



P2: Pollution Prevention

Reducing inadvertently generated PCBs through pollution prevention

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Overview

The U.S. Environmental Protection Agency's (EPA) Pollution Prevention program supports the development and implementation of P2 solutions through grant programs, technical assistance, and by connecting researchers, industry experts, and others to develop innovative solutions to environmental challenges. Preventing pollution at its source means fewer hazards posed to public health and the environment. This approach can also save businesses money.

In EPA Region 10 (WA, OR, ID, AK), the regional Pollution Prevention and PCB programs have collaborated to address the challenge of iPCBs. The programs have worked together to evaluate potential options for reducing iPCBs in products and to support state environmental agencies, EPA's Office for Research and Development, and industry experts in developing upstream P2 approaches to reduce the release of iPCBs into the environment.



Traditional road paint often contains iPCBs.

What are iPCBs?

Polychlorinated biphenyls (PCBs) are persistent, bioaccumulative, and toxic (PBT) compounds. Although commercial PCB production was banned in 1979 under the Toxics Substance Control Act (TSCA), Non-Aroclor¹ PCBs (iPCBs) are generated inadvertently as a byproduct or impurity resulting from some chemical manufacturing processes. iPCBs can be generated during a variety of production processes, and they can contaminate products as well as waste streams. iPCBs have been identified in certain pigments that are currently manufactured for use in paints, inks, textiles, paper, cosmetics, leather, and other materials.^{2,3} iPCBs have also been found in effluent discharges, sanitary sewer systems, surface water bodies, and in humans. iPCB contamination of water bodies is a non-point source challenge meaning iPCBs come from many different sources. Water quality standards for PCBs are set at extremely low concentrations due to their bioaccumulation and biomagnification in the food chain. Even if iPCBs contribute only a small amount of contamination at a time, our states and nation can't ensure clean water without addressing this non-point source of pollution. Upstream, pollution prevention solutions and viable alternatives to iPCB-containing products will reduce the generation of iPCBs and help protect human health and the environment.

Innovative Partnerships to Develop Pollution Prevention Solutions

In October 2019, the Washington State Department of Ecology used EPA P2 grant funds to host an iPCB workshop in partnership with EPA Region 10, Spokane River Regional Toxics Task Force (SRRTTF), the Color Pigments Manufacturer Association (CMPA), Northwest Green Chemistry (NGC), the Bullitt Foundation, and industry representatives to discuss opportunities to reduce iPCBs in inks and pigments and the downstream products and processes using those inks and pigments. The workshop helped establish lines of communication between chemical manufacturers, product manufacturers, purchasers, and end-of-life managers with the intention of formulating actionable steps to stimulate innovation and create markets for safer products.⁴ Workshops like this one, that work with supply chains to foster communication and collaboration, are a first step to develop innovative, non-regulatory pollution prevention approaches to environmental challenges. Since the October 2019 workshop, participants have continued the conversation through their participation on working groups facilitated by NGC.

1 PCBs were often sold under the trade name Aroclor

2 America's Children and the Environment, Third Edition, PCB Section, 2015: <https://www.epa.gov/sites/production/files/2015-05/documents/biomonitoring-pcbs.pdf>

3 Liu, X. AND M. Mullin. Inadvertent Polychlorinated Biphenyls (PCBs) in Consumer Products. the 2019 ISEE & ISIAQ Joint Conference, Kaunas, Europe, LITHUANIA, August 18 - 22, 2019. https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NRMRL&dirEntryId=346285

4 Inadvertently Produced PCBs in Inks and Pigments Workshop Summary: https://srtrtf.org/?page_id=10745.



Washington State Department of Enterprise PCBs Risk Calculator.

Pollution Prevention Solutions in Action

Washington State's 2014 Revised Code of Washington⁵ limits PCBs in state-purchased products. As a result of this law, the state updated many of their procurement contracts. For example, the Washington State Department of Transportation (WSDOT) updated their road paint master contract to prohibit the purchase of road paints containing diarylide pigments and pigment 83, which are pigments associated with iPCB generation. WSDOT found that they could procure road paint that met the required performance standards while implementing this environmentally preferable purchasing (EPP) policy. Additionally, Washington Department of Enterprise Services has created a PCB Risk Calculator to help procurement and EPP specialists determine the likelihood that products may contain iPCBs and to make recommendations for whether to test the product before buying in bulk.

Continuing P2 efforts

In 2019, Washington State passed the *Pollution Prevention for Healthy People and Puget Sound Act*⁶, which creates a new way to keep harmful chemicals out of the environment by authorizing the Washington State Department of Ecology to restrict or eliminate toxic chemicals in consumer products when safer alternatives are available. The Washington State Department of Ecology is currently evaluating PCBs in paints and printing inks under this new law.

Additional EPA Contributions to Pollution Prevention Innovation

- EPA's Office of Research and Development, with support from the EPA PCB and Pollution Prevention programs, is conducting product testing to determine the range of concentrations of iPCBs within consumer products, with a special emphasis on children's products. Future research will evaluate how iPCBs migrate out of consumer products and into our environment and bodies.
- The Region 10 regional PCB and Pollution Prevention programs collaborated with the EPA Small Business Innovation Research (SBIR) Grant program to solicit proposals in 2020 for innovative coloration technologies that do not result in iPCB generation.⁷ The SBIR program provides research and development funding to small businesses to support commercialization of innovative technologies that help support EPA's mission of protecting human health and the environment.
- The National Toxicology Program is working with EPA to evaluate the toxicology of PCB-11, a PCB congener often associated with inadvertent PCB generation.

5 RCW 39.26.280-290: <https://app.leg.wa.gov/rcw/default.aspx?cite=39.26.280#:~:text=RCW%2039.26, in%20packaging%20containing%20 polychlorinated%20biphenyls>.

6 More information about the Pollution Prevention for Healthy People and Puget Sound Act, Substitute Senate Bill 5135, can be found here: <https://ecology.wa.gov/Waste-Toxics/Reducing-toxic-chemicals/Safer-products>.

7 SBIR funding information: <https://www.epa.gov/sbir/sbir-funding-opportunities>.