Human Health Risk

**Exposure Concerns**

- Widely measurable in the blood of U.S. population, higher levels in people living near contaminated sites
- Diet and drinking water are major exposure pathways
- Slow elimination from body leads to accumulation in people (blood, organs)
- Persistence leads to chronic environmental exposures

**Health Concerns**

- High cholesterol levels
- Lower birth weight
- Developmental effects in children
- Problems in pregnancy
- Altered hormone levels
- Thyroid disease
- Immune system changes
- Cancer
Known and Potential Impacted Areas in Washington
PFAS in Public Drinking Water Supplies

<table>
<thead>
<tr>
<th>Public Water System</th>
<th>Population</th>
<th>Combined PFOA &amp; PFOS (ppb)</th>
<th>EPA lifetime health advisory PFOA &amp; PFOS (ppb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issaquah Water System</td>
<td>26,000</td>
<td>0.490*</td>
<td></td>
</tr>
<tr>
<td>City of DuPont Water System</td>
<td>11,500</td>
<td>0.030</td>
<td></td>
</tr>
<tr>
<td>JBLM Lewis</td>
<td>75,000</td>
<td>0.051</td>
<td></td>
</tr>
</tbody>
</table>

*This impacted well was blended with other sources before delivery to homes. Drinking water at the tap was estimated to be ≤ 0.100 ppb.


Source: Aliton, C. HDR, The ABCs of PFCs in Water Supplies
## US Military Detections in Drinking Water Wells

<table>
<thead>
<tr>
<th>Public Water System</th>
<th># of Wells</th>
<th>Wells above EPA LHA</th>
<th>Combined PFOA &amp; PFOS (ppb)</th>
<th>EPA lifetime health advisory (ppb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naval Air Station Whidbey Island (Nov, 2016- Jun, 2017)</td>
<td>232</td>
<td>13</td>
<td>0.030 - 3.80 PFOS 0.006 - 0.66 PFOA</td>
<td>0.07</td>
</tr>
<tr>
<td>City of Airway Heights and other residential wells near Fairchild AFB (Nov, 2017)</td>
<td>126</td>
<td>81</td>
<td>ND- 1.20 PFOS ND – 0.30 PFOA</td>
<td></td>
</tr>
</tbody>
</table>


Expanded Water Testing for PFAS

- Risk-based approach – water systems near locations of AFFF use, spills, and firefighter training.
- Eligible: untested Group A public water systems
- Funding: ~400 samples

Group A: 15 or more service connections, serve ≥ 25 people
Participating Water Systems

Legend
Active Group A Systems
Participating
- Yes

Response
100 sources (60 WS) = YES
64 sources (43 WS) = MAYBE
28 sources (18 WS) = NO
# Water Systems, Public Notice (PN)

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Contaminant level</th>
<th>Regulatory Response</th>
<th>Public Health Advice</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFOS and PFOA</td>
<td>Below 70 ppt</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>PFOS and PFOA</td>
<td>Above 70 ppt</td>
<td>Require public notification</td>
<td>Do not drink</td>
</tr>
<tr>
<td>PFOS, PFOA, PFHxS, PFNA, PFHpA (interim)</td>
<td>PFOS and PFOA below 70 ppt, but with added contaminants above 70 ppt.</td>
<td>Require public notification targeted at specific populations</td>
<td>Pregnant and nursing women, parents and caregivers of infants should seek advice from medical provider</td>
</tr>
</tbody>
</table>
Chemical Action Plan (CAP)

1. 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.
   - WA administrative Code 173-333

2. Why PFAS qualify
   - Are PBT chemicals
   - Considers legacy PFAS (long-chain), precursors, related substances, & substitutes
   - Short-chain replacements, have similar PC properties

https://www.ezview.wa.gov/?alias=1962&pageid=37105
Interim CAP Recommendations

https://fortress.wa.gov/ecy/publications/summarypages/1804005.html

<table>
<thead>
<tr>
<th>Drinking Water:</th>
<th>Firefighting Foam:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Support drinking water rulemaking.</td>
<td>• Implement firefighting foam restrictions (RCW 70.75A).</td>
</tr>
<tr>
<td>• Drinking water testing.</td>
<td>• Survey and outreach to foam users.</td>
</tr>
<tr>
<td>• Technical assistance.</td>
<td>• Replace PFAS foam.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental contamination:</th>
<th>Investigate Sources:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Develop cleanup levels – soil,</td>
<td>• Other sources of exposure.</td>
</tr>
<tr>
<td>groundwater, surface water.</td>
<td>• Firefighting PPE notification.</td>
</tr>
<tr>
<td>• Investigate effective cleanup</td>
<td>• Alternatives assessments, food packaging (RCW 70.95G).</td>
</tr>
<tr>
<td>methods.</td>
<td></td>
</tr>
</tbody>
</table>
CAP Next Steps

Oct 4, 2018 Advisory Committee Meeting → Spring 2019 Webinar Cost Analysis → Summer 2019 Draft CAP Publication

End of 2019 Publish Final CAP ← Fall 2019 Advisory Committee Meeting ← 60-90 day public comment period

State Board of Health - Rule-making

1. Petition to set state PFAS drinking water standards
2. SBOH accepted petition Oct 2017
3. Considerations
   ✓ SAL vs. MCL
   ✓ Which PFAS to include?
   ✓ Action level?
   ✓ PFAS mixtures?

Timeline: 2018-2019

DOH Recommendation

1. DOH recommends the Board consider the SAL process for PFAS
   - Protects public health by requiring notification
   - Quicker response - Allows for emerging science
   - Could support future MCL

2. Support of water utilities is critical
   - Health-based values for drinking water can be used to derive state cleanup standards.
   - State revolving loan fund