PFAS

Dealing with “Forever” Chemicals

Climate Resiliency Committee

March 2025

Background- Chemistry

- PFAS – per-PolyFluoroAlklySubstances
  - The Fluorine –Carbon bond is one of the strongest in chemistry
  - As more fluorine is added to the same carbon the bonds straighten making these some of the most unreactive organic compounds
  - Originally built on carbon chains called alkyl giving the A in PFAS
  - The chemistry contributes to their non-stick and friction reducing properties
  - Addition of functional groups they become surfactants with hydrophobic tail and a hydrophilic tail making them ideal for fire fighting foam (PFOA and PFOS)

Background- History

- PFAS – per-PolyFluoroAlklySubstances
  - PFAS chemistry was discovered in the late 1930's
  - In the early 1950's they began to appear in consumer and industrial products
  - Now more than 11,000 compounds
  - In May 2000 the major producer of PFOS announced a voluntary phase out of production of PFOS, PFHxS, and PFOA
  - Blood levels of PFOS and PFOA have declined in the years since the phase out

PFAS are Ubiquitous

- PFAS – per-PolyFluoroAlklySubstances
  - Compounds are found world wide
  - Present in food packaging, ski wax, waterproof fabrics, carpets, paint, cosmetics, electrical wire insulation, Tef.tape, gaskets,
  - Multiple exposure pathways
    - Drinking water
    - Food
    - Inhalation
  - The health effects at very low levels in the parts per trillion

PFAS for Spokane

- Air releases no current rules but
- Biosolids – communities and states already have rules and regulations such as Maine
- Possibly add PFAS compounds to RCRA list of hazardous constituents
- Water discharge
- Drinking Water regulations - where the remainder of the presentation will focus

Drinking Water

- Our source is the Spokane Valley Rathdrum Prairie Aquifer
  - Starts at Lake Pend O'reille goes to Lake Spokane
  - Amazing source of water for Idaho and Washington
  - Very clean

History of PFAS in water

- Detected in surface water near PFAS manufacturing locations in the 1990's
- EPA added 6 PFAS compounds to the Unregulated Contaminant Monitoring Rule round 3 (UCMR3) in 2013
- 2017 Fairchild Airforce Base released results of PFAS testing
  - City of Airway Heights impacted
- 2023 State of Washington adopted rules for monitoring 5 PFAS compounds with state action levels (SAL)
- April 2024 EPA announces rules for 6 PFAS effective in 2027

Testing at the Source

- The City has 8 wells
  - Havana in July 2024
- All located in the east part of the City
- Not all are used year round

UCMR 3 in 2015

- City tested 5 wells Central, Hoffman, Nevada, Parkwater, and Ray Street
- Sampled twice, March and September
- No PFAS detected
- Test method not as sensitive with limits of 10 to 90 parts per trillion (ppt).
  - None of current detections would have been found

State SAL in 2023

- City tested 7 wells
- Detections at Grace and Ray Street.
- New test methods were adopted in 2019
- Measures down to 2 ppt
- Also conducted additional testing for Multi District Litigation (MDL)

UCMR 5 testing in 2024

- City tested 6 wells
- 29 PFAS compounds.
- Same test method used in SAL testing
- Detections at Ray Street, and Havana
- Measures down to 2 ppt
- Also conducted additional testing for Multi District Litigation (MDL)

On Going Testing

- Tested Central, Hoffman, Nevada, Parkwater and Ray Street for quarterly in 2024
  - Central, Hoffman, and Parkwater had no detections
  - Nevada had 2.01 ppt PFOS in October
  - Ray Street had detections every quarter
- Will sample Grace, Havana, Well Electric every quarter in 2025
- On going quarterly testing of Ray Street based on findings

EPA Compliance

- Reporting in CCR required now for detections
- April 2027 – compliance monitoring begins
- April 2029 – System must comply with MCL's. Compliance determination begins
- MCL of 4 ppt for PFOA and PFOS on a running annual average (RAA)
- MCL of 10 ppt for PFNA, PFHxS, and HFPO-DA on RAA
- Hazard Index (HI) of 1 for PFNA, PFHxS, HFPO-DA, and PFBS on RAA
  - HI is the weighed sum of concentration of each chemical divided by its health-based water concentration

EPA MCL compliance

	Sample Date								
Compound	3/20/2023	4/25/2023	7/25/2023	10/24/2023	2/20/2024	6/6/2024	8/27/204	10/22/2024	1/28/2025
PFBS Perfluorobutanesulfonic acid	2.89	2.9	2.22	3.49	3.9	2.48	0	2.93	4.37
PFHxS Perfluorohexanesulfonic acid	< 2	< 2	< 2	< 2	< 3	< 2	0	0	2.14
PFNA Perfluorononanoic acid	< 2	< 2	< 2	< 2	< 4	< 2	0	0	0
PFOS Perfluorooctanesulfonic acid	4.44	4.74	0	4.9	6.1	0	0	0	6.29
PFOA Perfluorooctanoic acid	2.75	2.97	0	2.82	0	2.44	0	0	0
HFPO-DA Hexafuoropropylene oxide dimer acid	< 2	< 2	< 2	< 2	< 5	<2	0	0	0

Rule compliance for PFOA and PFOS is based on running annual average (RAA) of 4 consecutive quarters

For Ray Street results in ppt

	Sample Date								
Compound	3/20/2023	4/25/2023	7/25/2023	10/24/2023	2/20/2024	6/6/2024	8/27/2024	10/22/2024	1/28/2025
PFOS RAA				3.52	3.94	2.75	2.75	1.53	1.57

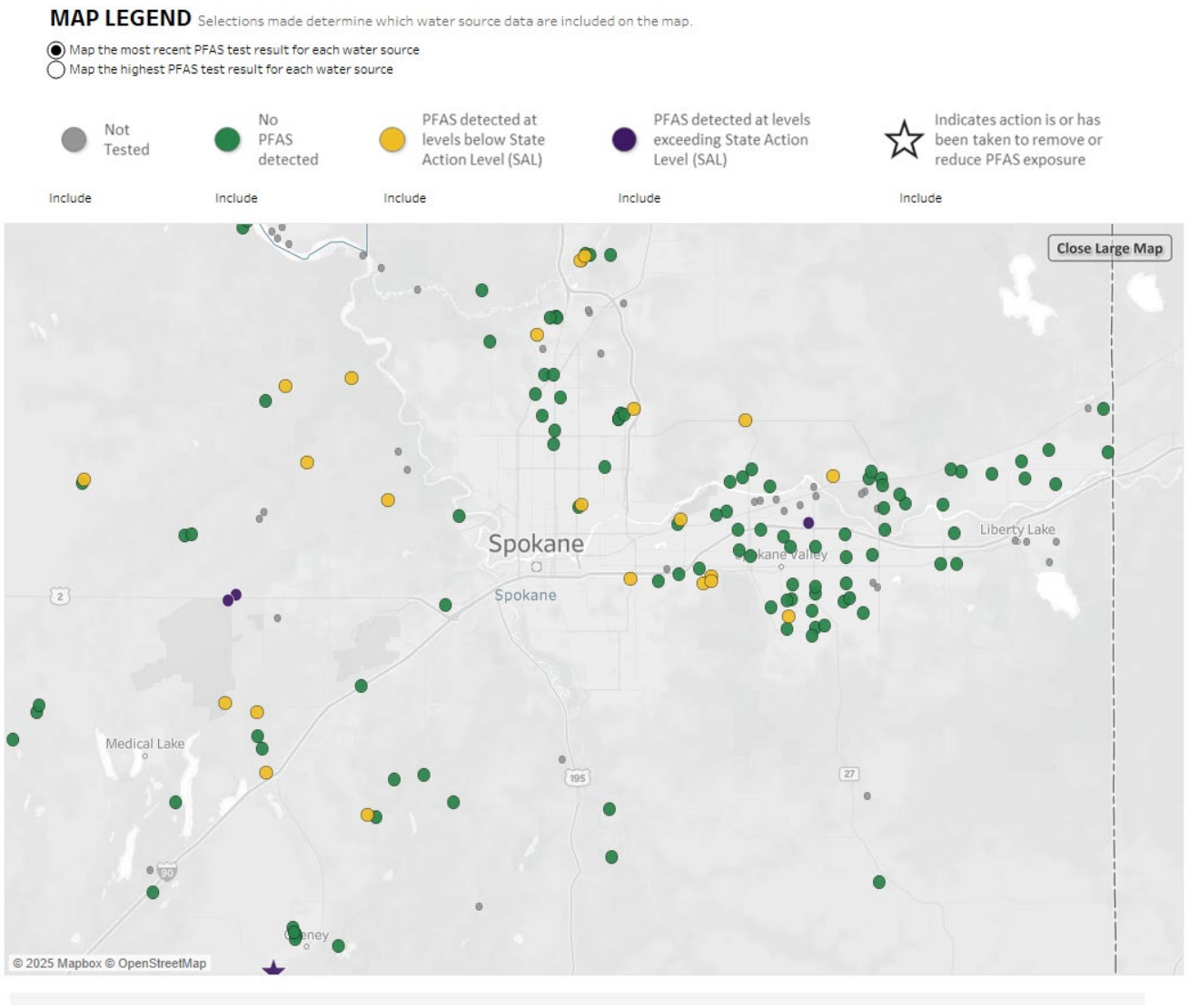
Putting Results in Perspective

City's **detections** are at **very low levels**

By **comparison**, Airway Heights had test results as high as **1,500 and 1,700** *pp/trillion* for PFOA and PFOS

Fairchild Air Force Base had test results that were **magnitudes higher than Airway Heights**

Spokane County The SVRP Aquifer



Potential Sources

- EPA has Identified potential sources
  - Landfills, Manufacturing, Fire Training Centers, and 20 more
- Spokane Aquifer Joint Board (SAJB) investigated these potential sources
- West Plains investigators identified other potential sources
  - Septic systems
- Idaho Department of Environmental Quality (IDEQ) sampled near potential sources and had no detections

What's Next

More closely evaluate requirements and timelines under new EPA rule

- Determine needed additional testing and monitoring needs
- Develop a plan to address levels of PFAS in our water

Investigate technologies and approaches to address concerns

Support Spokane Aquifer Joint Board in investigating potential sources

- Review results of other water purveyors in our region

Continue work on plans to:

- Support **Airway Heights**
- Monitor concerns at **Spokane International Airport** and **West Plains**