1015 18th Street, NW
Suite 900
Washington, DC 20036
202.833.9140
www.limno.com

Memorandum

From:	Kat Ridolfi, Dave Dilks	**Date:**	July 6, 2016
		Project:	SRRTTF4
To:	SRRTTF		

SUBJECT: DRAFT: Cost/Effectiveness of PCB Control Actions for the Spokane River

Comment [BAP(1]: Comment on workshop review:

Suggested questions for further exploration of the chosen control actions:
- What does the control action do?
- What is the expected outcome?
- How do we measure effectiveness?

Summary

The Spokane River Regional Toxics Task Force (SRRTTF) was created with the goal of developing a comprehensive plan to bring the Spokane River into compliance with applicable water quality standards for the toxic chemical polychlorinated biphenyls (PCBs). To accomplish that goal, the functions of the SRRTTF include preparing recommendations for controlling and reducing the sources of listed toxics in the Spokane River and review of proposed Toxic Management Plans, Source Control Plans and Control Actions. A previous memorandum (LimnoTech, 2016b) identified a total of 44 control actions. The intent of this memorandum is to provide information to assess these control actions in order to help identify those that may be most appropriate in making measurable progress in controlling PCBs in the Spokane River Watershed. It is divided into sections describing:

- Control Actions Considered
- Review of Control Actions
- Prioritizing Control Actions for the Comprehensive Plan
- Future Steps

Fact sheets are provided for each Control Action under consideration. Each Control Action is reviewed in terms of expected removal efficiency, the significance of the PCB source area or pathway it addresses, cost, presence of an agency willing to implement the action, location in the Pollution Prevention hierarchy, relationship to existing control efforts, implementation/effectiveness time frames, and ancillary benefits provided.

While it is recognized that it is solely up to the discretion of the Task Force regarding which Control Actions to recommend for inclusion in the Comprehensive Plan, this review can provide some guiding principles to contribute to the discussion. They are, in order of priority:

1. **Maintain existing Control Actions:** Numerous Control Actions are already being implemented, and are targeted to control the largest delivery mechanisms of PCBs. These Control Actions are expected to significantly reduce PCB loads to the River and Lake Spokane. Primary consideration should be given to maintaining and supporting these activities.
2. **Gain understanding of uncertain source areas and pathways:** The majority of the Control Actions under consideration act upon pathways of uncertain magnitude. Consistent with comprehensive PCB plans in other watersheds, initial efforts should focus on collecting data to better understand the magnitude of uncertain source areas and transport pathways, prior to implementing specific Control Actions on them. The source areas and transport pathways to be investigated should be prioritized using the best current estimate of their magnitude.

3. **Assess if additional actions merit near-term consideration:** Other Control Actions can be considered for inclusion in the Comprehensive Plan, to the extent that they can be reasonably expected to achieve noticeable reductions in PCB loading to the river or lake.
4. **Understand the timeframes for implementation and effectiveness**: Control actions can be evaluated in terms of the timing of their success to help rank the practical application of a Control Action within five year windows.

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Control Actions Considered

LimnoTech (2016b) identified a total of 44 control actions considered potentially applicable to address PCBs in the Spokane River. The control actions identified in that memorandum were obtained from several sources:

Comment [BAP(2]: The number of control actions is inconsistent throughout the documents. 29 in Appendix B and 46 in Table 1.

(Also, some inconsistencies in labeling between text and Appendix A and Appendix B).

- BMP Toolbox for the San Francisco Bay Area (SFEI 2010)
- Stormwater Management Manual for Eastern Washington (Washington Department of Ecology 2004)
- Spokane Regional Stormwater Manual (Spokane County, City of Spokane, and City of Spokane Valley 2008)
- Spokane River Regional Toxics Task Force February 6-8, 2016 Workshop
- PCB Chemical Action Plan (Washington Department of Ecology, 2015)
- Discussions within the SRRTTF BMP subgroup

Each control action considered is summarized by category in Table 1.

Review of Control Actions

Information on the potential suitability of the Control Actions identified above was gathered from a range of sources including: descriptions of application to other sites, internet searches, and phone interviews with Task Force members. While no clear precedent exists for evaluating PCB Control Actions, some guiding principles may be useful in evaluating them. The most desirable Control Actions will be ones that:

- **Affect qualitatively significant pathways:** Even though many intermediate transport pathways are uncertain or not quantified, sufficient information exists to allow at least a qualitative understanding of the importance of most pathways. Control Actions that affect larger pathways will be preferred over Control Actions that affect smaller pathways.
- **Are qualitatively cost effective:** Similar to above, a qualitative understanding likely exists regarding the cost effectiveness of many Control Actions, even in the absence of quantitative case examples. Control Actions that remove PCBs at lower costs will be preferred over Control Actions that remove similar amounts of PCBs at greater costs.
- **Have a responsible party capable of implementation:** Control Actions must be implemented in order to reduce PCB loads. The presence of a party capable (and willing) of ensuring that the selected Control Action will be implemented is a necessary condition.
- **That are already occurring or are in process of implementation as a function of regulatory/voluntary programs.** Control Actions that are the result of permits are subject to refinement and upgrades as permit cycles revolve. Control Actions should be identified and understood as they are implemented under the NPDES program, MTCA program, or the MS4 programs, etc.

Table 1. Menu of Control Actions Identified as Potentially Applicable for Reducing PCB Loads to the Spokane River and Lake Spokane

Category	Sub-Category	Control Action
Institutional	Government Practices (Regulatory Actions and/or Incentivized Voluntary Programs)	Disposal assistance for PCB-containing items
		Land use/development ordinance that encourages LID
		Leaf removal
		Street sweeping
		Catch basin/pipe cleanout
		Purchasing standards
		Survey of local utilities for electrical equipment
		Regulation of waste disposal
		Removal of carp from Lake Spokane
		Building demolition control actions
		PCB-product labeling law
		Leak prevention/detection in electrical equipment
		Environmental monitoring
		Accelerated sewer construction
		PCB identification during inspections
		Regulatory rulemaking
		Compliance with PCB regulations
		Support green chemistry alternatives
	Educational	Survey of PCB-containing materials in schools/public buildings
		Education/outreach about PCB sources
		Education about discharge through septic systems in aquifer recharge area
		Education about filtering of post-consumer paper products
		PCB product information

Comment [BAP(3]: The SFEI definition, which is used for the control actions is:

"any activity, technology, process, operational method or measure, or engineered system, which when implemented prevents, controls, removes, or reduces pollution."

Environmental monitoring is not a control action and should be removed from this list.

It is, however, very important and should be included as a section in the Comprehensive Plan.

It looks like LimnoTech has included "effectiveness monitoring" as a measure for each control action. There are a number of ways to monitoring effectiveness that do not necessarily involve environmental sampling.

As far as environmental monitoring to fill data gaps, this should be covered in the "next steps" portion of the comprehensive plan.

As far as overall evaluation of the comprehensive plan, there should be a section on targets and benchmarks and this would include general environmental monitoring. Looks like LimnoTech also discusses this later on.

Table 1 (continued). Menu of Control Actions Identified as Potentially Applicable for Reducing PCB Loads to the Spokane River and Lake Spokane

Category	Sub-Category	Control Action
Stormwater Treatment	Pipe Entrance	Infiltration control actions
		Retention and reuse control actions
		Bioretention control actions
		Isolation of contaminated source areas from the MS4
		Filters
		Screens
		Wet vault
		Hydrodynamic separator
	End of Pipe	Constructed wetlands
		Sedimentation basin
		Discharge to ground/dry well
		Diversion to treatment plant
		Fungi (mycoremedation) or biochar incorporated into stormwater treatment
Wastewater Treatment		Development of a Toxics Management Action Plan
		Implementation of a source tracking program
		Chemical fingerprinting or pattern analysis
		Remediation and/or mitigation of individual sources
		Elimination of PCB-containing equipment
		Public outreach and communications
		Review of procurement ordinances
		Pretreatment regulations
Site Remediation		Identification of contaminated sites
		Clean up of contaminated sites

- **Are Located Higher in the Pollution Prevention Hierarchy:** The Pollution Prevention Act of 1990 explicitly recognized that source reduction is fundamentally different and more desirable than waste management or pollution control. This hierarchy has been refined for PCBs as "Don't make it > Don't use it > Use less of it > Manage it properly > Dispose of it properly > Treat it." Control Actions that are located higher in the pollution prevention hierarchy are preferable to ones that are located lower.
- **Provide ancillary benefits:** Control Actions that provide benefits beyond PCB load reduction will be preferable to those that address only PCBs, all else being equal.
- **Are relevant and practical from a timeframe for effectiveness**. Control Actions will require practical investments in terms of making measurable progress within the timeframes set up both internally to the SRRTTF and externally for the demands of the regulatory agencies.

This section first describes the factors that were used to review each Control Action, then summarizes the findings of the review.

Review Factors

Each Control Action is reviewed with respect to several factors, consisting of: reduction efficiency, significance of pathway, cost, implementing entity, pollution prevention hierarchy, ancillary benefit as well as timeframes for implementation and results. In addition, because many significant Control Actions are currently being undertaken in Spokane, each action is assessed in terms of the extent that it overlaps with existing efforts.

The information gathered for this review indicates that many of the reviewed Control Actions have no quantitative information available on costs or effectiveness. In addition, the magnitude of the transport pathways between source areas and delivery mechanisms assessed in (LimnoTech, 2016a) were determined to be either highly uncertain, or unknown. Because quantitative information is lacking for many aspects of this review, a qualitative scoring system is used. The definition of each aspect of the review, as well as the qualitative scoring system used, is described below.

Significance of Pathway: Significance of Pathway describes the suitability of the pathway to deliver PCBs to the river or lake from the source area or pathway being targeted by the Control Action. Control actions that interrupt significant pathways may be very effective in preventing PCB sources from contributing PCBs to the system. Even though many intermediate transport pathways are uncertain or not quantified, sufficient information exists to allow at least a qualitative understanding of the importance of most pathways. As such, Control Actions will be rated as follows:

- Highly suitable: Pathway provides >1% of the total PCB load delivered to the system[1]
- Moderately suitable: Pathway provides 0.1- 1% of the total PCB load delivered to the system
- Less suitable: Pathway provides <0.1% of the total PCB load delivered to the system

Reduction Efficiency: Reduction Efficiency is a primary consideration in terms of prioritizing Control Actions, as it describes the extent to which a given action is expected to reduce PCB movement from its targeted source area or pathway. Although quantitative information defining reduction efficiency was not available for many Control Actions, sufficient information exists to allow the majority of Control Action to be rated as follows:

- Highly suitable: >50% reduction in targeted source area or pathway
- Moderately suitable: 10-50% reduction in targeted source area or pathway
- Less suitable: <10% reduction in targeted source area or pathway

Cost: Cost describes the expected cost of implementing the Control Action, considering both capital and operating costs. Control Actions that remove PCBs at lower costs will be preferred over Control Actions that remove similar amounts of PCBs at greater costs. Even in the absence of quantitative data, a qualitative understanding exists regarding the costs of many Control Actions, and they are rated as follows:

- Highly suitable: <$100,000
- Moderately suitable: $100,000-$1,000,000
- Less suitable: >1,000,000

[1] Total PCB load to the system estimated as 800 mg/day, based on work conducted in LimnoTech(2016a)

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Comment [BAP(4]: Suggest that Appendix A use the term "Significance of Pathway" for the evaluation criteria.

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Comment [BAP(5]: Suggest that the Significance of Pathway evaluation criteria be split in three:
1.Magnitude of pathway (i.e., what is the percentage of total load that the pathway delivers, defined in this memo)
2.Magnitude of source area (building materials, sediments, etc.) (Spelled out in the Magnitudes memo)
3.Relationship of the action to the pathway as demonstrated in the diagrams.
More detail is provided in comments for Appendix B.

Comment [BAP(6]: Could not find where 800 mg/day is spelled out in the LT2016a reference. Suggest that the total load calculation be provided in the LT2016a reference. Also, suggest that a loading diagram be added similar to the one on page 99 of the 2007 source assessment (https://fortress.wa.gov/ecy/publications/documents/1103013.pdf)

Implementing Entity: The success of a given Control Action depends upon the presence of some entity capable of, and willing to, taking responsibility for its implementation. Implementing Entity describes the extent to which there is a clearly identified responsible party for implementing the control action due to their enrollment in a regulatory or voluntary program, along with an assessment of their willingness to do so. It is rated as follows:

- Highly suitable: Entity identified and willing to implement
- Moderately suitable: Entity identified, willingness uncertain
- Less suitable: No willing entity identified

Pollution Prevention Hierarchy: Experience with a wide range of pollutants has shown that preventing the creation or release of a pollutant is far more effective than controlling it once released. Pollution Prevention Hierarchy describes where the Control Action is located on the spectrum from limiting production and use of PCBs to treating PCBs prior to their release to the river or lake. It is rated as follows:

- Highly suitable: Controls production or use of PCBs
- Moderately suitable: Manages the mobility of PCBs in the environment
- Less suitable: Performs "end-of-pipe" treatment of PCBs prior to discharge

Existing Efforts under regulatory and/or voluntary programs: This describes the extent to which a given Control Action relates with existing PCB control efforts that are required by state or federal law. It is rated as follows:

- Highly suitable: Addresses a source area or pathway that is not currently being addressed
- Moderately suitable: Expands upon existing controls of a source area or pathway
- Less suitable: Redundant with existing efforts

Ancillary Benefit: Some Control Actions provide benefits beyond removal of PCBs from the system. Ancillary Benefit describes the extent to which a given Control Action provides these benefits. It is rated as follows:

- Highly suitable: Provides significant additional benefits beyond reduction of PCB loads
- Moderately suitable: Provides marginal additional benefits beyond reduction of PCB loads
- Less suitable: Provides no additional benefit beyond reduction of PCB loads

Implementation and Effectiveness Timeframes: Control Action can be implemented and their effectiveness assessed in timeframes that are meaningful and relevant to the actions and efforts of the SRRTTF and other entities involved in controlling PCB pollution. It is rated as follows:

- Highly suitable: Expected efficacy of 80-100% within two year timeframe
- Moderately suitable: Expected efficacy of 80-100% within five year timeframe
- Less suitable: Expected efficacy of 80-100% within twenty year timeframe

Review Findings

Appendix A summarizes the findings of the review for all candidate Control Actions, using a simple shading scheme to identify whether each aspect of each control action is:

- Highly suitable
- Moderately suitable
- Less suitable
- Unable to be evaluated, due to a lack of information

Individual Fact Sheets are provided in Appendix A, which describes each control action and briefly discusses how the ratings were obtained.

Some key observations can be made from this review. First and foremost, the most significant delivery

Comment [BAP(7)]: Is there a better term than "suitable" for this criteria? Some might argue that end of pipe treatment is more suitable.

How about
"Higher Level"
"Moderate Level"
"Lower Level"

(still not sure this is it, maybe there is better language out there . .)

Comment [BAP(8)]: See comment in Appendix B on this topic.

Under guiding principles (below), maintaining existing control actions is a priority. Therefore, redundant is the highest level and this prioritization should be flipped.

We can evaluate/take advantage of/find synergies and efficiencies with that and those efforts that we can expand upon.

If we are not currently addressing these opportunities then it might require more effort to develop a program and implement them.

Comment [BAP(9)]: This is sort of arbitrary and subject to interpretation. Is there a way to put more context to it?

"more than one additional benefit identified"
"Additional benefit identified
"no additional benefit identified"

(just a thought)

Comment [BAP(10)]: See comments in Appendix B.

Suggest that this be subdivided into short and long term benefits (short being < 5 years and long being > 5 years) and the evaluation criteria related to
1)Ability to implement and
2)Ability to see results.

So, the three evaluation criteria would be:
- **Highly suitable**: Short Term implementation with short term efficacy
- **Moderately suitable**: short term implementation with long term efficacy
- **Less suitable**: long term implementation with long term efficacy.

Also, what does "efficacy" mean? Is it related to seeing results in the environment only? Or can it be related to seeing efficacy in the control action as well (recommended).

If the latter, we can implement and see results quickly using effectiveness monitoring for the individual control actions and environmental monitoring over the long term to evaluate long term effectiveness.

mechanisms of PCBs all have existing Control Actions in various phases of development. Specific PCB-related Control Actions underway in Spokane are:

- Wastewater treatment plants discharging to the Spokane River are all required to develop and install treatment systems to reduce nutrient loading that will concurrently result in reductions of PCB loading. In addition, each wastewater facility has developed a Toxics Management Action Plan that includes a PCB source identification study and associated control actions. These treatment plants are operated by:
  - City of Coeur d'Alene
  - Hayden Area Regional Sewer Board
  - Kaiser Aluminum
  - Spokane County
  - City of Post Falls
  - Liberty Lake
  - Inland Empire Paper
  - City of Spokane
- Remediation activities for known contaminated sites in Washington are being implemented and managed under the jurisdiction of the Model Toxics Control Act (MTCA). Marti and Maggi (2015) searched for sites in Spokane that could be contributing PCB contamination to groundwater in the area of the Spokane River. They identified 31 clean-up sites, three of which have confirmed release of PCBs and subject to MTCA remediation. They are:
  - Spokane River Upriver Dam and Donkey Island
  - Kaiser Aluminum
  - General Electric Company, E. Mission Ave.
- The City of Spokane is actively addressing stormwater and CSO loading of PCBs as part of their Integrated Clean Water Plan. Other entities are also controlling their stormwater loads to the Spokane River under NPDES permits, including:
  - Idaho Transportation Department
  - City of Post Falls
  - Washington Department of Transportation
  - City of Coeur d'Alene
  - Post Falls Highway Department
- The large majority of stormwater in the remainder of the watershed (including Spokane County and the City of Spokane Falls) is being diverted to groundwater, as opposed to direct surface discharge to the River. This activity is consistent with many of the PCB Control Actions discussed previously under the category of "Stormwater Treatment--Pipe Entrance," and is regulated under the State of Washington's Underground Injection Control Program.
- Local electric utilities have replaced their transformer with essentially PCB-free oils, and eliminated the use of large capacitors. The following utilities were surveyed in LimnoTech (2016a):
  - Avista Utilities
  - Modern Electric Water Company
  - Kootenai Electric Cooperative
  - Inland Power and Light Company
  - Vera Water and Power

PCB concentrations and estimated mass are provided in the above-referenced document.

The second observation is that many of the Control Actions initially identified as potentially applicable are already being implemented with existing efforts. For example, many Control Actions identified from other sites were specific to stormwater controls. Stormwater PCB loads are largely already undergoing control actions as a function of NPDES permits and MS4 permits.

The third observation is that many Control Actions either operate on pathways of highly uncertain magnitude, or are so uncertain in their effectiveness that they cannot be fully evaluated at this time. The final observation is that there are a class of Control Actions that are not intended to lead to immediate

Comment [BAP(11]: LimnoTech 2016a states the total mass is 11.1 kg but the math adds up to 12. 9 kg

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Comment [BAP(12]: Reframed this to have a positive outlook on the situation. This is a good thing!

Deleted: These are largely redundant for consideration in Spokane because, as mentioned above, s

load reduction, but rather to collect information to better define pathways or reduction efficiencies and educate the public so as to effect a cultural changes that result in the long-term control of PCBs that are handled by the public.

Comment [BAP(13]: See comment on the environmental monitor section.

It is true that more information will need to be collected to do some of the control actions and monitor their effectiveness. However, collection of information in and of itself is (by definition) not a control action.

Prioritizing Control Actions for the Comprehensive Plan

The ultimate goal of evaluating a range of Control Actions is to inform the Task Force in the prioritization and selection of specific actions to be included in the Comprehensive Plan. While it is recognized that it is solely up to the discretion of the Task Force regarding which Control Actions to recommend for implementation, this section describes lessons that could be learned from other watershed-based PCB Control Actions and provides some potential guiding principles to be considered for prioritizing Control Actions.

Lessons from Other Sites

The challenge discussed above regarding insufficient information of PCB transport pathways and cost/effectiveness of Control Actions is not unique to Spokane. Essentially all other watershed-based PCB Comprehensive Plans have dealt with the issues of incomplete information on costs and effectiveness and uncertain magnitudes of transport pathways. The examples that follow illustrate different approaches to selection and implementation of PCB Control Actions in the face of incomplete information:

- San Francisco Bay TMDL: Urban stormwater controls are being adaptively selected and implemented over 20 years, beginning with permittees selecting and pilot testing their own BMPs to assess effectiveness and technical feasibility. Based on lessons learned during the pilot testing, additional controls will be implemented in strategic locations and will inform development of a plan to that will attain desired PCB load reductions. This effort faced similar challenges to Spokane in terms of uncertainty of the magnitude of PCB transport pathways, but successfully addressed it by creating an implementation plan with specific timelines and schedules that still allowed for adaptive management.
- Delaware River PCB TMDL: The implementation plan adopted a non-numeric approach requiring pollutant minimization plans for point and nonpoint source dischargers to track down and reduce PCBs. Components of the pollutant minimization plans included source identification and reduction, monitoring and reporting, and remediation activities for known contaminated sites. One strength of this effort is the existence of the Delaware River Basin Commission, a long-standing agency which is responsible for oversight of contributing jurisdictions, and serves to coordinate all entities.
- Illinois Lake Michigan Nearshore PCB TMDL: Stormwater MS4 permittees were given a menu of BMPs to choose from, with no guidance provided regarding expected cost or effectiveness. Near-term permits will be process-based rather than performance based, i.e. permittees must demonstrate that BMPs will be implemented but will not be held to numeric PCB loading limits. The primary challenge facing this effort was that the primary source of PCBs is from the atmosphere; however, the developers of the plan (the TMDL program) only had responsibility for discharges to water. During development of this plan and responding to public comments, the Illinois Water Division communicated frequently with the Illinois Air Division. As a result of this increase communication (i.e., breaching of institutional silos), the plan includes a comprehensive discussion of air sources and programs.
- Lake Ontario Tributaries PCB TMDL: Affected dischargers are required to implement a PCB monitoring plan, establish an interim limit, and review monitoring data to determine where it would be appropriate to require a PCB minimization plan. NYSDEC's PCB Minimization Program

(PCBMP) states that permittees shall develop, implement and maintain PCBMPs for those outfalls which have been shown through monitoring that concentrations of PCBs in their discharge have a reasonable potential for being reduced. Where it can be shown that the PCBs present in a dischargers effluent is attributable to atmospheric deposition, the discharger will not be responsible to take actions Management of Lake Ontario and its main tributary, the Niagara River, is under the jurisdiction of NYSDEC, USEPA, Ontario Ministry of the Environment, and Environment Canada. The multi-jurisdictional nature of the Lake Ontario watershed is a challenge because each jurisdiction has a different water quality standard for PCBs, and developer of this plan only had control over New York sources. An additional challenge is that the primary source of PCBs is from the Niagara River, which requires binational collaboration for restoration.

These implementation plans are varied, but all are based on adaptive management principles that provide flexibility in selecting and implementing controls, typically after additional data has been collected to better inform the decision.

Potential Guiding Principles for Prioritizing Control Actions

While it is recognized that it is up to the discretion of the Task Force regarding which Control Actions to recommend for inclusion in the Comprehensive Plan, this review can provide some guiding principles to contribute to the discussion. These principles are, in order of priority:

Comment [BAP(14]: Would switch 2 and 3 or, actually just leave the principles unnumbered. There are only three so no need to prioritize.

1. **Maintain existing Control Actions:** Numerous Control Actions are already being implemented, and are targeted to control the largest delivery mechanisms of PCBs. These Control Actions are expected to significantly reduce PCB loads to the River and Lake Spokane. Primary consideration should be given to maintaining, supporting and upgrading these activities. Because these efforts are being conducted under the auspices of many different regulatory programs, efforts to facilitate communication between these programs will be essential. Equally essential will be the need to craft NPDES permits and stormwater programs with consistent language, consistent programs and protocols and data collection procedures that will facilitate:
    a. The evaluation and monitoring of effectiveness in controlling PCB pollution
    b. Allowing data to be shared and compared in ways that are useful across the basin for understanding the transport, fate and control of PCBs
    c. Adaptive management in the face of ongoing data collection
2. **Gain understanding of uncertain source areas and pathways:** Consistent with comprehensive PCB plans in other watersheds, initial efforts should focus on collecting data to better understand the magnitude of uncertain source areas and transport pathways, prior to implementing specific Control Actions on them. The source areas and transport pathways to be investigated should be prioritized by the best current estimate of their magnitude, with preference given to those sources believed most likely to be contributing to elevated PCB concentrations in the Spokane River and Lake Spokane.
3. **Assess if additional actions merit near-term consideration:** Other Control Actions can be considered for inclusion in the Comprehensive Plan, but only after the above two priorities are met. Any additional Control Actions should be restricted to those that can be reasonably expected to achieve noticeable reductions in PCB loading to the river or lake.

Future Steps

It is worthwhile, when evaluating these Control Actions, to keep overall objectives in mind. A primary objective of the Task Force is to demonstrate measurable progress towards reducing loads of PCBs to the Spokane River and towards achieving the applicable water quality criteria for PCBs. After Control Actions have been selected by the Task Force, additional steps will be needed to ensure that this progress is being

Deleted: in meeting the goals and objectives of the SRRTTF measurable progress

made. These steps include:

1. Numerical milestones for control action efforts need to be developed as a Task Force. These should be interim, numerical goals that are developed as we understand the ability for the Control Actions to deliver measurable progress. Such interim goals should be assessed at scheduled intervals that make sense in order to adjust to our growing understanding of the issues. These interim goals should be adopted into the Comprehensive Plan and used by Ecology with support from DEQ and EPA to determine whether the SRRTTTF is making measurable progress towards bringing the Spokane River into compliance with water quality standards for PCBs.
2. Timelines for implementation of Control Actions will be set at the Control Action level within the Comprehensive Plan. A schedule for implementation (or a rolling timeline if the process requires years) should be developed for each control action
3. Each control action or suites/combinations of control actions will have a schedule and program for effectiveness monitoring. If control actions are a function of regulatory programs such as the NPDES program, then these schedules should be included inside of those permits and be consistent with and coincide with the schedule inside the Comprehensive Plan. This effectiveness monitoring should guide the management and provide room to adapt strategies, phase out actions that are not working, and phase in new control actions that are developed. Additionally, this effectiveness monitoring should help WDOE in their efforts to make Measurable Progress determinations at five year intervals.

References

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LimnoTech, 2016a. DRAFT: Magnitude of Source Areas and Pathways of PCBs in the Spokane River Watershed. Prepared for Spokane River Regional Toxics Task Force. May 18, 2016.

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San Francisco Estuary Institute (SFEI), 2010. A BMP Tool Box for Reducing Polychlorinated Biphenyls (PCBs) and Mercury (Hg) in Municipal Stormwater. San Francisco Estuary Institute, Oakland, CA. http://www.sfei.org/sites/default/files/biblio_files/A_BMP_toolbox FINAL_04-04- 10.pdf

Spokane County, City of Spokane, and City of Spokane Valley 2008. Spokane Regional Stormwater Manual. http://www.spokanecounty.org/data/engineers/srsm_apr08final/SRSM_April2008Final.pdf

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Comment [BAP(15): Suggest that there are two levels of evaluation (it looks like this is what LT is suggesting here but to clarify my thinking on this):
1)Environmental goals and benchmarks which would be periodically evaluated (similar to what EPA suggested): see schedule page 11: http://srrttf.org/wp-content/uploads/2015/07/EPA-plan-for-PCBs-in-response-to-court-order.pdf
2)Effectiveness monitoring: an assessment of the effectiveness of a control action, which could involve different types of measurements. The expected results and method for evaluating effectiveness should be determined for each control action.

Comment [BAP(16): See page 2 for definition: http://srrttf.org/wp-content/uploads/2014/07/Measurable-Progress-Definition-07152014-Final-Revised-Header.pdf

Comment [BAP(17): *From the MOA*

The Regional Toxics Task Force will work collaboratively to characterize the sources of toxics in the Spokane River and identify and implement appropriate actions needed to make measurable progress towards meeting applicable water quality standards for the State of Washington, State of Idaho, and The SpokaneTribe of Indians and in the interests of public and environmental health.

http://srrttf.org/wp-content/uploads/2012/07/SRRTTF-MOA-Final-1-23-2012.pdf

Also, here is the definition of measurable progress: more than just outputs. Technically the numerical goals refer to **outcomes** (if they are environmentally based). See page 2

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

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Comment [BAP(18): See S13 and S14 for the relationship between the permits, the comprehensive plan, and the permittee BMP plans in Washington.

EXAMPLE
http://srrttf.org/wp-content/uploads/2016/07/WA0024473_Spokane_Riverside_Park_AWTF_and_CSOs_DRAFT_Permit_2016-06-30.pdf

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Appendix A. Summary of Control Action Review

Control Action	Magnitude of Pathway	Removal Efficiency	Cost	Implementing Entity	PP Hierarchy	Ancillary Benefit	Existing Efforts	Time Frame
Disposal assistance								
LID ordinance								
Leaf removal								
Street sweeping								
Catch basin/pipe cleanout								
Purchasing standards								
Survey of electrical equipment								
Regulation of waste disposal								
Remove Carp from L. Spokane								
Building demolition control								
PCB-product labeling law								
Leak prevention/detection								
Environmental monitoring								
Accelerated sewer construction								
PCB I.D. during inspections								
Regulatory rulemaking								
Compliance with PCB regulations								
Support green chemistry								
Survey schools/public buildings								
Education on PCB sources								
Education on septic discharge								
Education on consumer filtering								
PCB product information								
Stormwater - pipe entrance								
Stormwater - pipe system								
Stormwater - end of pipe								
Wastewater treatment								
I.D. of contaminated sites								
Clean up of contaminated sites								

Key

Unknown

Magnitude of Pathway

>1% of total load
0.1 - 1% of total load
<0.1% of total load

Removal Efficiency

>50% reduction
10-50% reduction
<10% reduction

Cost

<$100k
$100k-$1M
>$1M

Implementing Entity

Identified and willing
identified
None identified

Hierarchy

Controls production or use
Manages mobility
End of pipe control

Ancillary Benefit

Significant
Marginal
None

Existing Controls

Not currently being addressed
Expands upon existing controls
Redundant

Time Frame

Efficacy w/in two years
Efficacy w/in five years
Efficacy w/in twenty years

Comment [BAP(19)]: I made some notes below on changes to this chart. But check with comments provided in Appendix B to make sure they are correct.

Comment [BAP(20)]: Removal Efficiency Comments: Comments based on the rating of the individual reduction efficiency rather than the anticipated overall efficiency.

Disposal Assistance Removal Eff ...

Comment [BAP(21)]: Pollution Prevention Comments

Disposal Assistance PP ...

Comment [BAP(22)]: Time Frame Comments

Disposal Assistance Time Frame ...

Comment [BAP(23)]: Ancillary Benefit Comments

Disposal Assistance Ancillary Benefit ...

Comment [BAP(24)]: Existing Efforts Comments

Disposal Assistance Existing Efforts ...

Comment [BAP(25)]: Implementing Entity Comments:

Suggest that the following entities should be noted as highly suitable because they are involved in a voluntary regulatory program:

LID (court settlement with City of Spokane); Green Chemistry (Ecology helped initiate http://www.northwestgreenchemistry.org/); Wastewater and stormwater control actions (permittees)

Comment [BAP(26)]: Magnitude of Pathway Comments

Disposal Assistance Pathway ...

Appendix B. Control Action Fact Sheets