Water Quality Standards and PCBs

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Inadvertently Produced PCBs Workshop: Partnerships for Innovative Solutions
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This presentation will discuss:

Washington's Surface Water Quality Standards (WQS)

PCBs in the Spokane River

PCB sources


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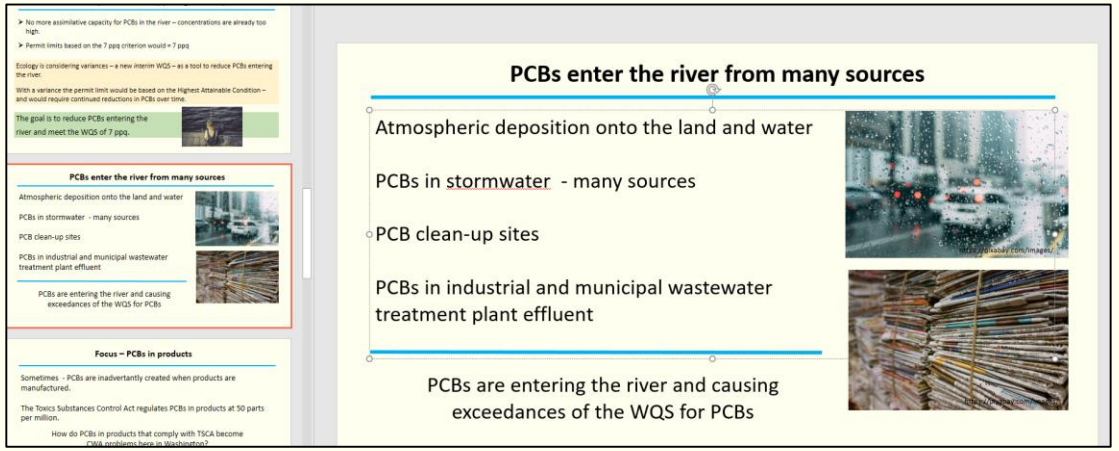

What are Water Quality Standards?

Water quality standards (WQS) are state, tribal, and federal regulations.

Purpose: WQS are to protect public health and welfare, enhance the quality of the water, and serve the purposes of the Clean Water Act.

(See 40 CFR 131.2)

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For example, WQS protect fishable and swimmable uses

WQS are composed of three main parts

- **Designated uses** – include aquatic life, domestic water supply, recreation, harvest, etc..
- **Water Quality Criteria** – levels of water quality that fully protect the uses

  Numeric and Narrative criteria
- **Antidegradation Requirements** – ensures that uses are maintained and protected, and that waters are not degraded unless necessary and in the over-riding public interest (WAC 173-201A-300).

Also: Other policies affecting application and implementation (e.g., mixing zones and downstream protection requirements)

WQS and permit limits

WQS are the foundation of state and tribal water quality-based pollution control programs under the Clean Water Act.

National Pollutant Discharge Elimination System (NPDES) permit effluent limits are placed in permits when there is a reasonable potential to exceed the WQS.

Freshwater PCB criteria

- WQ criteria for toxic pollutants are, in most cases, very low concentrations
- Usually expressed in the parts per billion range, aka "ppb."

Washington's Freshwater Criteria for PCBs		
Criterion type	**Parts per billion (ppb)**	**Basis**
Human health criteria (HHC)	**0.000007** (= 7 parts per quadrillion)	**Fish ingestion by people** drives the calculation
Aquatic life criteria	**2.0** **0.014**	**Fish health** drives the calculation

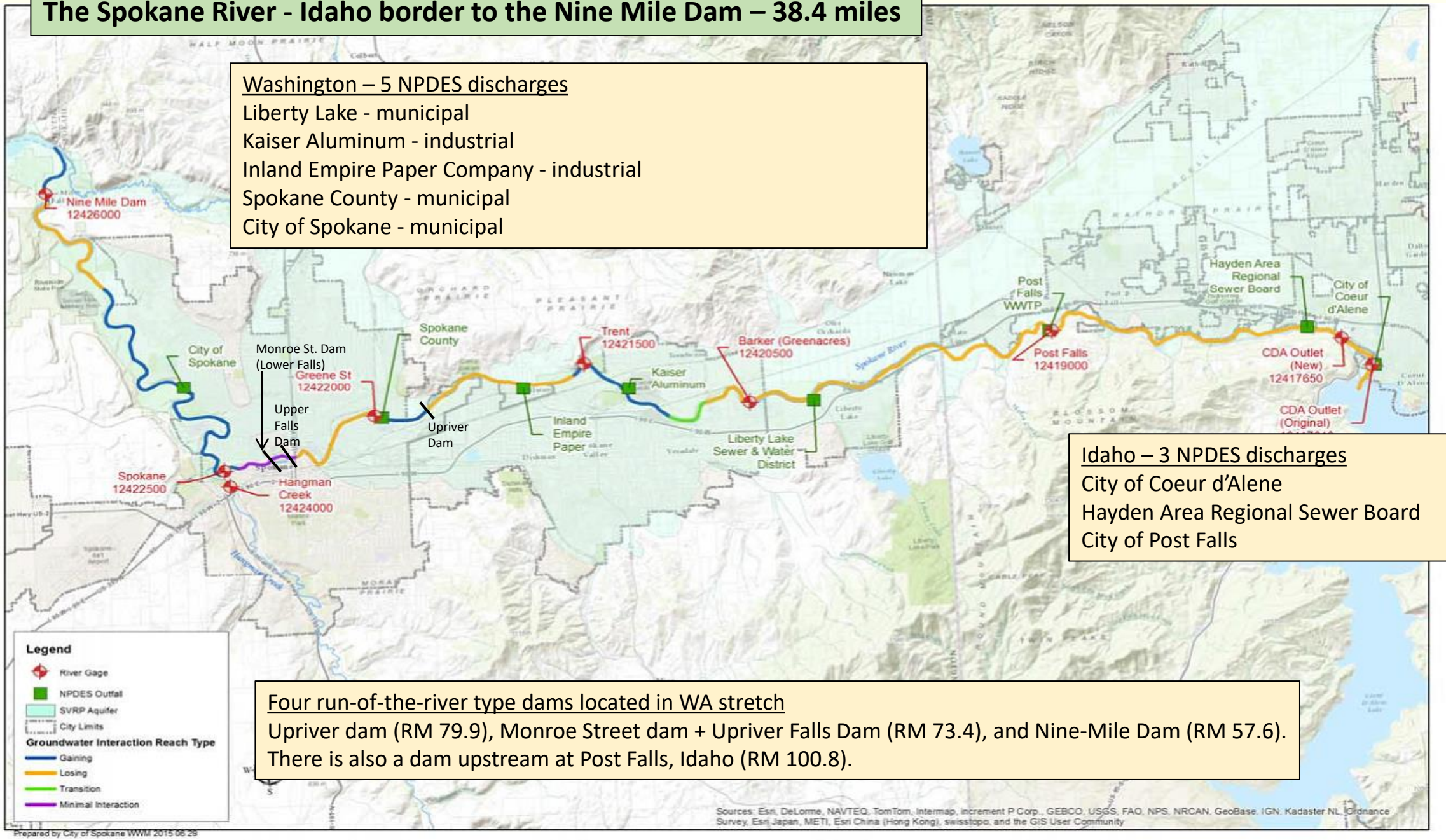
- Downstream Spokane Tribe HHC for PCBs is **1.3 ppq**.

How small is small?

One part per billion (ppb): One sheet in a roll of toilet paper stretching from New York to London

One pert per quadrillion (ppq): One postage stamp on a letter the size of California and Oregon

The Spokane River - Idaho border to the Nine Mile Dam – 38.4 miles



<u>Washington – 5 NPDES discharges</u>
Liberty Lake - municipal
Kaiser Aluminum - industrial
Inland Empire Paper Company - industrial
Spokane County - municipal
City of Spokane - municipal

<u>Idaho – 3 NPDES discharges</u>
City of Coeur d'Alene
Hayden Area Regional Sewer Board
City of Post Falls

<u>Four run-of-the-river type dams located in WA stretch</u>
Upriver dam (RM 79.9), Monroe Street dam + Upriver Falls Dam (RM 73.4), and Nine-Mile Dam (RM 57.6).
There is also a dam upstream at Post Falls, Idaho (RM 100.8).

PCB criterion = 7 ppq

What we see in the river

- Elevated PCB concentrations in water
- Elevated PCB concentrations in fish tissue - high enough to prompt fish advisories

The Spokane River is CWA 303(d) listed as impaired by PCBs.

What does the Spokane River 303(d) listing mean for permits?

- No more assimilative capacity for PCBs in the river – concentrations are already too high.
- Permit limits based on the 7 ppq criterion would be 7 ppq.

Ecology is considering variances – a new *interim* WQS – as a tool to reduce PCBs entering the river.

With a variance the permit limit would be based on the Highest Attainable Condition – and would require continued reductions in PCBs over time.

The goal is to reduce PCBs entering the river and meet the WQS of 7 ppq.

PCBs enter the river from many sources

Atmospheric deposition onto the land and water

PCBs in stormwater - many sources

PCB clean-up sites

PCBs in industrial and municipal wastewater treatment plant effluent

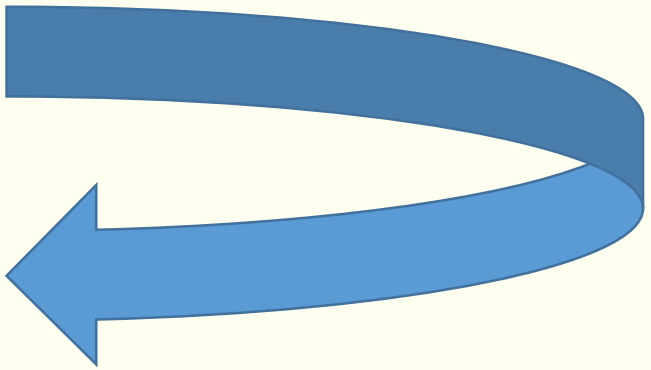
PCBs are entering the river and causing exceedances of the WQS for PCBs.

Focus – PCBs in products

Sometimes PCBs are inadvertently created when products are manufactured.

The Toxics Substances Control Act regulates PCBs in products at 50 parts per million.

How do PCBs in products that comply with TSCA become CWA problems here in Washington?



…let's circle back to the PCB water quality standards.

Regulatory/guidance levels for total PCBs	Total PCBs (ppq)	Total PCBs (ppb)	Total PCBs (ppm)
Human health water quality criterion (40 CFR 131.45)	★ **7**	0.000007	0. 00000007
Aquatic life-based water quality criteria (WAC 173-201A)	2,000,000 14,000	★ **2.0** **0.014**	0.002 0.000014

The PCB criteria are set at very low concentrations

Regulatory/guidance levels for total PCBs	Total PCBs (ppq)	Total PCBs (ppb)	Total PCBs (ppm)
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Aquatic life-based water quality criteria (WAC 173-201A)	2,000,000 14,000	★ **2.0** **0.014**	0.002 0.000014
TSCA regulatory level for PCBs in products	**50,000,000,000**	50,000	★ **50**

★ We usually refer to the PCB criteria and the TSCA level in different units of concentration.

Product testing is usually reported in ppb's

Regulatory/guidance levels for total PCBs	Total PCBs (ppq)	Total PCBs (ppb)	Total PCBs (ppm)	Reference
Human health water quality criterion (40 CFR 131.45)	★ **7**	0.000007	0. 00000007	40 CFR 131.45
TSCA regulatory level for PCBs in products	**50,000,000,000**	50,000	★ **50**	40 CFR 761.3
Product	**Total PCBs (ppq)**	**Total PCBs (ppb)**	**Total PCBs (ppm)**	Reference
5 motor oils and lubricants	623,000. – 2,375,000.	0.623 – 2.375	0.000623 – 0.002375	City of Spokane, 2015
3 road de-icers	38,000. – 1,952,000.	0.038 – 1.952	0.000038 – 0.001952	
Regular unleaded gasoline	935,000	0.935	0.000935	
PVC pipe and 2 pipe repair materials	1,110,000. – 17,780,000.	1.110 – 17.78	0.001110 – 0.01778	
One hydroseed mix	2,509,000,000.	2,509	2.509	

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Regulatory/guidance levels for total PCBs	Total PCBs (ppq)	Total PCBs (ppb)	Total PCBs (ppm)	Reference
Human health water quality criterion (40 CFR 131.45)	★ **7**	0.000007	0. 00000007	40 CFR 131.45
TSCA regulatory level for PCBs in products	**50,000,000,000**	50,000	★ **50**	40 CFR 761.3
Product	**Total PCBs (ppq)**	**Total PCBs (ppb)**	**Total PCBs (ppm)**	Reference
One laundry detergent	174,000	0.174	0.000174	City of Spokane, 2015
One dish soap	83,000	0.083	0.000083	
Three toothpaste products	100,000-110,000	0.10-0.11	0.00010-0.00011	Ecology 2016 (note: still undergoing data validation)
Five clothing samples	1,300,000 – 16,600,000	1.3 – 16.6	0.0013 – 0.0166	
11 cosmetic/body care products	100,000 – 7,800,000	0.1 – 7.8	0.0001 – 0.0078	
12 printed materials/newsprint	2,400,000 – 53,500,000	2.4 – 53.5	0.0024 – 0.0535	

Products matter

Manufacturers are meeting the TSCA requirement, but we need even lower levels of PCBs in products to help meet WQS.

Consumers need choices that reduce PCBs entering the environment.

We all share the responsibility to reduce PCBs.

The goal is to reduce PCBs entering the river and meet the WQS of 7 ppq.

Questions/comments?

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