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Safety of PVC water pipe questioned in new report

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Bennington, Vt.-based Beyond Plastics, a nonprofit group that aims to end plastic pollution, is pushing against using federal funds to replace lead water pipe with PVC.

The group on April 18 released a 56-page report that warns of human health risks related to PVC and recommends state and local officials avoid using the material as well as chlorinated PVC (CPVC) for their communities' water pipes.

"We recommend avoiding PVC plastic and CPVC because independent researchers have documented roughly 30 to 60 different toxic chemicals released by PVC and CPVC pipes and their fittings," said Judith Enck, president of Beyond Plastics and former EPA regional administrator under President Barack Obama's administration.

"While individual chemicals have generally been found at very low levels, we don't know enough about the health significance of exposure to complex chemical mixtures," Enck said.

For plastics pipe trade groups, the Beyond Plastics report is another attack on products used for decades that meet standards set by NSF International (NSF, formerly National Sanitation Foundation) and the American National Standard Institute (ANSI).

"The Beyond Plastics report is wrong. PVC pipes are safe with nearly 60 years of rigorous NSF testing — the legally recognized standard for water pipes in the U.S. and Canada. NSF standards and some 10 million quality control tests conducted since 1965 ensure that PVC and CPVC, safely deliver clean drinking water," Ned Monroe, president and CEO of the Vinyl Institute, said in an email.

Founded in 1982, the Arlington, Va.-based industry group represents manufacturers of vinyl, vinyl chloride monomer, vinyl additives and modifiers, and vinyl packaging materials.

As Beyond Plastics rolls out a public appeal that calls for banning vinyl chloride monomer, Monroe said, "Many municipal governments rely on PVC to bring clean drinking water to their residents because PVC pipes meet rigorous safety standards and last 100 years or longer."

The issue is relevant now because the U.S. federal government has committed to spending $15 billion to help municipalities replace lead water service lines.

Enck said about 9.2 million U.S. households and 400,000 schools and daycare centers still have lead service lines carrying water from the mains in the street to

the plumbing system in their buildings.

Enck spoke during an April 18 teleconference about the report, "The Perils of PVC Plastic," which was co-published with the Washington-based Plastic Pollution Coalition and a partner identified as Environmental Health Sciences.

The Plastic Pollution Coalition launched a similar campaign in October, urging the public to ask local decision-makers not to replace lead service lines with plastic pipe and to provide all households with options other than bottled water before, during and six months after lead lines are removed.

The lead lines, which are mostly in older cities and buildings constructed before 1986, can leach the poisonous metal into tap water, where it can cause neurological problems and learning delays in children and cardiovascular disease in adults.

Beyond Plastics members recommend the lead service lines be replaced with pipes made from stainless steel or unlined recycled copper as opposed to virgin copper because of the environmental impacts associated with mining and smelting.

The recommended pipe alternatives cost more but are arguably similar in cost to install when it comes to labor and machinery, according to Enck.

As for PVC and CPVC pipes, Enck said there's not enough scientific evidence to suggest they are safe.

The Uni-Bell PVC Pipe Association, based in Irving, Texas, has not responded yet to a request for comment from *Plastics News*.

Bruce Hollands, the group's executive director, spoke out last fall when the coalition raised issues about plastics pipe, but he also noted that PVC is not used for water service lines as much as high density polyethylene, cross linked polyethylene and copper.

Still, when PVC pipe is used, it is safe, according to Hollands.

"PVC is one of the most researched and tested materials in the world used to carry potable water and over 60 years of use confirm its safety and effectiveness," Hollands said in an email last October.

The report also noted that HDPE can be used for service lines, but Beyond Plastics focused on PVC and CPVC, making a connection with those resins and vinyl chloride monomer. VCM is linked to increased risk of liver, brain, and lung cancers, as well as lymphoma and leukemia, according to the National Institutes of Health.

Enck noted the Consumer Product Safety Commission prohibited use of vinyl chloride as an aerosol in consumer products and the Food and Drug Administration banned its use in cosmetics.

"Federal agencies banned the use of vinyl chloride in various consumer products like hair spray ... and cosmetics, but not in pipes that deliver drinking water to our homes every single day," Enck said.

In its call on the U.S. Environmental Agency to ban vinyl chloride, Beyond Plastics says the agency regulates water quality at the point of entry into the distribution system, when it leaves the water treatment plant and enters water mains, but not the tap.

"That means that, even if PVC service lines were leaching significant levels of vinyl chloride into drinking water, it would not be detected under current EPA regulations," the report says.

Enck is encouraging the EPA to get involved more.

"In the months and years ahead, this new federal money will be flowing to state and local governments and unfortunately the EPA hasn't provided any guidance on what's a safe substitute for lead service line pipes. They could, but EPA has chosen not to," Enck said.

Defending plastics

Plastics pipe in general have the lowest life cycle costs and a 60-year track record in the field, according to David Fink, president of the Irving, Texas-based Plastics Pipe Institute Inc. (PPI), which primarily represents producers of PE pipe.

Although PE pipes aren't the focus of the report, the products are an option for service lines and they were mentioned several times.

Fink issued a statement after the teleconference, noting a wide range of HDPE products that have a good reputation in the marketplace.

"Not only is high density polyethylene used to manufacture pipe for potable water systems, it is also used for milk, juice, and potable water bottles and jugs," Fink said. "This is just another sign of quality assurance and the public's confidence in HDPE."

When it comes to pipe, HDPE products range from 3/4 to 65 inches in diameter and are leak-free, corrosion free and don't tuberculate, which Fink said means the rate of water flow remains the same "from day one to year 100."

"Plus, it is favored by engineers, utilities, towns and cities because it is cost-effective and easy to install using a variety of methods, including trenchless installation and rehabilitation technologies, which can save an additional 30 percent on average vs open trench," Fink said of HDPE.

Questioning NSF

For almost 80 years, Ann Arbor, Mich.-based NSF has been a trusted certification body to protect health through impartial product testing of everything from water treatment systems to household appliances to dietary supplements to sustainable flooring.

However, Beyond Plastics points out the private organization is partially funded by pipe manufacturers and relies on some self-reported data from those processors.

"Researchers also question the soundness of the certification process in which water pipe manufacturers pay NSF International to test and certify that their products do not leach chemicals above the limits set by the NSF/ANSI 61 standard," the report says.

Standards set by a third party can't protect the public's health as well as the standards set by a regulatory agency with enforcement powers, the report continues.

"Third-party organizations are not accountable to the public, and they often do not have rigorous conflict-of-interest policies, unlike a government agency. When industry is part of standard setting — as it is with NSF/ANSI 61 — but transparency in proceedings is not required, it erodes trust," the report says.

Beyond Plastics takes issue with NSF International for not sharing its testing database with the public or publishing failure rates.

Product failures identified by testing are reported to the manufacturer so that the manufacturer can correct the problem.

NSF International should be required to publish contaminant migration and concentration data for each certified product over the entire period of testing, while protecting manufacturers' proprietary information, the report says.

"That way, water utilities can make informed decisions and researchers can better focus their investigations into potential health issues associated with plastic pipes," the report says.

Vinyl chloride concerns

The production of PVC and CPVC water pipe can release harmful chemicals into the air and water at each stage of the product's life cycle, from manufacturing to transport, installation and use to end of life, according to Beyond Plastics.

"PVC is mostly made in Louisiana, Texas and Kentucky in low-income communities and communities of color where there is a concentration of petrochemical facilities, making this a very significant environmental justice issue," Enck said.

She also pointed to the Feb. 3 Norfolk Southern train derailment in East Palestine, Ohio, as an example of the threat that PVC and its feedstock vinyl chloride monomer pose to Americans.

The contents of five tanker cars of VCM and four hopper cars of PVC resin all burned either during the derailment and its immediate aftermath, or intentionally three days later to avert an explosion.

"That burn-off created an enormous, toxic mushroom cloud possibly containing hydrochloric acid, the World War I gas phosgene, and dioxins. The mushroom cloud spread across the Ohio- Pennsylvania border and was so large it was visible from space," the report says.

The PVC pellets in three train cars were produced by Shintech Inc. and were on their way to a PVC pipe manufacturing plant owed by JM Eagle, according to Mike Schade, Mind the Store campaign director for the Seattle, Wash.-based Toxic-Free Future, an environmental health research and advocacy organization.

"We know this from a review of the train manifest, which can be found in the EPA's administrative order," Schade said during the teleconference. "JM Eagle is one of the biggest producers of PVC pipes in the entire country. And three of Shintech's train cars containing PVC that burned in the derailment were on their way to this PVC pipe manufacturing facility."

Schade said another company involved in the derailment was Occidental Chemical Corp., which produced the vinyl chloride in three of the rail cars that derailed and was burned. The monomer was being sent to Occidental's PVC production plant in New Jersey, he added.

Schade also recalled a 2012 train derailment in Paulsboro, N.J., that sent a massive cloud of vinyl chloride into the community.

"In fact, one local resident died, attributed likely due to exposure to vinyl chloride in this disaster. That train was heading to the very same ... plant as the Ohio train derailment," Schade said.

Other businesses also play a role in the demand for vinyl chloride and PVC and CPVC products, Schade said, pointing to major retailers.

"Home Depot and Lowe's can take action and help prevent these problems by phasing out and banning the sale of PVC piping and other PVC building

products. [They] can leverage their market power and influence to drive this poison plastic off store shelves and help bring safer products to market," Schade said.