

PCBs in the New River Watershed

New River Symposium
19 May 2015



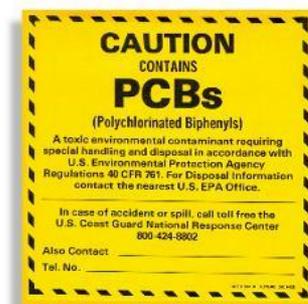
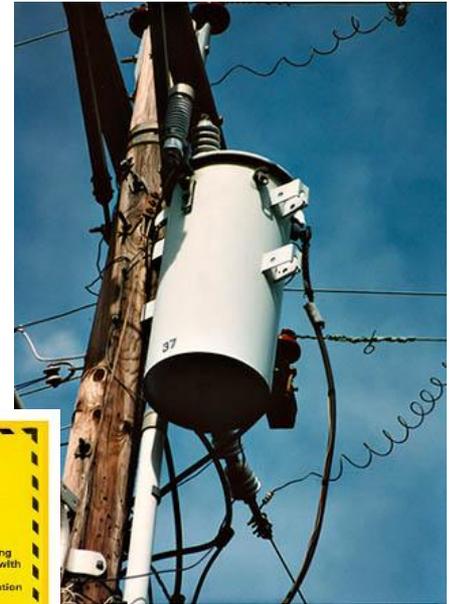
Meeting Overview - PCBs

- **Background**
 - **Why important?**
- **Legacy Pollutant**
- **Regulatory Framework**
- **PCBs in the New River watershed**
 - **Data analyses to date**
 - **Next Steps**



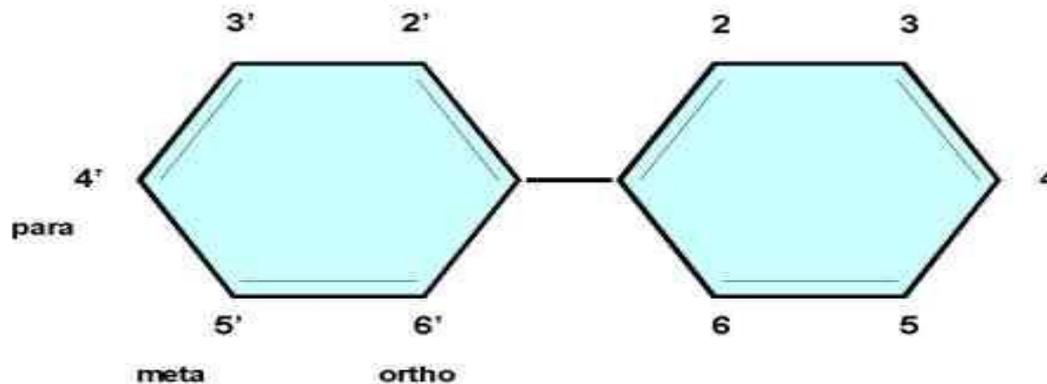
PCBs

- Estimated that > 1.5 Billion lbs. manufactured in the U.S. until 1977 - “Legacy Contaminant”
- Very stable and heat resistant
 - Persistent in environment
- Common uses:
 - Transformers, capacitors, hydraulic fluids, circuit breakers, PVC Products, carbonless copy paper, caulking material, paints, etc.



PCBs - What are They?

- Biphenyl molecule (1-10 chlorine atoms)
- 209 distinct PCB Compounds
- Regulated by DEQ as Total PCB (tPCB) = 209 compounds summed
- Referred to as PCB Aroclors (Monsanto tradename) = mixture of PCB compounds



Structure of Polychlorinated Biphenyl (PCB) Molecule

PCBs - Why Are They Important?

- Bioaccumulate at low concentrations (lipids)
- “Probable” human carcinogen
- Other toxicological effects (humans)
 - Immunotoxicity, reproduction and developmental, hepatotoxicity (liver), neurotoxicity, and chloracne
- Major Sources of Exposure (humans)
 - **Consumption of contaminated fish**
 - Inhalation (dust from contaminated sites)

WQC = 0.00064 ug/L

PCBs - A Legacy Pollutant?

- Banned in late 70's
- Accumulate and persist in river sediments from historic releases
 - “Hot Spots”
- Generally not detected in VPDES Program (unless in a PCB impaired watershed)



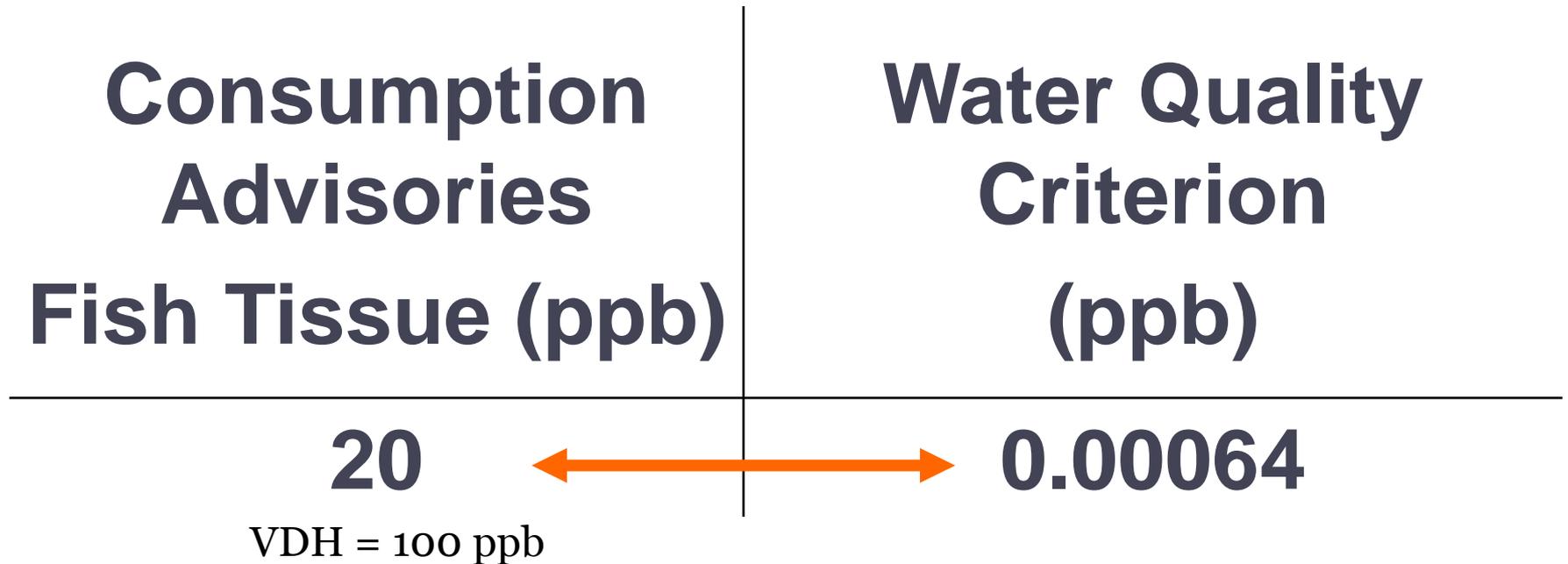
PCBs - Current Releases?

- PCBs used many years after banned
- Contaminated sites with active transport (non-point - e.g., CERCLA, RCRA, VRP, unknown)
- Point Sources
- Dielectric oils considered non PCB < 50 ppm
 - Fish advisories at 0.05 ppm
- Inadvertent production
 - Carbon + heat + chlorine
 - Up to 50 ppm allowed (TSCA)
- Atmosphere

NO PCBs



VA Regulatory Criteria: Total PCBs



Water Quality Criteria represents concentration in the water column where the bioaccumulation of tPCBs in fish is minimized to be protective of fish consumption (by humans)

0.00064 ppb = 640 picograms/L = 1 drop in 31 Olympic sized swimming pools!

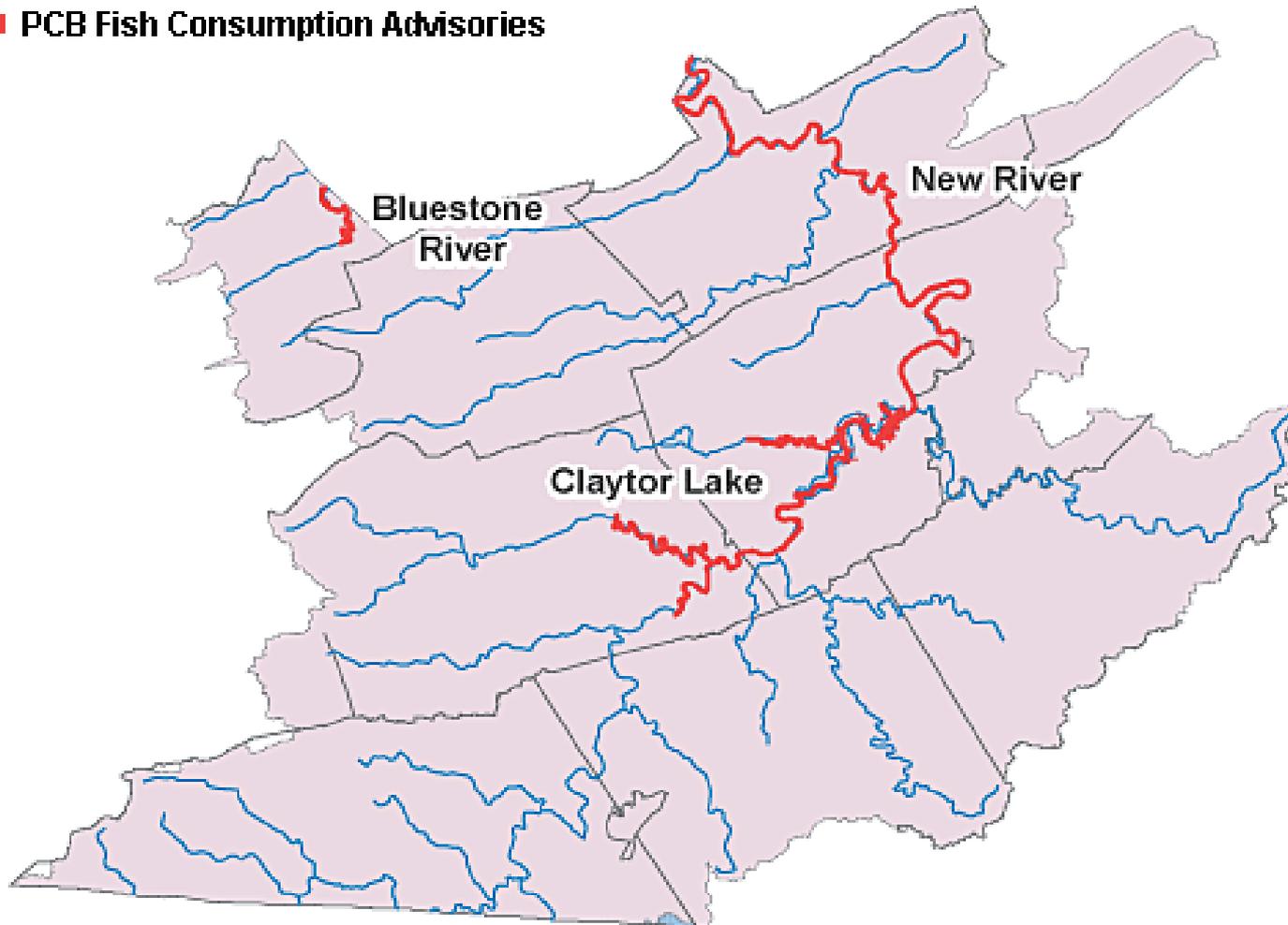
VDH Fish Consumption Advisories

Waterbody and Affected Boundaries	Affected Localities	Contaminant	Species	Advisories/Restriction
New River from below Claytor Lake Dam downstream ~ 68 miles to the VA/WV state line near the town of Glen Lyn in Giles County, VA (8/6/01; modified 12/13/04)	Giles Co., Montgomery Co., Pulaski Co. and Radford City	PCBs	Carp Flathead Catfish Channel Catfish	DO NOT EAT No more than two meals/month
New River/Claytor Lake from the Rt. 77 bridge near Jackson Ferry downstream to Claytor Lake Dam including its tributaries Peak Creek up to the confluence with North Fork Peak Creek (Tract Fork) in Pulaski and Reed Creek up to the confluence with Miller near Rt. 121 bridge near Max Meadows. These river segments comprise ~68 miles. (12/13/04)	Pulaski Co. and Wythe Co.	PCBs	Carp Smallmouth Bass	No more than two meals/month
Bluestone River from the Rt. 460 bridge just south of Bluefield, VA downstream ~ 9 miles to VA/WV state line near the town of Yards in Tazewell County, VA (8/6/01; modified 12/13/04)	Tazewell Co.	PCBs	Carp White Sucker Rock Bass Largemouth Bass	DO NOT EAT No more than two meals/month

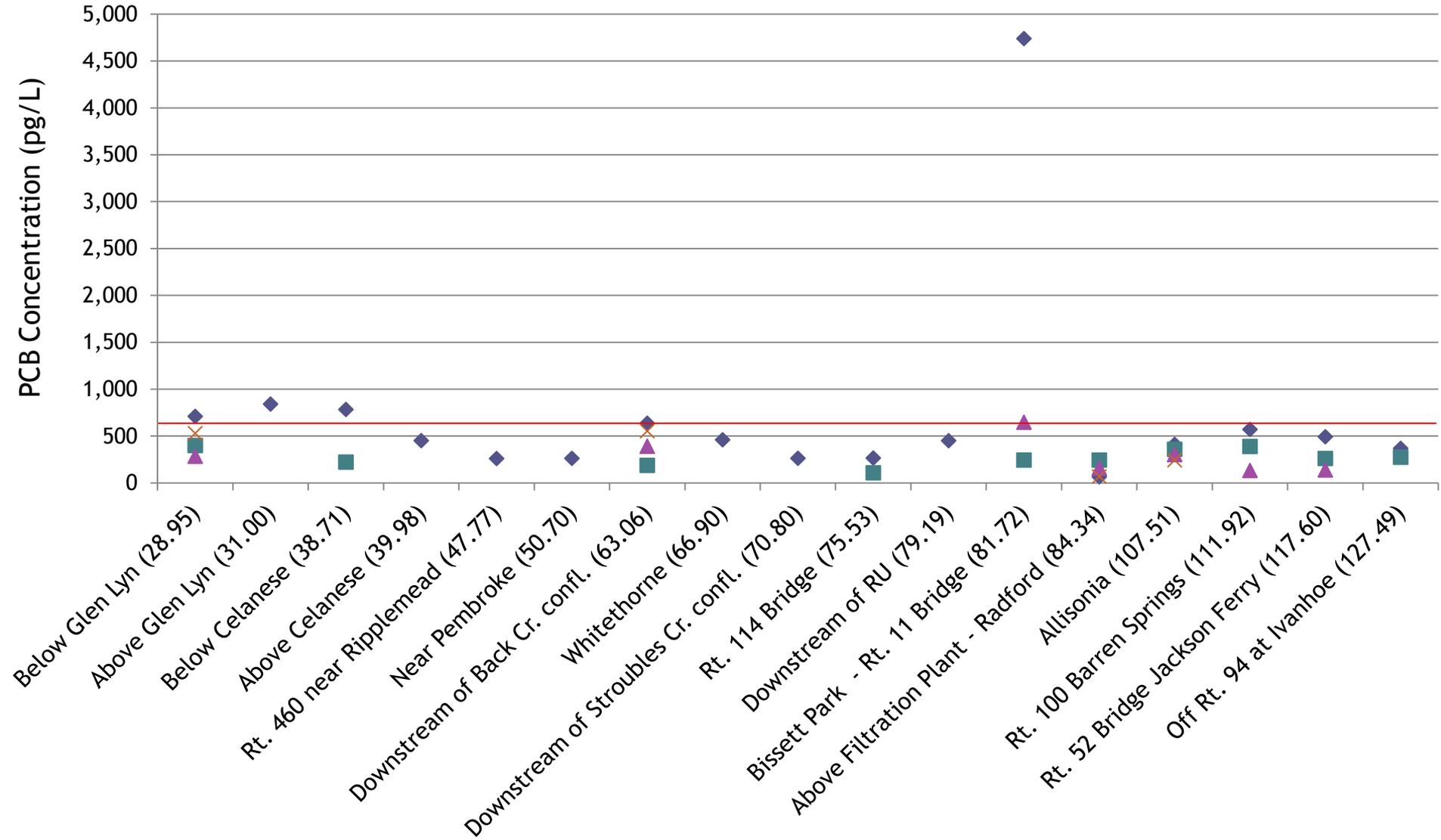
<http://www.vdh.state.va.us/epidemiology/DEE/PublicHealthToxicology/Advisories/NewRiver.htm>

VDH Fish Consumption Advisories

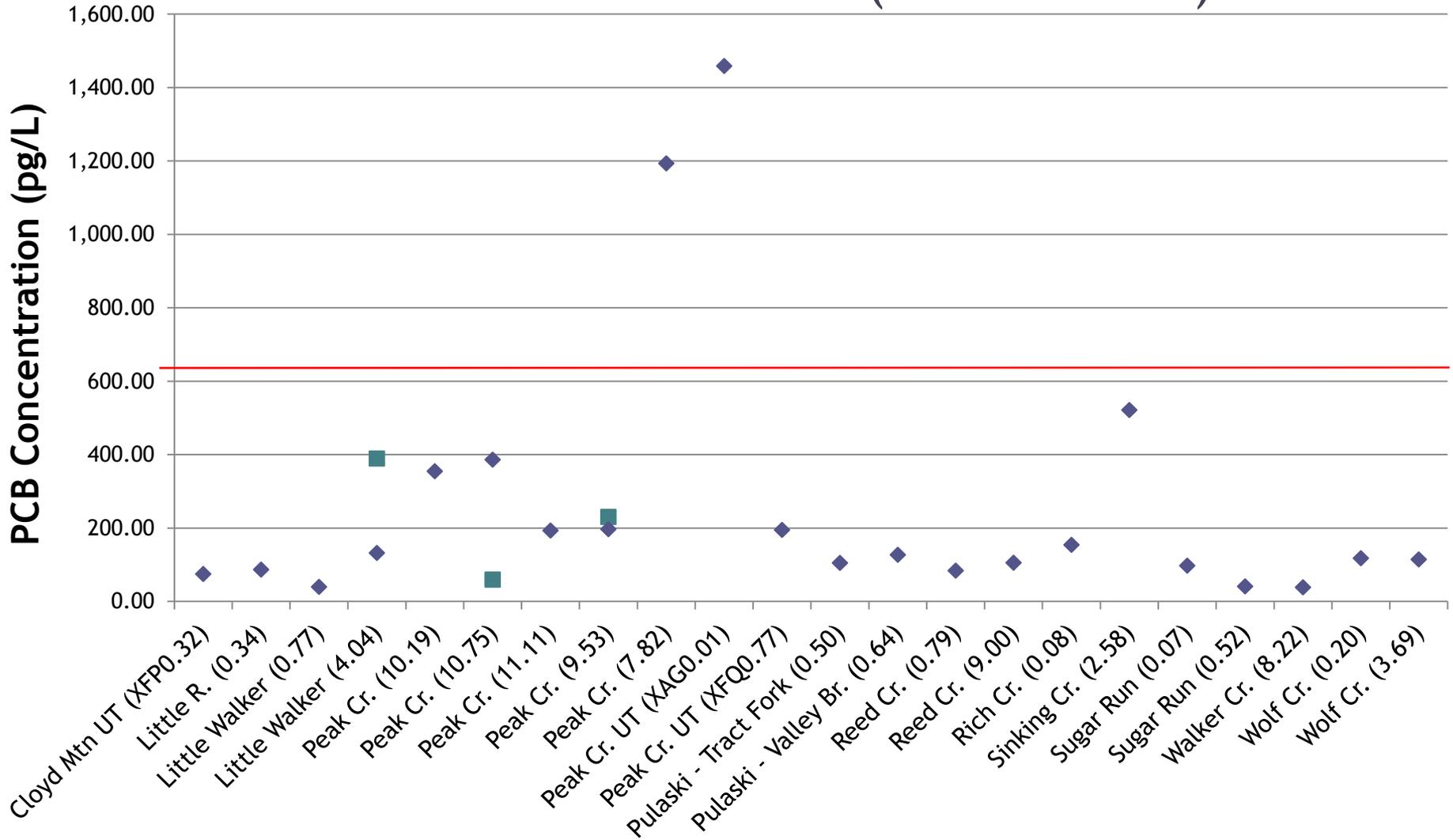
■ PCB Fish Consumption Advisories



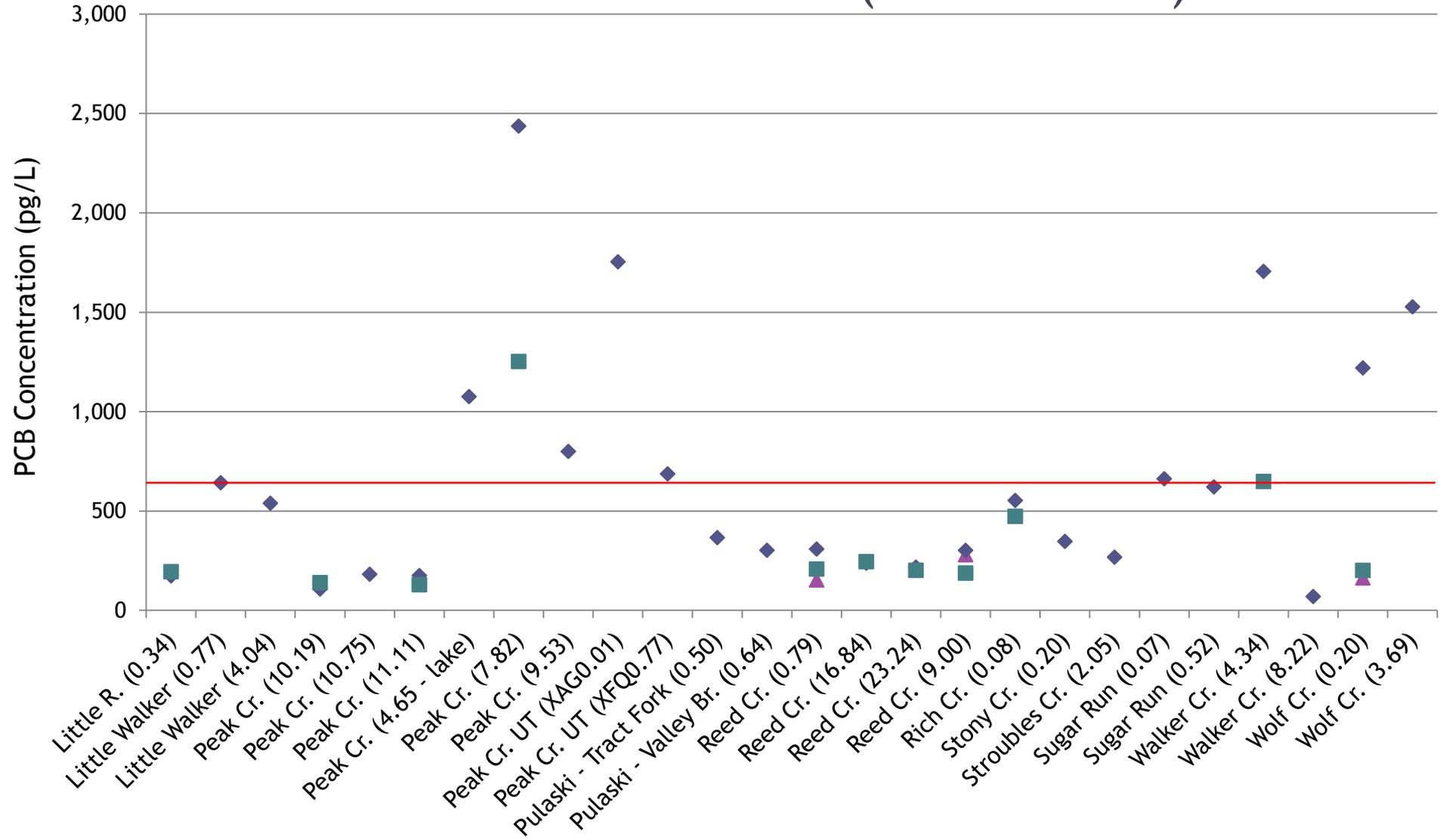
PCB Concentrations at High Flow New River Main Stem (2010 - 2014)



PCB Concentrations at Base Flow New River Tributaries (2012 - 2014)



PCB Concentrations at High Flow New River Tributaries (2010 - 2014)



Data Analyses (in progress)

- Hot spots
 - Peak Creek and tributaries – high flow, base flow and sediment
 - Elevated PCB concentrations at base flow may indicate an active source
 - Wolf and Walker Creeks – high flow
 - Still working on evaluating point source (VPDES) permitted facility data
 - Base flow

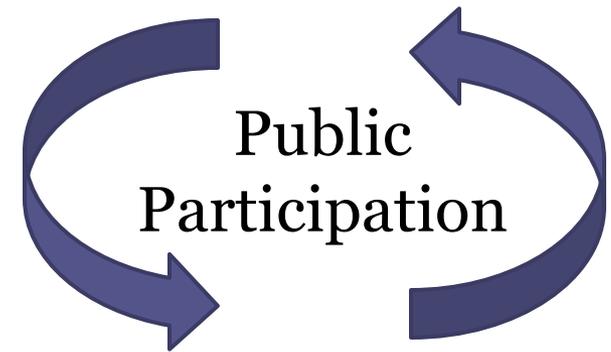
Next Steps (continued)

- Continue data analysis (sediment, fish tissue) including congener analysis
- Conduct follow-up PCB sampling
 - Locations TBD
- Review VPDES permitted facility PCB data



Next Steps (continued)

- Total Maximum Daily Load Study for PCBs in the New River!
 - PCB load modeling (VT BSE)
 - Define a “pollution budget”
 - Public Informational Session coming soon!



Questions?

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