Port of Seattle Comments
Interim PFAS Chemical Action Plan, Publication 18-04-005, April 2018

Ensure Drinking Water is Safe

1. ***Clarify how Ecology will participate in DOH rulemaking for limits on PFAS in drinking water.*** Ecology should identify how it will contribute to rulemaking for drinking water. Drinking water programs and regulations often apply a "precautionary principle" to regulation, which can be incompatible with the "risk-based" approach to site-specific regulations used for site clean-up. For example, if drinking water regulations encompass the entire class of PFAS chemicals (both long chain and short chain), then site clean-up efforts may have limited information on toxicological or fate parameters on which to base clean-up levels. This could stall clean-up efforts in areas known to be affected by long-chain PFAS chemicals.

2. ***Clarify whether Ecology is engaged in EPA's "Four-Step Plan" and how it might affect the CAP.*** EPA's efforts appear to parallel and could potentially supersede the State's recommendations regarding maximum contaminant levels (MCLs), designation of PFAS as hazardous substances, establishing groundwater cleanup recommendations, and assessing toxicity of short-chain PFAS such as GenX and PFBS. Having two parallel regulatory efforts will cause confusion.

3. ***Support and promote collaborative outreach by the State, water purveyors and site owners.*** The discovery of PFAS in local drinking water supplies, combined with both local and national news coverage, has created a difficult communication and decision-making problem for both water purveyors and site owners. Collaborative outreach is an important responsibility that Ecology should lead to communicate that there is no "bad guy" here, just a bad problem. A balance is needed between the burden on drinking water purveyors (who can provide certainty on the level of PFAS reaching drinking water through treatment) and site owners (who are now unwittingly responsible for an uncertain level of groundwater contamination).

4. ***Adopt a broad-based approach to initial clean-up efforts and timelines***. Drinking water requirements for PFAS (overseen by DOH) will place a burden on purveyors, while MTCA-type approaches (overseen by Ecology) will place a burden on PFAS site managers. Regulatory uncertainty paralyzes clean-up efforts and diminishes confidence of the public in their drinking water supply.

Ecology should consider a programmatic approach, perhaps similar to the Voluntary Clean-up Program or other insurance-based approaches, where pooled funding and resources are available for collaborative solutions to specific site clean-ups and treatment of affected drinking water resources. Overlap and funding through drinking water programs, such as Wellhead Protection Area (WHPA) plans, could also be effective. This will engage all stakeholders and should encourage collaboration on solutions, rather than conflict over resources. A "one-size-fits-all" regulatory approach may slow down clean-up response and create animosity between purveyors and site owners.

Manage Environmental PFAS Contamination

1. ***Develop a consistent and adaptive approach to exposure levels.*** Development of enforceable cleanup levels for PFAS at this time is challenging given the diversity of site types, potential receptors, and the level of scientific uncertainty surrounding specific aspects of PFAS fate and toxicity. Ecology should balance responsiveness to public health threats with adaptive management approaches that can respond to change. There is a disagreement on "safe" or "no effect" exposure levels (i.e. reference doses). Current State and Federal reference dose values can vary by a factor of 10 or more, and are likely to change in the next few years as additional studies and evaluations are conducted. Additionally, the approach for dealing with multiple PFAS exposures (beyond PFOA and PFOS), is not clear from the toxicological literature. The available data does not indicate that all PFASs are equally toxic, and it is unclear whether all relevant PFAS risks would be reduced to acceptable levels if a site were cleaned up for PFOS and PFOA only. For example, most US states rely on a reference dose of 20 ng PFOA/kg body weight*day, which the USEPA has identified as a "no effect" exposure dose for PFOA[1]. However, the state of New Jersey has interpreted the toxicological studies on PFOA differently than USEPA and has identified a "no effect" exposure dose for PFOA of 2 ng PFOA/kg body

[1] USEPA. 2016. Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA). United States Environmental Protection Agency. Office of Water. EPA 822-R-16-005. May.

weight*day[2], which is 10 times lower (more conservative) than the USEPA value.

2. ***Outline a process for assigning quantitative PFAS fate parameters.*** Ecology should establish a transparent process for assigning default quantitative inputs of key PFAS fate mechanisms that drive the calculation of soil clean-up values. This would include the partitioning between PFASs in soil and groundwater, plant uptake, digestive availability of PFASs in soil, and the transformation of PFAS precursors (e.g., in AFFF) to stable and persistent PFASs. Initial calculations and modeling by the USEPA (using the Regional Screening Level (RSL) calculator[3]) to estimate soil screening levels calibrated to the drinking water health advisory value (70 ng/L) have resulted in soil screening levels for PFOA and PFOS of 0.2 to 0.4 µg/kg. This has been shown to be lower than ambient/background levels in some soils from uncontaminated areas[4] [5]. The approach to calibrating clean-up levels with groundwater quality goals and soil background levels at specific sites should be addressed in the final CAP. Alternatives to conventional clean-up goal "calculators", such as RSL or MTCA Method B, should also be considered that could provide flexibility (with appropriate consensus), so that specific sites known to affect drinking water can begin clean-up activity.

3. ***Focus on drinking water.*** The most straightforward case of risk management is for PFAS in drinking water, where cleanup levels could be developed and implemented on an interim basis at specific sites known to impact drinking water supply. Remedial systems to treat or mitigate PFAS in drinking water are relatively more adaptable in the case that reference toxicity values (and thus, cleanup levels) change. Conversely, establishing comprehensive cleanup levels

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[2] New Jersey Drinking Water Quality Institute. 2016. Health-based Maximum Contaminant Level Support Document: Perfluorooctanoic Acid (PFOA).

[3] USEPA. 2018. Regional Screening Level (RSL) calculator. https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

[4] Strynar, M.J., A.B. Lindstrom, S.F. Nakayama, P.P Egeghy, and L.J. Helfant, 2012. Pilot scale application of a method for the analysis of perfluorinated compounds in surface soils. Chemosphere, (86): 252-257.

[5] Rankin, K., S.A. Mabury, T.M. Jenkins, and J.W. Washington, 2016. A North American and global survey of perfluoroalkyl substances in surface soils: Distribution patterns and mode of occurrence. Chemosphere, (161): 333-341.

in support of soil remediation will be extremely challenging, potentially resulting in inefficient remedial efforts that waste agency and stakeholder resources. Ecology should establish a balance between the burden on drinking water purveyors (who can provide certainty on the level of PFAS reaching drinking water) and site owners (who are now unwittingly responsible for an uncertain level of groundwater contamination). A framework that enables collaboration on solutions, rather than conflict over resources, is warranted. Ecology should consider a program similar to the Voluntary Clean-up Program, where pooled resources are available for collaborative solutions to specific site clean-ups affecting drinking water resources.

4. ***Outline a process for risk management and change.*** Ecology should outline how it will incorporate changes in scientific or regulatory aspects of PFAS management. This is especially important for site owners that may initiate cleanup of soil and for water purveyors who invest in treatment systems in the near future. While an assessment of default soil cleanup values is helpful, it would be beneficial for all stakeholders if Ecology invested resources in developing a risk-based framework for site-specific or area-specific risk management and cleanup. This should involve collaboration with Department of Health (DOH) and stakeholders. Existing programs and methodologies, such Wellhead Protection Area (WHPA) guidance may also be useful (perhaps with enhancements), particularly for soil-to-drinking water pathway. Site owners and drinking water purveyors need to understand and monitor the State's position on key exposure pathways and what available toxicity information to use to quantify risk and need clarity on what levels of exposure would require immediate clean-up.

5. ***Fund further study and consolidation of available scientific information.*** Ecology can assist the national regulatory and technical community in contributing to the scientific study of key fate issues important to cleanup level development. As noted above, the soil-to-groundwater pathway is currently a key issue for many sites and affected communities. Another key issue is defining ambient levels of PFASs in Washington soil, groundwater, surface water, and aquatic sediment, which is needed to establish achievable clean-up levels at impacted sites. As more information becomes available, Ecology and DOH should work together to ensure consistency and a coordinated approach to reliance on the information.

Reduce Risks to Drinking Water from Firefighting Foam

1. ***Clarify expectations on AFFF use at FAA-certified airports****:* As recognized in ESSB 6413 and stated in the Interim CAP, restrictions on the use of AFFF containing PFAS do not apply to AFFF use by the military or at Federal Aviation Administration (FAA)-certified airports, petroleum refineries or terminals, or large chemical plants. Ecology may want to include additional language in the Interim CAP to clarify their expectations in light of FAA and military specification restrictions, including revising the description of this recommendation in the executive summary.

2. ***Consult Further with FAA regarding responsibilities.*** Further consultation with the FAA is recommended prior to finalizing the interim CAP to clarify areas of Federal responsibility and avoid promoting specific training practices or other best practices that conflict with Federal and FAA requirements and recommendations. The FAA requires airport operators to purchase firefighting foam that meets DoD's military specifications[6]. Military specifications for AFFF liquid concentrate for fresh and sea water were last updated on 7 September 2017 to include the following summary[7]:

   "The DoD's goal is to acquire and use a non-fluorinated AFFF formulation or equivalent firefighting agent to meet the performance requirements for DoD critical firefighting needs. The DoD is funding research to this end, but a viable solution may not be found for several years. In the short term, the DoD intends to acquire and use AFFF with the lowest demonstrable concentrations of two particular per- and PFAS; specifically, PFOS and PFOA. The DoD intends to be open and transparent with Congress, the Environmental Protection Agency (EPA), state regulators, and the public at large regarding DoD efforts to address these matters. AFFF manufacturers and vendors are encouraged to determine the levels of PFOS, PFOA, and other PFAS in their products and work to drive these levels toward zero while still meeting all other military specification requirements".

[6] GAO, 2017. DoD has acted on some emerging contaminants but should improve internal reporting on regulatory compliance. Report to Congressional Committees on drinking water. https://www.gao.gov/assets/690/687822.pdf. GAO-18-78.
[7] DoD, 2017., Performance specification, Fire extinguishing agent, Aqueous Film-Forming Foam (AFFF) liquid concentrate, for fresh and sea water. MIL-PRF-24385F(SH) w/ Amendment 2. 7 September. Department of Defense. http://quicksearch.dla.mil/qsDocDetails.aspx?ident_number=17270.

3. ***Consult with FAA-compliant airports and commercial airlines with maintenance facilities on the survey proposed in the Interim CAP.*** This survey will be a useful opportunity for clarifying Ecology's expectations and role in promoting awareness, education, and best management practices that are aligned with FAA and Federal requirements. Ecology needs to be well-versed in these issues prior to engaging with AFFF users to avoid confusion and misinterpretation of Ecology's role, given that FAA requirements take precedence.

Investigate other sources of PFAS

1. ***Consult the ACRP Research Report to help in identifying other PFAS sources.*** The Airport Cooperative Research Program (ACRP) Research Report 173 published in 2017[8] provides a very useful summary of the sources of potential PFAS and associated chemicals at airports. It appropriately focuses on the most common largest source, fire-fighting materials. The ACRP report describes potential additional sources from other materials so that if these are present, they can be accounted for in assessment of the potential issues. It describes the appropriate "life cycle" stages of AFFF, including procurement, storage, the various uses (maintenance, use/testing, and training), and disposals/releases (discharge to environment, containment, and treatment/off-site disposal). The report also describes appropriate Best Management Practices (BMPs) from selection of different chemicals (lower toxicity and/or persistence) to proper containment and disposal.

2. ***Utilize the MAPA Screening Tool***. The ACRP report includes a spreadsheet-based tool referred to as the *Managing AFFF and PFASs at Airports* (MAPA) Screening Tool. This tool would be highly useful for airports to utilize to either determine the potential for PFASs to be an issue at an airport and appropriate BMPs to then address both legacy issues as well as current uses of PFASs. Adaptations of the ACRP tool approach may be useful for other facilities utilizing PFAS.

[8] ACRP, 2017. ACRP Research Report 173, Use and Potential Impacts of AFFF Containing PFAS at Airports, Transportation Research Board, National Academies of Sciences, Engineering, and Medicine. 2017