

Develop Industry List of Pigments: Chlorinated vs. Non-Chlorinated
Scope of Work

Task: Develop an industry list of pigments that distinguishes between chlorinated and non-chlorinated manufacturing processes.

The Spokane River Regional Toxics Task Force (SRRTTF) is a group with members from industry, government, and conservation groups collaborating together to identify and implement solutions to reduce Polychlorinated biphenyls (PCBs) to the Spokane River. These persistent, bio-accumulative, and toxic chemicals (PBTs) have been designated by EPA as probable human carcinogens and are ubiquitous in the environment. In order to reduce PCBs in an effort to attain water quality standards, there must be both beginning-of-life and end-of-life solutions. One suggested beginning-of-life action is to reduce PCBs in supply chains, specifically by implementing *government and business procurement policies* by focusing on certain pigments used in a variety of products. The purpose of this project is to develop a resource in the form of a comprehensive list of chlorinated-containing pigments and non-chlorinated pigments.

As the presence PCBs continue to be studied, a need for further research into the formation of inadvertent PCBs related to pigments has emerged. PCBs in certain pigments that contain chlorine can be created as an unintentional byproduct of the manufacturing process, which are known as inadvertent PCBs (iPCBs). Under the Toxic Substances Control Act of 1976 (TSCA), products made by pigment manufacturers cannot exceed an average inadvertent PCB concentration of more than 25 parts per million or an absolute limit of 50 parts per million. This low level may have consequences further down the supply chain because some products are made with pigments that could contain iPCBs. The total amount of iPCBs in any given pigment is not clearly understood and additional work to provide more details on the types of iPCBs found and their subsequent concentration is required.

Pigments are used in many consumer products. Manufactured products and the pigments within them may inevitably end up in the environment. Some of these PCB-containing wastes are diverted to recycling and wastewater treatment facilities. Wastewater dischargers in the state of Washington face PCB limits of 170 parts per quadrillion, or 0.00000017 parts per million, which is nearly 300 million times lower than the allowable levels under TSCA. Wastewater treatment plants (WWTPs) in the Spokane River basin have invested in advanced treatment systems that are capable of removing and destroying up to 99% of the PCBs entering their systems. Even with these most advanced, state-of-the-art treatment systems, low levels of PCBs continue to enter the Spokane River above the water quality standards.

In order to meet stringent water quality regulations, wastewater dischargers and environmental regulatory agencies are looking for solutions further up the supply chain. This effort has led government and businesses to implement procurement policies limiting PCB concentrations, but the success of these policies is hindered by a variety of issues including scarcity of information on PCB content in products. In order to address the problem posed by PCBs in the environment, beginning-of-life solutions must be researched and advanced in addition to end-of-life solutions.

This project will provide an important resource in helping to understand which pigments could contain iPCBs. Additional work will be necessary to confirm their presence once the list of chlorine containing pigments is compiled. Eventually, this information along with other supporting data can be provided to interested parties to allow them to make informed decisions. The information will also be used to investigate how pigments without a high prevalence of iPCBs might be used as an alternative in specific applications.

References/Appendix:

1. Color Index International reference tool maintained by the *American Association of Textile Chemists and Colorists* and the *Society of Dyers and Colourists*, <https://colour-index.com/>
2. “Industrial Organic Pigments: Production, Properties, Applications” by Klaus Hunger and Willy Herbst
3. MADE SAFE Banned List: Polychlorinated biphenyls (containing 60 or more percent chlorine by molecular weight), <https://www.madesafe.org/banned-list/>
4. PCB’s and their Inadvertent Presence in Pigments – Presentation by Mark Vincent of Dominion Colour to the SRRTTF, <http://srrttf.org/wp-content/uploads/2015/07/PCBs-in-pigments-July-2015.pdf>
5. Letter to EPA from Inland Empire Paper Company, The Lands Council, and Spokane Riverkeeper in response to ANPRM, August 20, 2010 (See Attachment)
6. Interstate Chemicals Clearinghouse (IC2), <https://theic2.org/#gsc.tab=0>
7. Pigments and inadvertent polychlorinated biphenyls (iPCBs): Advancing no and low iPCB pigments for newsprint, and paper and paperboard packaging, http://srrttf.org/wp-content/uploads/2019/07/Final20190628_iPCBs-and-Pigments.pdf