

Delaware River Basin Commission

Status Update:

Stage 2 PCB TMDLs for the Delaware Estuary

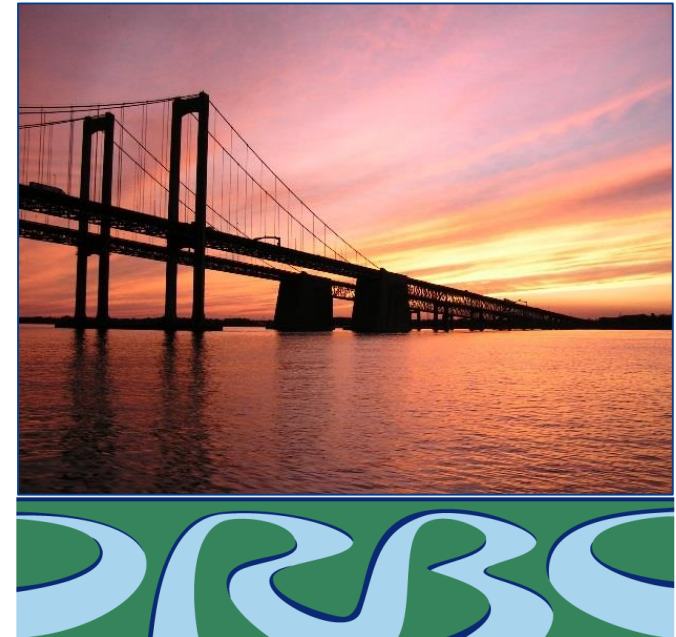
Namsoo S. Suk, Ph.D.

Toxics Advisory Committee Meeting

West Trenton, NJ

July 26, 2018

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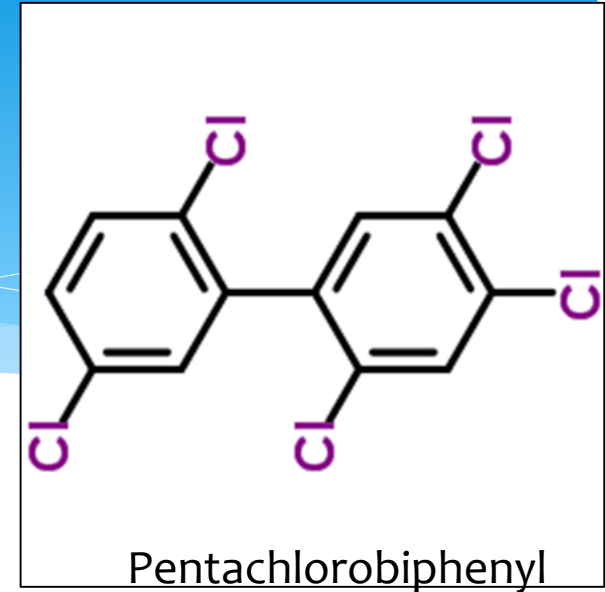
Delaware River Basin Commission

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UNITED STATES OF AMERICA

Outline

- Background
 - PCBs; TMDLs
 - Stage 1 PCB TMDLs
 - * Outcomes of Stage 1 PCB TMDLs
- Why do we need Stage 2?
- Current Status and Next Steps

PCB Chemistry



- ❑ Polychlorobiphenyls (PCBs):
 - 209 possible compounds based upon the number of chlorine atoms and locations.
- ❑ Terminology:
 - Congeners (name for individual compounds); Homologs (# of chlorine atoms); Aroclors (commercial mixtures)
- ❑ Properties: Hydrophobic, tend to accumulate in sediments and the tissues of aquatic life.
- ❑ Usage: widely used as dielectric and coolant fluids in electrical equipment such as transformers, capacitors; paints, printing inks, paper, pesticides, hydraulic fluids, lubricants, synthetic rubber, plasticizers, floor tile, brake linings, adhesives, carbon copy paper, fluorescent light ballasts, and asphalt, etc.
- ❑ Toxicology: classified as a probable human carcinogen; 12 congeners have dioxin-like effects; developmental effects, neurobehavioral effects, suppression of the immune system.

Total Maximum Daily Loads (TMDLs)

- ❑ TMDLs are total loads of a pollutant that can enter the water body and still meet the water quality criterion.
- ❑ TMDLs are allocated to
 - individual point sources, called Wasteload Allocations (WLAs),
 - categorical non-point sources, called Load Allocations (LAs),
 - Margin of Safety (MOS)

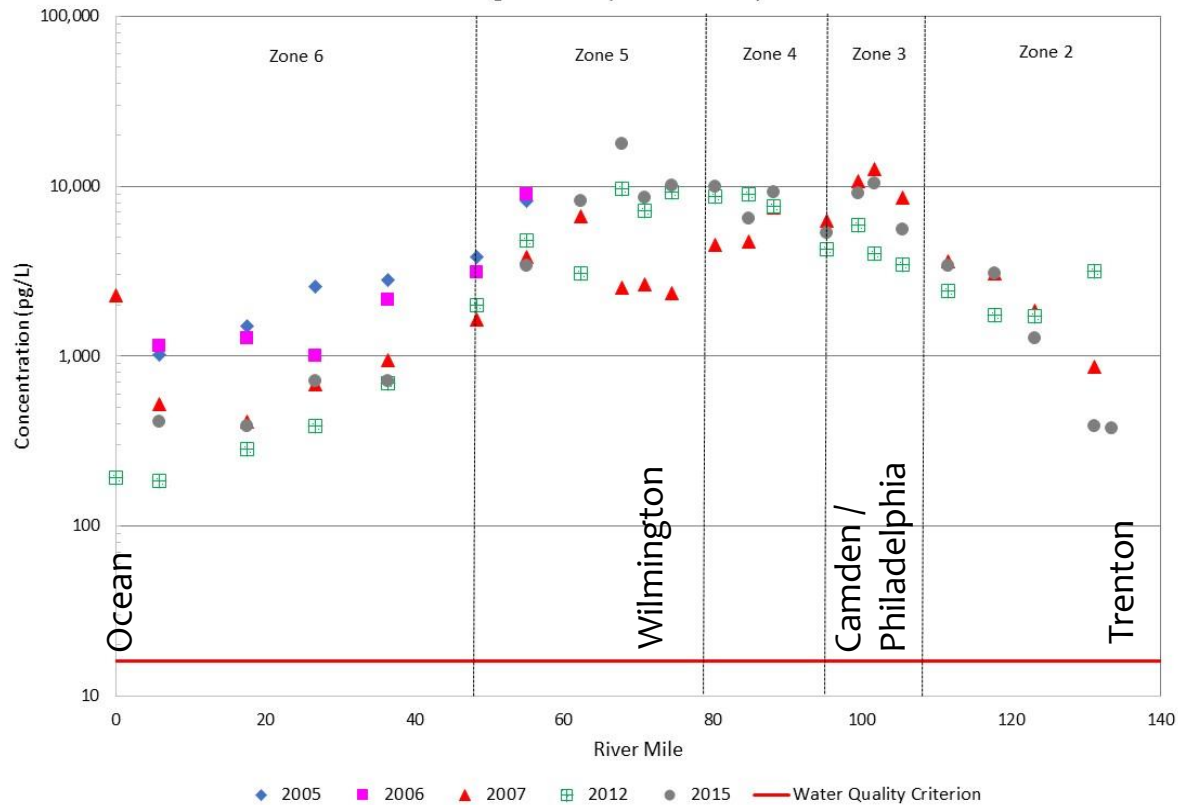
$$TMDLs = \Sigma WLAs + \Sigma LAs + MOS$$

Why PCB TMDLs needed for the Delaware Estuary?

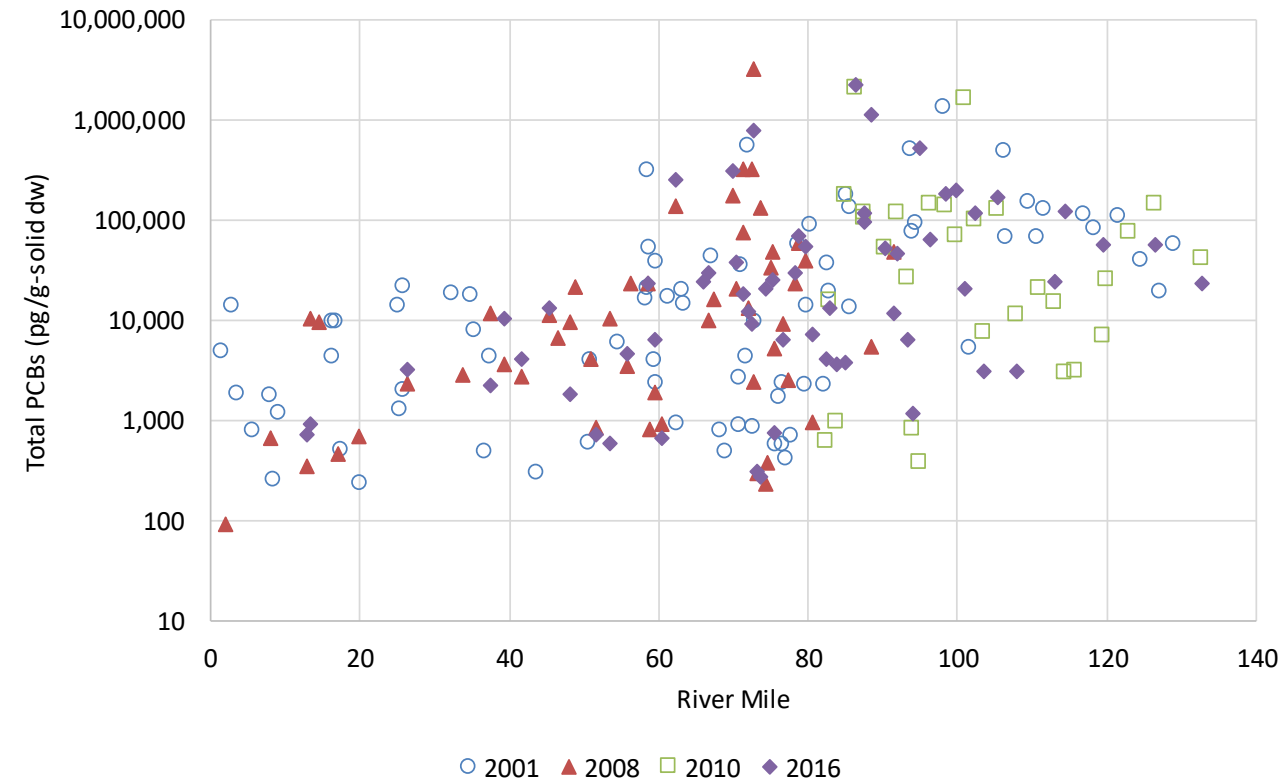
- ❑ Production of PCBs banned in 1970s but
 - Active sources – aging transformers, electrical equipment, hydraulic equipment, paint, caulk
 - Inadvertent production of PCBs
- ❑ Fish consumption advisories for the entire Estuary and Bay issued by all three states.
- ❑ Listed as “impaired” by all three states in 1990’s.
- ❑ PCB levels in ambient water are 100s to 1000s times greater than the WQ criterion.

Total PCBs in Delaware River Estuary

PCB Ambient Water Concentrations of Total PCBs
Stage 2 data (2005 - 2015)



Total PCBs Concentrations in Surficial Sediment in Delaware Estuary



Stage 1 PCB TMDLs

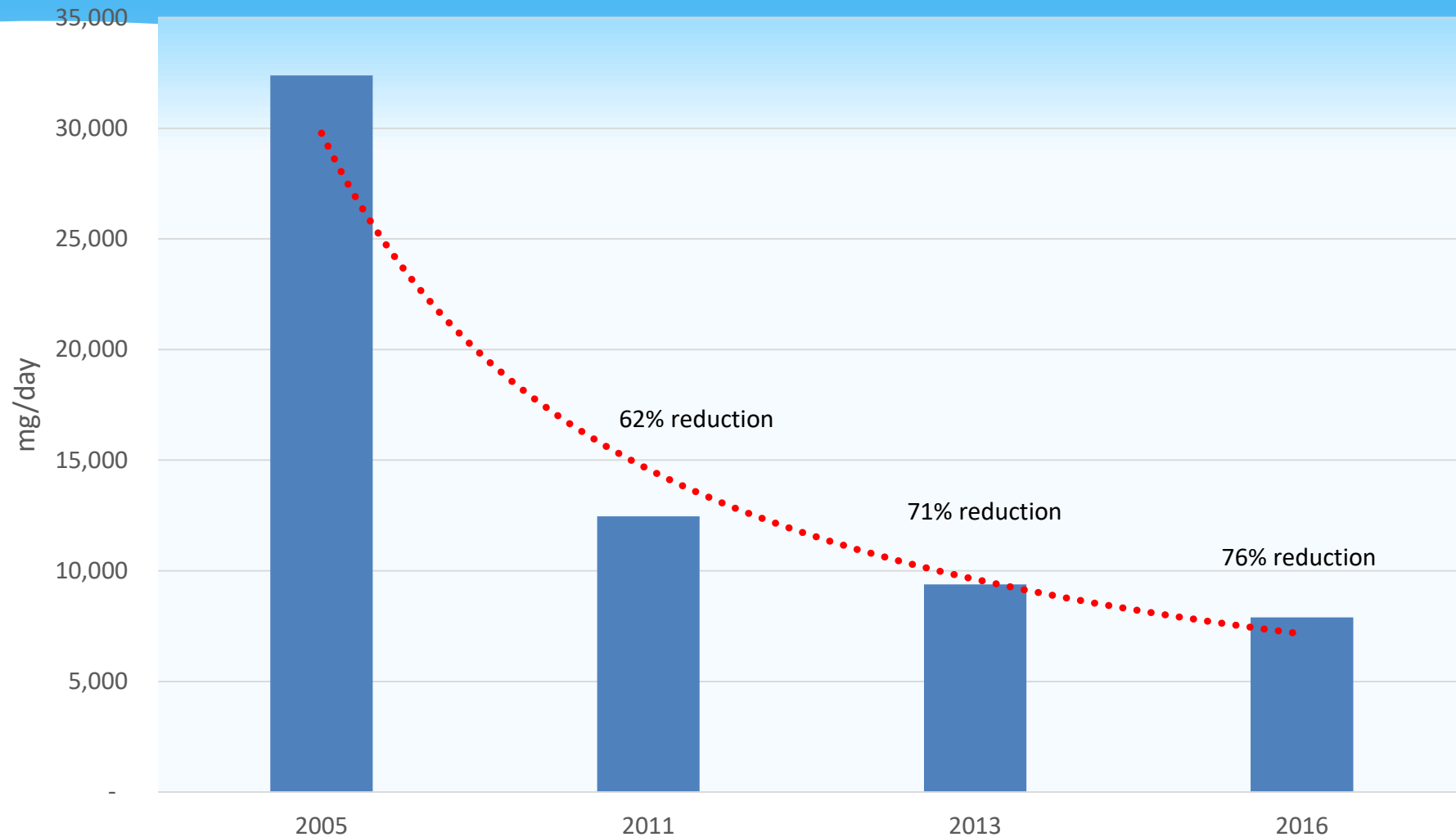
- ❑ The estuary consists of 5 water quality management units called Zones.
- ❑ DRBC staff prepared documentation for TMDLs.
- ❑ EPA Regions II & III establish Stage 1 PCB TMDLs for Zones 2 – 5 in December 2003.
 - Each Zone is assigned a TMDL.
- ❑ EPA Regions II & III establish Stage 1 PCB TMDL for Zone 6 (Delaware Bay) in December 2006.



Implementation of Stage 1 PCB TMDLs

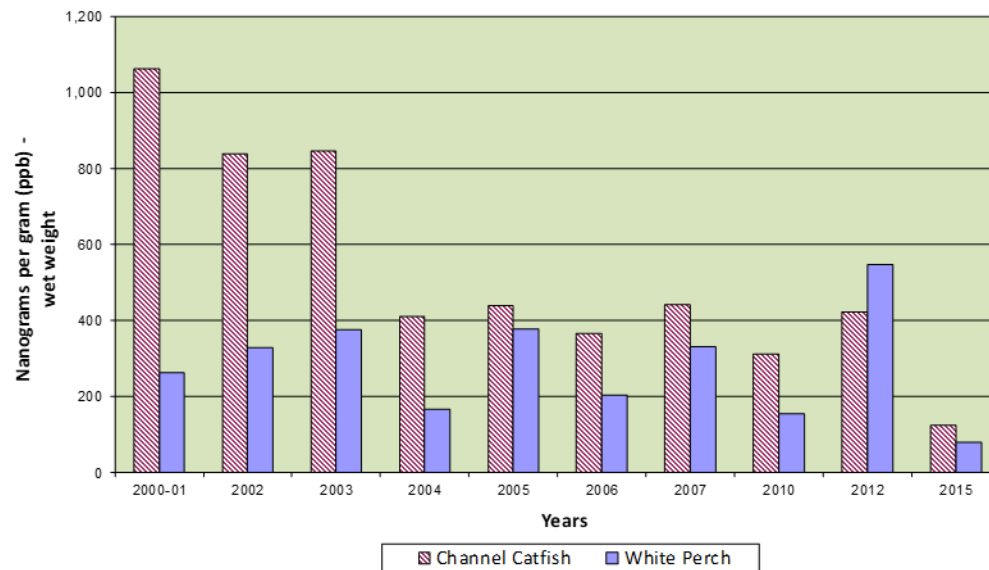
- ❑ Implementation Requirements: focused on point sources since NPDES permits must be “consistent” with the TMDLs.
 1. Monitoring using a sensitive analytical method for all 209 congeners.
 2. Requirement to develop and implement a Pollutant Minimization Plan (PMP) to identify and reduce sources of PCBs.
- ❑ A 64% reduction in PCB loadings was achieved from traditional continuous point source discharges during the period 2005 – 2013.

PCB Loadings Top Ten Dischargers from 2005 mg/day

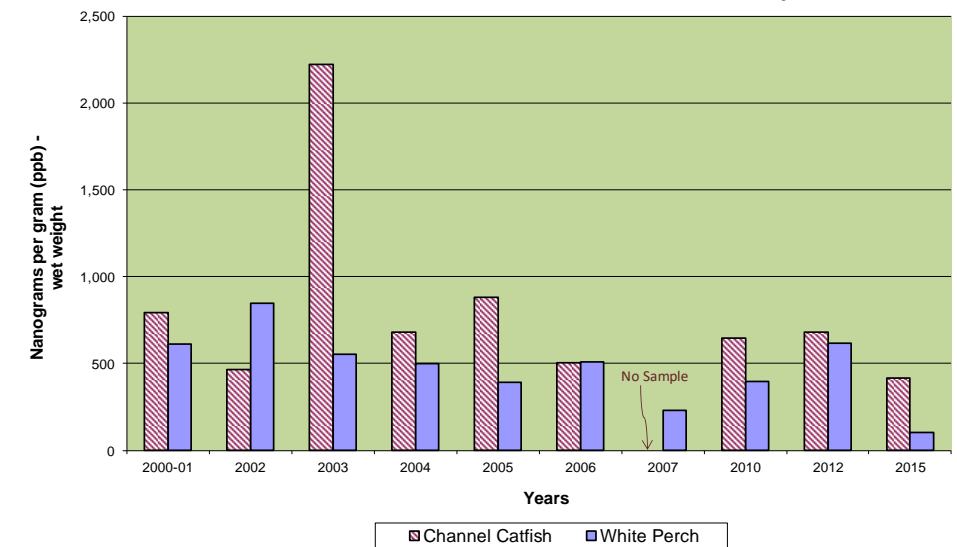


PCBs in Fish Tissue Delaware River Estuary 2000 to 2015

Historical Trend in PCBs in Fish Tissue
Crosswicks Creek - Delaware Estuary



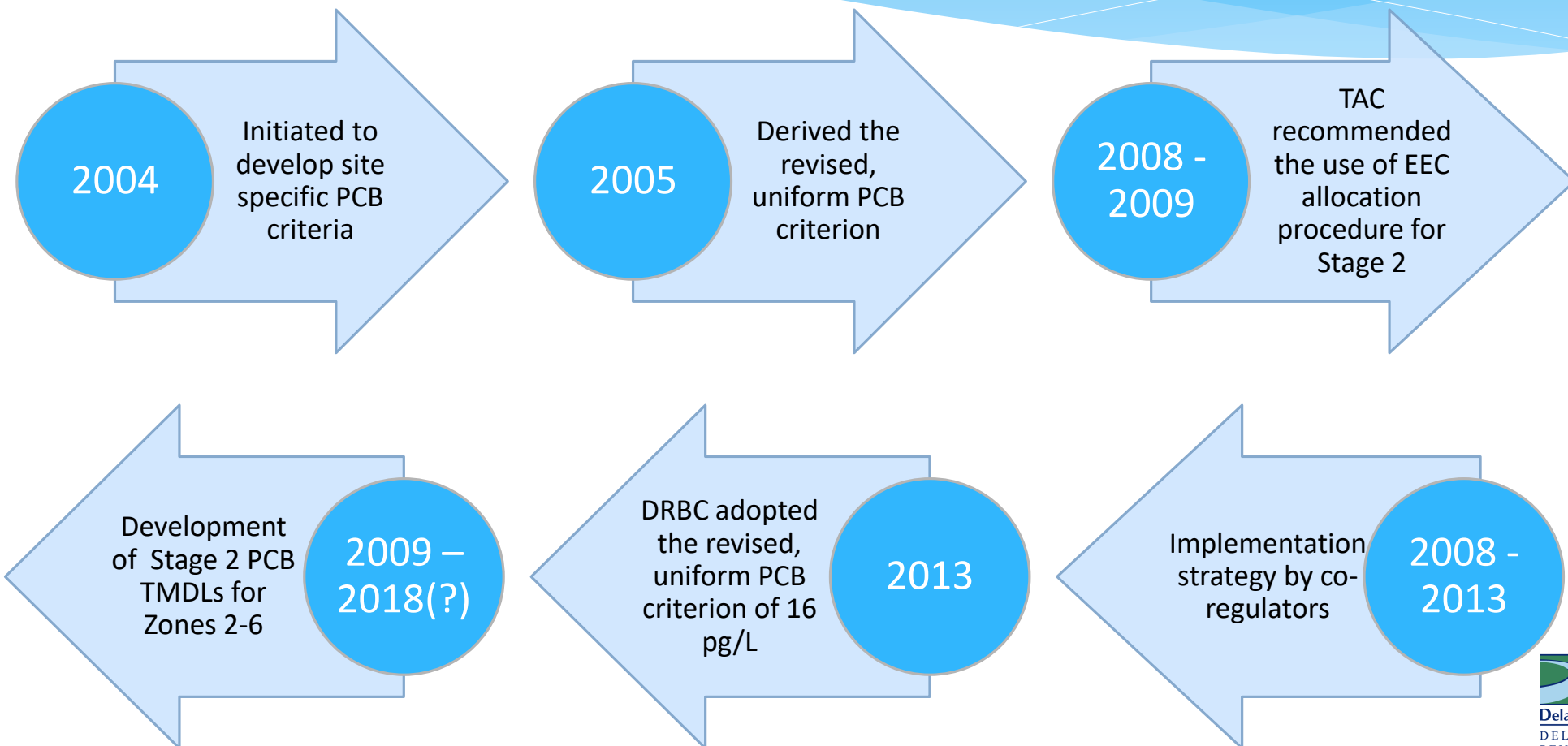
Historical Trend in PCBs in Fish Tissue
Salem River / C&D Canal - Delaware Estuary



Need for Stage 2 PCB TMDLs

- ☐ Update the TMDLs to the revised WQ criterion of 16 pg/L,
- ☐ Utilize a new, more equitable allocation procedure agreed upon by stakeholders (Equal Effluent Concentration),
- ☐ Include a revised implementation strategy for point and non-point sources as an Appendix to the Stage 2 TMDL report, and
- ☐ Provide certainty to this long-term process.

Timelines of Stage 2 PCB TMDLs for the Delaware River Estuary and Bay



Comparison of Stage 1 vs Stage 2 TMDLs

Stage 1

1. Old stepwise water quality criteria
2. TMDL Procedure – driven by criteria transition in Zone 5
3. Allocation Procedure – Equal Percent Removal: equity and efficiency issues
4. Implementation Strategy:
 - a) Monitoring for PCB congeners using Method 1668A
 - b) Development and implementation of PMP

Stage 2

1. New water quality criterion: 16 pg/l
2. TMDL Procedure:
load = flow x WQC
3. More equitable allocation procedure – Equal Effluent Concentration (EEC)
4. Revised Implementation Strategy –
 - Developed by Co-Regulators, builds upon monitoring and PMP implementation
 - Action Level requirements to maintain loading reductions achieved

Current Status

- ❑ DRBC staff delivered draft Stage 2 TMDLs Report to EPA - March 2016
- ❑ Draft report sent to states for review and comment – June 2017
- ❑ DRBC staff responds to State comments through conference calls, meetings and written responses: July 2017 through on-going
- ❑ Currently, a meeting is scheduled with all three states and EPA to discuss on the implementation approach

Next Steps

- ❑ Land on the revised implementation approach
- ❑ Finalize the draft Stage 2 report and distribute to states and EPA for 2nd review and comments
- ❑ Finalize the draft report and solicit public comments
- ❑ Hold public meetings and prepare the responses to comments document
- ❑ Establish Stage 2 PCB TMDLs for the Delaware River Estuary and Bay by EPA Regions 2 and 3.