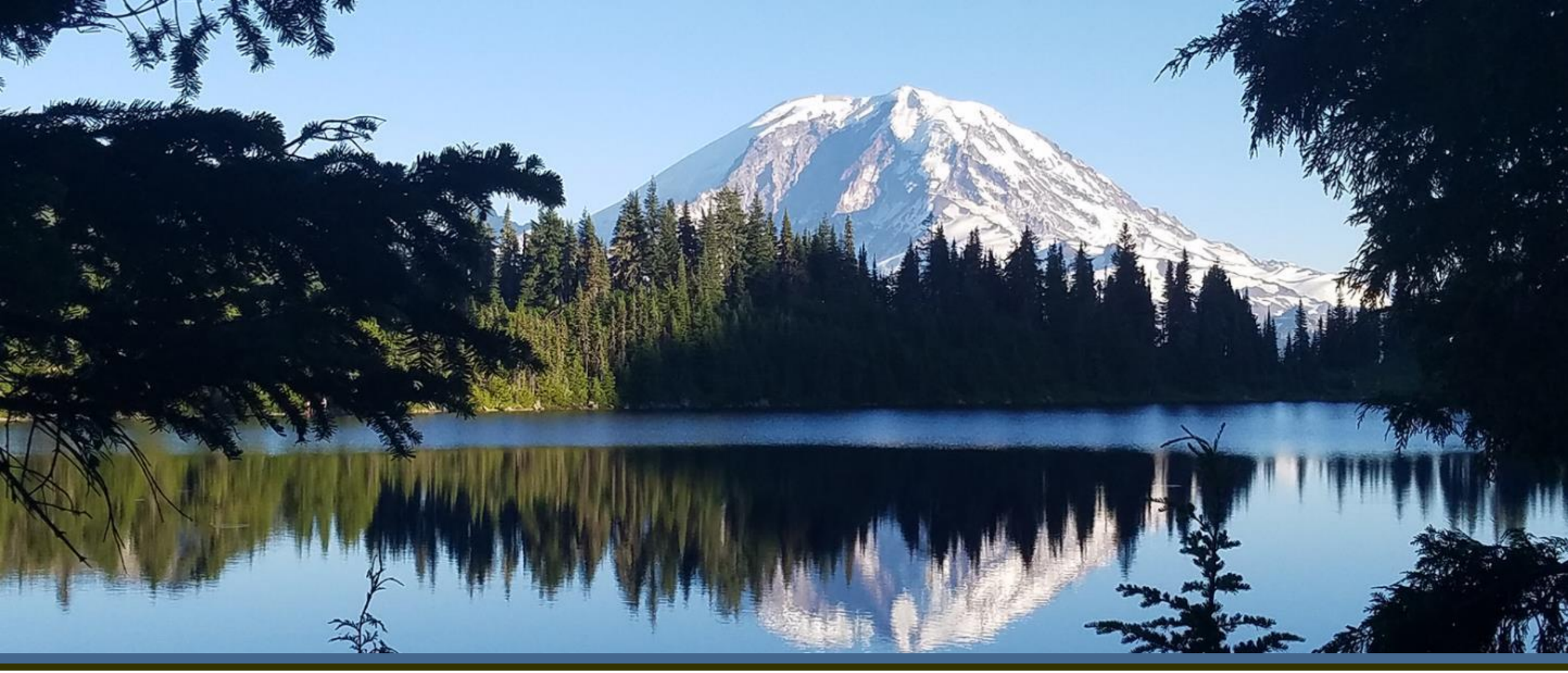


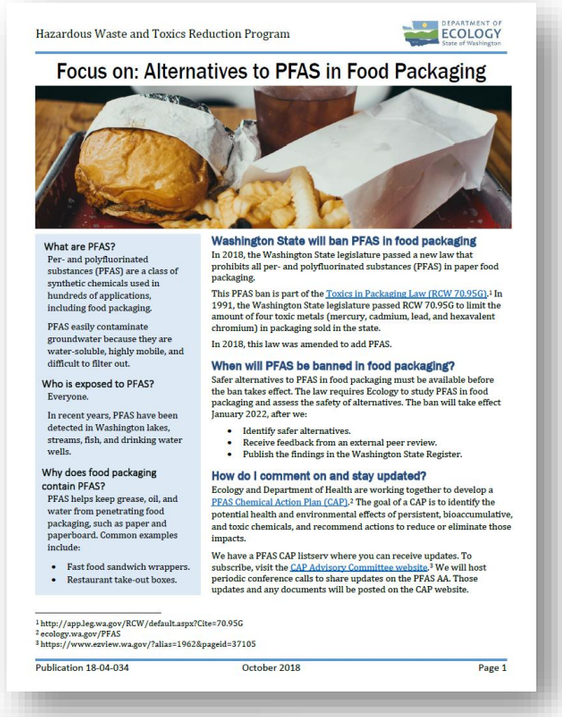
PFAS in Food Packaging Alternatives Assessment Project Update: 6-30-2020

EZView Website:
https://www.ezview.wa.gov/site/alias__1962/37610/pfas_in_food_packaging_alternatives_assessment.aspx

DEPARTMENT OF ECOLOGY
State of Washington

PFAS in Food Packaging AA Agenda

- Intro/Welcome
- Background
- AA Process
- Products Review/CBI
- Timelines



Hazardous Waste and Toxics Reduction Program

DEPARTMENT OF ECOLOGY State of Washington

Focus on: Alternatives to PFAS in Food Packaging

What are PFAS?
Per- and polyfluorinated substances (PFAS) are a class of synthetic chemicals used in hundreds of applications, including food packaging.

PFAS easily contaminate groundwater because they are water-soluble, highly mobile, and difficult to filter out.

Who is exposed to PFAS?
Everyone.

In recent years, PFAS have been detected in Washington lakes, streams, fish, and drinking water wells.

Why does food packaging contain PFAS?
PFAS helps keep grease, oil, and water from penetrating food packaging, such as paper and paperboard. Common examples include:

- Fast food sandwich wrappers.
- Restaurant take-out boxes.

Washington State will ban PFAS in food packaging
In 2018, the Washington State legislature passed a new law that prohibits all per- and polyfluorinated substances (PFAS) in paper food packaging.

This PFAS ban is part of the Toxics in Packaging Law (RCW 70.95G).[1] In 1991, the Washington State legislature passed RCW 70.95G to limit the amount of four toxic metals (mercury, cadmium, lead, and hexavalent chromium) in packaging sold in the state.

In 2018, this law was amended to add PFAS.

When will PFAS be banned in food packaging?
Safer alternatives to PFAS in food packaging must be available before the ban takes effect. The law requires Ecology to study PFAS in food packaging and assess the safety of alternatives. The ban will take effect January 2022, after we:

- Identify safer alternatives.
- Receive feedback from an external peer review.
- Publish the findings in the Washington State Register.

How do I comment on and stay updated?
Ecology and Department of Health are working together to develop a PFAS Chemical Action Plan (CAP).[2] The goal of a CAP is to identify the potential health and environmental effects of persistent, bioaccumulative, and toxic chemicals, and recommend actions to reduce or eliminate those impacts.

We have a PFAS CAP listserv where you can receive updates. To subscribe, visit the CAP Advisory Committee website.[3] We will host periodic conference calls to share updates on the PFAS AA. Those updates and any documents will be posted on the CAP website.

[1] http://app.leg.wa.gov/RCW/default.aspx?Cite=70.95G
[2] ecology.wa.gov/PFAS
[3] https://www.ezview.wa.gov/?alias=1962&pageid=37105

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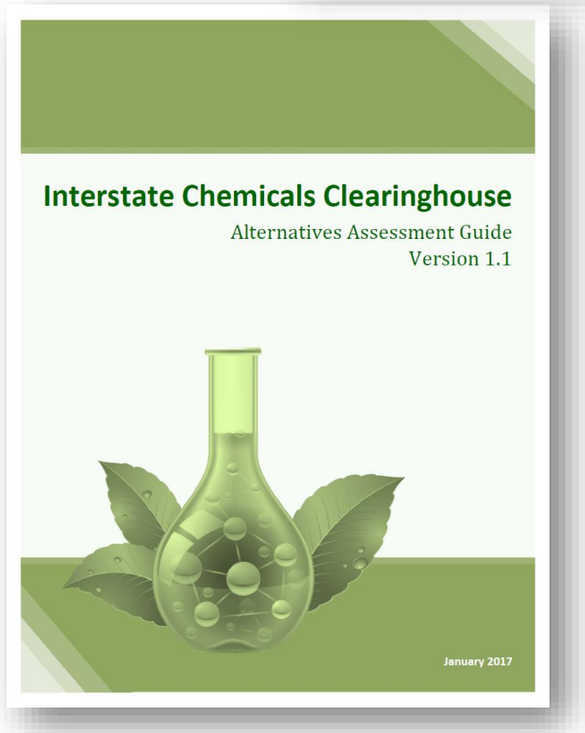


Interstate Chemicals Clearinghouse

Alternatives Assessment Guide
Version 1.1

January 2017

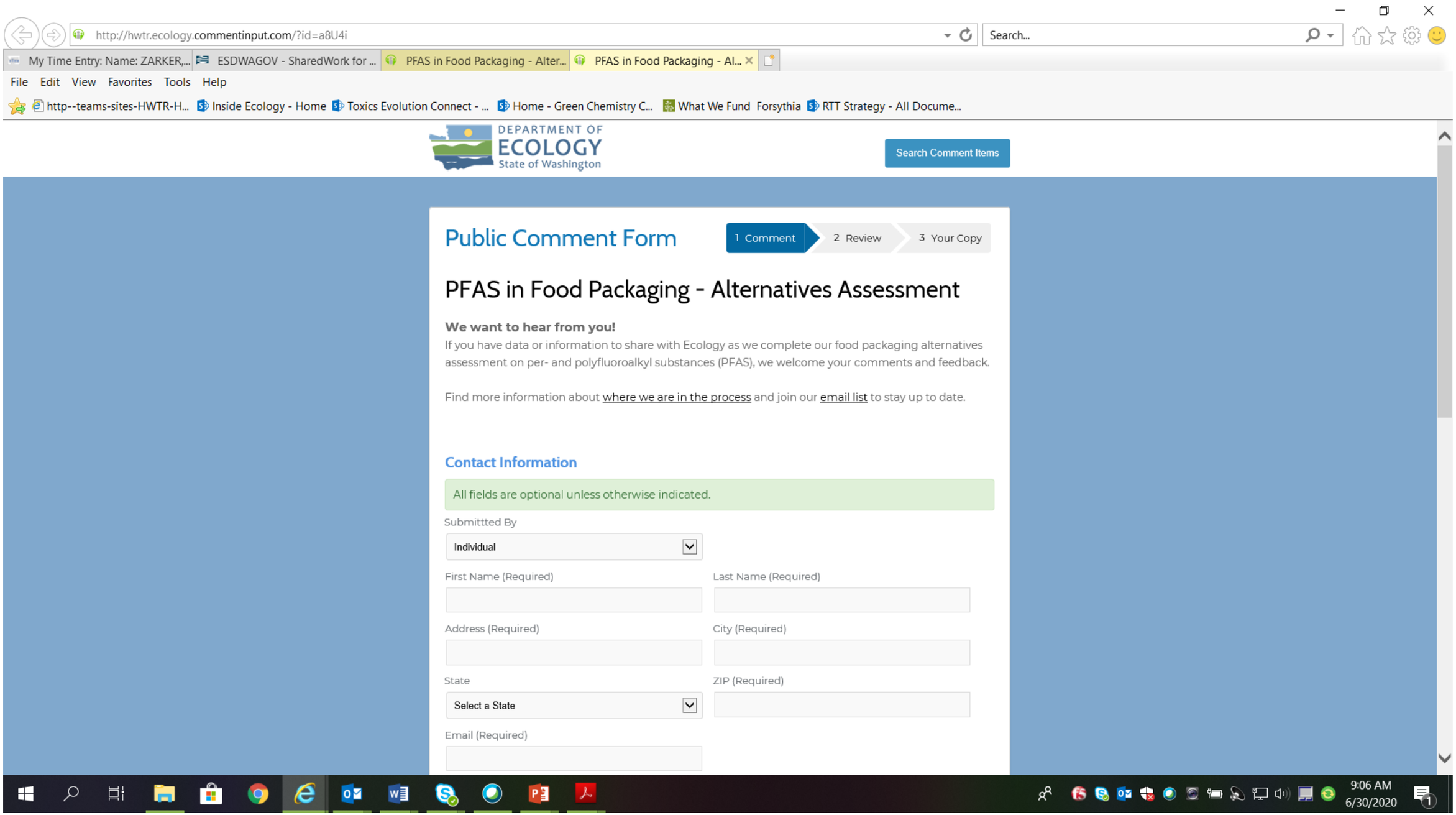
COVID-19 & State Furloughs Update

- PFAS AA team members are continuing to work from home through the end of the year.

- Some stakeholders have indicated their ability to engage at this time is limited.

- WA State furloughs.

PFAS Alternatives Assessment Public Comment Website



http://hwtr.ecology.commentinput.com/?id=a8U4i

WA Toxics in Packaging Law RCW 70.95G.070

- Legislature passed toxics law that bans perfluorinated and polyfluorinated substances in paper food packaging.
- Ecology will determine whether alternatives are available for specific packaging applications. A peer review process is required.
- Ecology reports to legislature and ban will take effect two years later.
- Based on the Interstate Chemicals Clearinghouse (IC2) modules: **Hazard (L2); Exposure (L1); Cost & Availability (L1) & Performance (L1).**

Basic AA Process

1. Chemical of Concern

2. Identify Alternatives

3. Hazard Assessment

Repeat steps as needed

4. Performance

5. Cost and Availability

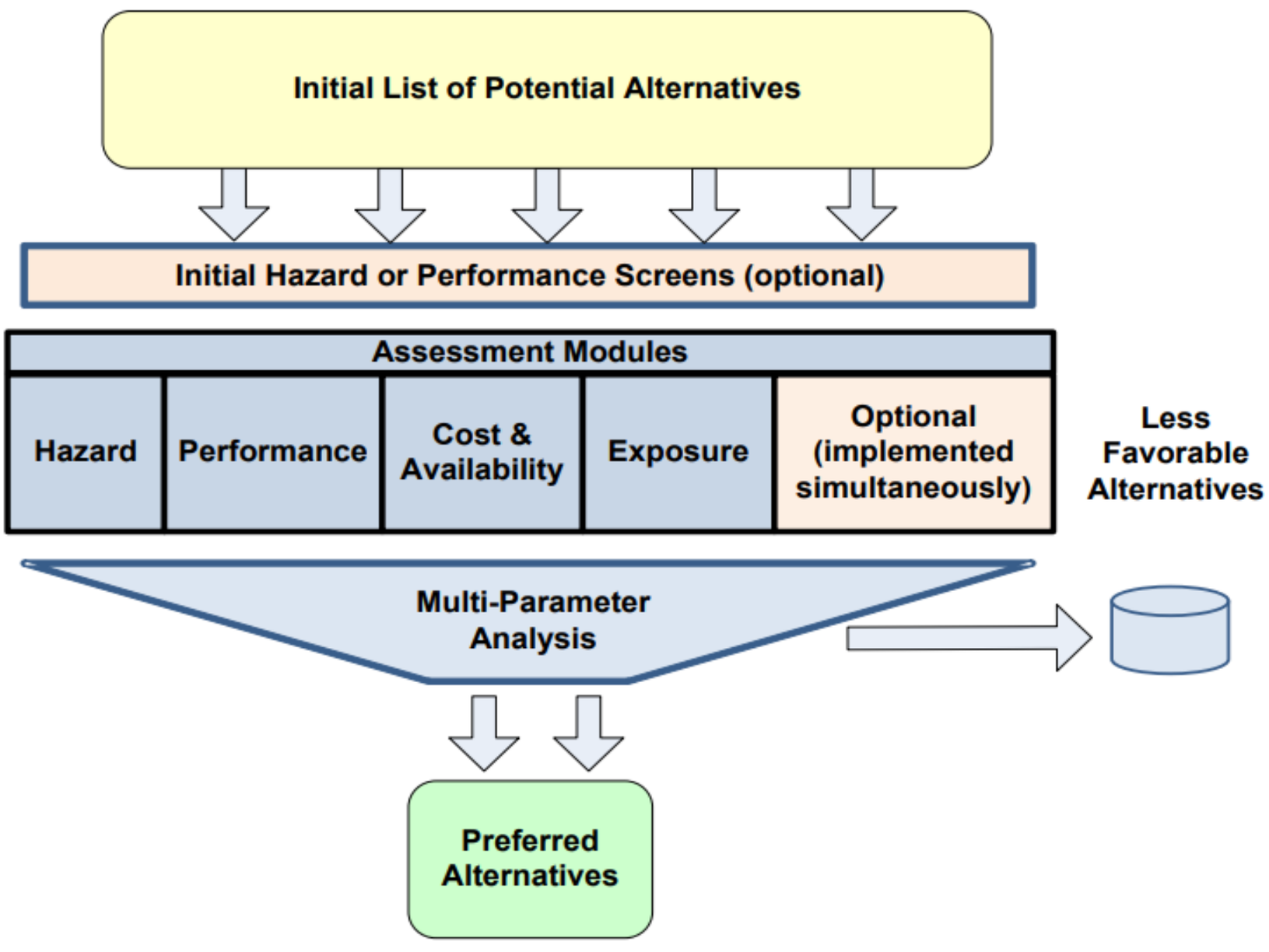
6. Exposure

Unknowns

Known not safer alternatives

Preferred Alternatives

The Interstate Chemicals Clearinghouse (IC2) Alternatives Assessment Guide



Technical Documents

- New documents have been posted to the website and are available for stakeholder comment:
  - Product and Alternatives Scoping Paper (2/24/2020)
  - Hazard Methodology (3/19/2020)
  - Exposure Methodology (3/19/2020)
  - **Performance Methodology (6/18/2020)**

IC2 Guidelines: Level 2 Hazard

GreenScreen evaluation

- Created by Clean Production Action in 2007
- Based on EPA Safer Choice hazard criteria
- 18 endpoints for human and environmental health
- Translates into four benchmarks from 1 Avoid to 4 Prefer

TABLE 1. **Example GreenScreen Hazard Summary Table for a Chemical**

Group I Human					Group II and II* Human									Ecotex		Fate		Physical	
C	M	R	D	E	AT	ST		N		SnS*	SnR*	IrS	IrE	AA	CA	P	B	Rx	F
						SINGLE	REPEATED*	SINGLE	REPEATED*										
DG	*L*	*L*	**M**	**M**	DG	*L*	*L*	**M**	**M**	**L**	**L**	**L**	**L**	*L*	*L*	*vH*	*M*	*L*	*L*

Glossary of GreenScreen® Hazard Endpoint Abbreviations

AA Acute Aquatic Toxicity
AT Acute Mammalian Toxicity
B Bioaccumulation
C Carcinogenicity
CA Chronic Aquatic Toxicity
D Developmental Toxicity
E Endocrine Activity
F Flammability
IrE Eye Irritation
IrS Skin Irritation
M Mutagenicity and Genotoxicity
N Neurotoxicity
P Persistence
R Reproductive Toxicity
Rx Reactivity
SnS Sensitization (Skin)
SnR Respiratory Sensitization
ST Systemic/Organ Toxicity

* *Repeated exposure*

IC2 Guidelines: Level 1 Exposure

Qualitative comparison for substantial differences

Preliminary questions on hazard

Compare Physicochemical properties

Compare Exposure pathways

Additional questions, if needed

- Environmental monitoring and biomonitoring
- Manufacturing
- Life cycle

Selected physiochemical properties

Property	Reason	Guidelines (NAS, 2014)
Volatility/ vapor pressure	Volatility/vapor pressure influence how likely the chemical is to be found in the air or how likely it is to enter the body	>10-8 mmHg; considered likely to found in the air. > 10-4 mmHg; considered to be more likely to enter the body.
Molecular weight	Generally, as molecular weight and size increase, bioavailability decreases (leading to a lower toxicity potential)	>1,000 amu is less likely to be bioavailable
Solubility in water	Generally, a chemical that is highly soluble in water will have more bioavailability and toxicity and is more likely to be found in water bodies and precipitation.	<1 ppb generally have lower water solubility
Log Kow	The log of the water-octanol coefficient (Log Kow), is an indicator of potential for bioaccumulation and bioavailability.	<5 for mammals <4 for aquatic species
Boiling and melting points	These help to determine if the chemical will be a solid, liquid or gas at a certain temperature.	<25 C will be a gas at room temperature <25 C will be a liquid at room temperature
Density/ specific gravity	Has implications for where the chemical might partition when with other liquids or gases.	
pH	A measure of free hydrogen. Has implication for water solubility and potential damage to cells.	For certain products, a pH of >2 and <11.5 is safest for eyes and skin (Safer Choice 2015)
Environmental Partitioning	A measure of how easily molecules or salts will break apart in under certain conditions (primarily in solution)	The higher the constant (Kd), the more likely the molecules or salts will break apart.

IC2 Guidelines: Level 1 Performance

Series of questions based on qualitative data and promotional materials:

What are the performance needs at the chemical, material, product, and process level?

Has the alternative already been identified as favorable with respect to performance?

Has an authoritative body demonstrated that the alternative functions adequately for both the process and product?

Is the alternative considered favorable but there are indications that it does not perform as well as the current chemical?

Has the proposed alternative been identified by expert sources as unfavorable?

IC2 Guidelines: Level 1 Cost and Availability

Basic Cost and Availability

Is the alternative currently used and offered for sale?

Is the price competitive?

IC2 Guidelines: Level 2 Stakeholder Involvement

- Seek input from external stakeholders

Contact stakeholders

Identify potential concerns

Address/mitigate concerns if possible

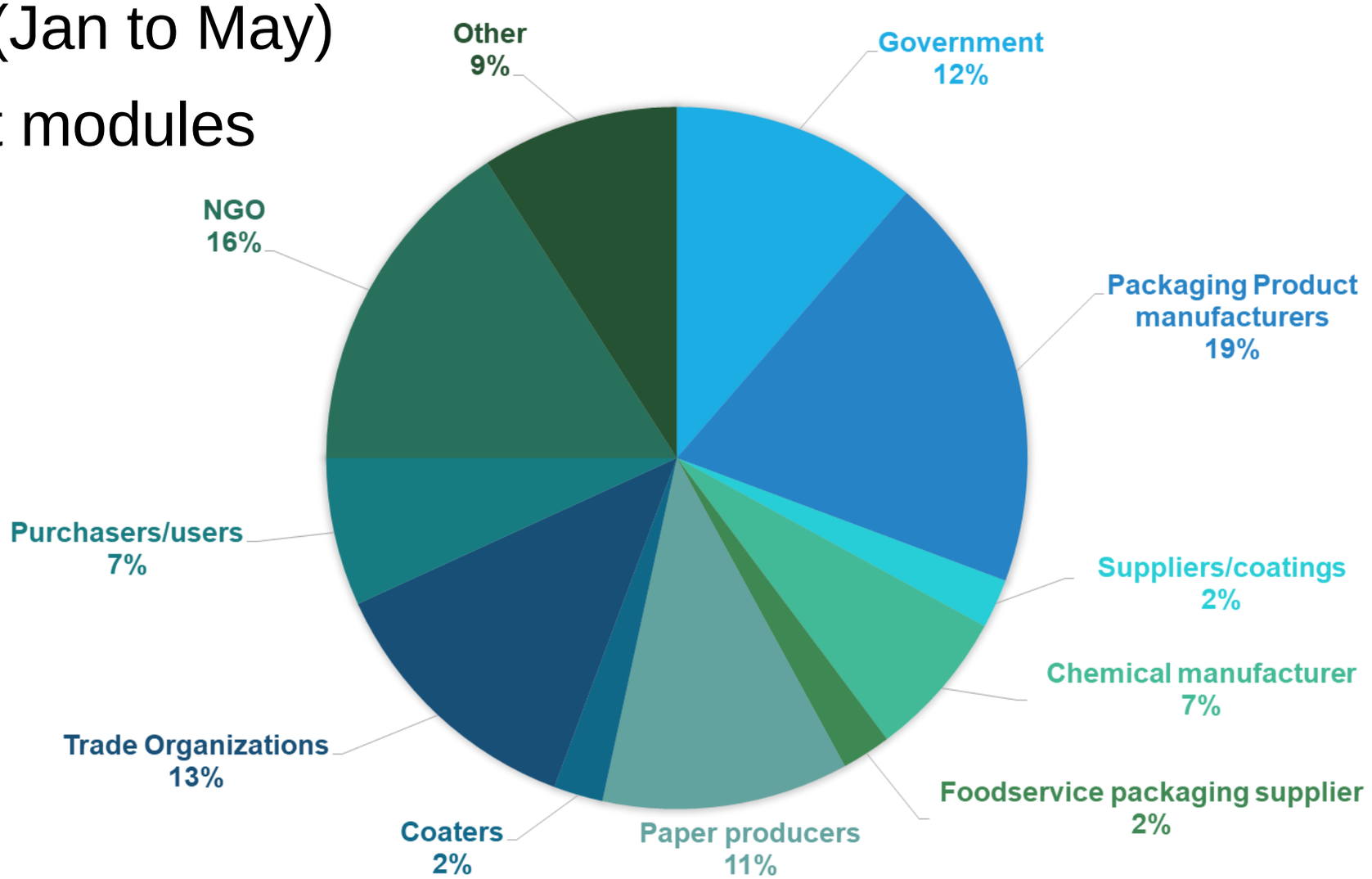
Incorporate concerns into decision making

Stakeholder Involvement

- Website with updates

  https://www.ezview.wa.gov/site/alias__1962/37610/pfas_in_food_packaging_alternatives_assessment.aspx

- Monthly Webinars (Jan to May)
- Comments on draft modules
- Small meetings



Product Categories in Scope

- **Category 1:** Paper Wraps, Liners, Bags & Sleeves

- **Category 2:** Dinnerware
  - Plates, bowls, trays

- **Category 3:** Food Service Containers
  - “Take-out” cartons or containers for storage and transport

Proposed Alternative Chemicals for Hazard Evaluation

Low Concern	EPA Safer Chemical	Hazard Evaluation Candidates
Uncoated paper	Petroleum wax[1]	Silicone coatings
Aluminum foil	Bio-based wax[2]	Polyvinyl alcohol coatings
	Kaolin clay (CAS 1332-58-7)	Polylactide (foam, plastic, coating) (CAS 9051-89-2)
		Polyethylene coatings
		Polyethylene terephthalate coatings
		Additives, residuals, contaminants, degradation products

1. Related EPA SCIL listings may include Paraffin waxes, petroleum, clay-treated (CAS 64742-43-4) and Paraffin waxes, petroleum, hydrotreated (CAS 64742-51-4)
2. Related EPA SCIL listings may include Soybean oil and soybean oil derivatives that could be hydrogenated to produce waxy substances: soybean oil (CAS 8001-22-7), soybean oil fatty acids (CAS 68308-53-2), soybean oil, methyl esters (CAS 67784-80-9), and soybean oil, sulfated, sodium salt (CAS 61790-16-7)

CBI Submission Update

- Ecology collaboration with product manufacturers to conduct hazard assessments of potential alternatives.

- Two Options: 1) Submit product info directly to Ecology, or 2) Submit GreenScreen for product.
  - GreenScreen must be conducted by a Licensed GreenScreen® profiler.
  - Ecology must have access to full report.

- Ecology staff working with companies to facilitate timely CBI reviews & information sharing.

More information can be found in the CBI Process for PFAS AA 4-8-20 document on the ezview website.

Current Timeline

June - July 2020 – CBI Submission from Stakeholders

June-Early August 2020 - SRC Final Report & Ecology/DOH Review

Late August - Early October 2020 – Peer Review by WA State Academy of Sciences

August-September 2020: Public Comment Period

Late October - November 2020 – Final AA Review

December 2020 – Submit potential notice to WA State Register

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