

Cordner Comments on PFAS CAP Drafts

Comments by Alissa Cordner, member of PFAS CAP Advisory Committee
Assistant Professor of Sociology, Whitman College
cordneaa@whitman.edu (509)527-5124

In general, I strongly support treating the entire class of PFAS compounds together. Though individual compounds differ in terms of hazard and exposure profiles, the significant amount of concern for *all* short- and long-chain PFASs warrants addressing them as a class, while acknowledging uncertainties and data limitations regarding specific compounds.

I also support evaluating the toxicity and exposure concerns of PFAS products as they are actually produced and sold – that is, with impurities, contaminants, byproducts, and short-term degradation products – because that represents the real-life toxicity and exposure concerns of the compounds. For example, if PFOA is frequently present as an impurity, contaminant, byproduct, or degradation product in other (shorter-chain) PFASs, it is appropriate to consider the possible contribution of PFOA to exposure and toxicity concerns.

I appreciate the places in the text where exposure levels were put in context with health information, for example, p. 10 in the Environment Chapter when PFAA levels in fish were compared to a DoH Provisional Screening Levels.

Comments on specific Chapters:

Introduction

- On page 4, there is a paragraph describing general data gaps. Perhaps a sentence should be added indicating, “A lack of evidence in these areas should not be interpreted as evidence for PFAS’ safety.”
- The introduction section might also lay out the general scope of the PFAS CAP. As it is written, it suggests that only PFOS and related salts are subject to review, when I believe the intention of the review is to investigate PFAS as a class.

Uses Chapter

- Page 2 – is there evidence that global production of long-chain PFASs has in fact declined? US production has declined significantly, but do we know the levels in other countries that still produce long-chains? The Buck et al. citation for China volumes in the PFOS section is dated. If not, specify that the production of long-chain PFAS in the U.S. has greatly declined.
- Also, it is not fully accurate to say that there is no existing regulation at the global level (the Fluoro Council citation), since PFOS is listed on the Stockholm Convention and

PFOA has been proposed for listing. It may be more accurate to say there is no national-level regulation in those countries.

- Page 3 – PFOA and PFNA section – unclear if you mean that these amounts are *total* production from 1951-2004, or per year production. Also, did all participating companies in the Stewardship agreement eliminate production by 2015? Unclear 1) if they met this goal since the citation is from 2014, and 2) if this refers to US-only production or also global production by these companies and subcontractors. If these companies or their subcontractors still produce long-chain PFASs internationally, this should be noted.
- Page 3 – consider a brief statement at the beginning of the Fluorotelomer Production section reminding the reader what falls into this group of compounds. Also consider noting (as is noted in the Chemistry chapter) that these compounds are produced as a broad mix of substances rather than individual compounds.
- Page 3 – under US Production Data. Why are data on PFOA and APFO withheld from the EPA database from 2012-2015?
- Page 8, 3rd paragraph – does the figure that 85% of PFAS releases are from consumer use take into account military and firefighting emissions, and industry releases? There are so many documented cases of intentional or unintentional releases at military, firefighting, and industry sites; if those releases truly account for only 15% of total releases in the US, this is quite concerning.
- Page 11 – is it known how many gallons of AFFF were used on the Mosier, OR oil spill?
- Page 11, biosolids – what standards classify wastewater solids as biosolids vs. sewage sludge?
- Page 12, metal plating – why is a REACH exception for PFOS relevant for the US? I thought PFOS was completely phased out in the US. Is this paragraph referring to metal plating in Europe only? Please clarify this point.
- Page 13, Dangerous waste regulation – how long has WA state required these reports? Only since 2010?
- Page 14, table 8 – why the dramatic increase in 2016? Why the huge jump to 311K gallons released? Is this from a single/handful of incidents?
- Page 14, Carpets – are the majority of carpets *still* produced with PFOS, or is this a description of legacy products? A time reference would be helpful in interpreting this information. The 5th sentence should be revised to indicate that (I assume) 88 mg/kg is the average PFOS content across multiple samples. Also, is the next sentence with the 75 mg/kg level from a different study? Unclear how these two numbers relate to each other; are you saying that even untreated carpet has relatively significant loading of PFOS?
- Page 14 and 15, calculations of PFOS loading from carpets and coatings – these calculations assume zero new PFOS-containing products after 2002. Is it the case that PFOS-containing products cannot be imported into the US? I do not think this is the case, and it is countered by earlier discussions of WA State reporting rules that note that manufacturers are still importing other consumer products containing PFOS.
- Also, it is not a reasonable assumption that all furniture is disposed of within 10 years. Many households keep furniture for longer than 10 years or buy furniture that is over 10 years old, especially if they are lower income and constrained in the amount they can spend on furniture. This should be acknowledged. An *average* lifespan does not encompass the full range of lifespans. Where does this 10 year average come from? If it is from an actual study (and not just furniture industry marketing materials, for example),

then the lifespan that should be used for calculation should be the average plus two standard deviations, or the 95th percentile lifespan.

- Page 18, Shaider study – why are these results not included in Table 9?

Chemistry chapter

- On page 10, you state: “The extent to which manufacturers purify their products is not well understood.” Could the manufacturing participants in this CAP help us to understand this? It seems like a very important topic. This is similar to the line on page 12 “If non-target isomers and homologues are not removed by further processing, they will end up in the final product formulation or treated articles”. Can manufacturers help us understand whether these non-target compounds are indeed removed?

Environment chapter

- Needs page numbers
- Page 2, introductory paragraph – the list of “major pathways” does not include intentional or accidental industry or manufacturing releases. These should be added to the list of major pathways, even if we don’t have known PFAS manufacturing sites within the state.
- Page 4, Environmental Pathways in WA – with the exception of our lack of manufacturing facilities, is there any reason to expect PFASs to behave differently in WA state? That is, it seems to me that environmental monitoring data from other locations should be relatively applicable to Washington State. Is this the case? If so, perhaps revise these parts of the environment chapter to not suggest that the lack of Washington-specific data is a huge problem in terms of characterizing our environmental conditions.

Health Chapter

- In other chapters, sources are referred to using parenthetical citation, but this chapter uses bracketed numbers. Parenthetical citation is preferable, because it provides more information about references without requiring the reader to flip to the back to learn anything about what/who is being cited.
- Page 2, last paragraph – Clarify that PFAS levels in humans *in the US* are declining as they are phased out *in the US*. It is not clear whether global levels of long-chain PFAS are declining.
- Page 3, top of the page – “The implications of these replacements on human and environmental health require further elucidation.” The data gaps and emerging concerns regarding replacements suggest to me not just that further elucidation is needed, but that protective public health policy and proactive moves by industry are also needed to prevent future public health disasters and significant burdens on state and federal public health systems.

- Page 3 – given the available database of EPA drinking water testing for PFASs, can you calculate how many Washingtonians, at a minimum, are exposed to PFOA and PFOS above the EPA’s guideline? Using a map of this data available at <http://sorenrundquist.com/PFAS>, it looks like there are exceedances in the Issiquah Water system, serving 22,926 customers; JBLM Lewis, serving 29,115 customers; and City of DuPont Water System, serving 8,430 customers. This would total 53,471 customers. This is an underestimate, as it does not include other individuals with known contaminated water (e.g., at Joint Base Lewis-McChord), or people whose drinking water is contaminated but has not yet been tested.
- Page 8, beginning of food section – it seems more accurate to say, “The majority of the United States population is not exposed to PFAS in their drinking water at levels above existing screening levels”. Given the water solubility of PFASs, it seems likely that most water systems in the US do in fact contain some level of PFAS contamination; the majority of the population, however, does not receive drinking water with *elevated* levels.
- Figure 2, page 13 – it would be helpful to include the total estimated exposure for each scenario, in addition to its breakdown. This information is available in the text but it would be nice to have it in the visual figure as well.
- Page 31, Whidbey Island tests – it would be useful to indicate which PFASs were included in the tests and what the levels of detection were.
- Page 33, information about DOH advice and funding – it would be useful to indicate where the public can look for this additional information (a map of contaminated drinking water sources; funding opportunities), perhaps a static website. It is unclear from how the text is written if this is the same as the series of maps beginning on p 35 or whether this is a different product.
- Page 39, Absorption section – PFOA absorption is not only expected, it is *documented* through numerous biomonitoring studies.
- Page 40 – occupational exposure to PFOA was linked to eye birth defects among women workers at DuPont’s Washington Works factory. I couldn’t find an academic paper, but this has been discussed in numerous articles that refer to industry documents released during the DuPont lawsuits (e.g., <https://theintercept.com/2015/08/11/dupont-chemistry-deception/>).
- Page 43 – it seems like the descriptions of key epidemiological sites should come much earlier in the Health chapter, given that many of the studies cited and health effects identified were from these sites.
- Page 43, Mid-Ohio River Valley site – contamination also resulted from the intentional dumping of PFOA-containing waste on a private farmer’s land.
- Page 50, immune toxicity of PFHxS – why are results from the Faroe Island cohort only discussed in the PFHxS section, and not also in the PFOA and PFOS sections?
- Page 50, reproductive and developmental effects – it is unclear why the format of the report changes markedly here, into bullet points. For consistency it seems that this should be rewritten into paragraph form.
- Page 56, paragraph about current fish advisories – this section is unclear. You state that there are no current advisories, but you also state that some fish exceed provisional level health effects. This section should clearly state what those provisional levels are, and explain why they are provisional and not final. This section could also compare Washington’s levels with other states’ levels. Does the FDA have any guidance on fish

consumption? Finally, if some fish are above the provisional level, what is DOH doing to move toward advisories as needed?

- The two paragraphs on p 63 about other states' fish advisories could be moved up to this section on Washington state fish advisories

Regulation Chapter

- Summary table – why do some regulations not have numerical limits (e.g., Alabama's fish consumption advisory has no numbers of fish or PFOS levels).
- Page 5, “Many more states do not have the funding for surveillance or PFAS analysis for recreational fish” – this is only part of the story; it is a question of funding *and* priorities for fish testing. That's to say, if fish testing was made a priority (for political or social reasons, for example), the funding could be found.
- Page 10, TSCA description – Clarify that these New Chemical evaluations only apply/applied to compounds submitted to EPA after TSCA was enacted. It would be helpful to list which PFAS compounds were included on the original TSCA inventory (i.e., were in use before 1976) and thus were grandfathered in without this New Chemicals Program review.
- Page 13, FDA's removal of three long-chains from CFR list of approved food additives – This is not an accurate description. In 2010, the FDA completed a thorough analysis of long-chain PFASs, and concluded that significant toxicity concerns existed. They worked with manufacturers to on a voluntary agreement to stop using several long-chain PFASs [Update on Perfluorinated Grease-Proofing Agents; Food and Drug Administration: Silver Spring, MD, 2015; <http://www.fda.gov/food/ingredientpackaginglabeling/packagingfcs/notifications/ucm308462.htm>]. But three classes of long-chain PFASs remained on the CFR list. As a result, a group of nonprofits led by NRDC and EDF petitioned FDA to remove those three PFASs on the basis of safety, not abandonment [National Resources Defense Council. Filing of Food Additive Petition. Fed. Regist. 2015, 80, 13508 Codified at 21 CFR 176]. In accordance with the FDA's own toxicological review, the petitioners used a “structural classbased argument” that grouped together all long-chain perfluorinated compounds because of structural similarities, concerns about biopersistence, evidence of biotransformation of some longer-chain PFASs into PFOA, and reproductive and developmental toxicity concerns of certain long-chain PFASs. Industry responses to this petition used the abandonment argument [Comment from Society of the Plastics Industry Inc (Keller and Heckman LLP); FDA Docket # FDA-2015-F-0714, 2015; <https://www.regulations.gov/document?D=FDA-2015-F-0714-0006>]. However, the FDA's ultimate decision was based on the *safety standard*, not abandonment [Food and Drug Administration. Indirect food additives: Paper and paperboard components. Fed. Regist. 2016, 81, 5–8 Codified at 21 CFR 176.]. I am the lead author on a paper on this topic, if you would like to discuss it further [Cordner, Richter, and Brown, “Can chemical class approaches replace chemical-by-chemical strategies? *Environmental Science & Technology* 2016, DOI: 10.1021/acs.est.6b04980].
- Page 14 – the “U.S. EPA Negotiations” section should be moved above, near the TSCA section, so all the EPA activities are in one place.

- Page 18, China – can you provide a list of acceptable uses under the China’s restriction of PFOS?