

Environmental Health Services Division

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Irina Makarow
HWTR Chemical Action Planner
Hazardous Waste and Toxics Reduction Program
Washington State Department of Ecology
300 Desmond Drive SE
Lacey, WA 98503

January 15, 2021

Dear Ms. Makarow,

Public Health – Seattle & King County (PHSKC) thanks the WA State Department of Ecology (Ecology) and the WA State Department of Health (Health) for the opportunity to comment on the Per- and polyfluoroalkyl substances (PFAS) Chemical Action Plan (CAP). We are grateful for the extended comment period provided to accommodate for the impacts of end-of-year activities and the COVID-19 pandemic.

PFAS make up a large and diverse chemical class of about 5,000 different chemical structures. Health impacts and chemical profiles are known for only a small percentage of this chemical class. The majority of chemicals in this class lack data on their usage and health effects largely due to limited requirements by companies to disclose the use of these chemicals in products. Health data that do exist indicate that this class of chemicals is hazardous to human and ecological health. The number of compounds that exist, coupled with the persistence of their hallmark Fluorine-Carbon bond and the data uncertainties around the majority of chemicals in this class, make PFAS a high concern for PHSKC.

Attached is a list of comments identified by PHSKC staff on specific sections of the CAP. The following areas highlight the major themes PHSKC would like to bring to the attention of Ecology and Health for considered emphasis in the final PFAS CAP.

The majority of PFAS chemicals in the environment lack usage, exposure and health effects data.

PHSKC would like to encourage Ecology and Health to place a greater emphasis on the lack of data on this large chemical class. Because PFAS are utilized in so many products and processes, all efforts possible should be made to understand what products contain PFAS and to identify which compound are being used and exposed to humans and the environment. We encourage both agencies to continue to focus on the producer and polluter, as a key focus for actions that reduce or remove PFAS sources/exposures, whether it be through policies that reduce sources in the environment or funding by polluters to remove their contributions of PFAS into the environment. A larger effort by Ecology and Health should be made to understand which PFAS are used, and to phase out unnecessary uses in WA State.

PFAS should not be distinguished based on long-chain, short-chain, and fluoropolymers. Due to similar molecular structures, environmental properties, and biological hazards, Ecology and Health should

provide a plan in the CAP to manage PFAS as a class. Such an approach differs from the traditional chemical management approach of chemical- or product-specific regulations by limiting the production and use of the entire class of PFAS to essential uses. In addition to preventing pollution and exposure, this could incentivize the development of safer alternatives, avoid regrettable substitutions of poorly-studied PFAS compounds, and simplify compliance and monitoring processes.

Products

Controlling PFAS sources starting upstream with products is much more efficient than trying to clean up or treat these chemicals once they enter the environment. Health and Ecology should lay out a clearer plan for PFAS beyond the Safer Products for WA program's mandate, so that PFAS can be addressed in a more comprehensive and efficient manner. Based on new data that re-confirm the vast number of products containing PFAS, initial efforts should focus on eliminating non-essential uses of PFAS in products and processes in WA State.

Analytical Methods Data

Analytical methods to determine PFAS in drinking water sources identify more than the five chemicals selected for State Advisory Levels (SALs). All opportunities to generate data on other PFAS should be made and a system to track and access this data set up for state and local agencies. Ecology should regularly update their analytical method guidance to keep pace with the developing science and recommend methods that will most accurately measure PFAS in different media.

Regulation and Monitoring

PHSKC encourages Ecology to develop testing and sampling standards for PFAS for the following Washington Administrative Code (WAC) Chapters: Chapter 173-201A WAC, "Water Quality Standards for Surface Waters of the State of Washington"; Chapter 173-308 WAC, "Biosolids Management"; Chapter 173-340 WAC, "Model Toxics Control Act"; Chapter 173-350 WAC, "Solid Waste Handling Standards"; and, Chapter 173-351 WAC, "Criteria for Municipal Solid Waste Landfills"; and Chapter 173-401 WAC, "Operating Permit Regulation." This will help to address major PFAS exposure pathways from air, biosolids, solid waste, soil, surface water, and groundwater. PHSKC encourages prompt action on addressing these standards.

PHSKC also supports the adoption of SALs through Chapter 246-290 WAC, "Group A Public Water Supplies", regarding PFAS and changes to the State Action Levels for Group A public water supplies. However, PHSKC encourages Ecology and Health to adopt additional SALs and move to the adoption of MCLs quickly, as more data become available. The State's drinking water program should consider cumulative and aggregate exposures to PFAS mixtures and other chemicals based on regularly updated data and scientific information.

Environmental Detection and Cleanup

Cleanup standards established under the Model Toxics Control Act by Ecology should match the five PFAS compounds proposed by Health for establishing SALs. Public Health supports the commitment to community engagement described in the CAP for cleanup activities. Funding should be established to assist environmental justice, lower-income, and communities of color with sampling and cleaning up PFAS in the environment. Communities should not have the burden for paying for expensive drinking water treatment and environmental cleanup.

Environmental Justice

PHSKC is pleased to see the efforts by Health and Ecology to increase community engagement and input around drinking water contamination events and for input on safer products for Washington State. We encourage both agencies to fund and bolster these efforts. For the work on safer products, we recommend that Ecology and Health dedicate staff and funding to develop a specific engagement plan that will lead to recommendations on actions the State should be exploring regarding products that contain PFAS.

PHSKC suggests that a robust environmental justice section be developed in the final CAP. During the fall of 2020, a State Environmental Justice Task Force provided recommendations for prioritizing environmental justice in Washington State Government to the Governor and the Legislature¹. PHSKC recommends that both Ecology and Health incorporate the recommendations from this report into the PFAS CAP as a specific section, highlighting how environmental justice activities can be taken for each of the actions proposed in the PFAS CAP.

We appreciate Health and Ecology's efforts to create this comprehensive document. If you have any questions about these comments, please contact Shirlee Tan (Shirlee.tan@kingcounty.gov) or Rory O'Rourke (rory.o'rourke@kingcounty.gov).

Sincerely,



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Enclosure: Table of specific staff comments

¹ https://healthequity.wa.gov/Portals/9/Doc/Publications/Reports/EJTF%20Report_FINAL.pdf

PFAS FINAL CAP

PUBLIC HEALTH SEATTLE & KING COUNTY (PHSKC) COMMENTS

ENSURE SAFE DRINKING WATER

Topic	Comment / Concern	Recommendations
Page 48-49	PHSKC thanks Ecology and Health for including equity impacts in the drinking water section. We are also happy to see that Ecology and Health will conduct groundwater/surface water investigations that will support local health jurisdictions (LHJs) in informing residents who may be impacted by PFAS contamination in the groundwater, private wells and Group B water systems.	Provide resources such as guidance on how to engage communities with potential PFAS in their drinking water and sample communications to LHJs, for use in communicating with private well owners in areas with PFAS contamination in the groundwater. Dedicated funding from the state for LHJs to do this work would be helpful, especially for addressing communities with greater needs such as lower income and communities of color.

MANAGE ENVIRONMENTAL CONTAMINATION

Topic	Comment / Concern	Recommendations
Recommendation 3.3 Implement other reductions of PFAS in products	The recommendation to look for products where safer substitutes can replace PFAS in products is a good one, but a separate and parallel effort should be made to identify non-essential uses of PFAS in products and remove those from markets in WA State.	PHSKC suggests including an additional recommendation in this section and the corresponding Appendix 3 on Sources and Uses, that outlines an approach for Ecology to identify and eliminate non-essential uses of PFAS in products and processes in WA State. Please utilize the following reference: https://pubs.rsc.org/en/content/articlelanding/2020/EM/D0EM00355G#!divAbstract
Page 15	Please state which compounds Ecology will develop cleanup levels for. Will it be the same five for which Department of Health is developing State Advisory Levels (SALs)? Fewer? Or more (as based on the testing method which will identify additional compounds).	Ecology should make all data detected by the method used for PFAS by Ecology and Health, publicly available beyond the five PFAS

		compounds for which SALs are being developed.
	PHSKC is happy to see the reference to the Health community engagement guide and the emphasis on community participation, vulnerable populations and low-income communities. We encourage both Ecology and Health to continue to move this this direction, seeking funding and staff capacity to move this work.	We encourage both agencies to continue to focus on the polluter, as a key focus for actions that reduce or remove PFAS sources/exposures, whether it be through policies that reduce sources in the environment or funding by polluters to remove their contributions of PFAS into the environment. More emphasis on understanding what companies are using in products and what is being released into homes, water and the air is encouraged in this document to reduce the burden on those exposed to those who are producing products containing PFAS – particularly non-essential uses of PFAS. The entire waste section should include this theme. While it is likely that rate payers will need to absorb the costs of cleanup for any PFAS found to be in high concentrations in biosolids, leachate, or wastewater, an ultimate goal should be to remove pollution sources and reduce cleanup costs. This should be stated clearly in the CAP.
Page 24-25:	Ecology should state for wastewater, biosolids, landfill leachate, groundwater, and emissions sampling which landfills will be selected for testing across the state, as well as include the methodology/criteria for how landfills will be chosen.	Please develop a comprehensive list of landfills that will be initially sampled (with criteria for selection and prioritization). Provide more specific details the PFAS that will be tested, and which sampling method will be used for each medium.
Page 31 and 38:	More information on marine species is of interest.	PHSKC would like the Fish Consumption Advisory section to include a discussion about marine species and how the need for a fish consumption advisory will be determined in the near future (are there data in other states? Has any

		new sampling occurred in WA on marine species? Should sampling be conducted to complete data gaps?) Please also address why freshwater fish may be higher in PFOS than marine species as current sampling data indicates.
Page 46	No details about the classification of PFAS as a class of hazardous substances are provided.	The document should clarify how PFAS are classified as hazardous substances in WA State and where this process currently stands.
Section 3.2.5 and 3.2.6:	Seattle tunnels are mentioned in this section, but more details are requested.	Please describe how the Tunnels in Seattle with fixed foam firefighting systems manage the foam – what do they do for practice and replenishing the foam when it expires?
Section 3.3.4	Should ski waxing activities be included in the list in this section?	Please list ski manufacturers and ski waxers as manufacturers, retailers, and workers that are likely exposed and may lead to environmental releases. Also please consider occupational exposures from recycling processes, such as mattresses, carpets, furniture, or other recycling jobs that may expose workers to PFAS on a regular basis.

REDUCE PFAS IN PRODUCTS

Topic	Comment / Concern	Recommendations
Source control	PHSKC strongly supports all measures in the CAP aimed at source control. Wastewater (and landfill leachate) is not a “source” of PFAS, it merely receives the PFAS that is produced or used in our homes and businesses. Source control is the strongest action we can take to control PFAS exposure for humans and the environment.	
Page 10: “For most people, exposure occurs through food, drinking water, and contact with things like disposable	Ingestion via dust is not described in this section.	Please include a information here about exposures through dust (from products that release them) and how this is may be a significant exposure, especially for small children.

<p>packaging or treated textile products, to name a few.”</p>		
<p>Page 10: “Certain short-chain PFAS used as replacements may be lower in toxicity and bioaccumulation, but their exposure and toxicity characteristics are still being studied. Short-chain replacements can be more mobile in the environment and just as persistent long-term, resulting in potentially expensive remediation should they be confirmed harmful to wildlife and humans.”</p>	<p>This is vague and makes it sound like Health thinks that short-chain PFAS may be lower in toxicity.</p>	<p>With so many compounds in existence, PHSKC suggests that the CAP emphasize that we do not know how toxic the majority of PFAS compounds are and that there are data that show that many of the short-chain compounds have hazardous effects (e.g., https://pubs.acs.org/doi/abs/10.1021/acs.est.0c02444).</p> <p>The report should also note how difficult it is to know what is being used, describing this issue more clearly in the document as a major limitation in understanding how short-chain PFAS are impacting the population. Avenues to obtain this information from manufacturers should be discussed so that the difficulties in this process are clear to the public and community groups who want to engage on this issue.</p>
<p>Page 14</p>	<p>Glad that indoor environments were included in exposure assessment work that the state should fund. The links between indoor environmental health and safer products for WA will be important.</p>	
<p>Page 19</p>	<p>The CAP should reference this recently published peer-reviewed article on consumer products and PFAS. The study found several hundred consumer products examined contained over one thousand different PFAS compounds. This research is consistent with growing evidence that PFAS is included (or a contaminant of) far more consumer products than</p>	<p>Please reference this paper: https://pubs.rsc.org/en/content/articlelanding/2020/EM/D0EM00291G#!divAbstract</p>

	previously thought—with huge implications for state efforts to manage PFAS pollution and exposure.	
Page 28:	More information is needed on the status of the aqueous film forming foam activities included in the CAP.	For the aqueous film forming foam updates, Ecology should clarify which actions are completed and which are still underway – for example, it’s not clear what came of the consultations, and information sessions with firefighting personal protective equipment manufacturers on the notification requirement – are these actions now happening?
Page 29-30	PHSKC would like to request that Ecology and Health provide additional discussion on how PFAS will fit into the Safer Products for WA program in the future, considering new information that is coming out all of the time on PFAS used in products.	Include a description of how Ecology will specifically utilize Safer Products for WA to explore products containing PFAS given limitations on this law and competing substances of concern. Please include how Ecology and Health will understand the exposures to WA residents and implement protections that remove these sources of exposure to humans and the environment. Because PFAS are so ubiquitous in products and formulations, and quantities used are largely unknown to the consumer and state and local regulators, it is important that the State of WA take a more active role in understanding this problem.
Page 29	PHSKC would like to encourage Ecology and Health to develop a process specific for PFAS compounds (pushing hard to understand what PFAS compounds are in children’s products – both long- and short-chain).	Develop a process to specifically understand PFAS in products (see reference: https://pubs.rsc.org/en/content/articlelanding/2020/EM/DOEM00355G#!divAbstract) Additional PFAS compounds beyond PFOS and PFOA, should be added to the Children’s Safe Products Act. CSPA should explore more stringent ways to prevent imports of PFOS and PFOA in children’s products from other countries.

Page 41	Recommend replacing “overseeing” with “responsible for” The statement about FDA overseeing PFAS in food packaging should be altered to – FDA is “responsible” for this activity.	
Table 27	Table 27 is informative but in many ways reflects the likely shift to short-chain PFAS.	This section should discuss what’s known and whether there are compounds that should be considered for inclusion because they are highly utilized in children’s products.
Page 183: The statement about state master contracts and all agency contracts that says “Purchasing PFAS-free products could increase state costs.”	Is this statement on costs increases based on any data?	If not, PHSKC recommend removing this. Regulating PFAS out of products could incentivize the market for being PFAS-free and lead to reduced costs for PFAS-free products generally. Research and development could drive costs for PFAS-free products to be lower over time.

EVALUATE WASTE MANAGEMENT

Topic	Comment / Concern	Recommendations
Recommendation 4.1 - evaluate PFAS in wastewater treatment	Second bullet states that “study design should ensure that the sampled wastewater treatment plants (WWTPs) either receive industrial discharges that are likely to contain PFAS or have drinking water sources with known PFAS contamination.” The study design should be amended to also sample WWTPs with mostly residential sources. This would increase understanding of residential vs. industrial loading of PFAS to wastewater influent. The final bullet states that Ecology may require PFAS monitoring for domestic as well as industrial WWTPs.	In order to inform any decision by Ecology about future requirements for monitoring or compliance in domestic WWTPs, it is important that PFAS in domestic WWTPs be studied as well as industrial WWTPs. This will likely require increased funding to expand study scope to sample WWTPs with mostly residential sources.
Recommendation 4.3 - Evaluate WA biosolids management	Fifth bullet recommends “Investigate land application sites where procedures mimic rates and practices under current state rule.” PHSKC supports this recommendation and asks that it be updated to specify that the research should include 1) non-biosolids amended control samples to quantify background concentrations of PFAS in the soil, and 2)	This is a request to clarify study scope and methodology. It should not require extra resources.

	field replications given difficulties with sample contamination.	
Recommendation 4.3 - Evaluate WA biosolids management	Sixth bullet recommends “Evaluate realistic exposure pathways.” PHSKC supports this recommendation and asks that it be updated to specify that these realistic exposure pathways should be science-based and peer-reviewed.	This is a request to clarify study methodology. It may require conferring with outside researchers but should not require extra resources.
Table 25	The table does not include WA State ferries.	What is known about their stockpiles of aqueous film forming foams?
Page 25	PHSKC strongly encourages Ecology to pursue updating the Solid Waste Handling Standards and the Criteria for Municipal Solid Waste Landfills (Chapters 173-350 and 351 Washington Administrative Code respectively).	Request for updates to Solid Waste Handling Standards specific to PFAS to require PFAS testing of leachate, landfill gas, groundwater, compost, and air.
Section 4.0	In addition to wastewater, landfills, and biosolids, compost should also be targeted for understanding PFAS in waste management. There should be a goal of establishing thresholds for the Table 220-B requirements in WAC 173-350-220 to reduce PFAS from entering the environment from finished compost.	Additional studies will be needed to understand PFAS concentrations in compost and different feedstocks in order to update Table 220-B sampling requirement. Funding should be provided to small-scale composters to help with funding the additional sampling parameters.
Page 67	Ecology should strive to advance knowledge around PFAS waste streams entering the landfill. An example of some great work in this field includes the PFAS Waste Source Testing Report for New England Waste Services of Vermont.	Funding will be needed to study data gaps and conduct sampling and analysis to advance activities around PFAS waste streams in landfills. Data gaps should be studied and more Washington-specific information acquired. Also, differences between climatic conditions on PFAS concentrations during leachate generation could be evaluated. Please include this reference in the CAP: Sanborn Head. 2019. PFAS Waste Source Testing Report: New England Waste Services of Vermont, Inc. Prepared for New England

		Waste Services of Vermont, Inc. File no. 4536.00. October 2019.
APPENDIXES		
Topic	Comment / Concern	Recommendations
Chemistry		
Section 1.5.2	The data gaps section and recommendations are minimal.	Greater emphasis should be placed on why these gaps exist. A recommendation to establish a mechanism for companies to disclose to WA State information on what PFAS chemicals are being used in different products and applications should be made.
Analytical Methods		
Page 128/ Section 2.4.2	The statement “Although analysis of PFAS is progressing, significant challenges remain from the fact that the complete list of PFAS relevant to environmental and human exposure scenarios is still unknown” should be emphasized.	Please provide a recommendation in the CAP for state agencies to develop ways to require companies to disclose PFAS chemicals currently being used in products and what methods they recommend for detection of those compounds.
Section 2.4.2	More information on laboratory accreditation for PFAS analytical methods needed.	PHSKC recommends that information should be added on how analytical laboratories can seek Ecology accreditation for PFAS analytical methods.
Section 2.4.2	PHSKC recommends that Ecology develop guidance for reducing PFAS contamination during sampling and analysis. Due to the ubiquity of PFAS in products, lab equipment, and the environment, PFAS is frequently found as a contaminant during sampling and laboratory analysis. Not having standard procedures for reducing contamination could affect data quality and comparisons across studies.	Funding will be needed to support evaluation and developing guidance document(s).
Sources and Uses		
Section 3.3.2 and other sections)	Update with new information from paper by Gluge et al., 2020.	https://pubs.rsc.org/en/content/articlelanding/2020/EM/D0EM00291G#!divAbstract Cross reference with Tables 41 and 42 in the CAP to see if any products or categories are missing.
Section 3.4.5 – last paragraph the statement	Does this statement only include PFOS/PFOA?	Please describe if this is due to the phase out of PFOS and PFOA or if this accounts for the increase of

<p>“Attention to reducing the use of PFAS chemicals has already resulted in a reduction in PFAS in human blood serum by 50% over the past 15 years (Rainey & Beecher, 2018).”</p>		<p>short chain PFAS that has likely replaced PFOS and PFOA over the last 15 years?</p>
<p>Section 3.4.5</p>	<p>This section should reference work done by the Minnesota Pollution Control Agency to characterize PFAS in contact water at compost facilities.</p>	<p>Please include references/discussion of these sources: https://www.pca.state.mn.us/waste/composting-and-pfas and Wood Environment & Infrastructure Solutions, Inc. 2019. Site Investigation Report for Investigation of Per- and Polyfluoroalkyl Substances at Select Source Separated Organic Material and Yard Waste Sites, Minnesota. Prepared for Minnesota Pollution Control Agency. https://www.pca.state.mn.us/sites/default/files/w-sw4-37.pdf</p>
<p>Section 3.4.5</p>	<p>This section refers to PFAS, but does not distinguish if the studies cited included short chain PFAS or if they are mainly only focused on PFOS and PFOA. It would be good to have some discussion of how the PFAS profiles may look for long and short chain in compost.</p> <p>Also, please include discussion of the new rules that compost facilities are setting for acceptance of only PFAS-free packaging in WA State.</p>	<p>Please include in this section:</p> <p>Discussion of PFAS testing and compost requirements: https://compostmanufacturingalliance.com/wp-content/uploads/2020/06/fluorinated-chemicals-2020.pdf</p> <p>https://compostmanufacturingalliance.com/cma-field-testing/ “FLUORINATED CHEMICAL POLICY Effective January 1, 2020, CMA facilities do not accept products for field testing or substrate review that contain > 100 ppm total fluorine and/or intentionally added fluorine. Any new submittals or items submitted for recertification must</p>

		be accompanied by this profile addendum (Form Here) with the qualifying documentation as requested. Effective January 1, 2021, any items containing total fluorine > 100 ppm, or items that are not verified as containing < 100 total fluorine by lab report from the manufacturer, will be removed from all CMA lists. To learn more about CMA's fluorine testing protocols, refer to our Technical Memos section under News/Blog tab above."
Section 3.6.1 Data gaps	PFAS concentrations in compost are not identified as a data gap.	Ecology should identify upcoming studies and resources for sampling PFAS in compost. Funding should be provided for small-scale composters. Feedstocks with higher PFAS concentrations should be sampled to acquire additional information. Best management practices at compost facilities to reduce PFAS impacts on the environment should be identified.
Figure 24	Landfills should be distinguished by age since this can change the profile of PFAS compounds found in leachate and groundwater.	Please include discussion of landfill age and difference in PFAS composition that may be detected: PFBS found to be compound with highest concentration (3000 ppt) in leachate at active landfill, PFOA (3000 ppt) at closed landfill in Vermont landfill leachate sampling. Active landfill had the highest number of PFAS detected. Source: Watson & Sampson. 2020. Poly- and Perfluoroalkyl Substances at Wastewater Treatment Facilities and Landfill Leachate: 2019 Summary Report. Prepared for Vermont Dept. of Env. Conservation.
Health		
	Immune section – include discussion on COVID-19 susceptibility and PFAS exposures (e.g., new paper (not yet peer reviewed) on immune deficiencies, PFAS and COVID susceptibility.)	Source: https://www.medrxiv.org/content/10.1101/2020.10.22.20217562v1

	Include new paper by Waterfield et al. 2020 in the reproductive section.	Source: http://www.documentcloud.org/documents/7205135-REPORT-Grandjean-2020-PFAS-ReproductiveImpacts.html
Regulations		
p. 425	The CAP cites Chapter 173-303 WAC for designating PFAS wastes under the 100 parts per million threshold for halogenated organic compounds. However, Ecology’s Publication 97-407 should also be updated with references to EPA and Ecology methods under development for analyzing PFAS compounds in different media.	Resources required would be updating Publication 97-407 and training local health jurisdiction staff on testing methods.
9.5.2 Recommendations	Recommendation 4.2 states that Ecology would update Chapter 173-350 WAC to require PFAS testing of leachate and landfill monitoring. However, Chapter 173-350 WAC only covers inert waste landfills and limited purpose landfills. Chapter 173-351 WAC would need to be updated to address municipal solid waste landfills.	Include all types of landfills in proposed update to WAC 173-350: WAC 173-350-400, “Limited purpose landfills” WAC 173-350-410, “Inert waste landfills” Chapter 173-351 WAC, “Criteria for Municipal Solid Waste Landfills”
Economic Analysis		
	The budget for investigation and remediation seems biased low.	PHSKC respectfully recommends that more research be pulled from other states that have more experience with groundwater remediation
	Analysis does not fully account for uncertainties in available use data. Economic costs of health and cultural impacts should be done in a way that incentivizes reporting information on use by industry.	PHSKC recommends that Ecology utilize best estimates, accounting for uncertainties in the data, to determine a value for the overall market share of PFAS, when performing the economic analysis to understand impacts of regulation and cleanup. This could help incentivize industry to provide more specific and reliable data for Ecology’s consideration of potential impacts. The economic evaluations should weight the costs of health and cultural impacts (accounting for uncertainties in data) more heavily than financial impacts on producers.

		Generally, these are harder to quantify but have more direct and lasting impacts on Washington residents.
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