

# Per- and Poly-fluorinated Alkyl Substances Chemical Action Plan Recommendations

December 12, 2017  
Advisory Committee Meeting



DEPARTMENT OF  
**ECOLOGY**  
State of Washington



Washington State Department of  
*Health*

# Chemical Action Plan (CAP)

## Persistent Bioaccumulative Toxic (PBT) Rule

- Identifies, characterizes, and evaluates uses and releases of a PBT and recommends actions to protect human health and the environment.
- Per- and Poly-Fluorinated Alkyl Substances CAP Meeting #4
  - Review recommendations, chapter updates
- More info at the PFAS CAP website:  
<https://www.ezview.wa.gov/?alias=1962&pageid=37105>

PBT Rule - WAC 173-333 - <http://apps.leg.wa.gov/wac/default.aspx?cite=173-333>

# Where we are in the CAP process

## **WAC 173-333-430: Process to develop CAPs**

- Plan and collect information.
- Work with external advisory committee.
- Review and collect more information.
- **Develop draft recommendations.**
- Public review and comment on draft Interim CAP.
- Interim action implementation.
- Advisory committee meetings (2018).
- Final recommendations/Final CAP.
- Implement actions.

<http://apps.leg.wa.gov/wac/default.aspx?cite=173-333-430>



# PBT Recommendations

## **WAC 173-333-420:**

- Reduce and phase-out uses and releases.
- Manage chemicals, products or wastes.
- Minimize exposure to the PBTs.
- Switch to safer alternatives.
- Encourage development of safer alternatives.

<http://apps.leg.wa.gov/wac/default.aspx?cite=173-333-420>



# PFAS CAP Timeline

**Interim CAP**

**Final CAP**

**Aug – Dec 2017**

**Jan – Mar 2018**

**Jun – Dec 2018...**

CAP Advisory  
Committee Meetings

Interim PFAS CAP  
60-day Public Review

CAP Advisory Committee Meetings

We are here

Implement interim actions



# Interim CAP Recommendations

- Interim Recommendations
  - Contaminated drinking water.
  - Environmental contamination.
  - Aqueous film-forming foam.
  - Source investigations.
- Discussions for 2018
  - Follow-up to interim work.
  - What needs more evaluation, data, research.
  - More input and discussion.
  - Assessment of economic impact requires more time.



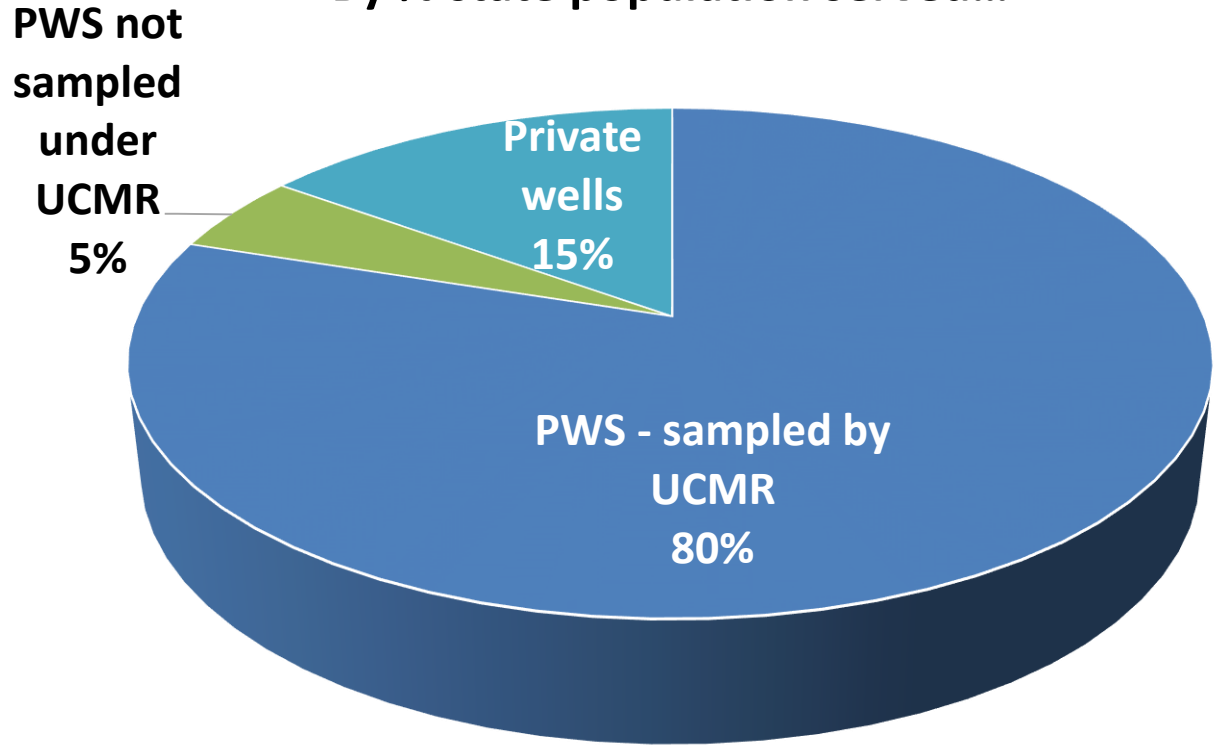
# Drinking water - problem

- At least five areas in state have contaminated ground water
- EPA health advisories are limited
- Drinking water testing panel is limited
- Many water systems have not tested for PFAS
- High cost for water systems



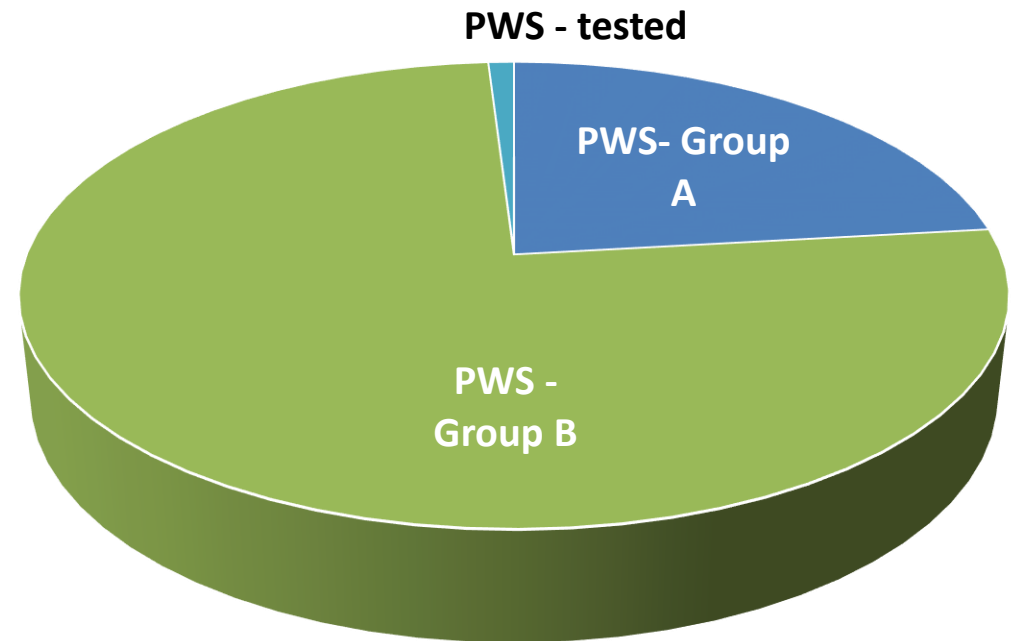
# PFAS tested vs. untested drinking water

By % state population served...



~20% of WA residents are served by wells that are untested for PFAS

By number of drinking water systems...



1% PWS tested for PFAS





# Drinking Water Recommendations

1. Support SBoH rule-making for drinking water standards
2. Develop options for expanded testing
  - Risk based testing
  - Broad testing of all public water systems
  - Expanded analyte panel
3. Develop outreach for public, water purveyors, and local government.

SBoH – State Board of Health



# Drinking Water Options - Cost Estimates

Agency Estimates	Staff Resources	# samples	Total costs
Support SBoH rule making - water quality standards for PFAS			\$450,000
Options for expanded water testing			
Risk-based testing	0.4 FTE	600	\$235,000
One time testing of all Group A	1 FTE	8,000	\$2.66 million
All public water systems (Group A & B)	2.3 FTE	24,000	\$8 million
DOH response/event	0.15-0.3 FTE		\$40,000-60,000
Outreach to LHJs, public, water purveyors, potential point sources	0.25 FTE		\$50,000



# Additional burden on water systems

Notify Consumers

Explore mitigation options

E.g., treatment options, abandon well, develop new source

Design and conduct Site investigation

to identify source and implement source control to protect water supply

to identify responsible party for cost recovery

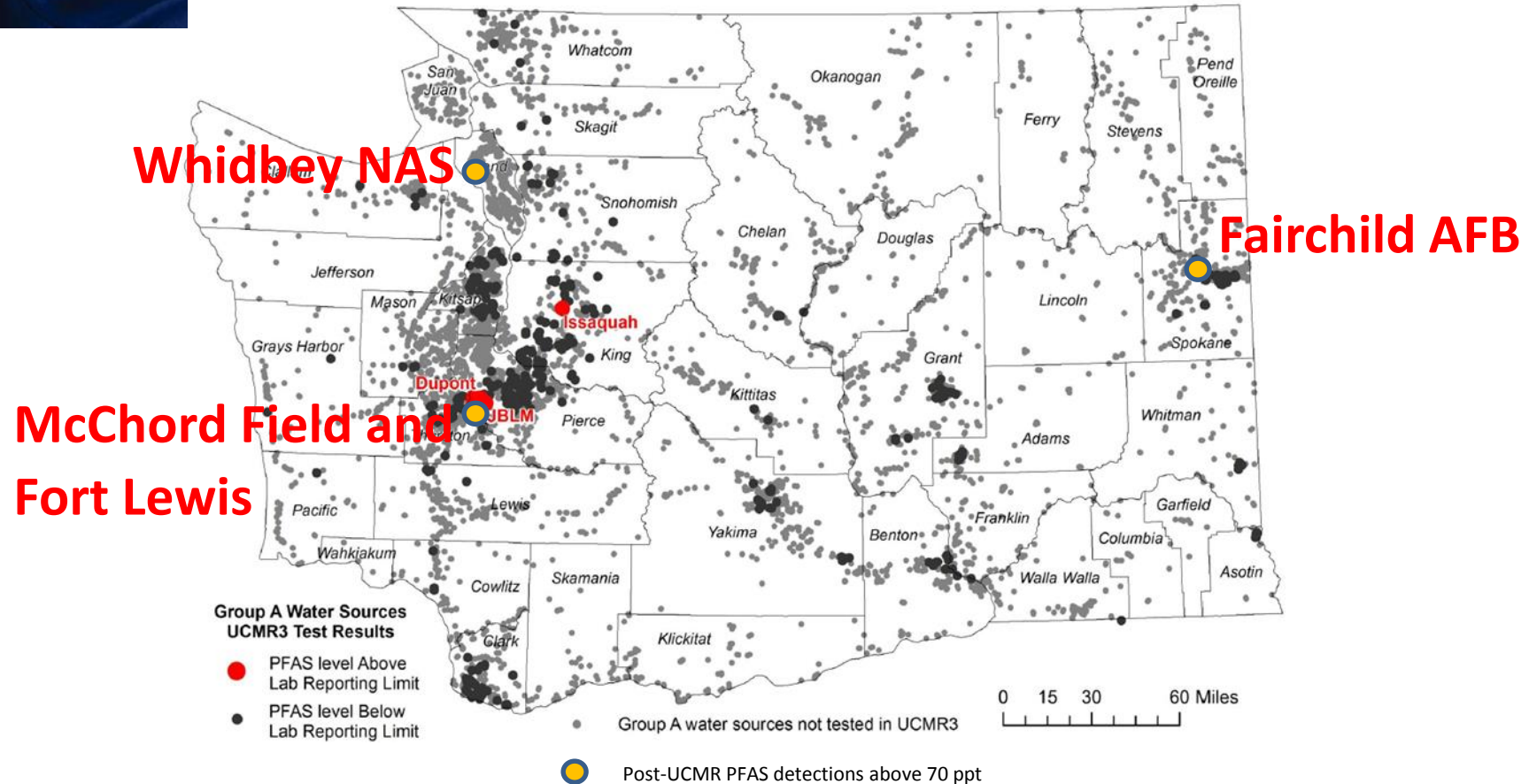
Ongoing costs:

filter change outs

Ongoing water monitoring



# Drinking Water

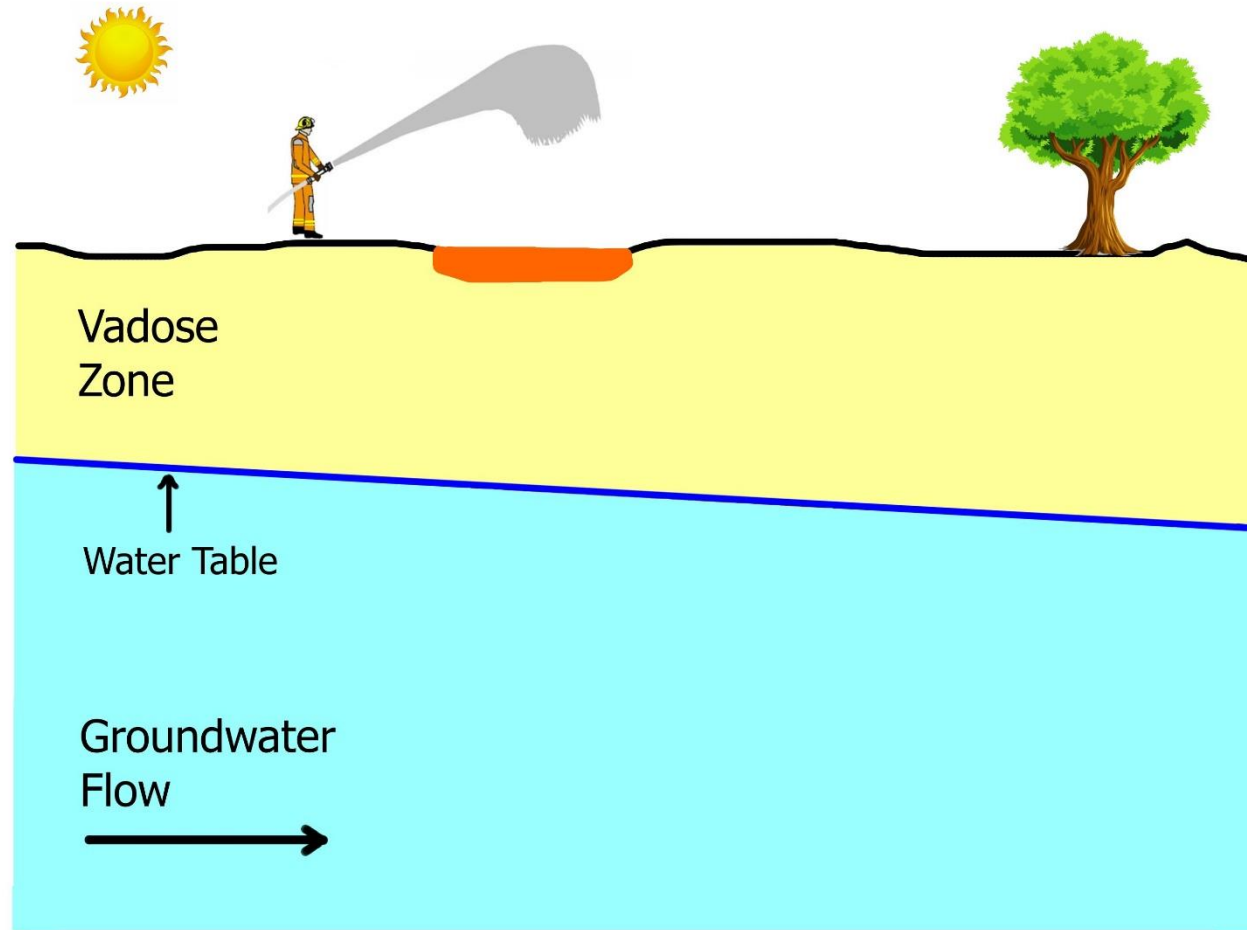


# Environmental contamination problem

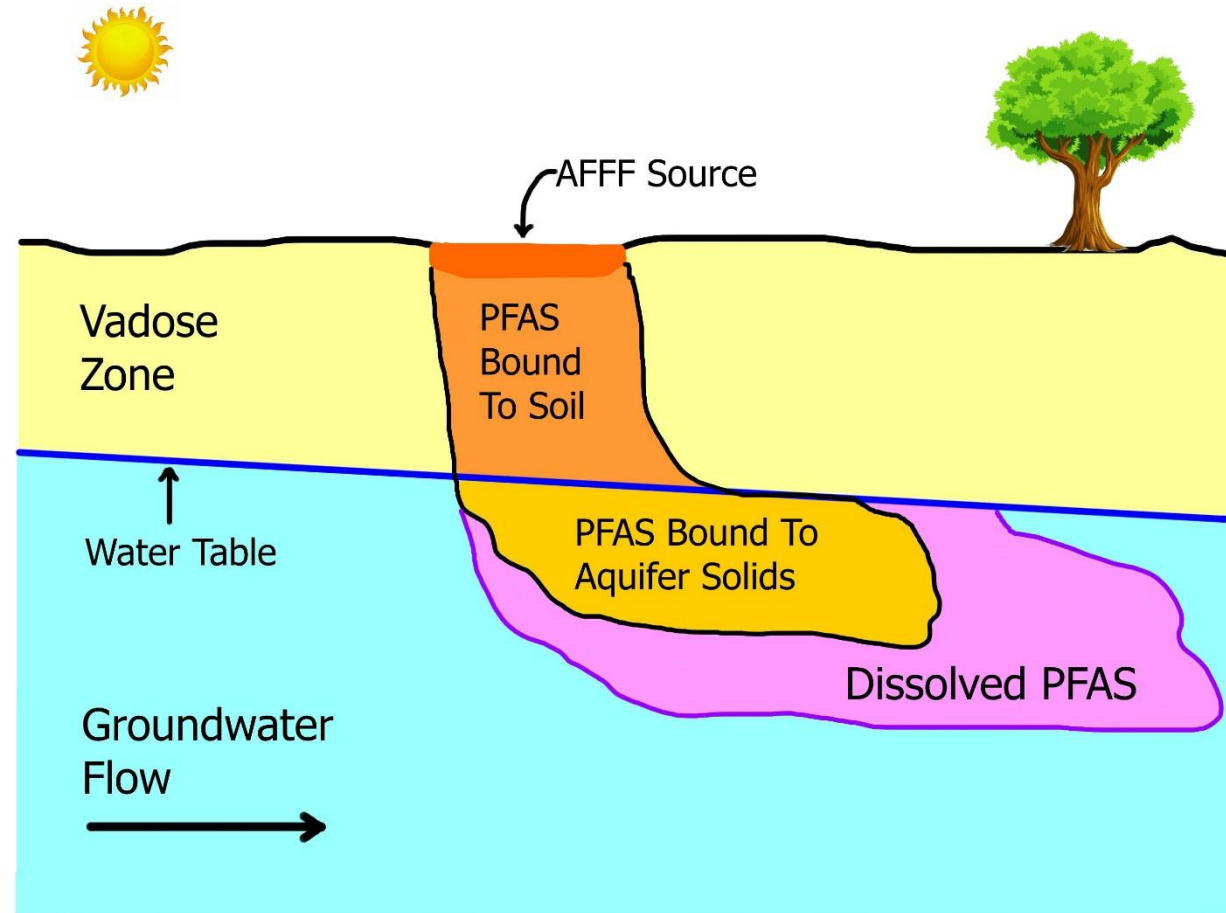
- Soil, groundwater and surface water in Washington are contaminated due to releases of PFAS to the environment.
- Exposure to this contamination has the potential to harm people, animals and plants.
- Initial response – reduce drinking water exposure at the tap.
- To address the long-term problem we need to understand:
  - The current extent of the contamination (soil & water in 3 dimensions).
  - Where it came from.
  - Where it's going.
- Without this information, it's hard to make good decisions about cleanup and other public health actions.



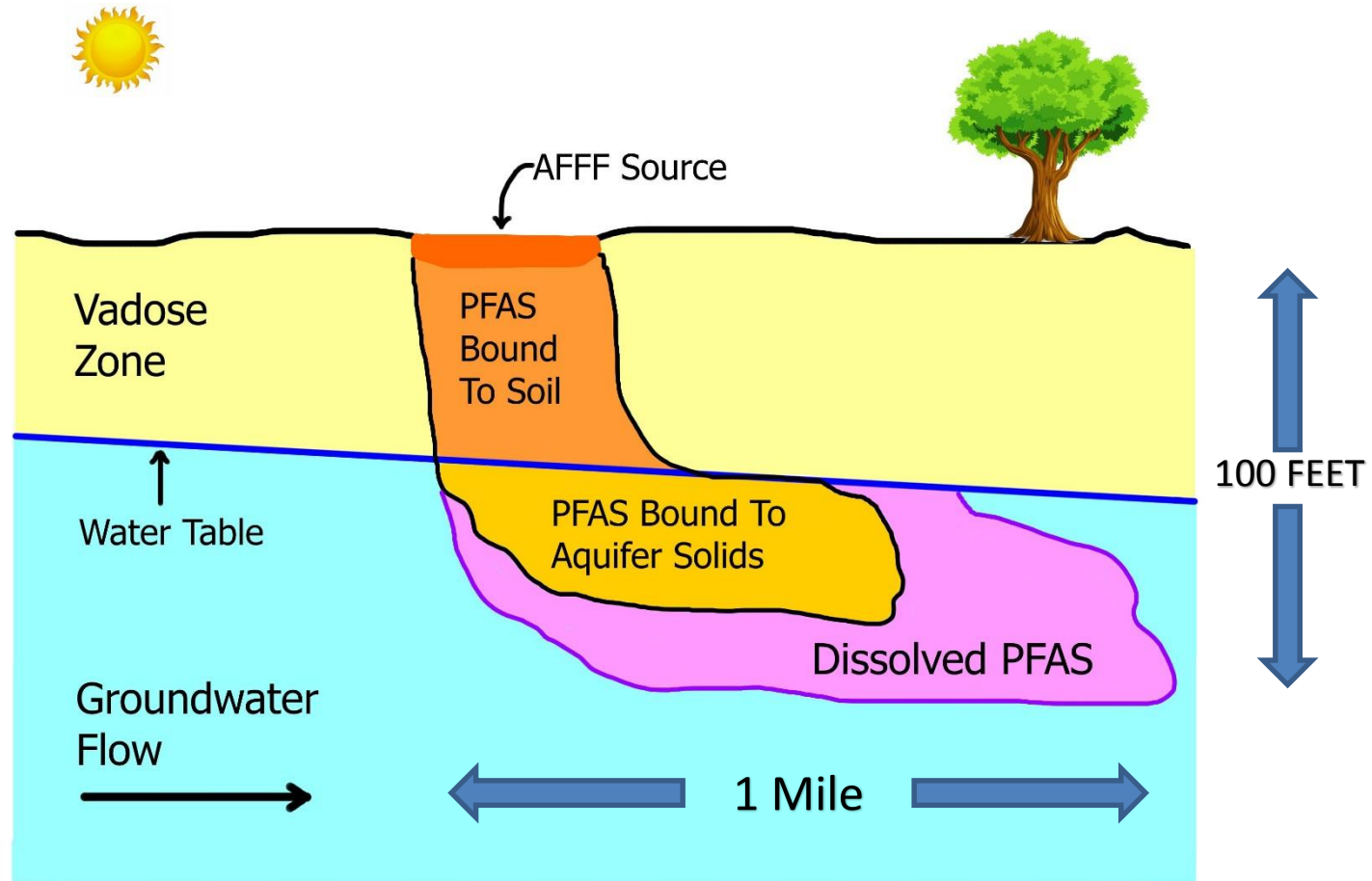
# AFFF Use



# AFFF moves through the environment

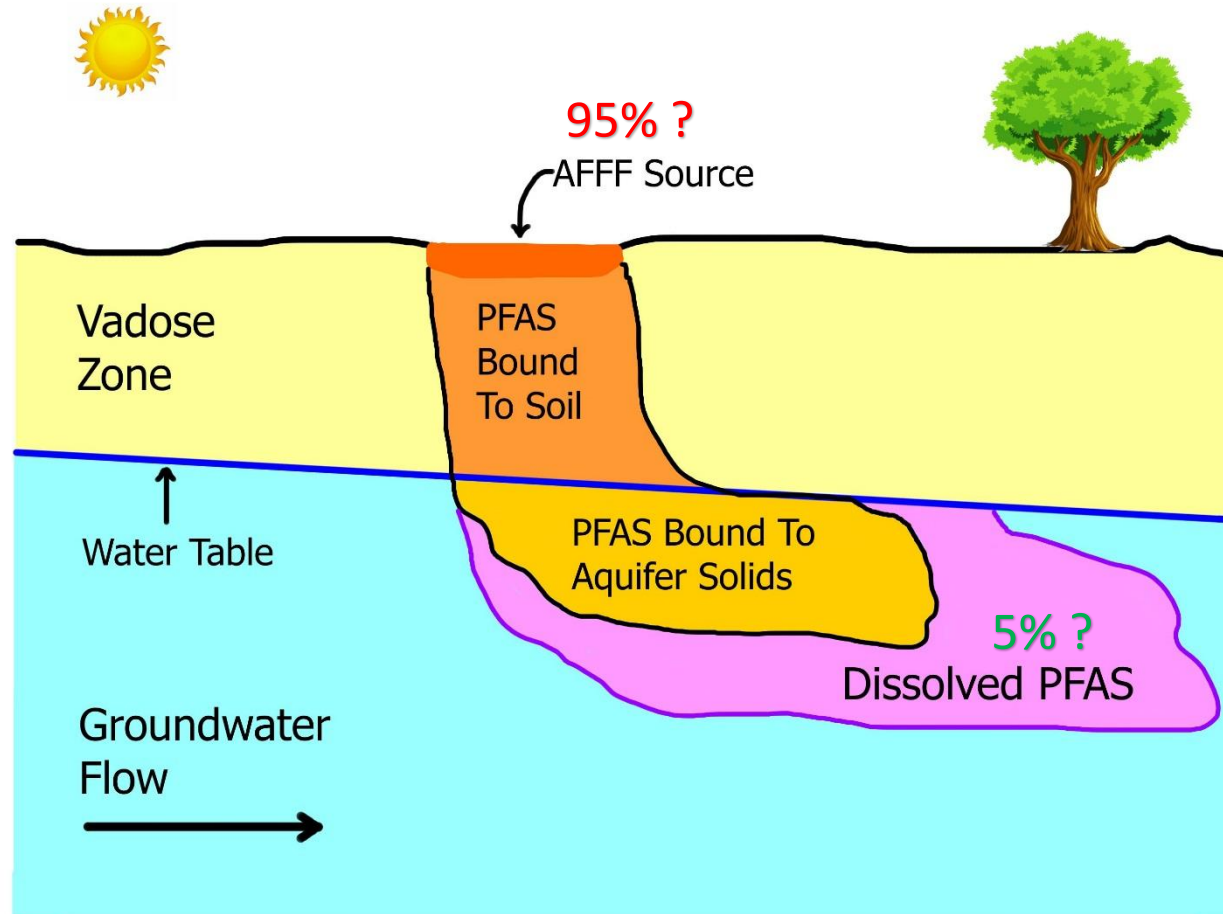


# AFFF Plumes May be Large

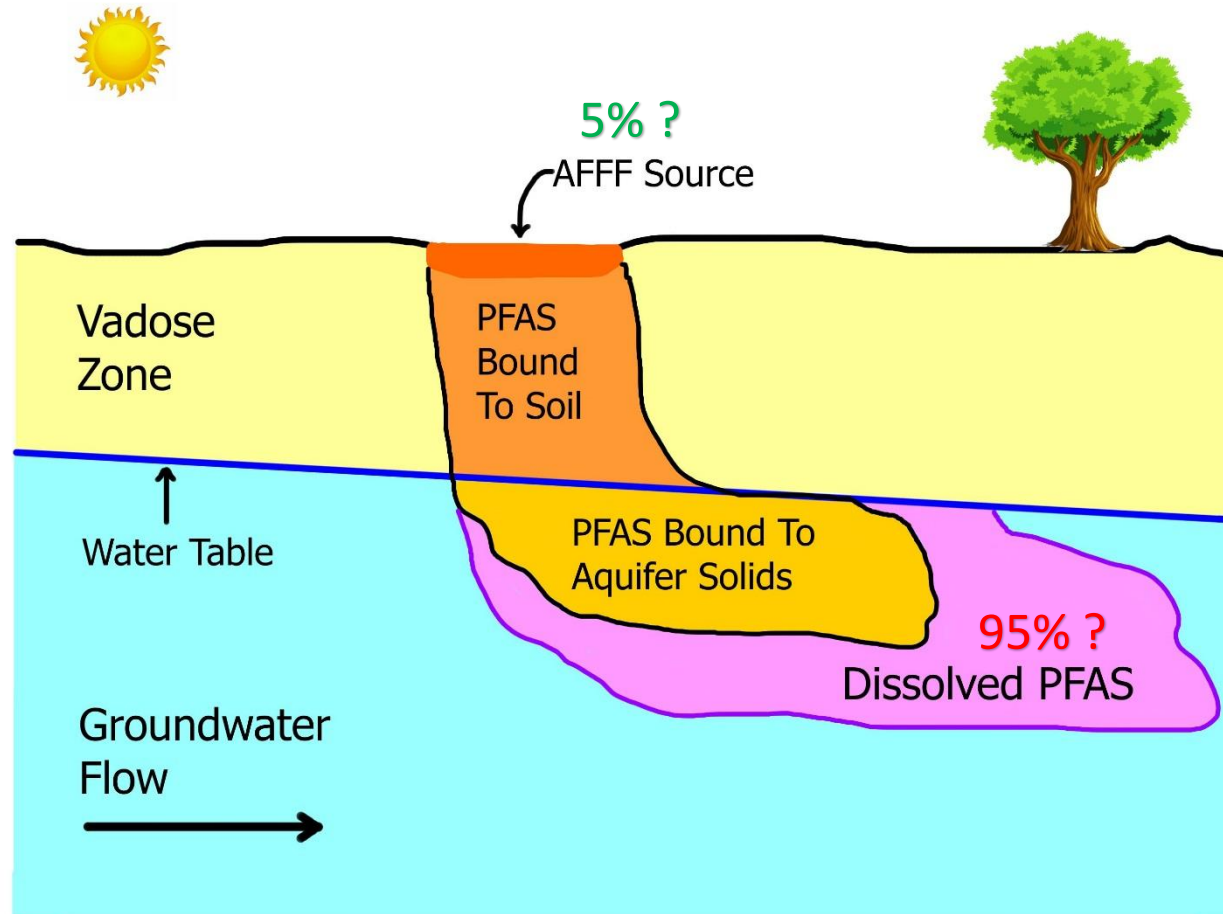




# Where Should We Focus Cleanup Efforts?



# Where Should We Focus Cleanup Efforts?



# Environmental PFAS Contamination

## Current Data Gaps and Questions

- How is the PFAS contamination currently distributed in the environment?
  - We need more sampling data.
- How will this change in the future?
  - Hard to predict with our current knowledge.
- Where are the original sources?
  - Have they all been found?
- The answers will help us make good decisions about actions to protect public health and the environment.

# Sampling to Understand the Problem and Develop Appropriate Solutions

- Need to collect and analyze an adequate and relevant set of samples of soil and groundwater.
- Each contaminated area is different.
  - Characteristics of the soil, groundwater, and PFAS contaminants affect movement through the environment.
  - We still have a lot to learn about these things.
- Some PFAS-contaminated soil and water may present little or no risk to people and the environment.
  - Develop PFAS concentrations to screen out low-risk areas and focus on the ones with potentially harmful contamination.



# Environmental Contamination Recommendations

1. Develop “investigation levels” for PFOS and PFOA (and other PFAS as appropriate) in soil, groundwater and surface water.  
Investigation levels are concentrations of PFAS in soil or water that are protective of health and the environment under specified exposure conditions.
2. Identify best practices for investigation of PFAS contamination.
3. Identify effective methods to reduce exposure to PFAS-contaminated soil, surface water and groundwater.
4. Develop and provide outreach materials for water purveyors, governments and the public.
5. Identify possible funding sources for exposure-reduction actions.



# AFFF problem

- Drinking water sources in Washington have confirmed the presence of PFOS and PFOA above 70 parts per trillion.
- Use of PFAS-containing fire-fighting foam appears to have contaminated groundwater.
- Need more AFFF information:
  - Historic handling, storage, use.
  - Current AFFF stockpiles and use.

AFFF – aqueous film-forming foam

# AFFF Recommendations

## 1. AFFF Survey:

- Current and former uses, storage, handling of AFFF.
- Identify high risk areas for groundwater contamination.

## 2. AFFF best management practices (BMP):

- Develop BMP for AFFF handling, use and disposal.
- Conduct outreach to AFFF users to implement BMP.

## 3. Identify funds needed to remove and replace legacy AFFF.

- Use survey results to identify legacy AFFF.
- Estimate funding needs for removal/replacement.

# AFFF cost estimates

Agency opportunities	Staff resources	Cost estimate
1 – AFFF survey to identify high risk areas <ul style="list-style-type: none"> <li>Survey fire dept, airports, industry, military</li> </ul>	1 FTE	\$110,000
2 – Outreach to AFFF users to follow BMPs <ul style="list-style-type: none"> <li>Develop/update BMPs</li> <li>Outreach to AFFF users</li> </ul>	0.75 FTE	\$85,000
3 – Fund replacement of legacy AFFF <ul style="list-style-type: none"> <li>Designate (\$500/sample)*</li> <li>Incinerate legacy AFFF (\$100/30 gal)*</li> <li>Replace with non-fluorinated foam (\$150/5 gal)*</li> </ul>	0.25 FTE \$250,000 grant program replace AFFF at 300 fire stations*	\$275,000

\* Assumes legacy AFFF replaced at the volumes and costs listed above.

FTE – full time equivalent





# Source identification problem

- The identities of PFAS chemicals, routes-of-exposure, and exposure amounts are poorly characterized.
- Additional research is needed to prioritize actions to protect the public and the environment.
- Available data are insufficient to determine the safety of short-chain PFAS used as alternatives to long-chain PFAS.



# Source identification recommendations

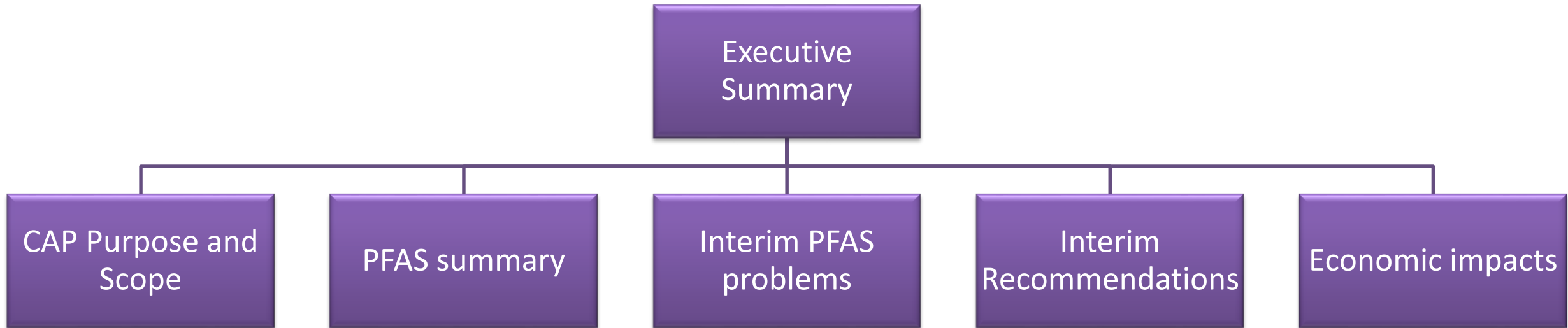
1. Request and review data
  - Ask EPA and FDA for data and approval process.
  - Request data from industry for current PFAS in consumer products.
2. Research PFAS in industrial, commercial, and consumer products to reduce exposures.
  - *Test for long-chain PFAS in imported products.*
3. Evaluate and promote use of safer alternatives for phased out PFAS in consumer products.
4. Promote best management practices for reducing people's exposure to PFAS and release to the environment.



# Source identification cost estimates

Agency opportunities	Staff resources	Cost estimate
1 – Request data from industry, EPA, FDA	0.25 FTE	\$30,000
2 – Research PFAS in industrial, commercial and consumer products <ul style="list-style-type: none"> <li>• <i>Product testing in 2018; PFOS/PFOA imports</i></li> </ul>	0.75 FTE	\$100,000
3 – Evaluate and promote safer alternatives <ul style="list-style-type: none"> <li>• AFFF alternatives assessment (AA)</li> <li>• Food contact material AA</li> <li>• Cosmetics AA</li> </ul>	1 FTE and \$412,000 per AA	\$550,000 per AA
4 – Promote BMPs for reducing exposure and environmental release	0.5 FTE	\$75,000

# Draft Interim CAP



Supported by “Chapters” on Chemistry, Health, Environment, Uses, Regulations, Economic Assessment  
Sections on Biosolids, EcoToxicology



# CAP Chapter Updates

- Clarified individual PFAS compounds or subgroups.
  - Use PFSA, PFCA, FTOH when appropriate.
- Added graphs and tables to support study summaries.
- Incorporated additional information from suggested references.
- Added more explanation where comments indicated confusion.

PFCA – perfluorocarboxylic acids  
PFSA – perfluorinated sulfonic acids  
FTOH – fluorotelomer alcohols

# CAP Chapter Updates

- Added a CAP editor to remove overlap, improve consistency, integrate related discussions in different chapters.
- Working through comments on equity issues, adding information about food contact materials.
- Considered multiple comments on scope of PFAS CAP:
  - Concerned about legacy PFAS (PFOA/PFOS) as well as the fluorinated replacements.



# Chapter Revision

## Washington Estimates (formerly Uses/Releases)

- Global data used to estimate WA portion (PFOS/PFOA).
- Followed EPA 2009 to estimate PFAS in 'typical' home.
  - EPA, 2009. *Perfluorocarboxylic acid content in 116 articles of commerce*. EPA/600/R09/033
- Applied PFAS concentration data to landfilled volumes of consumer products in Washington.
- Identified potential WA businesses using PFAS and AFFF.
- *Summarized PFAS reporting to WA and product testing studies.*



# Wrap up – next steps

- Ecology/Health finalize Draft Interim PFAS CAP.
- Public comment January 2018.
  - 2 public meetings in March 2018.
- Review public comments, incorporate into Final PFAS CAP.
- Next Advisory Committee meeting spring/summer.

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**PFAS CAP Website:** <https://www.ezview.wa.gov/?alias=1962&pageid=37105>