

## Memorandum

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**To:** SRRTTF

**Project:** SRRTTF4

**CC:**

**SUBJECT: DRAFT: Inventory of Best Management Practices to Be Evaluated for the Spokane River**

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### Summary

The Spokane River and Lake Spokane are impaired by polychlorinated biphenyls (PCBs), and the Spokane River Regional Toxics Task Force (SRRTTF) is developing a Comprehensive Plan to identify and implement load reductions needed to make measurable progress towards meeting applicable water quality standards. As an initial part of the Comprehensive Plan development, this memorandum provides an inventory of best management practices (BMPs) that have the potential to reduce PCB loads. This memorandum defines possible BMPs, divided into four categories:

- Institutional
- Stormwater Treatment
- Wastewater Treatment
- Site Remediation

A total of 23 BMPs (or groups of BMPs) were defined and are summarized in Table 1.

The intent of this memorandum is not to evaluate the feasibility of any BMP for application in the Spokane region, it is solely intended to identify BMPs to be evaluated. Subsequent project tasks will assess the cost and reduction efficiency of these BMPs in order to help identify those that may be most effective at reducing PCB loads to the Spokane River.

**Table 1. Menu of BMPs Described in this Memorandum Potentially Applicable for Reducing PCB Loads to the Spokane River and Lake Spokane**

Category	Sub-Category	BMP
Institutional	Government Practices	Take-back programs
		Leaf removal
		Street sweeping
		Purchasing standards
		Survey of PCB-containing materials
		Review laws regulating waste disposal
		Identify PCBs during inspections
		TSCA reform
		Support green chemistry alternatives
	Educational	Survey of electrical equipment containing PCBs
Education/outreach re: PCB sources		
PCB product information		
Stormwater Treatment	Pipe Entrance	Infiltration BMPs
		Retention and reuse BMPs
		Bioretention BMPs
	Pipe system	Filters
		Screens
		Wet vault
		Hydrodynamic separator
	End of Pipe	Constructed wetlands
		Sedimentation basin
		Discharge to ground/dry well
Diversion to treatment plant		
Wastewater Treatment		PCB Minimization Plan
		Pump station clean out
		Isolate incoming stream
		Upgrade/clean sewer pipes
		Alter treatment processes
Site Remediation		Identify contaminated sites and clean up
		Demolition and remodeling BMPs

## Introduction

The Spokane River Regional Toxics Task Force is developing a Comprehensive Plan to identify and implement load reductions needed to make measurable progress towards meeting applicable water quality standards for PCBs. An initial step in Comprehensive Plan development is to identify the universe of best management practices (BMPs) that have the potential to reduce PCB loads.



Because the term “BMP” can have a specific regulatory connotation in some contexts, it is important to clarify exactly how the term is interpreted in this memorandum. In the context of the Spokane River Comprehensive Plan, BMPs are defined consistent with SFEI (2010) as “any activity, technology, process, operational method or measure, or engineered system, which when implemented prevents, controls, removes or reduces pollution.”

The BMPs identified in this memorandum were obtained from several sources:

- BMP Toolbox for the San Francisco Bay Area (SFEI 2010)
- Stormwater Management Manual for Eastern Washington (Washington Department of Ecology 2004)
- Spokane River Regional Toxics Task Force February 6-8, 2016 Workshop
- Discussions within the SRRTTF BMP subgroup

For purposes of discussion, BMPs were divided into the following five categories based upon discussions of the Spokane River Regional Toxics Task Force Workshop BMP planning group.

- Institutional
- Stormwater Treatment
- Wastewater Treatment
- Site Remediation

The intent of this memorandum is not to evaluate the feasibility of any BMP for application in Spokane, it is solely intended to identify BMPs to be evaluated. Subsequent deliverables will assess the cost and reduction efficiency of these BMPs in order to help identify those that may be most effective at reducing PCB loads to the Spokane River.

## **Institutional**

Institutional BMPs include information sharing (educational campaigns) and governmental practices to help businesses and the general public avoid, or clean up and properly dispose of products containing PCBs. These BMPs require the least amount of infrastructure, engineering work, maintenance, and disturbance of existing land because the point is to avoid the continued use, inadvertent production, or release of PCBs. The BMPs listed below will help reduce PCB loads through clean-up of existing sources and proper disposal of PCB-containing products and waste. Institutional BMPs can be further broken down into two categories, government practices and educational BMPs.

### ***Government Practices***

This sub-category of Institutional BMPs consists of actions that government agencies can take which will directly reduce sources of PCBs. Specific BMPs under this category consist of:

- Implement/strengthen take-back programs, which are government- or non-profit-run programs to accept and properly dispose of PCB-containing waste
- Make leaf removal a regular, government-run program since foliage is a receptor of atmospheric PCB loadings. Removal of leaf litter prior to it being discharged to the river could reduce loading PCB associated with this source.
- Modify current street sweeping frequency and area covered to target sources of PCBs, or when/where more material is washing down streets to prevent it from entering storm drains



- Pass state/local laws to reduce or totally eliminate the purchase of products that contain PCBs. Current examples include the two below:
  - Washington State Senate Bill 6086 (passed in 2014) requires State agencies to establish a purchasing and procurement policy that provides a preference for products that do not contain PCBs (<http://apps.leg.wa.gov/billinfo/summary.aspx?bill=6086&year=2014>).
  - Spokane County (Spokane County Resolution #2014-1022 passed 12/16/2014) and the City of Spokane adopted similar ordinances in response to concerns with PCB impairment of the Spokane River. The City of Spokane's ordinance requires City departments to purchase PCB-free items (defined as less than the practical quantification limit using EPA Method 1668) if a feasible alternative is available at less than a 25% cost increase (Spokane Municipal code 07.06.172).
- Survey PCB-containing materials in schools/public buildings and enact a program to dispose of it properly
- Review local/regional laws regulating waste disposal, and revise as necessary (e.g. imposing fines for improperly disposing of PCBs, sharing information on safer alternatives for lighting, paint, caulk, etc.)
- Identify PCB-containing materials as part of other regular inspections (e.g., building permits, IDDE, facility inspections)
- Implement controls on building remodeling and demolition to safely contain and properly dispose of potential sources of PCBs, and safer replacement products
- TSCA reform to change allowed concentration of PCBs in dyes/pigments
- Support green chemistry alternatives

### **Educational**

This sub-category of Institutional BMPs consists of actions that will indirectly reduce sources of PCBs, by providing information to help direct future PCB reduction efforts. Specific BMPs under this category consist of:

- Conduct a survey of local utilities and other owners of electrical equipment to document presence/amount of PCBs in transformers and to confirm/correct the data in the EPA PCB Transformer Registration database. Follow up steps after identifying this information could include providing technical assistance where requested for disposal and replacement of the contaminated fluid, learning what is known about electrical equipment with PCBs greater than 2ppm, and finding out when such electrical equipment is estimated to be replaced.
- Conduct public education and outreach campaigns to facilities, local officials, and demolition/construction contractors to spread information about the potential sources of PCBs, what to do with them if discovered, and safer alternatives. Information should be shared with buyers and suppliers of industrial equipment, consumers, as well as with residents who fish for recreation or subsistence to increase their awareness of fish advisories and the fish species that contain the highest concentrations of PCBs.
- Learn more about what products contain PCBs and promote the use of processes that don't inadvertently generate PCBs, particularly dyes and pigments. Products identified in City of Spokane (2015) included:
  - Road Oil
  - Hydroseed additives
  - Deicer



## Stormwater Treatment

Stormwater Treatment BMPs are engineered options to be installed or built with the existing storm sewer infrastructure to capture soil and water containing PCBs and prevent it from being discharged to the Spokane River. Since PCBs adsorb to soil/sediment, reducing solids will in turn reduce PCBs. They can be implemented anywhere, but the limiting factor is access because they require regular inspection and maintenance and specialized knowledge for installation. These BMPs are effective at treating a range of contaminants, and are not limited to controlling PCB loads. They are organized by their placement relative to storm sewer pipes, and divided into sub-categories of:

- Pipe entrance
- Pipe system
- End of pipe

### *Pipe entrance*

This sub-category of BMPs is designed to capture PCBs before they enter storm pipes, and includes:

- Infiltration BMPs such as trenches, basins, dry wells which are designed to infiltrate stormwater quickly through gravel or similar material so that the contamination is dissipated/filtered through the soil or groundwater and not directly discharged to surface waters or the MS4.
- Retention and reuse BMPs such as rain barrels, underground tanks, ponds, detention basins. These BMPs are designed to retain stormwater to slow down peak discharges to the MS4 system, and potential reuse of the effluent for practices such as watering gardens and playing fields.
- Bioretention BMPs such as swales, buffer strips which are designed to provide some infiltration/trapping of solids before discharge to the MS4.

### *Pipe system*

This sub-category of BMPs is installed in the MS4 infrastructure (e.g., pipes, storm drain inlets). They usually have higher maintenance requirements (compared to other stormwater BMPs) and can sometimes back up flow when not maintained properly. Options include:

- Screens trap contaminated solids and larger debris and prevent discharge to receiving waterbodies
- Filters, like screens, trap contaminated solids and prevent discharge to receiving waterbodies
- Wet vault is a permanent pool of water in a vault that rises and falls with storms and has a constricted opening to let runoff out. Its main treatment mechanism is settling of solids that are contaminated.
- Hydrodynamic separators use cyclonic separation to trap solids and debris as stormwater flows through them before being discharged to receiving waterbodies



### **End of pipe**

This sub-category of BMPs is installed at the end of MS4 pipes, but before the discharge will reach receiving waters (the Spokane River, Lake Spokane, and their tributaries). They can have high maintenance requirements or require significant areas of land to implement. Options include:

- Constructed wetlands work to slow peak stormwater flows to prevent erosion and also help to trap contaminated solids and debris from entering receiving waterbodies
- Sedimentation basin is similar to a wetland in its purpose and trapping mechanism but allow for a large volume of detained stormwater to be ponded prior to discharge
- Discharge to ground/dry wells work to infiltrate stormwater into the ground prior to discharge
- Diversion to treatment plant involves a separation of a stream of stormwater from the rest in order to have it routed to a wastewater treatment plant instead of being discharged untreated to receiving waterbodies

### **Wastewater Treatment**

Wastewater Treatment BMPs are composed of changes in maintenance and treatment practices of wastewater systems to capture PCBs and treat it so that the effluent that is discharged to the Spokane River is no longer contaminated by PCBs. These BMPs are effective at treating a range of contaminants, and are not limited to controlling PCB loads. Considerable resources may be needed for these BMPs if changes to treatment practices require new equipment or increased maintenance.

- Develop a PCB Minimization Plan to reduce PCBs in influent
- Clean out any solids that build up in pump stations to reduce the potential for contaminated solids to enter the waste stream
- Identify and isolate an incoming source of PCBs (e.g., single industrial discharge, certain area of service area) and separate the stream for additional treatment before joining the rest of the influent that gets treated
- Upgrade or clean out sewer pipes to reduce contaminated solids in influent
- Alter treatment processes to target particular PCB congeners that are currently in effluent
- Modify biosolids management if current plan results in contaminated biosolids re-entering the waste stream or receiving waterbodies (e.g., treat biosolids prior to disposal, change end use of biosolids to prevent re-contamination)

### **Site Remediation**

Site Remediation BMPs involve identifying and cleaning up soil that has been contaminated from past use of PCBs. It is important to identify and remediate this contaminated soil before it can be mobilized and transported into the storm drain system, especially during wet weather, to avoid further discharge and distribution into the Spokane River and tributaries. In addition, remediation of contaminated soil and sites will also prevent further contributions to atmospheric concentrations of PCBs. There is significantly more equipment use and land disturbance required for these solutions, especially if entire buildings are to be demolished.

- Identify contaminated sites and clean up illegally dumped waste such as old drums, electrical equipment, or building demolition material that may have contaminated by PCBs.



- Identify older building that may contain PCBs and replacing the fixtures with safer alternatives; or remove the buildings altogether. Common options include:
  - Removal of caulking installed before 1979 that contains PCBs
  - Identifying and disposing of light ballasts, surfaces painted with PCB-containing paint, etc.
  - Changes to remodeling/demolition practices to contain PCB-containing waste

## References

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