



Wood Treatment Chemicals

(Antisapstain Chemicals and Wood Preservatives)

in the Georgia Basin

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What are wood treatment chemicals?

Wood treatment chemicals include antisapstains and wood preservatives. Antisapstains are chemicals used by the lumber industry in moist coastal areas of BC to prevent the staining that is caused by fungus and molds on freshly cut softwood lumber intended for export. Wood preservatives are chemicals used to provide long-term protection to wood intended for use in exposed conditions including railway ties, patio decks, fence posts, and utility poles. Although usage of these chemicals has declined substantially since the 1990s, very large volumes of wood treatment chemicals are still used in BC and these chemicals account for the majority of total pesticide use.

In the past, chlorophenates, copper 8-quinolinolate and TCMTB were used for antisapstain treatment; however, their use has been discontinued and DDAC (didecyl dimethyl ammonium chloride) and IPBC (3-iodo2-propynyl butylcarbamate or iodocarb) are used almost exclusively for this purpose. The registration of these substances for antisapstain control is reviewed annually.

Six heavy-duty wood preservatives are currently used in BC. These include creosote, pentachlorophenol, CCA (copper chromium arsenate), ACQ (alkaline copper quaternary), disodium octaborate tetrahydrate, and ammoniacal copper zinc arsenate (ACZA). The bulk of wood preservative products are used in the Lower Mainland region.

Why are they of concern?

DDAC and IPBC are both less toxic to aquatic species and less likely to bioaccumulate than were chemicals used for antisapstain purposes in the past. However, both DDAC and IPBC are toxic to aquatic species at low concentrations and can cause a number of adverse effects at sublethal concentrations. In addition, some studies indicate that the toxicity of these substances may be additive when exposure to

both chemicals occurs simultaneously. Some past studies on these chemicals suggested that existing provincial guidelines for maximum allowable DDAC and IPBC concentrations in stormwater discharges from wood treatment facilities be reviewed to ensure that the most recent information on toxicity is reflected.

The commonly used wood preservative chemicals in BC (creosote, CCA and PCP), are also known to be toxic to aquatic species at low concentrations. In addition, creosote and PCP both contain other chemical contaminants of environmental concern. Creosote contains very high concentrations of PAHs, while commercial formulations of PCP contain a variety of chemical impurities including HCB, CDPEs, PCDDs, and PCDFs.

CCA has recently been phased out for use on lumber products for consumer use due to potential health concerns associated with the arsenic contained in this product. CCA is being replaced with ACQ for consumer use.

How can they enter the Georgia Basin environment?

In the past, large amounts of antisapstain chemicals were released to the environment as a result of the uncovered storage of treated lumber which generated large volumes of contaminated surface runoff. The development and implementation of Best Management Practices at the mills has greatly reduced the release of antisapstain chemicals to stormwater runoff in lumber yards and allowable concentrations of antisapstain chemicals in stormwater runoff are now regulated by the BC Ministry of Environment.

Similarly, past practices at wood preservation facilities also resulted in the release of large quantities of contaminated stormwater to the environment. However, the introduction of codes of practice and the implementation of inspection and enforcement programs by the federal government have reduced stormwater discharges from these facilities by more than 90% compared to discharges in the early 1990s.

Are they present in the Georgia Basin environment?

The past widespread use of chlorophenol-based antisapstains in BC resulted in environmental contamination in the vicinity of several wood protection facilities. However, chlorophenols are not persistent in the environment and concentrations declined rapidly following a ban on the use of these substances for antisapstain treatment. Information on levels of DDAC and IPBC in the Georgia Basin environment is limited; however, these chemicals have been detected in water and sediment samples collected from the Fraser River in the vicinity of lumber mills.

Similarly, prior to the implementation of effective pollution control measures, the use of wood preservation chemicals resulted in their presence at elevated levels in the environment near wood preservation facilities. In addition, the entry of these chemicals to the environment also resulted in the release of a number of other chemicals which are present as contaminants in commercial wood preservative formulations. For example, creosote contains high concentrations of many PAH compounds, while PCP formulations can contain HCB, CDPEs, PCDDs and PCDFs. Elevated concentrations of several of these contaminants have been detected in the environment near wood preservation facilities. However, the introduction of more comprehensive pollution control measures substantially reduced the discharge of contaminated stormwater from these facilities and resulted in decreased concentrations of chlorinated phenols, PCDDs and PCDFs in the environment.

Key Reference

(Information for this fact sheet was taken from the following publication)

Garrett, C.L. 2004. Priority substances of interest in the Georgia Basin: profiles and background information on current toxic issues. Technical Supporting Document of the Canadian Toxics Work Group of the Puget Sound/Georgia Basin International Task Force. GBAP Publication No. EC/GB/04/79. Environment Canada, Pacific and Yukon Region, Vancouver, BC.

Useful Websites

Wood Preservation Chemicals

- [*Canadian Council of Ministers of the Environment \(CCME\) - Wood treatment: the Canadian perspective*](#)
- [*Environment Canada - Wood Preservation Sector*](#)
- [*Fisheries and Oceans Canada - Guidelines to Protect Fish and Fish Habitat from Treated Wood used in Aquatic Environments in the Pacific Region*](#)
- [*Wood Preservation Canada - Types of Wood Preservatives*](#)
- [*Fraser River Action Plan Report - Evaluation of Leachate Quality from Pentachlorophenol, Creosote, and ACA Preserved Wood Products*](#)

Wood Protection or Antisapstain Chemicals

- [*Environment Canada - Assessing the Potential Impact of Antisapstain Chemicals, DDAC and IPBC, in the Fraser River*](#)
- [*Environment Canada - Toxicity of the Antisapstain Fungicides, DDAC and IPBC, to Fishes and Aquatic Invertebrates*](#)
- [*BC Ministry of Environment - Antisapstain Waste Control Regulation*](#)
- [*BC Ministry of Environment - A Review of the Environmental Impact and Toxic Effects of DDAC*](#)