DEPARTMENT OF ECOLOGY
State of Washington

Washington State Department of HEALTH

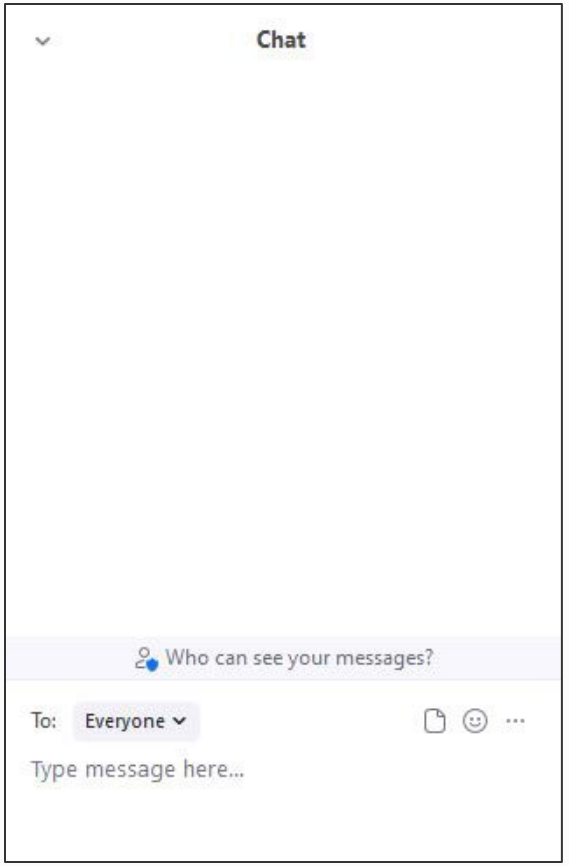
Safer Products for Washington

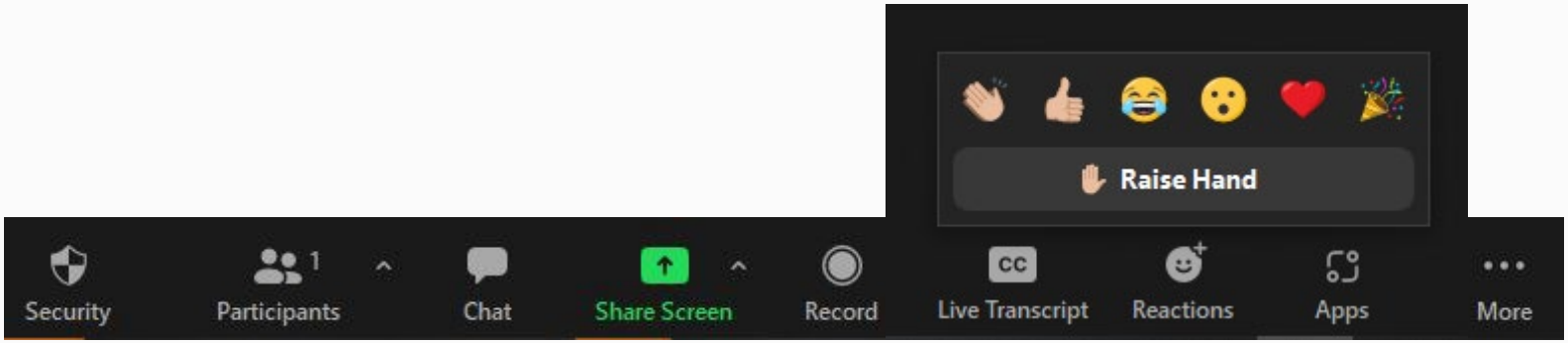
Cycle 1.5 PFAS Chemical Action Plan Implementation Cycle

August 10, 2023

Zoom Logistics

- Contact Joshua Kinne (co-host) with Zoom questions.
- Send questions, comments, and discussion to **Everyone** in chat.
- Participants are muted until the Q&A sections.





Safer Products for Washington Team

Staff working on Safer Products for Washington Cycle 1.5 PFAS Chemical Action Plan Implementation Cycle

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Webinar agenda

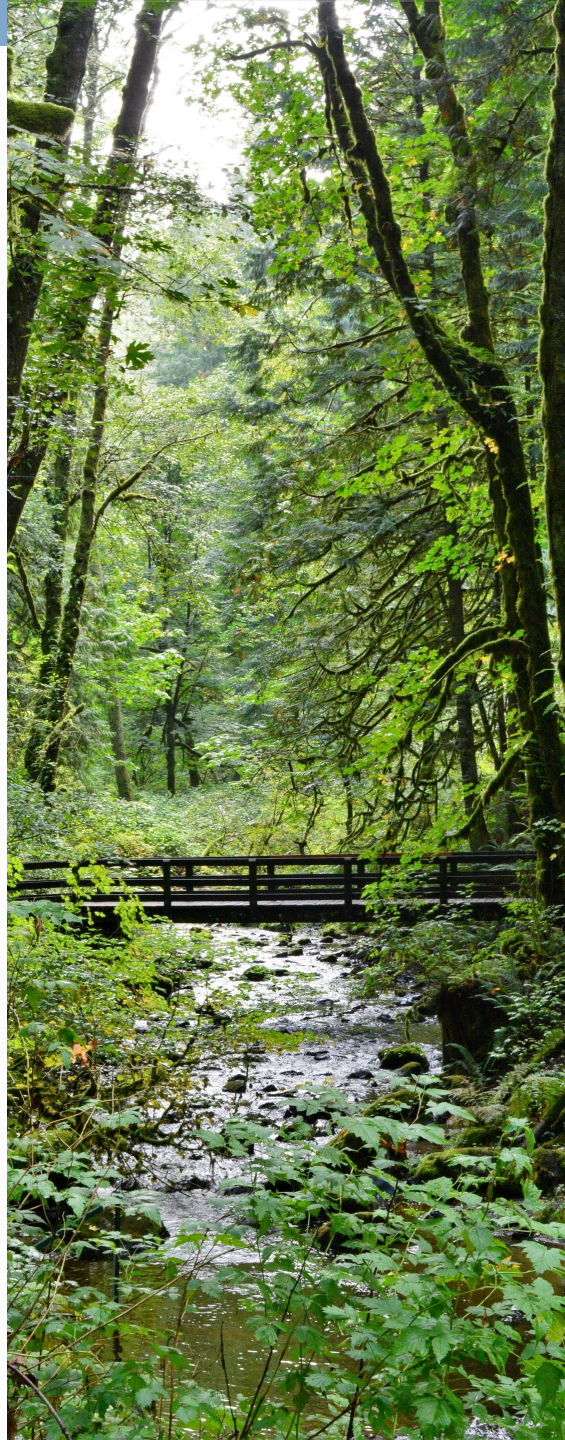
1. Program introduction
2. Technical methods overview
3. Preliminary conclusions
4. Reducing PFAS in products
5. Alternatives to PFAS in products
6. Conclusions
7. Final questions and answers

Safer Products for Washington Introduction

Part 1

Safer Products for Washington Background

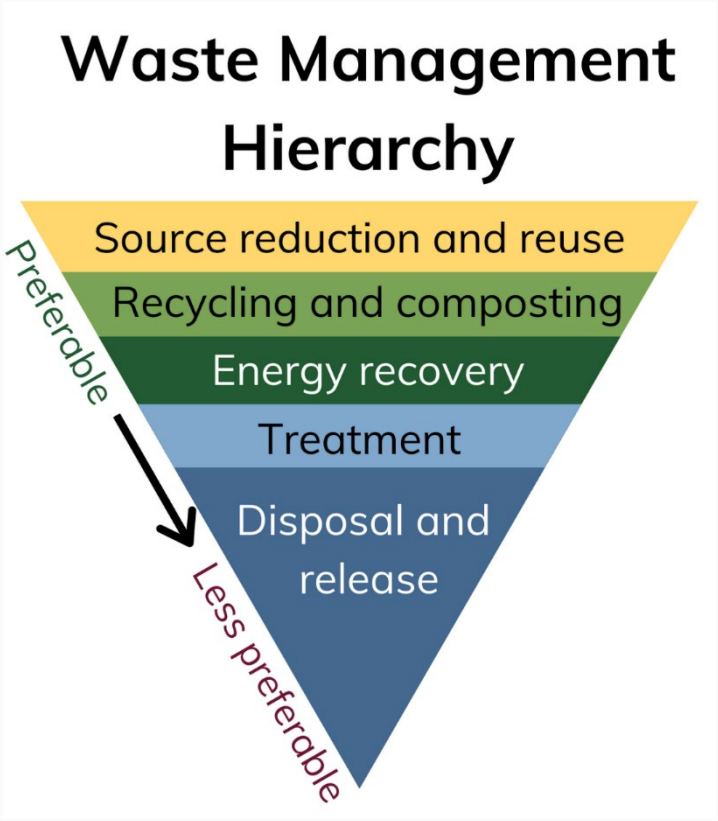
- Implementation program
- Law signed in May 2019
- Equitably reduce exposure to toxic chemicals from consumer products
- Prevent releases of toxic chemicals into the environment



Why do we need to reduce toxic chemicals in consumer products?

- Once hazardous chemicals are in consumer products, reducing exposure is challenging.
- It's hard to predict how people will use consumer products and what they'll do with them when they're done.
- Contamination from hazardous chemicals in consumer products can:
  - Expose communities and wildlife
  - Harm environmental resources

Reduce risks by reducing the use of hazardous chemicals



- Focus on reducing risk by avoiding the use of hazardous chemicals.
- Healthier for people and the environment.
- Avoids the monetary and environmental costs associated with hazardous chemical cleanups.

↓ Hazard X Exposure = ↓ Risk

Safer Products for Washington Implementation Process

Phase 1

PRIORITY CHEMICAL CLASSES

Select priority chemicals and chemical classes to focus on during the cycle.

Phase 2

PRIORITY CONSUMER PRODUCTS

Identify which consumer products contain these chemicals and can harm people and the environment.

Phase 3

REGULATORY ACTIONS

Determine whether we'll regulate when these chemicals are used. Will we require notice, restrict/prohibit, or take no action?

Phase 4

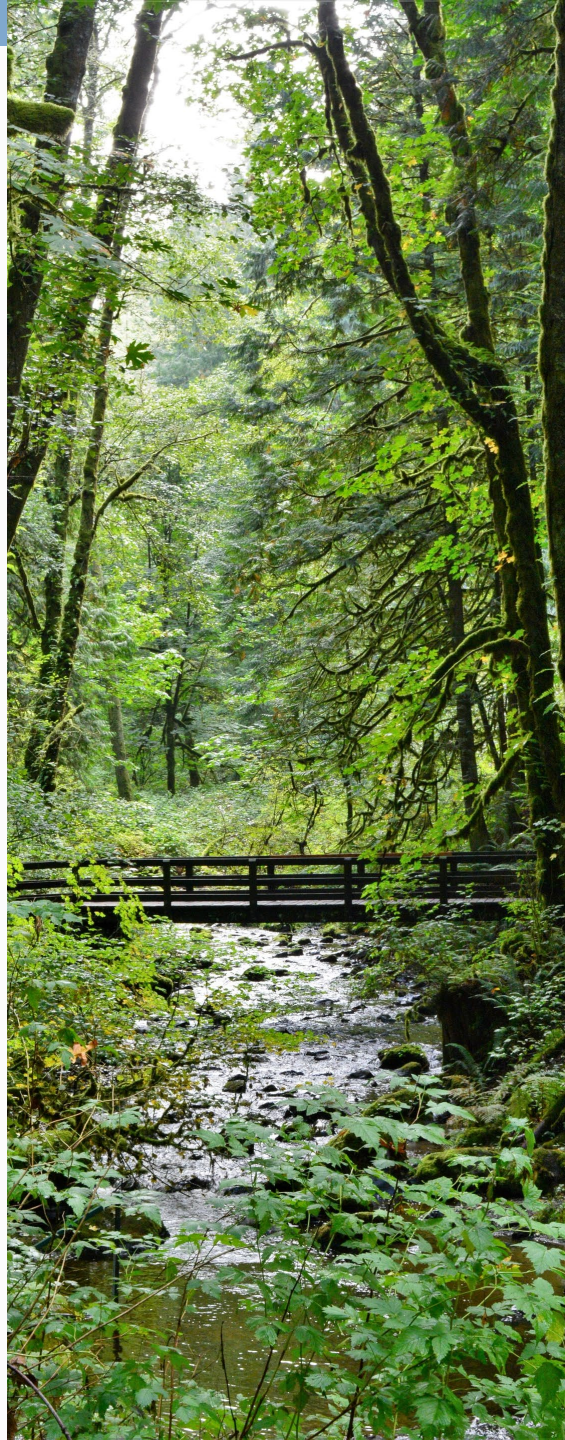
RULEMAKING

Restrict the use of chemicals in products or require reporting to keep people and the environment safer.

Back to Phase 1

Current Safer Products for Washington Phases

- Cycle 1 Phase 4: Rule adopted May 2023
  - Chapter 173-337 WAC
- Cycle 2 Phase 1: Draft Priority Chemical Report Released June 2023
- **Cycle “1.5” Phase 3: Preliminary Conclusions Webinar Today!**



Cycle 1.5 Focuses on PFAS

- PFAS are a class of fluorinated organic chemicals containing at least one fully fluorinated carbon atom.
- In 2022, the Legislature amended 70A.350 RCW to add specific requirements to reduce PFAS in products.
  - Allows us to consider products identified in the final PFAS Chemical Action Plan as priority products without additional actions
  - Identifies firefighting personal protective equipment as a priority product
  - Establishes a timeline for an initial set of regulatory actions

Priority Products from the Chemical Action Plan

- Firefighting Personal Protective Equipment
- Apparel and gear
- Nonstick cookware and kitchen supplies
- Cleaning products
- Car waxes and washes
- Floor waxes
- Hard surface sealants
- Ski wax

Safer Products for Washington Implementation Process

Phase 1
May 2019

PRIORITY CHEMICAL CLASSES

Select priority chemicals and chemical classes to focus on during the cycle.

Phase 2
May 2022

PRIORITY CONSUMER PRODUCTS

Identify which consumer products contain these chemicals and can harm people and the environment.

Phase 3
June 2024

REGULATORY ACTIONS

Determine whether we'll regulate when these chemicals are used. Will we require notice, restrict/prohibit, or take no action?

Phase 4
December 2025

RULEMAKING

Restrict the use of chemicals in products or require reporting to keep people and the environment safer.

Timeline for Phase 3

2022
Introductory webinar (September)

2023
Preliminary conclusions (Today!)

2023
Draft report and formal public comment period (December and January)

2024
Final report to the legislature (June)

Technical Methods for Phase 3

Part 2

Phase 3

Regulatory Determinations:

- Restriction
- Reporting Requirement
- No Action

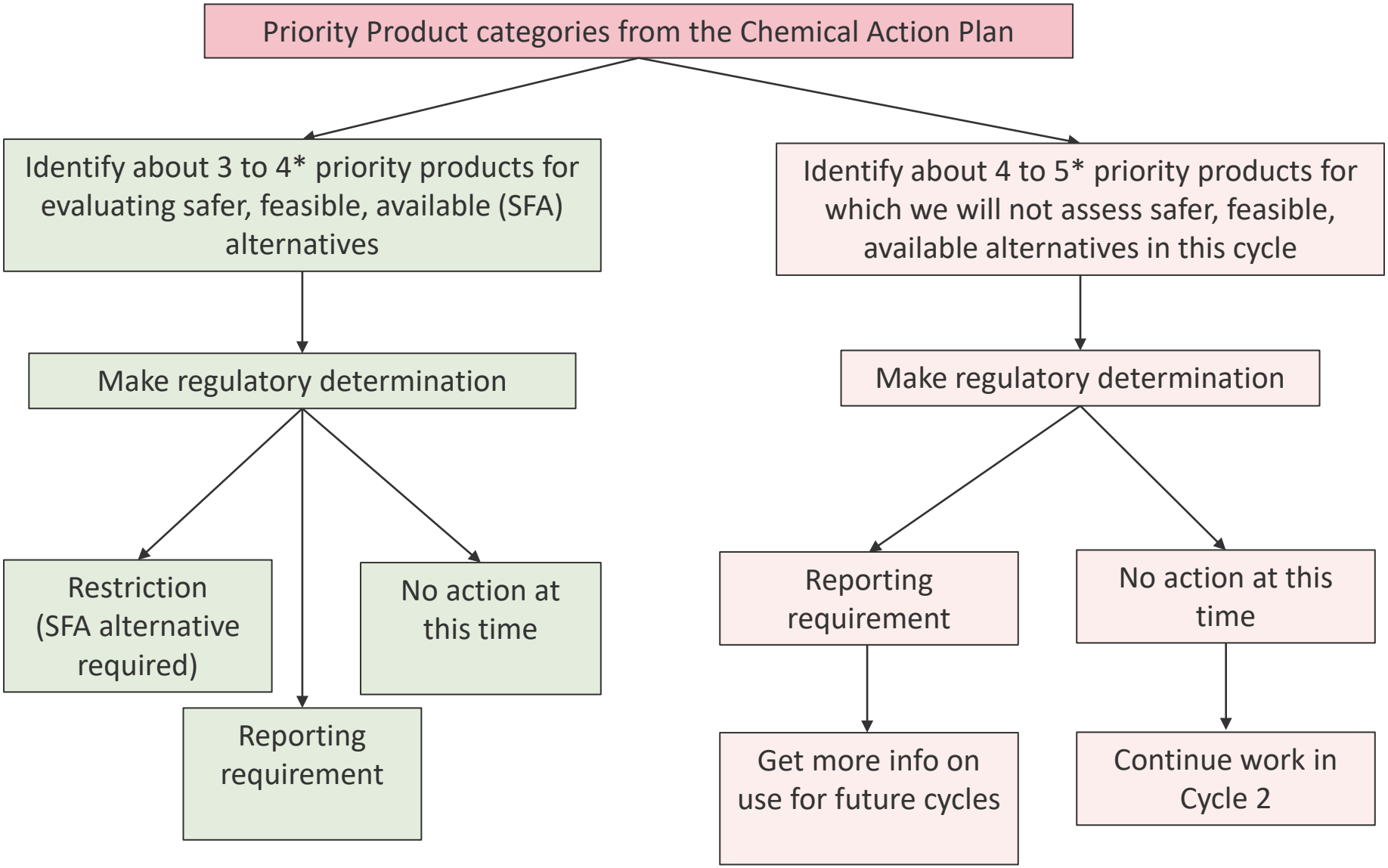
If we propose a restriction:

- Safer alternatives must be feasible and available.
- It must reduce a significant source or use.

What do we consider when making regulatory determinations?

- Feasibility and availability of safer alternatives
- Whether a restriction would reduce a significant source or use
  - Estimations of the volume used or present in Washington
  - Potential for exposures to sensitive species and populations
  - Leverage information in the chemical action plan
- Preliminary market analysis

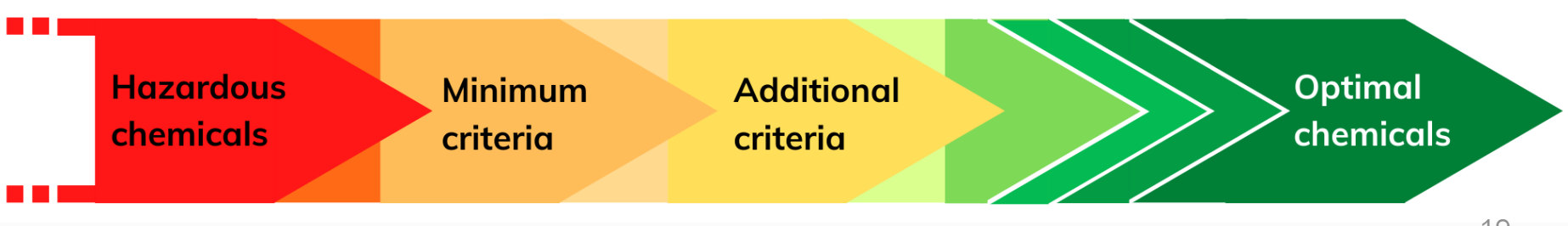
Possible Regulatory Determinations



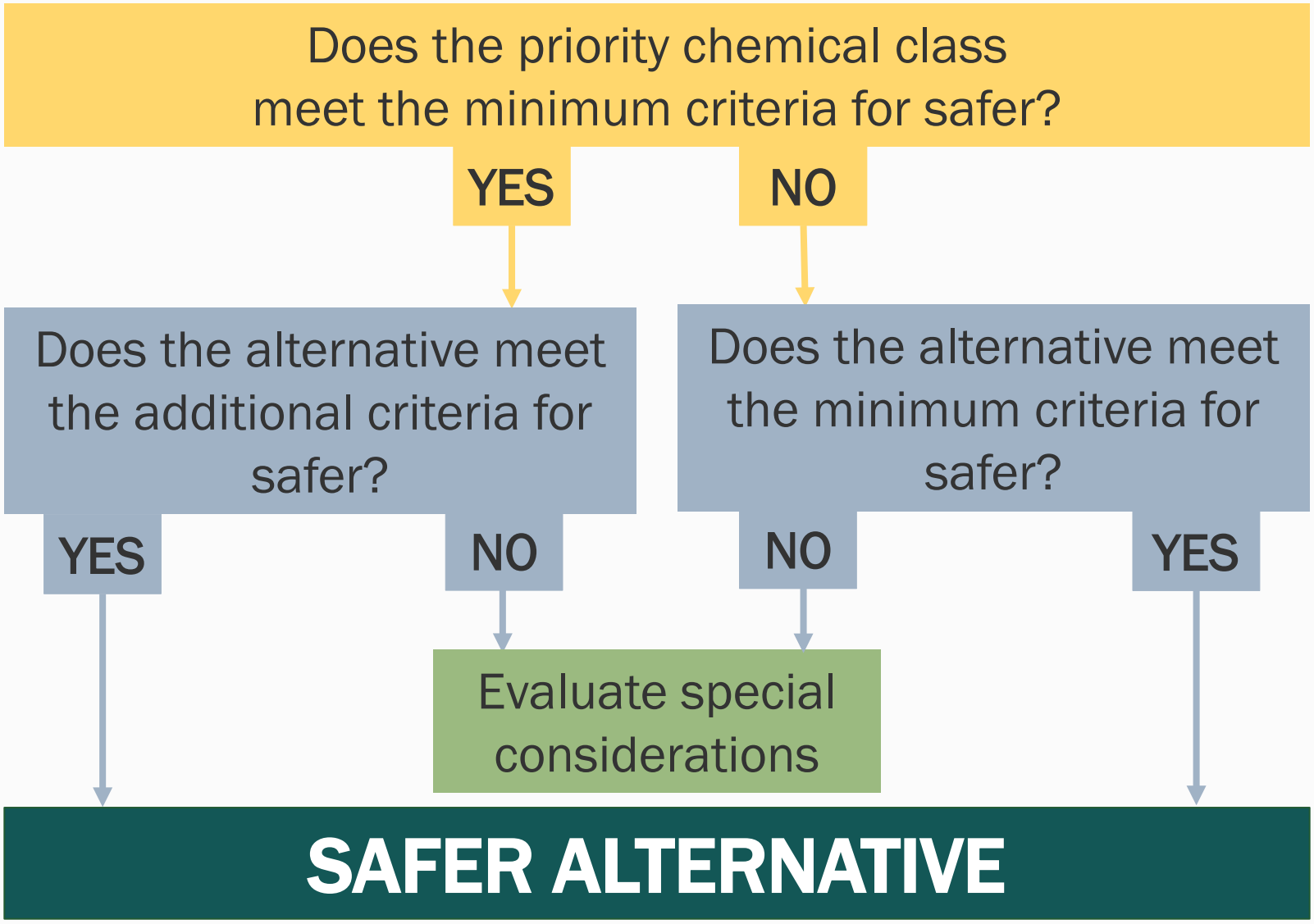
*numbers have shifted slightly

What is Safer?

- "Safer alternative" means an alternative that is less hazardous to humans or the environment than the existing chemical or chemical process.
- A safer alternative to a particular chemical may include a chemical substitute or a change in materials or design that eliminates the need for a chemical alternative.



How do we identify safer alternatives?



What is the minimum criteria for safer?

- Chemicals used to function like priority chemicals cannot have:
  - High concerns for carcinogenicity, mutagenicity, reproductive or developmental toxicity, or endocrine disruption.
  - High toxicity in other ways and very persistent or very bioaccumulative.
  - Very high persistence and very high bioaccumulation.
- For a full description—see appendix C of the 2022 regulatory determinations report to the Legislature.

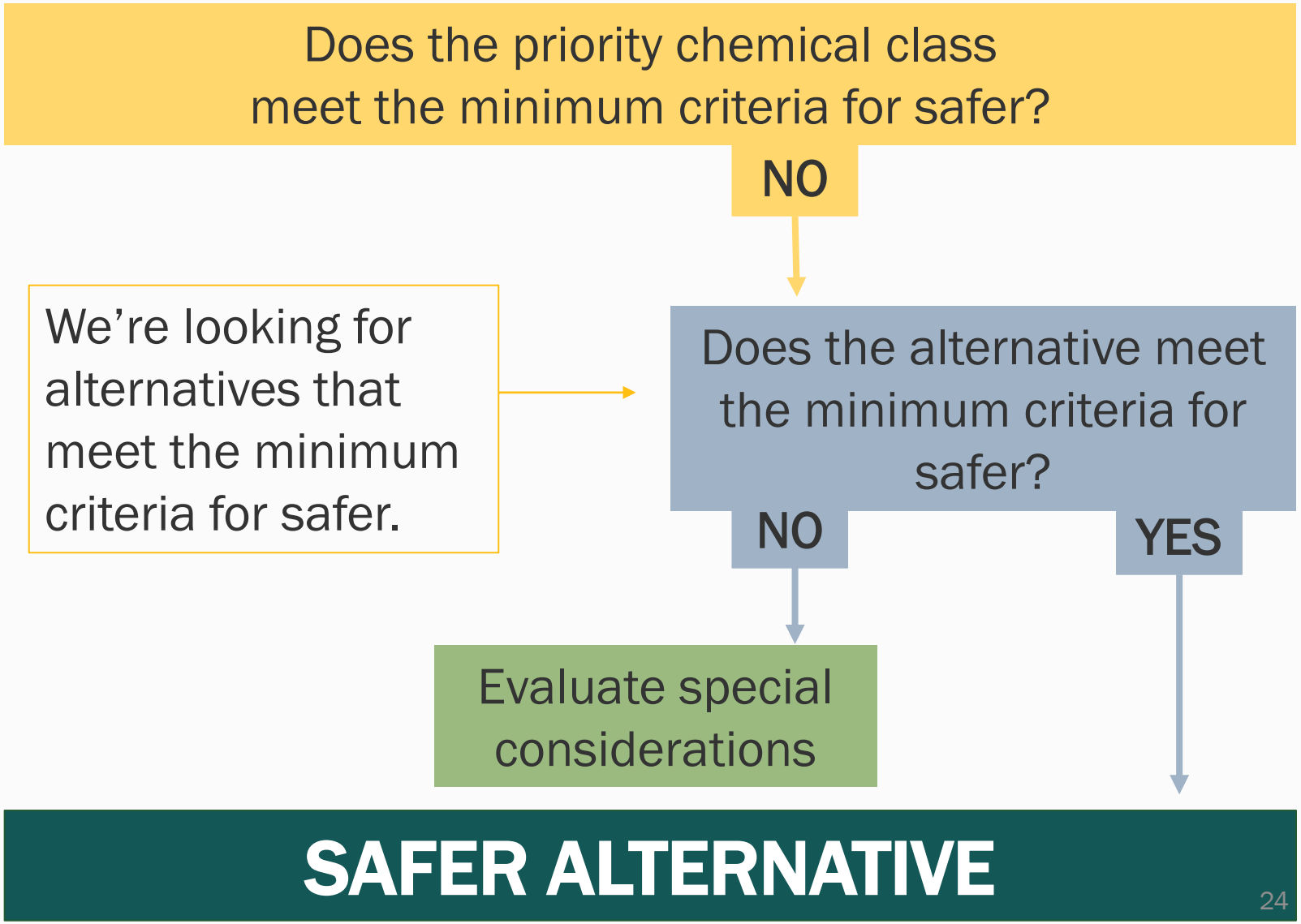
Hazards of PFAS

- All PFAS are persistent or break down to persistent PFAS.
- Many bioaccumulate.
- Many have reproductive and developmental toxicity.
- Many have systemic toxicity including immunotoxicity, neurotoxicity and thyroid toxicity.
- Some are toxic to aquatic organisms.

Do PFAS meet the minimum criteria for safer?

- There is some variability in PFAS as a class.
- Our 2022 regulatory determinations report determined that PFAS as a class do not meet our minimum criteria for safer.
  - Evaluated 14 data-rich PFAS
  - Common hazard concerns included: persistence and bioaccumulation, carcinogenicity, reproductive and developmental toxicity and systemic toxicity

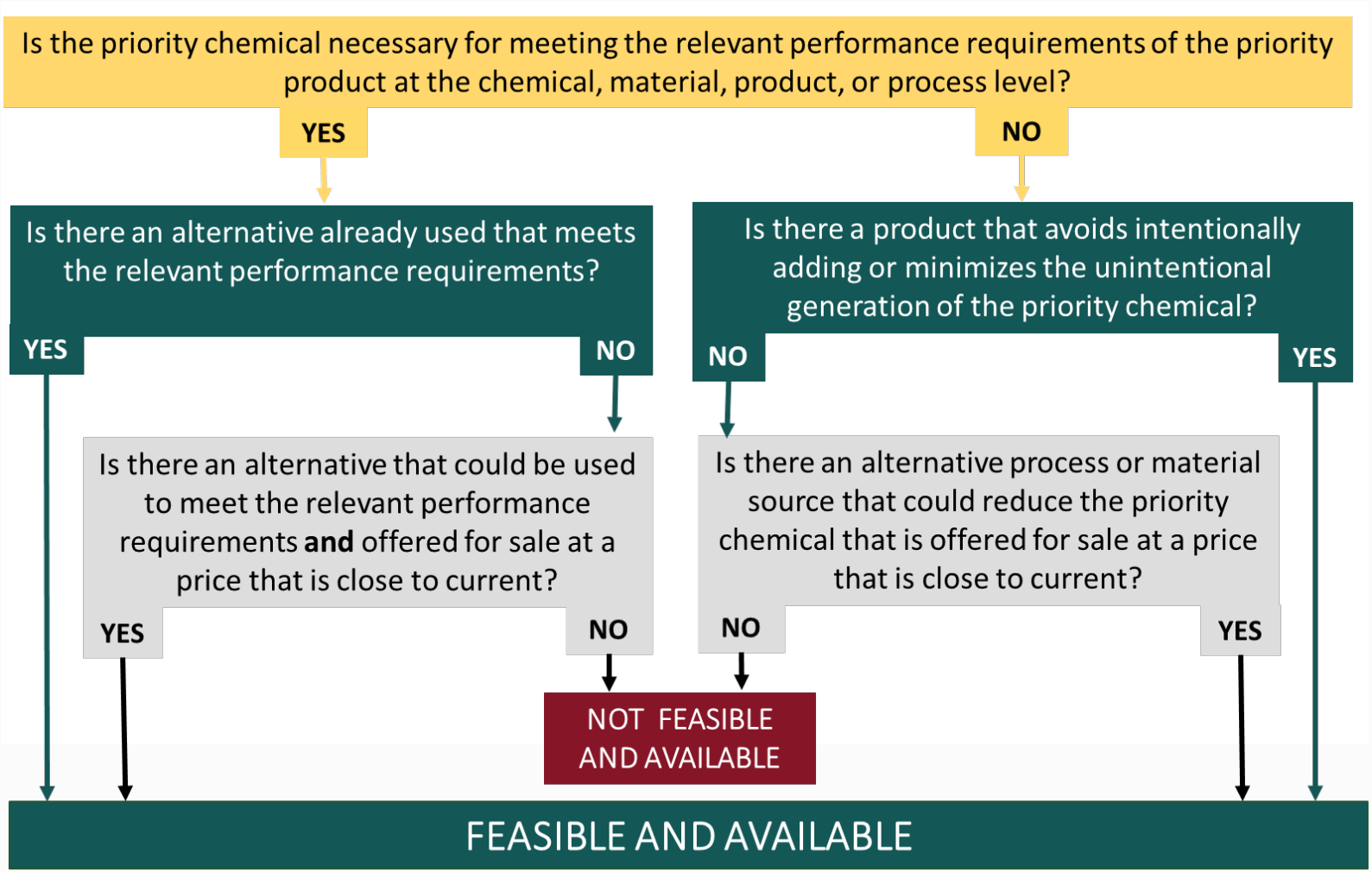
How do we identify safer alternatives?



How can we show alternatives meet our minimum criteria for safer?

- Some existing hazard assessments and certifications either meet or can meet our minimum criteria for safer with additional verification.
- Hazard assessments:
  - GreenScreen® Benchmark 2, 3 and 4
  - Chemforward Bands C, B and A
  - Scivera Yellow, Yellow/Green and Green
- Product certifications:
  - Cradle to Cradle Certified®: Material health certificate silver, gold and platinum
  - Some GreenScreen® certified products
- EPA Labels:
  - Safer chemical ingredients list chemicals evaluated against the master criteria
  - Safer choice products (depends on chemical function)
- More details can be found in appendix E of our 2022 Regulatory Determinations Report to the Legislature.

How do we show that alternatives are feasible and available?

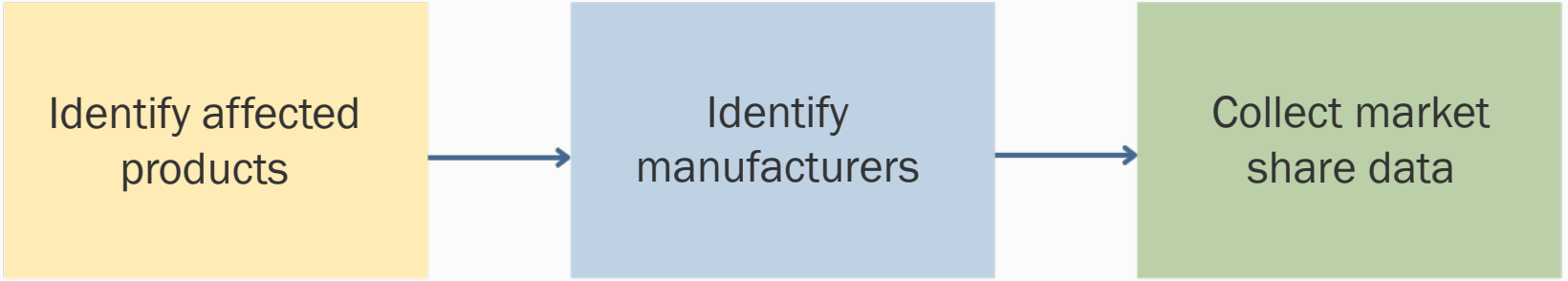


*Any reference in this presentation to persons, organizations, services, products, or activities does not constitute or imply endorsement, recommendation, or preference by the Washington Department of Ecology.

Market Analysis

The purpose of market analysis is to assess the availability, price, demand, and market impact of alternatives

Steps completed in market analysis



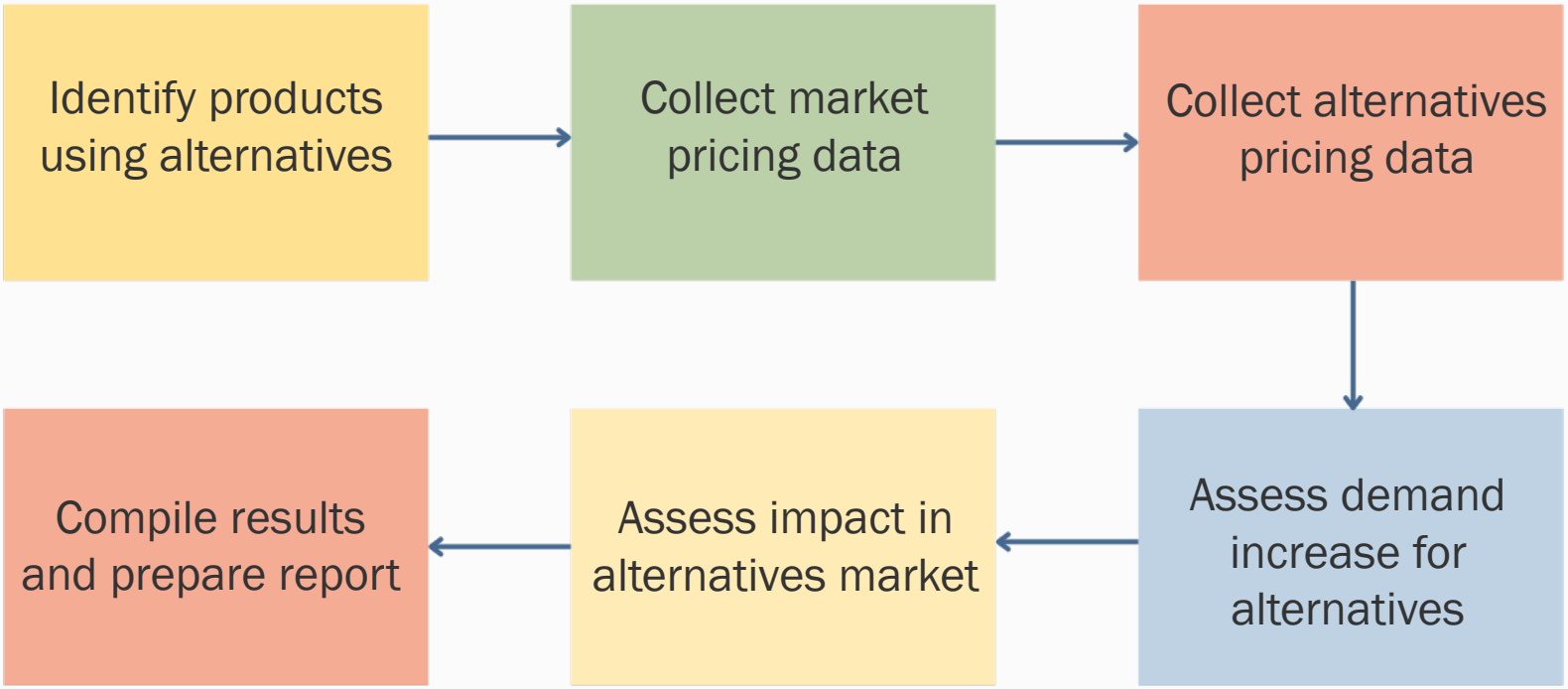
NAICS Categories of Impacted Manufacturers

NAICS Code	Description	Priority Product
313310	Textile and fabric finishing mills	Firefighting PPE
315250	Cut and sew apparel manufacturing (except contractors)	Apparel and gear
315990	Apparel accessories and other apparel manufacturing	Apparel and gear
325510	Paint and coating manufacturing	Hard Surface sealants
325611	Soap and other detergent manufacturing	Cleaning products
325612	Polish and other sanitation good manufacturing	Cleaning products, Car waxes and washes, Floor waxes and polishes
325620	Toilet preparation manufacturing	Cleaning products
332215	Metal kitchen cookware, utensil, cutlery, and flatware manufacturing	Nonstick cookware and kitchen supplies
339113	Surgical appliance and supplies manufacturing	Firefighting PPE
339920	Sporting and athletic goods manufacturing	Ski waxes

Data Collection

Products	Number of Impacted Businesses	Estimated WA Market Size
Firefighting PPE	1 - 63	$8.0 million
Apparel and Gear	7 - 395	$140.4 million
Cleaning Products	7 - 259	$316.1 million
Car Washes and Waxes	1 - 48	$12.5 million
Floor Waxes and Polishes	1 - 48	$12.5 million
Ski Waxes	2 - 75	$3.7 million
Hard Surface Sealants	3 - 90	$77.3 million
Nonstick Cookware	1 - 48	$2.0 million

Next Steps for Market Analysis

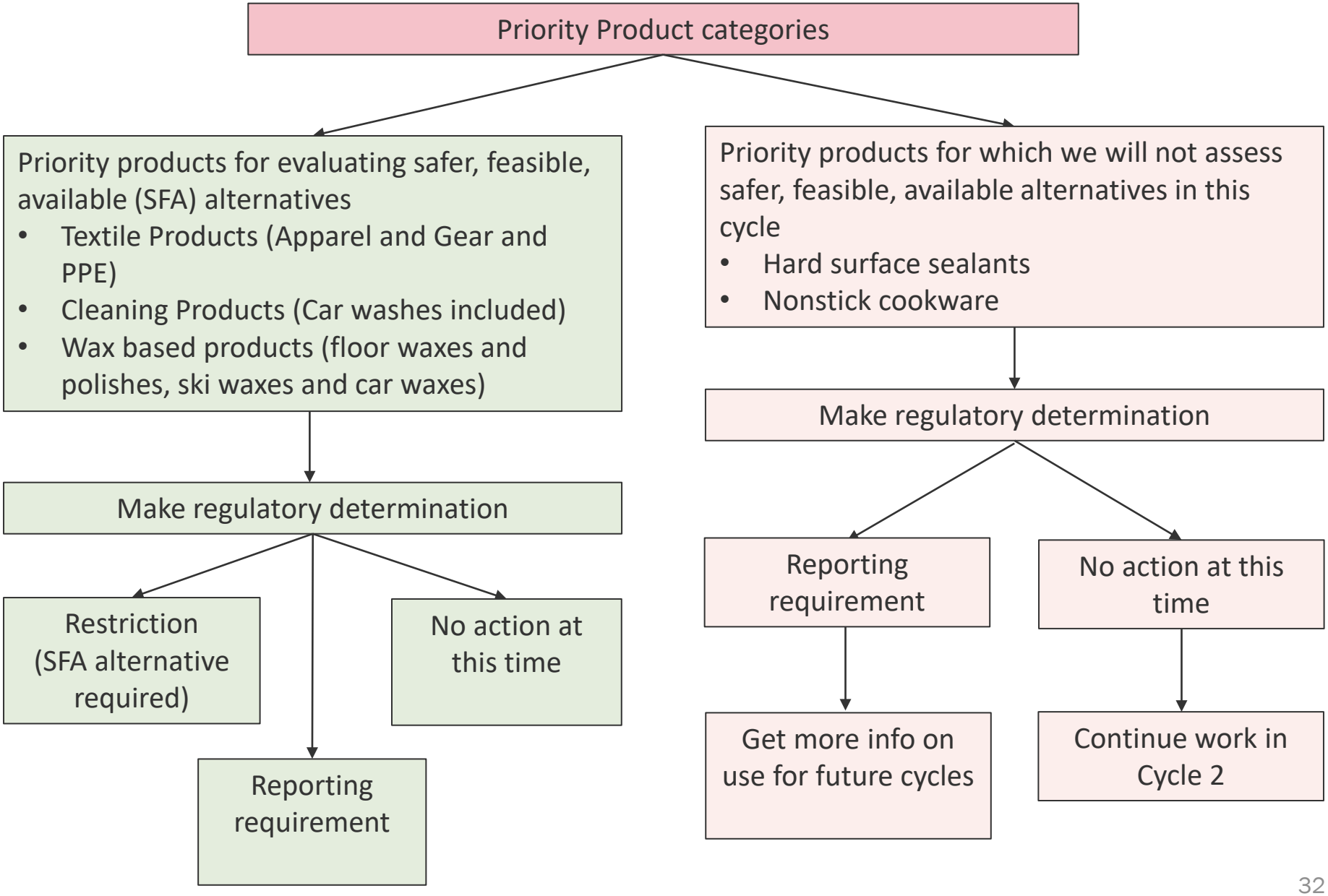


We encourage you to reach out to us (economics@ecy.wa.gov) if you have additional information you'd like us to consider.

Preliminary Conclusions

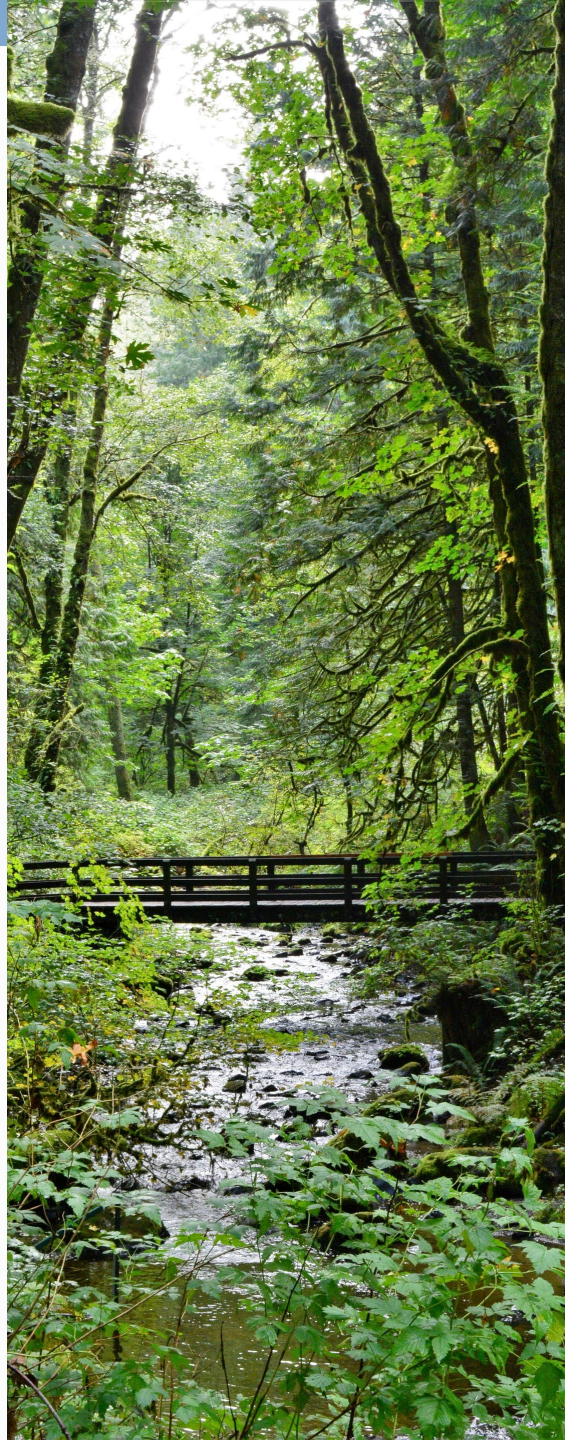
Part 3

Possible Regulatory Determinations



Preliminary Conclusions 2

- Based on information we currently have.
- We are actively soliciting more information that may change our conclusions.
- **We encourage you to reach out to us if you have additional information you'd like us to consider!**



Preliminary Conclusions on Alternatives

Products	Safer, Feasible, Available Alternatives	Next Steps
Firefighting PPE	In progress	Manufacturer order and outreach
Apparel and Gear	In progress	Manufacturer order and outreach, hazard assessments
Cleaning Products	In progress	Hazard assessments in progress
Car Washes	In progress	Hazard assessments in progress
Car Waxes	In progress	Manufacturer outreach
Floor Waxes and Polishes	In progress	Manufacturer outreach, hazard assessments
Ski Waxes	In progress	Manufacturer outreach

Preliminary Regulatory Determinations

Products	Preliminary Regulatory Determinations	Rationale
Firefighting PPE	No Action	Continue work in cycle 2
Apparel and Gear	No Action	Continue work in cycle 2
Floor Waxes and Polishes	No Action	Continue work in cycle 2

Preliminary Regulatory Determinations Cont.

Products	Preliminary Regulatory Determinations	Rationale
Cleaning Products	Reporting Requirement	PFAS exposure concerns
Car Washes	Reporting Requirement	PFAS exposure concerns
Car Waxes	Reporting Requirement	PFAS exposure concerns
Ski Waxes	Reporting Requirement	PFAS exposure concerns
Hard Surface Sealants	Reporting Requirement	PFAS exposure concerns
Nonstick Cookware and Kitchen Supplies	Reporting Requirement	PFAS exposure concerns

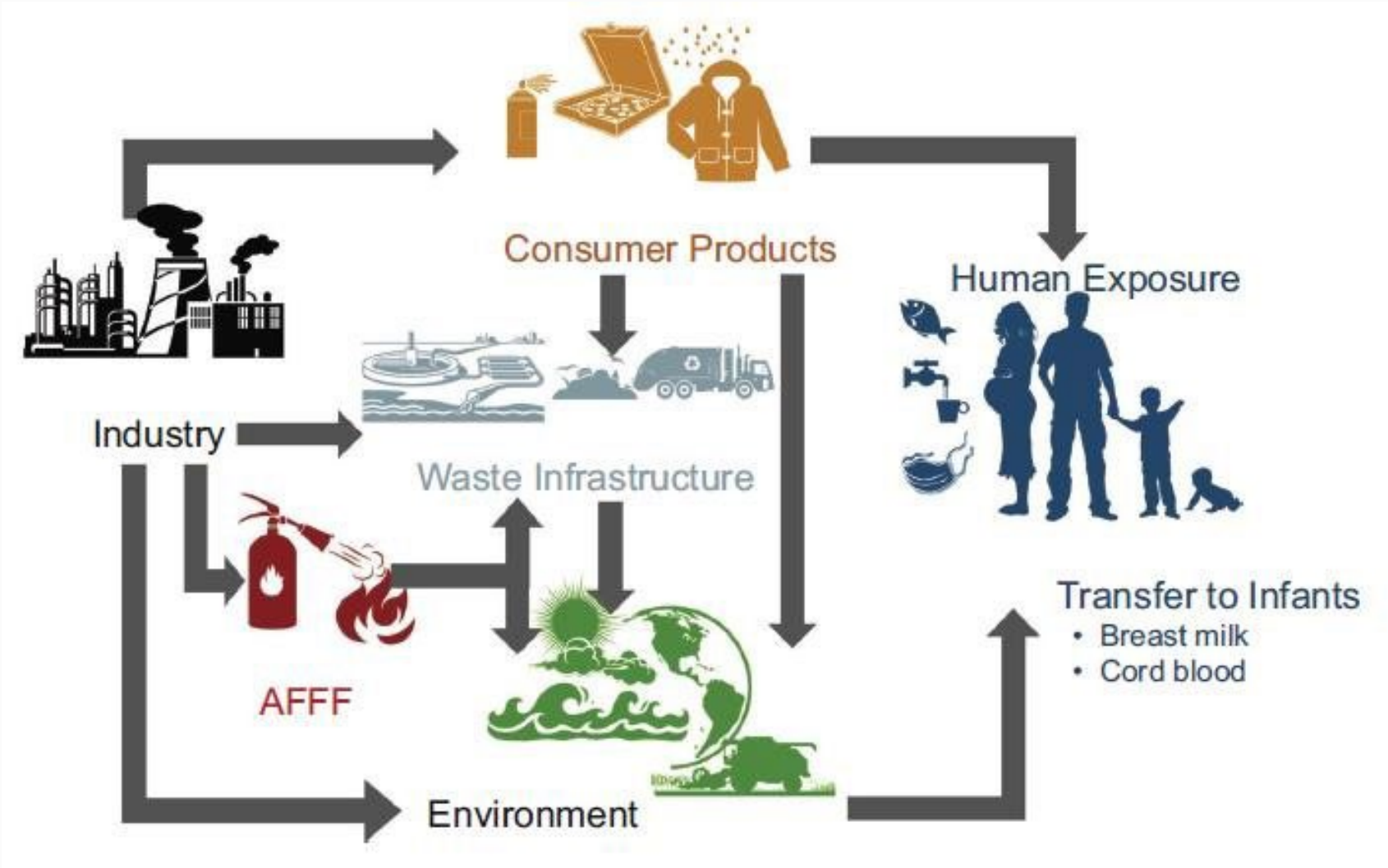
Reducing PFAS in Products

Part 4

Significant Sources or Uses

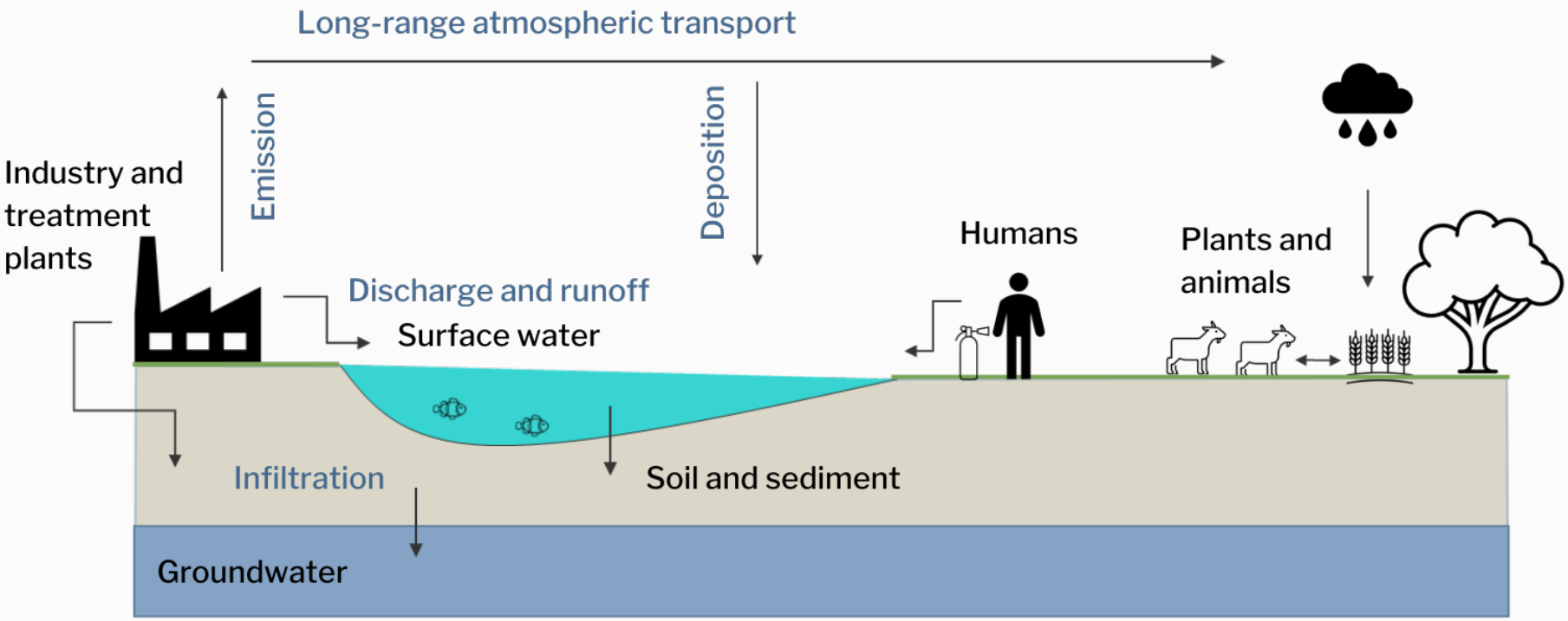
- The **estimated volume** of a priority chemical in products in Washington
- The **potential for exposure** in sensitive populations or sensitive species
- The potential for priority chemicals to be **found in the environment**
- Other regulations
- The availability and feasibility of safer alternatives
- Whether the department has already identified the consumer product in a **chemical action plan** completed under chapter 70A.300 RCW as a source of a priority chemical

Human Exposure Pathways



Sunderland et al. (2019)

Environmental Exposure Pathways



Apparel and Gear

Where is PFAS found?

- Used for stain resistance and waterproofing
- Household items
  - Umbrellas, sails, tents, shoes, coats, school uniforms, climbing rope

PFAS Exposure

- Studies have shown PFAS presence in 72 percent of stain- and water-resistant coats and raincoats
- 160 kilograms PFAS used yearly as textile and apparel finishing agents

Firefighting PPE

Where is PFAS found?

- Used for waterproofing, steam burn protection, heat resistance in PPE
  - Found in the outer, middle, and inner layers of clothing
- Includes clothing and heat resistant masks

PFAS Exposure

- Multiple kinds of PFAS identified within turnout gear
  - Concentrations of each type varied

	Inner thermal liner (ppm)	Middle thermal liner (ppm)	Outer shell (ppm)
Unused gear	50 ± 22	105 ± 53	21,500 ± 5,000
Used gear	72 ± 39	145 ± 40	15,700 ± 3,700

Cleaning Products

Where is PFAS found?

- Stain removers, dishwasher and laundry detergent, shampoo, car wash soaps
  - Used in products that break down grease and stains

PFAS Exposure

- Approximately 109 kilograms PFAS used in soaps and household cleaning compounds yearly
- Approximately 1,125 kilograms PFAS used in manufacturing and industrial cleaning solvents and degreasers yearly

Waxes

Where is PFAS found?

- Used in ski, car, and floor waxes
- Most professional wax floor polishes contain PFAS
  - 0.3 to 8.7percent concentration of PFAS by mass identified on average

PFAS Exposure

- Airborne and environmental exposure occurs during application as well as cleanup
- Studies show 25 to 45 times the amount of PFAS in the blood of professional ski waxers

Cookware

Where is PFAS found?

- Most nonstick cookware including pots, pans, spatulas, and whisks
- Causes PFAS ingestion after food exposure

PFAS Exposure

- PFAS estimates in the home:
  - PFCA: 1,235 micrograms per home
  - FTOH: 11 micrograms per home

Hard Surface Sealants

Where is PFAS found?

- Increases stain, water, and oil resistance as well as makes a smooth finish
- Used on hard surfaces such as stone, tile, grout, concrete, wood, and asphalt

PFAS Exposure

- PFAS estimates in the home:
  - PFCA: 2,430 micrograms per home
  - FTOH: 423,000 micrograms per home

Q&A Notes for All Product Categories

- **Q:** Are you saying you are only proposing a reporting requirement for cookware for now and delaying alternatives assessment, or as your 'final' regulatory action?
- **Q:** In your product categories, are you covering food packaging materials? These are a direct exposure concern (and add to landfills)…is Ecology working on testing and removing PFAS packaging materials from the supply chain?
- **Q:** Given the level of variability as you discussed within the class of PFAS, will all 12,000 PFAS chemicals in the class be restricted or will specific chemicals be identified as appropriate?
- **Q:** What does the term “gear” mean in regards to Safer Products?
- **Q:** How does Ecology interact with data collection?
- **Q:** How about non-bioaccumulative and nontoxic PFAS?
- **Q:** Does “in process” mean that alternatives are in process — or that your evaluation of alternatives are in process?

Q&A Notes for All Product Categories

- **Q:** Market analysis issues. These might be too early in the process for you to address, but nevertheless wondering: 1. Equity Impacts (highly captured markets/rural/low-income/ testing access)? 2. Internet/out-of-state purchases (your global estimates perhaps) and grandfathered manufacturers/shelf life?
- **Q:** Are you also considering the financial costs of not acting to reduce exposure (e.g., costs for cleaning up groundwater and drinking water contamination in WA state, health impacts of exposure to PFAS)?
- **Q:** How does WA define "high concerns for carcinogenicity, mutagenicity, reproductive or developmental toxicity, or endocrine disruption" and "high toxicity in other ways and very persistent, bio accumulative, toxic"? Is this definition in statute or regulation?
- **Q:** "Whether a restriction would reduce a significant source or use." Does this go beyond a simple aggregate total and consider that significant exposures can occur to sub-populations, such as workers, hobbyists, etc.? Significant exposures may not occur to everyone, but they may be significant to certain subpopulations of individuals.

Alternatives to PFAS

Part 5

Priority Products

Textile Products

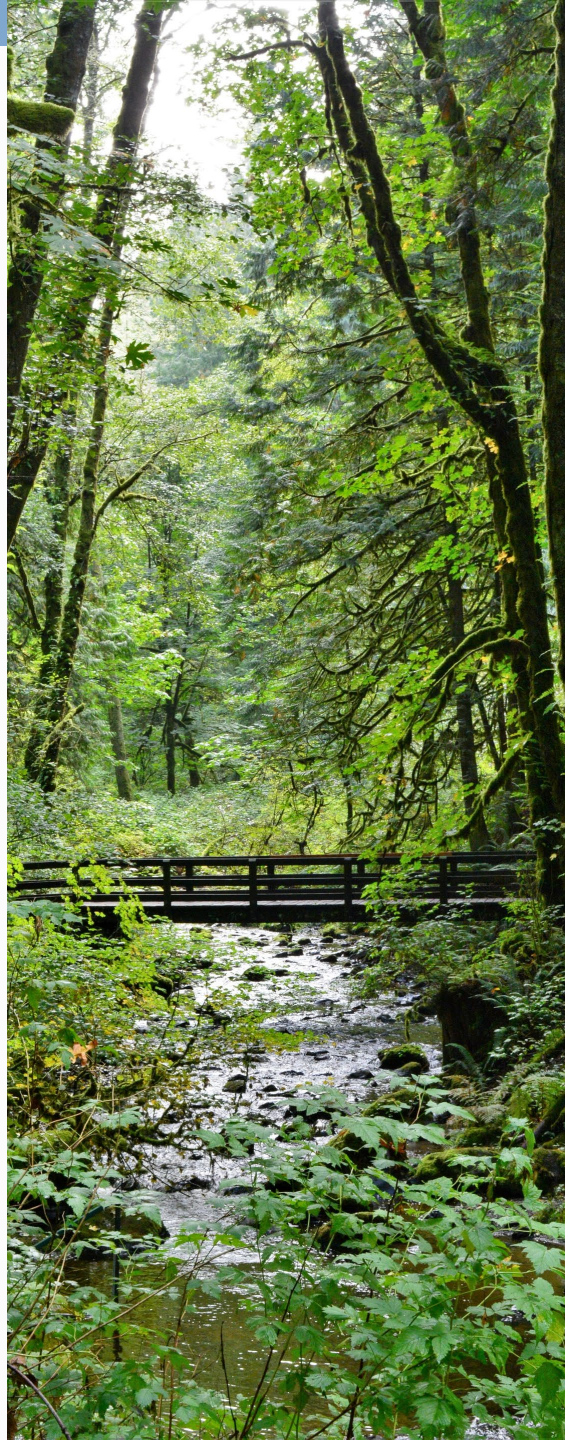
- Apparel and gear
- Firefighting PPE

Cleaning Products

- Cleaning products
- Car washes

Wax-based Products

- Car waxes
- Floor waxes
- Ski Waxes



Safer Products for Washington:

Apparel and Gear

Firefighting Personal Protective Equipment

Justin N. Rewerts, PhD
Hazardous Waste and Toxics Reduction Program

Overview:

Apparel and Gear

Firefighting Personal Protective Equipment

For each priority product:

- Function of PFAS
- Scope of product classes
- Preliminary findings

Function of PFAS in Apparel Textiles

- Added to textiles for repellent properties
  - Water, oil, stain repellency
  - Makes some apparel products easier to clean
- Added to rain gear to help keep users dry
- Used for broad applicability to many different fabric types

Typical Applications of PFAS to Textiles

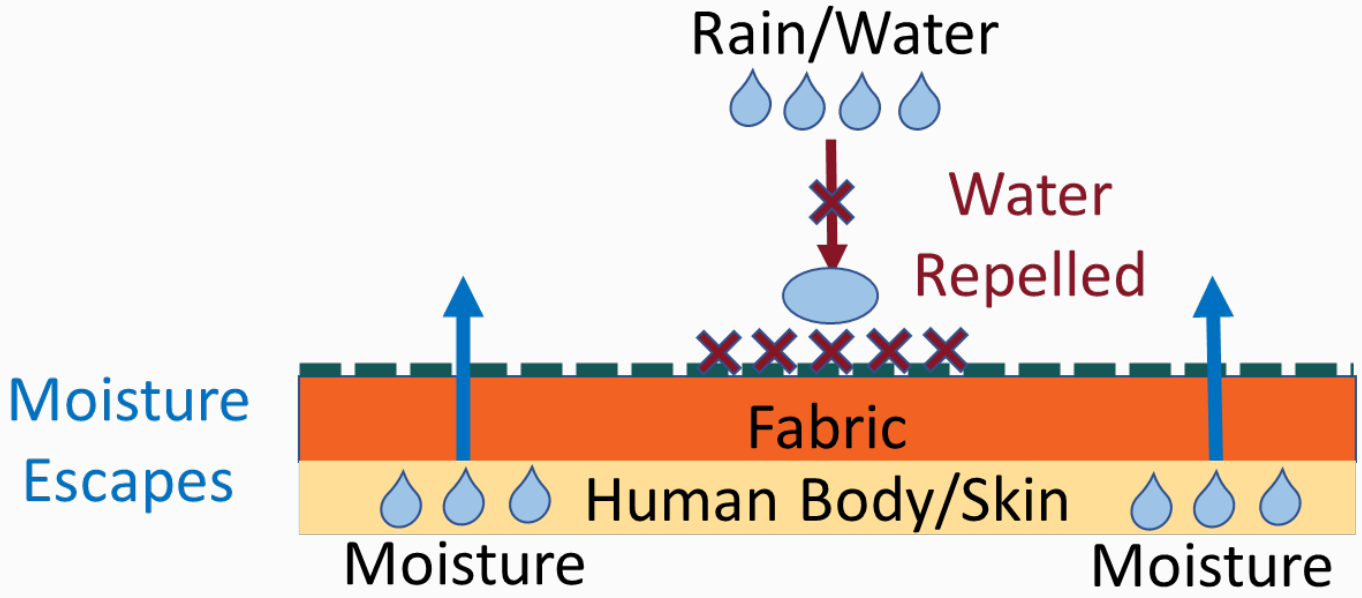
- Durable water repellents (DWRs).
- Sprays or polymer suspension (particles in water).
- Coatings are applied to the outer surface of textiles.

How are DWRs Applied and Used?

1. Application (Dip/Padding)

2. Drying (Removes Water)

3. Curing (Film Forming)



Subcategories: Apparel and Gear

Apparel Types

- Active and sportwear
- Outdoor wear
  - Includes professional
- Formal wear
- Everyday wear
- Workwear
- Accessories and gear
  - Backpacks and bags
  - Gloves
- Footwear

Fabric Types

- Cellulosic fabrics
  - Cotton
  - Silk
  - Linen
- Synthetic fabrics
  - Polyester
  - Nylon
  - Acrylic
- Other
  - Leather
  - Blends
  - Viscose and rayon
  - Wool

Approach to Finding Alternatives (Apparel and Gear)

- Physical and chemical alternatives
  - Alternative processes, apparel materials, DWRs
- First pass: Certified products
  - Example: Cradle to Cradle Certified®
- Stakeholder Engagement
  - Talked to several brands that shared certain PFAS-free DWRs
  - Reached out to 11 companies with PFAS-free DWRs (CBI Agreements)
- We are still working to actively determine safer for PFAS-free alternative DWRs.

Alternatives to PFAS: Apparel and Gear (Overview)

- Some apparel categories don't need PFAS treatment.
  - Low total fluorine results suggest PFAS non-intentionally added.
  - Example: Sport and activewear total fluorine study.
- Limited product level alternatives (no certified alternative products found).
  - Most PFAS-free alternatives found are chemical DWRs.
  - Without PFAS, there is no oil repellency.

Feasibility of Hydrocarbon-Based Chemistries

- Paraffin wax
  - Works primarily on synthetic textiles
- "Unmodified natural plant wax"
  - Amenable to cellulosic and synthetic textiles
  - Works best on synthetic textiles
- Acrylate-based polymers
  - Can be applied to cellulosic and synthetic textiles
  - Auxiliary chemicals can be used for broader applications

Feasibility of Mixed-Mode Chemistries

- Fatty acid amides
  - High performance on cotton and synthetics
  - Works well on synthetic and cotton blends
- Acrylic and silicone blends
  - Blending enables fine tuning of intended effects
    - Silicone preserves softness, hand feel, and repellency
    - Mixed chemistry allows application to blends

Feasibility of Broad Substrate Finishes

- Any combination of the previously described chemistries
- Varied auxiliary chemicals
  - Enables applications to cellulosic and synthetic textiles, blends, and others (including leather and wool)
  - Examples:
    - Hyperbranched dendritic polymers
    - Broad spectrum acrylic based polymers
    - Direct polymerization onto fabric surface

Alternative Processes: Cleaning Methods

Cleaning products and stain removers

- Cleaning products can be used to remove stains after they have occurred.
- Example: Professional Wet Cleaning
  - Works for formal wear, avoids use of PERC
- Example: EPA Safer Choice Detergents or Stain Removers
  - Evaluated against Safer Choice Criteria
  - Do not contain regrettable substitutions

Alternative Processes: Altered Fabric Weave

- Fibers are manufactured to be denser, and are woven in a specific way:
  - Creates smaller pores in fabric, allows breathability.
  - Water droplets are too large to pass through pores.
- Examples
  - Dyma-tex (by Vessi)
    - “No-leather” polyurethane knit
    - Used in shoes and gloves
  - LIFA Infinity Pro (by Helly Hansen)
    - Polypropylene face fabric with altered weave
    - Polypropylene as a moisture barrier (laminate)
    - Used in jackets and ski pants

Feasible Alternatives Per Apparel Category

Apparel Type	No PFAS (100% Untreated)	Hydrocarbon	Mixed-Mode	Broad Substrate	Cleaning Methods	Altered Weave
Activewear	✓	✓	✓	✓	✓	X
Outdoor Wear	X	✓	✓	✓	✓	✓(Certain Products)
Everyday Wear	✓	✓	✓	✓	✓	X
Accessories and Gear	?	✓(Certain Products)	?	✓(Certain Products)	✓(Certain Products)	✓(Certain Products)
Footwear	?	X	X	✓	?	✓
Formal Wear	✓(Certain Products)	?(No data to confirm treatment with PFAS, but marketing information suggests PFAS treatment.)			✓	X
Work Wear	X (Depends on performance needed for occupation)					

✓Apparel type has at least one feasible alternative within chemistry family

? Need further confirmation or information

X Alternative within chemistry family not feasible or not found

Safer Alternatives Per Apparel Category

Safer ?	No PFAS (100% Untreated)	Hydrocarbon	Mixed-Mode	Broad Substrate	Cleaning Methods	Altered Weave
Yes	✓	-	-	-	✓	✓
No	-	-	-	-	-	-
TBD	-	✓	✓	✓	-	-

Apparel and Gear: Wrap-up

- Untreated fabric is a safer and available alternative.
  - Feasible for activewear and sportswear
- Professional wet cleaning is a safer and available alternative.
  - Feasible for delicate apparel, such as formal wear
- Several non-fluorinated DWRs are feasible and available.
  - Currently working to determine if safer
- Fabrics engineered with small pores are safer, feasible alternatives.
  - Available for shoes and gloves, and in jackets and ski pants
- Gaps in alternatives for work wear.
  - Feasibility is dependent on performance

Firefighting Personal Protective Equipment (PPE)

Function of PFAS in Firefighting PPE

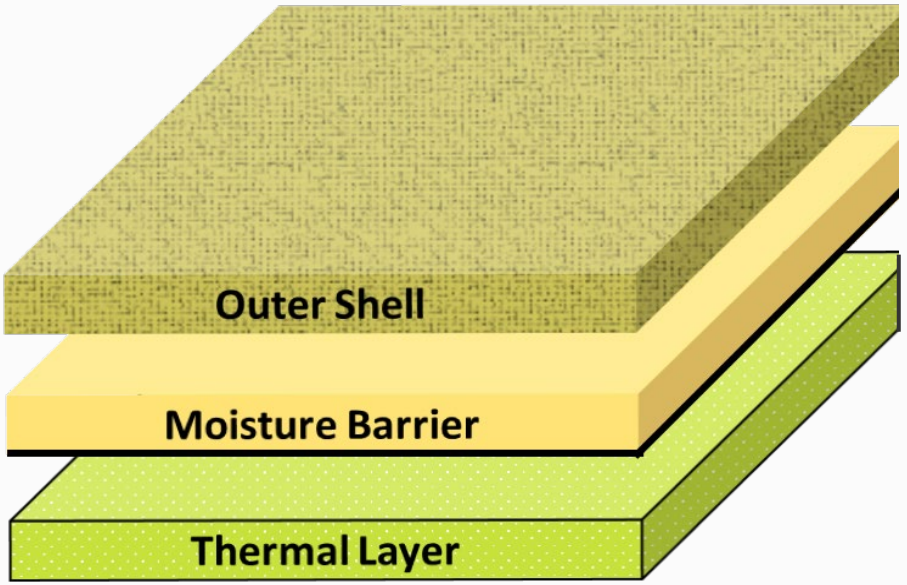
- Firefighting PPE must conform to established performance standards.
- Function of PFAS depends on PPE.
  - Apparel PPE: penetration resistance of water, oil, fuels, and biological fluids (viral penetration resistance)
    - Example: Turnout gear, gloves, boots
  - Mechanical PPE Components: reduce mechanical wear, enable use in high moisture and heat
    - Example: PFAS-treated seals and gaskets in self-contained breathing apparatuses

NFPA Standard 1971

- Standard on Protective Ensembles for Structural Fire Fighting and Proximity Firefighting.
  - Voluntary Consensus Standard.
- Materials used in PPE are evaluated for thermal protection, liquid penetration, shrinkage, and more.
- Most contested aspects: UV degradation resistance, viral penetration resistance.
  - PFAS are the only chemicals that satisfy the UV and viral resistance requirements.

Subcategories: Firefighting PPE

- Turnout gear
  - Coats and pants
  - 3-layer laminate
    - Outer Shell
    - Moisture Barrier (PTFE)
    - Thermal Layer



- Boots and gloves
  - Typically have PTFE moisture barrier
- PPE components
  - Seals, O-rings, greases

Alternatives to PFAS: Firefighting PPE

- Current non-PFAS alternative DWRs are feasible and available for turnout outer shells.
  - Alternatives for boots, gloves, or mechanical components of PPE have not been found.
- We have not identified safer alternatives for the PTFE moisture barrier.
  - Viral penetration and UV degradation test is a challenge.
  - PFAS thought to be the only chemicals to satisfy this requirement.
- NFPA compliant, PFAS-free moisture barrier identified.
  - Engagement with manufacturers is planned.
- Manufacturers have not yet responded to our inquiries.
  - Have not been able to assess safer for non-PFAS alternative DWRs.
  - Manufacturer data orders in progress.

Preliminary Determinations and Next Steps

- Preliminary regulatory determinations
  - No restrictions or reporting requirements at this time.
  - Apparel and gear and firefighting PPE alternatives work will continue in Safer Products for Washington cycle 2.
- Continuing voluntary outreach efforts
  - Several other manufacturers identified, targeted for outreach.
  - May obtain information through voluntary disclosure.
- Manufacturer data orders in progress

Question and Answer

Apparel and Gear

Firefighting Personal Protective Equipment (PPE)

- Are there functions of PFAS in these products that we might have missed?
- Do you have ideas for helping us fill the data gaps we described?
- Do you know of alternative processes we could consider?
- Do you have additional feedback or suggestions?

Apparel and Gear and Firefighting PPE Q&A Notes

- **Q:** What is the definition of gear?
- **Q:** Nantucket firefighters in Massachusetts have been told that one manufacturer (of the two manufacturers) of middle layer of firefighting gear is, in fact, working on an alternative.
- **Q:** What about alternatives for medical wear?
- **Q:** The industry would likely disagree from a customer perspective that activewear and sportswear do not need water and stain resistance. This chemical class is highly pervasive and used in more products than one might think.

Apparel and Gear and Firefighting PPE Q&A Notes

- **Q:** Did I understand correctly that there were indeed safer, feasible, and available alternatives identified for apparel? Can you please clarify why your preliminary findings for apparel do not involve restrictions?
  - **A:** It is important to look at needed function of performance requirements. There can be many alternatives in to work wear.
  - **A:** Two noticeable trends: Extinction of aquatic life happening at a faster rate due to the upstream pollution and using soil as a bioremediation material.
- **Q:** Can you discuss alternatives to gaskets and rings?
- **Q:** The viral protection role of PFAS in middle layer of gear is new to me. Can you provide additional information?

Apparel and Gear and Firefighting PPE Q&A Notes

- **Q:** Assuming Ecology moves forward restricting the use of many forms of PFAS in many different uses, we would then assume a reduction in exposure and release of PFAS to the environment. But is Ecology planning to actually validate reductions in exposure and release of PFAS through any sort of testing? In other words, will we look to see if there are fewer PFAS in our water, air, soil, and bodies?
- **Q:** Do the categories include sweat-resistant workout gear that is not necessarily for outdoors?
- **Q:** I have always worried about PFAS in Tyvek® "building wraps." I now see new building wraps in use that do not list any PFAS in their ingredients. Building wraps are in wide use, and scraps often go to the dump. Is this being studied?
- **Q:** Have you looked at children's wear or infant products?

Safer Products for Washington:

Cleaning Products

Sean C. Zigah
Hazardous Waste and Toxics Reduction Program

Cleaning Products and Product Scope

Product Sub-category	Product Description
General Purpose Cleaning Product	A formulated consumer product with intended use in **cleaning and removal of unwanted material** from **hard surfaces** such as kitchen counters, bathrooms, etc.
Automotive Cleaning Product	A formulated consumer product with intended use in **clean the exterior surface** of an automotive vehicle.
Glass Cleaning Product	A formulated consumer product with intended use in **cleaning and removal of unwanted material** from **glass-based surfaces**.
Floor Cleaning Product	A formulated consumer product with intended use in **cleaning and removal of unwanted material** from **hard floor surfaces.**

Product Scope and Functions of PFAS in Cleaning Products

Functions

- **Surfactants** are substances that reduce surface tension in liquids.
- PFAS can function as a **propellant** in cleaning aerosols and are out of scope for this category.
  - ~~Difluoroethane is a commonly used PFAS in aerosol.~~*

Scope Comments

- To date research has focused on household and institutional cleaning products.
  - Alternatives for cleaning products intended for industrial use might be evaluated in the future.

*We removed this example because it does not meet our definition of PFAS.

Relevant Product Certifications

Cradle to Cradle (C2C) Certified® and C2C Material Health Certificate

Including all products under V4.0 and products under V3.1 at the Gold level or higher

PFAS, if present as an impurity, must be less than 100 ppm.

EPA Safer Choice Products

Can meet Ecology's minimum or additional criteria for safer **depending** on the function of the chemical under evaluation

Evaluation of Safer

EPA Safer Choice Ingredient List (SCIL)

Chemicals evaluated against the SCIL surfactant functional-class criteria **may meet** our minimum criteria for safer.

EPA Safer Choice Products

EPA Safer Choice certified products containing a SCIL chemical functioning as a “surfactant” **may meet** our minimum criteria for safer.

Potential Alternative Chemicals to PFAS in Cleaning Products

Chemical (Chemical Group)	CAS Number
Sodium lauryl sulfate* (Alkyl sulfates/ether sulfates)	151-21-3
Cocamidopropyl betaine* (Amines)	61789-40-0
Cocamidopropyl amine oxide* (Amine/amide oxides)	68155-09-9
Quaternary ammonium compounds**	68187-69-9
Docusate sodium* (Sulfosuccinates)	577-11-7
Capryl Glucoside** (Alkyl polyglucoside)	68515-73-1
Acetic Acid*	64-19-7

* Meets Ecology's minimum criteria for safer
** Chemical hazard assessment in-progress

Third-Party Certified Products are Feasible and Available

Product Categories	Certifications	Ingredient (Surfactant Function) from a Relevant Certified Product OR Product with Relevant Certification
General Purpose Cleaning Products	EPA Safer Choice	Caprylyl/Capryl Glucoside**
Automotive Cleaning Products	EPA Safer Choice	C9-11 Pareth-6***; Sodium xylene sulfonate**; Diethylene glycol mono-N-butyl ether**
Glass Cleaning Products	C2CC® Gold 4.0	Hygiene Green Professional – HG10 Glass Green
Floor Cleaning Products	EPA Safer Choice	Caprylyl/Capryl Glucoside**

*Any reference in this presentation to persons, organizations, services, products, or activities does not constitute or imply endorsement, recommendation, or preference by the Washington Department of Ecology.
**Ingredients to be or are in the process of being evaluated for safer criteria
*** Ingredients meet minimum criteria for safer

Preliminary Conclusions for Safer, Feasible, and Available in Cleaning Products

Available and feasible alternatives exist for each subcategory and are **currently being evaluated for safer**.

- Lack of uniform industry ingredient disclosure hindered this category's assessment.

Preliminary evidence supports a **reporting requirement** for cleaning products:

- Automotive cleaning products
- General purpose cleaning products
- Floor cleaning products*
- Glass cleaning products*

*Preliminary research shows safer, feasible, and available alternatives exist and are still being assessed.

Question and Answer

Cleaning Products

- Are there functions of PFAS in these products that we might have missed?
- Do you have ideas for helping us fill the data gaps we described?
- Do you know of alternative processes we could consider?
- Do you have additional feedback or suggestions?

Cleaning Products Q&A Notes

- **Q:** Why are PFAS propellants out of scope for the cleaning product category?
- **Q:** Propellants seem like a much higher priority issue.
- **Q:** Would cleaning agents include disinfectants and sanitizers, since many are cleaners and disinfectants, for example?
- **Q:** Regarding filling data gaps. If it's difficult to collect ingredient information on certain products, and if PFAS could be used in the product in theory, then based on the precautionary principle would it not make sense to prohibit PFAS in that product class? 1. PFAS may be added in the future so prohibiting it now makes sense. 2. If the companies selling these products aren't sharing data, then prohibiting the product should coax them to cooperate.

Cleaning Products Q&A Notes

- **Q:** Ecology has identified safer alternatives but has not given any reporting requirements. Is this because you are still investigating?
- **Q:** Is there any way Ecology can work with California regarding their findings?
- **Q:** The difluoroethane chemical structure (C2H4F2) is not a PFAS per Washington's definition. It does not have one fully fluorinated carbon atom.

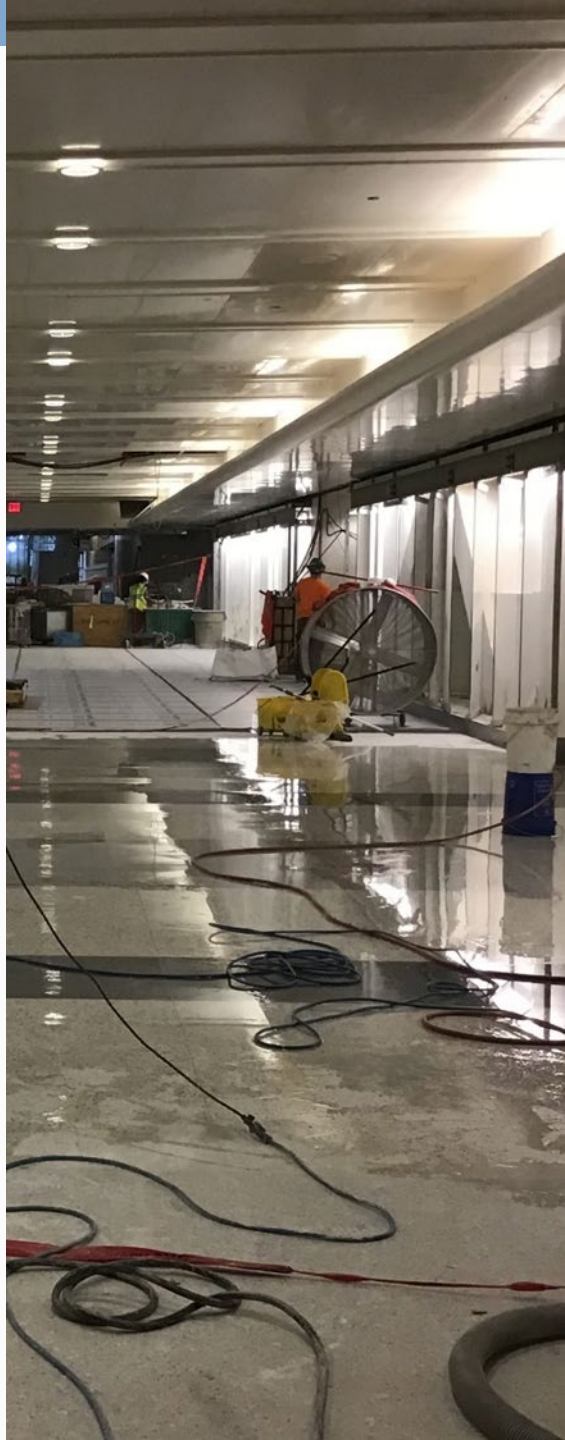
Safer Products for Washington:

Waxes and Finishes

Sean C. Zigah
Hazardous Waste and Toxics Reduction Program

Waxes and Polishes: Product Scope

Product Use Category	Description
Automotive Wax and Polish	A product marketed for use on an **automotive exterior as either a wax, a polish, or a finish.** Premarket automotive waxes and polishes are excluded.
Floor Wax and Polish	A product designed to **polish, protect, or enhance a floor's surface.** Spray buff products, floor cleaners, and floor finish strippers are excluded.
Ski Wax	A product designed to **improve ski performance** by modifying friction properties of the skis.



PFAS Function in Wax and Polishes

Product Use Category	Function of PFAS	Function Definition
Automotive Wax and Polish	Wax	Provides aqueous repellency for a surface; Provides protection from environmental elements
Floor Wax and Polish	Surfactant or leveling agent	Provides aqueous repellency for a surface; increasing the spreading abilities of a liquid
Ski Wax	Wax	Modifies friction properties for skis and other snow sporting equipment; predominantly reduces wet friction

Alternatives Chemicals Used

Automotive Wax and Polish

- Available alternatives, such as carnauba wax/beeswax mixtures, are used in the industry. They offer water repellency and mechanical surface protection.
- It is unknown if PFAS is used in these formulations.

Floor Wax and Polish

- Sulfosuccinates such as docusate sodium have been used in varnishes and polishes and are available on the market.
- Alkyl polyglycosides are available on the market with comparable technical performance.
- It is unknown if PFAS is used in these formulations.

Potential Alternatives Chemicals

Ski Wax

- Formulations are not disclosed.
- One company mentions advanced hybrid materials and an alkylated dimethicone have replaced fluorinated raw materials.
- It is unknown if PFAS is used in these formulations.

Status of Assessing Alternatives as Safer

Product Subcategory	Chemical	Status of Safer
Automotive Wax and Polish	Paraffin wax and dimethicone	Chemical hazard assessments in progress Lack of transparency on mixtures prevents assessment
Floor Wax and Polish	Docusate sodium	Scivera score for docusate sodium: Yellow Chemical hazard assessments in progress
Ski Wax	Dimethicone and unknown components	Scivera score for Dimethicone: Yellow Lack of transparency on mixtures prevents assessment

Preliminary Conclusions for Safer, Feasible, and Available in Waxes and Polishes

- Ski wax
  - Some ingredients used in feasible and available alternatives are safer but are used in mixtures with unknown chemicals.
- Automotive wax and polish:
  - Some ingredients are safer but might be used with PFAS.
- Floor wax and polish:
  - Some ingredients are safer but might be used with PFAS.

Preliminary Regulatory Determinations for Waxes and Polishes

Preliminary evidence supports **a reporting requirement** for the following product categories in Safer Products for Washington:

- Ski wax
- Automotive wax and polish

No action will be taken at this time with continued work in cycle 2 for:

- Floor wax and polish

Question and Answer

Waxes and Finishes

- Are there functions of PFAS in these products that we might have missed?
- Do you have ideas for helping us fill the data gaps we described?
- Do you know of alternative processes we could consider?
- Do you have additional feedback or suggestions?

Waxes and Finishes Q&A Notes

- **Q:** Paraffin wax is a known concern when it comes to other products like candles. It is interesting to see it used as an alternative. Is this simply because related to PFAS it is okay?
- **Q:** Are PFAS in furniture and carpets already being phased out?
- **Q:** Could you please say more about why the proposal is for a reporting requirement for ski wax and auto wax and polish, but there is no action for floor wax and polish?
- **Q:** Based on what you see, is PFAS manufacturing dominated by a few companies, so that trade secrets will control innovation?
- **Q:** Is there a need to inform the public about older furniture, pillows, children's pajamas, etc. to remove from home exposures?
- **Q:** For ski wax, have you considered that Vermont has already banned PFAS as of this summer?

Waxes and Finishes Q&A Notes

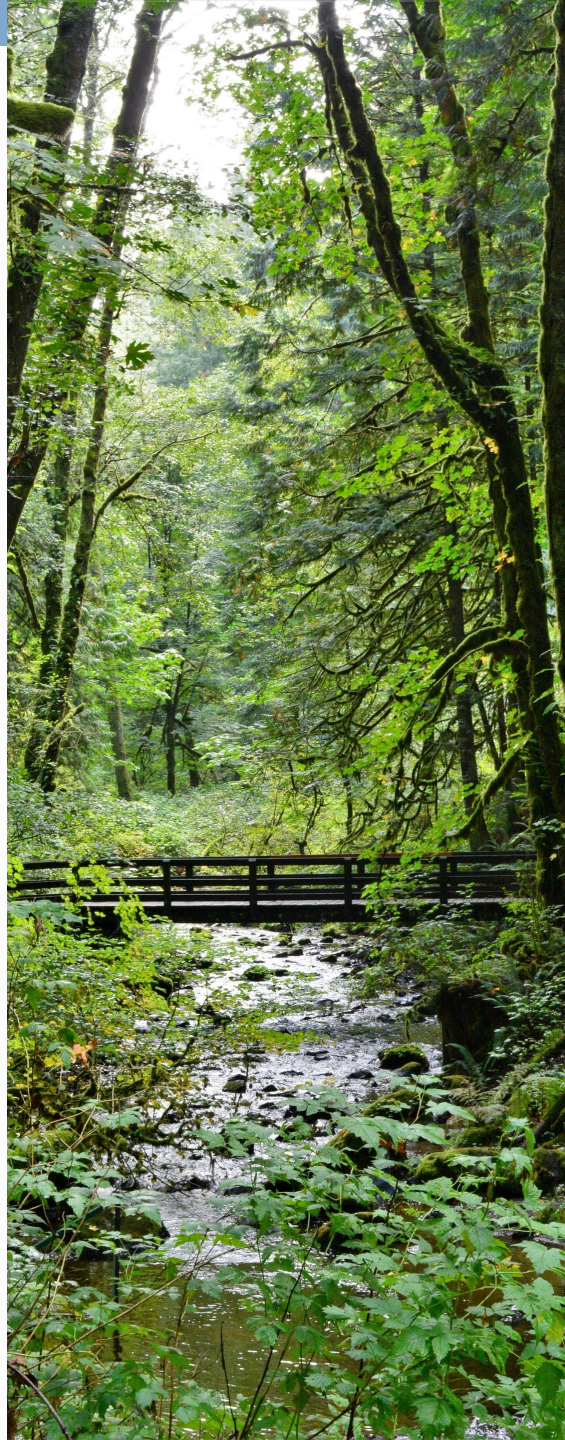
- **Q:** Why are waxes and polishes that come on cars already out of scope?
- **Q:** Do the alternative assessments for floor polishes and finishes include physical safety implications of the dried film (i.e., in terms of how alternative chemicals affect slip resistance of the coating to ensure safe pedestrian transit on the surfaces)?
- **Q:** It seems contradictory to separate these two specific uses in this category but not to separate uses in other categories like apparel — especially when there are apparel categories for which there are safer alternatives already available and on the market.
- **Q:** What was the decision criteria for defining PFAS differently than the EPA definition?
- **Q:** Did you consider flooring that does not require waxing or polishing?
- **Q:** What about performance standards regarding flooring? Is less polishing and waxing an option? Does the floor have to be that shiny?

Presentation Wrap-up

Part 6

Preliminary Conclusions

- Based on information we currently have.
- We are actively soliciting more information that may change our conclusions.
- **We encourage you to reach out to us if you have additional information you'd like us to consider!**



Preliminary Conclusions on Alternatives

Products	Safer, Feasible, Available Alternatives	Next Steps
Firefighting PPE	In progress	Manufacturer order and outreach
Apparel and Gear	In progress	Manufacturer order and outreach, hazard assessments
Cleaning Products	In progress	Hazard assessments in progress
Car Washes	In progress	Hazard assessments in progress
Car Waxes	In progress	Manufacturer outreach
Floor Waxes and Polishes	In progress	Manufacturer outreach, hazard assessments
Ski Waxes	In progress	Manufacturer outreach

Preliminary Regulatory Determinations

Products	Preliminary Regulatory Determinations	Rationale
Firefighting PPE	No action	Continue work in cycle 2
Apparel and Gear	No action	Continue work in cycle 2
Floor Waxes and Polishes	No action	Continue work in cycle 2

Preliminary Regulatory Determinations

Products	Preliminary Regulatory Determinations	Rationale
Cleaning Products	Reporting requirement	PFAS exposure concerns
Car Washes	Reporting requirement	PFAS exposure concerns
Car Waxes	Reporting requirement	PFAS exposure concerns
Ski Waxes	Reporting requirement	PFAS exposure concerns
Hard Surface Sealants	Reporting requirement	PFAS exposure concerns
Nonstick Cookware and Kitchen Supplies	Reporting requirement	PFAS exposure concerns

Timeline for Phase 3

2022

Introductory webinar (September)

2023

Preliminary conclusions (Today!)

2023

Draft report and formal public comment period (December and January)

2024

Final report to the legislature (June)

Safer Products for Washington Implementation Process

Phase 1
May 2019

PRIORITY CHEMICAL CLASSES

Select priority chemicals and chemical classes to focus on during the cycle.

Phase 2
May 2022

PRIORITY CONSUMER PRODUCTS

Identify which consumer products contain these chemicals and can harm people and the environment.

Phase 3
June 2024

REGULATORY ACTIONS

Determine whether we'll regulate when these chemicals are used. Will we require notice, restrict/prohibit, or take no action?

Phase 4
December 2025

RULEMAKING

Restrict the use of chemicals in products or require reporting to keep people and the environment safer.

Question and Answer

All product categories, including:

- Hard surface sealants
- Nonstick cookware and kitchen supplies

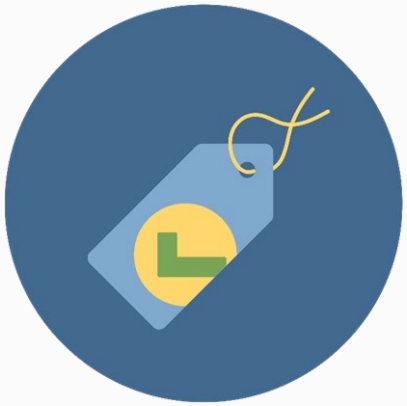
Q&A Notes for All Product Categories

- **Q:** International Association of Firefighters (IAFF) is also looking at alternatives to PFAS in middle layer (and filing a lawsuit against the NFPA regarding the standard, since Gore is part of the committee that sets standard). Has or could the WA Department of Ecology be in contact with IAFF?
- **Q:** The Nantucket deputy fire captain has been in touch with the manufacturer of the PPE that has a PFAS-free middle layer. My sense was the manufacturer was doing its own testing before releasing to the market. Possibly connecting with Nantucket firefighters might also help in connecting to the manufacturer?
- **Q:** Is waste treatment through landfill management and wastewater treatment systems effective to reduce the environmental risks of PFAS to safer levels?
- **Q:** Are you all looking at the issue of PFAS from fluorinated plastic containers? It will potentially affect the products if they are in containers that are fluorinated.

Q&A Notes for All Product Categories

- **Q:** Given how much information has come out since the PFAS CAP, including the number of PFAS in existence and products they are in, are there any things that would help Ecology accelerate the processes of SPWA?
- **Q:** I'd like to recommend that Ecology consider products that were not known when the CAP was drafted, such as extruded plastics and building products (including, for example, artificial decking and turf).
- **Q:** Other than today, what platform can we use to submit questions and comments about preliminary conclusions?
- **Q:** PFAS is not required in firefighter gear in WA state, but there are currently no or limited options for PFAS-free firefighting gear.
- **Q:** Textiles is a great category to be acting on.

Thank you for joining us!



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Chapter 70A.350 RCW

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