American Coatings ASSOCIATION℠

December 31, 2024

Sascha Stump
Toxicologist, Hazardous Waste and Toxics Reduction Program
Washington Department of Ecology
300 Desmond Drive SE,
Lacey, WA 98503

Re: Department of Ecology's Cycle 2, Draft Identification of Priority Products Report to the Legislature, Washington Safer Consumer Product Program, regarding architectural paint.

Submitted via online portal at: https://hwtr.ecology.commentinput.com/?id=9gHGTCx2EV

Dear Dr. Stump:

American Coatings Association (ACA) appreciates Washington Department of Ecology (hereinafter "Ecology") maintaining open communication with stakeholders as it continues to develop the Safer Products for Washington Program. ACA is eager to continue engaging with Ecology to implement an effective program, based on a clear and accurate understanding of products causing contamination and their impact on health and the environment. ACA and its members appreciate the opportunity to provide comment on Ecology's *Draft Report to the Legislature* (hereinafter "Draft Report") and its related *Draft Technical Supporting Documentation*.

The Association's membership represents 90% of the paint and coatings industry, including downstream users of chemicals, as well as chemical manufacturers. Our membership includes companies that manufacture a variety of formulated products including paints, coatings, sealants and adhesives and their raw materials that may be affected by requirements, due to the broad set of covered chemicals, regardless of associated hazards.

I. Introduction

In November, Ecology published a draft report to the legislature with a supporting technical document identifying paint as a priority product for PFAS content, under Cycle 2 of the Safer

Consumer Products Program. Consumer surveys did not indicate paint as a product of concern prior to this designation. Ecology defines the priority product as “architectural coatings” applied to the interior and exterior surfaces of buildings by non-professional and professional users. Ecology further explains that the category includes “paints, primers, and clearcoats such as varnishes or lacquers.”[1]

Ecology identifies concerns for emissions containing 6:2 fluorotelomer alcohols, a C-6 compound, during paint drying times. Ecology also indicates the possibility of other C-6 compounds in paints, although these did not volatilize during testing. Related to overall PFAS content, Ecology raises concerns about paint-flakes associated with household dust, used paint discharged into municipal water supplies and construction debris leaching PFAS upon disposal. Ecology explains that residential painters and workers, particularly adults of child-bearing age, are susceptible to exposure from air emissions during drying. Ecology also has concerns for children ingesting paint flakes and/or PFAS-containing dust.

ACA appreciates the opportunity to comment on these matters. The Draft Report is highly speculative about potential risk from painting and paint as a contamination source. It is unclear why Ecology has proposed paint as a priority product when other products have clearly been identified as contributors to indoor and environmental PFAS. Ideally, Ecology would rescind this proposed listing to evaluate significant sources.

If Ecology chooses to proceed, ACA provides some additional context regarding use of fluorinated chemistries and their hazards and risks. ACA also provides additional context regarding PFAS emissions during and after paint application, risk abatement and potential of paint to cause PFAS-containing dust and contamination generally. It is our hope that Ecology provides context when describing issues so as not to mislead the legislature regarding the degree of risk.

ACA also requests that Ecology amend the scope of included “architectural paints” to focus on those paint ingredients indicated in the Draft Report, while excluding fluorinated chemistries not associated with PFAS contamination or health effects. ACA requests that Ecology exclude fluoropolymer-based paints and solvents containing a single C-F bond.

To that end, this comment consists of the following sections.

I. Introduction
II. Recommended changes to scope of covered architectural paint products.
    a. Certain high-performance coatings incorporate fluoropolymer chemistries.
    b. OECD publication regarding PFAS in paints and coatings notes that replacements do not perform at the same level as coatings with fluoropolymers.
    c. Fluoropolymers used in coatings do not have properties associated with PFAS contamination.
III. Low-VOC architectural coatings are possible due to a short-chained fluorinated solvent.

[1] Draft Report to the Legislature, p. 22.

IV. ACA recommends excluding components of architectural paint with a single carbon-fluorine bond.

V. ACA recommendations related to health risk from emissions, flaking, discharges and construction debris.

   a. Volumes of paint sold in the state, referenced in the draft report, are not correlated to risk of exposure.
   b. Painting has not been identified as a primary source of indoor air concentrations of PFAS or PFAS exposure, even while painting.
   c. ACA recommends providing additional context or removing references to total fluorine content since these measurements are not an indicator of PFAS content.
   d. The Draft Report to the Legislature does not adequately characterize DIY residential painters' standard risk-abatement practices.
   e. A chemical in a paint matrix does not cause health effects associated with the unbound chemical.

VI. Fluorinated chemistries do not have a "drop-in" alternative in architectural paints.

VII. Ecology must identify contamination sources with a risk assessment.

VIII. Conclusions and additional recommendations.

ACA and its members requests that Ecology amend the draft report to the legislature and supporting technical document as suggested below:

II. Recommended changes to scope of covered architectural paint products.

ACA recommends amending the scope of covered products by excluding architectural coatings used to preserve critical infrastructure, where fluoropolymers are a key component. Additional information regarding the non-toxicity of fluoropolymers is included below. The current scope of covered paint products described in the report may also potentially include non-architectural coatings products, such as primers, clearcoats, varnishes and lacquers. Ecology includes primers, clearcoats, varnishes and lacquers within the category of covered paints at page 22, while also identifying the category of products as "architectural paints." ACA appreciates Ecology's clear exclusion of certain paint categories. Ecology explains "This category doesn't include automotive paints, special purpose, or industrial original equipment manufacturer coatings, applied in factory settings."[2]

a. Certain high-performance coatings incorporate fluoropolymer chemistries.

Fluorinated chemistries are sometimes necessary to meet high performance standards, often reducing raw materials and energy usage due to durability of the fluorinated product. Further, paint manufacturers may formulate products to meet standardized performance requirements, such as AAMA 2605-20 (2020) *Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with*

[2] Washington Department of Ecology, *Draft Technical Supporting Documentation for Priority Products*, p. 87 (November 2024), Publication 24-04-050.

Coil Coating Appendix) or *SSPC Paint 47, Highly Weatherable Fluoropolymer Topcoat, Performance-Based*. Federal agency specifications and municipal codes may adopt these and other related performance standards as requirements for coatings. Another application includes intumescent coatings on industrial buildings used to delay or stop the spread of industrial fires.

ACA encourages Ecology to consider the necessity of fluoropolymers to meet specifications. Fluoropolymer binders are essential for providing the kind of durability, safety, and sustainability that permit long lifespan protective coatings for critical infrastructure such as bridges, buildings, and other structures; and fluoropolymers are specified to meet several architectural industry performance standards, such as AAMA 2605, SSPC Paint 47, etc. Less effective technologies will lead to greater waste and replacement costs and higher risk of structural deterioration and aesthetics reduction.

b. OECD publication regarding PFAS in paints and coatings notes that replacements do not perform at the same level as coatings with fluoropolymers.

In January 2022, the OECD published *Per- and Polyfluoroalkyl Substances and Alternatives in Coatings, Paints and Varnishes (CPVs) (Report on the Commercial Availability and Current Uses)*.[3] The report considers uses, function and efficacy of alternatives to PFAS as used in paints and coatings, while focusing on three types of products:

- Coatings for cables and wiring;
- Coatings used on solar panels; and
- Household and architectural paints, while mostly focusing on paints for bridges.

For most uses, OECD concludes that performance characteristics of coatings with fluoropolymers make them more desirable products than their non-performing alternatives.[4] Use of coatings with fluoropolymers is limited by need where a buyer is willing to pay additional costs for high-performance characteristics. When considering bridge paint, the OECD concludes that,

> [I]t would cost approximately 26% more with the FP (fluoropolymer) based coating compared to polyurethane. However, after 30 years it was concluded that the total cost for the polyurethane coating would cost 16 % more than the FP-based coating, owing to the faster degradation of the non-PFAS coating and therefore a need for more frequent recoating, with associated labour and material costs.

[3] *Alternatives in Coatings, Paints and Varnishes (CPVs) (Report on the Commercial Availability and Current Uses)* (hereinafter, "OECD Report") is available online at: https://www.oecd.org/chemicalsafety/portal-perfluorinated-chemicals/per-and-polyfluoroalkyl-substances-alternatives-in-coatings-paints-varnishes.pdf

[4] OECD Report at p. 65-66

CEPE (The European Council of the Paint, Printing Ink, and Artist's Colours Industry), in collaboration with ECCA (European Coil Coating Association), engaged an external consultant that conducted an in-depth life cycle assessment of the various coil coating systems. This work concluded that PVDF coatings, when compared with other systems used by the coil coating industry, has the lowest environmental impact – 74% lower than commonly-used polyester coating.

The lower environmental impact is driven by the durability of PVDF coatings, which has double the life expectancy (30 years) of polyester coatings (15 years). The increased durability of PVDF lowers the frequency of the need for: (1) repainting, and (2) replacement of a building's metal cladding.[5] Additional material and manufacturing costs associated with non-fluoropolymer alternates have an environmental impact from increased use of raw materials, energy consumption, waste production and disposal, etc.

c. Fluoropolymers used in coatings do not have properties associated with PFAS contamination.

Fluoropolymers are considered "polymers of low concern" (PLC) recognized by several regulators, since they are chemically stable, non-toxic, non-bioavailable, non-water soluble and non-mobile. Recently, Ecology, when considering fluoropolymers as part of its review of PFAS under *its Safer Products for Washington* program, concluded:

> Fluoropolymers have been found to have thermal, chemical, photochemical, hydrolytic, oxidative, and biological stability (Henry et al., 2018; Korzeniowski & Buck, 2019a). They are almost insoluble in water and not subject to long-range transport. With very high molecular weight (greater than 100,000 Da), fluoropolymers cannot cross the cell membrane. They are neither bioavailable nor bioaccumulative. Clinical studies of their use in medical devices has [sic] demonstrated lack of chronic toxicity or carcinogenicity and no reproductive, developmental, or endocrine toxicity.[6]

The two studies Ecology relies on, from *Henry, et. al*. and *Korzeniowski*, evaluated criteria to conclude that fluoropolymers are not mobile, bioavailable or bioaccumulative. Further, they do not transform into long chain, non-polymeric chemistries associated with PFAS contamination. Fluoropolymers are a fundamentally different chemistry from non-polymeric PFAS chemicals associated with contamination, including the C-6 compounds indicated in Ecology's Draft Report. Because of these qualities, fluoropolymers have been classified as "polymers of low

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[5] Submission to the Public Consultation on the Proposed PFAS Restriction: The Use of PVDF and FEVE Fluoropolymers in the European Coil Coating Industry, by Dr T.J.Goodwin, Sustainability Director, ECCA; 21st August 2023.

[6] Washington Department of Ecology, *Per- and Polyfluoroalkyl Substances Chemical Action Plan*, p. 97, Sept. 2022 revision of original publication from April 4, 2021, available online at: https://apps.ecology.wa.gov/publications/documents/2104048.pdf.

concern" by regulators.[7] For these reasons, Canada proposed to exclude fluoropolymers from its definition of PFAS for regulatory purposes, proposed in its *Updated Draft State of Per- and Polyfluoroalkyl Substances (PFAS) Report*[8].

DoE (Department of Energy) recently concluded that fluoropolymers are distinct from non-polymeric PFAS chemicals in its report, *Assessment of Fluoropolymer Production and Use with Analysis of Alternative Replacement Materials* (published January 2024). DoE explains that due to relatively smaller molecular weight, non-polymeric PFAS are mobile in a variety of media, increasing particle dispersion. Significantly higher molecular weight of all forms of fluoropolymers, over non-polymeric PFAS, makes fluoropolymers stable and non-water soluble compared to non-polymeric forms. The report notes that literature suggests that fluoropolymers are generally non-mobile and cannot permeate the cell membrane. Some reports disputing these conclusions note evidence related to polymers rather than fluoropolymers.

The DoE further explains that,

> The unique characteristics of fluoropolymers can enhance product durability, sustainability and safety. Products that are lighter and longer-lasting will generally have lower life cycle costs, embodied energy, transportation-related emissions, and safety risks.

Benefits of fluoropolymer usage in building construction and infrastructure are covered in Section 2.4.3, page 2-11 of DoE's Report. Fluoropolymer coatings can reduce building cooling costs and improve energy efficiency by up to 22%. Fluoropolymer coatings reduce building maintenance by extending building life, even in harsh environments, while enhancing overall stability. Fluoropolymer coatings also are resistant to dirt adhesion enhancing their solar reflective and protective properties. Based on the findings of these bodies, including Ecology's prior assessment of fluoropolymers, ACA recommends removing fluoropolymer-based paints from the scope of covered products.

III. Low-VOC architectural coatings are possible due to a short-chained fluorinated solvent.

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[7] See Henry, B.J., Carlin, J.P., Hammerschmidt, J.A., Buck, R.C., Buxton, L.W., Fiedler, H., Seed, J. and Hernandez, O. 2018, *A critical review of the application of polymer of low concern and regulatory criteria to fluoropolymers*, Integr Environ Assess Manag, 14: 316-334, available online at: https://doi.org/10.1002/ieam.4035;
See also Korzeniowski, S.H., Buck, R.C., Newkold, R.M., El kassmi, A., Laganis, E., Matsuoka, Y., Dinelli, B., Beauchet, S., Adamsky, F., Weilandt, K., Soni, V.K., Kapoor, D., Gunasekar, P., Malvasi, M., Brinati, G. and Musio, S. 2022. *A critical review of the application of polymer of low concern regulatory criteria to fluoropolymers II: Fluoroplastics and fluoroelastomers*. Integr Environ Assess Manag, available online at: https://doi.org/10.1002/ieam.4646.

[8] See the Executive Summary in the Canadian Gazette, July 2024: https://www.gazette.gc.ca/rp-pr/p1/2024/2024-07-13/html/notice-avis-eng.html#ne3.

ACA recommends updating the reports (*Draft Technical Supporting Documentation* and the *Report to the Legislature*) to note that short-chained PFAS are critical component of low-VOC coatings. Advancements in coatings technology have led to significant reductions in volatile organic compound (VOC) emissions from paints and coatings. These changes are facilitated by a short-chained fluorinated solvent not associated with contamination of waterways. California's South Coast Air Quality Management District (SCAQMD), which includes the Los Angeles area, has the most stringent air emissions regulations in the country, due to air quality issues in the district. As such, ACA analyzes the air quality data collected by the local air district since it is a great indicator of emissions trends globally. The data collected in this area demonstrates that, despite increasing sales, emissions from architectural coatings have decreased by more than 40% since 2008. This dramatic reduction in emissions illustrates industry's commitment to reducing its environmental footprint and improving air quality.

IV. ACA recommends excluding components of architectural paint with a single carbon-fluorine bond.

Ecology identifies concerns from C-6 fluorotelomers and other similar PFAS compounds associated with contamination and possibly indoor air quality. ACA requests that Ecology exclude architectural coatings containing critical use short-chained fluorinated solvents, containing one C-F bond. These chemistries are not associated with contamination. Exclusion of architectural paint containing solvents with one C-F bond would still include a wide array of PFAS chemistries within scope, estimated by EPA to be 1,364 chemicals on the TSCA Inventory and 9,400 existing PFAS structures. In its TSCA PFAS Reporting Rule, EPA excluded "lightly fluorinated" PFAS chemistries, including chemistries with a single C-F bond.[9] EPA determined that these compounds are not persistent. In effect, these compounds are not a contamination source.

V. ACA recommendations related to health risk from emissions, flaking, discharges and construction debris.

Ecology states that DIY painters can be exposed to PFAS from paint through emissions after application. Ecology also identifies possible exposure to household dust with PFAS content, speculating deteriorated paint might be a source. Ecology reports that pregnant women can be particularly susceptible to health effects from emissions and children are susceptible to ingesting PFAS-containing dust.

Ecology raises concerns about emissions of fluorotelomer alcohol (6:2 FTOH) and other related PFAS, as described in one study by *Cahaus, et. al*.[10] ACA appreciates Ecology's bringing the

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[99] EPA, Final PFAS Reporting Rule, 88 Fed. Reg. 195, 70516, ,70518 (Oct. 11, 2023).

[10] Liliana Cahuas, Derek J. Muensterman, Mitchell L. Kim-Fu, Patrick N. Reardon, Ivan A. Titaley, and Jennifer A. Field, *Paints: A Source of Volatile PFAS in Air_Potential Implications for Inhalation Exposure*, Envir. Sci. Technol. 2022, 56, 17070-17079, available online at: https://pubs.acs.org/action/showCitFormats?doi=10.1021/acs.est.2c04864&ref=pdf

Cahaus, et. al. study to ACA's attention, but ACA urges Ecology to recognize the limitations of this study. These limitations should be articulated more clearly in the report to the legislature, so as not to mislead the public and legislators regarding the degree of risk. Paint has a negligible potential to contribute to PFAS-containing dust due to the matrix-effect of having trace-levels of PFAS in a paint matrix coupled with the life-span of indoor architectural paint, which remains embedded on a wall. Paint is typically not released, unless sanded.

Ecology's proposed listing of paint as a "significant source" includes no consideration of other products as emissions, dust or contamination sources. Other, non-paint, sources of PFAS are recognized by *Cahaus, et. al*. and others. Studies do not indicate paint as a primary or significant source of PFAS contamination or a health hazard from emissions. As ACA details in sections below, Ecology's approach to identifying priority products undermines the public health and environmental protections intended by the legislature, relying on speculative and inconclusive information. The *Cahaus, et. al.* study is designed to encourage further examination of potential risks, but it is not intended to initiate regulatory action. ACA encourages Ecology to withdraw this listing to conduct additional due diligence to identify products with toxicologically relevant potential for PFAS exposure.

a. Volumes of paint sold in the state, referenced in the draft report, are not correlated to risk of exposure.

ACA recommends updating the draft report and technical report to cite current sales volumes, while noting that volumes of architectural paint sold in the state may have no toxicological relevance. Product sales volumes do not indicate increased exposure to fluorotelomer alcohols or PFAS generally. Regarding emissions, Ecology relies on one study by *Cahaus, et. al*. The authors of this study clearly did not intend it to be a substitute for risk assessment. As explained below, this study is intended to identify areas for further scientific study, while developing a methodology for PFAS detection in paints.

Current information demonstrates that sales volumes for architectural coatings has decreased since 2019.[11] Ecology refers to outdated information from 2019 in its draft report. Although sales volumes have little to no correlation to exposure and health and environmental effects, assuming some correlation, Ecology can assume paint is less of a "significant source" of contamination than the draft report indicates, due to recent lower sales volumes.

b. Painting has not been identified as a primary source of indoor air concentrations of PFAS or PFAS exposure, even while painting.

If Ecology proceeds with listing paint, ACA recommends providing the proper context to understand the paint emissions study by *Cahaus, et. al*., while noting that it is not a clear indicator of risk. *Cahaus, et. al.* evaluated paint samples, consisting of 22 interior paints and 5

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[11] Pilcher, George (ChermQuest), *The State of the U.S. Paint and Coatings Market: More Reliable Supply Chain, Slight Decline in Volume*, Coating Tech., Sept.-Oct. 2023 edition, available online: [CoatingsTech - Issue Library]

exterior paints, in a closed chamber test, to measure emissions of 6:2 FTOH and 6:2 diPAP, at intervals over a 3-hour drying period. The closed chamber consisted of a 5.7 L box, with estimated dimensions being 13 5/8" L x 8 1/4" W x 4 7/8" H. *Cahaus, et. al.,* identified target PFAS (6:2 FTOH and 6:2 diPAP) in 14 samples (out of 27), with higher concentrations in five exterior paint samples. Target PFAS emissions were identified in nine indoor air samples, out of 22.

Cahaus, et. al. then estimated exposure using ConsExpo modeling methods to compare exposure values to a reference chronic dose of 5 μg/kg–bw/day, based on a chronic reference dose of 5000 5 μg/kg–bw/day for male rats with a correction factor of 1000 for humans.[12] Emissions from one interior paint sample exceeded the reference exposure value. Ecology accepts this as an indicator that paint is a “significant source” of emissions.

ACA recommends further consideration of the high degree of variability in results of ConsExpo modeling. Vapor pressure is a critical consideration in exposure modeling. Because *Cahaus, et. al.* identified a broad range of vapor pressures for 6:2 FTOH, they used vapor pressures of 18, 130 and 880 Pa, while also adjusting temperature at 15^{o} C (about 59^{o} F), 25^{o} C (about 77^{o} F) and 35^{o} C (about 95^{o} F).[13] At 18 Pa, *Cahaus, et. al.* estimated that no paint samples cause exposures exceeding the reference dose value of 5 μg/kg–bw/day. At 880 Pa, three paint samples are associated with exposures more than the reference value. As would be expected, exposure potential increased rapidly as temperature increased, due to higher rates of volatilization.

Cauhas, et. al., emphasize variability in estimates to conclude that, “Actual air measurements while paint dries is needed to fully understand the contribution of 6:2 FTOH in air as paint dries.”[14] Clearly, the study is not designed to support regulatory action. Rather, it is designed to identify issues that deserve further consideration of scientific community, including industry. *Cahaus, et. al.,* state,

> The objective of this study was to develop and validate an analytical method for volatile and nonvolatile PFAS in paints and to use a variety of techniques to verify the volatilization of volatile PFAS to the air.[15]

The Cahaus study succeeds in its purpose of identifying a methodology and identifying issues for further consideration. The study is inconclusive with regards to the overall risk from paint emissions, and it does not identify paint as primary contributor to indoor air concentrations of 6:2 FTOH or other target PFAS.

c. ACA recommends providing additional context or removing references to total fluorine content since these measurements are not an indicator of PFAS content.

[12] Cahaus, et. al. at p. 17073-17074.
[13] Cahaus, et. al. at 17076-17077.
[14] Cahaus, et. al. at 17077.
[15] Cahaus, et. al. at 17071.

ACA recommends providing additional context for total fluorine measurements, which typically are not an accurate indicator of PFAS. At page 88 of the Draft Technical Supporting Document, Ecology concludes that additional PFAS must be present in paints due to total organic fluorine measurements taken by the Healthy Building Network and the 2022 Cahaus, et. al. study. ACA cautions against review of total organic fluorine as an indicator of PFAS content. Total fluorine testing does not distinguish the variety of PFAS chemistries from overall fluorine content, resulting in inaccurate and over-inclusive measurements. Noting limitations of total fluorine measurements, a study concludes, "Measurement of total fluorine (TF) is inexpensive, but it is not as reliable of a proxy for PFAS because it includes inorganic fluoride in addition to organic fluorine."[16]

The Healthy Building Network measures total fluorine content, and as such, Ecology should not rely on these measurements or note that total fluorine does not indicate PFAS content. Total fluorine measurements by *Cahaus, et. al.* have different limitations. *Cahaus, et. al.* note a shift in NMR results that are consistent with organic fluorine, rather than inorganic. *Cahaus, et. al.* speculate that this shift could be caused by unmeasured C-6 PFAS content. As noted above, the paint industry uses short-chained PFAS molecules that are not associated with contamination. Indicators of organic fluorine may not indicate toxic forms of PFAS.

ACA recommends removing the statement at page 88 of the supporting technical document that,

> "This (total fluorine content) suggests that additional PFAS molecules are present in the paints that have yet to be identified."

ACA suggests that any discussion of total fluorine include information about the limits of total fluorine as a detection method, noting that total fluorine is not an accurate indicator of PFAS content.

ACA recommends modifying the following statement at p. 22 of the Draft Report to the Legislature:

> "Product testing studies on paint have found that around half of paint products tested contain organic fluorine (an indicator of PFAS) or 6:2 fluorotelomer alcohols, which are volatile PFAS chemicals (Cahuas et al., 2022; Healthy Building Network, 2023)."

ACA recommends the following modification:

> Product testing studies on paint have found that around half of paint products tested contain fluorine or 6:2 fluorotelomer alcohols, which are volatile PFAS chemicals (*Cahuas et al., 2022; Healthy Building Network, 2023*). Although total fluorine content may not indicate PFAS content, Ecology believes the issue of PFAS content in paint deserves further consideration.

[16] Young, Anna, et. al., *Organic Fluorine as an Indicator of Per- and Polyfluoroalkyl Substances in Dust from Buildings with Healthier versus Conventional Materials*, Environ. Sci. Technol. 2022, 56, 23, 17090–17099, available online at: https://pubs.acs.org/doi/10.1021/acs.est.2c05198#

d. The Draft Report to the Legislature does not adequately characterize DIY residential painters' standard risk-abatement practices.

Ecology correctly identifies that the greatest potential for exposure to VOC and 6:2 FTOH emissions during the drying time after paint application. Under the hierarchy of controls for risk management, engineering controls, designed to remove a hazard before an individual comes in contact, is preferred over PPE. Similarly, administrative controls, such as restricting access to areas of potential exposure, is preferred over PPE, but falls after engineering controls. The paint industry incorporates these principles when providing instructions for the safe use of its products.

Applying these principles, risk from emissions during paint drying times can be abated with proper ventilation, by opening a window, circulating air with fans, etc. Risk is further eliminated by removal of childbearing or other individuals from the painted room, applying the principle of "administrative controls." The study by *Cauhaus, et. al.* does not comment on the need for PPE to abate risk.

Ecology identifies heightened exposure potential for residential painters, particularly young adults of childbearing age, because of a failure to use respiratory protection while painting. Ecology explains:

> According to a press release by 3M that describes the result of a 2012 National Safety Council survey on DIY safety, only 39 percent of respondents reported using respiratory protection when working on home improvement projects, indicating around 60% are not using PPE (3M, 2012).[17]

ACA recommends removing this statement since PPE is not the primary method of risk mitigation. Under the hierarchy of controls, painters should first implement engineering controls (e.g. ventilation) and administrative controls (removing susceptible individuals from the painted room) to abate risk. If this is not possible, then they should use PPE. Even if 60% of residential painters are not using PPE, these individuals can be expected to have abated risk via preferred methods.

Residential, DIY painters can reasonably anticipate chemical emissions during the drying process and can take appropriate abatement measures. In evaluating "low-VOC" and other related claims, the FTC (Federal Trade Commission) considered whether consumer awareness and expectations align with actual emissions during drying times for paint. The FTC determined that such marketing claims are aligned with consumer awareness and expectations if emissions reach a "trace level of emissions" within 6-hours after application. Here, FTC refers to *all* chemical emissions from drying paint.

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[17] Ecology, *Draft Technical Supporting Documentation for Priority Products*, p. 92, Publication 24-04-050 (Nov. 2024)

The *Cauhaus, et. al.* study consists of closed chamber measurements within 3-hours after paint application. It also references ConsExpo modeling with a 132 minute time frame.[18] The "emissions period" for 6:2 FTOH during paint drying is well within the FTC's 6-hour time period where consumer expect emissions. Workers, consumer (residential DIY painters) and by-standers, can expect to use standard precautions during this six-hour period, such as opening a window, enhancing air flow, standard PPE used by professional painters, etc.

Ecology also raises concerns related to increased use of paint from public and residential housing development. During construction and when re-painting, professional painters are trained in standard PPE practices, including use of respirators, gloves and adequate ventilation. Workers would only be presented with potential risk if they do not follow standard practices.

e. A chemical in a paint matrix does not cause health effects associated with the unbound chemical.

Ecology also raises concerns about PFAS contamination in household dust and land contamination from construction debris. Although Ecology provides no direct information identifying paint as a cause of contamination, Ecology speculates that paint deterioration could be a contamination source. *Cahaus, et. al.* also speculate that paint contains non-volatile PFAS content that could be a contamination source. ACA encourages Ecology to recognize that these are speculative statements and not conclusive determinations. Another consideration is the "matrix effect" minimizing potential risk of exposure to trace-level PFAS components in deteriorated paint flakes.

IARC (International Agency for Research on Cancer) and California's OEHHA (Office of Environmental Health Hazard Assessment) considered hazards of particles in a paint matrix when considering potential carcinogenicity of certain paint components. A key consideration for classification is the "availability for exposure," presented by particulates when "bound" in a wetted-paint or coatings mixture. Given the published findings of IARC and California's OEHHA, the "availability for exposure" factor has resulted in clear moderating statements on carcinogen classifications. IARC's monographs, for example, include the following mitigating statement for carbon black and titanium dioxide as present in paints and coatings:

> FOR CARBON BLACK
>
> "Operators in user industries who handle fluffy or pelleted carbon black during rubber, ***paint and ink production are expected to have significantly lower exposures to carbon black than workers in carbon black production***. Other workers in user industries who handle it occasionally have little opportunity for exposure."

And further…

[18] *Cahaus, et. al.* at p. 17073.

"End-users of these products (rubber, ink or paint) are unlikely to be exposed to airborne carbon black particles, which are bound within the product matrix."

"Many workers were exposed to carbon black in bound matrices such as paint or rubber. It is probable that workers exposed to carbon black in this study were exposed to lower levels than those in other studies."

FOR TITANIUM DIOXIDE

"No significant exposure to primary particles of titanium dioxide is thought to occur during the use of products in which titanium dioxide is bound to other materials, such as in paints."[19]

California's OEHHA issued similar language for classification under California's *Safe Drinking Water and Toxic Enforcement Act (Prop. 65)*, when issuing a Safe Use Determination for crystalline silica:

"Most of the crystalline silica particles in the paints were above respirable size (10 µm) and partitioned out of the respirable paint aerosol when the aerosol was generated. This is the likely reason for the lack of crystalline silica detection in respirable wet paint aerosol under these testing conditions. Since NPCA (now ACA) took a reasonable approach in its effort to measure crystalline silica from the spraying activity, i.e., the pooling of filters, ***OEHHA believes the wet aerosol portion of the exposure may be much less toxicologically significant than that produced from the dusts that result from sanding.***

A number of factors may tend to increase or decrease estimates of exposure relative to the approach used to develop the exposure levels described above. ***We believe, on the whole, that the assumptions made are likely to have resulted in overestimates of exposure levels from the average use of interior flat latex paint."***[20]

Considering these authoritative findings, based on the lack of exposure and risk associated with particles integrated in a wetted mixture, it is not appropriate to assume paint is a contamination source for a paint component or that paint causes an adverse health effect from a hazard associated with a chemical component bound in a paint matrix.

VI. Fluorinated chemistries do not have a "drop-in" alternative in architectural paints.

[19] IARC Monograph on Carbon Black and Titanium Dioxide
http://monographs.iarc.fr/ENG/Monographs/vol93/index.php
[20] OEHHA "Safe Use Determination for Crystalline Silica
http://www.oehha.org/prop65/CRNR_notices/safe_use/sylicasud2.html

Ecology notes that it is too early in its process to consider regulatory controls, but it preliminarily notes that PFAS can be substituted out of paints. Ecology identifies silicone-based polymers as a potential substitute.[21] It also notes that Green Seal, "a leading industry standard certification," is in the process of developing a PFAS standard prohibiting PFAS in paints and coatings, further encouraging substitution. Ecology also notes trials have been conducted on PFAS alternatives.

ACA cautions against a general assumption that fluorinated chemicals will be substituted in architectural coatings. Alternatives analysis is product and chemical specific, factoring in a variety of performance and technical factors. Silicone based polymers will not function as a substitute for many products. As noted above, both the OECD 2022 report and the DoE report, published in 2024, indicate that fluoropolymer-containing architectural coatings, used on external buildings and structures, lose critical functionality when substituted. More frequent application of a less-effective paint results in additional environmental considerations. Also, described above, a non-toxic, short-chained fluorinated solvent is used to maintain low-VOC levels in paint.

Regarding the proposed Green Seal standard for PFAS in paints, ACA does not expect this standard to have a significant impact on paint formulation. In the paint industry, Green Seal is not a leading certification organization. It has fallen into disuse by perpetuating an unrealistic understanding of paint components and related risk. The PFAS standard will further this legacy.

Ecology also notes that, "Alternative chemistries with similar performance characteristics conferred by PFAS paint products have been explored in trials conducted by Arkema and published by the American Coating Association."[22] Here, Ecology is referring to lab tests of two paint samples formulated in a laboratory, being compared to performance characteristics of conventional paint.

This publication does not indicate a commercially viable substitute. Instead, it concludes that substitution may be possible, requiring "creative polymer design . . . further modulated through formulation techniques" to compensate for certain deficits in performance of paint samples with the PFAS substitute.[23] ACA cautions against using this paper to conclude that commercially viable substitutes are available across the spectrum of coatings incorporating short-chained fluorinated chemistries.

VII. Ecology must identify contamination sources with a risk assessment.

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[21] Washington Department of Ecology, *Priority Consumer Products Draft Technical Report* (Nov. 2024), p. 94 Publication 24-04-05.
[22] Draft Technical Report, p. 94.
[23] Chervenak, Mary C., *Improved Performance in a Waterborne All Acrylic Latex Produced Without PFAS* (March/April 2024), p. 51.

As noted in ACA's prior comments during Cycle 1, ACA questions Ecology's interpretation of a "significant source" of contamination when identifying priority products. To clearly identify sources of PFAS contamination, ACA strongly suggests that Ecology conduct a source-to-receptor assessment. Absent an assessment, ACA is concerned that major sources, including legacy sources, are not being addressed as part of the Safer Consumer Products regulatory process, decreasing potential program benefits.

Cahaus, et. al. identify carpets, consumer products and textiles as known sources of PFAS in indoor environments. The purpose of their study is not to identify paint as a significant source over these other sources, but rather to examine methodologies to identify paint as a possible additional source. *Cahaus, et. al.,* explain, that "identifying other indoor sources of volatile PFAS can help further assess human exposure to these compounds."[24]

More recent studies also identify other products as key contributors to PFAS in indoor environments. *Rice, et. al.,* in a paper published in January 2024, note widespread use of 6:2 FTOH in other products, including food packaging materials, consumer products, firefighting foams, anti-fogging sprays and other consumer products.[25] Notably, *Rice, et. al*., whose study examines toxicological effects in rodents from 6:2 FTOH exposure, do not identify paint as a source of exposure. Ecology has not considered the main contributors of PFAS contamination. Most contamination, both indoors and outdoors, is associated with discharge of firefighting foams, a use that is currently being phased out. Firefighting foam use has largely been phased out of use in Washington. Discharges from legacy use of firefighting foams may form particulates that contribute to contamination in household dust particles.

The criteria for selection of consumer products, provided in RCW 70A.350.030 requires Ecology to consider both exposure potential and potential for contamination in the environment, amongst several other considerations. Specifically, the section requires Ecology to consider:

> The potential for *exposure* to priority chemicals by sensitive populations or sensitive species when the consumer product is used, disposed of, or has decomposed . . .
> (RCW 70A.350.030(2)(c))

The act further requires consideration of:

> The potential for priority chemicals to be found in the outdoor environment, with priority given to surface water, groundwater, marine waters, sediments,

[24] Cahaus, et. al. at 17070.

[25] Rice, et. al., *Evaluating the toxicokinetics of some metabolites of a C6 polyfluorinated compound, 6:2 fluorotelomer alcohol in pregnant and nonpregnant rats after oral exposure to the parent compound*, Food and Chemical Toxicology, Vol. 183, 114333 (January 2024); and Rice, et. al., *Comparative analysis of the toxicological databases for 6:2 fluorotelomer alcohol (6:2 FTOH) and perfluorohexanoic acid (PFHxA)*, Food and Chemical Toxicology, Vol. 138, 111210 (April 2020).

> and other ecologically sensitive areas, *when the consumer product is used, disposed of, or has decomposed.*
> (RCW 70A.350.030(2)(d)

Ecology has not identified actual exposure to PFAS caused by architectural paint. Information related to PFAS-containing dust, merely notes that PFAS is contained in paints and it could be a contributor. Further, Ecology sites to *Cahaus, et. al.,* whose purpose is to identify testing methodologies for PFAS emissions during paint drying.

Ecology also indicates that volumes of paint sold in the state indicate exposure. Here, exposure potential is entirely speculative. Ecology assumes environmental contamination based on a rough estimate of volumes of paint sold, based on Washington's population as a percentage of the national market. Ecology offers no data about the types of products sold into the state. Further, evidence of product sales and volumes is not evidence of contamination caused by product use.

Under that same section of the act, Ecology must consider the feasibility and availability of alternatives, estimated volumes of the priority chemical in priority products, volumes of priority product sold in the state and regulatory actions in other jurisdictions and by the agency. Ecology must consider these factors in their entirety, including exposure-related considerations. Ecology has not fulfilled its statutory obligation by selecting a product with trace-levels of a priority chemical with minimal exposure potential. ACA is concerned that identifying paints as a priority product will not address PFAS contamination at issue while imposing a high cost to the paint industry.

Ecology's approach undermines the purpose of the statute articulated in the preamble to the act as, "preventing toxic pollution that affects public health or the environment."[26] By failing to identify the main contributors to PFAS contamination, Ecology minimizes potential benefits of the program, undermining its legislative purpose.

VIII. Conclusions and additional recommendations.

ACA appreciates the opportunity to comment on Ecology's draft Report to the Legislature and accompanying technical document. ACA is concerned that the scope of defined architectural paints is overly broad, encompassing paints that are not associated with PFAS exposure and/or contamination. ACA also remains concern that the report does not properly contextualize risk from paint application, use, disposal and degradation, effectively overstating actual risk.

ACA recommends removing fluoropolymer paints from the scope of architectural coatings for this listing. Fluoropolymer paints are professionally applied to minimize worker risk and do not present potential for risk to residential painters. Fluoropolymer paints are fundamentally

[26] Substitute Senate Bill 5135 ("Safer Products for Washington Act"), 2019 Legislative Session, available online at: http://lawfilesext.leg.wa.gov/biennium/2019-20/Pdf/Bills/Session%20Laws/Senate/5135-S.SL.pdf.

different from non-polymer PFAS. ACA also recommends limiting the scope of the listing of architectural paint to PFAS components at issue in the cited studies, by focusing on C-6 compounds, including 6:2 FTOH, while excluding paint components with a single C-F bond from scope since these are not associated with contamination.

The draft technical report contains a high degree of uncertainty. It's unclear why Ecology selected architectural paints from the variety of products known to contribute to indoor air concentrations of PFAS and PFAS contamination. Ideally, Ecology would withdraw this proposal pending additional evaluation of main contributors of PFAS in indoor environments and causing environmental contamination.

If Ecology chooses to proceed, ACA requests that Ecology clearly articulate uncertainty so as not to mislead the public or legislators regarding the degree of risk. Both the technical document and the report to the legislature should be reviewed to clarify the following issues:

- Exposure estimates to 6:2 FTOH during paint drying times show a high degree of variability, while typically being below the reference value, even at high temperatures.
- The indoor air exposure reference value is based on male rate studies; it is not a precise threshold for risk. The *Cahaus, et. al*. study is not a risk assessment, but rather designed to provide a methodology for further consideration of paint emissions.
- Risk from paint emissions during drying would largely be abated with ventilation and/or staying out of the painted room while paint dries.
- Although one survey notes many consumers do not use PPE, PPE is not necessary to abate risk. PPE is lower on the hierarchy of controls than ventilation and staying out of the painted room. Those consumers that are not using PPE may have successfully abated risk by these preferred methods.
- Total fluorine content and total organic fluorine may not necessarily indicate the presence of C-6 PFAS compounds.
- Compounds in a paint matrix have reduced potential for exposure from degradation than the unbound chemical.
- The sources of PFAS-containing dust are varied. No studies indicate that paint degradation is a source of PFAS-containing dust.
- No studies provide information about degraded paint contributing to environmental contamination.
- The PaintCare program runs an active paint recycling program in Washington that minimizes discharges of used paint.

ACA further recommends adding the following contextual statements and changes to the Technical Supporting Document and Report to the Legislature to more accurately reflect potential risk and benefits. These recommendations are organized by topic area noted in the Draft Technical Supporting Document. Additional changes may be needed to incorporate the issues noted above.

1. **Uses of PFAS**

ACA recommends adding the following uses to page 87-88 of the Technical Supporting Document and at page 22 of the Report to the Legislature:

- Non-toxic fluoropolymers are used for protection of critical infrastructure (bridges, water delivery systems, etc.) extending their lifespan and reducing waste from structural deterioration. These high-performance coatings eliminated the need for more frequent paint application of non-fluoropolymer paints, which would inevitably require greater resource use for paint production, transport, application and waste management.
- Short-chain PFAS molecules are used to reduce VOC levels in paint, facilitating production of low-VOC paints. Such solvents are not associated with contamination.

2. **Estimated Volumes of PFAS in Paint.**

- ACA recommends removing the statement at page 88 of the supporting technical document that "This (total fluorine content) suggests that additional PFAS molecules are present in the paints that have yet to be identified." ACA suggests that any discussion of total fluorine include information about the limits of total fluorine as a detection method, noting that total fluorine is not an accurate indicator of PFAS content.

- ACA recommends modifying the following statement:

  "Product testing studies on paint have found that around half of paint products tested contain organic fluorine (an indicator of PFAS) or 6:2 fluorotelomer alcohols, which are volatile PFAS chemicals (Cahuas et al., 2022; Healthy Building Network, 2023)." (p. 22 of the Draft Report to the Legislature).

  ACA recommends the following modification:
  "Product testing studies on paint have found that around half of paint products tested contain fluorine or 6:2 fluorotelomer alcohols, which are volatile PFAS chemicals (Cahuas et al., 2022; Healthy Building Network, 2023). Although total fluorine content may not indicate PFAS content, Ecology believes the issue of PFAS content in paint deserves further consideration. Where total organic fluorine is indicated, this could include compounds containing a since C-F bond not associated with contamination"

3. **Potential for exposure:**

ACA recommends adding the following statement at page 91 of the Technical Supporting Document:

OEHHA in California and IARC have both recognized, in hazard assessments, that an otherwise hazardous chemical does not present the same degree of hazard when bound in a paint matrix.

ACA recommends modifying the following statement at page 91 of the technical report by adding the text in italics:

"*Although studies do not indicate that paint is a source of PFAS in household dust*, building materials, including paints and coatings, have been suggested to be a potential source of PFAS-contaminated household dust (Cahuas et al., 2022; Savvaides et al., 2021)."

4. Sensitive Populations.

ACA recommends adding the following statements:

- Survey information did not consider ventilation practices of residential painters during drying times or removal of individuals while paint dries. These methods are preferred in the hierarchy of controls over PPE.
- ACA recommends removing the following statement as being a false conclusion, "to the large surface area and volume of paints applied indoors, it is reasonable to assume that the degradation of paint on surfaces contributes to PFAS found in indoor dust and the potential for exposure in children." Ecology has provided no information regarding degradation of paint and potential to create PFAS-containing dust. Mere surface coverage does not indicate deterioration into PFAS-containing dust.

5. Availability of Alternatives:

ACA recommends adding reference to the following:

- Both the OECD and DoE indicate that non-fluoropolymer paints are not as effective. In effect, fluoropolymer substitutes lower the degree of protection to critical infrastructure, resulting in waste from deterioration and more frequent paint application.
- PFAS substitutes will vary by type of coatings product. Some products may not have readily available substitutes.

ACA appreciates your consideration of these issues. Please feel free to contact me if I can provide any additional information. I look forward to our continued engagement.

Sincerely,
/s/
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