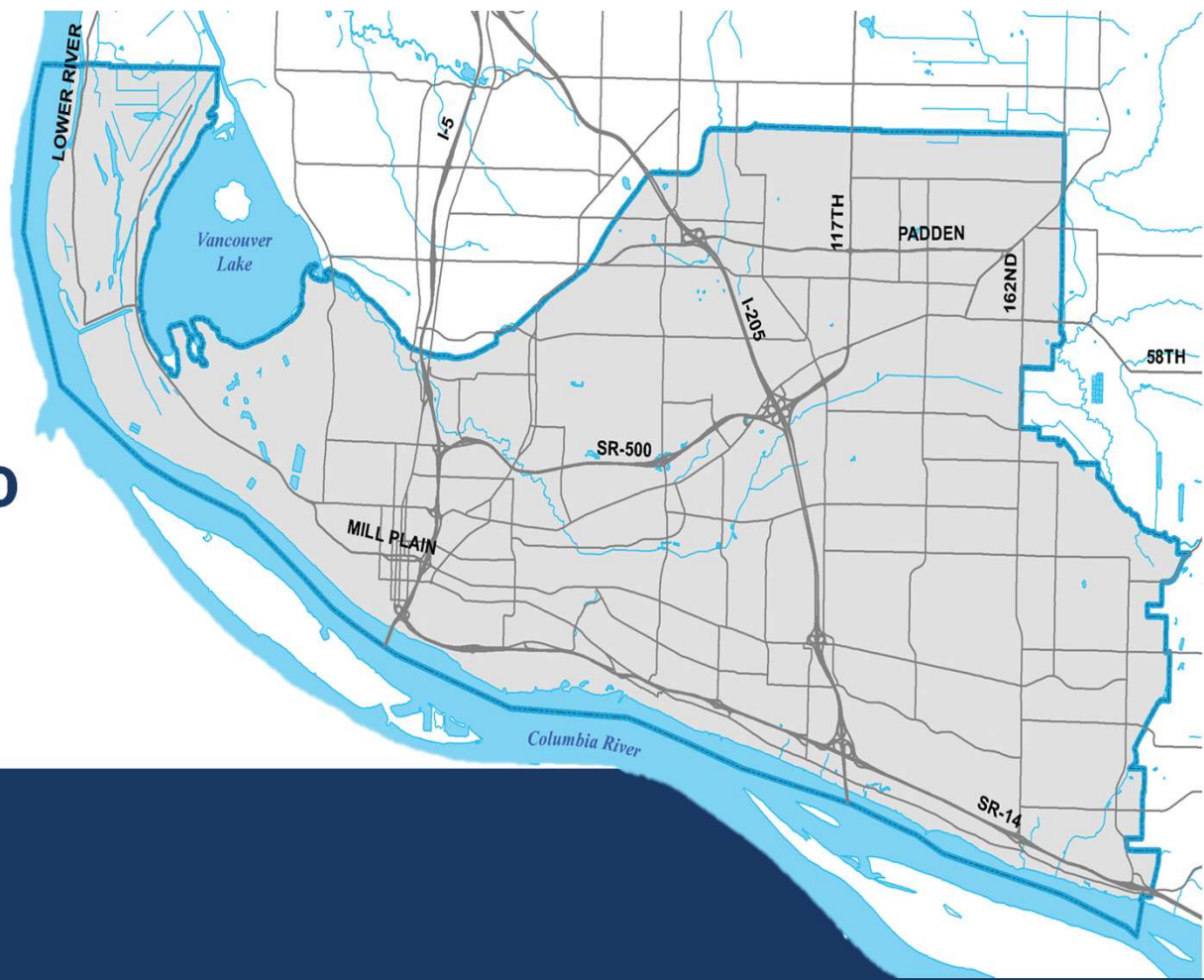




# A PFAS Journey- Vancouver's Approach to Widespread Source Detections

**Tyler Clary**  
Program Manager  
Water Engineering



# What's Your Favorite Fairy Tale?



# Once Upon a Time in a Land Called Vancouver.....

- 3<sup>rd</sup> 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
- Forever Chemicals
- PFOA and PFOS



Stain- & water-  
resistance  
treatments



Nonstick  
cookware



Waterproof  
apparel



Cleaning  
products



Firefighting  
foam



Takeout  
containers



Carpets &  
textiles

Resources: [ecology.wa.gov/pfas](https://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

Resources: [atsdr.cdc.gov/pfas](https://atsdr.cdc.gov/pfas)





# What regulations are there for PFAS?

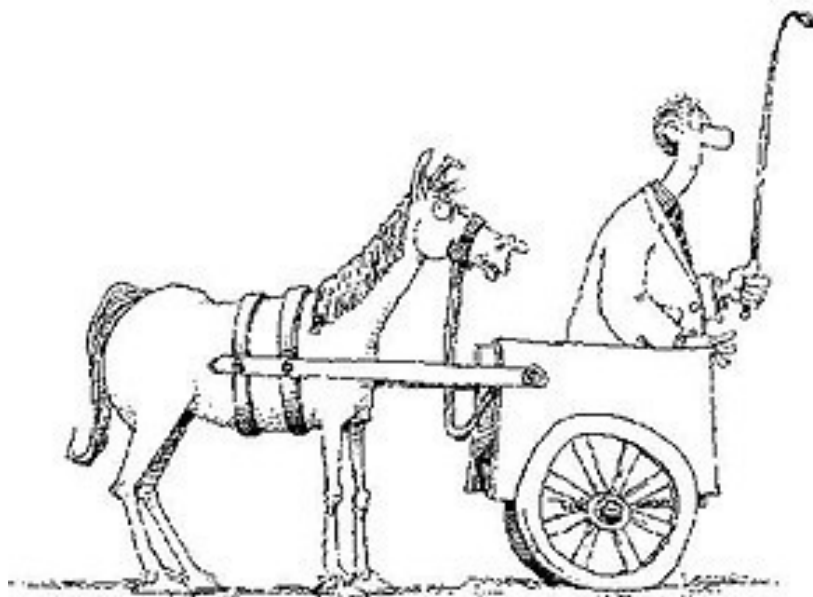


# Who Regulates Water Quality

Environmental  
Protection  
Agency (EPA)

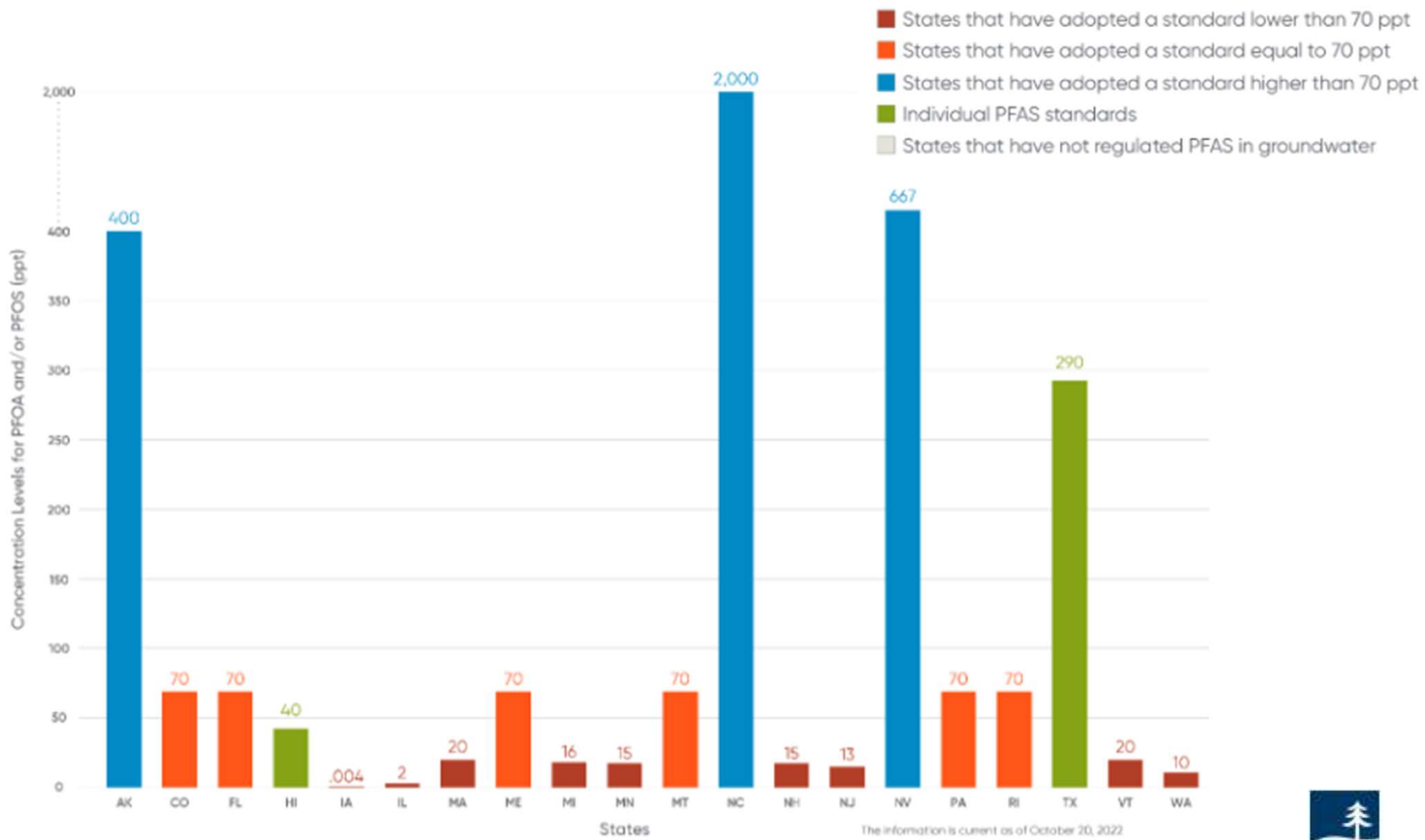
Washington  
State  
Department of  
Health (DOH)





**Hang on.. I must be doing something wrong..  
How does that saying go again?**





# Responding to PFAS

**2013**  
City UCMR3 PFAS  
sampling  
below reporting limit



City milestones

State and federal milestones

**2016**

EPA sets new PFOS &  
PFOA Health Advisory  
Levels (70 ppt)

WA begins  
developing PFAS  
Chemical Action Plan

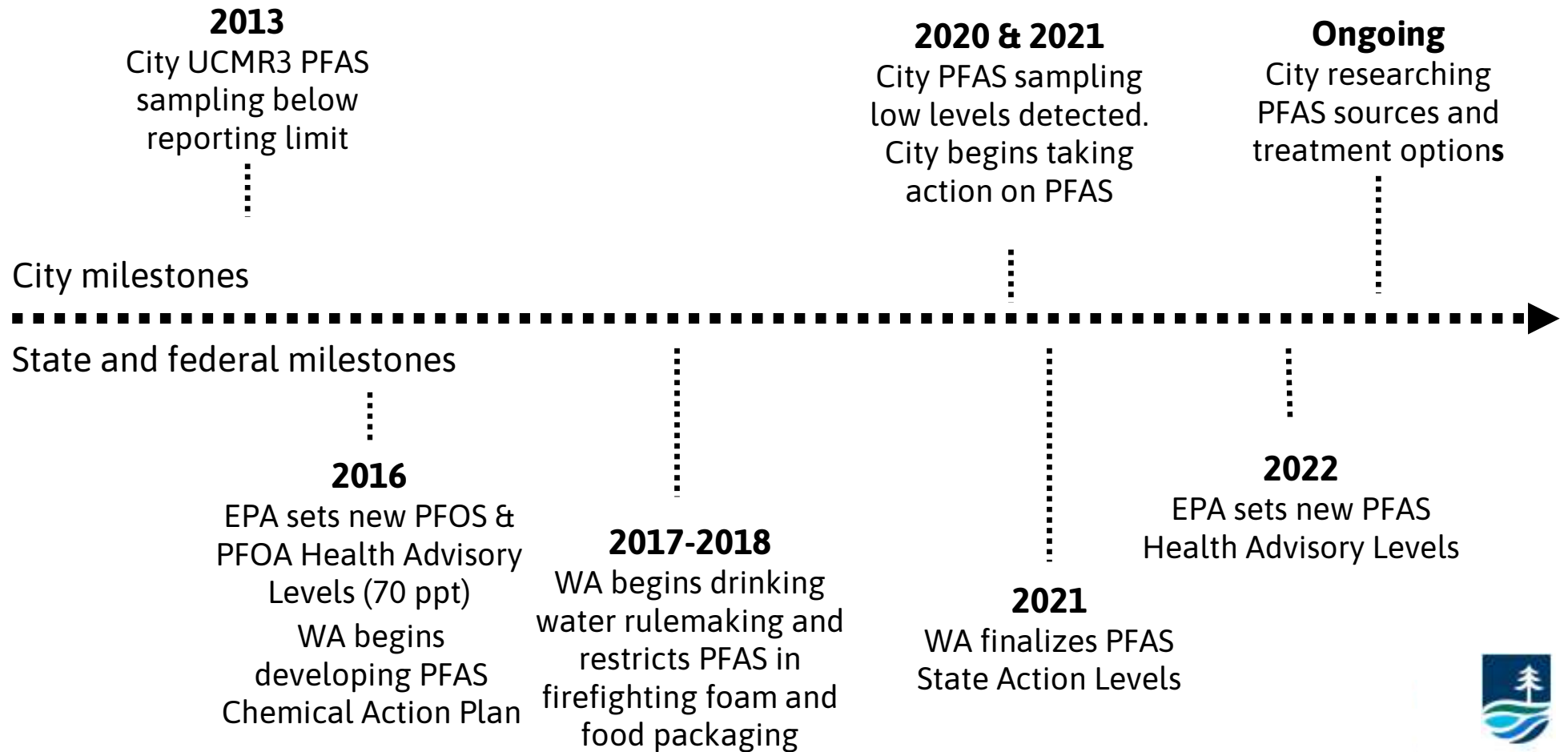
**2017-2018**

WA begins drinking  
water rulemaking and  
restricts PFAS in  
firefighting foam and  
food packaging

		Method 537	
ACRONYM	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



# 537 vs. 537.1 vs. SAL vs MCL

		2013 Method 537	2020 Method 537.1		
ACRONYM	UNITS	EPA MRL	EPA MRL	State Action Level	MCL
PFBS	ng/l	90	2	345	??
PFHxS	ng/l	30	2	65	??
<b>PFOS</b>	<b>ng/l</b>	<b>40</b>	<b>2</b>	<b>15</b>	??
PFNA	ng/l	20	2	9	??
<b>PFOA</b>	<b>ng/l</b>	<b>20</b>	<b>2</b>	<b>10</b>	??



# State Rulemaking - 2023

- 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

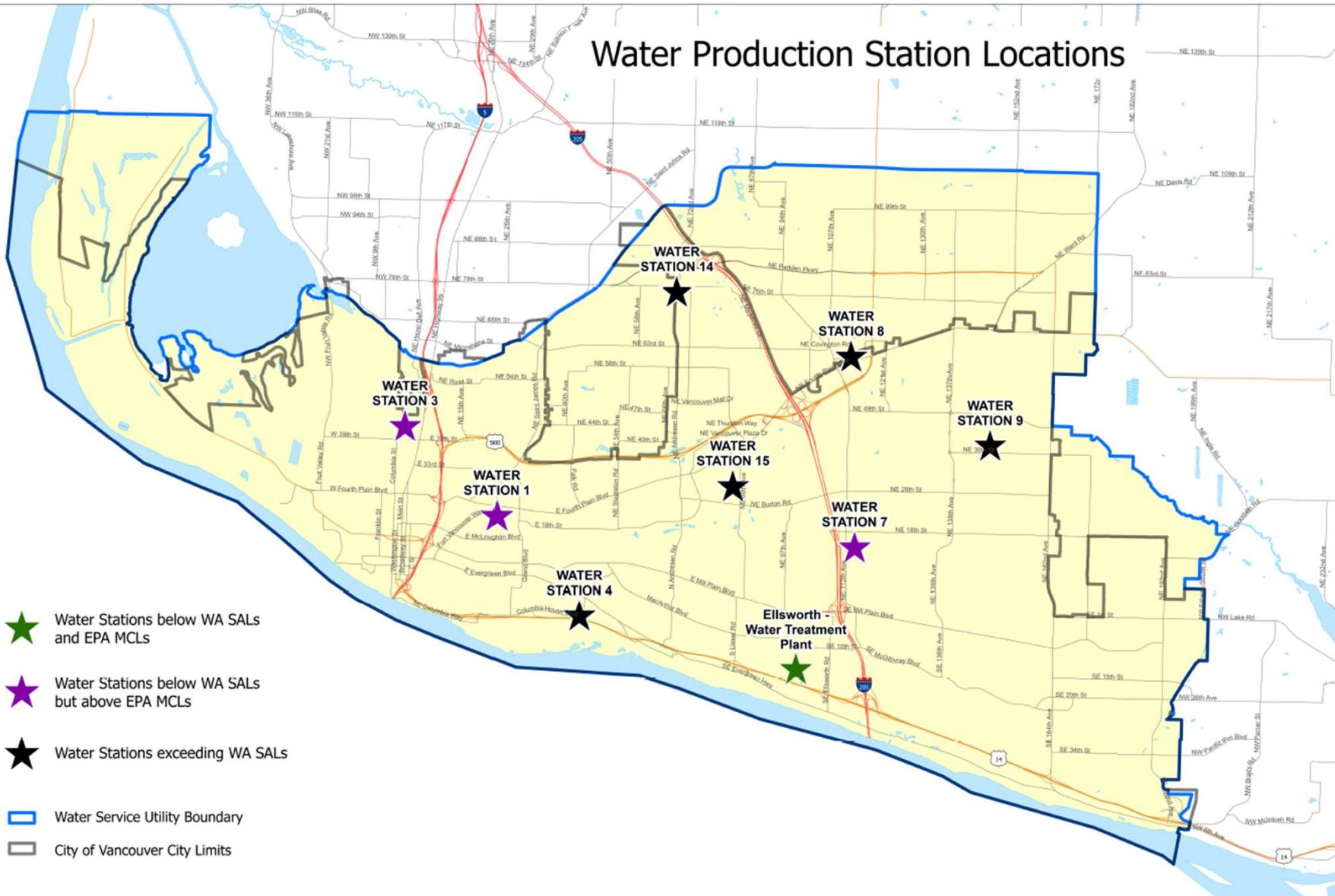


WATER STATION # - WELL #	Perfluoro-1-octanesulfonic acid (PFOS)	Perfluoro-n-octanoic acid (PFOA)
SAL	15.0	10.0
WS4-1	25.0	12.0
WS4-2	14.0	6.0
WS4-3 13%	16.0	6.9
WS4-4	23.0	10.0
WS4-5	23.0	8.6
WS4-9	19.0	8.2
WS8-2 4%	17.0	6.7
WS8-3	20.0	8.5
WS9-3	15.0	6.1
WS9-4 25%	17.0	7.2
WS9-5	12.0	4.9
WS9-6	15.0	6.3
WS9-7	17.0	6.7
WS14-1	24.0	12.0
WS14-2 5%	22.0	11.0
WS14-3	22.0	12.0
WS15-1	20.0	4.6
WS15-2 4%	20.0	ND
WS15-3	14.0	2.6

# Testing Results



# Water Production Station Locations





**What actions is Vancouver taking?**





# CMA Spreadsheet

Sent email to Dan/Loretta recommending public outreach	1/15/2021
Carlson Notified	1/21/2021
Memo to Eric Holmes sent	2/2/2021
Info posted on website	2/5/2021
Memo sent to council	2/9/2021
Update Council in CM communications (10 min)	2/22/2021
Samples taken - all wells	2/23,24/2021
Results Received	3/11/2021
Notified Loretta/Dan of 2021 results with a presentation	3/30/2021
Memo to Eric sent to Dan/Loretta for Review	4/13/2021
Lab Comparison results back from both BSK and Eurofins	4/28/2021
Info updated on website	4/29/2021
Memo #2 to Eric Holmes sent	5/11/2021
Memo #2 sent to council	5/21/2021
Met w/ WDOH to discuss our situation	7/8/2021
3rd round samples - all wells	7/15/2021
Results Received	8/9/2021



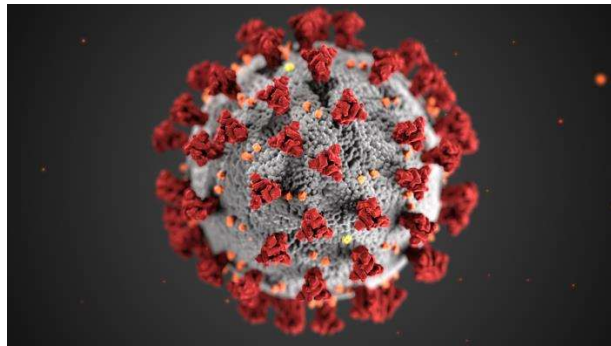
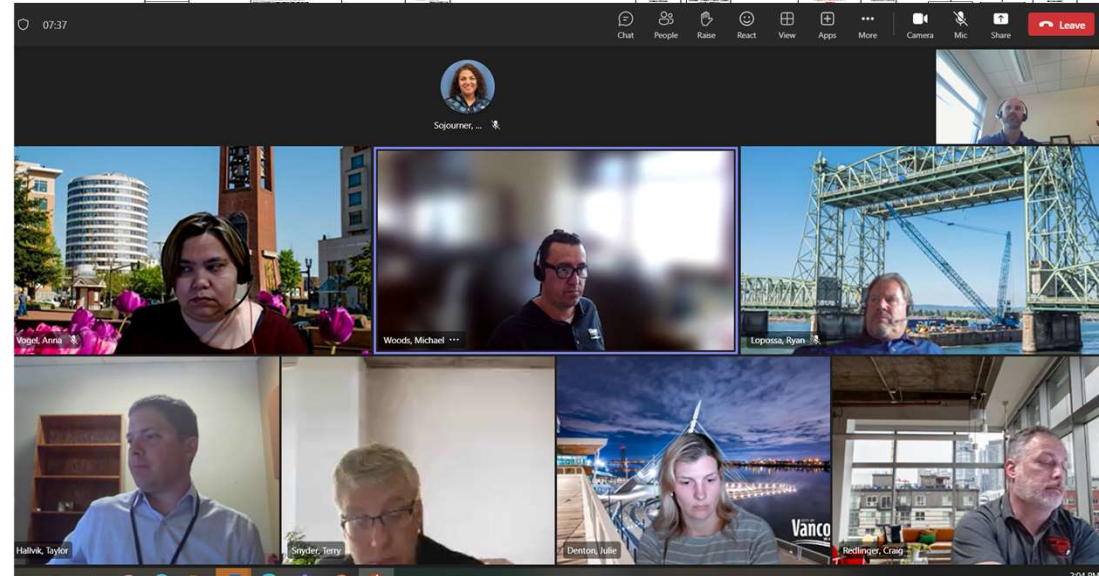
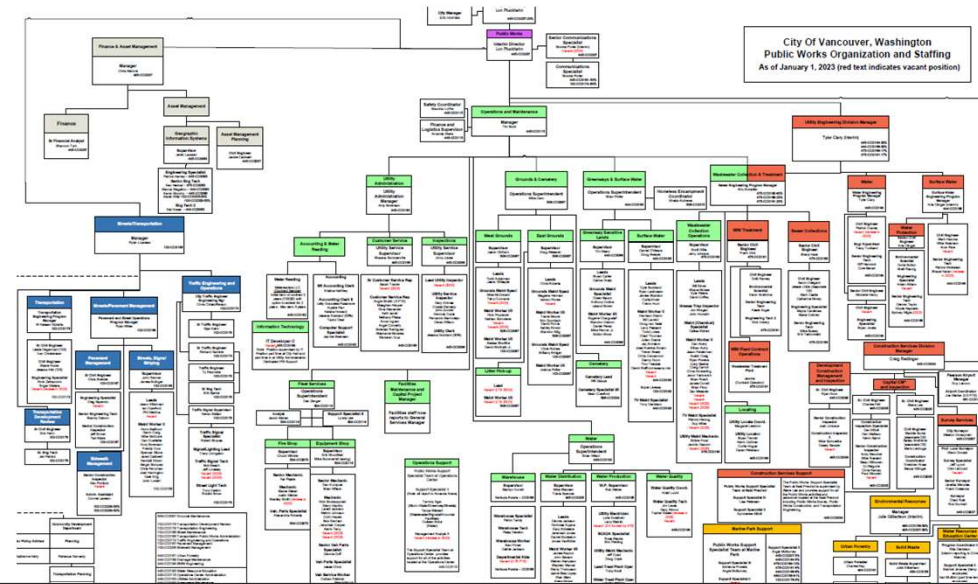
# Vancouver's Immediate Response

- 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



## **Treatment Estimates**

Hired Brown & Caldwell to evaluate treatment options to remove PFAS from the water. Developed Water Resiliency Strategy.



## **Finding Long-term Solutions**

Hired Confluence and GSI to find potential sources of PFAS and the extent of PFAS in the local groundwater. Also working with Farallon.



## **Communications**

Hired Barney and Worth (Conсор) to develop a communications plan.



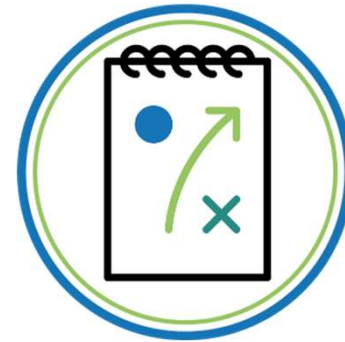
## **Evaluating Treatment Options**

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



## Planning for the Future

PFAS Management Plan completed. Future costs for PFAS mitigation are included in the City's long-range capital plan.



## Reducing Costs

The City is pursuing grants and loans to reduce the impact to ratepayers.





# Treatment Estimates






- Evaluated six wellfields all at or over SAL
- Reviewed site constraints (is there room?)
- GAC vs IX

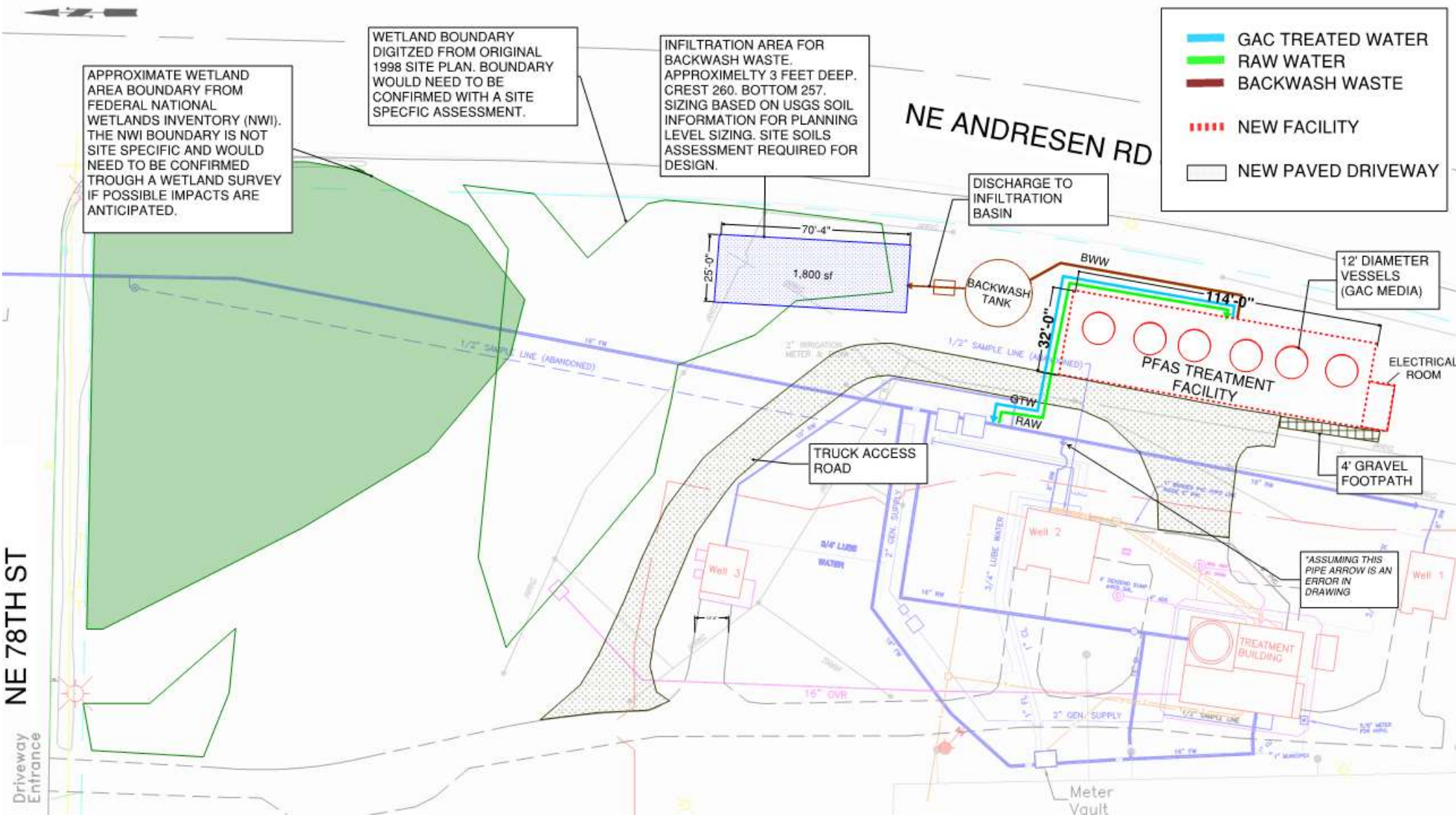


WETLAND BOUNDARY DIGITIZED FROM ORIGINAL 1998 SITE PLAN. BOUNDARY WOULD NEED TO BE CONFIRMED WITH A SITE SPECIFIC ASSESSMENT.

APPROXIMATE WETLAND AREA BOUNDARY FROM FEDERAL NATIONAL WETLANDS INVENTORY (NWI). THE NWI BOUNDARY IS NOT SITE SPECIFIC AND WOULD NEED TO BE CONFIRMED THROUGH A WETLAND SURVEY IF POSSIBLE IMPACTS ARE ANTICIPATED.

INFILTRATION AREA FOR BACKWASH WASTE. APPROXIMATELY 3 FEET DEEP. CREST 260. BOTTOM 257. SIZING BASED ON USGS SOIL INFORMATION FOR PLANNING LEVEL SIZING. SITE SOILS ASSESSMENT REQUIRED FOR DESIGN.

	GAC TREATED WATER
	RAW WATER
	BACKWASH WASTE
	NEW FACILITY
	NEW PAVED DRIVEWAY



NE ANDRESEN RD

DISCHARGE TO INFILTRATION BASIN

BACKWASH TANK

12' DIAMETER VESSELS (GAC MEDIA)

ELECTRICAL ROOM

PFAS TREATMENT FACILITY

4' GRAVEL FOOTPATH

TRUCK ACCESS ROAD

\*ASSUMING THIS PIPE ARROW IS AN ERROR IN DRAWING

TREATMENT BUILDING

Meter Vault

NE 78TH ST

Driveway Entrance





**Table 4-1. Capital Cost Estimate for PFAS Impacted Water Stations**

Water Stations	Upper range (+100%)	Estimated Cost	Lower Range (-50%)
WS3	\$52,300,000	\$26,200,000	\$13,100,000
WS4	\$102,300,000	\$51,100,000	\$25,600,000
WS8	\$31,800,000	\$15,800,000	\$7,900,000
WS9	\$92,000,000	\$46,000,000	\$23,000,000
WS14	\$31,400,000	\$15,700,000	\$7,900,000
WS15	\$34,100,000	\$17,000,000	\$8,500,000
<b>Total</b>	<b>\$343,900,000</b>	<b>\$171,800,000</b>	<b>\$86,000,000</b>



designed by freepik.com



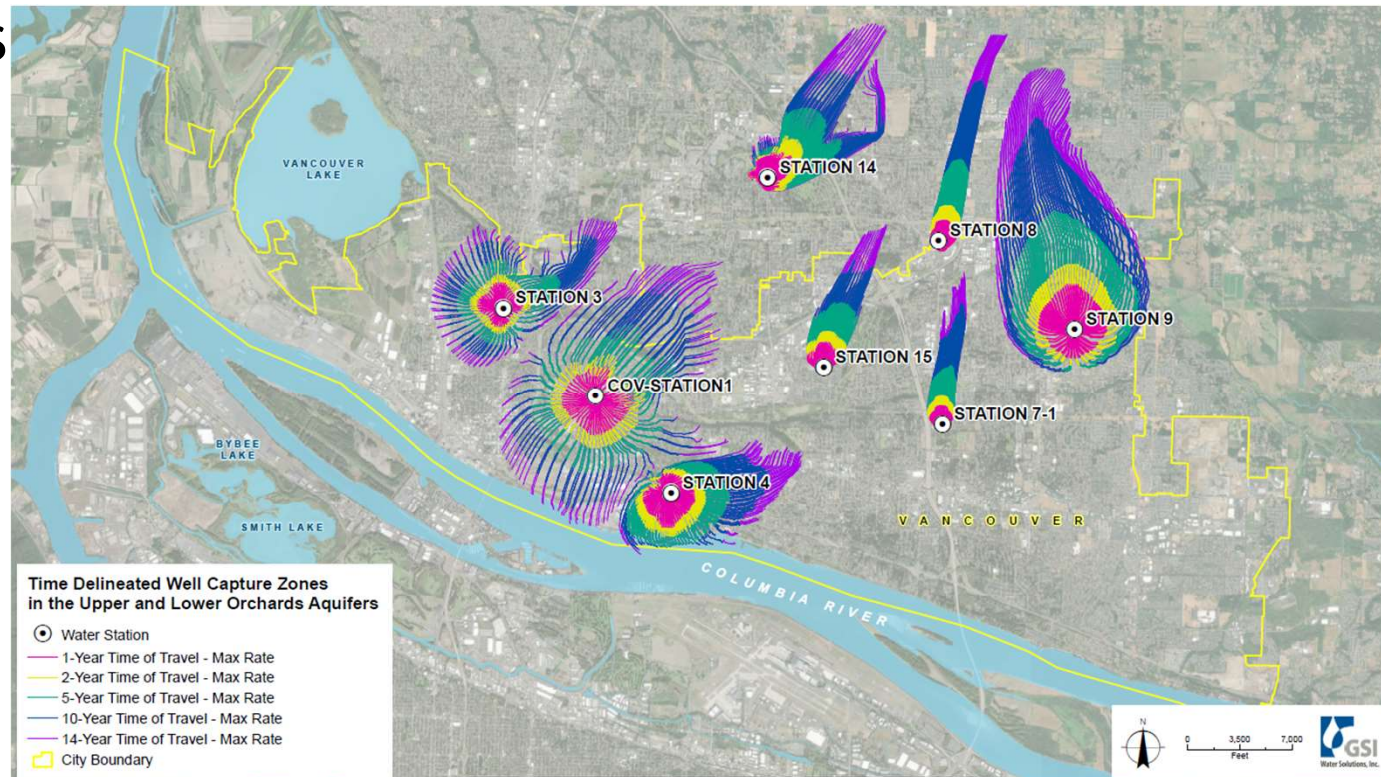
**Table 5-2. Annual Average O&M Costs**

Water Station ID	Media Replacement Costs <sup>a</sup>	Staffing Costs	Analytical Costs	Total Annual Average O&M Costs <sup>b</sup>
WS3	\$109,000	\$17,000	\$9,000	\$134,000
WS4	\$221,000	\$18,000	\$9,000	\$248,000
WS8	\$108,000	\$16,000	\$6,000	\$130,000
WS9	\$425,000	\$23,000	\$9,000	\$457,000
WS14	\$112,000	\$16,000	\$6,000	\$134,000
WS15	\$112,000	\$16,000	\$6,000	\$134,000
<b>Total</b>	<b>\$1,087,000</b>	<b>\$106,000</b>	<b>\$45,000</b>	<b>\$1,237,000</b>



# Potential Sources

- Updated groundwater model
- Industrial sources
- Landfills
- Septic tanks
- Drywells
- AFFF



# Chemical found in Vancouver water

at scattered  
or four days

By ANNE DONELSON  
Correspondent, The Oregonian

blizzard roar  
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Laird. More  
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## sea lanes

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and 2,800 nau-  
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1 Seattle.  
Guard cutter  
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400 miles off  
xtreme north-  
1 State.

VANCOUVER, Wash. — Varying levels of the contaminant tetrachloroethylene — which federal investigators call a possible cancer-causing agent — have been found in city wells that supply drinking water to the south-central area of Vancouver.

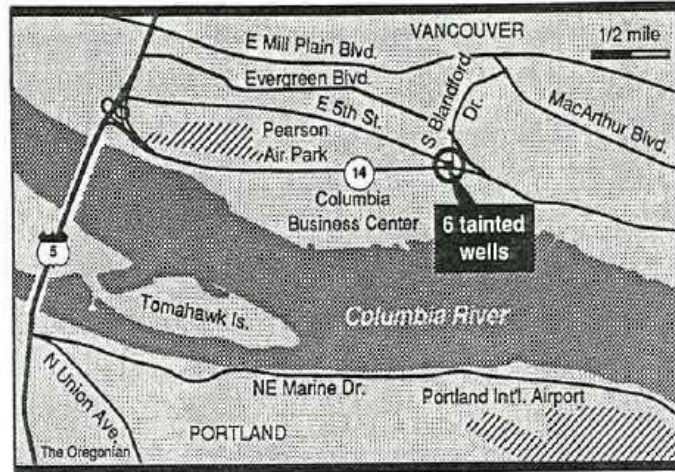
State and city tests reveal the compound, commonly referred to as PCE, is present in the six wells of the well field at Blandford Drive and Washington 14, about a half-mile east of Pearson Air Park. Test results were negative in the other 30 wells in the city's municipal water supply system.

The tests began last spring, but results were not made public. Two of the wells with the lowest concentration of PCE still are being used regularly; the other four are being used for backup supplies.

"There's no reason or regulation to announce (the tests results) if we don't exceed safe drinking water standards," said City Engineer Victor Ehrlich. "There is no reason for alarm. These are very low levels."

Tetrachloroethylene is a degreaser and cleaning solvent often used in dry cleaning and printing establishments. Based on animal research, the U.S. Environmental Protection Agency has identified PCE as a possible cancer-causing agent.

A toxicologist from the state



Department of Social and Health Services told City Council members at a workshop Monday that the levels in Vancouver's water supply do not pose a threat to the population.

Using the figure of 10 parts per billion of PCE, Roseanne Lorenzara said if one million residents drank two liters of water per day for 70 years there would be an additional 16 cases of cancer.

Federal safety standards have not yet been set on the compound, but the EPA is expected to announce standards in April.

"The presence of the compound is not a major threat, but it needs to be addressed and eliminated," said Tom Barton, director of environ-

mental health for the Southwest Washington Health District.

Bill Litke, head of the drinking water section at the Department of Social and Health Services, said he didn't think there was "an immediate health problem" in Vancouver.

Tests of the city's water for PCE vary widely. Three samples analyzed by the state in March, May and October uncovered levels ranging from 7.8 parts per billion to 10.1 parts per billion.

Subsequent tests performed by the city revealed four wells with levels ranging from 4.1 parts per billion to 19.4 parts per billion. However, tests in January showed only three and four parts per billion.

The EPA is expected to issue a maximum PCE standard that could range anywhere from five parts per billion to 20 parts per billion, Ehrlich said.

If the federal standard turns out to be lower than the level present in the city's water system, Vancouver could be faced with some expensive alternatives for getting rid of the chemical.

Tetrachloroethylene evaporates easily, and some areas use aeration to dispose of the contaminant, Barton said.

However, that process is expensive, as would be abandoning the well field and relocating some of the city's water storage facilities.

"We'd like to avoid that and find out where things are coming from," Ehrlich said.

In 1988, the city tested for a variety of organic compounds regulated by the EPA, including trichloroethylene, or TCE. That compound along with PCE was found in Milwaukie's water supply last year, prompting that city's officials to begin buying water from Portland's Bull Run reservoir.

The presence of PCE in Vancouver's water has prompted a request to the Vancouver City Council for a \$75,000 study to determine the source of the contamination. If the study points to particular businesses or industries in the area, they could be responsible for costs of the cleanup, Ehrlich said.





# Communications

- Website developed
- Numerous memos to council
- Discussed in multiple council meetings, but typically as a part of another topic
- Info included in CCR
- Consistent with DOH and EPA
- Coordinate with Clark County Public Health, WDOH, CPU, Camas on Communications

The image shows a website interface. On the left is a navigation menu with a dropdown menu titled "I want to...". The menu items are: Public Works (with sub-links for Future Public Works and Operations Campus), At Your Service Customer Center, Service Requests, Drinking Water (with sub-links for Annual Water Quality Report, Aquifers - Our Water Resources, and Water Quality Reports), Learn About PFAS (with sub-link for PFAS Sampling Results), and Backflow and Cross-Connection Prevention (with sub-link for Water Station 1 Project & Master Plan). The main content area is titled "Learn About PFAS" and "5 Things to Know About PFAS and Your Drinking Water". It includes a breadcrumb trail: Home » Public Works » Drinking Water. The text states: "Providing our customers safe water and protecting public health is the City's top priority. Water is critical to the livability and vitality of our community." It then lists five key actions: 1. Evaluating treatment options, 2. Finding long-term solutions, 3. Planning for the future, 4. Reducing costs, and 5. Sharing information. A sidebar on the right features a photo of hands filling a glass from a faucet, followed by the heading "Actions the City is taking to protect and maintain water quality include:" and five icons with corresponding text: Evaluating Treatment Options, Finding Long-Term Solutions, Planning for the Future, Reducing Costs, and Sharing Information.

Home » Public Works » Drinking Water

## Learn About PFAS

### 5 Things to Know About PFAS and Your Drinking Water

Providing our customers safe water and protecting public health is the City's top priority. Water is critical to the livability and vitality of our community.

**1. The City is taking action now to address an emerging issue with PFAS**—a group of human-made chemicals that have the potential to adversely affect human health and the environment. In late 2020, the City completed proactive testing that found PFAS at very low levels in some of the City's groundwater wells. Actions the City is taking to protect and maintain water quality include:

- **Evaluating treatment options:** Water quality engineers are evaluating cost-effective treatment options to remove PFAS from the water
- **Finding long-term solutions:** Expert scientists are determining potential sources of PFAS and the extent of PFAS in the local groundwater.
- **Planning for the future:** Future costs for PFAS treatment are included in the City's long-range capital plan.
- **Reducing costs:** The City is pursuing federal and state grants and loans to reduce the impact to ratepayers.
- **Sharing information:** Information on PFAS and test results are posted on the City's website and reported in the Annual Water Quality Report.

**2. PFAS (per and polyfluoroalkyl substances) have been manufactured and used worldwide since the 1950s** in food packaging, non-stick cookware, clothing, furniture, firefighting foam, and many other commercial household and workplace products. The presence of PFAS chemicals is widespread because they do not break down easily in the natural

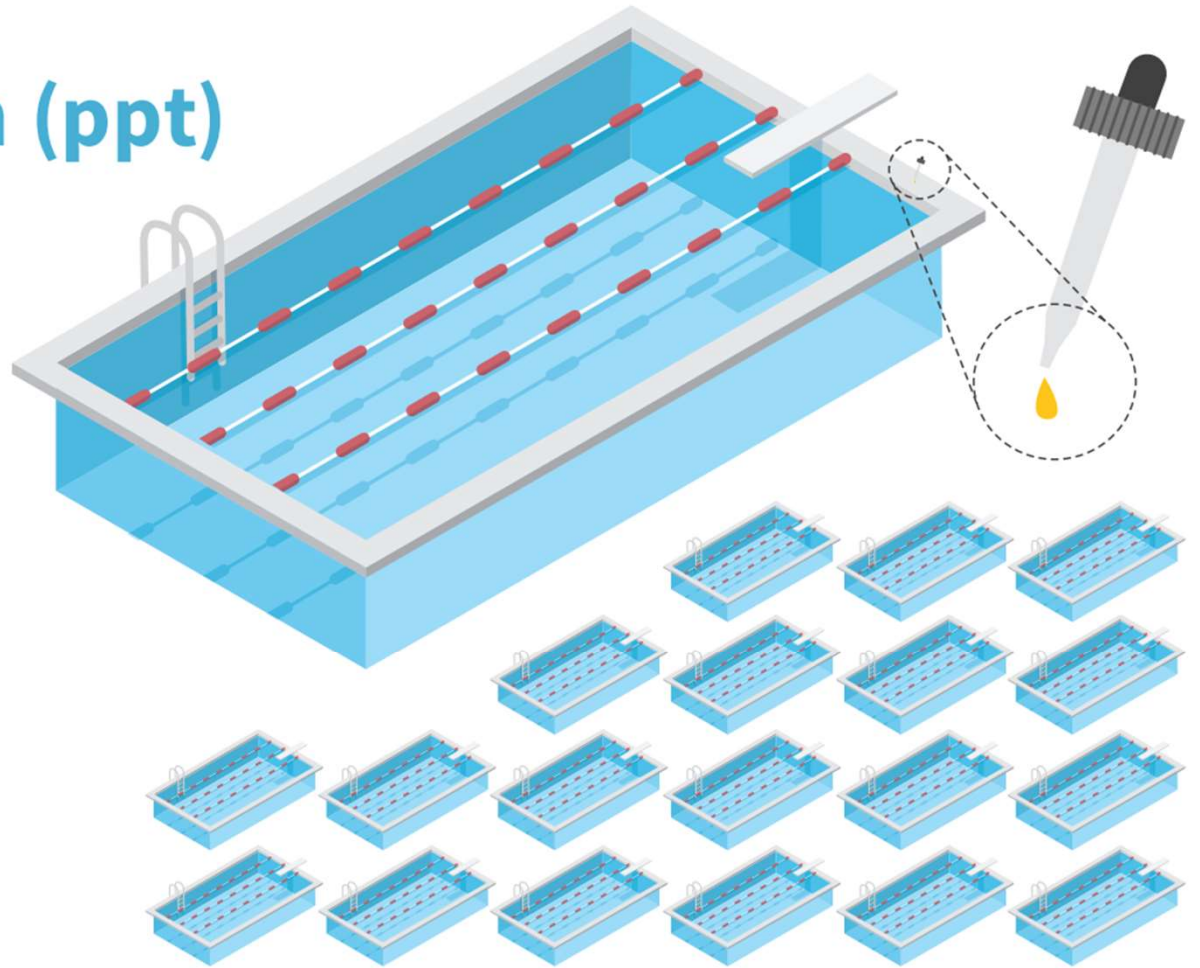
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**1 part per trillion (ppt)**

**IS EQUIVALENT TO A  
SINGLE DROP OF  
WATER IN**

**20 olympic-sized  
swimming pools**



# Communications Issues

- Clear truthful language that doesn't create confusion and paranoia
- Date set for first compliance samples
- Seattle Time Articles - 10/23/22 and 1/20/23
- Neighboring water utility test results
- Postcard first week of Feb. 2023
- Staff training
- Columbian article 2/24/23 and 4/12/23.....
- Public interest increasing



# Postcards/Newsletters/Rack Cards/Talking Points/FAQs



A QUARTERLY NEWS UPDATE FOR THE COMMUNITY JULY 2023 | VOLUME 1 | ISSUE 1

## Introducing your new city newsletter

These days information moves fast. While there are a lot of advantages to sharing information online, there are some things that deserve more than a "head". This is why we've created a new newsletter to send information about City programs, services and initiatives directly to your home.

We hope this publication will become a valued way for you to stay informed about what is going on in your hometown.

The newsletter will be mailed to you once a quarter if you live in Vancouver or live outside city limits and receive some of your municipal services from the City. You can watch for the next issue later this fall.

Our first issue is mainly focused on summer in Vancouver. Inside you'll find stories about all the exciting events and places to have fun and stay cool in the Cove this summer. Also, as part of our continuing work to keep you informed about PFAS,

we have a story about this important topic in this issue.

The newsletter is also available in Spanish, Russian, Vietnamese, and Chinese. You can scan the QR code at the bottom of this page to read them. Please let us know if you would like the newsletter translated into a different language. We hope you enjoy the newsletter. If you have any questions, you can send them to [Laura.Scheidt@cityofvancouver.us](mailto:Laura.Scheidt@cityofvancouver.us).

## PFAS and water quality: why it matters

Protecting public health and providing a safe water supply is a top priority for the City of Vancouver. To that end, we are monitoring, researching and planning how to resolve the challenge of PFAS in our water supply.

### What are PFAS?

You've probably heard of "forever chemicals." Often, this term refers to per- and polyfluoroalkyl substances (PFAS) that have been used since the 1940s in many water-resistant, stain-resistant and non-stick products such as outdoor clothing, camping upholstery, non-stick cookware, food packaging and other common household products.

Like many communities, Vancouver has been monitoring and testing for these human-made chemicals in our water supply, and here's what we've found.

### Spring testing

Earlier this year, we shared the results of PFAS testing with the community. We've recently conducted another round of testing and detected PFAS above the State Action Levels (SAL) for optimal health.

The City's extensive water system has 40 wells located at nine wellfields across the community. The latest testing completed in

late May showed that one sample result exceeded the SAL for PFAS concentrations. These results occurred at one of the City's nine wellfields, Water Station 14 (see table below).

Testing results from late May show only one water station above State Action Levels.

Water Station	PFOS Result	PFOS SAL	PFOA Result	PFOA SAL
Station 14	18 ppt**	Above	-	-

\*\*ppt parts per trillion (1 ppt is equivalent to one drop of water in 100,000 gallons)

\*\*ppt parts per trillion (1 ppt is equivalent to one drop of water in 100,000 gallons)

This does not mean that you will get sick or have health problems when you drink or use the water. Risk accumulates over long-term exposure, and water isn't the only potential source for exposure.

If you are concerned about long-term exposure, part of a sensitive population, pregnant, nursing or have an infant who consumes formula mixed with tap water, you can learn how to reduce PFAS exposure at the Clark County Public Health website.

### What we're doing about PFAS

As we work on a PFAS Management Plan, we are taking action by:

- Evaluating treatment options:** Water quality engineers are testing four different treatments to determine which is the most effective at removing PFAS from our water supply. Results will determine the full-scale treatment system design.

- Identifying the source:** Engineers and hydrogeologists are using groundwater modeling and sampling to determine potential sources of PFAS and the extent of PFAS in local groundwater.

- Reducing costs:** The City is pursuing grants and loans to reduce ratepayer impacts. We've already received \$12 million in funding through the State Resilience Fund program to help finance the first treatment system installation.

Scan the QR code with your phone's camera or visit [cityofvancouver.us/pfas](http://cityofvancouver.us/pfas) to learn more about PFAS and view our sampling results.



PFAS do not break down easily and can remain in the environment, including groundwater, for a long time. That's why they're a top concern for water providers across the nation.

### Products commonly containing PFAS include:



## Understanding PFAS

The City of Vancouver is addressing the emerging issue with per- and polyfluoroalkyl substances, also known as PFAS. These substances are a group of manufactured chemicals that have the potential to impact human health and the environment. PFAS are found worldwide and have been used in consumer products since the 1940s. [cityofvancouver.us/PFAS](http://cityofvancouver.us/PFAS)

## About PFAS and Vancouver's Water

Vancouver is taking steps to protect and maintain the quality of our water supply in response to PFAS as a national water quality issue. Through proactive testing, not required by state or federal standards, PFAS have been found at low levels in Vancouver's water supply previously. [cityofvancouver.us/PFASResults](http://cityofvancouver.us/PFASResults)

## New Testing and More Information

In February, the City of Vancouver will conduct new testing for PFAS in the water supply. Information and testing results will be mailed to you in March. The testing will comply with state and federal guidelines. Regular testing and reporting schedules will be developed this year.

- Testing the water supply. Vancouver currently meets all federal and state requirements for water quality testing to ensure a safe water supply. In addition to this regular water testing, Vancouver will begin testing quarterly for PFAS.

- Completing compliance sampling and notification using new state standards for PFAS.
- Working with water quality experts to determine potential sources of PFAS, evaluate treatment options and explore costs to remove PFAS.
- Planning for the future by including costs for PFAS treatment in long-range capital plans and seeking state and federal financing.
- Sharing information with all customers and the public so that you can make informed decisions.

## Stay Informed

We want to help you stay informed about issues related to PFAS. You'll find more information about PFAS on the City's website, including the latest sampling results.

VISIT: [cityofvancouver.us/PFAS](http://cityofvancouver.us/PFAS)  
CONTACT: City of Vancouver Utility Services at 360-487-7999

To read this in additional languages visit [cityofvancouver.us/PFAS](http://cityofvancouver.us/PFAS).



Department of Public Works  
P.O. Box 1995  
Vancouver, WA 98668



## Keeping you informed about Vancouver's water.

You are receiving this postcard because you are one of the City of Vancouver's 78,000 water customers. Vancouver delivers about 9.5 billion gallons per year of clean and safe water to more than 270,000 people. Protecting public health and providing our customers a safe water supply is our top priority.



# 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

## COMMUNITY FUNDED JOURNALISM

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](http://www.pfascommunityengagement.org/register)



# Three Vancouver wells have too much PFAS

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

## COMMUNITY FUNDED JOURNALISM

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

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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 scan-



Sarah Ferris with her daughters, 4-month-old Ruby and Avigail, 7, outside their home in Vancouver, Washington, last November.

frequently called "forever chemicals," can don't want a negative headline."



# Bench and Pilot Testing

- Bench testing narrowed down to four media
- Pilot testing complete
- IX vs GAC



# PFAS Management Plan

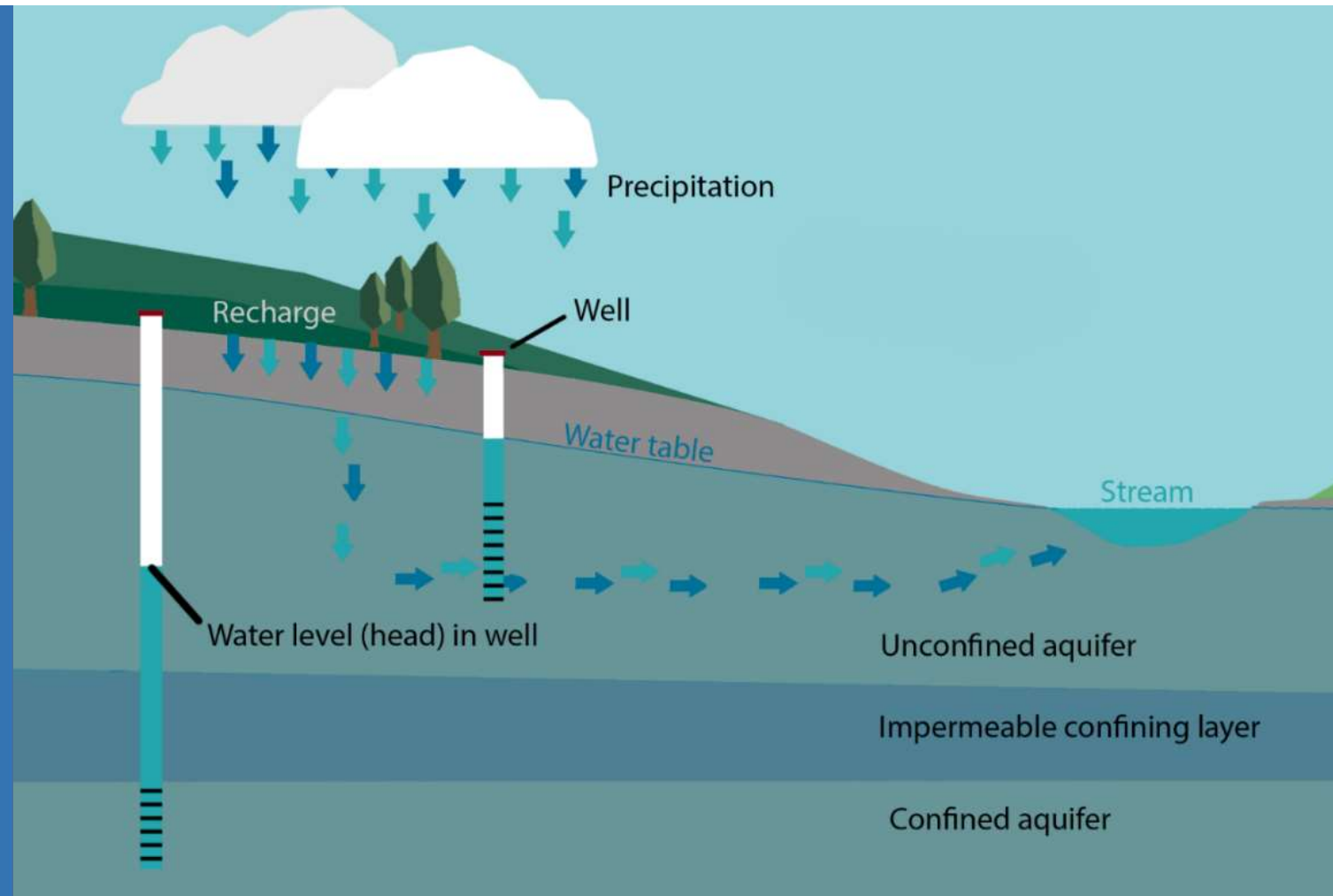
## Key Objectives

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



# Clark County Aquifers

- Upper aquifer prolific, but higher risk to contamination
- Deep aquifer confined and lower risk



Source: [Land, Air, Water Aotearoa \(LAWA\) - Groundwater basics](#)

**Table 5-3. Capital Costs for PFAS Treatment at Impacted Water Stations - GAC vs IX – Without Building**

Water Station	Treatment Capacity (gpm)	Treatment Capacity (mgd)	GAC Model 12-40 Vessel Pairs	GAC	IX Model 12 Vessel Pairs	IX
				Estimated Capital Cost		Estimated Capital Cost
				(+100%/-50%)		(+100%/-50%)
WS1	10,000	14.4	10	\$38,700,000	6	\$32,600,000
WS3	6,000	8.6	6	\$20,300,000	4	\$20,200,000
WS4	10,700	15.4	10	\$34,500,000	6	\$28,900,000
WS7	3,333	4.8	3	\$13,700,000	2	\$12,900,000
WS8	3,333	4.8	3	\$13,700,000	2	\$12,900,000
WS9	10,872	15.7	10	\$35,400,000	6	\$30,500,000
WS14	3,200	4.6	3	\$11,500,000	2	\$10,900,000
WS15	4,000	5.8	4	\$17,600,000	3	\$17,900,000
			<b>Total GAC Cost</b>	<b>\$185,400,000</b>	<b>Total IX Cost</b>	<b>\$166,800,000</b>



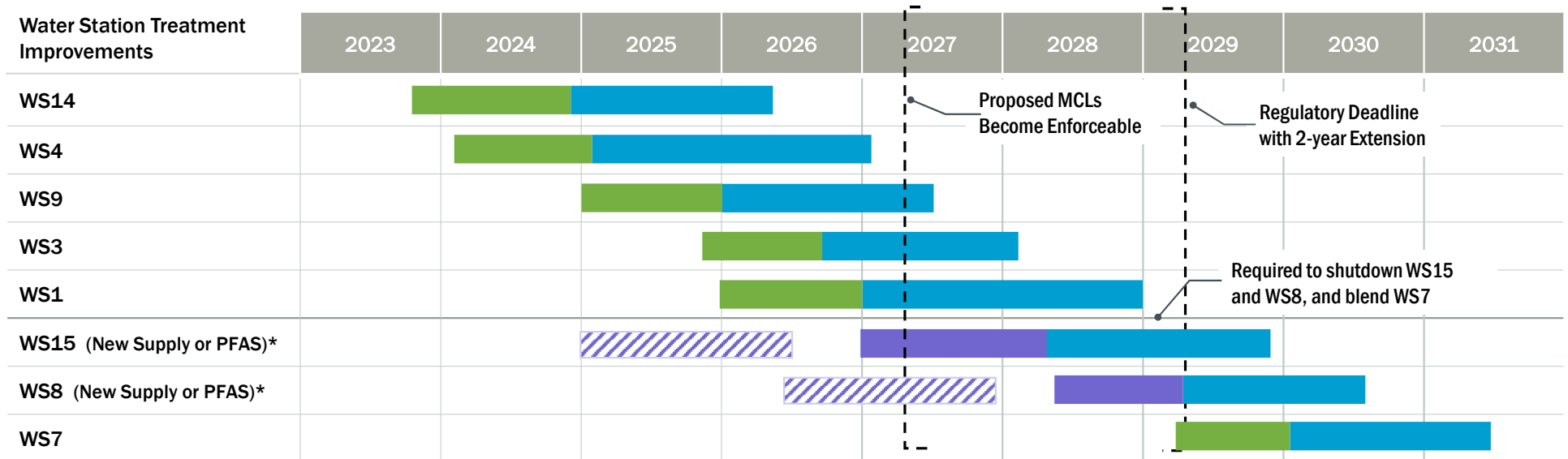
designed by freepik.com

**Table 5-8. Annual O&M Costs<sup>a</sup>**

Water Station	Total Annual Average O&M Costs	
	GAC	IX
WS1	\$236,000	\$288,000
WS3	\$159,000	\$202,000
WS4	\$236,000	\$281,000
WS7	\$93,000	\$115,000
WS8	\$98,000	\$115,000
WS9	\$288,000	\$356,000
WS14	\$100,000	\$118,000
WS15	\$112,000	\$154,000
<b>Total</b>	<b>\$1,321,000</b>	<b>\$1,628,000</b>



# PFAS Mitigation Implementation Schedule



**LEGEND:** ■ PFAS Treatment Design ■ Construction  Potential New SGA Well(s) Development ■ Iron/Manganese Treatment Design or PFAS Treatment Design

--- Proposed MCL timeline and regulatory deadline is subject to change based on finalization of the National Drinking Water Standard for PFAS.

\* Site is a potential candidate for development of a new well supply from the deep aquifer, dependent on on-going water rights evaluation. WS15 is highly likely for SGA development.



# Interim Mitigation Options



## System-wide

- Shut down sources
- Blending



## Customer Specific

- Point of use treatment
- Bottled water
- Rebate program
- Pilot treatment unit
- Water filling station







# 8-Year Water Utility Capital Impact

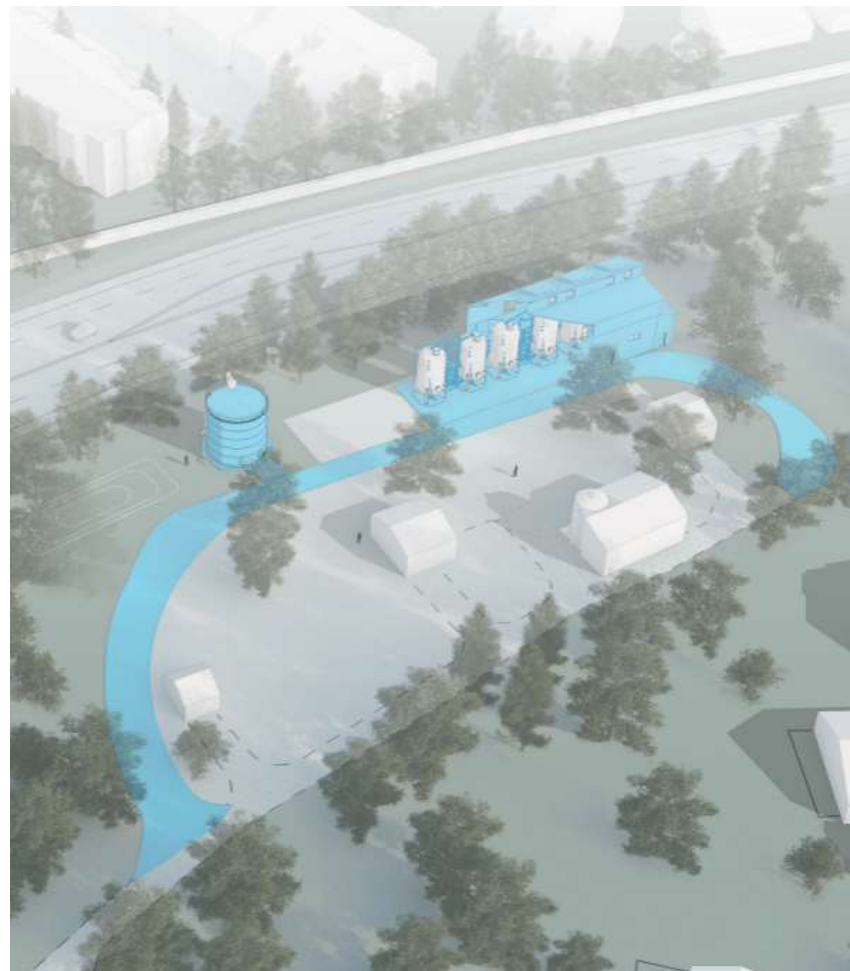
2024	2025	2026	2027	2028	2029	2030	2031
25,146,708	37,511,000	41,513,000	59,604,000	66,200,000	27,600,000	35,673,000	25,451,000





# Planning for the Future and Reducing Costs

- SRF
- Earmark Funding
- WIFIA
- Water Resiliency Strategy
- Legal/Settlements
- Rate increases



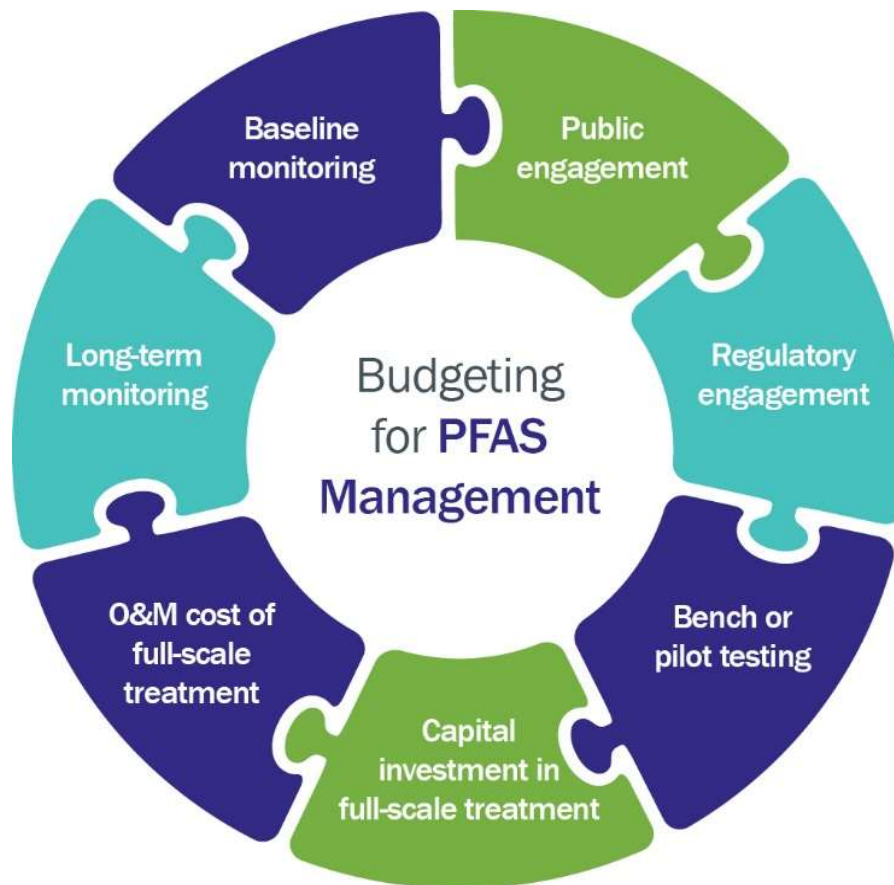
# Upcoming City Milestones



- Interim Measure Implementation
- Finalize WS 14 design and begin WS 4 design
- RFQ late 2024 for WS 9
- Pursue sources of PFAS in groundwater
- Funding strategy
- Cost recovery/Settlements
- Ongoing customer outreach and education



## Building your toolbox for flexibility among uncertainty



- Understand the problem
- Develop a Plan
- Communicate
- Implement
- **Adapt**

# And They Lived Happily Ever After



# Thank You

