February 2, 2023

Washington Department of Ecology
300 Desmond Drive SE
Lacey, Washington 98503

Re: Draft Rule for Safer Products for Washington – Cycle 1 and flame retardants in plastic external enclosures for electric and electronic products

To the Department of Ecology:

My name is Thomas Osimitz. By way of background, I have a doctorate degree in toxicology and am certified in toxicology by the American Board of Toxicology (DABT). I am quite familiar with the environmental and human health issues associated with flame retardants. I am Chair of the Science Advisory Council (SAC) of the North American Flame Retardant Alliance (NAFRA) which operates under the auspices of the American Chemistry Council (ACC). The opinions I express below are mine and not necessarily those of ACC.

I am submitting the following comments on Washington Department of Ecology's ("Department" or "Ecology") Draft Rule ("Draft Rule") as part of Safer Products for Washington – Cycle 1.[1] The comments focus on the Draft Rule regarding the use of organohalogen flame retardants (OFRs) in plastic casings and enclosures for electronic and electrical equipment.

My comments focus on the following topics:

- Failure to Consider Exposure and Risk
- Inappropriately Assuming that all OFRs Pose the Same Hazard
- Applying Inconsistent Criteria in Assessment of Alternatives

Failure to Consider Exposure and Risk

The Department's regulatory approach incorrectly assumes that all OFRs used in enclosures for electrical and electronic products pose the same level of risk even though no assessment supports this approach. Risk to humans and/or the environment is a function of both toxicity, a property inherent to the chemical, and the extent of exposure that a human or environmental species receives. We are exposed to many chemicals every day, including some naturally occurring molecules that in several cases look chemically very similar to synthetic flame retardants and that have inherent toxicity. But because of the level of exposure and/or our body's ability to detoxify many of these chemicals, risk is low or nonexistent.
The current state of the science does not support this regulatory proposal. While there are data demonstrating some level of specific OFRs both in various media and in the environment, this is

[1] Washington Department of Ecology, *Chapter 173-337 Washington Administrative Code (WAC): Safer Products for Restrictions and Reporting*, December 2022, https://ecology.wa.gov/DOE/files/34/34868dd6-a7ea-4944-814f-010df10dde99.pdf.

not the case for all OFRs, and the Department has not established that plastic casings and enclosures for electronic and electrical equipment are a significant source of any potential releases. Even the presence of a chemical in blood or urine detected in biomonitoring studies needs to be considered in relation to actual levels that might cause adverse effects to human health. As the Centers for Disease Control and Prevention makes clear in its National Report on Human Exposure to Environmental Chemicals:

> "The presence of an environmental chemical in people's blood or urine does not mean that it will cause effects or disease. The toxicity of a chemical is related to its dose or concentration, in addition to a person's individual susceptibility. Small amounts may be of no health consequence, whereas larger amounts may cause adverse health effects."[2]
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> The primary value of a risk assessment is to aid in the establishment of priority for action. Some exposures to certain populations may warrant potential management such as regulation, labeling or restrictions, whereas others may not require any action. Declaring all OFR molecules as unacceptable is not a reasonable approach and will lead to the elimination of molecules that pose no risk whatsoever. Moreover, this approach essentially forestalls innovation for new products using halogen-containing molecules.

Inappropriately Assuming that all OFRs Pose the Same Hazard

As scientist, I encourage the Department to carefully consider the recent report by the National Academy of Sciences[3] that recommends *against* assessing OFRs as one single class. Important excerpts from their extensive review and analysis of OFR toxicology:

> "The committee conducted its own analysis to determine whether OFRs can be treated as a single class. It first created an inventory of 161 OFRs from several sources and then identified analogues on the basis of functional, structural, and predicted bioactivity information. To evaluate similarity, the committee compared the OFR inventory to the analogues and found that the OFRs cannot be treated as a single class for the purposes of a CPSC hazard assessment. The OFRs can, however, be divided into sub- classes on the basis of chemical structure, physicochemical properties, and predicted biologic activity. The committee identified 14 subclasses that can be used to conduct a class-based hazard assessment and concluded that the best approach is to define subclasses as broadly as is feasible for the analysis; defining subclasses too narrowly could defeat the purpose of a class approach to hazard assessment."

Furthermore:

> "The committee hopes that the scoping plan that it has described will give CPSC a means to use a class approach to assessing the hazards posed by OFRs. A class approach will likely result in increases in efficiency and decreases in cost compared with the traditional approach of evaluating individual chemicals.

[2] Fourth National Report on Human Exposure to Environmental Chemicals, 2009, Executive Summary, p. 3.
[3] National Academies of Sciences, Engineering, and Medicine. 2019. A Class Approach to Hazard Assessment of Organohalogen Flame Retardants. https://doi.org/10.17226/25412

> Although the challenges to a class approach might appear daunting, the alternative -- individual assessments of hundreds of chemicals—is unrealistic. The only possible practical approach for a set of chemicals as large as the OFRs is a class approach."

Despite this highly rigorous assessment, the Department proposes to implement a regulatory action that does not differentiate OFRs by any specific mechanism of action.

Applying Inconsistent Criteria in Assessment of Alternatives

The assessment approach being used as a justification for proposed regulations was not applied evenly for OFRs and identified alternatives. In many instances, the Deparment has used environmental measurements of a subclass of older flame retardants, the polybrominated diphenyl ethers (PBDEs) – which were used in textiles, upholstered furniture, and electronics – as a proxy for other flame retardants.[4] These data should not serve as a basis for making conclusions about other flame retardants, much less an entire class of flame retardants. The Department itself stated in earlier assessments that, other than PBDEs, actual monitoring data indicate that some of the other referenced flame retardants (DBDPE, TBBPA, BTBPE, or TTBP-TAZ) are *not* found in the Washington environment or are found at extremely low levels not likely to present a risk.[5]

Most notably, The Department's approach to regulating OFRs as a class essentially deems all OFRs to be unacceptable. However, it seems that the Department has applied a lower level of rigor to identified alternatives. The Department has identified a Benchmark 2 score as meeting its minimum criteria for safer designation. Even if, under their Working Criteria for "Feasible and Available"[6], an OFR scores Benchmark 2 GreenScreen® Assessment, it still may not meet "safer" criteria. This is because the Department claims such chemicals may fail additional within-class criteria.[7] They have concluded that two non-halogenated flame retardants identified as alternatives – triphenyl phosphate (TPP) (CAS RN 115-86-6) and resorcinol bis(diphenyl phosphate) (RDP) (CAS RN 57583-54-7) – meet the minimum criteria for "safer" and have a Benchmark 2 score as part of a GreenScreen® Assessment.[8]

By contrast, GreenScreen® Assessments for two OFRs – decabromodiphenyl ethane (DBDPE) (CAS RN 84852-53-9) and 1,3,5-triazine, 2,4,6-tris(2,4,6-tribromophenoxy) (TTBPT) (CAS RN 25713-60-4) – were conducted and submitted to the Department with each chemical assigned a

[4] In the United States, the manufacture and import of pentaBDE and octaBDE ceased in 2004, and the manufacture and import of decaBDE ceased in 2013.
[5] Washington Department of Ecology, Flame Retardants in Ten Washington Lakes, 2017-2018, December 2019. https://apps.ecology.wa.gov/publications/documents/1903021.pdf
[6] Regulatory Determinations Report at pages 301-305.
[7] Regulatory Determinations Report at page 42.
[8] Regulatory Determinations Report at pages 64 - 65.

Benchmark 2 score.[9,10] However, since DBDPE and TTBPT are OFRs, additional within-class criteria apply and both DBDPE and TTBPT fail this additional test as part of the Department's assessment process. This means that OPFRs with Benchmark 2 scores are being considered "safer" by the Department while OFRs with Benchmark 2 scores are not being considered "safer" by the Department. This is a biased application of the criteria. However, if the same within-class criteria approach were applied to TPP and RDP just as it has for DBDPE and TTBPT, both phosphorus compounds would not meet the Department's criteria for "safer" designation. This highlights the need for a revised process that consistently assesses existing chemicals and identified alternatives.

Conclusions

Please consider my comments as a toxicologist in the following areas:

- Failure to Consider Exposure and Risk
- Inappropriately Assuming that all OFRs Pose the Same Hazard
- Applying Inconsistent Criteria in Assessment of Alternatives

Addressing the issues noted above will better ground the rule in science and focus everyone's resources to better protect public health and the environment.

I appreciate the opportunity to comment on the Department's Draft Rule. If you have questions, please contact me at tom@sciencestrategies.com

Sincerely,

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[9] Gradient. GreenScreen® Assessment for [Decabromodiphenyl ethane; DBDPE (CAS # 84852-53- 9)]; Prepared for: American Chemistry Council: December 2021.

[10] Gradient. GreenScreen® Assessment for [1,3,5-triazine, 2,4,6-tris(2,4,6-tribromophenoxy) TTBPT (CAS # 25713-60-4)]; Prepared for ICL Group: June 2022.