

Spokane River Regional Toxics Task Force

Department of Ecology

Evaluation of Measurable Progress

Evaluation Period: January 1, 2012 – December 31, 2014

FINAL
15 MARCH 2016

Table of Contents

Executive Summary.....	3
Measurable Progress Definition	7
Metrics	7
Adaptive Management	8
Key Questions	8
Assessment Period.....	8
Evaluation of Inputs	10
Criteria Relating to the Evaluation of Inputs	10
Results Summary	10
Task Force Input Data	11
Trends Relating to Inputs.....	14
Recommendations Relating to Inputs	14
Evaluation of Outputs	15
Criteria Relating to the Evaluation of Outputs	15
Results Summary	15
Task Force Output Data	16
Task Force Member Output Data	21
Trends Relating to Outputs.....	31
Recommendations Relating to Outputs	31
Evaluation of Outcomes.....	33
Criteria relating to the evaluation of Outcomes.....	33
Results Summary	33
Task Force Outcome Data.....	34
Task Force Member Outcome Data.....	37
Trends Relating to Outcomes	40
Recommendations Relating to Outcomes.....	42
Demonstration of Measurable Progress.....	43

Executive Summary

In 2011, Ecology issued five individual National Pollution Discharge System (NPDES) permits to Spokane River wastewater dischargers.¹ Given the ubiquitous nature of PCB contamination, it became evident during the permitting process that relying solely on available treatment technology was unlikely to bring the Spokane River into compliance with either the state or Spokane Tribal water quality standards for PCBs. A more comprehensive approach that addressed both point and nonpoint sources of PCBs was necessary.

Spokane County and the Spokane Riverkeeper brought forth the concept of the Spokane Regional Toxics Task Force (Task Force) as a more comprehensive approach that includes an aggressive toxic source identification, control, reduction, and elimination strategy. Ecology believes cooperative action is in the best interest of all stakeholders. Therefore, the permits require NPDES dischargers to form and participate in the Task Force. The permits provide the rudimentary structure of the Task Force, leaving the development of its operational details to the NPDES permittees and other stakeholders.

The Task Force concept is intended to avoid the immediate need for a PCB TMDL by initiating source reduction and clean up actions sooner than if a TMDL came first. However, Ecology maintains its obligation to use its regulatory authority to bring the river's water quality into compliance with applicable water quality standards. If the proposed Task Force approach is not successful, other means and methods will be employed including a PCB TMDL.

Ecology's obligation to pursue the other means and methods, including a PCB TMDL option, is triggered when the Task Force fails to make "measurable progress" toward achieving the PCB water quality criteria in the Spokane River.²

Ecology published its definition of measurable progress on July 17, 2014.³ The definition consists of an ongoing series of actions, results, and environmental outcomes. Ecology recognizes the long-term nature of toxics reductions. Therefore, a formal evaluation of measurable progress occurs during the 5-year permit renewal cycle, recognizing that achieving the water quality goal may take longer than a single cycle.

The Department of Ecology has completed its measurable progress evaluation for the Spokane River Regional Toxics Task Force (SRRTTF or Task Force). Ecology used the "Measurable Progress Definition," (dated July 17, 2014)⁴ as the basis for its assessment. Ecology compared criteria in the definition with

¹ Spokane Advanced Wastewater Treatment Plan, WA 0024473; Spokane County Regional Water Reclamation Facility, WA 0093317; Liberty Lake Sewer and Water District, W 0045144; Kaiser Aluminum Washington, LLC, WA0000892; Inland Empire Paper Company, WA0000825.

² Spokane County Fact Sheet

https://fortress.wa.gov/ecy/wqreports/public/WQPERMITS.document_pkg.download_document?p_document_id=20868

³ *Final Definition of Measurable Progress*: srrttf.org/wp-content/uploads/2014/07/Measurable-Progress-Definition-07152014-Final-Revised-Header.pdf.

⁴ *Final Definition of Measurable Progress*: srrttf.org/wp-content/uploads/2014/07/Measurable-Progress-Definition-07152014-Final-Revised-Header.pdf.

documented Task Force activities, activities of Task Force organizations, and measured environmental outcomes.

Ecology's evaluation includes an adaptive management component. This evaluation cycle emphasizes the activities that position the Task Force to achieve on-the-ground reductions and environmental outcomes in future permit cycles. In future evaluations Ecology will place more emphasis on outcomes that demonstrate toxics reductions as well as achievement of environmental and public health goals.

Ecology concludes that, during the assessment period of January 1, 2012 through December 31, 2014, the Task Force made measurable progress towards meeting applicable water quality standards.

Specifically, the Task Force consistently worked collaboratively as an entity and with outside partners, garnering sufficient resources to achieve its stated goals in a timely manner.

The cumulative actions, decisions, and work products of the Task Force, member organizations, and others resulted in measured reductions and a decreased risk of PCBs reaching Spokane River. The types of PCB source reductions cover a wide range of prevention, removal, treatment, and source reduction activities.

Ecology's data about PCB levels in fish show that PCB concentrations have decreased considerably since 1996. Ecology's recently collected data provides a baseline for this assessment. The 2012 data shows that PCBs in Spokane River fish remain elevated compared to other areas in Washington and are often more than 10 times Washington's Fish Tissue Equivalent Concentration⁵ of 5.3 µg/kg. The data also show that in general, fish contaminant levels have not significantly changed since 2005. However, in some locations, it is possible that PCB concentrations in fish are trending downward.⁶ Future fish sampling efforts, which are part of Ecology's toxics monitoring program, may provide more certainty about this trend.

Synoptic sampling at eight river locations during the 2014 low flow conditions showed that, with the exception of two locations, the concentrations of PCBs in water were below the Washington water quality standard of 170 parts per quadrillion (ppq). Limited sampling during high flow concentrations show that PCB concentrations in the river were also below the water quality standard and too low to measure using the most sensitive analytical method.⁷

⁵ The Fish Tissue Equivalent Concentration (FTEC) is the concentration of a contaminant in fish tissue that equates to Washington's water quality standard for toxic substances for the protection of human health. Washington uses the National Toxics Rule Water Quality Criteria for the protection of human health. The FTEC is calculated by multiplying the contaminant-specific Bioconcentration Factor (BCF) times the contaminant-specific National Toxics Rule Water Quality Criterion for water.

⁶ <http://srrttf.org/wp-content/uploads/2014/04/FFCMP-2012-SRRTTF-mtg-042314.pdf>

⁷ <http://srrttf.org/wp-content/uploads/2015/07/Ecology-Response-to-Questions-from-EPA-email-dated-7-May-2015.pdf>

Ecology's recommended actions for the next permit cycle to further environmental progress are summarized below:

Build Partnerships.

- The Task Force has demonstrated the ability to build partnerships that further its mission. Partnerships result in creative solutions and a more efficient use of financial resources.⁸ Ecology recommends that the Task Force review and update its Funding Strategies Document⁹ with the goal of continuing its spirit of sharing and cooperation. Include in the document federal, state, local, and private funds or resources that might be available to assist the Task Force.

Characterize the Watershed.

- Continue to address data gaps in the Spokane watershed, with a focus on identifying and reducing PCB inputs.

Set goals and identify solutions.

- Create a Task Force 5-year Work Plan that contains:
 - Short-term goals and strategies to achieve those goals.
 - An estimate of the financial and technical assistance needed to implement the strategies.
 - Adapt NPDES¹⁰ Toxics Management Plans towards achieving these goals.
- Identify costs for
 - Information/education activities.
 - Ongoing monitoring and evaluation within the watershed.
 - Long-term operation and maintenance of management measures.
 - Shortfalls between needs and available resources.

Design a Toxics Reduction Program.

- Complete the Comprehensive Plan, including recommended Best Management Practices, by December 31, 2016, as planned.
- Consider EPA's permitting recommendations¹¹.
- Identify in the NPDES Toxics Management Plans:
 - Best Management Practices suitable for implementation by individual facilities.
 - Implement BMPs, monitor effectiveness, and apply adaptive management.

⁸ Building Local Partnerships: A Guide for Watershed Partnerships:

<http://www.ctic.org/media/files/Building%20Local%20Partnerships.pdf>

⁹ Funding Strategies Document. <http://srrttf.org/wp-content/uploads/2013/07/Funding-concepts-Rev-061213-FINAL.pdf>

¹⁰ NPDES is the National Pollutant Discharge Elimination System under the Clean Water Act.

¹¹ USEPA, "EPA's Plan for Addressing PCBs in the Spokane River," 14 July 2015. <http://srrttf.org/wp-content/uploads/2015/07/EPA-plan-for-PCBs-in-response-to-court-order.pdf>

Implement the Toxics Reduction Program.

- Create an implementation schedule for the Comprehensive Plan that includes targets and measurable milestones towards achieving the water quality standard.
- Initiate activities that implement the Comprehensive Plan elements, including securing adequate funding needed to implement Best Management Practices.¹²

Measure progress and make adjustments.

- Conduct a monitoring program that assesses the effectiveness of implementation actions.
- Prepare an annual report that summarizes the work of the Task Force, progress made towards achieving the goals and, if needed, recommended revisions to the 5-year plan.
- Implement the adaptive management component of the program to allow for course corrections, as needed.

¹² USEPA, *Handbook for Developing Watershed Plans to Restore and Protect Our Waters*, EPA 841-B-08-002, March, 2008: http://water.epa.gov/polwaste/nps/upload/2008_04_18_NPS_watershed_handbook_handbook-2.pdf

Measurable Progress Definition

In 2004, the State of Washington listed the Spokane River as impaired for toxics, in particular PCBs and dioxins. In 2011, Ecology required the Spokane River NPDES permittees to create and participate in the Task Force. The Task Force Memorandum of Agreement (MOA) outlines a strategy to reduce toxics and bring the Spokane River into compliance with applicable PCB water quality standards. The strategy consists of a series of actions; including source identification, toxics reductions, Best Management Practices, as well as the development and implementation of a comprehensive plan and strategy by December 31, 2016.

The concept of “measurable progress” is a key component of the overall toxics reduction strategy on the Spokane River. Measurable progress reflects the success of the Task Force towards reducing PCBs in the Spokane River and achieving the applicable water quality criteria for PCBs. The permits obligate Ecology to develop a PCB TMDL¹³ in the Spokane River if the agency determines that the Task Force is failing to make measurable progress towards meeting applicable water quality criteria for PCBs. Permittees and stakeholders contribute towards Task Force progress through their participation.

Ecology published the definition of “measurable progress” on July 17, 2014.¹⁴ The definition consists of an ongoing series of actions, results, and environmental outcomes. Ecology recognizes the long-term nature of toxics reductions. Therefore, a formal evaluation of measurable progress occurs during the 5-year permit renewal cycle, recognizing that achieving the water quality goal may take longer than a single 5-year cycle.

Metrics

Ecology uses three categories of data to measure progress:

Inputs: organizing activities and resources devoted to the effort.

Outputs: activities and work products completed during the evaluation period.

Outcomes: Environmental indicators of progress towards achieving the applicable PCB water quality criteria in the Spokane River. Environmental indicators include trends and/or measured reductions of toxics in the river and fish tissue, as well as achievement of the applicable water quality or health standards.

Ecology expects that the relative importance of inputs, outputs, and outcomes will change over time as the Task Force organizes, collects data, and reduces sources of PCBs to the river. For example, Ecology

¹³ TMDL, or Total Maximum Daily Load, is the maximum mass of a particular pollutant that can be discharged to a water body on a daily basis so that the water body still meets water quality standards.

¹⁴ *Final Definition of Measurable Progress:* srrttf.org/wp-content/uploads/2014/07/Measurable-Progress-Definition-07152014-Final-Revised-Header.pdf.

expects input metrics to dominate in the first permit cycle while the Task Force develops the structures, systems, and plans needed to conduct its business. As the organizational structure and collaborative relationships develop, Ecology expects output and outcome metrics to increase in importance. Ecology expects the Task Force to conduct studies that fill data gaps, gather and interpret data, and engage in actions that reduce toxics and directly improve water quality.

Adaptive Management

Ecology encourages adaptive management by providing the opportunity for course corrections as part of the measurable progress review. In the context of adaptive management, measuring progress can result in adjustments that improve Task Force function, efficiency, and accountability for the following tasks:

- Build Partnerships.
- Characterize the Watershed.
- Set goals and identify solutions.
- Design a Toxics Reduction Program.
- Implement a Toxics Reduction Plan.
- Measure progress and make adjustments.¹⁵

The point at which the Task Force is unable or unwilling to engage in adaptive management such that progress can no longer be measured is the point at which Ecology will pursue a TMDL.

Key Questions

At the end of each 5-year permit cycle (i.e., 2016, 2021, 2026), Ecology makes a measurable progress determination by assessing the status of three fundamental criteria:

- 1) Is the Task Force still working together in a collaborative manner?
- 2) Is the Task Force still moving forward on activities that will lead to identification of sources, reduction of PCBs in the river, the development of best management practices, and a comprehensive plan for progress toward achieving applicable water quality criteria for PCBs?
- 3) Is there environmental evidence that the Task Force is making progress towards achieving applicable water quality criteria for PCBs in the Spokane River?

Assessment Period

Ecology selected the assessment period of January 1, 2012 through December 31, 2014 as relevant and applicable to the first permit cycle. This 3-year baseline period extends from the formation of the Task Force to the end of the calendar year immediately preceding permit renewal.

¹⁵ USEPA, *Handbook for Developing Watershed Plans to Restore and Protect Our Waters*, EPA 841-B-08-002, March, 2008: http://water.epa.gov/polwaste/nps/upload/2008_04_18_NPS_watershed_handbook_handbook-2.pdf

This document provides a summary of the data that Ecology reviewed to determine measurable progress. Ecology used data from published reports, the Task Force website (srrttf.org) as well as data submitted by individual Task Force members. This set of data is not a complete catalog of all of the Task Force and Task Force member activities. It is, however, sufficiently representative of Task Force activities, accomplishments, and environmental conditions existing at the time of the assessment. Ecology notes that additional data exists, beyond what Ecology presents here, that supports the findings of this assessment.

Evaluation of Inputs

Criteria Relating to the Evaluation of Inputs

Inputs focus on the activities needed for the Task Force to organize, function, and achieve results. Examples include signing the MOA, convening regular meetings, seeking financial assistance, and budgeting.

Inputs achieve results by fostering trust, collaboration, and agreement on actions needed to achieve goals. Measures include numbers of key decisions, meetings, and actions directed towards funding the Task Force activities.

Inputs are important during the entire process but of higher priority during the first permit cycle.

Ecology is obligated to proceed with the development of a TMDL in the Spokane River for PCBs or determine an alternative to ensure water quality standards are met if, in the evaluation of measurable progress, inputs are absent or not productive.

Results Summary

Ecology concludes that the Task Force has made measurable progress with respect to the input criteria.

Ecology's review of the organization and functions of the Task Force during the assessment period shows that the Task Force made measurable progress on this criterion. During the assessment period the Task Force organized, and established protocols for deliberation, public transparency, and decision-making. Documentation on the Task Force website of its regular meetings, action items, and decisions demonstrate that it was fully functional during the assessment period. While the Task Force did not identify an ongoing source of funding, the Task Force was successful in garnering the private and public funding needed to complete its scheduled activities. Furthermore, the Task Force created a non-profit organization to streamline management of Task Force expenditures. The Administrative and Contracting Entity (ACE) supports the Task Force by providing fiscal accountability, and transparency for funding and expenditures. The Task Force directed ACE to serve as the contracting entity for its independent advisors (the Ruckleshaus Center and LimnoTech). The Ruckleshaus Center managed the Task Force's public participation including, meeting facilitation, a website clearinghouse for reports, minutes, and other information. LimnoTech provided technical expertise needed to evaluate existing data, identify data gaps, develop work plans, and conduct in-river studies. Both advisors provided support for two technical workshops featuring national PCB experts.

Task Force Input Data

- 1. The Spokane River Regional Toxics Task Force (Task Force) established itself on January 23, 2012, with 11 organizations participating as signatories to the Memorandum of Agreement (MOA).¹⁶** The MOA fosters participation by a diverse set of organizational groups (dischargers, regulators, sovereigns, citizens) who discuss issues in a congenial way, reinforcing the importance of collaboration.
 - The Spokane Tribe of Indians submitted a letter of support for the Task Force on February 12, 2014. The Spokane Tribe provided funding support for the first year of Task Force operations. On May 21, 2012, the Spokane Tribe notified the Department of Ecology that it would no longer participate and support the Task Force. On June 13, 2012, USEPA communicated with the Spokane Tribe of Indians noting that the Tribe provided valuable direction during the formation of the Task Force and reiterating EPA's commitment to the Task Force, sovereign governments, and other entities involved.¹⁷
 - On November 26, 2014, Ecology invited local sovereign tribes (Spokane, Colville, Coeur d'Alene, and Kalispel) to participate on the Task Force and become signatories to the MOA. The Kalispel Tribe notified Ecology that they respectfully declined to participate.¹⁸ Ecology did not receive a formal response from the other tribes.
- 2. The Task Force was fully functional during the assessment period.** Task Force members participated in more than 90 regular meetings of the Task Force, working groups, and focus groups. Meeting notes document that the Task Force worked collaboratively and cooperatively, as demonstrated by the consensus approval of more than 100 collaborative decisions¹⁹ and cooperative engagement in more than 400 actions.²⁰
- 3. The Task Force provided Ecology with details of its organizational structure, specific goals, funding, and governing documents.** The Task Force MOA, its governance document, outlines the Task Force goal and organizational structure. The goal of the Task Force is to "develop a comprehensive plan to bring the Spokane River into compliance with applicable water quality standards for PCBs."²¹

¹⁶ Organizational documents: srtrtf.org/?page_id=961

¹⁷ Letters from BJ Kieffer, Spokane Tribe of Indians to Jim Bellatty, Department of Ecology, dated February 12, 2014: <http://srtrtf.org/wp-content/uploads/2012/02/Bj-SpokaneRiver.pdf> and May 21, 2012: http://srtrtf.org/wp-content/uploads/2012/05/Bellatty-Letter-5_21_20121.pdf ; Letter from Michael Bussell, USEPS to BJ Kieffer dated June 13, 2012: <http://srtrtf.org/wp-content/uploads/2012/07/201206181618281561.pdf>

¹⁸ SRRTTF MOA Workgroup and Revisions Page, http://srtrtf.org/?page_id=3824

¹⁹ The MOA uses a consensus based decision-making process. A "unanimity minus one" decision rule confirms and finalizes consensus-based decisions. A decision is affirmative if unanimous or if one or fewer of the attending members oppose the proposed decision and vote accordingly. A decision is not affirmative if two, or more, of the attending members oppose the proposed decision and vote accordingly.

²⁰ The actions determined from Action Items, as identified in the meeting notes. http://srtrtf.org/?page_id=961

²¹ SRRTTF Memorandum of Agreement: <http://srtrtf.org/wp-content/uploads/2012/07/SRRTTF-MOA-Final-1-23-2012.pdf>

Funding is determined on a year-to-year basis. The Task Force prepared a Funding Concepts document in 2012.²² The Task Force has not identified a funding mechanism that supports all activities on an ongoing basis. However, the Task Force organized a combination of private and public funding sources (including NPDES permittees in Washington and Idaho, Department of Ecology, the Washington State Legislature and Spokane Tribe of Indians) that provided direct and in-kind funding during the assessment period.

Revenue for Task Force activities was approximately:²³

- 2012 (Ecology, Spokane Tribe, and Washington and Idaho NPDES permittees; administered by Ecology): \$63,400.
- 2013 (Ecology, Washington and Idaho NPDES permittees, Center for Justice; administered by ACE): \$248,000.
- 2014 (Ecology and Washington and Idaho NPDES permittees, administered by ACE): \$454,000.

Expenditures for Task Force activities through ACE were approximately:

- 2012: \$5700.
- 2013: \$152,000.
- 2014: \$430,000.

The Task Force supported the Columbia River Restoration Act, intended to provide federal resources towards implementing water quality improvements in the Columbia River Basin.²⁴

The Department of Ecology, Environmental Assessment Program and other programs provided in-kind technical support (see “Department of Ecology Publications and Presentations” in the “Task Force Member Output Data” section of this evaluation).

4. **During the assessment period, the Task Force accomplished specific goals** required during the 2011 to 2016 permit cycle.²⁵ The Task Force **provided a forum for the review and discussion of Spokane River toxics issues** through the following actions:
 - Engaged Ruckleshaus Center as an independent third party facilitator to organize and facilitate task force activities.
 - Held **regularly scheduled Task Force and Work Group meetings** where local, regional, and national experts participated, shared information, and discussed Spokane River Toxics issues with Task Force members and the public. All meetings and workshops were open to and accessible by the public, either in person or via conference call.

²² *Funding Strategies Document*: <http://srtrtf.org/wp-content/uploads/2013/07/Funding-concepts-Rev-061213-FINAL.pdf>

²³ Data for revenue and expenditures obtained from contract documents and ACE financial reports.

²⁴ SRRTTF Letter to Congressional representatives in Washington and Oregon, dated September 29, 2014: <http://srtrtf.org/wp-content/uploads/2014/09/Columbia-River-letter-092914-Final.pdf>

²⁵ SRRTTF *Memorandum of Agreement*, “Specific Task Force Goals Relating to NPDES Permit Compliance”: <http://srtrtf.org/wp-content/uploads/2012/07/SRRTTF-MOA-Final-1-23-2012.pdf>

- Established and maintained communications systems such as a **website at srrttf.org** that serves as a **clearinghouse for data, reports, minutes, and other information** gathered, collected, or developed by the Task Force.
- Developed, organized, and sponsored **two public Technical Workshops** (June 5-6, 2012²⁶ and December 4-5, 2013²⁷) Public participation with national experts advanced the understanding of Spokane River toxics issues.
- In 2012, the Task Force **selected an independent community technical advisor** (LimnoTech).
- The Task Force and its members participated in **public education and engagement** to advance the understanding of Spokane River issues, including:
 - Public education and outreach strategy recommendations developed for the Task Force (2013).²⁸
 - Presentation and outreach reference materials developed for public education and engagement (2013).²⁹
 - Introductory meetings with the Center for Environmental Research, Education and Outreach³⁰; an academic research consortium (2013).
 - Support for PCB in products testing by Keri Hornbuckle, University of Iowa (2014).³¹
 - Interviews with Spokesman Review newspaper and KYRS Community radio (2012, 2013).
 - Participant in:
 - WSU Student Challenge, “Saving the Spokane” (2013-2014).³²
 - Gonzaga Student Seminar (2014).
 - Pullman High School documentary project. (2014).
 - Presentations at
 - StormCon (2012).
 - National Tribal Toxics Council meeting (2013).
 - Legislative briefing at the Spokane County Water Resources Center (2013).
 - American Chemical Society Green Chemistry Conference where the Task Force supported the participation of Professor Christy, an international pigments expert (2013).³³
 - NCASI: presentation and podcast (2013).
 - Pacific Northwest International Section of AWMA (2014).

²⁶ 2012 Workshop: http://srrttf.org/?page_id=549

²⁷ 2013 Workshop: http://srrttf.org/?page_id=2312

²⁸ PIO Recommendations to Task Force: <http://srrttf.org/wp-content/uploads/2013/02/SRRTTF-Meeting-Summary-1-30-13.pdf>

²⁹ Outreach presentation materials: http://srrttf.org/?page_id=1406

³⁰ CEREO meeting summary: <http://srrttf.org/wp-content/uploads/2013/09/SRRTTF-Meeting-Summary-9-25-13-FINAL.pdf>

³¹ Keri Hornbuckle Letter of Support: <http://srrttf.org/wp-content/uploads/2014/02/SRRTTF-Hornbuckle-Letter-Approved-by-SRRTTF-3.pdf>

³² WSU Student Challenge Brochure: <http://srrttf.org/wp-content/uploads/2013/10/Undergraduate-Multidisciplinary-Research-Challenge-UMRC-Info-Brief.pdf>

³³ SRRTTF Meeting Summary, April 13, 2014: <http://srrttf.org/wp-content/uploads/2013/03/SRRTTF-Meeting-Summary-4-3-13.pdf>

- Spokane River Forum (2014).
- Washington Municipal Stormwater Conference (2014).

Task Force Member Input Data

- Department of Ecology awarded the City of Spokane \$49,085 under its Grants of Regional or Statewide Significance program for PCB testing of products potentially associated with stormwater (2013).

Trends Relating to Inputs

Task Force participation remained consistent during 2012 – 2014. The Task Force complied with the MOA participation requirements achieving a quorum at all regularly scheduled meetings. Over the three-year assessment period, the Task Force held an average of 12 Task Force and 18 Work Group/Focus Group meetings per year. The meeting notes show that the Task Force consistently worked collaboratively. The total number of actions substantially increasing after the first year from 73 to more than 137 in subsequent years. The number of decisions also increased from 14 the first year to 47 each year after.

Outreach activities have a similar trend with most activities (14 events) occurring during 2013.

Financial measures trended upward from 2012 through 2014, more than doubling the increases in annual income and expenses.

Recommendations Relating to Inputs

During the next permit cycle, Ecology expects the Task Force inputs to lead to successful implementation of the Comprehensive Plan. A reliable estimate of the financial and technical assistance needed to implement the entire plan, will require cost estimates for:

- Information/education activities, monitoring, and evaluation.
- Long-term operation and maintenance of management measures.

Federal, state, local, and private funds or resources might be available to assist in implementing the plan. The Task Force should review and update its Funding Strategies Document^{34, 35} identify funding needs, available resources, shortfalls between needs and available resources, and provide a strategy to address the shortfalls.

³⁴ *Funding Strategies Document*: <http://srtrtf.org/wp-content/uploads/2013/07/Funding-concepts-Rev-061213-FINAL.pdf>

³⁵ USEPA, *Handbook for Developing Watershed Plans to Restore and Protect Our Waters*: http://water.epa.gov/polwaste/nps/upload/2008_04_18_NPS_watershed_handbook_handbook-2.pdf

Evaluation of Outputs

Criteria Relating to the Evaluation of Outputs

Outputs are the activities and work products of the Task Force. Examples include reports, plans, studies, contracts, workshops, and permits.

Outputs lead to results by providing data and processes needed to identify and implement source reductions. Measures include numbers of reports, plans, studies, contracts, workshops, and permits that contribute towards achieving source reductions.

Outputs are important to the entire process but of higher priority during the first permit cycle.

Ecology is obligated to proceed with the development of a TMDL in the Spokane River for PCBs or determine an alternative to ensure water quality standards are met if, in the evaluation of measurable progress, outputs are absent or not productive.

Results Summary

Ecology concludes that the Task Force has made measurable progress with respect to the output criteria.

Ecology's review of the activities and work products of the Task Force during the assessment period show that the Task Force made measurable progress on this criterion. The assessment identified a minimum of 30 reports and studies, 12 plans, 2 workshops, 11 contracts, and 4 new permits as outputs of the Task Force or outputs influenced by Task Force efforts.

Based on an assessment of existing information about PCBs and methods used to characterize them, the Task Force planned and executed a synoptic study that:

- Addressed identified data gaps; and
- **Better characterized the amounts, sources, and locations of PCBs in the Spokane River** under low flow conditions.

Synoptic sampling events during August 2014 resulted in a **semi-quantitative assessment of PCB loading** during dry weather. **The results from the sampling event identified four areas of interest in the river:**

- Groundwater from Barker Road to Trent Avenue Bridge.
- Groundwater from Green Street Gage to Spokane Gage.
- Latah Creek Tributary.
- Little Spokane River Tributary.

Some of the outputs set the stage for achieving source reductions. For example, **Toxics Management Plans** prepared by the NPDES permittees identify and characterize sources of PCBs in the municipal wastewater and stormwater systems.

Of note is the **City of Spokane's Integrated Planning** efforts leading towards the elimination of Combined Sewer Overflow (CSO) discharges to the river and innovative **Low Impact Development approaches** to improve stormwater management.

The Task Force **worked towards eliminating PCBs at the point of production** through:

- Actions to encourage Toxic Substances Control Act and regulatory reform.
- Support and development of Green Chemistry as a means of finding safer alternatives to PCB-containing pigments.
- Assistance with Ecology's development of the PCB Chemical Action Plan
- Creation of market incentives for PCB-free products through state law and local ordinances.

Task Force Output Data

1. **Activities characterizing amounts, locations, and sources of PCB in the Spokane River.** During the assessment period, the Task Force prepared the following:

Reports

- Conceptual Model intended as a planning tool for future investigations and data gap analysis (2012).³⁶
- Confidence testing results establishing measurement capabilities for low concentrations of PCB in water (2014).³⁷
- Field Sampling Report for synoptic sampling event during low flow conditions (2014).³⁸
- Interim analysis of data for the synoptic sampling event during low flow conditions (2014).³⁹

Plans

- The Task Force adopted the first Draft Work Plan on October 21, 2012, which outlines four phases of work needed to result in the completion of a Comprehensive Plan by December 2016.⁴⁰
- Technical Consultant Priority Work Plan (2013).⁴¹
- SRRTTF Priority Work Plan (Biennium Budget Period) 2013.⁴²
- The Task Force prepared a Quality Assurance Project Plan, Sampling and Analysis Plan, and Spokane River Field Implementation Plan for the 2014 synoptic sampling event.⁴³

³⁶ SRRTTF Conceptual Model: <http://srrttf.org/wp-content/uploads/2012/02/Conceptual-Models.xls>

³⁷ SRRTTF Final Confidence Testing Memo: http://srrttf.org/wp-content/uploads/2014/07/SRRTTF_Confidence_Testing_Results_2014_Jul16-2.pdf

³⁸ Gravity Low Flow Conditions Field Sampling Report: <http://srrttf.org/wp-content/uploads/2014/11/Gravity-Sampling-Field-Report.pdf>

³⁹ LimnoTech Interim Analysis of Synoptic Survey Data: http://srrttf.org/wp-content/uploads/2014/11/SRRTTF_Dilks_11_17_2014b.pdf

⁴⁰ SRRTTF First Draft Work Plan: <http://srrttf.org/wp-content/uploads/2012/10/SRRTTF-Work-Plan-First-Draft-Adopted-10-24-12-CLEAN.pdf>

⁴¹ SRRTTF Technical Consultant Priority Work Plan: http://srrttf.org/wp-content/uploads/2013/05/SRRTTF_Phase2-4_WorkPlan_04232013.pdf

⁴² SRRTTF Priority Work Plan (Biennium Budget Period): <http://srrttf.org/wp-content/uploads/2013/09/SRRTTF-Priority-Work-Plan.pdf>

⁴³ SRRTTF 2014 Spokane River Study: http://srrttf.org/?page_id=3189

Studies

- The Task Force conducted a Synoptic Sampling event in August 12-25, 2014 to evaluate groundwater contributions of PCB during low flow conditions, an identified data gap.⁴⁴
- During 2012 the Spokane River Urban waters team, City of Spokane Wastewater Management Department and Spokane Riverkeeper continue work on PCB Source Investigations in The City's stormwater and CSO system.⁴⁵

Contracts

- *Workshops* On August 22, 2012, the Task Force approved the Articles of Incorporation and draft By-Laws for an administrative Business Entity (the Administrative and Contracting Entity, or ACE).⁴⁶ By 2014, ACE managed all or portions of the following contracts:
 - Third Party Facilitator.
 - Independent Technical Consultant.
 - PCB Analysis Laboratory.⁴⁷
 - Conventional Chemical Analysis Laboratory.⁴⁸
 - Sampling Contractor.⁴⁹

Workshops

- June 5-6, 2012
- December 4-5, 2013.^{50, 51}
- December 17, 2014: approved the final agenda for technical workshop held in January 2015.⁵²

Permits

- During the assessment period, five of the signatories to the MOA (all in Washington State) were organizations with current NPDES permits.
- Ecology issued the Phase II Eastern Washington Municipal Stormwater Permit on August 1, 2012.⁵³
- On December 1, 2014, the EPA issued NPDES permits to three municipal wastewater treatment plants (City of Coeur d'Alene, City of Post Falls, and Hayden Area Regional Sewer Board).⁵⁴

⁴⁴ SRRTTF 2014 Spokane River Study: http://srrttf.org/?page_id=3189

⁴⁵ City of Spokane, *Eastern Washington Phase II Municipal Stormwater Permit, 2012 Annual Report*: <https://static.spokanecity.org/documents/publicworks/stormwater/management/2012-stormwater-annual-report.pdf>

⁴⁶ SRRTTF ACE Organizational Documents. http://srrttf.org/?page_id=1999

⁴⁷ SRRTTF Meeting Page, April 23, 2014: <http://srrttf.org/?p=2752>

⁴⁸ SRRTTF Meeting Page, May 13, 2014: <http://srrttf.org/?p=2867>

⁴⁹ SRRTTF Meeting Page, June 18, 2014: <http://srrttf.org/?p=2921>

⁵⁰ SRRTTF 2012 Workshop: http://srrttf.org/?page_id=533

⁵¹ SRRTTF 2013 Workshop: http://srrttf.org/?page_id=2312

⁵² SRRTTF Meeting Page, December 17, 2014: <http://srrttf.org/?p=3767>

⁵³ Phase II Eastern Washington Municipal Stormwater Permit: <http://www.ecy.wa.gov/programs/wq/stormwater/municipal/phaseiiEwa/ewph2permit.html>

⁵⁴ EPA Region 10 current NPDES permits: <http://yosemite.epa.gov/r10/water.nsf/NPDES+Permits/Current+ID1319>

2. The Task Force created the Technical Consultant Priority Work Plan,⁵⁵ which **incorporated findings from technical studies, identified data gaps, and advanced the understanding of toxics in the river.** The Technical Consultant:
 - Identified, reviewed, evaluated existing information relevant to the Spokane River,^{56, 57} and provided a summary database.
 - Reviewed and commented on Standard Operating Procedures for the collection and analysis of PCB data.⁵⁸
 - Described conceptual models of PCBs and dioxins in the Spokane River watershed.⁵⁹
 - **Identified data gaps** in the understanding of PCB loading in the Spokane River.⁶⁰ The key data gaps included 1) the magnitude of true sources contributing to stormwater loads, 2) PCB sources upstream of the Idaho/Washington border, and 3) the significance of loading from atmospheric and groundwater sources.
 - Summarized the available modeling tools that describe the in-stream fate of PCBs and dioxins.⁶¹

3. The Task Force developed, organized, and sponsored **two Technical Workshops** (June 5-6, 2012 and December 4-5, 2013).^{62, 63} The workshops **incorporated findings from the technical studies, and advanced and increased the region-wide understanding of toxics in the Spokane River.** Local, regional, and national experts gave presentations on the “state of the knowledge” with respect to PCB in the environment.

*2012 Workshop Key Points*⁶⁴

- About 90% of the PCBs in river samples are in the dissolved fraction, although sampling and analyzing water with low concentrations of PCBs remains problematic.
- **Stormwater is the largest identified PCB source** to the river.
- In-line storm sewer sampling is critical for source identification tracking efforts. City of Spokane is **removing sediment from storm catch basins.**

⁵⁵ SRRTTF Technical Consultant Priority Work Plan: http://srرتtf.org/wp-content/uploads/2013/05/SRRTTF_Phase2-4_WorkPlan_04232013.pdf

⁵⁶ LimnoTech Data Request Memo: http://srرتtf.org/wp-content/uploads/2013/04/SRRTTF_Data_Request_Memo_2013_04_17.pdf and Data acquisition log: <http://srرتtf.org/wp-content/uploads/2013/05/SRRTTF-Data-Contact-Log-6.28.13-T4-FINAL.pdf>

⁵⁷ LimnoTech Review and Evaluation of Data, Final Memo: http://srرتtf.org/wp-content/uploads/2014/05/SRRTTF_DataReviewMemo_2013_08_30_final.pdf

⁵⁸ LimnoTech Review of Standard Operating Procedures for PCB Data Collection and Analysis: http://srرتtf.org/wp-content/uploads/2013/06/Spokane_QAPP_review_062813.pdf

⁵⁹ LimnoTech Initial Conceptual Models of PCBs and Dioxins in the Spokane River Watershed - Final: http://srرتtf.org/wp-content/uploads/2014/05/SRRTTF_ConceptualModelMemo_2013_Nov14.pdf

⁶⁰ LimnoTech Final Data Gaps Memo: http://srرتtf.org/wp-content/uploads/2014/05/SRRTTF_Identification-of-Data-GapsMemo_2013_Nov14.pdf

⁶¹ LimnoTech Review of Modeling Tools: http://srرتtf.org/wp-content/uploads/2014/05/7-SRRTTF_ModelReviewMemo_2014_Feb_4_final.pdf

⁶² SRRTTF 2012 Workshop: http://srرتtf.org/?page_id=533

⁶³ SRRTTF 2013 Workshop: http://srرتtf.org/?page_id=2312

⁶⁴ SRRTTF Technical Track Workgroup Report Out, August 22, 2012: <http://srرتtf.org/wp-content/uploads/2012/08/Work-Group-Report-Out-082212-01.pdf>

- Kaiser Aluminum is focusing on **sediment removal from internal sources**.
- The Task Force considered the approach of the Delaware River PCB TMDL, which **focuses on minimization plans** (such as transformer removal, track down studies and sediment removal) and **effectiveness monitoring**.
- The level of **importance of atmospheric deposition likely varies from region to region** based on contributions from other sources.
- **Only chemical analysis Method 1668 is able to provide pg/L data**. Less than 10 laboratories in North America are capable of running Method 1668. There is no analytical confidence below 3 pg/L for Total PCB (without pre-concentration). Data with Total PCB levels below 1,000 pg/L is variable and highly influenced by blanks.
- **The Task Force incorporated the results of the 2012 workshop into its Technical Work.**

*2013 Workshop Key Points*⁶⁵

- The Task Force mapped out a 2-year data collection strategy, which included the **2014 dry weather (August) synoptic sampling**. The dry weather sampling assessed the impact of groundwater as a source of PCB input to the river.
- Wet weather concentrations, which could include snowmelt hydrology/seasonal influence, remain a data gap.
- There are a number of sampling and analysis considerations due to low concentrations, uncertainty of analysis, missing flow data at critical points, preferred analytical method, and laboratory costs.
- Atmospheric deposition may be important.

During the assessment period, the Task Force **engaged in technical studies, identified data gaps, and collected data**, completing Phases 1, 2 and parts of Phase 3 of the Work Plan. Synoptic sampling events during August of 2014 resulted in a **semi-quantitative assessment of PCB loading** during dry weather.

The results from the sampling event identified four areas of interest in the river:^{66 67}

- Barker Road to Trent Avenue Bridge, groundwater.
- Green Street Gage to Spokane Gage.
- Latah Creek Tributary.
- Little Spokane River Tributary.

4. During the assessment period, the Task Force engaged in actions to **encourage regulatory reform aimed at preventing new PCBs from entering the environment**.

⁶⁵ SRRTTF 2013 Workshop Meeting Summary: <http://srtrtf.org/wp-content/uploads/2014/01/SRRTTF-2013-Workshop-Meeting-Summary-DRAFT.pdf>

⁶⁶ LimnoTech, Interim Analysis of Synoptic Sampling Data: http://srtrtf.org/wp-content/uploads/2014/11/SRRTTF_Dilks_11_17_2014b.pdf

⁶⁷ LimnoTech, Mass Balance Assessment of 2014 Synoptic Survey Results: http://srtrtf.org/wp-content/uploads/2014/10/SRRTTF_MassBalance_Dilks_2015_01_13.pptx

- On August 28, 2012, the Environmental Council of States approved and submitted a resolution to EPA with the intent of improving regulation of PCB under the Toxic Substances Control Act. Ecology Director Ted Sturdevant, Tala Henry from the EPA, Doug Krapas from Inland Empire Paper, Rick Eichstaedt from Spokane Riverkeeper and Lisa Rodenburg from Rutgers University provided informational material.
 - In June 2013, representatives of the Task Force met with the Environmental Protection Agency, National Program Chemicals Division, to discuss the 2010 Advanced Notice of Proposed Rulemaking (ANPR) Reassessment of PCB Use Authorizations, and to encourage regulatory reform that reduces and/or eliminates current use authorizations for inadvertently formed PCBs as a byproduct or impurity in chemical manufacturing processes.⁶⁸ On July 24, 2013, the Task Force approved the self-nomination of Rick Eichstaedt, Center for Justice and Doug Krapas, Inland Empire Paper, on the EPA Small Business Advocacy Review for the TSCA PCB Use Authorizations Update Rule.⁶⁹
 - The Task Force followed up these actions on October 24, 2013, with a letter to the Environmental Protection Agency requesting further regulation of inadvertently produced PCBs and enforcement of existing regulations.⁷⁰
5. During the assessment period, the Task Force **provided technical education information to the public.**
- In addition to hosting the two Technical Workshops, the Task Force developed and maintained the Spokane River Regional Toxics Task Force website (srtrtf.org).
 - Task Force members provided media events and presentations during the assessment period (more than 7 times in 2013 and more than 6 times in 2014) supported the public education goal.
 - Ecology provided data to the Spokane County Community Indicators Project.⁷¹

⁶⁸ Agenda, Meeting with EPA's National Programs Chemicals Division: <http://srtrtf.org/wp-content/uploads/2013/05/SRRRTF-PCB-ANPR-Meeting-Proposal-5-15-13.pdf>

⁶⁹ SRRRTF Letter of Support for Rick Eichstaedt: <http://srtrtf.org/wp-content/uploads/2013/08/Letter-of-support-Eichstaedt.pdf>; SRRRTF Letter of Support for Doug Krappas: <http://srtrtf.org/wp-content/uploads/2013/08/Letter-of-support-Krapas.pdf>

⁷⁰ Letter to Jim Jones and Cynthia Giles, Re: Implementation of TSCA to Address PCBs: <http://srtrtf.org/wp-content/uploads/2012/08/SRRRTF-to-EPA-final-approved-102313r.pdf>

⁷¹ Spokane Community Indicators, Average PCB concentration by type of fish and location: http://www.communityindicators.ewu.edu/graph.cfm?cat_id=4&sub_cat_id=1&ind_id=10

Task Force Member Output Data

1. Toxics Management Plans and Other Water Management Plans

The NPDES permits require municipal dischargers to prepare Toxics Management Plans.⁷² On April 24, 2013, Ecology provided its Toxics Management Plans review principles.⁷³

Outputs from toxics and water management plan activities:

City of Spokane^{74, 75}

- Identified potential industrial sectors and potential PCB sources.
- Identified Union Basin and a couple of other locations as having heightened levels of PCBs in stormwater.
- Interceptor source tracing activities point to the possibility that older areas of the wastewater treatment plant (WWTP) collection system have higher levels of PCBs.
- Installed storm drain markings for the Combined Sewer Overflow (CSO), infiltration and municipal stormwater (MS4) Systems: “only rain down the drain.”



- Prepared stormwater education guide in collaboration with Spokane River Forum, Spokane Riverkeeper, and Gonzaga University.⁷⁶
- Completed public education efforts to promote Low Impact Development (LID) (bill insert, brochure, website, and demonstration site).⁷⁷ The Hazel’s Creek demonstration site shows how implementation of LID will prevent PCB-contaminated runoff from entering the CSO and MS4 systems.
- **Low Impact Development (LID) incentive ordinances.** Revised the Spokane Municipal Code in August 2013, to encourage and incentivize the use of LID in Spokane. LID incentive ordinances were required by August 2013 as the result of a consent decree between the City of Spokane and the Spokane Riverkeeper, Center for Justice, and the Gonzaga University School of Environmental Law Clinic. The ordinance process involved the formation of an internal Technical

⁷² City of Spokane AWWTP, WA0024473; Liberty Lake Sewer and Water District, WA0045144; and Spokane County Regional Water Reclamation Facility, WA0093317.

⁷³ Department of Ecology, SRRTTF presentation, *Toxics Management Plans: Ecology Review Principles*: <http://srtrtf.org/wp-content/uploads/2013/04/Ecology-Toxics-Mgmt-Plan-Review.pptx>

⁷⁴ Letters from Ellie Key, Department of Ecology to Dale Arnold, City of Spokane, dated January 13, 2014; October 13, 2014; and November 9, 2015 regarding evaluation of City of Spokane Toxics Management Plan, NPDES Permit No. WA 0024473.

⁷⁵ City of Spokane, Toxics Management Plan Updates 2012, 2013, 2014.

⁷⁶ Spokane River Forum website: <http://www.spokaneriver.net/spokanestormwater/book.swf#p=12>

⁷⁷ City of Spokane website: <https://my.spokanecity.org/publicworks/stormwater/green-infrastructure/> and <https://my.spokanecity.org/publicworks/stormwater/hazels-creek/>

Advisory Committee as well as public involvement through a Stakeholders' Group. Technical standards and LID best management practices were developed and included in the Eastern Washington Low Impact Development Guidance Manual.⁷⁸

- Updated the City of Spokane Website to raise environmental awareness and connect with the public. The website now includes new pages for PCBs, the Integrated Clean Water Plan, fact sheets about Union Basin, blogs and the PCB-free purchasing policy.⁷⁹

City of Spokane Adaptive Management Plan for PCBs in Stormwater and Sediments

The City of Spokane uses an adaptive management approach to reduce PCBs in stormwater discharges. Using this three-step approach, the City 1) analyzes and interprets existing data; 2) identifies likely sources of PCBs, and 2) designs and implements remedial actions and BMPs.

The City presented for Task Force review its 2013 Annual report on June 26, 2013.⁸⁰ The report documents the results of catch basin sediment sampling since 2010 and compares rates of **PCB removal from catch basins resulting from cleaning activities**. The 2013 report concludes that:

- Individual sources are difficult to identify.
- Sources of PCBs are widespread and diffuse and includes legacy sources exist from historic industrial activity and PCBs found in everyday items (motor oil, hydraulic fluid, etc.).

The City presented to the Task Force its 2014 annual update on July 23, 2014.⁸¹ The report summarizes the 2013 stormwater system sampling and **notes a correlation between elevated concentrations of PCBs in stormwater and high wind events**. In addition to the observations from the previous year's report, the City noted that it was:

- Designing treatment and infiltration in Union basin, which would disconnect that basin from the river.
- Evaluating other PCB reduction opportunities as part of the Integrated Clean Water Plan.

Combined Sewer Overflow (CSO) Plan

The City of Spokane amended its CSO Plan on December 31, 2013⁸² intending to reduce the frequency and volume of CSOs at the remaining outfalls, starting in January 2014. At the end of 2014, the City

⁷⁸ Eastern Washington LID Guidance Manual: <http://www.wastormwatercenter.org/ew-lid-guidance-manual>

⁷⁹ Department of Ecology meetings with individual Task Force Members April 20-30, 2015.

⁸⁰ City of Spokane Wastewater Management, An Adaptive Management Plan for PCBs in Stormwater and Sediments: <http://srrttf.org/wp-content/uploads/2013/06/SRRTTF-2013-Annual-Report-Presentation.pdf>, City of Spokane 2012 Annual Stormwater Report: <https://static.spokanecity.org/documents/publicworks/stormwater/management/2012-stormwater-annual-report.pdf>

⁸¹ 2014 Annual Report, Adaptive Management Plan for Reducing PCBs in Stormwater Discharges, July 23, 2014: <http://srrttf.org/wp-content/uploads/2014/07/SRRTTF-2014-Annual-Report-Presentation.pdf>, City of Spokane 2013 Annual Stormwater Report: <https://static.spokanecity.org/documents/publicworks/stormwater/management/2013-stormwater-annual-report.pdf>

⁸² City of Spokane, *CSO Plan Amendment*, Draft: <https://static.spokanecity.org/documents/publicworks/wastewater/cso/2013/2013-cso-plan-amendment.pdf>

reported having reduced the number of Spokane River CSO outfalls from 24 (permitted number in 2000) to 20.⁸³ When fully implemented by 2017, the City anticipates that it will reduce the number of CSO discharges from 225 in 2013 to 13 in 2017, with a reduction in volume from 51 million gallons to 8 million gallons.

Integrated Clean Water Plan

During 2012, the City of Spokane revealed its integrated planning strategy for reducing the discharge of pollutants to the Spokane River. The City of Spokane presented for Task Force review its Integrated Clean Water Plan⁸⁴ on June 26, 2013, and updated the Task Force⁸⁵ on April 23, 2014. The plan, finalized in December 2014,⁸⁶ intends to reduce both stormwater and CSO discharges in an integrated manner by focusing on the basins where the greatest amount of pollutants enter the river. **Its holistic approach considers all Clean Water Act discharges and works to reduce sanitary effluent, stormwater, and CSO discharges by focusing on projects that have the greatest positive impact to the river.** PCBs were one of the major pollutants considered when selecting alternatives.

To fund some of the projects in the Integrated Clean Water Plan, the City sold \$200 million in Water Wastewater Utility “green” revenue bonds in November 2014. Also in November 2014, Spokane citizens approved a new 20-year levy for street reconstruction and rehabilitation. This levy will provide about \$25 million per year in funding for integrated streets that accommodates multiple modes of travel as well as above and below ground utility needs. As part of the levy program, the City has committed to managing stormwater on site as they rebuild streets. This will reduce the amount of stormwater and related pollutants reaching the river. The City is using green infrastructure techniques, from bioretention and bio-infiltration facilities to pervious pavement treatments. In addition, the City is embedding this “integrated” approach into a current update of its 20-year Comprehensive Plan.

The City notes in its presentations on the Integrated Plan, the need for funding to implement the plan.⁸⁷ Example projects requiring funding that provide PCB removal benefit include:

- **Cochran Basin:** The Cochran Basin stormwater basin is the City’s largest MS4 basin, encompassing nearly 50% of the entire MS4 system. About 250 million gallons of runoff flow from the basin in an average year with peak flows that can exceed 100,000 gallons per minute. The City estimates PCB loading from the Cochran basin at 15 mg/day on an annual average basis. The Integrated Clean Water Plan identifies a \$34 million solution that will prevent 14 mg/day of PCBs from directly entering the river. The solution involves constructing a series of

⁸³ City of Spokane, *Combined Sewer Overflow Annual Report, FY2014*, <https://static.spokanecity.org/documents/publicworks/wastewater/cso/2014-annual-cso-report.pdf>

⁸⁴ City of Spokane, *Integrated Clean Water Plan*, presentation June 26, 2013: <http://srtrtf.org/wp-content/uploads/2013/06/City-of-Spokane-Integrated-Planning.pdf>

⁸⁵ City of Spokane, *Integrated Clean Water Plan*, presentation, April 2014: <http://srtrtf.org/wp-content/uploads/2014/04/City-of-Spokane-Integrated-Plan-PPT-4-22-14.pdf>

⁸⁶ City of Spokane, *Integrated Clean Water Plan, Final*, December, 2014: <https://my.spokanecity.org/publicworks/wastewater/integrated-plan/>; City of Spokane, *PCB Reduction Activities: Accomplishments and Plans for Reducing PCBs in Stormwater and Wastewater Discharges*, June 8, 2015.

⁸⁷ Department of Ecology meetings with individual Task Force Members April 20-30, 2015.

large storage and infiltration facilities that settle and infiltrate stormwater through an engineered soil layer, followed by plant uptake.

- **Next Level of Treatment:** The City is required to install enhanced Next Level of Treatment (NLT) (membrane filtration) at its wastewater treatment facility in order to meet wasteload allocations set in the 2011 Dissolved Oxygen TMDL for dissolved oxygen in the river. Once installed, NLT must operate during the critical season for dissolved oxygen, from March to October. Extending the operation of NLT year-round would remove an additional 18 mg/day of PCBs, bringing the total additional PCB removal from NLT to 58 mg/day thus reducing the annual average loading from roughly 70 mg/day to just 12 mg/day. The life cycle cost of year-round NLT operation is about \$15.5 million over a 25-year period; an amount included in the City's strategic capital budget.

The City coordinated with a variety of stakeholders and the public in creating the Integrated Clean Water Plan. The EPA, the Spokane Tribe, Spokane Riverkeeper, Lake Coeur d'Alene Waterkeeper, The Lands Council, and the Spokane River Regional Toxics Task Force provided support letters (the Task Force approved two letters of support^{88, 89}). Additionally, the U.S. Conference of Mayors' Water Council and the National Association of Clean Water Agencies endorsed the plan. All believe that the City of Spokane's Integrated Clean Water Plan is a meaningful investment in Spokane's future and a model for other communities within the state and nation.

Liberty Lake Sewer and Water District^{90, 91}

Liberty Lake Sewer and Water District Annual Toxics Management Plans (2013, 2014) provided evidence of the following:

- Collection and analysis of 18 influent and 12 effluent samples during the evaluation period. The results of the collection system testing and data analysis identify residential areas as potential sources of PCBs, possibly from consumer products, although no specific correlations could be identified. Further analysis of the congener data is needed.
- **Older neighborhoods have higher levels of PCBs in the system, specifically the pentaCB homologs.**
- Test results showed that certain sources (the drainage from Wet Well Drying Beds at the Reclamation Facility and a commercial car wash), previously identified as significant, can be removed from consideration.
- **LLSWD identified actions that prevent PCBs from entering the wastewater system**, including: monitoring of construction activities, inspection of car washes for proper maintenance and

⁸⁸ SRRRTF Letter to Governor Jay Inslee and Maia Bellon, sent May 30, 2014: <http://srrttf.org/wp-content/uploads/2014/06/SRRRTF-Support-Letter-CoS-Integrated-CW-Plan-Updated-5-28-14-FINAL.pdf>

⁸⁹ SRRRTF Letter to Governor Jay Inslee, dated July 24, 2014: <http://srrttf.org/wp-content/uploads/2014/07/SRRRTF-Letter-Governor-pship-COS-7-24-14.pdf>

⁹⁰ Letters from Ellie Key, Department of Ecology, to BiJay Adams, Liberty Lake Sewer and Water District, NPDES Permit No. WA 0045144; dated June 2, 2014 and July 7, 2015.

⁹¹ Liberty Lake Sewer and Water District, *Toxics Management Plan Update*, March 2015.

monitoring of pretreatment systems, inspection of manholes for silt intrusion, proper disposition of removed street sweepings and sediments.

- Public outreach regarding PCBs in four newsletters, presentations, and other materials.
- Collaboration and data sharing with other municipal permittees to further identify PCB source contributions.

Spokane County^{92, 93}

Spokane County shared the results of the 2013 and 2014 investigations done under their Toxics Management Plan.⁹⁴ The Annual Toxics Management Plans submitted to Ecology (2013, 2014 and 2015) provided evidence of the following:

- **A 4-year program approach of source investigation and identification, remediation and/or mitigation of individual sources, application of Best Management Practices, and application of pretreatment regulations.**
- Regular sample collection with a total of 14 sampling events during the evaluation period and analysis of the facility effluent and influent trunk line at seven locations.
- The County identified seven PCB source factors in the system using Positive Matrix Factorization (PMF). Both the influent and effluent contain PCB-11 in relatively high concentrations. Factorization of the congener profiles revealed Factor 1 in the effluent. This factor, similar but not identical to Aroclors 1016 and 1242, possibly represents the dissolved phase of PCBs which is not removed during the wastewater treatment process. The other factors (Factors 4-7) have varying levels of correlation with Aroclors 1242, 1248, 1254, and 1260). The proportions of the seven factors in influents were similar to each other but very different from the effluent. For example Factor 1, the dissolved phase low molecular weight Aroclors represented 3-4% of the influent and 46% of the effluent.
- The County was not able to identify specific sources of toxics. However, the data suggests that a large number of smaller sources rather than a small number of large sources contribute to the influent PCB concentrations.
- The County's public education efforts consist of a multimedia outreach program for residential and commercial/industrial sewer customers, including the following:^{95, 96}
 - Mailed about 40,000 bill inserts to residents, announcing the County Open house.
 - Open house: November 22, 2014.
 - PCB Annual Report presentations – Spokane River Forum: Mike Milne November 20, 2104; Pacific Northwest International Section of the Air and Waste Management

⁹² Letter from Ellie Key, Department of Ecology to Rob Lindsay, re: review of *Spokane County Toxics Management Plan*, NPDES Permit No. WA 0093317, dated June 24, 2013 and June 3, 2014.

⁹³ Spokane County Regional Water Reclamation Facility, *Toxics Management Plan Update*, April 2015

⁹⁴ Spokane County Toxics Management Plan presentations to SRRTTF: <http://srtrtf.org/wp-content/uploads/2013/04/County-TMP-Presentation-042313.pptx> and http://srtrtf.org/wp-content/uploads/2014/09/Spokane-County-Toxics-Manag.-Summary-Annual-Report-April-2014_Presentation.pdf

⁹⁵ Spokane County, Water Resources, Polychlorinated Biphenyls: <http://www.spokanecounty.org/wqmp/content.aspx?c=3102>

⁹⁶ Email from David Moss, Spokane County to Adriane Borgias and Ellie Key, Ecology, dated May 14, 2015.

Association: Rob Lindsay October 29, 2014; Pacific Northwest Clean Water Association: Lynn Williams October 29, 2014.

- Participates in and sponsors the Envirostars program, which supports environmentally responsible businesses.
- Updated PCB webpage.
- The County collaborated and shared data with other municipal permittees to further identify PCB source contributions.

Inland Empire Paper: PCB Source Identification Study

Inland Empire Paper's (IEP) literature review of source PCBs in pulp and paper mills identified azo pigments, specifically diarylide pigments (C.I. Pigment Yellow 12, C.I. Pigment Orange 13, and C.I. Pigment Red 38) as sources of by-product PCBs produced during pigment manufacture. Congener PCB 11 is associated with this PCB source.

As part of its source identification study, IEP collected samples for PCB analysis at seven locations within its paper recycling processing system. IEP expects to receive analytical results in the first quarter of 2015.⁹⁷

Kaiser Aluminum: PCB Source Identification Study

Kaiser Aluminum's source identification and cleanup actions during the assessment period included:

- Sampling and analysis of water and sediment in the plant's wastewater conveyance system.
- Comparison of sampling methods (SPMD, CLAM) to determine the reliability of sample collection methods for future internal source identification work.
- Sediment removal followed by confirmation and effectiveness sampling.⁹⁸

As part of its PCB source identification work, Kaiser Aluminum has also reviewed facility materials (hydraulic fluids, coatings on the casting pits, bottom block grease, soybean hydraulic oil, and castor oil) for the presence of PCBs.⁹⁹

2. PCB Chemical Action Plan

Ecology initiated and completed a draft **PCB Chemical Action Plan** during the Assessment period. Members of the Task Force participated in the development of the plan, which recommends and prioritizes specific actions that will reduce PCBs.

⁹⁷ Letter from Ryan Ekre, Inland Empire Paper to Patrick Hallinan, Ecology, dated October 31, 2014.

⁹⁸ Letters from Bernard Leber, Kaiser to Pat Hallinan, Ecology, dated August 15, 2012; February 15, 2013; August 15, 2013; and August 15, 2014.

⁹⁹ Department of Ecology meetings with individual Task Force Members April 20-30, 2015.

Ecology presented information about the Persistent Bioaccumulative Toxics Strategy and the PCB Chemical Action Plan to the Task Force on April 24, 2013. Ecology reviewed the Draft PCB Chemical Action Plan with the Task Force on September 24, 2014.^{100, 101, 102}

3. Columbia River Toxics Workgroup

Ecology and Spokane Riverkeeper participated in the Columbia River Toxics Reduction Working Group¹⁰³ throughout the assessment period, fostering collaboration and knowledge transfer regarding toxics reduction in the Columbia River Watershed. On August 28, 2013, EPA presented the Columbia River Toxics Reduction Strategy to the Task Force.¹⁰⁴

4. Urban Waters

Ecology's Spokane River Urban Waters team, the City of Spokane Wastewater Management Department, and Spokane Riverkeeper continued work on PCB source investigations in the City's stormwater and Combined Sewer Overflow system throughout 2012.¹⁰⁵

5. Source Reduction Activities

In 2014, the Center for Justice was involved in legislation prohibiting state agencies from purchasing PCB-containing products except when it is not cost-effective or technically feasible to do so.¹⁰⁶ The City of Spokane and Spokane County subsequently adopted similar ordinances in 2014.¹⁰⁷

6. Department of Ecology Publications and Presentations

Washington State Toxics Monitoring Program: Evaluation of SPMDs for Trend Monitoring of PBTs in Washington Waters, 2010-2011, Publication No. 12-03-036, June 2012.¹⁰⁸

¹⁰⁰ Department of Ecology SRRTTF presentation, *PBT Initiative and PCBs*, April 24, 2013: <http://srرتtf.org/wp-content/uploads/2013/04/Ecology-PBT-Initiative-and-PCBs-0423131.pptx>

¹⁰¹ Department of Ecology SRRTTF presentation, *Draft PCB CAP Public Meeting*, September 24, 2014: <http://srرتtf.org/wp-content/uploads/2014/09/Public-MeetingsPCBs.pdf>

¹⁰² Department of Ecology, *PCB Chemical Action Plan*, February 2015: <https://fortress.wa.gov/ecy/publications/SummaryPages/1507002.html>

¹⁰³ Columbia River Toxics Working Group: <http://www.epa.gov/columbiariver/trwg.html>

¹⁰⁴ EPA Update SRRTTF presentation: *Columbia River Toxics Reduction Strategy*: <http://srرتtf.org/wp-content/uploads/2013/08/August-2013-Spokane-Toxics-Task-Force-Presentation.pdf>

¹⁰⁵ Spokane River Urban Waters: <http://www.ecy.wa.gov/urbanwaters/spokaneriver.html>, Spokane City, Public Works and Utilities, Wastewater: <http://www.spokanewastewater.org/Stormwater.aspx>, Center for Justice, Spokane Riverkeeper.

¹⁰⁶ RCW 39.26.280: <http://apps.leg.wa.gov/rcw/default.aspx?cite=39.26.280>

¹⁰⁷ Spokane Municipal Code 76.06.172: <https://my.spokanecity.org/smc/?Section=07.06.172>; Spokane County Resolution #2014-1022 passed 12/16/2014.

¹⁰⁸ Department of Ecology, *Washington State Toxics Monitoring Program: Evaluation of SPMDs for Trend Monitoring of PBTs in Washington Waters, 2010-2011*: <https://fortress.wa.gov/ecy/publications/SummaryPages/1203036.html>

Recommendations for the Design of a Long-term Toxics Monitoring Program in the Mainstem of the Spokane River, intended to be a living document that aligns with the Task Force's work plan, Draft June 2012.¹⁰⁹

Spokane River Toxics Reduction Strategy, Publication Number 11-10-038, revised August 2012.¹¹⁰

Spokane River Urban Waters Source Investigation and Data Analysis Progress Report, Publication Number 12-04-025, September 2012.¹¹¹

SRRTTF Presentation, *Toxics Monitoring Plan for the Spokane River during Fiscal Year 2013 (FY13)*, Updated September 2012. In cooperation with the Spokane Tribe of Indians, Ecology initiated monitoring activities for toxics in fish and water in the Spokane River. The Spokane Tribe of Indians committed funding and personnel in support of fish sampling and analysis.¹¹²

Liberty Lake Source Trace Study Regarding PCB, PBDE, Metals, and Dioxin/Furan - A pilot project for Spokane Basin Source Tracing, Publication Number 10-04-027, Revised October 2012.¹¹³

Quality Assurance Project Plan: PCB Method Comparison of High Resolution and Homolog Analysis, Publication No. 12-03-127, November 2012.¹¹⁴

Quality Assurance Project Plan: Spokane River Toxics Fish Tissue and Preliminary Monitoring in Fiscal Year 2013 in Support of the Long-term Toxics Monitoring Strategy, Publication Number 13-03-103, January 2013.¹¹⁵

Focus on Local Source Control Partnership, Publication Number 13-04-002, February 2013.¹¹⁶

¹⁰⁹ <http://srrttf.org/wp-content/uploads/2012/07/Spokane-River-Longterm-Toxics-Monitoring-Plan-6-19-12-Final-Draft.docx>

¹¹⁰ Department of Ecology, *Spokane River Toxics Reduction Strategy*:

<https://fortress.wa.gov/ecy/publications/summarypages/1110038.html>

¹¹¹ Department of Ecology, *Spokane River Urban Waters Source Investigation and Data Analysis Progress Report*:

<https://fortress.wa.gov/ecy/publications/SummaryPages/1204025.html>

¹¹² <http://srrttf.org/wp-content/uploads/2012/09/Spokane-FY13-Toxics-sampling-Summary-for-SRRTTF-TWG-9-7-12.pdf>

¹¹³ Department of Ecology, *Liberty Lake Source Trace Study Regarding PCB, PBDE, Metals, and Dioxin/Furan - A pilot project for Spokane Basin Source Tracing*:

<https://fortress.wa.gov/ecy/publications/SummaryPages/1004027.html>

¹¹⁴ Department of Ecology, *Quality Assurance Project Plan: PCB Method Comparison of High Resolution and Homolog Analysis*: <https://fortress.wa.gov/ecy/publications/documents/1203127.pdf>

¹¹⁵ Department of Ecology, *Quality Assurance Project Plan: Spokane River Toxics Fish Tissue and Preliminary Monitoring in Fiscal Year 2013 in Support of the Long-term Toxics Monitoring Strategy*:

<https://fortress.wa.gov/ecy/publications/SummaryPages/1303103.html>

¹¹⁶ Department of Ecology, *Focus on Local Source Control Partnership*:

<https://fortress.wa.gov/ecy/publications/documents/1304002.pdf>

Focus on Clean Water, Fund innovative approach to get PCBs out of the Spokane River, Publication Number 13-10-003, February 2013.¹¹⁷

Roadmap for Advancing Green Chemistry in Washington State, Publication Number 12-04-009, updated May 2013.¹¹⁸

Quality Assurance Project Plan: Freshwater Fish Contaminant Monitoring Program, Publication Number, 13-03-111, May 2013. SRRTTF Presentation August 2013.¹¹⁹

Eastern Washington Low Impact Development Guidance Manual, Publication Number 13-10-036, June 2013.¹²⁰

Establishing a Pacific Northwest Green Chemistry Center, Publication Number 14-04-005, January 2014.¹²¹

PCB Method Comparison of High and Low Resolution Sediment Analysis, Publication Number 14-03-009, March 2014.¹²²

SRRTTF Presentations, *High Volume Sampling Methods Evaluation* (August 13, 2013 and April 23, 2014).¹²³

Freshwater Fish Contaminant Monitoring Program: 2012 Results, Publication Number 14-03-020, May, 2014. SRRTTF presentation, results of 2012 fish tissue sampling (April 23, 2014).¹²⁴

Addendum #1 to Quality Assurance Project Plan - PCBs in General Consumer Products, Publication Number 13-04-008a, July 2014.¹²⁵

¹¹⁷ Department of Ecology, *Focus on Clean Water, Fund innovative approach to get PCBs out of the Spokane River*: <https://fortress.wa.gov/ecy/publications/documents/1310003.pdf>

¹¹⁸ Department of Ecology, *Roadmap for Advancing Green Chemistry in Washington State*: <https://fortress.wa.gov/ecy/publications/documents/1204009.pdf>

¹¹⁹ Department of Ecology, *Quality Assurance Project Plan: Freshwater Fish Contaminant Monitoring Program*: <https://fortress.wa.gov/ecy/publications/documents/1303111.pdf>; SRRTTF Presentation: <http://srرتtf.org/wp-content/uploads/2013/08/SRRTTF-Update-8-28-13-2.pdf>

¹²⁰ Department of Ecology, *Eastern Washington Low Impact Development Guidance Manual*: <https://fortress.wa.gov/ecy/publications/SummaryPages/1310036.html>

¹²¹ Department of Ecology, *Establishing a Pacific Northwest Green Chemistry Center*: <https://fortress.wa.gov/ecy/publications/SummaryPages/1404005.html>

¹²² Department of Ecology, *PCB Method Comparison of High and Low Resolution Sediment Analysis*: <https://fortress.wa.gov/ecy/publications/SummaryPages/1403009.html>

¹²³ Spokane River Toxics Monitoring 2012-2013, Surface water (Grab composites and CLAM) and Sediment Traps: <http://srرتtf.org/wp-content/uploads/2014/04/SRRTTF-4-23-14-2014.pdf> and <http://srرتtf.org/wp-content/uploads/2013/08/SRRTTF-Update-8-28-13-2.pdf>

¹²⁴ Department of Ecology, *Freshwater Fish Contaminant Monitoring Program: 2012 Results*: <https://fortress.wa.gov/ecy/publications/SummaryPages/1403020.html> and SRRTTF presentation; <http://srرتtf.org/wp-content/uploads/2014/04/SRRTTF-4-23-14-2014.pdf>

¹²⁵ Department of Ecology, *Addendum #1 to Quality Assurance Project Plan - PCBs in General Consumer Products*: <https://fortress.wa.gov/ecy/publications/SummaryPages/1304008a.html>

Focus on Chemicals in Consumer Products, Publication Number 14-04-042, August 2014.¹²⁶

Polychlorinated Biphenyls (PCBs) in General Consumer Products, Publication Number 14-04-035, August 2014.¹²⁷

Quality Assurance Project Plan: Lake Spokane PCBs in Carp, Publication Number 14-03-123, October 2014.¹²⁸

Quality Assurance Project Plan: Little Spokane River PCBs in Fish Tissue Verification Study, Publication Number 14-03-127, December 2014.¹²⁹

7. Department of Ecology Contracts

- 2012 NPDES permittees and Spokane Tribe for Task Force facilitation support.
- 2012, 2013 Ruckleshaus Center facilitation services.
- 2013, 2014 Cooperative Agreement with Spokane County for TASK FORCE support.
- 2014 Contract with the SRRTTF Administrative and Contracting Entity for Task Force support.

8. Product Sampling and Analysis

On December 17, 2014 the City of Spokane presented preliminary results of its products sampling study¹³⁰, funded by Ecology's municipal stormwater Grants of Regional or Statewide Significance (GROSS) program. The study identified PCBs in almost every product. The two most significant findings were PCBs in hydroseed and road deicer salt.

The Department of Ecology engaged in similar analyses under its Hazardous Waste and Toxics Reduction program.^{108, 109, 110}

¹²⁶ Department of Ecology, *Focus on Chemicals in Consumer Products*:

<https://fortress.wa.gov/ecy/publications/documents/1404042.pdf>

¹²⁷ Department of Ecology, *Polychlorinated Biphenyls (PCBs) in General Consumer Products*:

<https://fortress.wa.gov/ecy/publications/documents/1404035.pdf>

¹²⁸ Department of Ecology, *Quality Assurance Project Plan: Lake Spokane PCBs in Carp*,

<https://fortress.wa.gov/ecy/publications/SummaryPages/1403123.html>

¹²⁹ Department of Ecology, *Quality Assurance Project Plan: Little Spokane River PCBs in Fish Tissue Verification Study*: <https://fortress.wa.gov/ecy/publications/SummaryPages/1403127.html>

¹³⁰ SRRTTF Presentation: http://srrttf.org/wp-content/uploads/2014/12/SRF14_PCB-Product-Sampling.pdf

Trends Relating to Outputs

The table below summarizes the trends in relevant outputs created by the Task Force or by Task Force organizations in support of toxics identification and reduction.

Outputs	2012	2013	2014
Reports	8	6	13
Plans	1	6	5
Studies	1	1	1
Workshops	1	1	0
Contracts	10	2	6
New Permits Issued	1	0	3

Recommendations Relating to Outputs

1. The most effective way to control toxics is to reduce or eliminate toxics at the point of manufacture. The Task Force should continue efforts such as:
 - Work with EPA to eliminate or reduce the production of inadvertently produced PCBs that is currently allowable under the Toxics Substances Control Act (TSCA) regulatory program. Reduce the currently allowable use limit of 50 ppm.
 - Work with Congress on TSCA reform legislation that better aligns PCB limits with limits under the Clean Water Act.
2. Eliminate use of PCB-containing products when feasible:
 - Continue to identify products containing PCBs. Develop and implement action plans to reduce the purchase and use of those products.
3. Improve management of PCB-containing materials to control release of PCBs to the environment:
 - Develop a comprehensive Spokane River toxics reduction plan. Consider the results of past and future studies and implementation actions, including those conducted by individual dischargers with their operation or service areas.
 - Develop recommendations and Best Management Practices for specific actions that will reduce toxics and/or prevent or control release of PCBs to the environment.
 - Implement recommendations from Ecology's PCB Chemical Action Plan:
 - Identify PCB-containing lamp ballasts in schools and other public buildings. Remove remaining PCBs lamp ballasts from schools and other publically owned buildings. Encourage replacement with more energy efficient PCB-free fixtures.
 - Reduce exposure to people from PCBs in historic building materials and prevent PCBs in building materials from getting into stormwater. Develop and promote Best Management Practices (BMPs) to contain PCBs in building materials currently in use and in those slated for remodel or demolition.
 - Assess schools and other public buildings for the presence of PCB-containing building materials.
 - Reduce newly generated PCBs in manufacturing processes. Learn more about what products contain PCBs and promote the use of processes that do not inadvertently generate PCBs.

- Confirm estimates of EPA-regulated electrical equipment with more than 500 parts per million (ppm) PCBs, learn what is known about electrical equipment with PCBs greater than 2 ppm, and find out when such electrical equipment is estimated to be replaced. Survey owners of historic electrical equipment, including transformers and large capacitors.
- Expand environmental monitoring to identify any new areas requiring cleanup and investigate air deposition. Find areas with highly concentrated PCBs and clean them up to prevent the wider release of PCBs.
- Conduct a public educational campaign. Provide information to residents about ways they can minimize exposure. Raise awareness of the problems associated with current and past production of PCBs. Educate residents to identify and address possible household sources of PCBs.
- Toxics Management Plan recommendations
 - Identify actions to reduce toxics inputs to the wastewater treatment system. Establish protocols to monitor and assess the effectiveness of toxics reduction efforts for:
 - Pretreatment.
 - Identification, implementation, and assessment of Best Management Practices.
 - Management of PCBs in construction and demolition materials.
 - Reducing input from commercial products containing PCBs.
 - Collaboratively produce public educational materials with region wide branding, similar to the “Puget Sound Starts Here” program.
- 4. Disposal and End of Pipe Treatment:
 - Improve treatment facilities in accordance with permit requirements.
 - City of Spokane’s Next Level of Treatment (membrane technology) is due at the end of 2021. The City has started pilot tests to evaluate membrane filters.¹³¹
 - Evaluate Inland Empire Paper’s Algevolve system for potential PCB removal benefits.
- 5. Permitting recommendations:
 - Evaluate impact and environmental fate of PCBs in biosolids.
 - Use a consistent framework for the Toxics Management Plans, “plan, do, check, act.”¹³²
 - Environmental Goals:
 - Reduce toxics loadings (including PCBs).
 - Bring Spokane River into compliance with state Water Quality Criteria for PCBs.
 - Objectives:
 - Reduce Loadings of PCBs to the Spokane River.
 - Ambient concentration of PCBs in the Spokane River meets the state Water Quality Criteria.
 - Remove Spokane River from 303(d) list.
 - Targets:
 - Achieve a statistically significant reduction of toxics in influents over the next 10 years.

¹³¹ Department of Ecology meetings with individual Task Force Members April 20-30, 2015.

¹³² Department of Ecology, SRRTF presentation, *Toxics Management Plans: Ecology Review Principles*: <http://srrtf.org/wp-content/uploads/2013/04/Ecology-Toxics-Mgmt-Plan-Review.pptx>

- Reduce PCBs in the effluent through source identification and reduction, implementation of BMPs, installation of the next level of treatment technologies for phosphorus reduction, and (if necessary) evaluation of additional treatment technologies for PCBs.
6. Complete the Comprehensive Plan by December 31, 2016. Include in the plan:
- A summary of the available data for PCBs in Spokane River water, fish tissue, and sediments.
 - A list of the identified sources of PCBs in the Spokane River with estimates of current loadings.
 - A range of BMPs expected to reduce or eliminate PCBs for each source or category of sources.
 - Recommendations for BMP implementation.
 - Recommendations for future studies to address remaining data gaps.

Evaluation of Outcomes

Criteria relating to the evaluation of Outcomes

Outcomes include the environmental results and measurable source reductions in the river as well as quantifiable source reduction actions. Outcomes indicate the effectiveness of actions that have been taken and quantify the amount of PCB known to have been removed from the Spokane River and Spokane River watershed.

Outcomes are important throughout the entire process but of higher priority after the first permit cycle. Examples of output measures include trending levels of PCB in fish and the water column, achievement of the applicable water quality standards for PCBs, permit compliance status and environmental trends relating to PCBs.

Ecology will evaluate if specific source reduction activities have been taken, and the amount of PCBs that have been removed because of those activities. This includes measured amounts of PCBs eliminated, isolated, or removed from the water, or watershed; including PCBs eliminated from river discharges, stormwater, and other sources. If source reduction activities do not result in decreasing toxics in the river, then Ecology and the Task Force will reevaluate the approach.

Ecology is obligated to proceed with the development of a TMDL in the Spokane River for PCBs or determine an alternative to ensure water quality standards are met if, in the evaluation of measurable progress, source reduction activities are absent or permittees do not comply with permit conditions.

Results Summary

Ecology concludes that the Task Force has partially achieved measurable progress with respect to the outcome criteria.

Task Force activities have resulted in the elimination of measurable quantities of PCBs. Activities such as stormwater maintenance activities, remedial clean up actions, and transformer removal actions have removed PCBs or prevented them from entering the Spokane River.

Wastewater treatment plants have demonstrated the ability to remove PCB from wastewater, which will be further improved prior to the end of the next 5-year permit cycle beginning in 2016. Tertiary membrane filtration upgrades at both the City of Spokane and Liberty Lake Sewer and Water District will

result in physical removal of PCB from their wastewater effluent; thereby, reducing point source PCB loading to the Spokane River.

Recent data shows that in many locations the concentration of PCBs in the river meets or is below the PCB water quality standard of 170 ppq. However, in a few locations, data points show that PCB concentrations substantially exceed the standard.

The concentrations of PCBs in fish significantly decreased from 1996 to 2005. More recent sampling from 2012 potentially shows decreasing trends, although this cannot be statistically verified with available data. The concentrations of PCBs in fish consistently exceed the fish consumption advisory level recommended by the Department of Health. Ecology expects that seeing statistically verifiable reductions in fish tissue PCB concentrations as a result of both nonpoint and point source PCB loading may take several years given PCBs bioaccumulate in fish tissue.

By December 2016, the Task Force expects to complete its Comprehensive Plan. This plan, which will contain Best Management Practices (BMPs) applicable to stormwater, wastewater and other sources, will address the toxics reduction activities needed to bring the Spokane River into compliance with water quality standards. Because the Task Force has not completed the plan or developed BMPs, Ecology is not able to evaluate progress on these elements.

During the next permit cycle, Ecology will place greater emphasis on the evaluation of outputs. Because Ecology recognizes that PCBs are persistent in the environment, reductions in fish tissue concentrations may take longer than reductions in water concentrations when PCB sources are removed. Even though the Task Force is actively engaged in source identification and reduction, unknown and unidentified sources of PCB may also cause environmental levels of PCBs to increase. Therefore, it may take several permit cycles before environmental monitoring demonstrates compliance with applicable water quality and public health standards.

Task Force Outcome Data

1. Monitoring and assessment of the effectiveness of toxic reduction measures.

On September 24, 2014, the Spokane River Stewardship Partners (SRSP) submitted a draft summary of PCB reduction activities.¹³³ The SRSP reports that **since 1991, Washington NPDES facilities on the Spokane River have removed an estimated 18,957 grams of PCB** through implementation of treatment plant upgrades and source removal activities.

2. Progress towards achieving water quality standards for PCB.

The 2014 Synoptic Sampling results illustrate the range of PCB concentrations in the Spokane River during low flow conditions. The data show that under these conditions, **the Spokane River meets water quality standards at Barker Road and upstream of that location.** The concentration of PCB is close to or just above the water quality standard at the Trent St and Pines Road sampling location and at

¹³³ Spokane River Stewardship Partners, *SRSP Measurable Progress: A Summary of Collective SRSP – PCB Reduction Activities: DRAFT for Discussion* <http://srrttf.org/wp-content/uploads/2014/09/Measurable-Progress-SRSP-PCB-reduction-activities-short-form-9-9-2014-.pdf>

locations downstream. **Anomalies, or “outlier data”, observed at Trent Street, Spokane Gauge, and Hangman Creek were significantly above the water quality standard.**¹³⁴ See Figures 1 and 2.

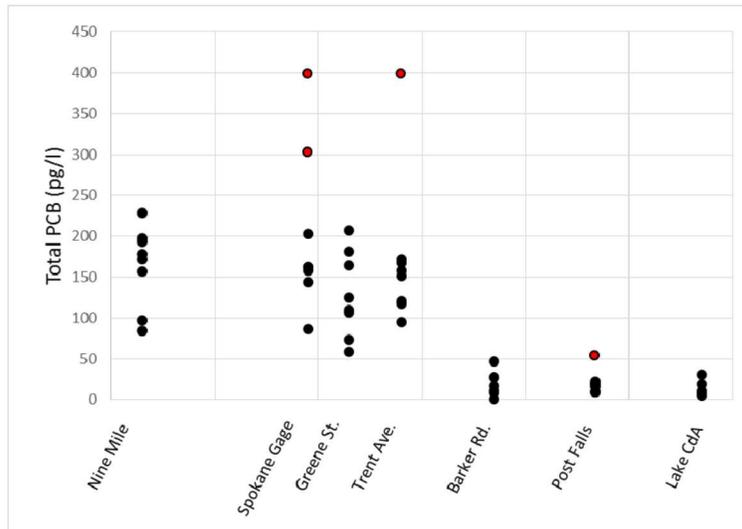


Figure 1. Spokane River Total PCB Concentrations Measured during Synoptic Survey (Outliers in Red)

	8/12	8/14	8/16	8/18	8/20	8/22	8/24	Composit e
Nine Mile	160/ 200*	200	180	170	230	98	84	140
Hangman Ck.	64	66	67/ 73*	53	2400	270	35	95
Spokane Gage	160	160/ 140*	300	200	160	400	86	140
Greene St.	160	210	110	120/ 110*	180	74	59	120
Trent Ave.	170	120	150	400	160/ 170*	95	120	110
Barker Rd.	28	17	9	47	11	1/ 28*	10	29
Post Falls	53	9	22	19	17	19	17/ 9*	230
Coeur d'Alene	19	31	11	9	7	7	5	11

*Replicate sample

Figure 2. River Total PCB Concentrations (pg/l) used in 2014 Mass Balance Assessment

¹³⁴ LimnoTech, *Spokane River Regional Toxics Task Force Phase 2 Technical Activities Report: Identification of Potential Unmonitored Dry Weather Sources of PCBs to the Spokane River*, 2015: http://srrttf.org/wp-content/uploads/2015/08/SRRTTF_Phase_2_Final_Report_2015_08_12-plus-AppendixA.pdf

3. Progress towards achieving applicable public and environmental health standards.

The goals of Ecology’s Freshwater Fish Contaminant Monitoring Program in 2012 were to: (1) characterize contaminant levels in fish, and (2) determine spatial and temporal patterns in contaminant levels in Spokane River fish. **Results from the Spokane River showed that levels of PCBs and PBDEs in fish remain elevated compared to most areas in Washington.** Ecology found differences in PCBs and PBDEs along the Spokane River for about half of the 21 site-species pairings examined.

Concentrations of PBDEs in mountain whitefish from the Nine Mile reach were approximately 4 to 10 times higher than in fish from other sites in the river.

In some cases, concentrations found in 2012 appear to be lower than in 2005, although this observation cannot be statistically verified. For PCBs, two of eleven cases show a decrease, with both cases occurring in the Mission Park reach. For PBDEs, five of eleven cases show a decrease.¹³⁵

4. Actions that eliminated, removed or isolated sources of PCB from the river or watershed.

Avista reports that **Avista’s transformer replacement project, has removed sources of PCBs** from the watershed.¹³⁶ See Figure 3.

PCB Concentration	Year 2011	Year 2014	Percent units removed
1-49 ppm	11766	3838	67%
50-500 ppm	891	191	78%
500+ ppm	38	1	97%

Figure 3. Summary of Avista’s Transformer Removal Actions.

This represents all transformers in the Avista system, not just Spokane River. As of April 22, 2015, more than 9600 transformers have been removed, including the single transformer with > 500 ppm PCBs. Avista calculates that this effort has taken approximately 18 pounds of PCBs out of the distribution system in the Spokane River Watershed.¹³⁷

5. Implemented actions from the Spokane River comprehensive toxics reduction plan.

The Task Force has not completed the Spokane River comprehensive toxics reduction. No measurable progress for this item. Ecology will evaluate this metric during the next assessment period.

¹³⁵ Department of Ecology, *Freshwater Fish Contaminant Monitoring Program: 2012 Results*: <https://fortress.wa.gov/ecy/publications/SummaryPages/1403020.html> and SRRTTF presentation; <http://srرتtf.org/wp-content/uploads/2014/04/SRRTTF-4-23-14-2014.pdf>

¹³⁶ Presentation to SRRTTF by Avista (May 28, 2014): *Distribution Transformer Change Out Program*: <http://srرتtf.org/wp-content/uploads/2014/05/Transformer-change-out-5-28-14.pdf>

¹³⁷ Email communication from Bruce Howard, Avista Corporation to Jim Bellatty, Department of Ecology, dated April 22, 2015.

6. Implemented Best Management Practices.

The Task Force has not developed, recommended, or implemented Best Management Practices. No measurable progress for this item. Ecology will evaluate this metric during the next assessment period.

Task Force Member Outcome Data

1. Kaiser Aluminum

Interim Clean up Actions

On October 22, 2014, Kaiser Aluminum reported on PCB removal and disposal activities at the West Discharge Ravine.¹³⁸ Based on a 2006 investigation, Kaiser and Ecology agreed upon the removal and off-site disposal of PCB-containing soil as an Interim Action. In 2007, Kaiser removed, for off-site disposal, 2500 cubic yards of soil holding an estimated 250 pounds of PCB. Some contaminated soil remained after the cleanup. An additional study in 2011 resulted in further capping at the upper-lower ravine and excavation activities in the lower-lower ravine. In 2014, Kaiser **removed, for off-site disposal, about 1,500 to 2,000 cubic yards of PCB-contaminated soil.**

Removal Action Performed under Agreed Order No. 2868

From 2008 through 2012, Kaiser Aluminum performed removal actions at its lagoon and sewer system. The lagoon and sewer cleanouts are showing results. Concentrations of PCBs in these locations have decreased from more than 500 ppm ten years ago to about 4-5 ppm.¹³⁹

The estimated mass of PCB removed from these actions is:¹⁴⁰

• Lagoon (2008)	4.7 lbs
• Sewer Phase 1 – Lot 1 (2009-2012)	7.2 lbs
• Sewer Phase 1 – Lot 2 (2009-2012)	0.6 lbs
• Sewer Phase 1 – Lot 3 (2009-2012)	0.7 lbs
• Sewer Phase 2 – Lot 1 (2009-2012)	<u>1.2 lbs</u>
Total	14.4 lbs

To address PCBs in groundwater, Kaiser is installing a 50-gpm pilot treatment system and expects it to be up and running during the third quarter 2015. Since this is part of the remedial action cleanup Kaiser will need to identify a plan for disposal of the treated groundwater.¹⁴¹

¹³⁸ Presentation to SRRTF by Kaiser Aluminum, October 22, 2014: http://srtrtf.org/wp-content/uploads/2014/10/PCB-related-cleanup-at-Trentwood_Kaiser-Presentation.pdf

¹³⁹ Department of Ecology meetings with individual Task Force Members April 20-30, 2015.

¹⁴⁰ Email communication from Bud Leber, Kaiser Aluminum to Adriane Borgias and Pat Hallinan, Department of Ecology, dated April 28, 2015.

¹⁴¹ Department of Ecology meetings with individual Task Force Members April 20-30, 2015.

2. City of Spokane^{142, 143}

Source Removal Actions

Removal and replacement of older electrical and mechanical equipment (potential sources of PCB) occurred prior to the evaluation period.

Removal of PCB-contaminated Sediment from Stormwater System

During the assessment period (2012), the City of Spokane removed 39,600 pounds (lbs) of sediments, resulting in a **reduction of about 2.7 grams of PCBs from the system**. Prior to the assessment period, the City removed 26 grams of PCBs contained in 280,000 lbs. of sediment (2010) and an estimated 3.7 grams of PCB contained in 268,000 lbs (2011).

Stormwater Decant Facility

In August 2014, the City completed construction of a decant facility at the Playfair site to manage stormwater catch basin solids and liquids. The facility uses evaporation to manage the liquid waste rather than discharge to the sewer, effectively preventing this PCB source from reaching the sanitary system. Based on available data, the City estimates that its **routine maintenance removes about 25 grams of PCBs annually** from the catch basin sediments in the storm sewer system.

Combined Sewer Overflow Facilities

The City's original sewer infrastructure combines the sanitary sewer system with the stormwater collection system. During high flow storm events, the combined sewer overflow (CSO) diverts portions of the flows to the river rather than routing the flow through the wastewater treatment facility. In order to curtail the number of CSO overflow events occurring throughout the year (and subsequent discharge of untreated storm and sewage to the river), the City's approach is to build storage tanks that equalize storm flow so that stormwater/wastewater is fully treated at the City's permitted wastewater facility. The City estimates that the **current wastewater plan treatment processes typically remove around 90% of the PCBs entering the treatment plant**.

The City's CSO Reduction Plan contains a variety of engineering actions aimed at decreasing the number of CSO overflow events. **The CSO Reduction Plan will bring all remaining CSO outfalls into compliance with WAC 173-245 by December 31, 2017**. This ultimately prevents/decreases the potential for PCBs to enter the river from this pathway.

As of the end of 2014, the City of Spokane operated seven CSO control facilities and nine reconfigured CSO regulators (weir modifications), and has eliminated four CSO outfalls. The City has also initiated construction of one up-basin CSO tank and substantially completed another up-basin CSO tank that will

¹⁴² Letters from Ellie Key, Department of Ecology to Dale Arnold, City of Spokane, dated January 13, 2014; October 13, 2014; and November 9, 2015 regarding evaluation of City of Spokane Toxics Management Plan, NPDES Permit No. WA 0024473.

¹⁴³ City of Spokane, *Toxics Management Plan Update*. (2012, 2013, 2014).

increase the use of the collection system for storage and reduce wet weather peak flow at the CSO 34 regulator. Construction of a CSO tank in basin 33 has started.¹⁴⁴

Enhanced Treatment of City Effluent

Spokane County Wastewater Reclamation facility treats up to 8 million gallons per day of wastewater that was previously treated by the City. The County's facility uses membrane treatment technology that removes PCBs from wastewater more efficiently than the City's treatment plant. The membrane technology used the County resulted in the removal of an additional 27 milligrams of PCB per day than if the wastewater was treated by the City. This calculates to the removal of 29,000 milligrams (29 grams) of PCB over the assessment period, which would have otherwise been discharged to the river through the City's treatment plant.¹⁴⁵

2. Liberty Lake Sewer and Water District^{146,147}

Source Removal Actions

- Monitoring of influent and effluent PCB concentrations indicate that **the treatment plant likely removes 92-98% of the PCBs prior to discharge.**
- LLSWD no longer disposes of street sweepings and sediments in the sewer system.
- The removal and replacement of older electrical and mechanical equipment (potential sources of PCB) occurred prior to the evaluation period.

3. Spokane County Water Reclamation Facility^{148, 149}

Source Removal Actions

- **Wastewater treatment membranes are highly efficient at reducing PCB and other toxic concentrations in effluent.** The County estimates that the membrane filters remove 402 mg/day of PCB, and that during the assessment period the County facility has removed a **total** of 434,600 mg of PCBs.¹⁵⁰
- Elimination of older county-owned mechanical and electrical machinery, including all known PCB-containing light ballasts occurred prior to the evaluation period.

¹⁴⁴ City of Spokane, *2014 Annual CSO Report*,

<https://static.spokanecity.org/documents/publicworks/wastewater/cso/2014-annual-cso-report.pdf>

¹⁴⁵ Email from David Moss, Spokane County to Adriane Borgias and Ellie Key, Ecology, dated May 14, 2015.

¹⁴⁶ Department of Ecology, Liberty Lake Sewer and Water District, NPDES Permit No. WA 0045144; Letters to BiJay Adams dated June 2, 2014 and July 7, 2015.

¹⁴⁷ Liberty Lake Sewer and Water District, *Toxics Management Plan Update*, March 2015.

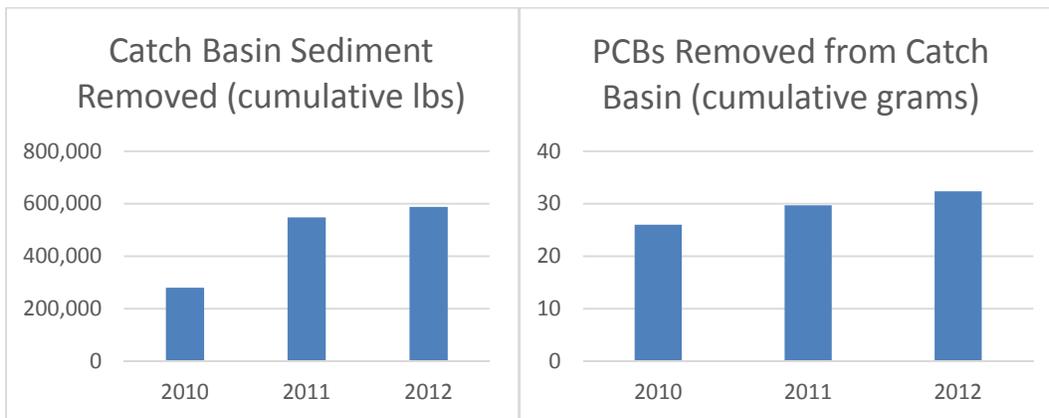
¹⁴⁸ Letter from Ellie Key, Department of Ecology to Rob Lindsay, re: review of *Spokane County Toxics Management Plan*, NPDES Permit No. WA 0093317, dated June 24, 2013 and June 3, 2014.

¹⁴⁹ Spokane County Regional Water Reclamation Facility, *Toxics Management Plan Update*, April 2015

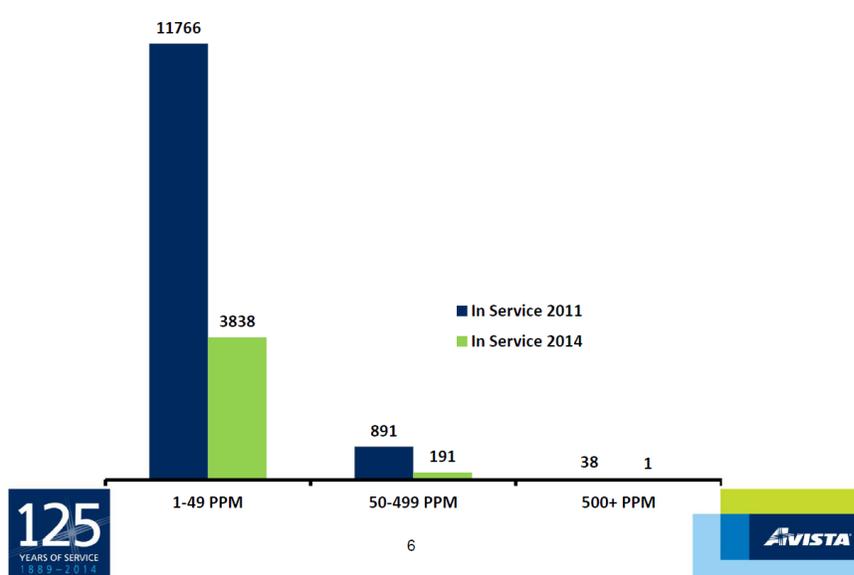
¹⁵⁰ Email from David Moss, Spokane County to Adriane Borgias and Ellie Key, Ecology, dated May 14, 2015.

Trends Relating to Outcomes

City of Spokane Catch Basin Sediment Removal from Union Basin¹⁵¹



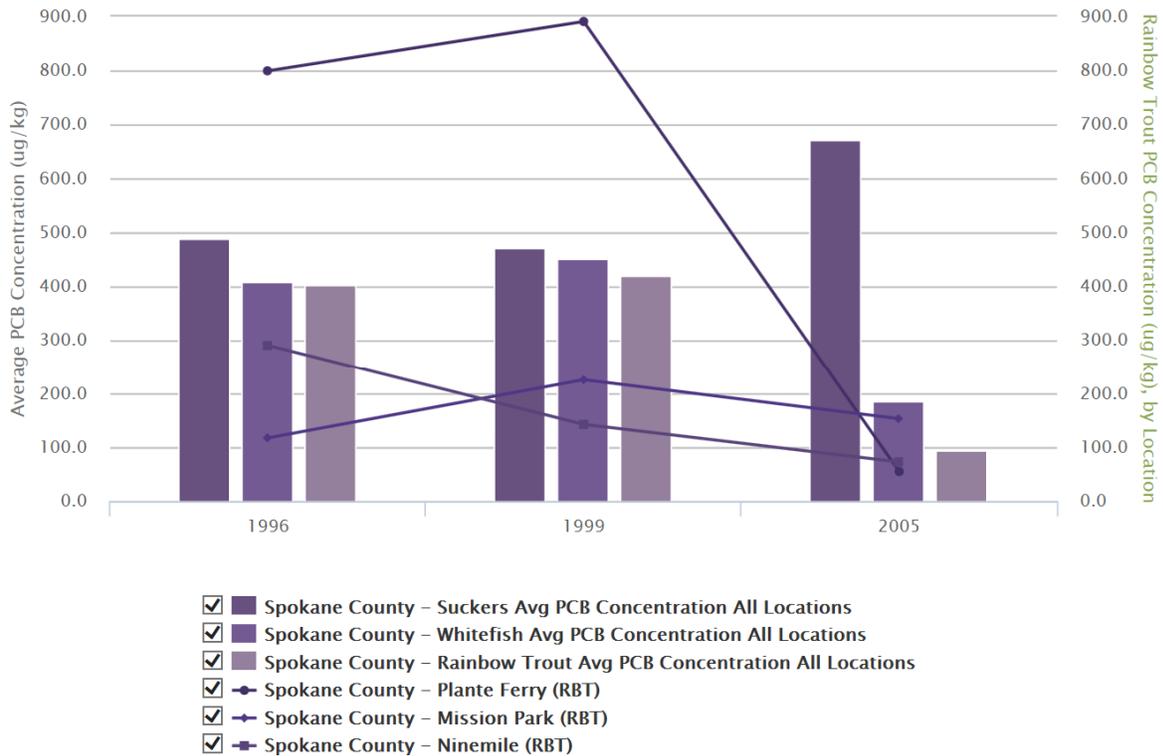
Avista Transformer Removal¹⁵²



¹⁵¹ SRRTTF Presentation, *An Adaptive Management Plan for PCBs in Stormwater and Sediments, 2013 Annual Report*: <http://srرتtf.org/wp-content/uploads/2013/06/SRRTTF-2013-Annual-Report-Presentation.pdf>

¹⁵² Presentation to SRRTTF by Avista (May 28, 2014): *Distribution Transformer Change-Out Program*: <http://srرتtf.org/wp-content/uploads/2014/05/Transformer-change-out-5-28-14.pdf>; This represents all transformers in the Avista system, not just Spokane River. As of April 22, 2015, more than 9600 transformers have been removed, including the single transformer with > 500 ppm PCBs. Avista calculates that this effort has taken approximately 18 pounds of PCBs out of the distribution system in the Spokane River Watershed.

Average PCB Concentration by Type of Fish and Location¹⁵³



Ecology 2012-3 Fish Monitoring Program

- PCBs and PBDEs in fish remain elevated compared to other areas in Washington.
- PCB concentrations in fish are often more than 10 times Washington’s water quality standard of 5.3 µg/kg.
- The high variability associated with sampling and measuring organic contaminants in fish is a large factor affecting the ability to discern spatial and temporal differences.
- Spatial differences were seen for PCBs and PBDEs in 48% of the pairings tested (22 of 42 site-species cases). Other differences among sites did not reveal consistent patterns.
- Exceptions include:
 - PCBs were higher in all species from Mission Park and Upper Lake Spokane compared to other sites.
 - Samples from Little Falls pool and the Spokane Arm of Lake Roosevelt consistently had some of the lowest levels of PCBs and PBDEs.
 - PBDEs in the Mountain White Fish samples from Nine Mile were about 4-10 times higher than in fish from other sites and are the highest levels seen in Washington.
 - PBDEs in all species from Nine Mile and Upper Lake Spokane were higher than PBDEs in fish from other sites.

¹⁵³ Spokane Community Indicators, source from Department of Ecology data:
http://www.communityindicators.ewu.edu/graph.cfm?cat_id=4&sub_cat_id=1&ind_id=10

- **Although some downward trends in fish tissue concentrations have been observed, in most cases, contaminant levels in fish between 2005 and 2012 have not significantly changed.**¹⁵⁴

Recommendations Relating to Outcomes

The Task Force should include specific milestones and measurable outcomes in its Comprehensive Plan milestones and measures for use in evaluating environmental and public health progress. During the next permit cycle, Ecology's measurable progress evaluation will place a higher level of importance on outcomes, specifically:

- Evidence of the effectiveness of toxics reduction activities, such as mass of PCBs removed from the system or prevented from entering the Spokane River through engineering or best management practices. Acceptable evidence includes:
 - Measurements or reasonable estimates of the amount of PCBs eliminated, removed, or isolated, from the river or watershed as a result of maintenance practices.
 - Engineered solutions and wastewater treatment plant upgrades.
 - Toxics reductions activities; implementation of best management practices.
 - Implementation of plans such as the Comprehensive Plan, Toxics Management Plan, Integrated Clean Water Plan, Stormwater Adaptive Management Plan, and the CSO Removal Plan.
- Measurements of PCB concentrations in the Spokane River under ambient concentrations demonstrating progress towards achieving water quality standards.
- Demonstration of progress towards meeting public health goals, such as decreasing PCB concentrations in fish and fish tissue.

¹⁵⁴ SRRTTF Presentation, *Spokane River Fish Tissue Monitoring, 2012 Results Summary*, (April 23, 2014)
<http://srtrtf.org/wp-content/uploads/2014/04/FFCMP-2012-SRRTTF-mtg-042314.pdf>

Demonstration of Measurable Progress

Ecology has evaluated a comprehensive set of data for the assessment period of January 2012 through December 2014 and has concluded that, during the assessment period, the Task Force has made measurable progress toward achieving the water quality standards for PCBs in the Spokane River.

Although compliance with applicable water quality standards for PCBs is not yet achieved in the Spokane River, there is evidence demonstrating that the Task Force is functioning in a collaborative manner and continuing to engage in activities that will ultimately lead to the reductions of PCBs in the river.

The Task Force also plans to complete development and implementation of a comprehensive Spokane River toxics reduction plan in 2016. Ecology will evaluate the effectiveness of the plan implementation during the next permit cycle.

Task Force members have also developed and are implementing numerous other plans that eliminate, remove, or isolate from the river or watershed measurable quantities of PCB.

Environmental trends show a potential decrease of PCB in fish. Ecology will further evaluate environmental trends during the next permit cycle. If source reduction activities do not result in decreasing toxics in the river or fish, then Ecology and the Task Force will reevaluate the approach.