



# Cleaning up PCBs in San Francisco Bay

High levels of PCBs in San Francisco Bay fish prompted state health officials to advise the public to limit their consumption of Bay fish, beginning in the mid-1990s. PCBs also harm fish and other wildlife in the Bay. In 2008, the San Francisco Bay Regional Water Quality Control Board (Water Board) adopted a clean water action plan (a “TMDL,” see page 2) for PCBs in the Bay. This plan requires municipalities, industry, and others to take action to reduce PCBs in the Bay.

## What are PCBs?

Polychlorinated biphenyls, called PCBs, are oils to which chlorine has been added to keep them from breaking down in industrial applications. Because PCBs are stable at high temperatures, they had numerous industrial uses beginning in the 1920s. After their harmful effects became known, Congress banned the manufacture and most uses of PCBs in 1979. Some PCBs are still in use today, primarily by electric utility companies in transformers.

## Why are PCBs a problem?

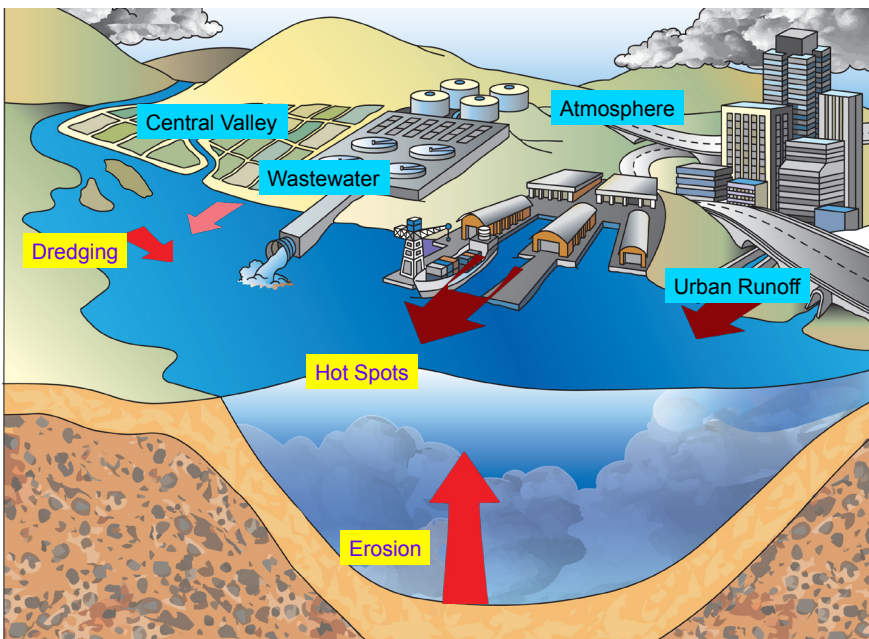
PCBs are a problem in the Bay because they are toxic, persist in the environment, and accumulate in the tissues of fish, wildlife, and humans. Studies with animals show that high levels of PCBs could harm the liver, digestive tract, and nerves; and could affect development, reproduction, and the immune system. PCBs have been found to cause cancer in some animal studies.

PCBs in the Bay are found more often in bottom sediment more than in the water. This means that they begin to accumulate at the very base of the food web. Bottom-dwelling organisms transfer PCBs to fish, diving ducks, and other marine life—and on up to large sport fish and humans who catch and eat them.

## How do PCBs reach the Bay?

Much of the PCBs pollution in the Bay happened decades ago, before the potential health and environmental effects of PCBs were widely known. Today, a smaller amount of PCBs still enters the Bay from these source categories, shown in the diagram at left:

- Atmospheric deposition: Some PCBs can evaporate into the air. When it rains, airborne PCBs are deposited on the ground and directly onto the Bay.
- Drainage from the Central Valley
- Municipal and industrial wastewater
- Storm drains and stormwater runoff
- Disturbance of buried Bay sediments by dredging or erosion



## TMDLs: Action Plans for Clean Water

**TMDL** stands for Total Maximum Daily Load, or the amount (load) of a pollutant that a water body can contain on an average day—and still be healthy for people and wildlife.

In California, a TMDL is a set of actions that responsible parties must undertake in order to restore good water quality.

The federal Clean Water Act requires states to develop TMDLs for waters that are “impaired” by pollutants, or have poor water quality. TMDLs must be based on sound science. The public has many opportunities to weigh in on both the science and the details of the action plan.

The PCBs TMDL for San Francisco Bay was adopted by the San Francisco Bay Regional Water Quality Control Board in 2008 and approved by the U.S. Environmental Protection Agency in 2010. It is being enforced through the Municipal Regional Stormwater Permit and the Watershed Permit for municipal and industrial dischargers of PCBs and mercury.

## What is being done about PCBs pollution?

**B**ecause PCBs take years to break down in the Bay, the Water Board has established an initial 20-year time-frame for reducing PCBs to safe levels. It will take time for the levels in some fish species to come down far enough to be safe to eat frequently.

Meanwhile, cities and industries around the Bay are working to reduce PCBs entering the Bay, in compliance with the action plan.

- **Industry and the military** are cleaning up sites near PCBs-containing Bay sediments.
- **Dredgers** are testing Bay sediments they remove, and properly disposing of materials with high levels of PCBs.
- **Municipal wastewater treatment plant operators** are using advanced methods to test for PCBs in treated wastewater.
- **Municipal storm drain programs** are pilot-testing several methods for reducing PCBs in runoff from city streets. They are testing ways to remove dirt particles from runoff, because PCBs cling to soil. After testing, municipalities will put the most effective methods into action.
- **The Regional Monitoring Program** continues to sample Bay water, sediment, and fish for PCBs, so that we can improve our understanding of how PCBs move through the food web. This monitoring is funded in part by the municipalities and industries mentioned above.
- The **Water Board** is working with the state **Office of Environmental Health Hazard Assessment** and the **Department of Public Health** to educate Bay Area residents about which Bay fish have PCBs and should be avoided. The municipalities and industries mentioned above are helping to fund this work.

## For more information...

- The Water Board’s PCBs TMDL web page: [www.waterboards.ca.gov/sanfranciscobay/water\\_issues/programs/TMDLs/sfbaypcbstmdl.shtml](http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/sfbaypcbstmdl.shtml)
- The Municipal Regional Stormwater permit: [www.waterboards.ca.gov/sanfranciscobay/water\\_issues/programs/stormwater/Municipal/index.shtml](http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/stormwater/Municipal/index.shtml)
- Waste Discharge Requirements for PCBs in municipal and industrial wastewater discharges to San Francisco Bay (Watershed Permit): [www.waterboards.ca.gov/sanfranciscobay/board\\_decisions/adopted\\_orders/2011/R2-2011-0012.pdf](http://www.waterboards.ca.gov/sanfranciscobay/board_decisions/adopted_orders/2011/R2-2011-0012.pdf)
- The Regional Monitoring Program: <http://sfei.org/rmp>
- Office of Environmental Health Hazard Assessment’s Guide to Eating San Francisco Bay Fish and Shellfish: [www.oehha.ca.gov/fish/nor\\_cal/2011SFbay.html](http://www.oehha.ca.gov/fish/nor_cal/2011SFbay.html)

## Some former uses of PCBs:

- Utility transformers and capacitors
- Fluorescent light fixtures
- Hydraulic fluids and lubricants
- Plasticizers (additives that maintain softness)
- Flame retardants
- Additives to paint, inks, sealants, and caulk

