November 1, 2017 PFAS CAP Advisory Committee Meeting

Supplemental material - List of PFAS issues for discussion

PFAS issues from the August 30th Advisory Committee meeting, draft CAP chapters, and other concerns identified by Ecology and Health are summarized in this document. The list of "issues" were split into several categories (some issues fall in several categories) and grouped into 'options.' Selected options in three categories are presented at the November 1 Advisory Committee meeting for discussion: AFFF, Drinking Water, and Source Identification. This document is a supplement to the slides, provided for discussion purposes, and not an exhaustive list of categories or options.

AFFF (aqueous film forming foam)

Problem: exposure and potential harm to drinking water from AFFF use.

AFFF Options:

- Inventory existing stocks of AFFF in WA – military sites, industrial sites such as oil refineries, local fire departments, emergency and spill response supplies (maritime and land-based).
    - Investigate other potential reservoirs – in building fire suppression systems? Any uses for wildfires? Other industrial uses?
- Implement BMPs for AFFF use in fighting fires and in training
    - BMPs are available for AFFF http://fluorocouncil.com/PDFs/Best-Practice-Guide-for-Use-of-Class-B-Fire-Fighting-Foams-PDF.pdf
- Understand current disposal practices in WA and develop recommendations as necessary to prevent further environmental release. (tailor to different users -local fire depts., fire training centers, military, etc.)
    - Explore incentives -bounty program?
- Identify and mitigate sites of historic AFFF releases
    - Map historic releases/likely releases in WA to guide investigative testing
    - Soil and groundwater clean-up levels would help guide cleanup operations.
    - Clarify who is the responsible party for cleanup costs. Is a volunteer fire department the "responsible party" when contamination occurred as part of labelled use of a firefighting foam?
- Conduct alternative assessment for alternatives to AFFF including non-PFAS options
    - lack of transparency in federal safety review limits independent state assessment, expect key data gaps
    - "safer" vs. preferred or "safest" options. Today's solution should not be tomorrow's problem.

Drinking Water

Problem: drinking water supplies are contaminated with PFAS in several areas of the state, many water systems have not been tested.

Drinking Water Options:

- Develop state drinking water standards and heath guidance for PFAS that occur in WA waters
- Consider how to address mixtures of PFAS in drinking water
- Expand water testing of untested drinking water systems, using a risk-based approach

- Investigate/understand sources and pathways of drinking water contamination in WA
  - Are other industries contributing to contamination? Metal plating, taxidermy, etc.
- Develop tools and outreach for water systems and private wells to encourage testing and mitigation, as necessary.
- Investigate treatment options that can remove a range of PFAS compounds from water
- Advocate for national health study of communities whose drinking water contains elevated PFAS associated with firefighting foam.

Source Identification

Problem: The identities of PFAS chemicals, routes-of-exposure, and exposure amounts are poorly characterized. New data and analysis are needed to prioritize actions to protect the public and the environment.

Food Contact Paper/Packaging Options:

- Investigate whether long-chain PFAS compounds are still present in coated food-contact papers from overseas suppliers.
- Understand which compounds are in current use and their hazard profiles.
- Assess PFAS migration from paper to people, from paper to the environment. What occurs during paper composting or recycling process? (exposure)
- Assess risks of replacements for long chain PFAS in food packaging
  - Understand extent of FDA review and limits of their evaluation (what was considered? FOIA request?). Use FDA assessment as starting point if possible.
- State ban of some or all PFAS in food packaging

Consumer product options:

- Best Environmental Practices (BEP) were developed by industry to help mills and finishers minimize waste and environmental release, and keep the products on the textile. http://fluorocouncil.com/PDFs/Guidance-for-Best-Environmental-Practices-BEP-for-the-Global-Apparel-Industry.pdf
- Textile alternatives assessment needs updating - new data from a dioxin meeting. (Laurie V will provide info)
- Determine whether cosmetics are significant source of human exposure
- Characterize current carpet treatments of carpets sold in WA (domestic vs foreign suppliers).
- Develop consumer guidance for reducing exposures in the home, proper disposal of carpets. What happens when products coated with PFAS chemicals expire? Where does dangerous waste go?

Sources of PFAS in food supply options:

- Assess plant uptake from biosolids or contaminated irrigation water, deposition to crop lands around PFAS emission sites in WA,
- Assess bioaccumulation in fish consumed by people
  - Collect additional samples to support fish advisory program

Other sources of PFAS release in WA:

- Quantify landfill emissions (all media) of PFAS.
- Identify likely manufacturing sources for PFAS emissions.
- How are WWTP biosolids and effluent affected in the State?
- Identify sources of PFAS in WWTP and urban lakes.
- Does higher density of traffic correlate with higher levels of PFAS (in the environment)?

Other Categories

Ecological Risk - Assessment of risks to wildlife

- Do wildlife need intervention to protect their health?
- Identify cleanup levels for key PFAS chemicals or mixtures in environmental media (e.g., soil, surface water, sediment) which protect nonhuman biota (representing a range of trophic levels).

Data Gaps

Understanding current use of PFAS in industrial and consumer products:

- Product safety data and technical information on chemical structures and "ingredients:" Product safety data and technical information sheets often provide limited information. For example, the U.S. Safety Data Sheets (SDSs) for Chemours FC-35 identifies the ingredient as a "trade secret" and mentions only the chemical category: "Partially Fluorinated Alcohol Substituted Glycol" [3E Company via Chemours website MSDS search]. Lack of full structure information makes it difficult to assess environmental fate and toxicity or to assess the relevance of newly-developed toxicity data for related PFAS substances.
- Labeling and Safety Data Sheets reporting thresholds: PFAS substances may not be listed on product labels or SDSs. SDSs are intended to identify workplace hazards for chemical products and must include hazard information for any component at or above the 1% level. Fluorosurfactants are highly efficient, requiring only very small quantities to achieve their intended function. These levels are often well-below SDS reporting thresholds at in-use concentrations.

Analytical methods:

- Validated PFAS testing for drinking water includes only 14 PFAS compounds.
- Suitable analytical methods and reference standards are not yet available for many PFAS. Non-target analysis (used to attempt identification of unknown substances) is difficult and slow, especially so for the complex mixtures often found in PFAS products or environmental samples. Even when product structures are known, it may not be possible yet to identify metabolites or environmental degradation products.
- Recent research highlights these concerns. Known PFCAs and PFSAs accounted for only 5-9% of the organic fluorine content of human and rat blood samples (Rand & Mabury, 2017). Known PFASs were not detected in LC/MS analysis of extracts from food contact papers even though total fluorine measurements (using a separate technique) suggested their presence. While this discrepancy may be explained by analytical method weaknesses, it's likely that current analytical methods simply cannot identify some current-use PFASs (Schaider et al., 2017).
- A significant amount of additional research on PFAS has been conducted in the last decade, and ongoing improvements in analytical methods have added new information to help fill in data gaps. However, these additions to the data on PFAS still leave us with an incomplete body of information that can be used to fully characterize the uses, exposures, environmental pathways, and chemical structures of the full suite of legacy and current-use PFASs.

Safety data for assessment:

- Limited to no publically available exposure and toxicology data for many PFAS compounds in use.
- Important data gaps remain for PFHxS, PFNA, PFOS and PFOA, and other phased out PFAS

Education and Outreach and **Human Health** 'options' are listed in specific topic categories.