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October 12, 2018

Maia Bellon
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600

LHWMP Supports Washington State Department of Ecology PFAS Alternatives Assessment in Food Contact Materials

Dear Ms. Bellon:

Thank you for your ongoing work with per- and polyfluoralkyl substances (PFAS) and the continued dialogue between the Washington State Department of Ecology (Ecology) and the Local Hazardous Waste Management Program in King County (LHWMP). As a long-time partner of Ecology, LHWMP is happy to engage in discussion about reducing PFAS related hazards.

In 2018, the Washington State Legislature passed two PFAS bans. First, PFAS-containing firefighting foam will be banned by 2020 (RCW 70.75A). Second, PFAS in food contact materials (RCW 70.95G) will be banned dependent on whether Ecology finds an available safer alternative through an alternatives assessment (AA). We are providing this letter to outline our position on Ecology's AA for PFAS in food contact materials and to reiterate our support for creating strategic, evidence-based solutions to reduce PFAS related hazards.

Reducing harmful PFAS exposures is a priority concern for LHWMP. Across King County and Washington State, residents are being exposed to PFAS from various pathways, including common household products.

- PFAS has been detected above U.S. Environmental Protection Agency health advisory levels in drinking water near Issaquah, Whidbey Island, and Joint Base Lewis-McCord.

- PFAS has been found in fish, water, soil, and sediment across Washington State.

- PFAS has been discovered in human and animal tissue nationally, provoking concern from citizens and media outlets, prompting state and federal agencies to take action.

LHWMP is a steadfast advocate for evidence-based solutions, like the AA being completed by Ecology. To protect King County residents, and to support best practices, we encourage Ecology to consider the following elements as it conducts its AA:

1. RCW 70.95G.070 states that Ecology must follow "the guidelines for alternatives assessments issued by the interstate chemicals clearinghouse." Notably, the Interstate Chemicals Clearing House (IC2) Alternatives Assessment Guide dictates clear direction on AAs including the following:

    - Hazard reduction is a key principle of an AA.

    - PFAS' classification as the chemical of concern for this assessment has already been established through legislative mandate and is thereby outside the scope of the AA.

2. Ecology should also follow the guidance it published via the 2015 Washington State Alternatives Assessments Guide (Pub. 15-04-002). Using this publication that follows the IC2 Alternatives Assessments Guide, the following modules and levels are suggested:

    - **Stakeholder: Level 2** – Formal process that seeks input

    - **Hazard: Level 2** – Green Screen Hazard Assessment Tool

    - **Performance: Level 1** – Qualitative, readily available information (e.g. promotional materials). Quantitative tests are not necessary to gauge performance. Using readily available and qualitative information, as described in the IC2 guide can be more useful. For example, data derived from the Technical Association of the Pulp and Paper Industry (TAPPI) 559 test may not be the appropriate test to use.

    - **Cost and Availability: Level 1** – Qualitative, readily available information (e.g. use in competitive products)

    - **Exposure: Level 1** – Qualitative, readily available information (i.e. keep focus on hazard)

3. Cost should not be the basis for early elimination of an alternative, as costs can change.

4. The AA should be done as part of the CAP process. Specifically, the AA should be done through a consultative, transparent, and equitable process with all stakeholders – not just industry.

5. As per LHWMP's focus on racial equity, identified alternatives should not disproportionately burden immigrants, refugees, low-income communities, or people of color.

Creating a strategic and evidence-based PFAS AA for food contact materials is an important task that LHWMP wholeheartedly supports. LHWMP is available to discuss the PFAS AA with

Ecology. We look forward to continuing the dialogue with Ecology on our shared interest of protecting King County and Washington State residents from unnecessary risks to human health and the environment.

If you have any questions, please contact LHWMP Policy Liaison Matthew Bangcaya at 206-477-4764 or mbangcaya@kingcounty.gov.

Sincerely,

Lynda Ransley

Lynda Ransley
Program Director
Local Hazardous Waste Management Program in King County

cc: Brian Penttila, Alternatives Assessment Lead, Washington State Department of Ecology

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

November 1, 2018

Lynda Ransley, Program Director
Local Hazardous Waste Management Program in King County
150 Nickerson Street, Suite 204
Seattle, WA 98109-1634

Dear Lynda Ransley:

Thank you for your letter to the Washington State Department of Ecology (Ecology) dated October 12, 2018, related to the per- and polyfluoroalkyl substances (PFAS) alternatives assessment (AA) in food contact materials. We appreciate the active participation by the Local Hazardous Waste Management Program in King County (LHWMP) on the PFAS Chemical Action Plan (CAP) Advisory Committee.

Your comments and suggestions are helpful in informing Ecology as we scope the PFAS Alternatives Assessment as part of the CAP process.

Enclosed is the current scope of work (SOW) for your review. The SOW adheres closely to the Interstate Chemicals Clearinghouse Alternatives Assessment Guide as specified in RCW 70.95G.070(2)(b) and incorporates many of your suggestions. We appreciate the ongoing commitment by the LHWMP to assist Ecology with this important endeavor.

Please let me know if you have any questions or need further follow-up. I can be reached at 360-407-6702 or Darin.rice@ecy.wa.gov.

Sincerely,

Darin Rice

Darin Rice, Manager
Hazardous Waste and Toxics Reduction Program

Enclosure

cc: Brian Penttila, Alternatives Assessment Lead, Ecology

PFAS in Food Packaging
Alternatives Assessment Work Assignment Summary
November 2018

Summary

In 2018, Washington State passed a new law to prohibit all per- and polyfluorinated substances (PFAS) in paper food packaging. The ban takes effect following the identification of safer alternatives (not limited to paper) as specified in the toxics in packaging law (RCW 70.95G).

The Washington State Department of Ecology (Ecology) is requesting bids from a pre-approved list of contractors to support Ecology's work to identify safer alternatives (chemical and non-chemical) to PFAS in food packaging.

The assessment of alternative products must follow the Interstate Chemicals Clearinghouse (IC2) Alternatives Assessment Guide (v 1.1) and consider chemical hazard, performance, cost and availability, and exposure. The alternatives assessment will focus on paper food packaging used in the food service, quick service restaurants, and other consumer packaged products industries.

In conducting the alternatives assessment (AA), Ecology will seek information and data from institutional and government purchasers, users of food packaging, producers of food packaging, producers of PFAS-free alternatives, researchers, chemical manufacturers, product testing laboratory services, and other interested parties.

Ecology is required to conduct an external peer review process of the AA and publish its findings in the Washington State Register.

Ecology will make the final decision on whether safer alternatives to PFAS food packaging are available and will report the findings to the legislature in late 2019. The ban will take effect on January 1, 2022.

Background

Ecology and the Washington State Department of Health (Health) have identified concerns related to PFAS as a class of chemicals given the potentially broad and long-term impacts to human health and the environment.

Ecology, Health and the CAP Advisory Committee identified concerns including:

- PFAS released from products or manufacturing sources can change into substances of concern that are extremely persistent in the environment.
- PFAS are soluble in water and can easily move in water and soil. It can be difficult and expensive to filter these chemicals out of drinking water.
- Ongoing concerns related to potential exposures to PFAS from both regional and global sources that will continue into the future.

Safer Alternatives for PFAS

PFAS-free alternatives must meet the following criteria:

- Improve hazard and exposure considerations relative to PFAS-containing products [RCW 70.95G.010 (6)].
- Practicably and economically substituted for PFAS-containing products [RCW 70.95G.010 (6)].
- Readily available in sufficient quantity and at a comparable cost [RCW 70.95G.070 (3)].
- Perform as well as or better than PFAS chemicals in a specific food packaging application [RCW 70.95G.070 (3)].

One or more contractors under the direction of Ecology will develop the data needed to address these assessment criteria. The contractor(s) will conduct research and convene meetings with interested parties and experts to gather data on hazard, performance, cost, and other criteria.

What Products Are Covered by the Law?

Food package means "a package or packaging component that is intended for direct food contact and is comprised, in substantial part, of paper, paperboard, or other materials originally derived from plant fibers."

Based on direction and funding from the legislature, Ecology is required to conduct a cost-effective and timely AA based on the functional requirements of the food packaging (e.g. grease and oil resistance). The alternatives that serve these functions and the appropriate products or product categories will be selected by Ecology with input from the consultant.

Scope of Work Proposal

This proposal follows the steps and assessment modules in the order described in the IC2 AA Guide.

Chemicals of Concern

RCW 70.95G.010 (5) identifies the chemicals of concern as "Perfluoroalkyl and polyfluoroalkyl substances" or "PFAS Chemicals." These are further defined as "a class of fluorinated organic chemicals containing at least one fully fluorinated carbon atom."

The AA will include a narrative description of the concerns associated with PFAS chemicals. Ecology will identify at least one PFAS formulation as an example of a chemical of concern.

Decision Rules

Ecology is responsible for the decision rules developed for conducting the AA. Ecology will direct the contractor to interview experts and knowledgeable parties, and engage interested parties (see Interested Parties Outreach and Engagement below) to develop data on cost, performance, and other assessment criteria (Table 1). The contractor will use follow the decision rule assumptions established by Ecology.

The PFAS prohibition will not take effect until Ecology identifies that safer alternatives exist and the assessment is supported by feedback from an external peer review. Ecology will publish the findings in the Washington Register.

Framework

Ecology's preferred approach is to use the sequential framework based on experience with the IC2 guide. Ecology will use adaptive management strategies as provided under the IC2 guidance. Ecology will use the IC2 guide to determine the appropriate evaluation levels for each module that meets the criteria under the packaging law.

Table 1. Development of Decision Rules (the AA module sections of this document contain additional detail)

Criterion	Decision Rule Assumptions	
	Contractor Role	**Ecology Role**
RCW 70.95G.010 (6) defines "safer alternative" as a substance or chemical that:		
• meets improved hazard considerations	Evaluate PFAS-free food contact substances via GreenScreen® assessments. Identify improved hazard considerations using the GreenScreen® methodology. For chemicals with the same GreenScreen® score, develop a narrative evaluation to identify improved hazard based on individual hazard endpoints.	Specify any narrative evaluation criteria. Determine if the alternative has an improved hazard profile. A chemical with a GreenScreen® benchmark of 2 or higher is considered improved.
• meets improved exposure considerations	Provide narrative description of the exposure considerations for each alternative.	Determine if exposure considerations of alternatives are improved.
• can be practicably and economically substituted	Conduct surveys, internet and literature reviews, contact users and manufacturers of alternative products to determine whether safer alternatives are being practicably and economically substituted. Obtain publically available cost information where possible.	Determine if the alternatives can be practicably and economically substituted.
RCW 70.95G.070 (3) specifies additional requirements that a safer alternative must:		
• be readily available in sufficient quantity and at comparable cost	Conduct surveys, internet and literature reviews, contact purchasers, users and manufacturers of alternative products to determine whether they available at a comparable cost.	Determine if alternative meets the requirement.
• perform as well as or better than PFAS chemicals in a specific application	Conduct surveys, internet and literature reviews to determine performance in a specific application. Document the findings, performance information or data that the alternative performs as well or better to a specific application.	Determine if alternative meets the requirement.
• if the alternative is a chemical	Verify that use of the food contact substances in any proposed packaging alternative comply with FDA regulations.	Determine if alternative meets the requirement.

Interested Parties Outreach and Engagement

Ecology will coordinate AA outreach and engagement as part of the PFAS CAP Advisory Committee. Ecology will: 1) provide regular updates to the PFAS CAP Advisory Committee and list serve, 2) implement the Peer Review process; and 3) provide subject matter expert opportunities to provide input, as needed.

Ecology will utilize the contractor to engage interested parties to gather information from the food packaging industry, food service business professionals and other interested parties to:

- **Identify Safer Alternatives to Evaluate.** The contractor will identify potential alternatives (chemical and non-chemical) and conduct one or more GreenScreen® evaluations for the AA.

- **Collect Performance Information.** The contractor will conduct research and engage interested parties to identify whether alternative products/solutions can be practicably substituted. Interested parties can also provide information on performance through standard industry test methods and/or product-specific performance tests, information or other methods.

- **Availability and Cost.** The contractor will develop information and data on availability and cost for competitive products, including market or sales information where available.

Confidential Business Information (CBI)

In many cases, the lack of publicly available information and data related to PFAS and PFAS-free chemicals creates data gaps for conducting an AA. As part of this process, Ecology will be seeking CBI that can support the successful outcomes of determining the availability of safer alternatives.

Ecology has statutory authority to protect CBI. Businesses have the option to submit CBI requests for confidentiality under RCW 43.21A.060. Ecology staff will provide technical assistance and help process the requests.

PFAS Food Packaging and Identifying Alternatives

Based on Ecology's AA budget and timeframe constraints, the agency will identify and prioritize the types of packaging and assess alternatives that are applicable to a wide ranges of products. Table 2 provides examples of food packaging where PFAS may be used. This list is not exhaustive and should not be interpreted as limiting the range of products considered for the AA.

Table 2. Food Packaging Market Information

MARKET SEGMENT	PACKAGE TYPE	PAPER BASE MATERIAL
Quick Service Restaurants (QSR): such as national brands or local chains	Wraps/Liners	Paper
	Pinch Bottom Bags	Paper
	Flat Bottom Bags	Paper
	Clam Shells	Corrugated
		Board
		Molded Fiber
	Cartons	Board
		Molded Fiber
	Bowls/Soup Containers	Board
	Pizza Boxes	Corrugated
Food Service (FS): such as private restaurants, hospitals, institutions, or groceries	Trays	Board
		Molded Fiber
		Corrugated
	Cartons	Board
	Take Out Packages	Board
		Molded Fiber
		Corrugated
	Pizza Boxes	Corrugated
	Boxes	Board
		Corrugated
	Bowls/Soup Containers	Board
	Bakery Packaging (bags/liners)	Paper
	Deli Packaging (wraps/liners/interleaves)	Paper
	Bread Bags	Paper
	Prepared/Ready-to-eat Food Containers	Board
Consumer Packaged Goods (CPG): such as items sold in retail stores	Confectionary/Candy Wrap	Paper
	Snack Bags	Paper
	Microwave Popcorn Bags	Paper
	Pet food bags	Paper

Published research suggests that PFAS-containing and PFAS-free food packaging products serve some of the same or identical markets (Andrews & Walker, 2017; Schaider, et al., 2017). Several recent investigations identified a variety of PFAS-free food packaging for many applications, as well as alternative coatings and treatment approaches (Center for Environmental Health, 2018; Clean Production Action, 2018).

The contractor will conduct research to identify PFAS-free products that are currently available on the U.S. market.[1]

Functional substitution or non-chemical alternatives (e.g., mechanical densification approaches) should be considered for relevant applications (Trier, Taxvig, Rosenmai, & Pedersen, 2018). Chemical or coating treatments may involve treatments introduced at the wet-end of the papermaking process or surface treatments, such as size press applications or off-machine coaters.

Suitable alternatives may not contain intentionally added PFAS in any amount. Given their widespread use in manufacturing operations, food packaging components may be contaminated with PFAS during manufacturing or downstream converting processes. There is no budget for such confirmatory testing.

Food packaging does not generally identify food contact substances. Ecology and the contractor will ensure that the manufacturer/supplier of a proposed alternative will disclose the food contact substances and formulation adjuvants, so that hazard and exposure assessments can be completed. Ecology will provide manufacturers and suppliers the opportunity to obtain confidential treatment under RCW 43.21A.060. The manufacturer/supplier should provide information on food types and conditions of use that would be consistent with FDA requirements for the application.[2]

The contractor must efficiently address the largest possible range of products (specific applications) in the PFAS food packaging market within the budget and duration of the contract. The contractor will identify potential alternatives for assessment and Ecology will make the final selection of products and application areas to assess.

Interested Parties Outreach and Engagement on Alternatives and Applications

The contractor will hold at least one webinar to share information on the proposed food packaging applications and alternative products identified by Ecology. Interested parties may provide input on:

- Prioritization of specific products for assessment.
- Other alternatives that should be considered for evaluation and valid groupings of products.
- Performance, cost, and availability of proposed alternatives.
- Whether the proposed alternatives can be practicably substituted [RCW 70.95G.010(6)].
- Whether the proposed alternatives are or could be readily available in sufficient quantity by 2022 [RCW 70.95G.070(3)].

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[1] RCW 70.95G.070 (3) specifies that a safer alternative must "...be readily available in sufficient quantity..." Given the two-year transition period that would occur prior to any potential product ban, the contractor may consider packaging products that are available in foreign markets and could be successfully introduced to the U.S. market.

[2] The FDA provides guidance on determining the regulatory status of food contact substances: https://www.fda.gov/food/ingredientspackaginglabeling/packagingfcs/regulatorystatusfoodcontactmaterial/default.htm.

Hazard Module

The contractor (or Ecology may separately contract) will use the GreenScreen® for Safer Chemicals to perform a hazard assessment[3] of formulation components. Ecology will publish completed GreenScreen® assessments in the IC2 Chemical Hazard Assessment Database. GreenScreen® assessments may be redacted so long as they permit endpoint hazard score (vH, H, M, L, vL) comparisons and alternative formulation components.

The contractor may perform an initial hazard screen using the GreenScreen® List Translator or other hazard screening method approved by Ecology before selecting chemicals for the minimum assessment.

GreenScreen® assessments must address all feasible and relevant transformation products. Transformation products are usually evaluated using the GreenScreen® List Translator. Some chemistries are likely to give rise to persistent or very persistent dead-end degradates. Persistent product chemicals or degradates should be evaluated with full GreenScreen® assessments. Ecology will approve the final list of chemicals for assessment.

Performance Assessment Module

The contractor will develop data to assess at least one alternative for each application. RCW 70.95G.070 (3) states that safer alternatives must "perform as well as or better than PFAS chemicals. . ." but does not further define performance. The contractor will consult with interested parties to identify appropriate performance criteria for each specific application. These may include qualitative or quantitative measures of performance.

Given the widespread use of PFAS-free food packaging, actual performance data from specific alternative products should also be available (Andrews & Walker, 2017; Schaider, et al., 2017). Interested parties can also help identify whether alternative products and solutions can be "practicably substituted" [RCW 70.95G.010 (6)].

The contractor may collect standardized test data as available and use the data to guide performance evaluations.

The contractor will propose decision rules to determine whether PFAS-free alternatives perform as well or better than PFAS chemicals. There may be cases where PFAS-based products perform beyond levels required for an application. Alternatives do not need to achieve levels beyond application requirements in order to meet the law's criteria for safer alternatives.

Cost and Availability Module

The contractor will perform an assessment of cost and availability. RCW 70.95G.010 (6) defines "safer alternative" as a substance or chemical that ". . . . can be. . .economically substituted . . ." RCW 70.95G.070 (3) specifies that a safer alternative must ". . . . be readily available in sufficient quantity and

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[3] The IC2 Guide identifies levels of effort for each of the assessment modules. Ecology is will determine the appropriate levels for this AA. The contractor can perform work beyond the requirements of the assigned level, as needed.

at a comparable cost." The IC2 Guide Cost and Availability Module uses similar cost comparison language.

Given the apparent widespread use of PFAS-free food packaging, food service businesses are clearly willing to purchase PFAS-free products in the same markets where PFAS-containing products are used (Andrews & Walker, 2017; Schaider, et al., 2017). The contractor will engage interested parties and experts to develop data on the costs of PFAS-free alternative products relative to PFAS-based products in specific applications.

The contractor will propose decision rules to address the cost and availability criteria that meet the provisions in the law. Cost and availability should be addressed in an order (and in time) to benefit the prioritization of chemicals for hazard assessment. Ecology must approve the decision rules regarding cost and availability.

Exposure Assessment Module

The contractor will perform an assessment of exposure. This includes a narrative explanation of primary exposure from food contact packaging to food, other use-phase exposures, and end-of-life exposures.

Local jurisdictions in Washington State, such as Seattle/King County, may send food packaging waste from households and businesses to composting facilities. Packaging chemicals or degradates can re-enter the food cycle when this compost is applied in commercial agriculture or home gardens (Bräunig, Baduel, Barnes, & Mueller, 2019; Bizkarguenaga, Zabaleta, Prieto, Fernández, & Zuloaga, 2016). Stormwater runoff associated with compost applications leads to further environmental exposures. Ecology will approve any decision rules for the exposure module.

Safer Alternative Determination

Ecology will make a determination of whether the assessed food packaging products meet the law's definition of safer alternatives. Tables 1 (above) and 3 (below) identify key decision authorities for the AA process. Ecology will report safer alternative determinations for external peer review. Ecology's findings and feedback from the peer review will be reported to the legislature and published in the Washington State Register.

Ecology Decision Authority

Table 3. Key decisions and the roles for contractor(s) and Ecology.

DECISION POINT	CONTRACTOR ROLE	ECOLOGY ROLE
DECISION RULES • **DETAILS DESCRIBED IN TABLE 1.**	Develop decision rules.	Approve decision rules.
SELECTION OF ALTERNATIVE TREATMENT (NON-PFAS) CHEMICALS, AS APPLICABLE	Identify candidate food contact substance formulations and recommends ingredients for hazard and exposure evaluation.	Select the alternative chemical formulation(s) prioritized for evaluation. Approve the specific list of substances for hazard and exposure evaluations. Substances may include and are not necessarily limited to ingredients, manufacturing intermediates, transformation products, and impurities.
SELECTION OF PRODUCT OR PRODUCT GROUPS	Recommend product or product groups.	Select product or product groups.
EVALUATE ALTERNATIVE PRODUCT OR PRODUCT GROUPS	Recommend product or product group for evaluation.	Select product or products for evaluation.
PEER REVIEW	No role.	Select peer review group and submit findings for their review.
FINAL REPORT ALTERNATIVE RECOMMENDATIONS	No role.	Prepare final report to legislature and publish in the Washington State Register.

Appendix

Timeline and Deliverables (in process)

References

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