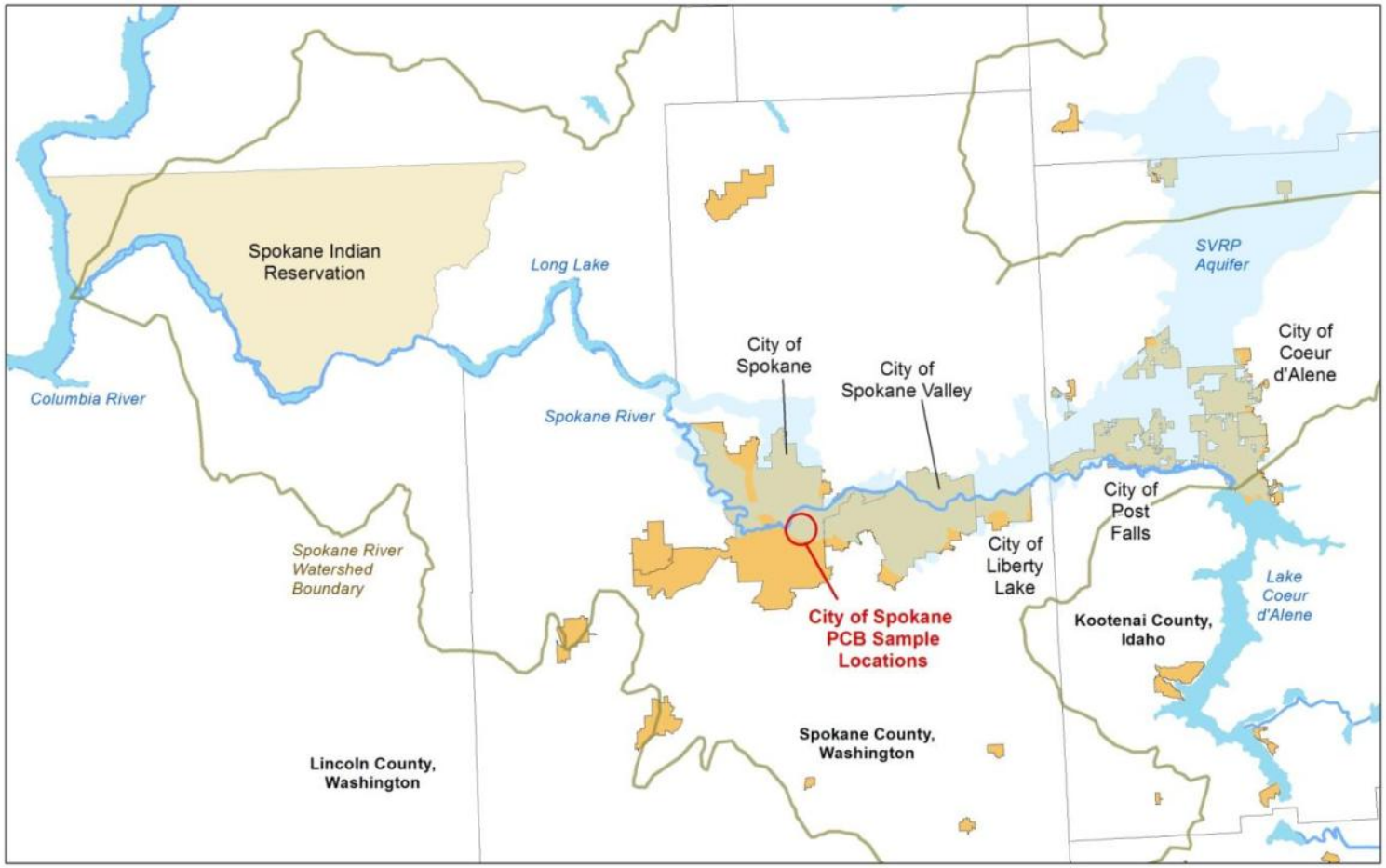
AN ADAPTIVE MANAGEMENT PLAN FOR PCBs IN STORMWATER AND SEDIMENTS

2013 ANNUAL REPORT

City of Spokane Wastewater Management
Raylene Gennett, Stormwater District Supervisor

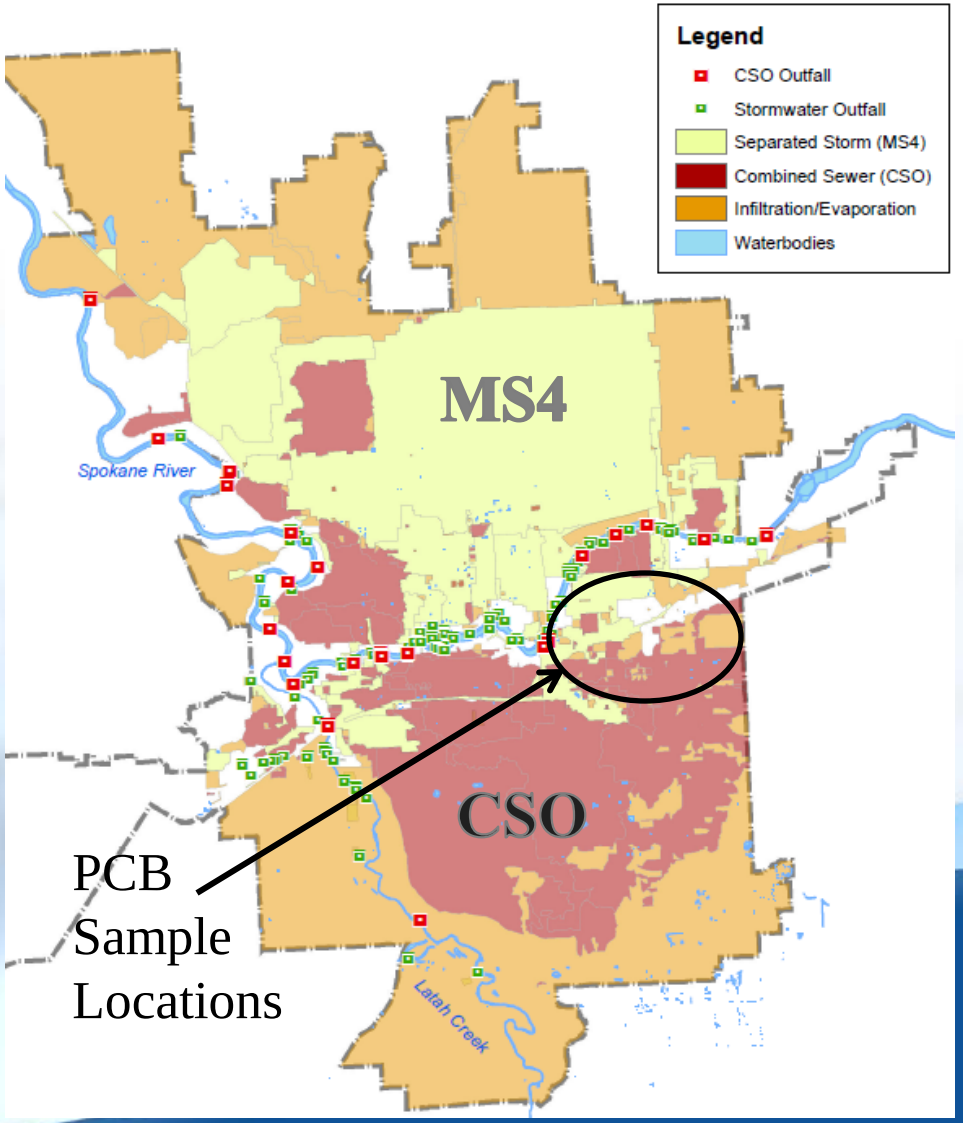
Study Area


Spokane Indian Reservation
Long Lake
SVRP Aquifer
City of Spokane
City of Spokane Valley
City of Coeur d'Alene
Columbia River
Spokane River
City of Post Falls
Spokane River Watershed Boundary
City of Liberty Lake
Lake Coeur d'Alene
City of Spokane PCB Sample Locations
Kootenai County, Idaho
Spokane County, Washington
Lincoln County, Washington

Stormwater Management in Spokane

Pathway for PCBs to enter the Spokane River

- MS4: Municipal Separate Storm Sewer System
- CSO: Combined Sewer Overflow (less frequent)



Adaptive Management Plan

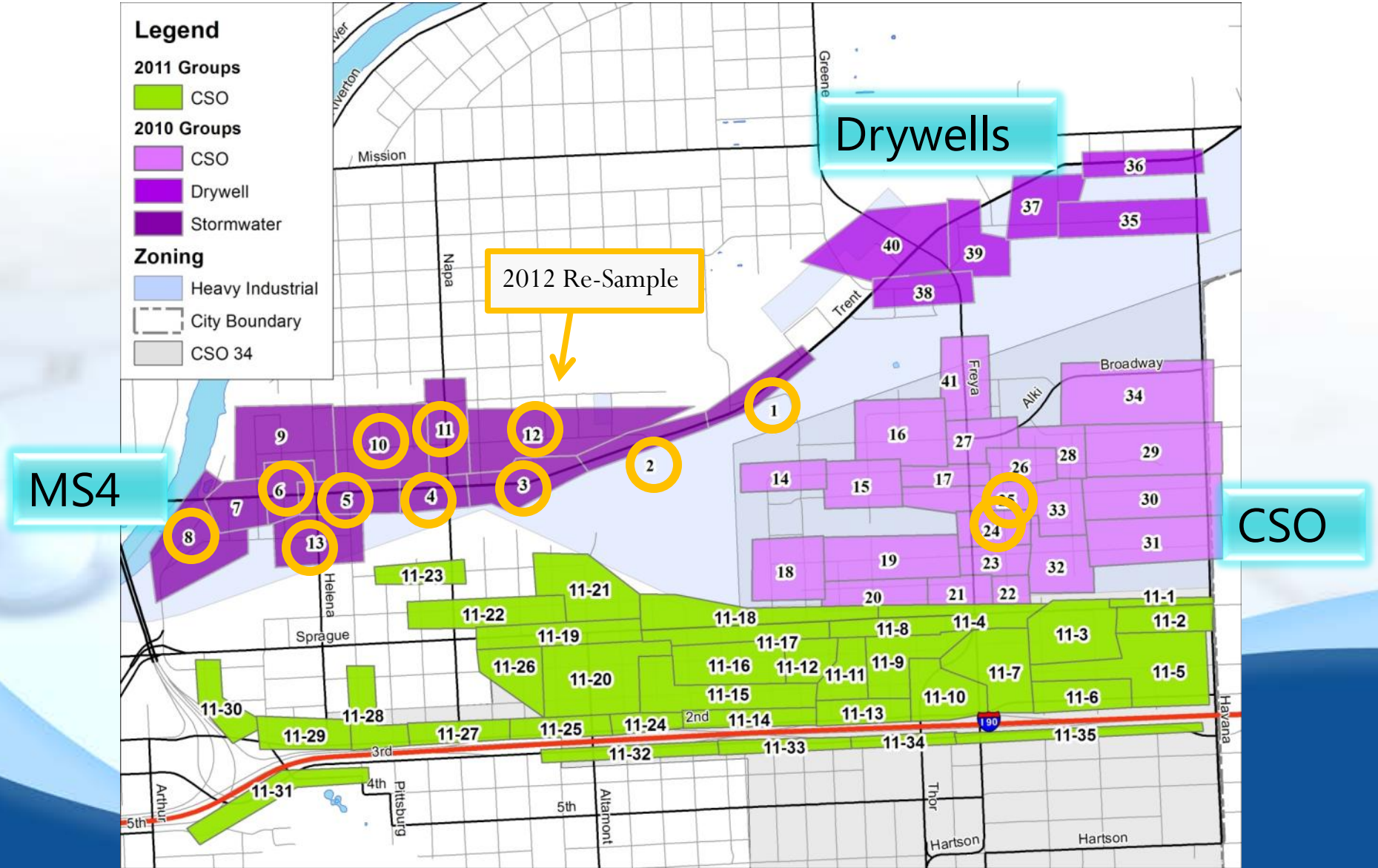
Reduce PCBs in stormwater discharges

1. Analyze and interpret existing data
2. Identify likely sources of PCBs. Design and implement remedial actions and BMPs.
3. Adaptive approach – further data collection and remedial action

Phase I: remedial maintenance, sampling, analysis of existing information

- PCBs particulate bound: sample catch basin sediments

Priority Investigation Areas



Sampling Procedures

- Composite samples ~ 10 CBs each group
- Individual samples from 1 CB only
- Four sediment samples per catch basin
  - Mix contents of each catch basin sample
- Chain of custody procedures
  - Anatek: Method 8082
  - Pacific Rim: Method 1668

- Decontaminate sampling equipment:
  DI water rinse → Liquinox soap → DI water → acetone → air dry → foil wrap

Remedial Maintenance

- Review Aroclor analysis results
  - Residential cleanup standard: 1.0 mg/kg
- Remove all sediments from catch basins
- Dump on separate pad, mix with sawdust
- Haul to lined cell at landfill

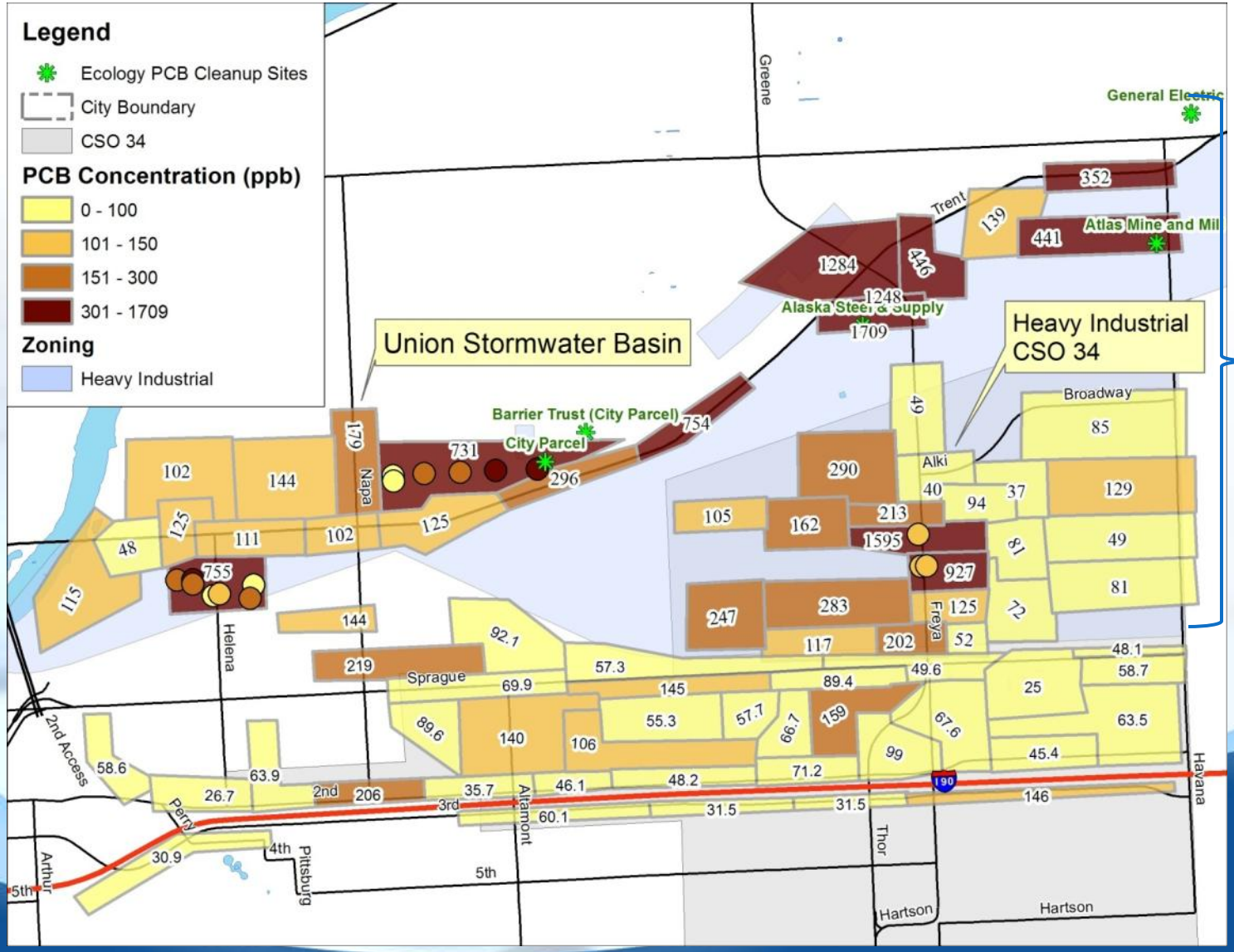
Curb Markers

Install markers at each basin after cleaning

Installation in progress throughout City on normal maintenance routes

- Over 4,200 Installed

2010 and 2011 Sampling Recap



Highest in HI Zone = 2012 Re-sampling

2010 and 2011 Sampling Recap

2010 Composite Samples

- 432 Catch Basins – broken into 41 Groups in Union Basin and HI CSO 34
- 280,000 lbs sediments removed
- **26 grams** PCBs removed

2011 Composite Samples

- 333 Catch Basins – 35 Groups in CSO 34 up-gradient (light industrial, commercial, residential)
- 268,000 lbs sediments removed
- **3.7 grams** PCBs removed

2011 Individual Samples

- Helped identify contaminated CB near City Parcel
  - Disconnected from MS4
- PCBs still found in 2010-cleaned CBs = continual PCB source in area

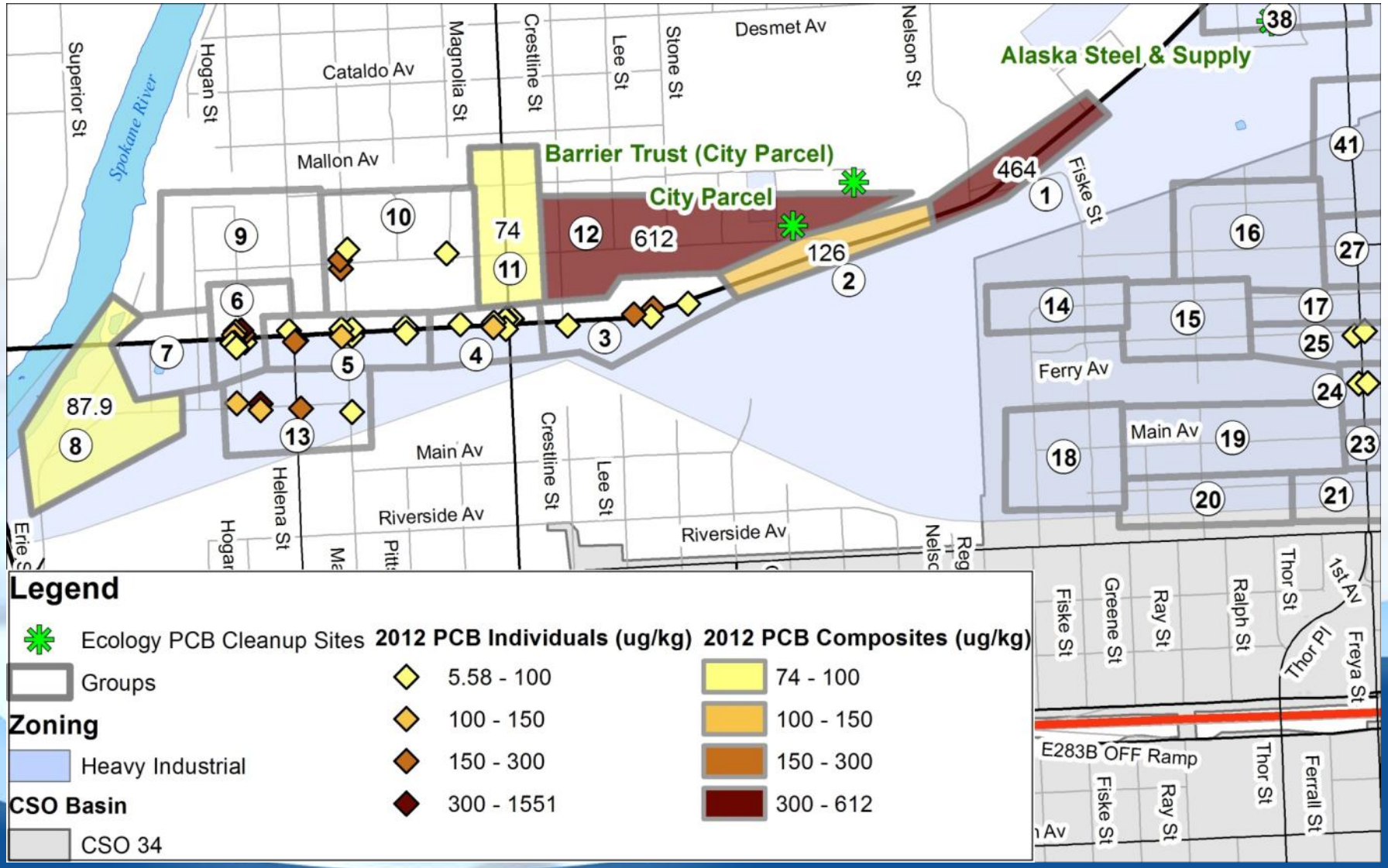
2012 Catch Basin Sampling

Focused on 2010 Groups

- Higher PCB concentrations than 2011
- Compare "apples to apples"
  - Preference: group composites
  - Individual testing if entire group can not be sampled (not enough sediment accumulation)
- Help determine continual PCB sources

2012 Sampling:
39,600 lbs sediments
2.7 grams PCBs removed

2012 Catch Basin Sampling



Year-to-Year Comparisons

COMPOSITE

Group Number	2010 Concentration (ug/kg)	2012 Concentration (ug/kg)	% Reduction
Group 1-C	754.0	464.0	38%
Group 2-C	296.0	126.0	57%
Group 8-C	115.0	87.9	24%
Group 11-C	179.0	74.0	59%
Group 12-C	731.0	612.0	16%

INDIVIDUAL

Group Number	2011 Concentration (ug/kg)	2012 Concentration (ug/kg)	% Reduction
Group 13-id-3	1185.0	767.0	35%
Group 13-id-4	279.0	120.0	57%
Group 13-id-11	5.0	5.6	-12%
Group 24-id-10	103.0	69.4	33%
Group 24-id-11	121.0	95.1	21%
Group 25-id-1	115.0	93.9	18%

2012 Catch Basin Sampling "Hot Spots"

PCBs in ug/kg (ppb), Congener Analysis

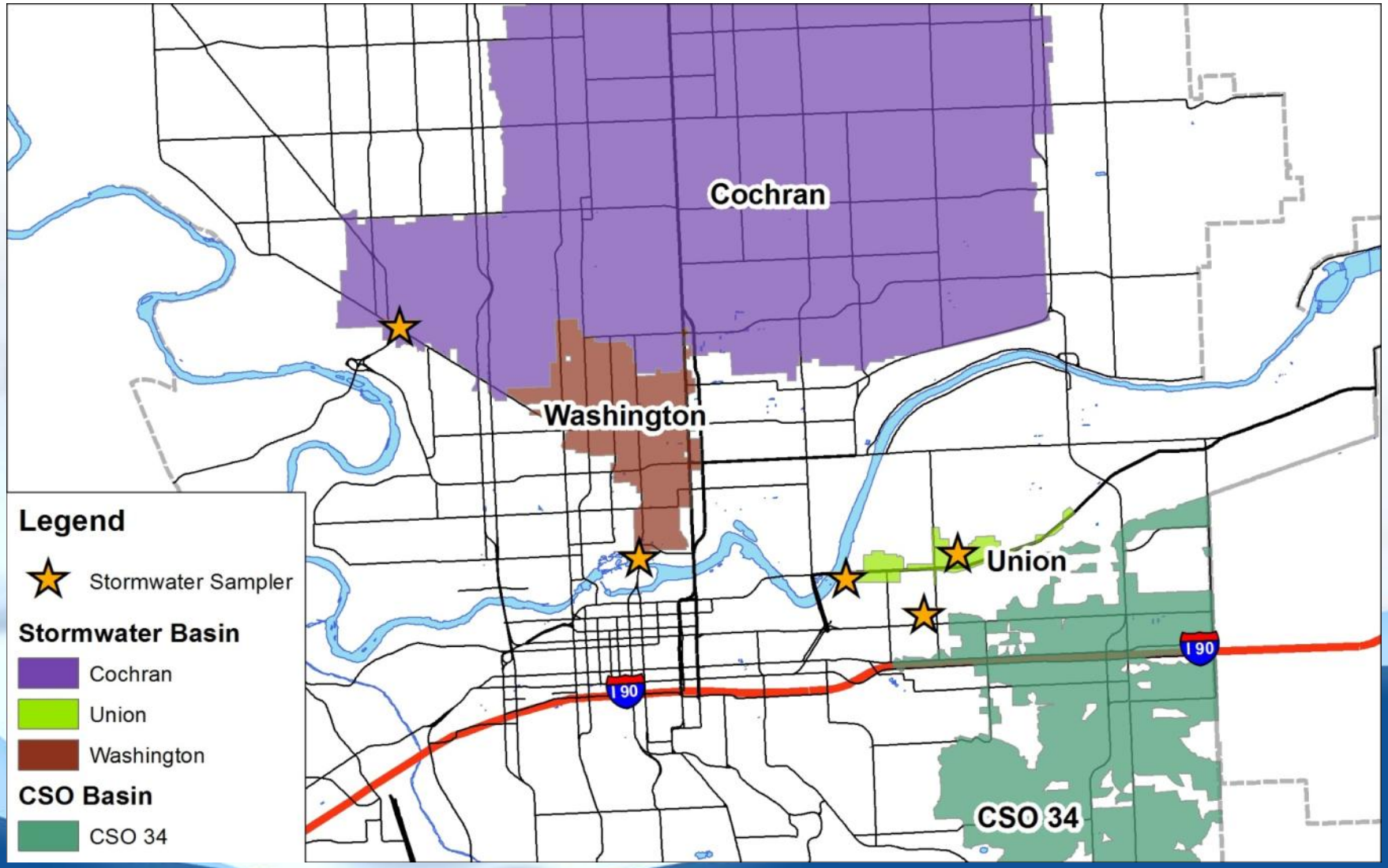
2012 Catch Basin Sampling "Hot Spots"

PCBs in ug/kg (ppb), Congener Analysis

2012 Catch Basin Sampling "Hot Spots"

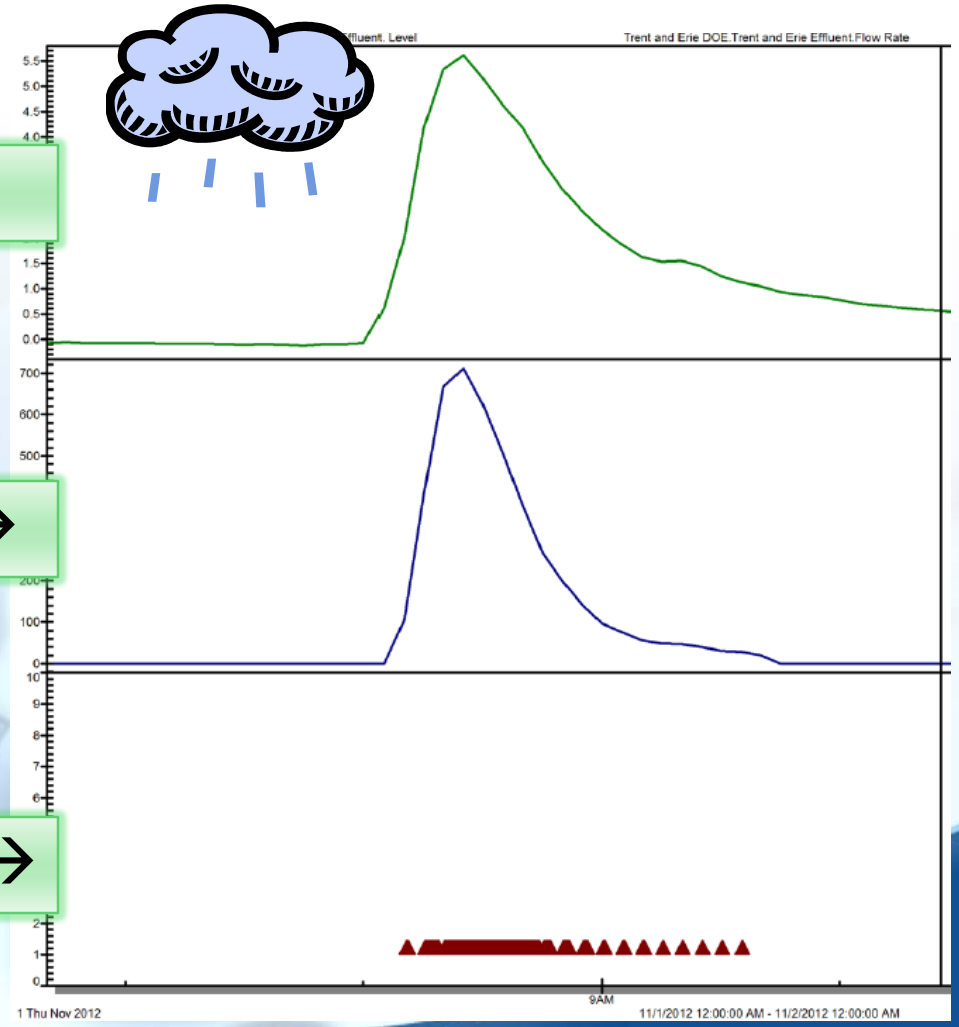
PCBs in ug/kg (ppb), Aroclor Analysis

Stormwater Sampling: 2012-2013



Stormwater Sampling

Automatic composite samplers



Depth →

Flow Rate →

Samples →

Stormwater Sampling

Location	Range (pg/L or ppq)	Notes
Union Basin Outfall	13,700 – 48,900	Industrial Land Use
Lee & Springfield (below City Parcel site)	35,300 – 66,000	Industrial Land Use, just below PCB cleanup site
Cochran Basin	1,000 – 12,600	"Average" Spokane stormwater (large area of city)
Washington Basin	4,000 – 8,800	Commercial/Residential
CSO 34	No Data Yet	
Liberty Lake Study (Ecology)	500 – 8,400	Urban "background," no known point source

Conclusions

- Individual sources difficult to identify
- Widespread, diffuse source of PCBs
  - Legacy sources from historic industrial activity
  - PCBs found in everyday items (motor oil, hydraulic fluid, etc.)
- Investigating options for treatment and infiltration in Union basin (disconnect MS4 from river)
  - Integrated Plan: treat and infiltrate Cochran basin stormwater

Questions?

More information: 2013 PCB Annual Report

http://www.spokanewastewater.org/StormwaterDocs.aspx