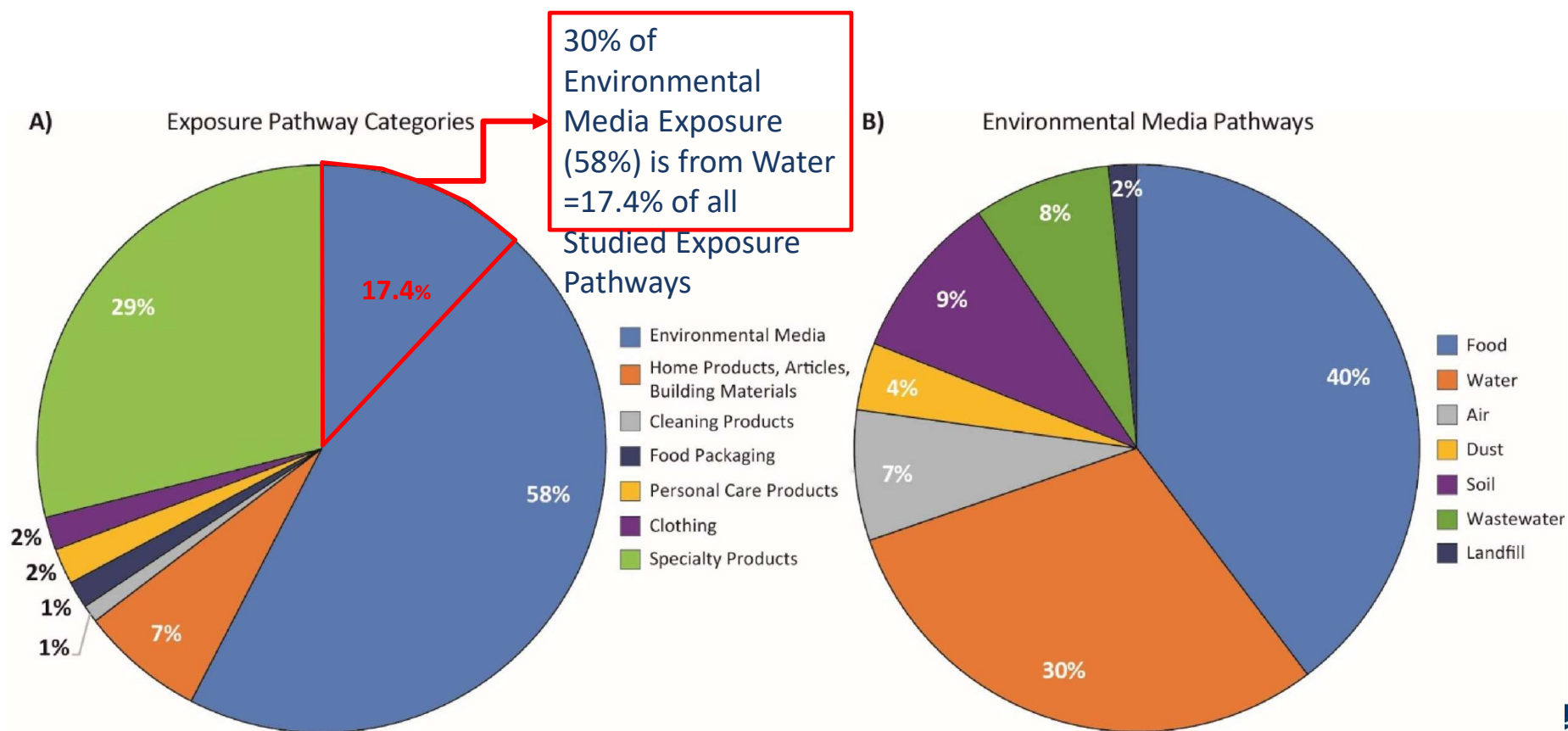
Increased risk of kidney or testicular cancer

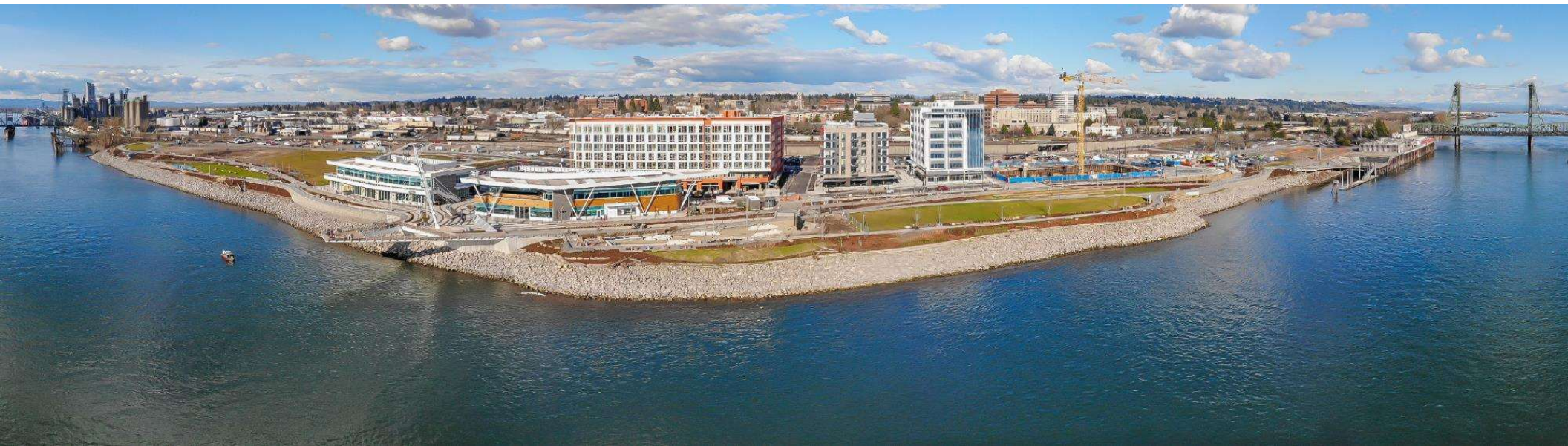
Chronic vs. Acute

Source: atsdr.cdc.gov/pfas



Distribution of PFAS Exposure





What regulations are there for PFAS?

Environmental Protection
Agency (EPA)

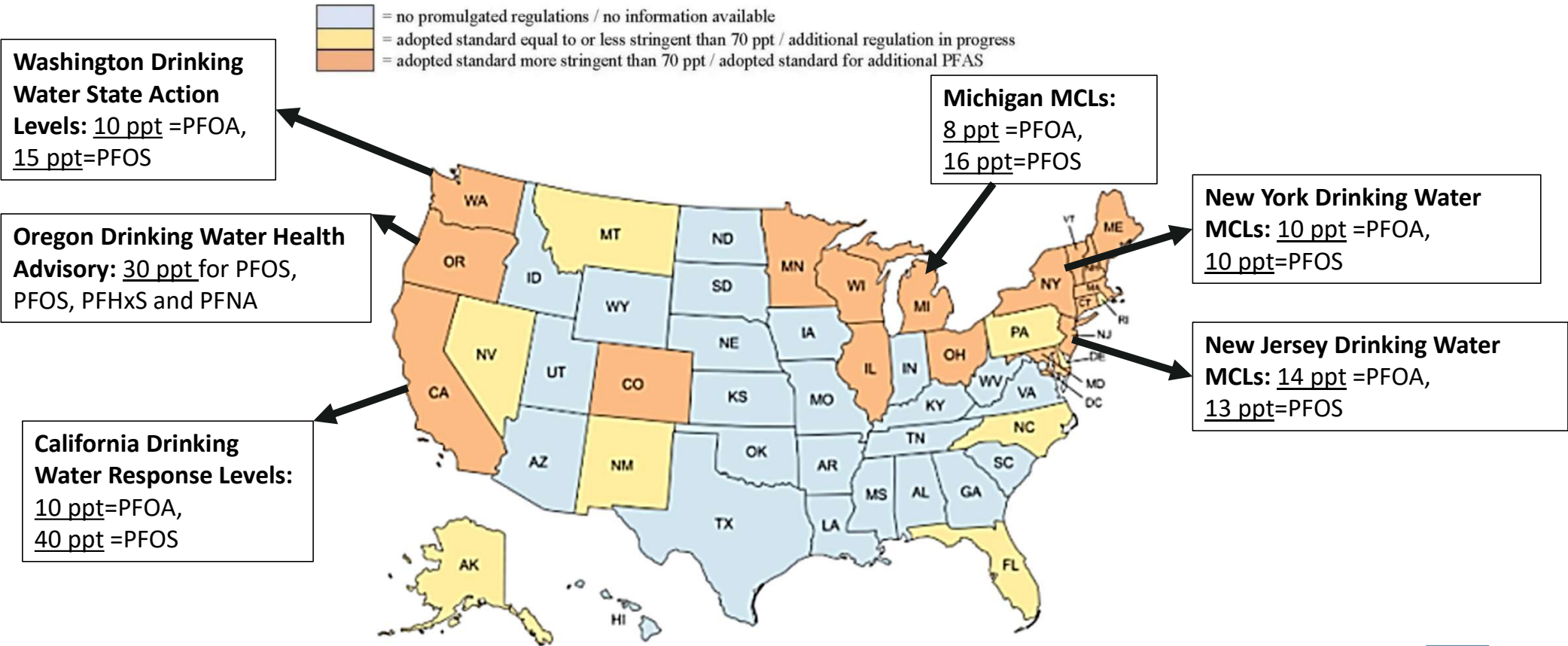
**Finalized MCL for
PFOA/PFOS at 4ppt**

Washington State Department
of Health (DOH)

**To be Superseded State
Action Levels
PFOS-15ppt
PFOA-10ppt**

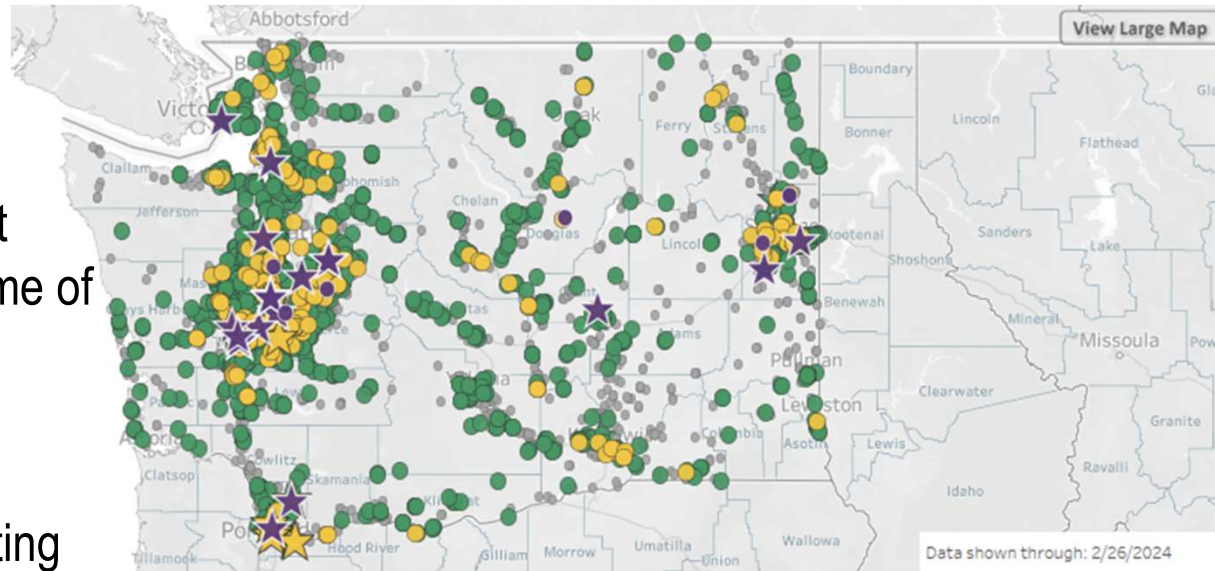


Conflicting Standards on a State by State Basis



Washington State Rulemaking

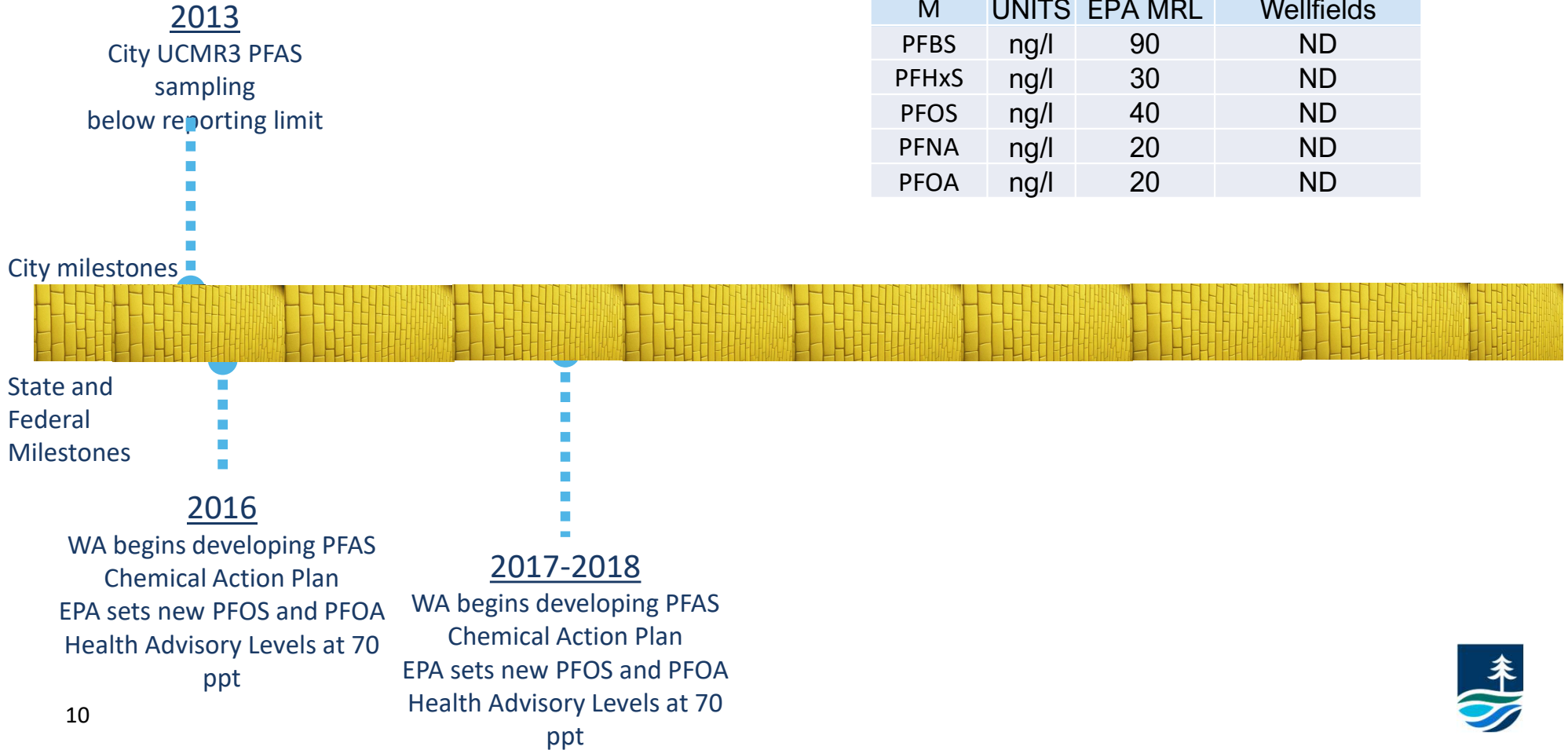
- State chose to regulate PFOA, PFOS, PFHxS, PFNA, PFBS in drinking water
- State Action Level (SAL)
 - A level in water expected to be without appreciable health effects over a lifetime of exposure, including sensitive groups
 - Does not require treatment
 - Protects public health by requiring testing and notification



Source: [PFAS Testing Results Dashboard](#) | [Washington State Department of Health](#)



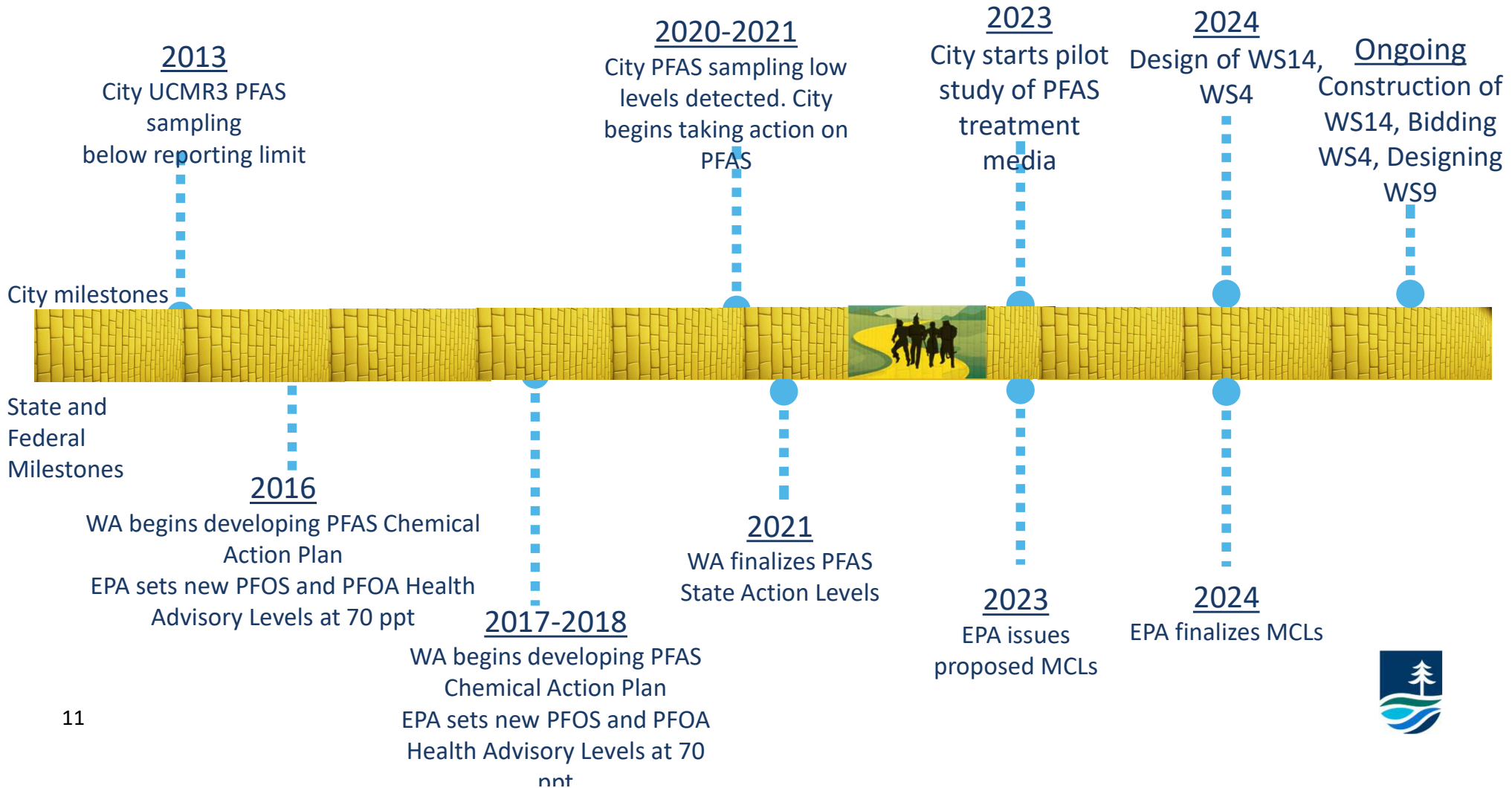
Responding to PFAS



Method 537			
ACRONY M	UNITS	EPA MRL	2013 COV Results All Wellfields
PFBS	ng/l	90	ND
PFHxS	ng/l	30	ND
PFOS	ng/l	40	ND
PFNA	ng/l	20	ND
PFOA	ng/l	20	ND



Responding to PFAS



What actions is Vancouver taking?



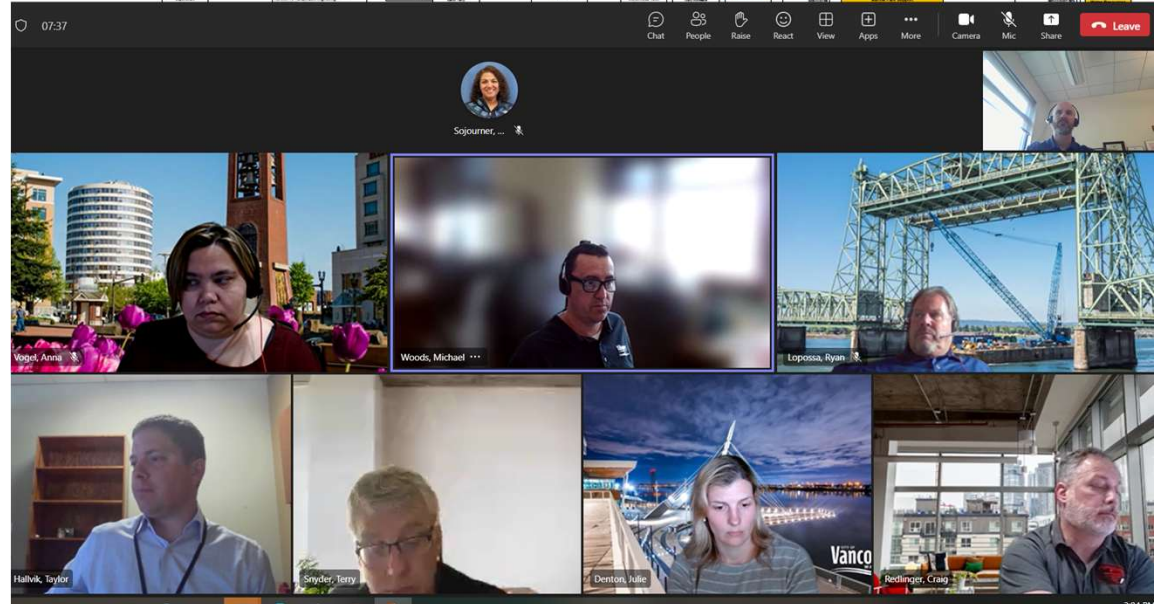
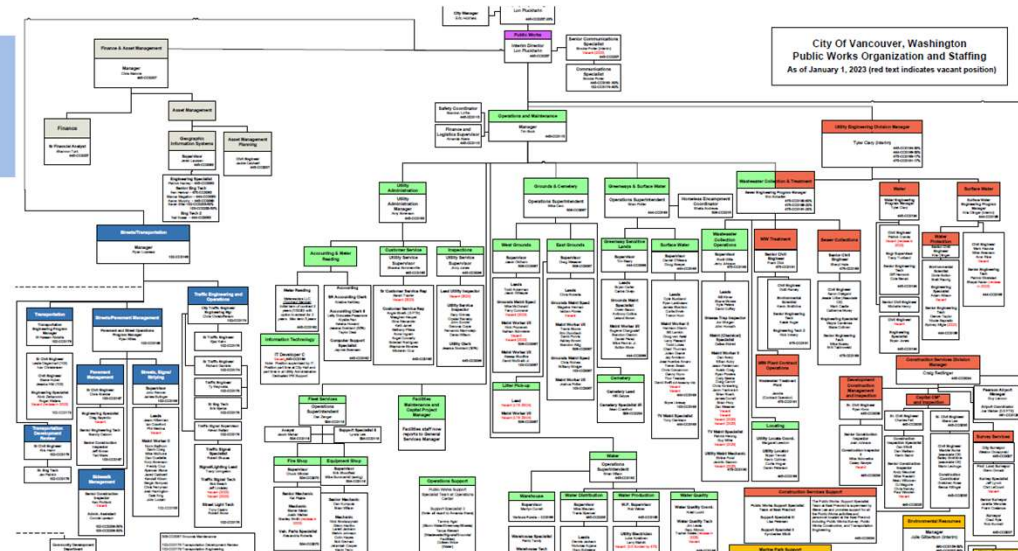
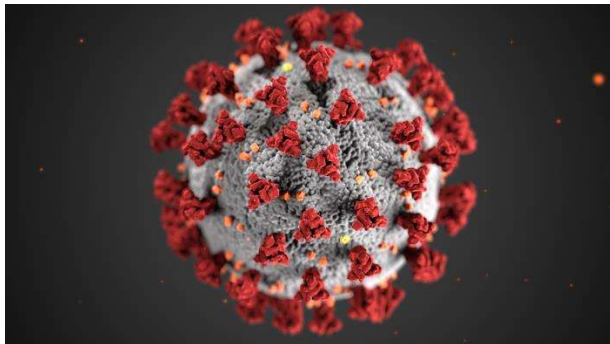
Vancouver's Immediate Response

- Assessed Rulemaking and learned about PFAS
- Got involved in State Rulemaking (DOH and CAP)
- Notified communications staff, public works director
- Notified city manager and city council
- Developed website
- Took more samples of individual wells
- Included information in CCR
- Adjusted operations



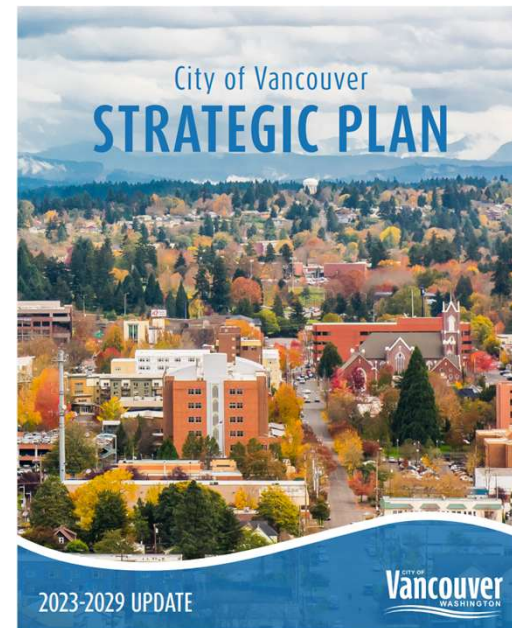
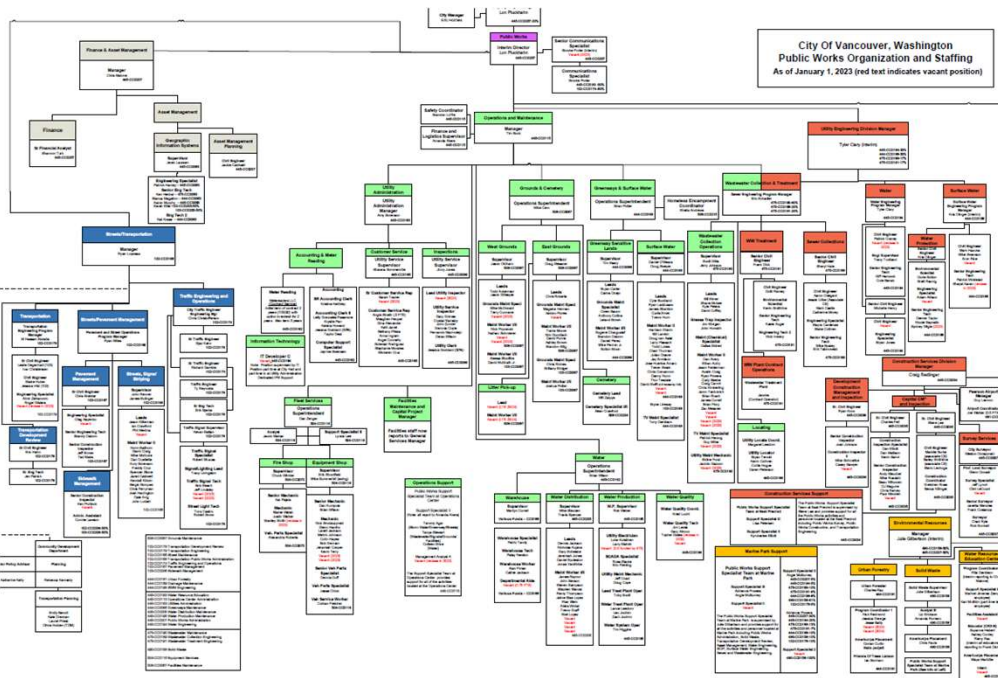
Initial Problems

- COVID
- Organizational Changes
- Working Remotely
- Council with Different Priorities



Initial Problems... Mostly Still Current Problems

- Organizational Changes
- Council with Multiple Priorities

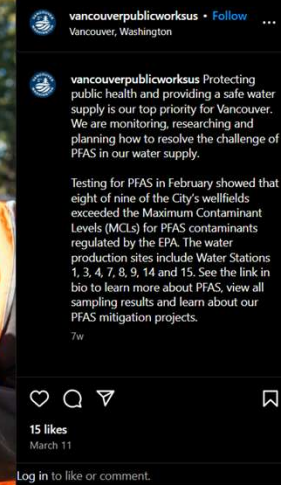
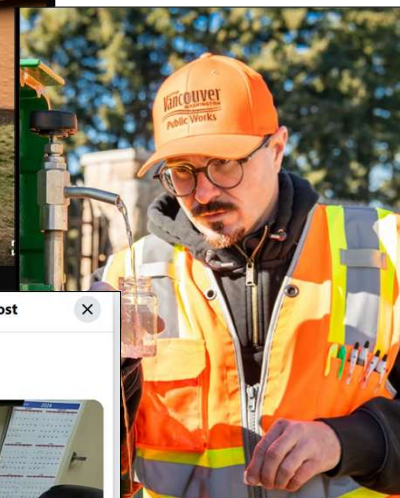


Transportation and Mobility
Economic Opportunity
Housing and Human Needs
Vibrant and Distinct Neighborhoods
Culture and Heritage
Safe and Prepared Community
Climate and Natural Systems
High Performing Government



Communications

- Website developed
- Social Media
- Council Memo/Workshops
- Info included in CCR
- Consistent with DOH and EPA
- Talks at Neighborhood Association Meetings



Communications Issues

- Quarterly Compliance Sampling
- Staff training
- Neighboring water utility test results
- Local news articles
- Public interest increasing
- Maintaining trust and transparency



Vancouver probes PFAS in city's water

Test results available March; chemicals' source unknown

By LAUREN ELLENBECKER
The Columbian

If you're a Vancouver resident, you may have received a mailer advising that your water contains "per- and polyfluoroalkyl substances," otherwise known as PFAS — harmful human-made chemicals.

The four-letter acronym

represents a class of thousands of substances, or "forever chemicals." Like the nickname implies, they don't break down in the environment or the human body.

Vancouver's public water system, which serves roughly 78,000 customers, is one of many nationwide that have detected trace amounts of PFAS in its drinking water.

City officials are currently sampling at Vancouver water stations and expect to have results within two weeks of sending them to a lab. They will provide a public notice

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describing the results in March.

In 2020, the city of Vancouver found that several of its water stations had the contaminants. Sampling the following year showed that 36 of the city's 40 wells contained some level of PFAS.

Some utilities in Washington with contaminated water may have an idea of where the chemicals come from

— military bases, airports or any site that may have conducted training with fire-fighting foam.

In Vancouver and neighboring cities, the answer is murkier.

"There's just no smoking gun that's telling us where the source of this stuff is," said Tyler Clary, Vancouver water engineering program manager. "It's just so widespread throughout our service area and across our fields that we're still trying to figure it out."

Officials are navigating

different potential sources, including landfills and stormwater, and say it's likely a combination of factors.

"Unfortunately, we know we have it in our water," Clary said. "At least we're ahead of the curve and people are informed about it so they can make decisions on what they want to do about it."

Clary said the city is determining whether its PFAS levels warrant treatment systems and, if pursued, what the cost would be and where

WATER, Page A9

PUBLIC MEETING

■ What: Regional Environmental Protection Agency PFAS strategy.

■ When: 6-8 p.m. March 15.

■ Where: Zoom meeting.

■ Info: Register at www.pfascommunityengagement.org/register

Home / Toxics / Vancouver



Credit: Jos Speertjens/Unsplash

Vancouver, Washington's water crisis exposes hidden risks of PFAS and broader public communication challenges

By EHN Curators • Mar 05, 2024 • 1 min read

Print | PDF | Email

Vancouver outlines steps to manage PFAS in water system

By Lauren Ellenbecker, The Columbian

Published: December 25, 2023, 2:41pm

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City to alert public water customers of 'forever chemicals'

By LAUREN ELLENBECKER
The Columbian

The city of Vancouver has found that three of its nine well fields exceed state levels for "per- and polyfluoroalkyl substances," compounds harmful to both humans and the environment in testing in late February.

The substances, also known as PFAS, include thousands of human-made compounds that have been branded "forever chemicals," since they don't break down in soil, water or the human body, said Tyler Clary, Vancouver water engineering program manager.

Later this week, Vancouver public water customers will receive a mailer outlining water sampling results, as well as the city's next steps to address the issue.

Washington's drinking

water levels, adopted in 2021, regulate five types of PFAS and provide guidance for how much water a user can consume over a lifetime and not suffer adverse health effects, even in sensitive groups.

Vancouver's findings indicate the most common compounds found at Water Stations 4, 14 and 15 — the well fields under focus — were perfluorooctanoic acid, or PFOA, and perfluorooctane sulfonic acid, or PFOS.

These are two of five

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state-regulated compounds, which have been removed from most products due to health and environmental risks, according to the Environmental Protection Agency. They have also been produced in the largest quantities within the United States.

Altogether, Vancouver's findings don't reveal much

new information. In 2020, Vancouver found several of its water stations had contaminants, and later sampling revealed 36 of Vancouver's 40 wells contained some level of PFAS. Since then, officials have taken steps to create a PFAS management plan and apply for grants.

The EPA awarded Vancouver nearly \$12.7 million this year to install a treatment system at Water Station 14, which has the highest concentration of PFAS.

The city is currently pilot testing treatment methods to determine what the best option will be.

Consultants for the city estimate it would cost \$172 million to install treatment systems for all Vancouver's wells that exceed state action levels.

But this number could easily skyrocket.

In March, the EPA proposed a federal drinking water limit for both PFOA

PFAS, Page A9

Three Vancouver wells have too much PFAS

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PFAS, Page A9

REPORTAGE

'We don't want a negative headline'

How communications from public officials downplay the danger of PFAS-contaminated water.

BY SARAH TRENT
PHOTOS BY BROOKE HERBERT

WHEN THE SIMPLE blue-and-white postcard arrived in January 2023, Sarah Ferris missed it. The mailer, sent by the city of Vancouver, Washington, told 270,000 municipal water users that a group of chemicals called PFAS had been found in city water. Levels were low, the postcard said; the city would soon test again to comply with state law and share more information.

When a more detailed flyer arrived in April, Ferris looked it over. A chart showed that water at three of the city's nine well-fields had tested above the state limit for two common PFAS chemicals, PFOA and PFOS. Other sections called these levels "very low," and said experts were "still learning about their health impacts."

Ferris tried to decipher it all. "I was scanning," she said, "frequently called 'forever chemicals,' can't don't want a negative headline."



Sarah Ferris with her daughters, 6-month-old Ruby and August, 7, outside their home in Vancouver, Washington, last November.

News / Clark County News

Vancouver water test results for PFAS a mixed bag

Some results see decline in forever chemicals, while others hold steady or increase

By Shari Phiel, Columbian staff reporter

Published: April 8, 2025, 6:08am

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Vancouver council approves contract for PFAS treatment at Water Station 9

In 2023, city began program for testing and reporting 'forever chemicals' in drinking water

By Shari Phiel, Columbian staff reporter

Published: February 4, 2025, 4:00pm

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SCIENCE & ENVIRONMENT

Vancouver aims to raise \$210M to remove 'forever chemicals' from drinking water

[f](#) [X](#) [@](#) [in](#) [p](#) [✉](#)


By April Ehrlich (OPB)
Sept. 26, 2024 5:46 p.m. Updated: Sept. 26, 2024 7:51 p.m.

The city of Vancouver is less than a quarter of the way to securing enough funding to remove "forever chemicals" from its drinking water by 2029.

This week, the city announced it has secured a \$10 million low-interest loan to build new water treatment systems, bringing its collection of grants and loans up to \$37.5 million. In all, it needs an estimated \$210 million.

Vancouver is the third-largest municipal provider of drinking water in Washington, behind only Seattle and Tacoma. It is one of hundreds of water providers in the region that need to reduce PFAS to comply with new federal drinking water standards, which the U.S. Environmental Protection Agency announced [this spring](#). They have less than five years to meet those standards.

PFAS are man-made chemicals that don't break down, giving them the nickname "forever chemicals." They accumulate in people's blood over time, increasing blood pressure and other harmful health effects that scientists are

r/vancouverwa • 1 yr. ago


Chemical_Actuary_190

I knew we had a problem, just not this bad

[Discussion](#)

[Here's a map of where PFAS \(forever chemicals\) exceed new limits. Zoom in on Vancouver.](#)


[The full article](#)

r/vancouverwa • 22 days ago

Possible-Estimate748


Is it bad I drink the tap water here?

[Question?](#)

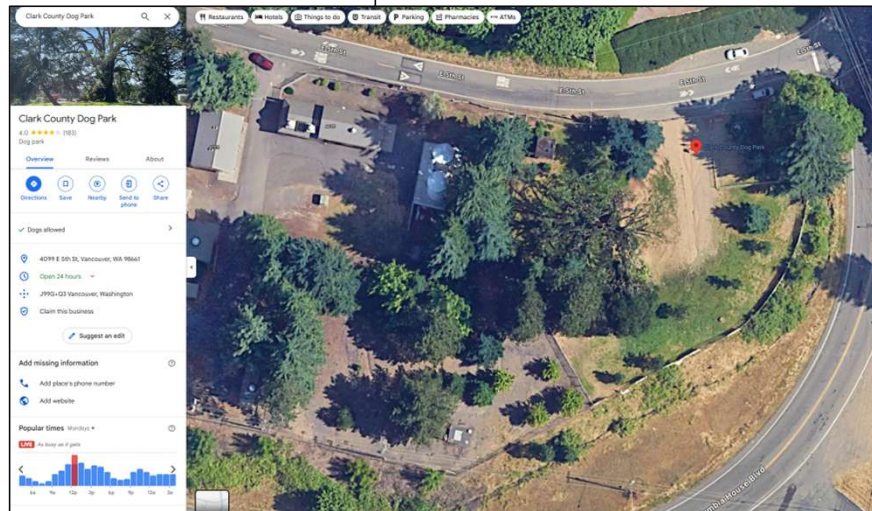
r/vancouverwa • 2 yr. ago

foopenna

City of Vancouver finds 3 of its water stations exceed state levels for PFAS







Planning Efforts



Vancouver's PFAS Planning Efforts



Treatment Estimates

Hired Brown & Caldwell to evaluate treatment options to remove PFAS from the water.



Evaluating Treatment Options

Hired HDR to complete bench and pilot testing to determine treatment.



Planning for the Future

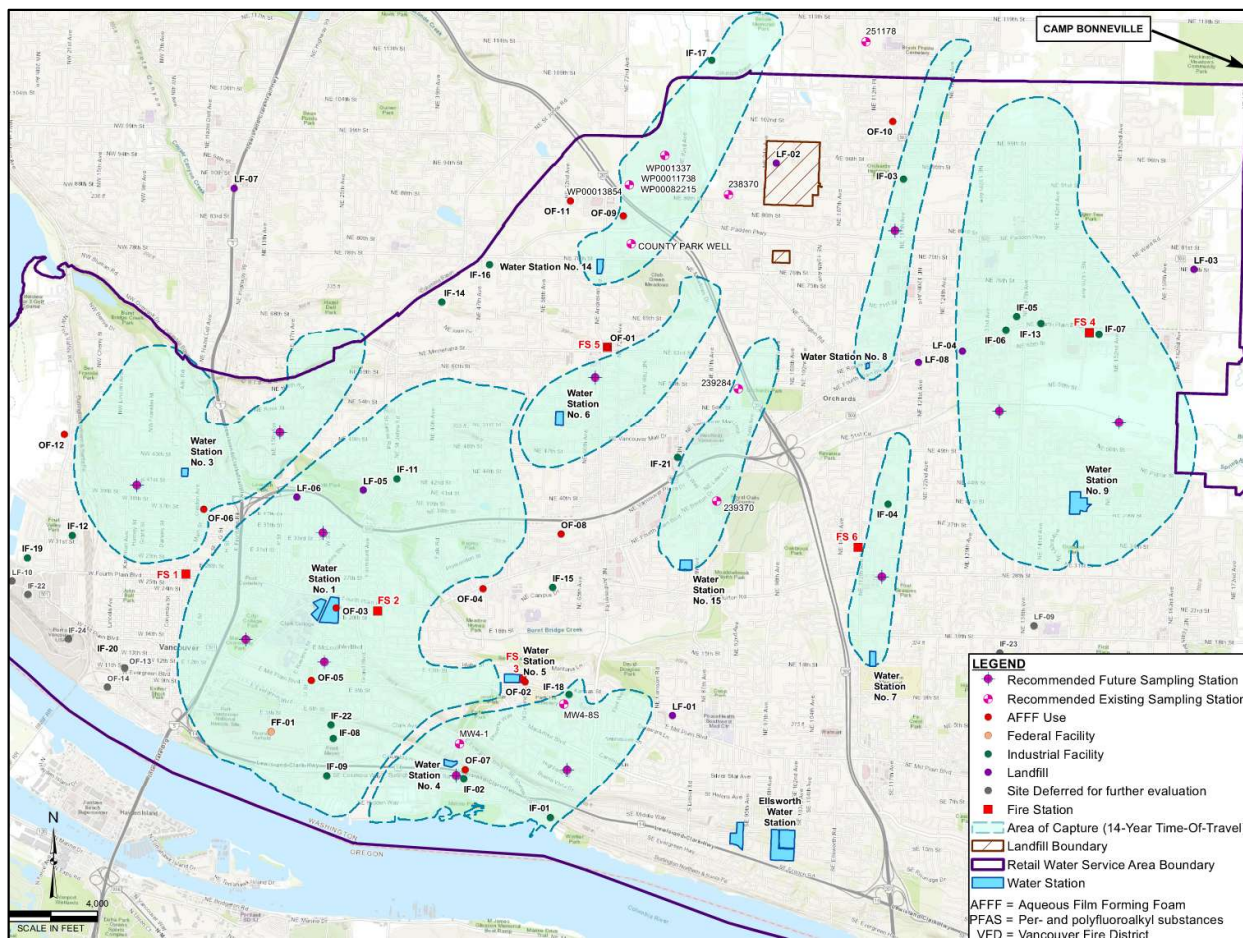
Hired Brown & Caldwell to develop a PFAS Management Plan. Future costs for PFAS mitigation are included in the City's long-range capital plan.

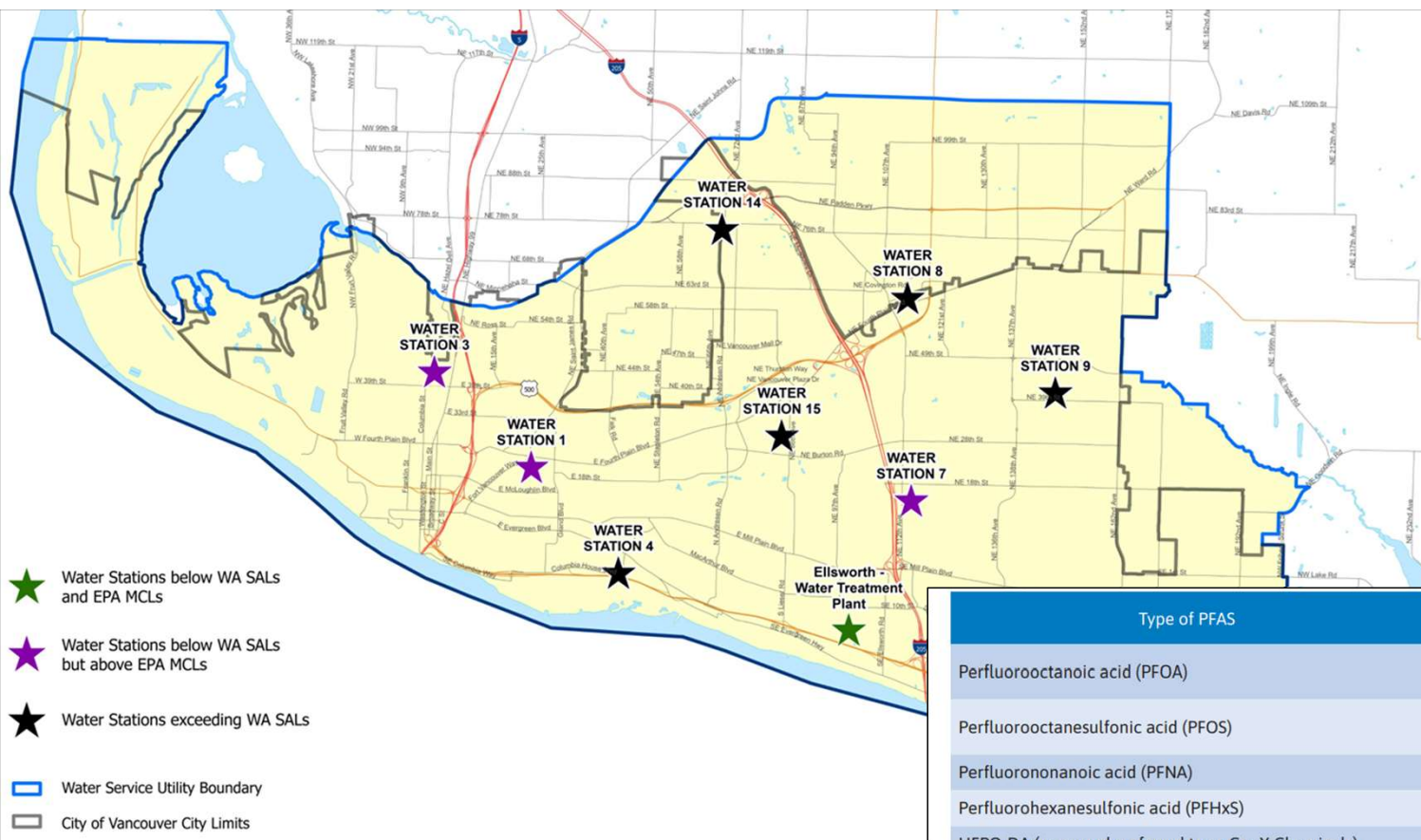




Potential Sources

- Hired Confluence and GSI to look into source investigation
- Looking to collect groundwater samples from existing wells





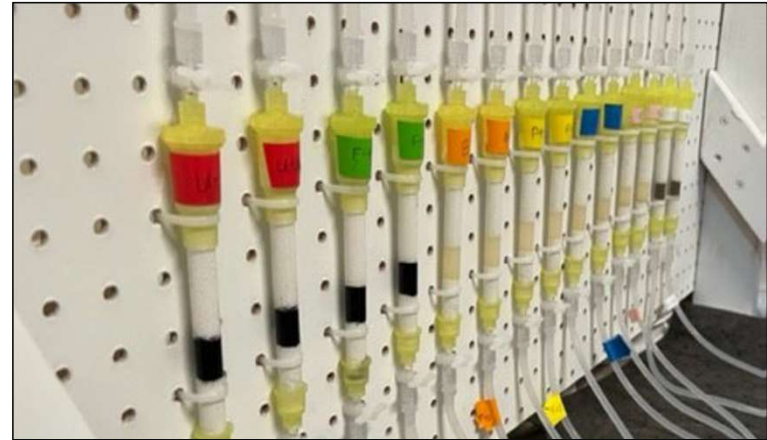
Type of PFAS	Vancouver Sampling Result Range	EPA Maximum Contaminant Level*	MCL Exceedance
Perfluorooctanoic acid (PFOA)	ND-12.5 ppt	4 ppt	Water Stations 4, 8, 9, 14 and 15
Perfluorooctanesulfonic acid (PFOS)	ND-23.1 ppt	4 ppt	Water Stations 1, 3, 4, 7, 8, 9, 14 and 15
Perfluorononanoic acid (PFNA)	ND	10 ppt	ND
Perfluorohexanesulfonic acid (PFHxS)	ND-6.8 ppt	10 ppt	—
HFPO-DA (commonly referred to as GenX Chemicals)	ND	10 ppt	ND
Perfluorobutanesulfonic acid (PFBS)	ND-8.5 ppt	—	—

Note: ppt = parts per trillion (1 ppt is equivalent to a single drop of water in 20 Olympic-sized swimming pools).

*The EPA MCL for mixtures containing two or more of PFHxS, PFNA, HFPO-DA and PFBS is the hazard index of 1. The hazard index of 1 is the level at which no known health risk could be anticipated. The EPA intends to provide water systems with a web-based form that will automatically calculate the Hazard Index for four types of PFAS together.

Bench and Pilot Testing

- RSSCT – 7 media tested
- 4 media Pilot Tested
- Approved in Dec 2024
- IX vs GAC
- Future Alternative Media

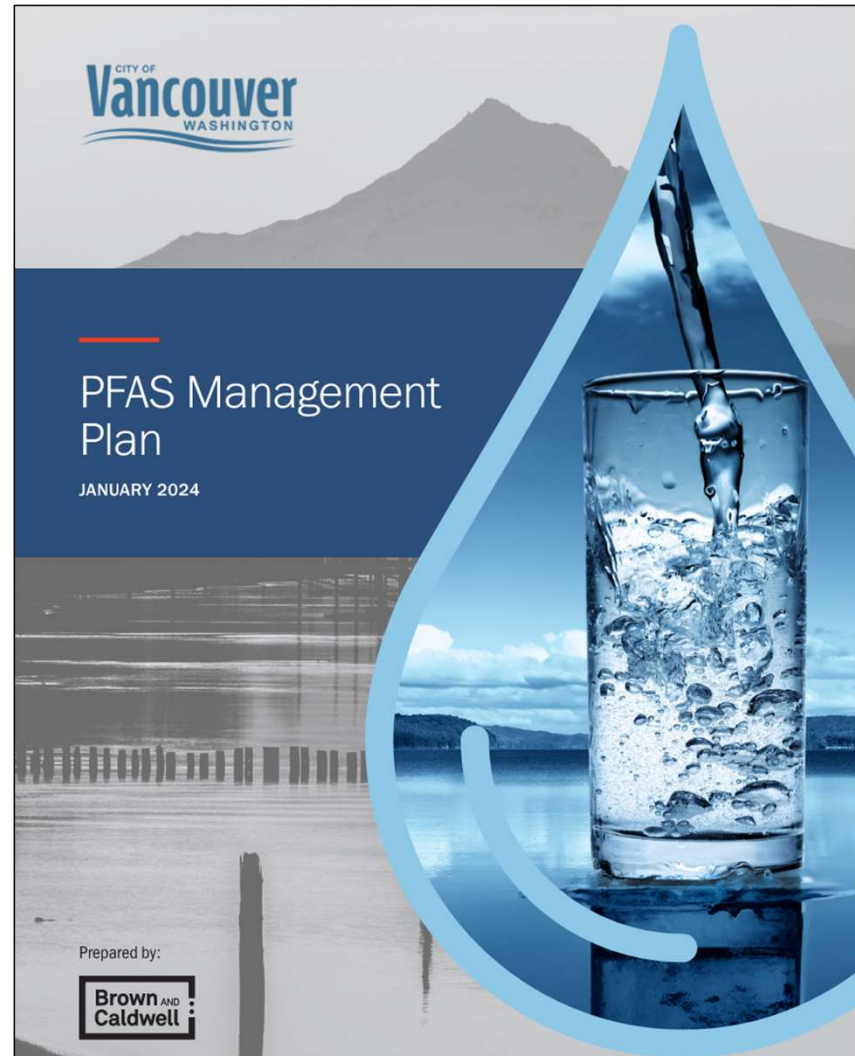


PFAS Management Plan

Key Objectives

- Evaluate long-term mitigation alternatives and update cost estimates
- Treatment goals
- Mitigation Implementation Schedule for Compliance
- Interim Measures

26



PFAS Management Plan

Table ES-2. Capital and Annual O&M Costs for Proposed Implementation Plan

Water Station	Improvement Type for Estimate ^a	Treatment Capacity (gpm) ^b	Lower Range (-50%)	Estimated Cost	Upper Range (+100%)	Annual O&M Cost ^c
WS14	PFAS Treatment	3,200	\$6,800,000	\$13,500,000	\$27,100,000	\$100,000
WS4	PFAS Treatment	10,700	\$20,100,000	\$40,300,000	\$80,600,000	\$236,000
WS9	PFAS Treatment	10,872	\$20,600,000	\$41,200,000	\$82,400,000	\$288,000
WS3	PFAS Treatment	6,000	\$12,000,000	\$24,100,000	\$48,200,000	\$159,000
WS1	PFAS Treatment	10,000	\$22,800,000	\$45,600,000	\$91,200,000	\$236,000
WS15	New Deep Well Supply ^d	4,000	\$14,150,000	\$28,300,000	\$56,600,000	\$73,000
WS8	New Deep Well Supply ^d	3,333	\$13,050,000	\$26,100,000	\$52,200,000	\$73,000
WS7	PFAS Treatment	3,333	\$8,200,000	\$16,300,000	\$32,600,000	\$93,000
Total			\$117,700,000	\$235,400,000	\$470,900,000	\$1,258,000

a. Treatment technology selected for planning-level cost estimation only. Selected treatment will be confirmed through future planning and design. PFAS treatment assumes granular activated carbon (GAC) media.

b. Treatment capacities to meet the proposed instantaneous water rights (Qi) based on City's evaluation as of September 14, 2023.

c. Costs are in 2023 dollars. PFAS treatment annual costs include media change out, staff time for typical operations and additional time for media change-out and backwashing, and PFAS sampling costs. Iron/manganese annual costs include media change out, staff time for typical operations, and raw water pumping costs.

d. Cost for new source includes new well drilling, new raw water pumps, and a new water treatment facility with a pressure filter system for iron and manganese removal. The City is still determining whether a deeper well supply is added to WS8 and WS15 or PFAS treatment is added.

Table 2-4. Capital Cost Comparison for New Source Development Compared to PFAS Treatment

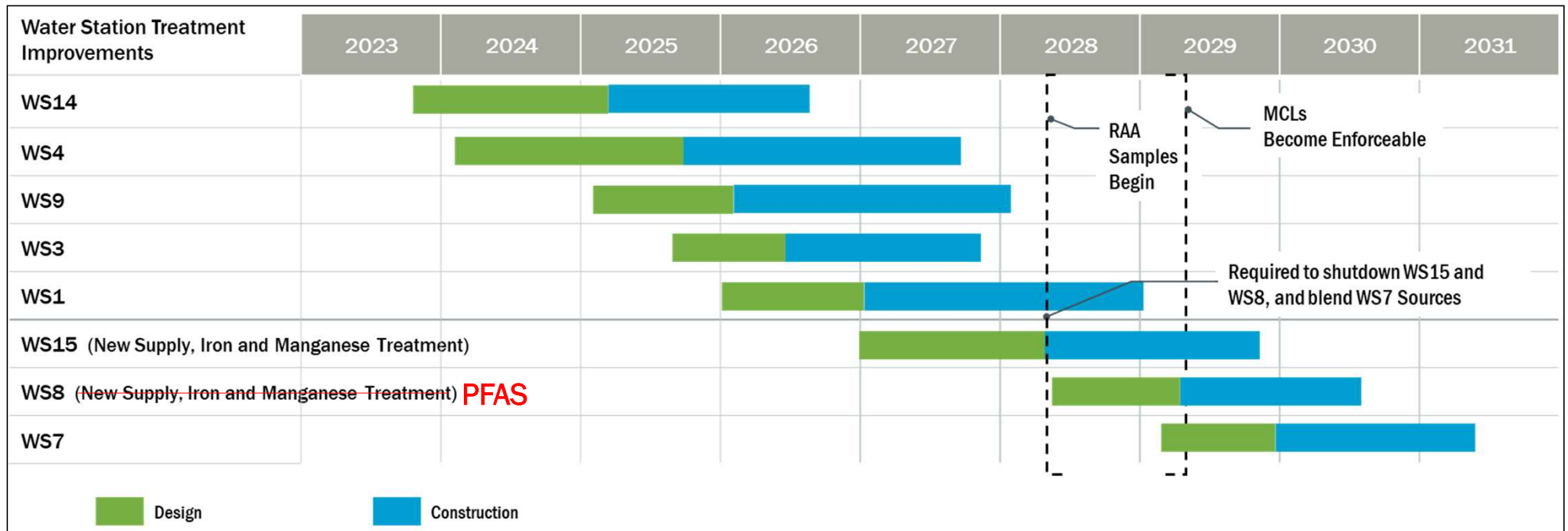
Site Type	Alternative	Upper Range (+100%)	Estimated Cost	Lower Range (-50%)
Large Site - 10,900 gpm (15.7 mgd)	New Supply Development from Deep Aquifer ^a	\$107,000,000	\$53,500,000	\$26,750,000
	PFAS Treatment of Existing Source Water ^b	\$90,400,000	\$45,200,000	\$22,600,000
	Cost Difference	\$8,300,000		
Smaller Site - 4,000 gpm (5.8 mgd)	New Supply Development from Deep Aquifer ^a	\$56,600,000	\$28,300,000	\$14,150,000
	PFAS Treatment of Existing Source Water ^b	\$39,900,000	\$19,900,000	\$10,000,000
	Cost Difference	\$8,400,000		

a. Cost for new source includes drilling new well, new raw water pumps, and new water treatment facility (greensand treatment system, e.g., ATEC, and water treatment facility building).

b. Cost for PFAS treatment is at WS9 with GAC treatment for large site (10,900 gpm), and at WS15 for the smaller site (4,000 gpm).



PFAS Mitigation Implementation Schedule

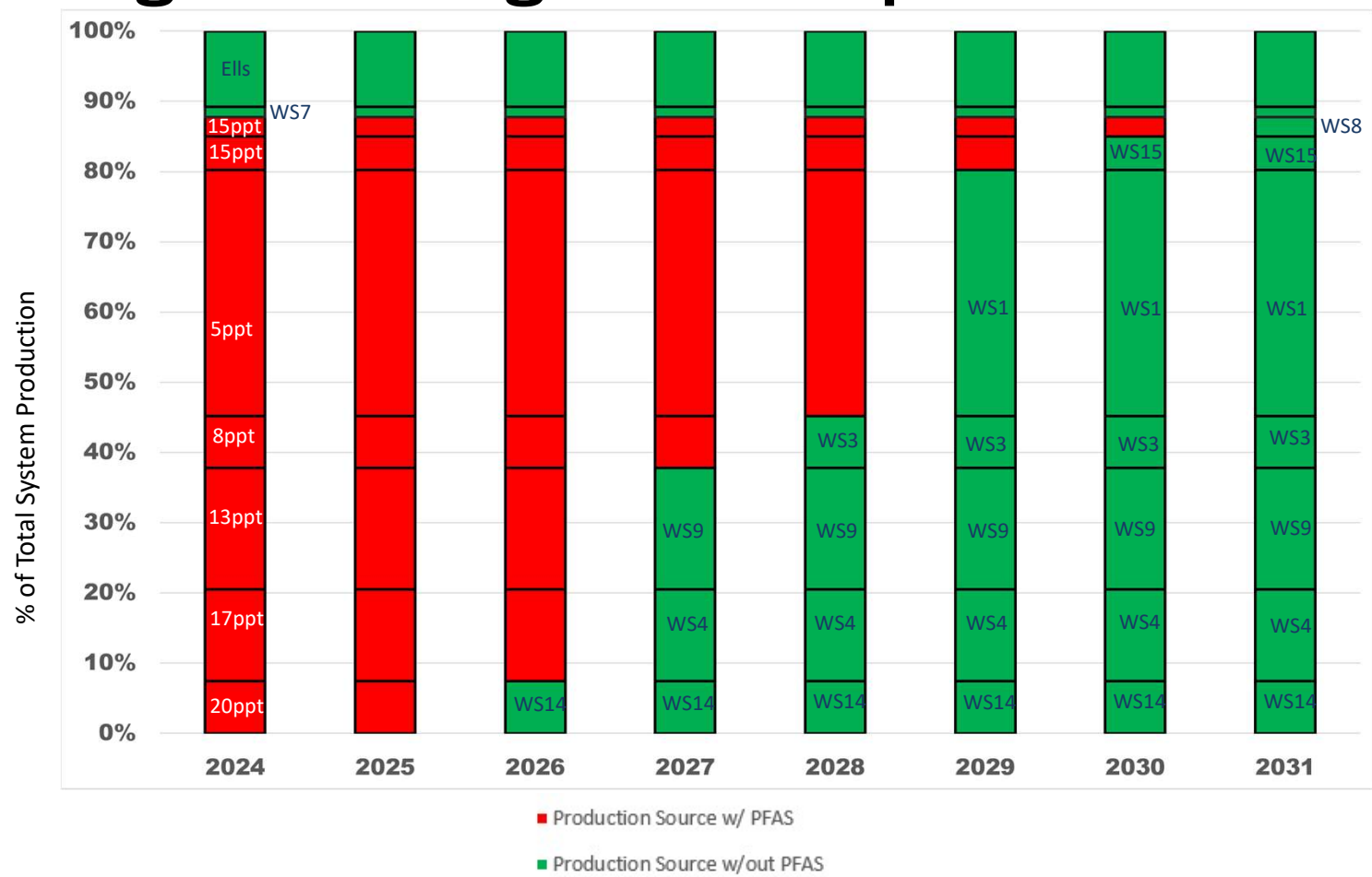


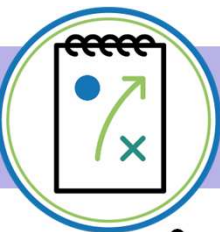
Developing “Standards”

- GAC with flexibility to change to IX/Future Media
- Treatment w/out building
- Assessing hydraulic upgrades for future media
- Future Alternative Media
- Operational Sampling Database



PFOS Concentration in our water system will decrease as long-term mitigation is implemented





Funding

- Drinking Water State Revolving Fund
- Litigation Efforts
- Public Works Board
- WIFIA
- Rate increases

Upcoming City Milestones



- Construction Start for WS 14
- WS4 Out to Bid this Fall
- WS9 in Design
- RFQ for WS 1 in the Fall
- Updating our Water System Plan
- Pursue sources of PFAS in groundwater
- Cost recovery/Settlements
- Ongoing customer outreach and education



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