Dear Planning Board, Happy Thanksgiving holiday.May it be thankful, restful and fun.

My hope is that this missive doesn’t seem a burden, but a linked collection of the PFAS science and trouble that Fearing Hill presents to us and for our meeting evolving solar questions as we consider what a developer is installing on our land for many years. With potential adverse consequences as well as benefits.

Carl sent a letter with the request to provide information for a handful of solar issues, having received the petition I signed.

1. Scientific information from U.S. EPA about PFAS, the toxic, cancer

causing forever chemicals that runoff from solar panels.

That’s reasonable if one can accept the response that there is a lot one can learn and there is a lot that is evolving information as this vast class of synthetic chemicals is exposed and attempted to be investigated, their whole life cycle understood and categorized including potential interactions and their toxicity measured . Numbers range from 6 to 10 thousand which don’t account for the ones the chemical industry is developing now as they transfer the slowly waning fossil fuel industry into plastics. How microplastics and PFAS interact in the environment is another developing concern.

This is framed by the assertion within the decision framework fo Fearing Hill proposed by Ken Buckland, Town Planner-

“NO polyfluoroalkyl substances (PFAS) are claimed to be in the manufacturing of the proposed solar panels. Other substances used in the making of the panels could become hazardous if they enter the environment in an active form.”

On the record Joseph Shanahan, the proponent for Con Edison Clean Energy referred to brand name definition of verification without defining PFAS accurately.

[Wareham\_e\_f\_memo\_to\_pl\_bd\_re\_pfas\_6-27-2022.pdf](https://www.wareham.ma.us/sites/g/files/vyhlif5146/f/pages/wareham_e_f_memo_to_pl_bd_re_pfas_6-27-2022.pdf)

“At the Planning Board meeting on June 13, 2022, Wareham resident Annie Hayes made comments with regard to her concerns about the possible presence of compounds known as PFAS in the solar panels we will be using in the construction of this solar project. To allay those concerns, this is to confirm that the solar panels to be used in the construction of this project will be manufactured by Jinko, widely recognized as a global leader in the solar panel industry, and Jinko does NOT utilize these compounds. As is noted in the “Solar Scorecard” published by the Silicon Valley Toxics Coalition, which Ms. Hayes included with her follow-up letter on this subject (which letter was uploaded to the Planning Board’s website on June 23, 2022), Jinko is THE worldwide leader in environmental health, safety and sustainability..”

In letters submitted by both Jinko and Dupont, maker of the Solar panel hydrophobic coating TEDLAR, both parties submit they do not use PFAS. Both these letters dated 2018 were well used form- letter assertions belied by the subsequent years awareness of the vast number of PFAS defined as both per and polyfluoroalkyl including the two constituent classes, Polymer and Non-Polymer PFAS. Dupont in its letter does not acknowledge that Tedlar is the Polymer PFAS, Polyvinyl fluoride, PVF, a well known polymer PFAS whose consequence has been increasingly examined as the onslaught of new information comes to the fore. – From The Microplastics and PFAS Connection, Cayla Cook and Eva Steinie-Darling, experts in chemical and environmental engineering advanced wastewater treatment, microplastics, biopolymer nanotechnology..

“Perhaps most surprisingly is the fact that one type of PFAS, polymeric PFAS, can break down into microplastics. This polymeric PFAS group consists of fluoropolymers, side-chain fluorinated polymers and poly and perfluoropolyethers )Lohmann et al 2020) PTFE and PVF TEDLAR- may occur as secondary microplastics in the environment or as intentionally produced primary microplastics. Due to their high density, environmental PTFE and PVF microplastics are more likely to settle into sediment which makes their removal more challenging. For example, if these particles are removed in wastewater treatment, then they are likely to be found in the solids or biosolids product.” Then in conclusion…. ” To bring this full circle, microplastics and PFAS are often found together in the environment and recent research has indicated that microplastics may increase PFAS toxicity. The co-occurence of these two contaminants may come as a surprise to the public, utilities, or industries as each has historically been treated as an isolated issue, however, that is not always the case.”

Holding Dupont up as a “better life through chemistry” industry is also implausible as there story is one of the first and worst betrayal of public trust by criminal activity known. Only through the indomitable perseverance and commitment of one attorney who had previously represented chemical industry clients so knew how they operated, would we be informed of the total ignorance we have even now of the malfeasance of the synthetic chemical manufacturers of our country and spread around the world.

For example: Dupont Teflon was recently discerned to be in waterproof mascara. Gen X that replaced PFOA hasn’t stopped although called to, because it is the by-peroduct of Polyvinyl Fluoride. Where is it being used?

Pet food is packaged in bags of hydrophobic PFAS that migrate into the food. As are wraps for kid’s meals, hundreds of times over advised limits.

# Chemical giants hid dangers of ‘forever chemicals’ in food packaging

**The chemicals, called 6:2 FTOH, are now linked to a range of serious health issues, and Americans are still being exposed to them**

****

The US Food and Drug Administration denied its oversight had been lax but said more studies were needed to draw conclusions about the safety of short chain PFAS. Photograph: Xinhua/Rex/Shutterstock

[**Tom Perkins**](https://www.theguardian.com/profile/tom-perkins)

Wed 12 May 2021 07.00 EDT The Guardian

Chemical giants DuPont and Daikin knew the dangers of a [PFAS](https://www.theguardian.com/environment/pfas) compound widely used in food packaging since 2010, but hid them from the public and the Food and Drug Administration (FDA), company studies obtained by the Guardian reveal.

The chemicals, called 6:2 FTOH, are now linked to a range of serious health issues, and Americans are still being exposed to them in greaseproof pizza boxes, carryout containers, fast-food wrappers, and paperboard packaging.But Daikin withheld a 2009 study that indicated toxicity to lab rats’ livers and kidneys, while DuPont in 2012 did not alert the FDA or public to new internal data that indicated that the chemical stays in animals’ bodies for much longer than initially thought.

Science from industry, the FDA and independent researchers now links 6:2 FTOH to kidney disease, liver damage, cancer, neurological damage, developmental problems and autoimmune disorders, while researchers also found higher mortality rates among young animals and mothers exposed to the chemicals.

Science from industry, the FDA and independent researchers now links 6:2 FTOH to kidney disease, liver damage, cancer, neurological damage, developmental problems and autoimmune disorders, while researchers also found higher mortality rates among young animals and mothers exposed to the chemicals.

Had the FDA seen the data, it is unlikely that it would have approved 6:2 FTOH, said Maricel Maffini, an independent researcher who studies PFAS in food packaging. And though Daikin may have broken the law, it and DuPont, which has previously been [caught](https://www.ewg.org/pfastimeline/) hiding studies that suggest toxicity in PFAS, are not facing any repercussions.

“Those things shouldn’t happen, and if they do then there should be consequences, but oversight is lax,” Maffini said.

**I think people need to be able to rely on the FDA to turn science at the agency into real action, and right now that doesn’t seem to be the caseTom Neltner**

In 2020, the FDA reached [agreements](https://www.fda.gov/news-events/press-announcements/fda-announces-voluntary-agreement-manufacturers-phase-out-certain-short-chain-pfas-used-food) with some major PFAS manufacturers to voluntarily stop using 6:2 FTOH compounds in food packaging within five years. But documents show that the FDA first became aware of DuPont’s hidden study in 2015, and public health advocates say a 10-year timeline to reassess and remove the chemical is unacceptable.

Moreover, the FDA phase-out only applies to 6:2 FTOH compounds, and does not include other similar “short chain” PFAS, raising questions about whether the agency is fully protecting the public from the class of potentially toxic chemicals.

“I think people need to be able to rely on the FDA to turn science at the agency into real action, and right now that doesn’t seem to be the case,” said Tom Neltner, chemicals policy director with the Environmental Defense Fund. He and Maffini obtained the companies’ studies and related documents from Daikin’s website and the FDA through Freedom of Information Act requests.

The 6:2 FTOH compound is part of a newer generation of “short chain” PFAS that were designed to replace older and supposedly more harmful “long chain” PFAS. The industry claims that short chain compounds are uniformly safe and “practically non-toxic”. However, independent researchers like Erika Schreder, science director for Toxic Free Future, have found that PFAS, regardless of chain length, accumulate in the environment and humans, and are toxic.

“The fact that we continue to uncover evidence that the current-use PFAS have similar toxicity to the [long chain] compounds that have been phased out makes a strong argument for regulating harmful chemicals like PFAS as a class,” Schreder said.

In a statement to the Guardian, an FDA spokesperson defended the agency’s handling of 6:2 FTOH, noting that the studies “do not demonstrate an imminent health hazard” and more studies were needed to draw concrete conclusions about its safety, and that of other short chain PFAS.

Daikin and Chemours, a company that in 2015 was spun off from DuPont’s PFAS division, did not respond to requests for comment.

<https://toxicfreefuture.org/research/earliest-exposures/>Every pregnant woman tested was awash in PFAS, mercury, bisphenol A,phthalates, and Teflon” chemicals.l

In addition the Silicon Valley Toxic Coalition that Mr. Shanahan sites folded after that 2018-2019 scorecard. Subsequent to folding it had developed more stringent qualification for scores based on greater environmental sourcing, worker’s rights and sustainability criteria with a focus on whole life cycle responsibility.

 Given Jinko’s record of forced Yughur labor in China (documented here) and their recent seizures bu Homeland Security at the US port for infractions of the FLPA, the Forced Labor Prevention Act implemented this summer, Jinko would likely have not made that list.

[Scorecard-10th-anniversary.php](http://www.solarscorecard.com/2018-19/scorecard-10th-anniversary.php)

[flpareports-reveal-which-manufacturer-is-believed-to-have-product-seized-under-uflpa/](https://motonewstoday.com/the-product-seized-under-the-uflpa-is-believed-to-be-jinkosolar-pv-magazine-usa/22325/)

[16/more-than-3-gw-of-solar-panels-held-by-us-customs-under-forced-labor-law/](https://www.business-humanrights.org/en/latest-news/usa-piles-of-solar-panels-held-at-border-since-uyghur-forced-labor-prevention-act-came-into-force/)

[chin5as-jinkosolar-says-some-panels-being-held-at-u-s-border/8628100](https://www.reuters.com/article/jinkosolar-shipments/chinas-jinkosolar-says-some-panels-being-held-at-u-s-border-idUSKBN2GC2AO)

[exclusive-us-blocks-more-than-1000-solar-shipments-over-chinese-slave-labor-2022-11-11/](https://www.reuters.com/world/china/exclusive-us-blocks-more-than-1000-solar-shipments-over-chinese-slave-labor-2022-11-11/)

For those who want to know more of the complexity of China solar, forced labor, or genocide as the un has recedntly named it, geo politcs, the rise and fall of American solar relalting and the potential consequence globallhy of the forced labor prevention act…

Here’s an education on the complex, interactive relation between the Forced Labor Prevention Act, US policy and motivation and the genocidal horror of the Yughur and other Muslim minorities from which Jinko Holding Company is implicated in benefitting . Blake’s Legal Dictionary includes ethics in its definition of welfare. In order to protecr our Health safety and welfare.

We[*https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire*](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire)

**Passages from a New report, "Sins of a Solar Empire," that calls for the solar industry to address unethical solar photovoltaic**

Institute have identified two suspected prison facilities within 1.5 miles of the monocrystalline silicon ingot and wafer factory operated by JinkoSolar Holdings Company in Xinjiang at 43.46°N, 83.25°E.[[100]](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire#fn-100) Open-source investigation has also uncovered evidence that JinkoSolar’s Xinjiang operations have accepted workers via labor transfer programs.[[101]](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire#fn-101) This facility represented 42% of JinkoSolar’s 8 GW ingot manufacturing capacity as of 2021,[[102]](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire#fn-102)with JinkoSolar as a whole ranking second among global solar PV module manufacturers and expecting to operate around 65 GW of PV module manufacturing capacity by the end of 2022.[[103](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire#fn-103) ……. Chinese firms also dominate the subsequent steps in solar manufacturing: monocrystalline silicon ingot production, silicon wafer slicing, solar PV cell production, and solar PV module assembly (Figure 2). The Chinese solar sector’s Xinjiang operations are much less extensive at these later steps of the supply chain, with a single known ingot and wafer factory owned by JinkoSolar Holdings Company (晶科能源控股有限公司) operating in the region.[[10]](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire#fn-10) Thus, the large majority of this production occurs in other provinces. For instance, over half (~180 GW) of Chinese ingot and wafer manufacturing capacity is located in Jiangsu, Yunnan, and Inner Mongolia,[[11]](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire#fn-11)compared with <4 GW capacity at JinkoSolar’s Xinjiang facility.[[12]](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire#fn-12)Nevertheless, due to the large fraction of upstream solar manufacturing that takes place in the XUAR, many downstream operations are significantly exposed to Xinjiang production through their suppliers. ……. Chinese firms also dominate the subsequent steps in solar manufacturing: monocrystalline silicon ingot production, silicon wafer slicing, solar PV cell production, and solar PV module assembly (Figure 2). The Chinese solar sector’s Xinjiang operations are much less extensive at these later steps of the supply chain, with a single known ingot and wafer factory owned by JinkoSolar Holdings Company (晶科能源控股有限公司) operating in the region.[[10]](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire#fn-10) Thus, the large majority of this production occurs in other provinces. For instance, over half (~180 GW) of Chinese ingot and wafer manufacturing capacity is located in Jiangsu, Yunnan, and Inner Mongolia,[[11]](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire#fn-11)compared with <4 GW capacity at JinkoSolar’s Xinjiang facility.[[12]](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire#fn-12)Nevertheless, due to the large fraction of upstream solar manufacturing that takes place in the XUAR, many downstream operations are significantly exposed to Xinjiang production through their suppliers. ……… .

Targeted Muslim groups have lost much of their freedom to travel within and outside China[[17]](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire#fn-17) and now live under intense, sweeping surveillance.[[18]](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire#fn-18) Meanwhile, the Chinese government has arbitrarily detained or imprisoned a shockingly high proportion of the XUAR’s Uyghur population within a vast, brutal prison camp system. Detainees are often held or imprisoned for years for arbitrary reasons including minor expressions of religious faith,[[19]](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire#fn-19). experiencing physical and mental torture while living under abjectly inhumane conditions in detention or prison facilities.[[20]](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire#fn-20) Leaked government documents reveal standing orders that armed guards should shoot to kill if detainees attempt to escape.[[21](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire#fn-21) **…“**But solar manufacturing plants that began operating in Xinjiang over a decade ago were attracted to industrial parks and coal mines established under regional political oppression that left Uyghur, Kazakh, and Kyrgyz peoples uniquely powerless—even by the political standards of authoritarian China—to object to local environmental and socioeconomic impacts. And in subsequent years, as regional authorities have intensified repressive policies targeting minoritized peoples, solar PV manufacturers have continued to expand in the region while directly participating in state-sponsored forced labor programs.”

“The Xinjiang region produces a significant quantity of some solar PV commodities, particularly solar-grade polysilicon. As such, the availability and price of solar PV products are currently quite sensitive to the region’s manufacturing output, elevating the risk that efforts to truly divest the solar industry from dependence on Xinjiang could disrupt solar supply chains, at least until new, ethical production capacity is established elsewhere”.....“However, tackling this hurdle head-on is exactly the right choice for promoting a better, more innovative, and more socially responsible future for solar PV technology. An ethical and sustainable solar supply chain clearly cannot continue over the long term to rely upon current Xinjiang-dependent, coal-dependent manufacturing norms. Nor is this choice entirely up to solar industry actors alone. With the Uyghur Forced Labor Prevention Act having entered into effect in the United States[[3]](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire#fn-3) and with the European Union considering similar policies to prohibit imports produced using forced labor,[[4]](https://thebreakthrough.org/issues/energy/sins-of-a-solar-empire#fn-4) a failure to transition away from problematic solar equipment suppliers could hamper the industry’s development. Having underprepared for addressing supply chain concerns over much of the past decade, solar PV companies, renewable energy developers, and investors would be well advised to rectify that error starting today.”

Unlike the non-existent score card, Sino Voltaics is an excellent big picture of what a municipality wants to know about a given solar panel And the extent to which Con Edison as the developer has not given planning even the basics.

<https://sinovoltaics.com/> <https://sinovoltaics.com/download-brochure/>

Back to Carl’s request for documentation of PFAS running off panels /leaching from panels through backsheet degradation, water intrusion, tape sealant breakdown, etc. Why weren’t these chemicals monitored and accounted for before the risk of runoff into our wells, watershed, wetlands, rivers and aquifer?And where are those agencies now?

The EPA’s history of regulation is a sorry tale.

[20-plus-years-epa-has-failed-regulate-forever-chemicals](https://www.ewg.org/research/20-plus-years-epa-has-failed-regulate-forever-chemicals)

[uri-steep-science-effort-responding-to-forever-pfas-chemical-pollution-renewed-for-8-1-million-for-another-5-years/](https://www.uri.edu/news/2022/10/uri-steep-science-effort-responding-to-forever-pfas-chemical-pollution-renewed-for-8-1-million-for-another-5-years/)

Closed loop for all non essential pfas including polymer pfas

Substitutes [won’t-we-ever-stop-playing-whack-a-mole-with-“regrettable-chemical-substitutions”/](https://www.washingtonpost.com/opinions/stop-playing-whack-a-mole-with-hazardous-chemicals/2016/12/15/9a357090-bb36-11e6-91ee-1adddfe36cbe_story.html) Environmental Defense Fund Begins with China replaces

<https://www.washingtonpost.com/opinions/the-government-isnt-protecting-you-from-dangerous-chemicals-congress-must-fix-that/2016/05/24/4415780e-2121-11e6-aa84-42391ba52c91_story.html?utm_term=.226dd2aef6d0&tid=a_inl_manual>

The government is failing at protecting the public from dangerous chemicals. Congress tried to regulate the various questionable substances that manufacturers and industry use to produce the products Americans buy. But the [1976 Toxic Substances Control Act](http://www2.epa.gov/laws-regulations/summary-toxic-substances-control-act) failed. Stuck with a lousy law, the Environmental Protection Agency moved slowly, and in 1991 a federal appeals court [threw out](http://openjurist.org/947/f2d/1201/corrosion-proof-fittings-v-environmental-protection-agency) the agency’s attempt to ban asbestos. The EPA has managed to ban only five chemicals since the 1970s, while thousands of others stay on the market with no review. We say “thousands” because it’s not even clear how many are out there. Congress has done little since to fix the problem. TheUS has still not banned use of asbestos as 60 countries have. It can be imported and used in limited amts.

<https://www.mesothelioma.com/lawyer/legislation/asbestos-ban/>

EPA history of Toxic chemical oversight, testing enforcement .

[Quarles Testifies on the Need for Toxic Substances Act](https://www.epa.gov/archive/epa/aboutepa/quarles-testifies-need-toxic-substances-act.html)[EPA press release - July 10, 1975]

* [Train Sees New Toxic Substances Law as "Preventive Medicine"](https://www.epa.gov/archive/epa/aboutepa/train-sees-new-toxic-substances-law-preventive-medicine.html)[EPA press release - October 21, 1976]
* [EPA Incinerator Approvals to Speed PCB Disposal](https://www.epa.gov/archive/epa/aboutepa/epa-incinerator-approvals-speed-pcb-disposal.html)[EPA press release - February 10, 1981]
* [EPA Announces Rule Requiring Schools to Test for Asbestos](https://www.epa.gov/archive/epa/aboutepa/epa-announces-rule-requiring-schools-test-asbestos.html)[EPA press release - May 24, 1982]
* [Signing of Asbestos Hazard Emergency Response Act](https://www.epa.gov/archive/epa/aboutepa/signing-asbestos-hazard-emergency-response-act.html)[EPA press release - October 23, 1986] (school relevant only- ah
* [Indoor Radon Abatement Act of 1988](https://www.epa.gov/archive/epa/aboutepa/indoor-radon-abatement-act-1988.html)[EPA press release - October 28, 1988]

1976 Toxic Substances Control Act (TSCA). TSCA “grandfathered in” the more than 60,000 chemicals on the market at the time, without requiring any testing or demonstration of their safety. Measured by tonnage, the vast majority of chemicals on the market today – 34 years later – is comprised of those same chemicals.

[pfas-chemicals-epa-roadmap](https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf) Earth Justice EPA roadmap doesn’t stay on tacck

[problem–getting-chemical-safety-back-on-track-5-years-after-tsca-reform/](https://blogs.edf.org/health/2021/06/22/getting-chemical-safety-back-on-track-5-years-after-tsca-reform/) Reagan is light years away from the previous administration.

A new study published in the [**Chemical Engineering Journal**](https://www.sciencedirect.com/science/article/pii/S1385894719319096?fbclid=IwAR3zIeEDnluiG2QKSGTh4HN0Q-sIsBvr_WuZAeS6dkrIshQBWyWQ8JF-8gA) [**dispelled**](https://www.ewg.org/release/study-newer-pfas-chemicals-may-pose-more-risks-those-they-replaced) chemical industry claims that the new generation of toxic fluorinated compounds, or PFAS, are safer than two banned PFAS chemicals linked to cancer.Environmental Working Group 8/23 <https://www.sciencedirect.com/science/article/abs/pii/S1385894719319096?fbclid=IwAR3zIeEDnluiG2QKSGTh4HN0Q-sIsBvr_WuZAeS6dkrIshQBWyWQ8JF-8gA>Scoence Diorect Short chain pfas in aquatic systems. Vol 380, January 2020

Per- and polyfluoroalkyl substances (PFAS) are a class of anthropogenic compounds comprised of a perfluoroalkyl backbone and a terminal functional group. As our knowledge on their environmental and health impacts grow, PFAS have drawn increasing regulatory attention and research interest in recent years. While long-chain PFAS have been the center of active research in the past decade or so, and while industrial production and applications of short-china PFAS continue to rise, very few studies have focused on the occurrence, fate, and transformation of short-chain PFAS in the environment. This review aimed to provide an updated overview of the state of the science about the fundamentals, occurrence, impacts and treatment of short-chain PFAS. The key findings from this review include: 1) Short-chain PFAS are more widely detected, more persistent and mobile in aquatic systems, and thus may pose more risks on the human and ecosystem health; 2) conventional adsorption, ion-exchange, and membrane filtration can remove short-chain PFAS, but are less effective than the long-chain homologues, and are challenged with poor material regeneration efficiency and disposal of process waste residual; 3) [advanced oxidation](https://www.sciencedirect.com/topics/earth-and-planetary-sciences/advanced-oxidation-process) such as thermolysis and sonolysis can achieve complete mineralization, but come with a high process cost; and 4) direct photolysis, oxidation/reduction, photocatalysis, and electrochemical reaction may degrade short-chain PFAS following similar degradation pathways as long-chain PFAS, but at a slower rate, and photocatalytic processes appear most promising. Overall, this review reveals an urgent need for developing more cost-effective treatment technologies for short-chain PFAS in drinking water, for advancing our knowledge on

the environmental fate, transport and impacts of short-chain PFAS in the environment, and for developing science-based regulations for short-chain PFAS.

And so we are awash in polymer pfas and plastics that degrade and interact.

# **Common Single-Use Consumer Plastic Products Release Trillions of Sub-100 nm Nanoparticles per Liter into Water during Normal Use**

* Christopher D. Zangmeister\*
* , James G. Radney
* , Kurt D. Benkstein
* , and Berc Kalanyan

[Cite this:](https://pubs.acs.org/action/showCitFormats?doi=10.1021%2Facs.est.1c06768&href=/doi/10.1021%2Facs.est.1c06768) *Environ. Sci. Technol.* 2022, 56, 9, 5448–5455

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<https://doi.org/10.1021/acs.est.1c06768>

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**SUBJECTS:**

* [Amides](https://pubs.acs.org/action/doSearch?ConceptID=290658),
* [Materials](https://pubs.acs.org/action/doSearch?ConceptID=292506),
* [Nanoparticles](https://pubs.acs.org/action/doSearch?ConceptID=290920),
* [Organic polymers](https://pubs.acs.org/action/doSearch?ConceptID=291503),
* [Polymer particles](https://pubs.acs.org/action/doSearch?ConceptID=291653)

## **Abstract**

This study demonstrates that commonly used consumer products such as single-use food grade nylon bags and hot beverage cups lined with low-density polyethylene release nanometer-sized plastic particles at number densities >1012 L–1 when exposed to water. The number of particles released was a function of the initial water temperature (high temperature vs ambient) for each of the tested materials. Mean particle diameters were between 30 and 80 nm with few particles >200 nm. The number of particles released into hot water from food grade nylon was 7 times higher when compared to single-use beverage cups. On a particle number density basis, particles released into water from a single 300 mL hot beverage cup equate to one particle for every seven cells in the human body in a size range available for cellular uptake.

<https://www.pca.state.mn.us/business-with-us/bpa-and-bps-in-thermal-paper>

Minnesota Pollution Control agency warns not to touch receipts that are slick feeling esp if pregnant or working with

“BPA can be absorbed into the body through the skin. The chemicals have been shown to be hazardous to reproductive systems in humans and animals and are linked with obesity and attention disorders. Learn more:

* [Bisphenol-A](https://www.health.state.mn.us/communities/environment/childenvhealth/chemicals.html#bisp) (MN Dept. of Health)
* [Endocrine active chemicals and other contaminants of emerging concern in Minnesota’s groundwater, 2009-2010 (wq-cm4-03)](https://www.pca.state.mn.us/sites/default/files/wq-cm4-03.pdf)
* [Statewide endocrine disrupting compound monitoring study, 2007-2008 (tdr-g1-08)](https://www.pca.state.mn.us/sites/default/files/tdr-g1-08.pdf)

“Studies have found that individual thermal receipts can contain BPA that is 250 to 1,000 times greater than the amount in a can of food. Testing thermal paper samples from 18 hospitality businesses in Minnesota found that half of them contained BPA at levels ranging from 54–79 micrograms per square centimeter of paper.”

* 
**We are GFSI Certified**GFSI ([Global Food Safety Initiative](https://mygfsi.com/)) certification is becoming the most important and widely accepted food safety standards across the globe. Becoming GFSI certified helps us to meet the demands of a globalized market for improving food safety across the food supply chain and to
* transition to these more environmentally-friendly papers will be communicated back to you with your order confirmations. 
* To: Fischer Paper’s Customers and Product Users

Date: September 28, 2022 Antioch, Illinois

**Re: Fischer eliminating all materials with intentionally added PFAS chemicals by end of 2022**

Download our statement here: [Fischer Paper Products – Statement on Elimination of PFAS Chemicals](https://fischerpaperproducts.com/wp-content/uploads/2022/10/Fischer-Paper-update-on-eliminating-all-added-PFAS-chemicals-by-end-2022-9-28-2022.pdf)

Learn more about PFAS Chemicals: [Food and Drug Administration Statement on Per- and Polyfluoroalkyl](https://www.fda.gov/food/chemical-contaminants-food/and-polyfluoroalkyl-substances-pfas)

[Substances (PFA](https://www.fda.gov/food/chemical-contaminants-food/and-polyfluoroalkyl-substances-pfas)S)

[Hair-straightening-chemicals-associated-higher-uterine-cancer-risk](https://www.nih.gov/news-events/news-releases/hair-straightening-chemicals-associated-higher-uterine-cancer-risk) NIH recent study.

It’s tragic for the many people, families, animals. lands, environments and livelihoods that suffered and died because of gross negligence and criminal behavior when regulators let manufacturers regulate themselves..

[devil-we-know-how-dupont-poisoned-world-teflon#:~:text=One%20of%20the%20key%20ingredients,Teflon%20its%20non-stick%20properti](https://www.organicconsumers.org/blog/devil-we-know-how-dupont-poisoned-world-teflon)

This is the 2019 Netflix version of PFOA, or C8, that Dupont brought into every American household as Teflon, a fluorinated polymer PFAS. The story is best told in the article “ The Lawyer Who Became Dupont’s Worst Nightmare”, published in the Washington Post, 2016, that documents the discovery of Dupont’s knowledge that PFOA, which it was using for household products and dumpinto into W. Va. farmland and waterways, was a carcinogen. Read it if you haven’t. It tells the story, relevant here for focusing on the EPA’s non regulatory function for much of its history. We owe a debt of gratitude to Rob Bilott, an attorney FOR chemical corporations, who recognized the truth when he saw it.

“Bilott spent the following months drafting a public brief against DuPont. It was 972 pages long, including 136 attached exhibits. His colleagues call it ‘‘Rob’s Famous Letter.’’ ‘‘We have confirmed that the chemicals and pollutants released into the environment by DuPont at its Dry Run Landfill and other nearby DuPont-owned facilities may pose an imminent and substantial threat to health or the environment,’’ Bilott wrote. He demanded immediate action to regulate PFOA and provide clean water to those living near the factory. On March 6, 2001, he sent the letter to the director of every relevant regulatory authority, including Christie Whitman, administrator of the E.P.A., and the United States attorney general, John Ashcroft.

DuPont reacted quickly, requesting a gag order to block Bilott from providing the information he had discovered in the Tennant case to the government. A federal court denied it. Bilott sent his entire case file to the E.P.A.

‘‘DuPont freaked out when they realized that this guy was onto them,’’ says Ned McWilliams, a young trial lawyer who later joined Bilott’s legal team. ‘‘For a corporation to seek a gag order to prevent somebody from speaking to the E.P.A. is an extraordinary remedy. You could realize how bad that looks. They must have known that there was a small chance of winning. But they were so afraid that they were willing to roll the dice.’’

With the Famous Letter, Bilott crossed a line. Though nominally representing the Tenants — their settlement had yet to be concluded — Bilott spoke for the public, claiming extensive fraud and wrongdoing. He had become a threat not merely to DuPont but also to, in the words of one internal memo, ‘‘the entire fluoropolymers industry’’ — an industry responsible for the high-performance plastics used in many modern devices, including kitchen products, computer cables, implantable medical devices and bearings and seals used in cars and airplanes. PFOA was only one of more than 60,000 synthetic chemicals that companies produced and released into the world without regulatory oversight.

Bryan Schutmaat for The New York Times

Image of Mr. Tenant whose beloved cows, all 136 of them, had drunk from the creek where Dupont flushed their toxins. They all suffered from grotesque tumors, misshapen hooves at birth and going mad for which he had to shoot and bury each one of them. He himself contracted cancer as did many of the residents of Parkersburg.



‘‘Rob’s letter lifted the curtain on a whole new theater,’’ says Harry Deitzler, a plaintiff’s lawyer in West Virginia who works with Bilott. ‘‘Before that letter, corporation could rely upon the public misperception that if a chemical was dangerous, it was regulated.’’ Under the 1976 Toxic Sub­stances Control Act, the E.P.A. can test chemicals only when it has been provided evidence of harm. This arrangement, which largely allows chemical companies to regulate themselves, is the reason that the E.P.A. has restricted only five chemicals, out of tens of thousands on the market, in the last 40 years.”

So it was a shock when this past summer in June, another story was published in the Post. “EPA warns toxic forever chemicals more dangerous than once thought”, with the subtitle “The guidance may spur water utilities to tackle PFAS, but health advvocates are still waiting for mandatory standards.”“ “<https://www.washingtonpost.com/climate-environment/2022/06/15/epa-pfas-forever-chemicals/> The speed with which the newly appointed director of th EPA acted, even without the whole picture was as startling as the information, pointing to the extreme fluctuation of EPA policy with differing administrations. And to the consequential harm to public health, safety annd welfare. [epa-pfas-forever-chemicals](https://www.epa.gov/newsreleases/epa-proposes-designating-certain-pfas-chemicals-hazardous-substances-under-superfund)[problem–getting-chemical-safety-back-on-track-5-years-after-tsca-reform/](https://blogs.edf.org/health/2021/06/22/getting-chemical-safety-back-on-track-5-years-after-tsca-reform/) Reagan is light years away from the previous administration. There is much work to restore public trust that the EPA isn’t a political device to obscure toxic chemicals from the public, protecting the manufacturers from oversight.

[edf.org/health/2020/06/22/on-the-tsca-4-year-anniversary-5-ways-were-holding-the-trump-administration-accountable-on-chemical-safety/](https://blogs.edf.org/health/2020/06/22/on-the-tsca-4-year-anniversary-5-ways-were-holding-the-trump-administration-accountable-on-chemical-safety/)

A review of damage and what must be achieved to begin protecting the public from hazardous chemicals.

In Massachusetts, the DEP immediately picked up the new advisory standards, announced by the EPA for PFOA (.004 trillion) and PFOS (.02) trillion, reduced from the norm of 70 trillion which Massachusetts had reduced to 20 trillion. The advisories are “so low that with today’s technology they are difficult to detect “(3,000 and 17,000 times smaller) .

While the EPA is planning to regulate these two PFAS, thousands of distinct compounds have been discovered. Many health advocates say federal regulators need to crack down on the compounds as a group.”

Kathleen Fox, who heads the office of Water at the EPA said the agency is considering more sweeping regulations of the class of compounds.”We are exploring options to propose a rule that is for groups, not just PFOS and PFOS”

Today’s announcement should set off alarm bells for consumers and regulators,” said Melanie Benesh , legislative attorney of the Environmental Working Group , an NGO, “These proposed advisory levels demonstrate that we must move much faster to dramatically reduce exposure to these PFAS manufacturers.”

And it is the lawyers, the vigilant public, the grandparents pushing for justice and correction from polluters that are making change.

[Companies-face-billions-in-damages-as-pfas-lawsuits-flood-courts](https://news.bloomberglaw.com/pfas-project/companies-face-billions-in-damages-as-pfas-lawsuits-flood-courts)

[How-dupont-may-avoid-paying-clean-toxic-forever-chemical-n1138766](https://www.ehn.org/how-dupont-may-avoid-paying-to-clean-up-a-toxic-forever-chemical-2645364471.html)

[dow-3m-and-others-likely-exploit-loophole-avoid-reporting-forever](https://pfasproject.com/2022/09/27/dow-3m-and-others-exploit-loophole-to-avoid-reporting-forever-chemicals-releases/)

AG Healey has initiated 13 suits, including going after the Dupont spinoffs created to shift liability to Dow affiliates that didn’t exist during their malfeasance. Thus creating a legal situation that holds the people suffering from long term illness, thelands lost, the families having lost members, empty handed. And the pollution costs in the hands of municipalities already strapped for maintenance of infrastructure that exists. Single towns have remediation costs that exceed the entire statewide budget of 8.4 million for PFAS remediation. [cities-towns-express-mounting-concerns-about-pfas-remediation/](https://www.mma.org/cities-towns-express-mounting-concerns-about-pfas-remediation/)

This past week, California has entered its own suit , in a coast to coast force to reclaim costs that are exorbitant at all government levels paid for the vulnerable and largely uninformed citizen. Education is a local level mandate.

According to California Attorney General Rob Bonta’s November 10, 2022, [press release](https://oag.ca.gov/news/press-releases/attorney-general-bonta-sues-manufacturers-toxic-forever-chemicals), California “alleges that these manufacturers, including 3M and DuPont, knew or should have known that PFAS are toxic and harmful to human health and the environment, yet continued to produce them for mass use and concealed their harms from the public.” California claims that as a result, “these toxic ‘forever chemicals’ are pervasive across California’s bays, lakes, streams, and rivers; in its fish, wildlife, and soil; and in the bloodstream of 98% of Californians.” The [complaint](https://oag.ca.gov/system/files/attachments/press-docs/11.10.22%20PFAS%20Complaint.Final_.pdf) claims that the manufacturers “created and/or contributed to a public nuisance, harmed and destroyed natural resources, marketed defective products, failed to provide adequate warnings concerning the use of their products, and engaged in unlawful business practices.”

The press release states that the lawsuit concerns seven common PFAS that have been detected in drinking water supplies, surface waters, and groundwater in California: perfluorooctanoic acid (PFOA); perfluorooctanesulfonic acid (PFOS); perfluorobutanesulfonic acid (PFBS); perfluorohexanesulfonic acid (PFHxS); perfluorohexanoic acid (PFHxA); perfluoroheptanoic acid (PFHpA); and perfluorononanoic acid (PFNA). California requests statewide treatment and destruction of PFAS, including, but not limited to, the treatment of drinking water by regulated water systems; water drawn from private wells and unregulated systems used for drinking water and irrigation; and water from other wastewater treatment plants and systems. California also seeks payment of funds necessary to mitigate the impacts to human health and the environment through environmental testing, medical monitoring, public noticing, replacement water (for period between testing and installation of treatment), and safe disposal and destruction.

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[In-water-quality-gets-the-attention-it-s-due-0001](https://www.wateronline.com/doc/in-water-quality-gets-the-attention-it-s-due-0001) 2022p, a series of questions asked of Martin Bureau. He is at the forefront of water solutions for PFAS due to expertise in science, patents, and awards for actual solutions in his current role as VP ALTRA Proven Water Solutions based in Canada.

HOW will the focus on PFAS and new state and federal maximum contaminant limits affect operations for water utilities?

“The new focus on EPA, whether its at the state or the federal level, is now putting tremendous pressure on water utilities for their wastewater and potable water treatment plants and in turn are channeling that pressure to the sources of PFAS upstream in their networks. Industrial plants that release PFAS in their wastewater stream as well as landfill sites and other sources of underground water contamination from PFAS are expecting to have their state EPA on their back for, at this point, reporting on the level of contamination that they release to the wastewater streams or underground water and eventually putting in place treatments for addressing these contaminants.” “If the source of contamination upstream is identified, the utility may be able to avoid or postpone the investments by putting pressure to invest in a treatment at the identified source.”

Here’s what Guy Campinha, head of Wareham wastewater says about his mandate to treat sludge, known to have PFAS of 100 ppb when sprayed for fertilize-. <https://youtu.be/uHSAc6IoL3I>.

His mandate includes testing all upstream businesses, which could include solar utilities capable of directing thousands of panel leachate currently of unknown composition downstream. We don’t know the make and model of most panels in Wareham to my knowledge, nor what condition they are in and if leaching is occurring. We do know they are mounted over our most valuable resource-water.

“Other treatment needs seen on the horizon? “

Dioxane, industrial chemicals like flame retardants based on brominated organic compounds used for textiles, chlorinated solvents still massively employed everywhere, pesticides (organophosphates0, phthalates and other plasticizers for plastic based products and of course microplastics which we find in every aquatic living organism.”

In a response to the Federal Strategy Plan for PFAss, July 2022, the office of Science and Tech Policy asked in a RFI for needs to fill gaps to inform PFAS Research and Development. The response indicates a strong need to test airborne emissions sources at landfills. Surprising was the statement that indoor air can have greater levels than ambient air in residential and non-residential. As Chief Kelly of Wareham fire said,”When we used to go into a home, the overstuffed chair was burning natural substances. Now when you go into a burning house, the homes’ contents have melted.” It’s just ot smoke we’re breathing. It’s toxic plastics.

THIS IS THE DILEMMA- about which we can’t be cavalier.

There has been gross negligence in protecting the American people and global life from the malignant behavior of US chemical corporations and the generational toxic ramifications that cannot be wished or washed away. The bioaccumulative effect not known for unknown levels of toxicity for 6-10- how many ?-thousands of chemicals coupled with new minute toxicity for the chemicals most known for harm is shocking the country. There is not enough money to repair munici;al facilities responsibility for clean air and water. Now there is a financial burden to test, analyze, triage, remediate and stop upstream these ungodly substances demonstrated to be in all our bodies, in the arctic aquatic creatures, in newborns and in the biota that reside in the wake of water contaminated soils.

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Certifying solar panel installations by the thousands installed for 25-30 years and leaching at perhaps 3-5 or 8- 10 ? Is an enormous responsibility. No slip of paper from entities like Con Edison, Dupont and Jinko that have their own track records of malfeasance is laughable and deadly serious. So when in the framework for decision making the criterion is

 Even as the Federal EPA has indefinite categories of toxic PFAS, imprecise testing protocol for very small limits for PFAS and has addressed only the tip of a calamitous iceberg, states AGs, environmental attorneys, citizens, NGOs and scientists are uncovering the buried legacy of synthetic chemicals run wild.

Many .gov sites are informative and also may feel like DIY projects.

Mass.gov points citizens to DEP questions and answers.

<https://www.mass.gov/doc/massdep-fact-sheet-pfas-in-drinking-water-questions-and-answers-for-consumers/download>

 We know that as toxic PFAS are put on the List, new synthetic replacements will be devised. We know that corporations are spinning off liability as fast as possible to avoid the overwhelmingly expensive cost of testing in so many places and categories of things that they can sink under the remediation settlements.

EPA Q and A

<https://www.epa.gov/sdwa/questions-and-answers-drinking-water-health-advisories-pfoa-pfos-genx-chemicals-and-pfbs>

Some are non specific answers: What is PFAS What are PFAS?

 “PFAS are a group of manufactured chemicals that have been used in industry and consumer products since the 1940s. There are thousands of different PFAS, some of which have been more widely used and studied than others. One common concern is that PFAS generally break down very slowly, meaning that concentrations can accumulate in people, animals, and the environment over time. Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) are two of the most widely used and studied chemicals in the PFAS group. PFOA and PFOS have been replaced in the United States with other PFAS in recent years. In chemical and product manufacturing, GenX chemicals are considered a replacement for PFOA, and perfluorobutane sulfonate (PFBS) is considered a replacement for PFOS. “

 Mass.DEP\_ Fact sheet under Miscellaneous 5. Says unequivocally-

“Mass. DEP’s solar guidelines, policy, model certification template approval letter and SOP for staff state that PWS shall use solar panels and solar sheets that do NOT contain PFAS. It’s a PWS’s responsibility to ask the manufacturer about PFAS from the solar panels being considered.” That’s CLEAR

That question is prefaced by answering the question.

” Can public water systems be contaminated by per and polyfluoroalkyl substances (PFAS) washing off solar panels and solar sheets installed at public water systems?”

Answer : We have not identified any water sampling results that have detected PFAS coming off solar panels or is present on solar panels. PFAS may be generated as a waste during the manufacturing of toxic substances”

That’s UNCLEAR What PFAS? Your definition of PFAS says there are thousands of them. Polymer or non-polynmer PFAS? Have you measured solar runoff without detecting PFAS of what kind? All the panels are different and some with unknown “proprietary “ secrets like Dupont Tedlar. Dupont does not allow independent testing of its products. As for knowing material components of Chinese company components, it is next to impossible. There is a universal history of replacement materials that are cheaper and Tedlar film knockoffs are available on numerous internet sites for Chinese manufacturers.[t](https://www.made-in-china.com/showroom/wxlianghai/product-detailtqoJOQGjgPWl/madeinchina.html)

There are no answers yet to many

Difficult questions. But there are answers that for what we know now, are far safer than operating on unvalidated assertions.

Sincerely, Annie

* Standard : ISO9001
* Production Capacity : 800,000 M2/ year
* Wuxi Fuhua Plastic Industry Co., Ltd.

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