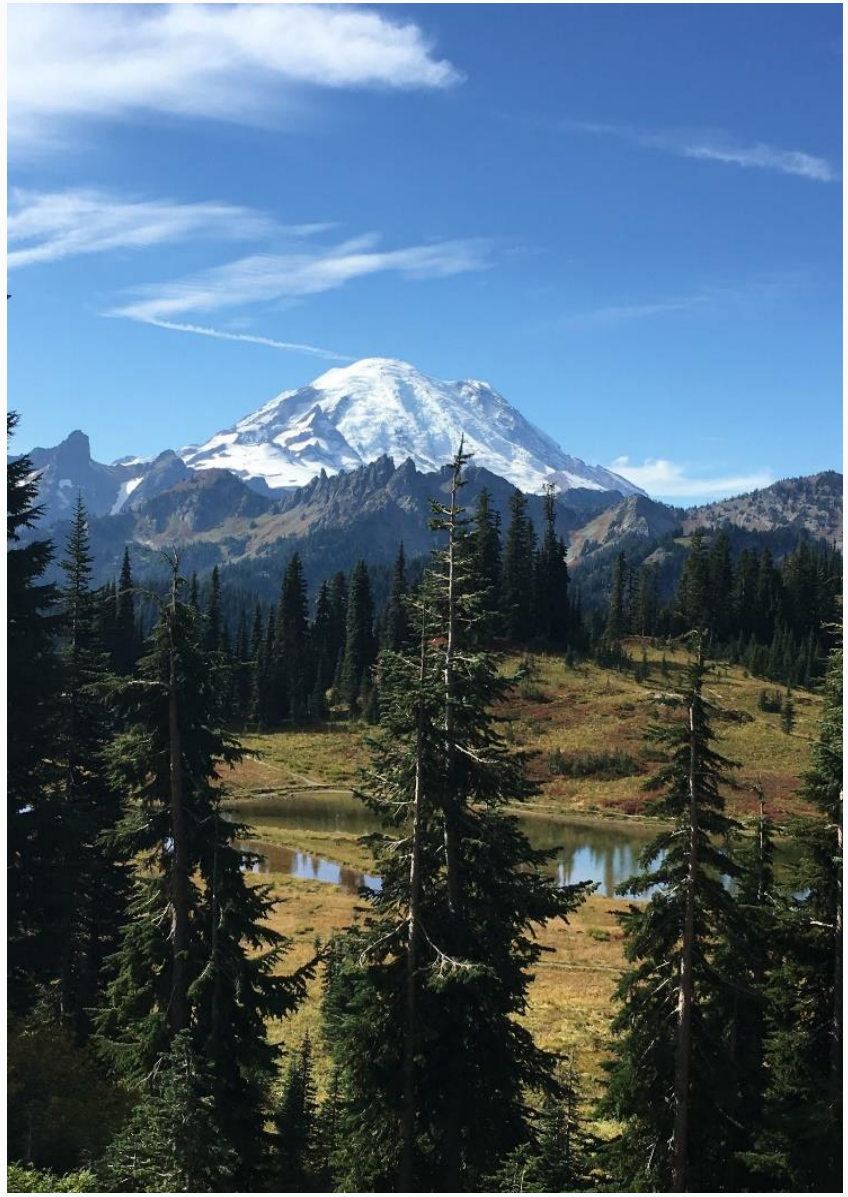
Washington State Dept. of Ecology (ECY) - Product Testing -

Environmental Assessment Program (EAP)

Product Studies Unit (PSU)

April 8, 2025

Introduction



Ecology Mission: Protect, preserve, and enhance Washington's environment for current and future generations.

EAP Mission: Measure, assess, and communicate environmental conditions in Washington State for the purpose of providing credible science to guide environmental decisions.

PSU: Design studies, develop methods, and assess for toxic chemicals in a variety of consumer products.

Collect, assess and report information on chemicals present in available Washington State products.

Compliance assistance with Washington's laws.

Partnerships

We're proud of the community involvement that supports Ecology's mission.

State, regional, and local governmental, non-governmental, and private constituents join forces to provide advice and oversight to a variety of projects and programs.

Air & Climate
Water & Shorelines
Waste & Toxics
Cleanup & Spills

[Partnerships & committees - Washington State Department of Ecology]

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Product Studies at Ecology

- Product studies work at Ecology has been growing
- EAP manages scientific product studies and data
- Compliance, policy, and rulemaking are managed by Hazardous Waste Toxic Reduction (HWTR) program
- Credible, defensible data following QA protocols is used to inform decision making
- Future goal: dedicated PSU laboratory for method development and consumer product studies (testing)

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Product Life-Cycle

WA Toxics in Products Laws

Title of Product Law	Laws and Regulations
Children's Safe Products Act (CSPA)	70A.430 RCW, WAC 173-334
Washington Consumer Protection Act (CPA - school supplies)	19.87.020 RCW
Safer Products for Washington (SPWA)	70A.350 RCW
Toxics in Packaging – Metals and Toxic Chemicals (PFAS, HM)	70A.222 RCW
Brake Friction Material - Better Brakes	70A.340 RCW, WAC 173-901
Bisphenol A (BPA) - Sports Bottles, Baby Bottles, Sippy Cups	70A.335 RCW
Persistent Bioaccumulative Toxic Chemicals	70A.300 RCW, WAC 173-333
Polybrominated Diphenyl Ethers - Flame Retardants (FR)	70A.405 RCW
Toxic-Free Cosmetics Act (TFCA) - Cosmetics	70A.560 RCW
Cookware Containing Lead	70A.565 RCW (HB1756 & ESSB 5628 - in-process)
PCBs in State Purchased Products	39.26.280 RCW

Examples of Products Subject to Assessment

<u>Available for purchase in Washington State</u>

Children's products (Jewelry, toys, school supplies*, etc.)

Packaging materials (wrappers, etc.)

Cosmetics, personal care

Electronics, flame retardant (FR) treated products

Textiles (carpet, adhesives, etc.)

Brake friction materials (brake pads)

- Change and grow as chemicals of concern are added through rule-making process.

*Washington Consumer Protection Act

Product Testing: Overview

- What is the goal?
- How will the data be used?

  - Process: Regulatory vs R&D
    - Quality
      - Study Design & Development
      - Sampling / Collection / Preparation
      - Lab Analysis
      - Data Validation
      - Data review & report

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Product Studies & Environmental Studies

- Collect representative samples
- Conduct analysis of toxic chemicals
- **Quality Assurance Project Plan (QAPP)**
  - Development and approval prior to start
- Data used for assessment, inform new policy, rulemaking

- Major differences vs traditional environmental:
  - Samples are consumer products
  - Sample matrices - unique impacts on analytical testing

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Quality Assurance:

Quality assurance is built into project planning, sampling, analysis, publications, and data management.

Credible Science

Many systems are in place to produce quality projects.

- Systems and processes to match advancing science

Quality Assurance Project plan: QAPP

ECY Publicaton#: 04-03-030

QAPP Elements

- Background, Description
- Organization & schedule
- Quality objectives: DQO, MQO
- Design
- Procedures: Field, Lab, QC, Data Management
- Audit / Report
- Data Verification, validation
- Data Quality: usability assessment
- References

Study Design & Development

- Designed based on law or policy:
  - Provide data for compliance with legislation enforcement, etc.
  - Provide data for policy development and rulemaking
- Special considerations in study design:
  - Product availability at specific stores
  - Product availability to specific professionals
  - Specific ingredients or label claims

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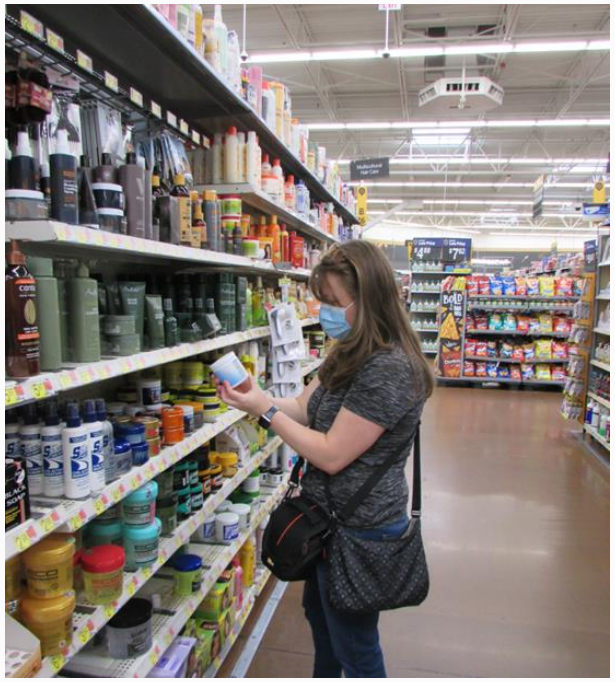
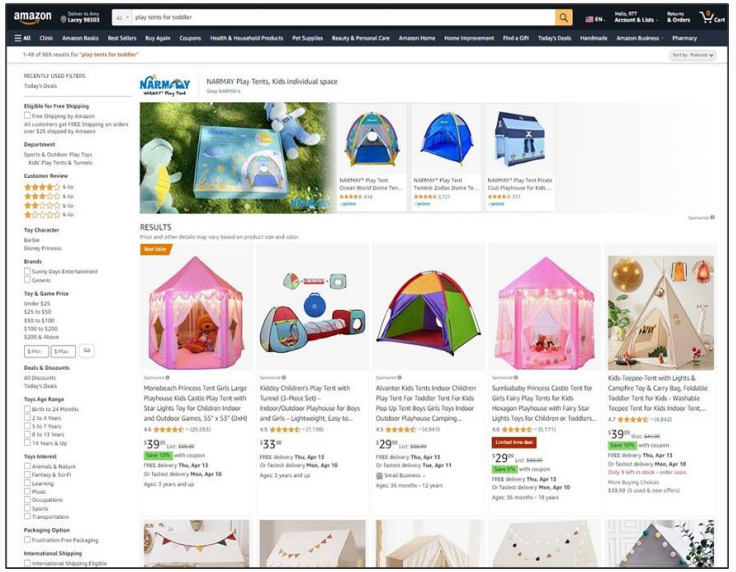
Study Design & Development

- Process can take several months depending on study size, scope, complexity, other on-going work
- Project Manager (PM) & team performs research & related activities for the study
- Partnership

Sampling & Collection

- Collecting consumer product samples is different from collecting environmental samples like water or soil.





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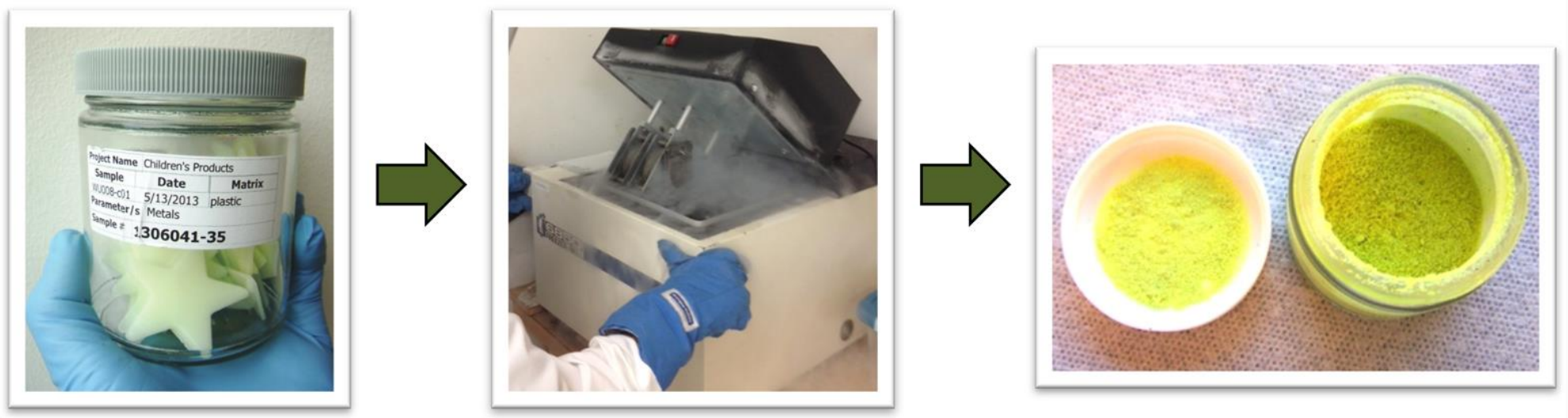
Preparation

- One consumer product can be made up of several material types (components).
- All product samples eventually need to be in liquid form for accredited testing.
- Some materials need little preparation, while others, like solid plastics, need more time to be reduced in size using specialized instruments that can turn a solid sample into a fine powder and then a liquid.
- Fine powder samples allow for more accurate testing.



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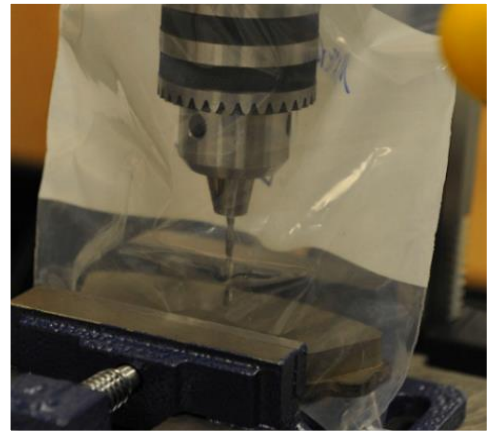
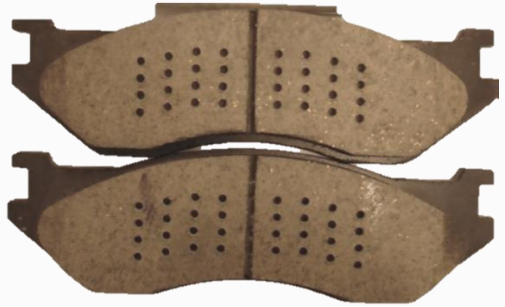
Sample Preparation for Testing

Physical Reduction



Drilling



Deconstruction

New Opportunities

Sample Receiving & Processing

DEPARTMENT OF ECOLOGY Intranet — Product Testing Data

Home | XRF batches | Lab batches | XRF results | Study details | Lab results | Help Documents

All purchases

Purchase ID: TG-51 **Purchase Date:** 12/20/2022 **Purchased From:** Target

Purchase | Products

Purchase Details

Purchase Type
Purchased at store

Purchase Date
12/20/2022

Purchased By
Salamone, Amy

Purchase Request Number
25572-23

Purchase price
$336.11

Available on a state contract

Purchased From
Target

665 Sleater Kinney Rd SE
Lacey WA 98503
US

Documents

Document Name	Document Type
Purchase Request 25572-23 for Target 12.20.2022	Request for product
Target Receipt 12.20.2022	Receipt

Page 1 of 1 (2 records)

Add a document

Purchase ID: TG-51 **Purchase Date:** 12/20/2022 **Purchased From:** Target

Purchase | Products

Products in this purchase

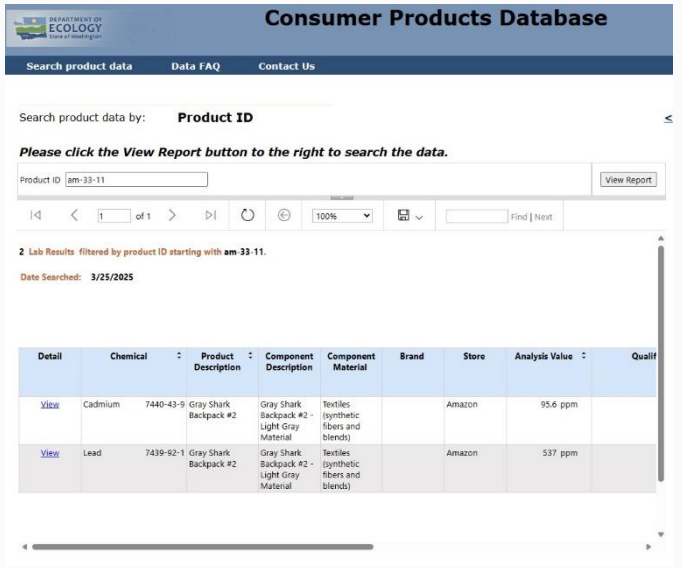
Add product

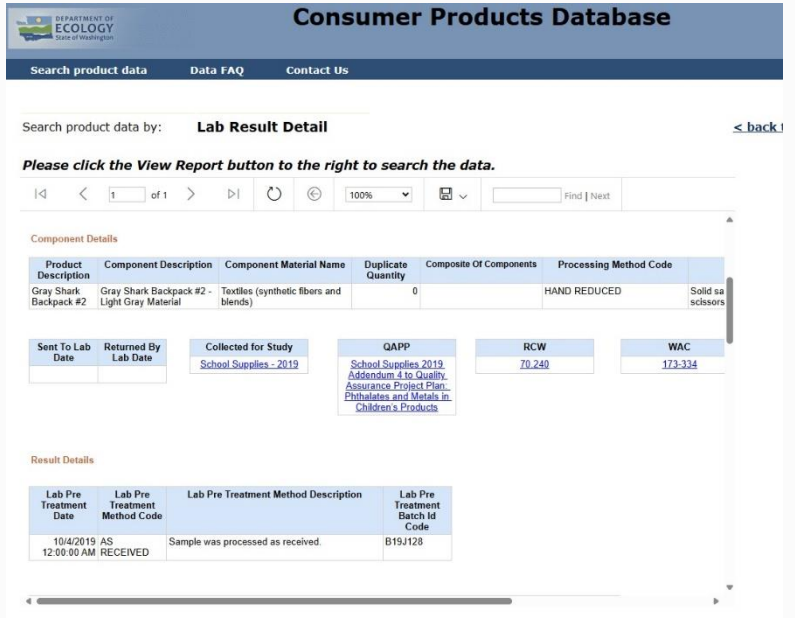
Search products | Reset search

	Product ID	Product Description	Brand	Product Type
View/edit	TG-51-6	Fair Games Play Tent	Melissa & Doug	Children's Products
View/edit	TG-51-7	Princess Castle Play Tent	FAO Schwarz	Children's Products
View/edit	TG-51-5	Garden Market Play Tent	Pillowfort	Children's Products
View/edit	TG-51-4	Spaceship Play Tent	Chuckle & Roar	Children's Products
View/edit	TG-51-1	Space Play Tent	Pillowfort	Children's Products
View/edit	TG-51-3	Spider Man Adventure Kit Tent and Sleeping Bag	Marvel	Children's Products
View/edit	TG-51-2	Frozen Adventure Kit Tent and Sleeping Bag	Disney	Children's Products

Page 1 of 1 (7 records)

Database





[Weblink: Consumer Product Reports]

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Capabilities - MEL

Manchester Environmental Laboratory

- Port Orchard, Wa
  - Accredited by ECY
  - Determinative methods
    - Microbiology
    - Inorganic
    - Organic
  - Data validation

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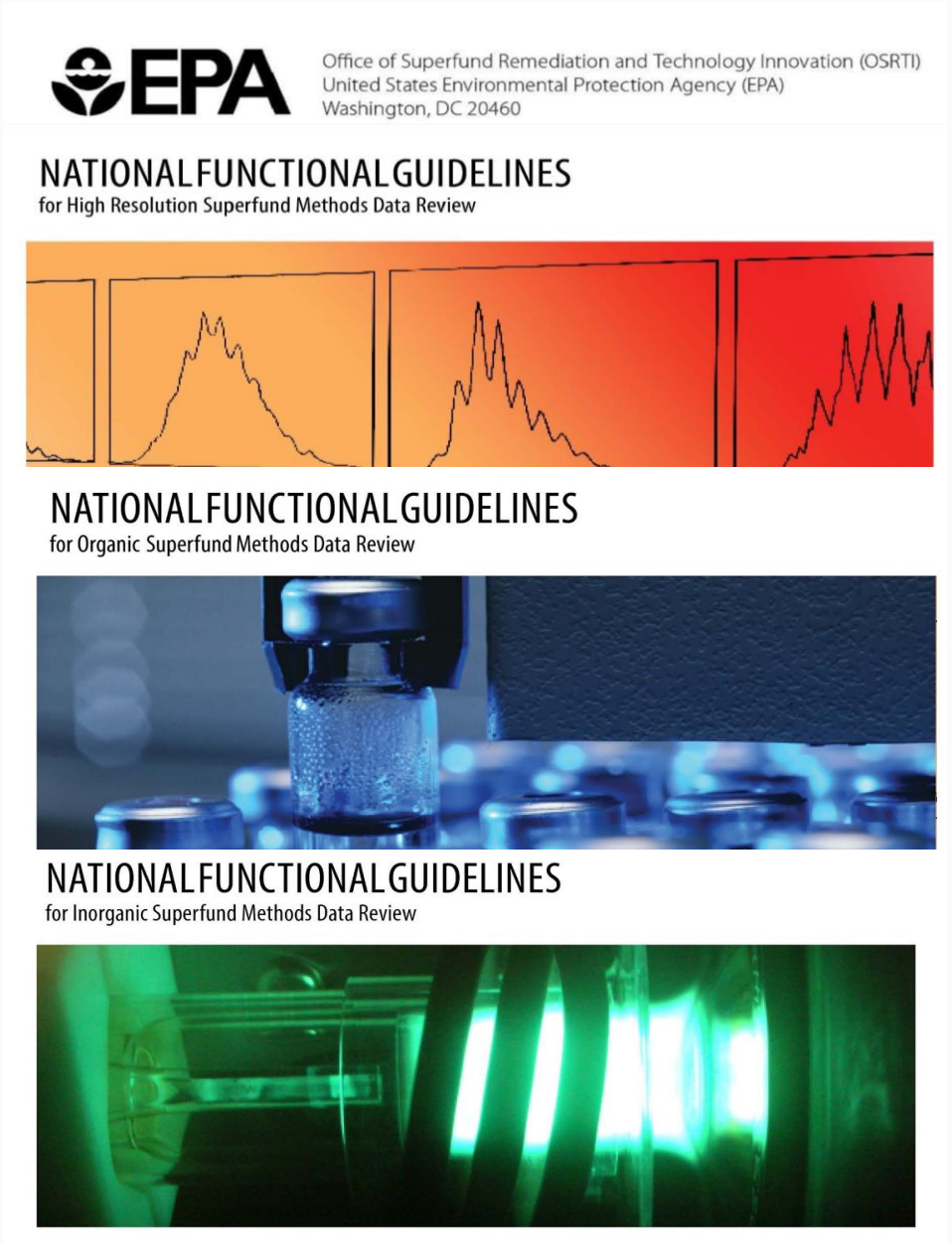
Data Validation

- Independent data validation required for product testing data used for rulemaking, legislation, or litigation.

- Validation of product testing compliance data ensures that the study yields data appropriate for the data use.



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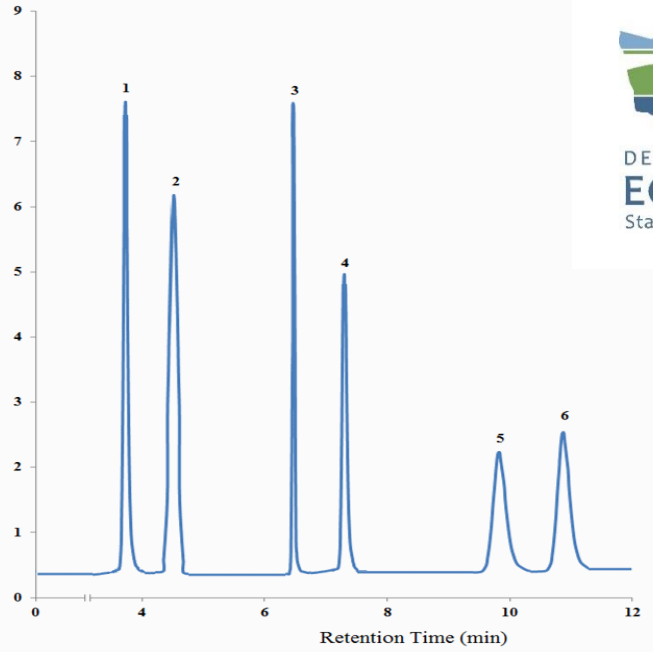
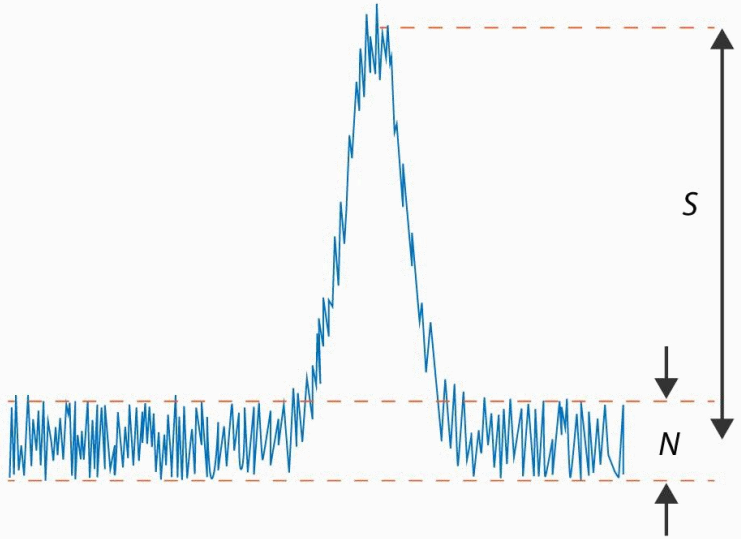
Limitations

- Lack of product testing labs using accredited EPA methods.
- Contract labs unwilling to analyze consumer products.
  - Matrix Interference
    - Resulting in additional purification or dilution steps that require adjustment of the method reporting limit
    - Causes poor resolution of chromatograph peaks and variability in retention time
  - Instrument Performance
    - Additional maintenance tasks
    - Chemical carryover





Product Testing – Study Highlights

Toxic Chemicals in Cosmetics

ECY Publications:

23-04-007 (Phase 1)

&

24-04-022 (Phase 2)

Legislation bans intentional addition of Ortho-phthalates, PFAS, formaldehyde, methylene glycol, mercury, triclosan, m-phenylenediamine, o-phenylenediamine.

Bans intentional use and limits Lead to 1 ppm

Designed to support Toxic Chemicals in Cosmetics Legislation

Phase 1 Study: Formaldehyde, Lead, Cadmium, and Arsenic

- Formaldehyde: detected in 26 out of the 30 body lotions and hair products.
  - Levels: estimated 39.2 ppm to 1660 ppm, with the highest level in a hair styling gel at 1660ppm.
  - None detected in dark-tint powder foundations.
- Lead: > 1 ppm was detected in two dark-tint powder foundations and one lipstick.
- A dark-tint powder foundation with a lead concentration of 5.5 ppm and an arsenic concentration of 2.1 ppm.

Phase 2 Study: Asbestos and phthalates

- Nail polishes, fragrance-free or unscented hair sprays, and unscented skin cleansing products.
- Asbestos in powder makeups, including blush and eyeshadow.
- 40 products tested for o-phthalates: diethyl phthalate in one scented nail product
- Did not find asbestos above the reporting limit in the 20 powder makeups tested, including blush and eyeshadow.

Lead & Cadmium in School Supplies

Ecology Publications: 24-03-012, 013, 014 & 015; 24-03-020

Assess compliance with Pb and Cd limits (90 and 40ppm, respectively)

- Ongoing partnership with WA Attorney General's Office to assess Lead and Cadmium in children's school supplies

Summary Results					
	2017	2018	2019	2021	2023
Samples (N)	60	76	76	49	60
N > Method Reporting Limit (MRL) for Lead and/or Cadmium	57	76	76	41	57
N > Regulatory Limits for Lead and/or Cadmium	31	67	72	24	42

Method EPA 3052 & EPA 6020B ICP-MS

Lead & Cadmium in School Supplies
Attorney General's Agreement

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Washington State Office of the Attorney General | Attorney General Bob Ferguson

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Home | News | News Releases | AG Ferguson: Amazon must remove toxic school supplies, kid's jewelry from marketplace nationwide

AG Ferguson: Amazon must remove toxic school supplies, kid's jewelry from marketplace nationwide

FOR IMMEDIATE RELEASE:
May 9 2019

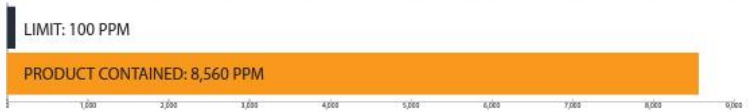
AG investigation found some school supplies with more than 80 times legal limit of lead

SEATTLE — Attorney General Bob Ferguson today announced that Amazon will commit to nationwide corporate reforms after his office's investigation found dozens of children's school supplies sold on its online marketplace had illegal levels of toxic metals lead and cadmium.

AMAZON TOXIC SCHOOL SUPPLIES

A pencil case tested during the investigation contained:

More than 80X the federal legal limit for lead



Children's Jewelry – Cadmium and other metals

2018 Follow-up study: ECY Publication 23-03-004

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2018 - Study designed to assess compliance with CSPA

- Cadmium and metals
  - 78 samples, 555 components.
    - 38 sent to MEL for analysis.
  - 2025 study in-process

METHOD:
EPA 3052 &
EPA 6020B ICP-MS

Summary Results

Analyte	Antimony	Arsenic	Cadmium	Cobalt	Lead	Mercury
Samples (N)	38	38	38	38	38	38
N > RL	16	12	30	16	36	0
% > RL	42	32	79	42	95	0
Minimum (PPM)*	2.52	9.64	1.59	1.22	1.13	n/a
Maximum (PPM)*	3720	58.3	966000	65	510000	n/a

* = RL = Reporting (quantitation) limit of 1 ppm, or ARL; includes only detected results.

Toxics in Packaging Studies

2014–2015, 2015–2016, 2017, & 2018–2019
ECY Publication # 25-03-004

122 samples; 159 component results

	Summary: Detections (ppm, maximum)			
Year	Cadmium	Chromium	Lead	Mercury
2014–2015	1220	230	1180	0.02
2015–2016	839	1	1	0.02
2017	974	483	1480	n/a
2018–2019	1020	78	2010	n/a

HF-1-6
Lead
2010 ppm
Cadmium
912 ppm

HF-1-1
Lead
1380 ppm

HF-1-7
Cadmium
812 ppm

PT-4-1
Cadmium
798 ppm

Study designed to assess compliance with Toxics in Packaging Legislation

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- Limits levels of Lead, Cadmium, Mercury, and hexavalent Chromium to 100 ppm total concentration of all four summed or of any individually.
- Ongoing study that can be implemented annually if resources allow.

	Results by year sorted by component materials.		
Year		Sum of N > 1 ppm	Sub Total
2014–2015	Metals (Including alloys)	6	36
	Synthetic Polymers—Plastic	30	
2015–2016	Synthetic Polymers—Plastic	4	4
2017	Bio-based Materials	19	71
	Metals (Including alloys)	8	
	Synthetic Polymers—Plastic	39	
	Textiles (synthetic fibers and blends)	5	
2018–2019	Synthetic Polymers—Plastic	48	48
Grand Total		159	

PCBs in State Purchased Products

Fabrics (23-03-001); Lubricants (22-03-006); Printing Inks (22-03-001)

Assessed PCBs in products available from Washington State contracts

Washington State Department of Enterprise Services (DES) leads the implementation of the law.

EAP/PSU - support DES and the PCBs in State Purchased Products legislation which requires state agencies to limit the purchase of products and packaging containing PCBs.

- Studies tested multiple categories, multiple state entities
- Analyzed for all 209 PCB congeners – EPA 1668C
- All samples had detectable levels of total PCBs; all below 50ppm TSCA limit

Flame Retardants in Electric and Electronic Casings: 2021

(ECY Publication 23-03-015)

Study designed to support SPWA Cycle 1, Implementation Phase 3

- Assess the presence of 9 flame retardants in the plastic casings of electric and electronic equipment. Flame retardants prioritized included those identified in the SPWA Cycle 1, Implementation Phase 3
  - DBDPE; BTBPE; HBCD; TBBPA; TTBP-TAZ; BDE-209; 2,4,6-TBP; RDP; TPP
  - 151 products, 80 component samples sent to lab.
    - 40 for Organophosphate flame-retardant (ex: triphenyl phosphate TPP)
    - 40 for Halogenated flame-retardant (ex: DBDPE)

FM-41-1

HD-8-3

BY-5-1

- Detections - but….all data by contract lab (halogenated compounds) was qualified as rejected due to serious deficiencies in the ability to analyze the sample, meet QC criteria, and other technical reasons.
  - Contract lab: Timing of surrogate addition, surrogate recovery levels, continuing calibration failure, Lab Control Samples (LCS) didn't pass, extracts exceeded hold time, etc.

BB-12-1

OD-6-4

Lessons learned from study

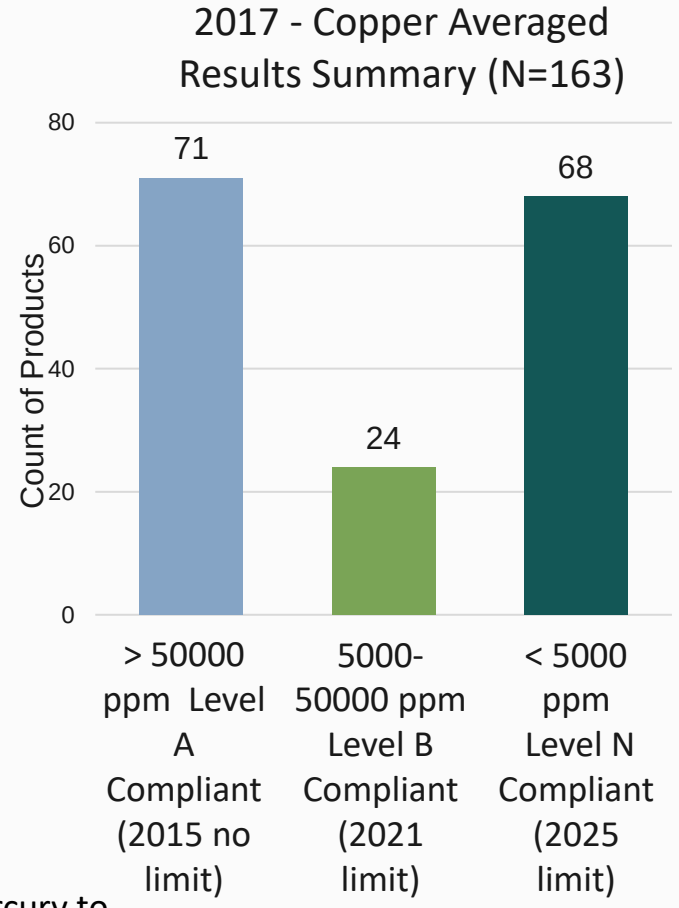
- Strong collaborations
  - Partner
  - Contract labs
- Need for PSU lab
  - Development, analysis challenges
    - Challenging product matrices: 6-12mo
    - Preparation, methods
- Validation
  - Stage 4 DV

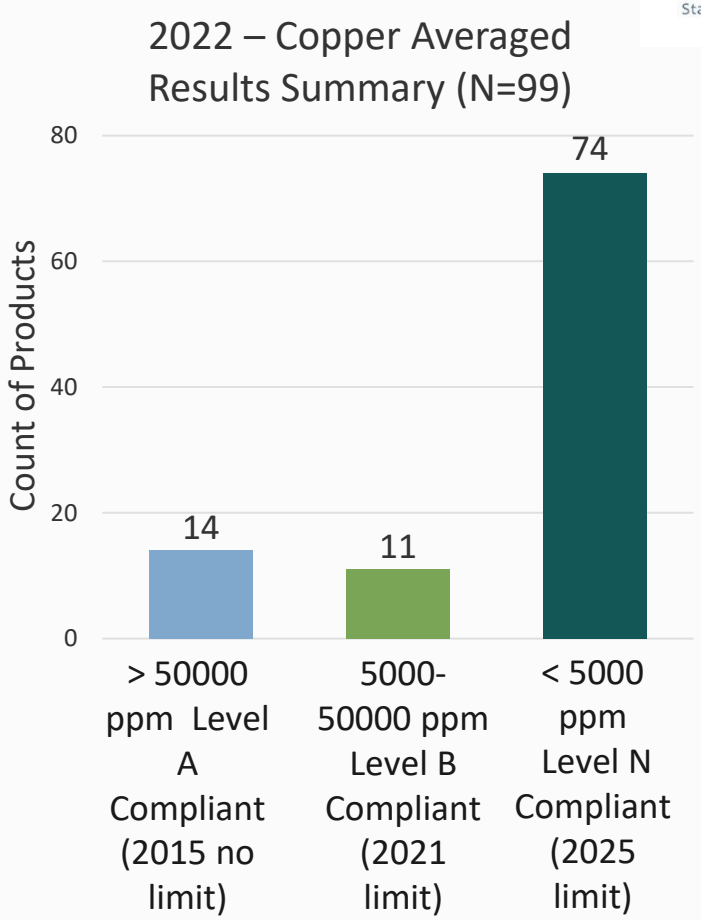
Better Brakes: 2017 and 2022 Compliance Assessments

- ECY Publications 18-04-003, 23-03-028
  - Analytes include cadmium, copper, lead, mercury, and hexavalent chromium

Brake Edge Code

A B N





Level A: limits levels of asbestos, chromium(VI), lead, and mercury to ≤ 1000 ppm and cadmium to 100 ppm.

Level B: all requirements of level A and limits copper to ≤ 50000 ppm.

Level N: all requirements of level A and limits copper to ≤ 5000 ppm.

Assessment of Flame Retardants in Gymnasium Foam and Dust Before and After Product Replacement

(current study)

ECY QAPP#
24-03-107

Goal:

Evaluate the effectiveness of product replacement activities by assessing selected flame retardants in foam pit cubes currently in use and in alternative foam pit cubes chosen as the replacement.

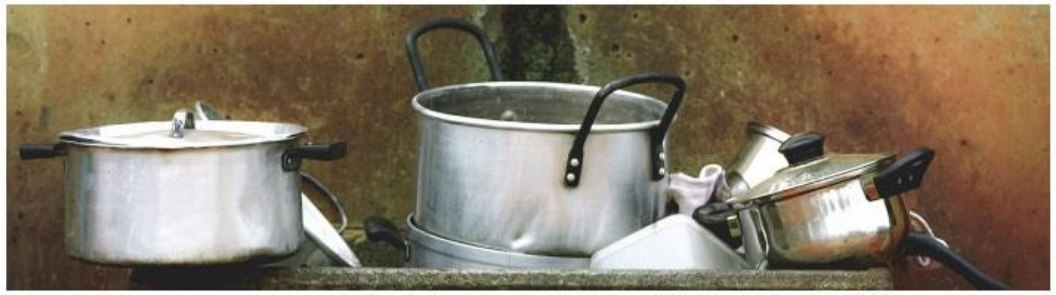
Flame Retardants—TDCPP, TCEP, TCPP, TPP, TBB, TBPH, BDE-047, BDE-066, BDE-099, BDE-100, BDE-153, BDE-154

Analysis Method:
EPA SW-864 Method 8270:
Semivolatile Organic Compounds By GC-MS

Future

- Cd, Cu, Pb, Cr - Brakes
- PFAS, 6PPDQ - Field Turf Study
- PFAS – AFFF (transition to F3)
- Pb, Cd, FR, Phthalates - CSPA
  - Children's Jewelry, Toys, Clothes
- CH_2O & releasers - Cosmetics
- Pb – Cookware

PSU Laboratory



Thank You

Product Studies Unit

Consumer products testing - Washington State Department of Ecology

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