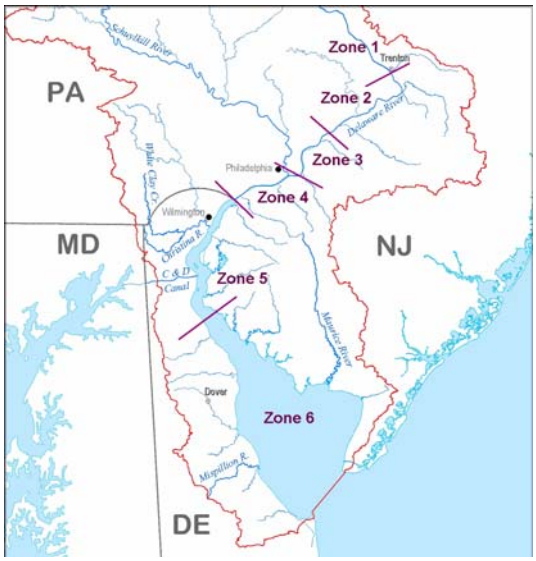
Delaware River Basin Commission
DELAWARE · NEW JERSEY
PENNSYLVANIA · NEW YORK
UNITED STATES OF AMERICA

Polychlorinated Biphenyls (PCBs) in the Delaware Estuary

"The Delaware River is the cleanest it's been in decades, but the presence of PCBs remains a problem. States bordering the river have issued fish consumption advisories because of elevated PCB levels in fish tissue. The reduction in PCB levels will not be achieved overnight and achieving the water quality standards will take decades. The goal is to reduce the level of this toxic substance to a point where the standards are met and the advisories are no longer necessary." -- DRBC Executive Director Carol R. Collier

On behalf of the states of New Jersey, Pennsylvania, and Delaware, and based on work conducted by the Delaware River Basin Commission (DRBC), the U.S. Environmental Protection Agency (EPA) in December 2003 established Stage 1 Total Maximum Daily Loads (TMDLs) for PCBs in the Delaware River from Trenton, N.J. downstream to the head of the Delaware Bay near Liston Point, Del. This 85-mile tidal reach of the river comprises DRBC Water Quality Management Zones 2-5.

A TMDL sets the maximum amount of a pollutant that a water body can receive without violating applicable water quality standards and allocates that amount among sources in the watershed – both point (end-of-pipe) and non-point (runoff). Dischargers must reduce loads to the allocated levels in order to achieve and maintain the standards.



DRBC Water Quality Management Zones

Building upon the 2003 action, a Stage 1 TMDL for the Delaware Bay, Zone 6, was established in December 2006. The development of Stage 1 TMDLs for Zones 2-6, which cover the entire estuary, took place under a court-mandated schedule resulting from a lawsuit against the federal government.

The Stage 1 TMDLs also include tidal portions of the tributaries in this covered area. Each TMDL must provide for the achievement of the applicable water quality standard within each zone and also must ensure that water quality in adjacent zones is adequately protected.

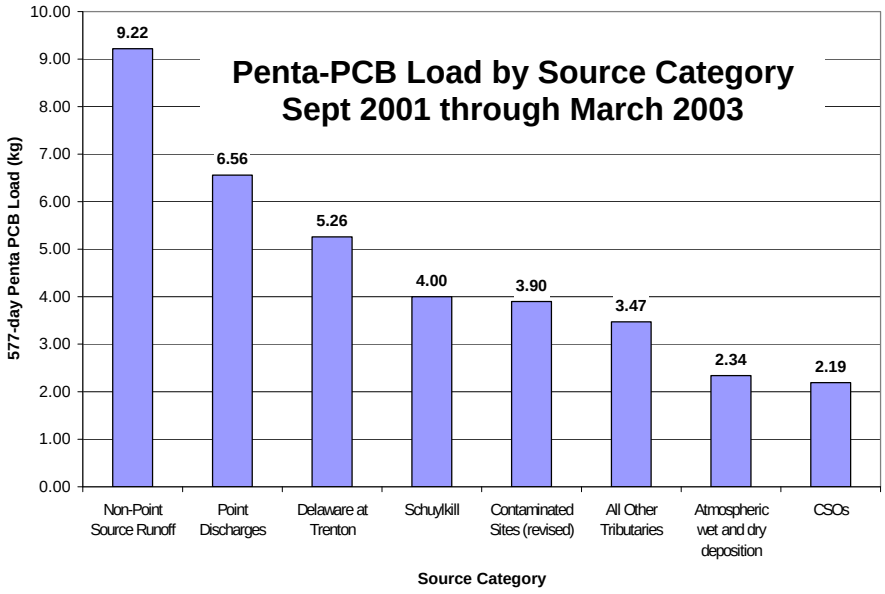
A staged approach is being used to establish the PCB TMDLs. DRBC staff developed and calibrated a water quality model for one particular type of PCB (known as "Penta-PCBs") that represents about one-quarter of the total PCBs present in the estuary. This, in turn, was extrapolated for total PCBs in order to develop the Stage 1 TMDLs. DRBC, EPA, and the

estuary states will continue to further refine the TMDLs through more detailed monitoring and modeling. The Stage 2 TMDLs using other types of PCBs are targeted for development by December 2009.

What are PCBs?

PCBs, which have been classified by EPA as a probable human carcinogen, are a class of chemicals present in the waters of the Delaware Estuary at concentrations up to 1,000 times higher than the water quality criteria. The U.S. banned the manufacture and general use (with a few exceptions) of PCBs in the late 1970s, but not before 1.5 billion pounds of the substance was produced. PCBs were used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they don't burn easily and are good insulators. Despite the ban, equipment containing PCBs is still in use due to the extended life span of the equipment. The chemical stability of PCBs, which led to their use in hundreds of industrial and commercial applications, also allows them to persist in the environment. PCBs enter fish and other wildlife through absorption or ingestion, and accumulate in their tissues at levels many times higher than in the surrounding water and at levels unsuitable for human consumption.

There are numerous sources of PCBs in the Delaware Estuary. They include contaminated sites, non-point sources, industrial and municipal point source discharges, the main stem Delaware River above Trenton, tributaries to the Delaware both above and below Trenton, the atmosphere, combined sewer overflows (CSOs), and the Atlantic Ocean.



DRBC's Role

In the spring of 2000, the three estuary states and EPA asked the DRBC to take the lead in developing the technical basis for the TMDLs, an extraordinarily complex task that has relied on scientific investigations, data collection efforts, and water quality modeling. DRBC staff worked closely with the commission's Toxics Advisory Committee (TAC), comprised of representatives from the states, the EPA, municipal and industrial dischargers, academia, agriculture, public health, environmental organizations, and fish and wildlife interests. Assisting commission staff and the TAC was an expert panel of scientists from EPA, Rutgers University, Tufts University, University of Maryland, Mississippi State University, and Interface Inc.

While the commission's TAC has formed the core of stakeholder involvement in the process, the DRBC established a new TMDL Implementation Advisory Committee (IAC) in 2003 that has been asked to develop creative and cost-effective strategies for reducing loadings of PCBs and achieving the TMDLs. Members include the three estuary states, municipal and industrial dischargers, and fishery, wildlife, and environmental organizations.

Innovative New PMP Rule Established in 2005 to Reduce PCB Levels

The DRBC unanimously adopted a rule in May 2005 to establish pollutant minimization plan (PMP) requirements for point and non-point discharges of PCBs in the Delaware Estuary. The commissioners also set a goal of reducing PCB loadings by 50% in five years.

"We believe this progressive action taken by the commissioners to require waste minimization and reduction plans will prove to be a significant pollution control milestone in the continuing efforts to reduce levels of PCBs in the tidal Delaware River and Bay," DRBC Executive Director Carol R. Collier said when the PMP rule was adopted. "While the ultimate goal is to meet water quality standards and eliminate fish consumption advisories, establishing a target reduction in PCB loadings of 50% in five years provides an important benchmark for judging the effectiveness of pollutant minimization plans over the short term," Collier added.

A non-numeric approach to implementing the Stage 1 TMDLs was taken, in part because it was understood that dischargers could not reduce their PCB loadings quickly enough to comply with numeric limits. The PMP rule embodies the *principle of adaptive management*, which encourages experimentation, measurement, and readjustment depending on the results of the actions taken. It reflects an awareness that while dramatic reductions in loadings from all source categories will be required to achieve the TMDLs over several decades, uncertainty as to the effectiveness of any particular reduction activity currently persists. The May 2005 rule provides the commission with the regulatory authority to require PMPs before permits are reissued by the states, thus ensuring that steps to improve the estuary's water quality begin sooner.

In June 2005, 42 of the 94 permittees listed in the Stage 1 TMDLs were required by the DRBC under the PMP rule to identify known and potential PCB sources emanating from their facilities, identify procedures for tracking down unknown sources of the pollutant, and identify and implement strategies for minimizing or preventing releases from all identified sources. A total of 41 PMPs were submitted and reviewed for completeness by commission staff. Dischargers must measure their progress in reducing PCB loadings in annual reports submitted to the DRBC beginning in March 2007. Monitoring data required of the remaining permittees have been received and will form the basis for additional PMP requirements for those permittees in 2007.

In light of the importance of contributions of PCB pollution from non-point sources, the rule allows the commission to require PMPs for contaminated sites where releases from the sites are not being addressed entirely through other state or federal regulatory programs.

"Commission staff began drafting this proposal in May 2004, and it has benefited from extensive public input," Collier said. "Representatives from industry, municipal wastewater treatment plants, environmental organizations, and regulatory agencies all have expressed support for this approach to reducing PCB contamination in the Delaware River and Bay."

The commissioners also established a peer review advisory committee to evaluate the PMPs, advise regulators on their anticipated effectiveness, and provide advice on additional measures that may be practicable.

In December 2005, New Jersey proposed its own PMP regulation modeled after the commission's rule.

Visit the DRBC web site at www.drbc.net for more information.