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Memorandum

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Project: SRRTTF4

To: SRRTTF

SUBJECT: **DRAFT: Inventory of Control Actions to Be Evaluated for the Spokane River**

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 (referred to in earlier documents as Best Management Practices). This memorandum provides an inventory of control actions that have the potential to reduce PCB loads, divided into four categories:

- Institutional
- Stormwater Treatment
- Wastewater Treatment
- Site Remediation

A total of 41 control actions (or groups of control actions) were identified and are summarized in Table 1.

The intent of this memorandum is not to evaluate the feasibility of any control action for application in the Spokane region; it is solely intended to identify the range of control actions to be evaluated. Subsequent project tasks will assess the cost and reduction efficiency of these control actions in order to help identify those that may be most effective at reducing PCB loads to the Spokane River. In addition, it is noted that many of these control actions are already being implemented in the watershed. For example, all wastewater treatment plants discharging to the Spokane River are required to prepare Toxics Management Action Plans, detailing specific control actions they are taking to reduce PCB loading to the Spokane River.

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

Category	Sub-Category	Control Action
Institutional	Government Practices	Take-back programs
		Leaf removal
		Street sweeping
		Catch basin/pipe cleanout
		Purchasing standards/product testing
		Survey of PCB-containing materials
		Review laws regulating waste disposal and illegal dumping
		Removal of carp from Lake Spokane
		Expand monitoring
		PCB-product labeling law
		Leak prevention/detection system ordinance for transformers and capacitors
		Accelerate sewer construction to replace septic systems
		PCBs identification during inspections
		TSCA and food packaging law reform
		Support green chemistry alternatives
	Educational	Survey of electrical equipment containing PCBs
		Education/outreach re: PCB sources
		Education about discharge through septic systems in aquifer recharge area
		PCB product information
Stormwater Treatment	Pipe Entrance	Infiltration control actions
		Retention and reuse control actions
		Bioretention control actions
		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

Introduction

The SRRTTF is developing a comprehensive plan to bring the Spokane River into compliance with applicable water quality standards for PCBs. An initial step in development of the comprehensive plan is to identify the universe of control actions that have the potential to reduce PCB loading to the river.

These control actions were previously referred to as Best Management Practices (BMPs) in earlier Task Force documents. The term Best Management Practice is no longer being used in Comprehensive Plan documents, because it has a specific legal meaning that varies between Washington and Idaho. In the context of the Spokane River Comprehensive Plan, control actions 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 control actions 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 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
- Discussions within the SRRTTF BMP subgroup

For purposes of this memorandum, control actions were divided into the following four 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 control action for application in Spokane, it is solely intended to identify control actions to be evaluated. Subsequent deliverables will assess the cost and reduction efficiency of these control actions in order to help identify those that may be most effective at reducing PCB loads to the Spokane River.

Institutional

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

Government Practices

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

- Implement take-back programs, which are government or non-profit run programs to accept and properly dispose of PCB-containing items
- Enhance current municipal leaf removal programs 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 area. Care will also need to be taken to ensure that where leaves are disposed does not create an additional load of PCBs to the River. The opportunity for expanded implementation for this control action within the watershed is limited, however, because leaf removal is already a government-provided service in the city of Spokane (seasonal), Spokane county (leaves can go in green bins collected by Waste Management), and Post Falls, ID (last two weekends in April and September), but not Coeur d'Alene, ID).
- Modify current street sweeping frequency and area covered to specifically target source areas of PCBs, or when/where more material is washing down streets to prevent it from entering storm drains
- Increase frequency of catch basin and pipe cleanout to specifically remove PCB-contaminated sediment
- Pass local laws to reduce or totally eliminate the purchase of products that contain PCBs. Further implementation of this control action primarily pertains to the Idaho communities, since most of the Washington jurisdictions in the watershed have already implemented purchasing standards. However, product testing by the manufacturers of alternative products under consideration for purchase at the state level could support the implementation of PCB free product purchasing laws. Current examples include the three 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=2013).
  - Spokane County passed Resolution #2014-1022 in December 2014
  - 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 them properly or implement encapsulation[1]. See BASMAA (2014) as example guidance for inspections to identify PCBs.
- Review local/regional laws regulating waste disposal (including oil burning) and illegal dumping, and revise as necessary (e.g. enforcing fines/other penalties for improperly disposing of PCBs, sharing information on safer alternatives for lighting, paint, caulk, etc.)
- Expand environmental monitoring to identify any new areas requiring

[1] Encapsulation is accomplished by painting a contaminated surface(s) with a coating material that serves as a barrier to prevent the release of a contaminant from a source (USEPA 2015a).

cleanup and investigate air deposition. This in and of itself will not have immediate impacts on PCB loads but will be a step towards better source area identification and targeted BMP implementation.

- Implement state/local ordinance to require a leak prevention/detection system in any PCB-containing transformer or capacitor.
- Identify PCB-containing materials as part of other regular inspections (e.g., building permits, IDDE, facility inspections). See BASMAA (2014) as example guidance for inspections to identify PCBs.
- Implement controls, incentives, or credits to encourage safe containment, proper disposal, and safer replacement products for those products used for building remodeling and demolition that may contain PCBs.
- Reform TSCA and FDA's food packaging law (21 CFR 109) to change allowed concentration of PCBs in chemical processes that can create inadvertently generated PCBs such as in dyes/pigments (regulated by TSCA) or food packaging (regulated by FDA)(See Washington Department of Ecology 2015, Appendix D for full list of processes that inadvertently generate PCBs).
- Support green chemistry alternatives to replace products that contain or could inadvertently release PCBs. Green chemistry is defined by EPA as "chemical products and processes that reduce or eliminate the use or generation of hazardous substances" (USEPA 2015b).
- Remove carp from Lake Spokane (0.023 – 0.062 grams of PCBs per carp)
- Implement labeling ordinance for products containing PCBs, similar to 2014 law for labeling construction materials that contain asbestos (RCW 70.310.030)
- Encourage acceleration of sewer construction to replace septic systems over the aquifer recharge area (prioritizing commercial properties)

Education

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

- Conduct a survey of local utilities and other owners of electrical equipment to document the presence/amount of PCBs in transformers. This survey was recently completed for several local utilities (Avista Utilities, Inland Power and Light Company, Modern Electric Water Company, Vera Water and Power, Kootenai Electric Cooperative, and Bonneville Power Administration), and they all have (or are in the process of) removed PCB-containing equipment. Follow up steps after identifying this information could include providing technical assistance where requested for disposal and replacement of the contaminated fluid.
- Conduct public education and outreach campaigns to spread information about the potential sources of PCBs, what to do with them if discovered (e.g., avoid pouring paint down the drain), 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. Pathways of PCB sources should also be discussed in such campaigns. There are several existing programs such as "Fix Leaks", "Go natural in your yard", and "Toxics free tips" that could potentially be leveraged for additional information on PCBs.

- Conduct studies to better define which products contain PCBs, test new products, and maintain a database that is publicly available. Products identified by the City of Spokane (2015) as potentially containing significant levels of PCBs included:
  - Road Oil
  - Hydroseed additives
  - Deicer
- Educate on-site septic system owners located over the aquifer recharge area (there are approximately 10,000 systems in the Spokane area) on proper disposal of wastes (e.g., not "down the drain") and on the environmental and functional benefits of regular tank pumping.

Stormwater Treatment

Stormwater Treatment control actions 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 control actions 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 control actions is designed to capture/treat stormwater onsite before it enters storm pipes or travel through the street where more PCB contamination can be picked up, and includes:

- Infiltration control actions 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 control actions, including rain barrels, underground tanks, ponds, detention basins, and green roofs. These control actions 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 control actions such as swales, buffer strips which are designed to provide some infiltration/trapping of solids before discharge to the MS4 or a drywell.
- Isolation of contaminated source areas from the stormwater system. A contaminated discharge could either be routed to a wastewater treatment plant

for proper treatment (and avoid direct discharge to the Spokane River), or ideally be cleaned up prior to discharge to the river.

Pipe system

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

- Screens that trap contaminated solids and larger debris to prevent discharge of that material to receiving waterbodies
- Filters or "socks", like screens, that trap contaminated solids and prevent discharge of that material to receiving waterbodies
- Wet vaults, consisting of 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 that 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 control actions is installed at the end of MS4 pipes, but before the discharge will reach receiving waters (the Spokane River, Lake Spokane, or their tributaries). They can have high maintenance requirements or require significant areas of land to implement. Options include:

- Constructed wetlands, that work to slow peak stormwater flows to prevent erosion and also help to trap contaminated solids and debris from entering receiving waterbodies
- Sedimentation basins, which are similar to a wetland in their purpose and trapping mechanism but allow for a large volume of detained stormwater to be ponded prior to discharge
- Discharge to ground/dry wells, which works to infiltrate stormwater into the ground prior to discharge. The issue of whether the discharge to dry wells would contribute PCBs to groundwater is unknown at this time and should be explored further before implementation.
- Diversion to treatment plant, which 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
- New technologies such as fungi and biochar, which are being investigated for effectiveness of their ability to break down PCBs when incorporated into bioretention or other green infrastructure design features.

Wastewater Treatmen

The Washington and Idaho (EPA) NPDES permits require each wastewater facility discharging to the Spokane River to develop and install treatment systems to reduce nutrient loading that will concurrently result in reductions of PCB loading. In addition, each facility has developed a Toxics Management Action Plan that includes a PCB source identification study and control actions. Control actions that are contained in the majority of these plans include:

- Preparation of an Annual Toxics Management Report
- Elimination of all known PCB-containing equipment under control of permittee

- Public outreach and communications
- Review of procurement ordinances
- Application of pretreatment regulations to industrial users

Other control actions appear in a limited number of Toxics Management Action Plans. These actions include:

- Implementation of a source tracking program
- Chemical fingerprinting or congener or homolog pattern analysis
- Remediation and/or mitigation of individual sources, conducted in the event that track-down sampling or chemical fingerprinting identifies potential individual sources

These Toxics Management Action Plans have been submitted to Ecology or to EPA under the terms of their respective NPDES permits. The Comprehensive Plan shall reference and incorporate these plans as submitted to the respective agencies. The SRTTFF shall evaluate the extent to which the plans should be further reviewed in the Comprehensive Plan.

Site Remediation

Site remediation control actions involve: 1) identifying, and 2) cleaning up soil that has been contaminated from past use of PCBs, before they can be mobilized and transported to the river. Marti and Maggi (2015) conducted preliminary research on existing soil and groundwater PCB data to assess contaminated sites that could be contributing PCBs to the Spokane River, and identified thirty one Toxic Control Program cleanup sites. These sites have either undergone cleanups and received No Further Action designation, are in the process of undergoing cleanups, or are awaiting cleanups.

Marti and Maggi (2015) note that PCB analytical data for the cleanup sites were primarily generated using method SW8082, with a standard reporting limit range of 0.5 to 100 ug/kg for soil and 0.0033 to 0.1 ug/l for water. Because of these higher detection limits, residual PCB contamination likely still exists at some of the sites that are currently designated for No Further Action. As such, continued identification of sites that could contribute PCBs to the Spokane River may be a worthwhile control action.

Remediation is the primary control action for identified contaminated sites. In Washington, remediation activities fall under the jurisdiction of the Model Toxics Control Act (MTCA), which will take precedence over Task Force activities.

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