Southern Resident Killer Whale Task Force Meeting #3: Discussion Guide – Contaminants

The Contaminants Working Group met on July 19, 2018 and identified the following recommended draft actions for discussion and consideration by the Task Force. They evaluated the effectiveness, affordability, and ease of implementation for each action. The full meeting summary of the Toxics working group meeting is available on the SRKW website.

This document is intended to help summarize discussions and draft recommended actions that were discussed at the Working Group meeting. This document presents some key issues for discussion and consideration so the Task Force may shape the actions prepared by the Working Groups into potential recommendations.

Actions are NOT listed in priority order.

QUESTIONS FOR THE TASK FORCE

For each issue below, please discuss and reply to the following questions:

- Would you like this action to be considered as a potential Task Force recommendation?
- What questions do you have about this potential action?
- Do you have suggested revisions or clarifications to this action?

ACTION 1. REFORM FEDERAL TOXIC SUBSTANCES CONTROL ACT TO PREVENT NEW CHEMICAL THREATS

Under existing law, many contaminants of emerging concern (CECs) are not regulated, or assessed for toxic impacts, before they are introduced into commerce or industrial processes. SRKW and their prey are exposed to these chemicals—many of which are endocrine disruptors—because they often find their way into our waters through wastewater treatment plants and stormwater runoff. It can be very expensive to clean up or provide water quality treatment at these "end of pipe" locations (i.e., stormwater and wastewater treatment).

This longer-term approach (10-15 years to enact) would reform the federal Toxic Substances Control Act (TSCA) to take a precautionary approach to chemical regulation. It would shift the control of toxic contaminants to the source of contamination—to the production of commercial products and industrial processes. Prior to federal reform, Washington could take action through an inter-state reform program with the Pacific Coast Collaborative. Both federal and state reforms would require toxicity data disclosures, minimum data sets and evaluations including assessments

of alternatives, and subsequent enforcement. TSCA reform would also bring co-benefits across communities and other ecosystems because it would reduce the creation of new legacy pollution.

Degree of Certainty: The degree of certainty was rated as high for the effectiveness and ease of implementation ratings, and medium for the affordability rating.

Criteria	Rating	Justification
Effectiveness	High	• Protects SRKW by stopping the flow of current & future chemicals to Puget Sound
Affordability	Medium	• Implementation will cost money, but will also prevent future clean-up costs • Shifts cost burden from public to producers (and those consuming products)
Ease of implementation	Medium	• Recent changes to federal law inadequate to address SRKW concerns • Technically feasible: requires significant data disclosure and evaluation • Political/social feasibility is a heavier lift • State action is could be explored—but would be much less effective without federal changes

ACTION 2. BAN ALL PCBS IN CONSUMER PRODUCTS THROUGH EXISTING STATE POLICY TOOLS

The current PCB ban prohibits the manufacture of PCBs, but does not cover PCBs produced as unintended by-products of other industrial processes. This is known as "inadvertent production," and commonly occurs during the manufacture of dyes and pigments (especially yellow), as well as packaging. Most SRKWs tested for PCBs have had levels that exceed a health effects threshold in harbor seals, and PCBs may reduce prey survival as well.

This approach would ban the inadvertent production of PCBs in dyes, pigments, and packaging by 2020, with phase-outs starting in 2025 as the program matures. It could also be broadened to cover other products. Specifically banning PCBs in state-purchased products would accelerate implementation. The State would need new regulatory authority to set limits and enforce the ban. Ecology would conduct alternatives assessments, product testing, and enforcement. This action builds on existing successes.

Degree of Certainty: There is a medium-high degree of certainty in this action. Effectiveness and affordability were rated high certainty; ease of implementation was rated medium certainty.

Criteria	Rating	Justification
Effectiveness	Medium	• Reduces new sources only • Legacy sources are significant • Benefits all pods
Affordability	High	• $300,000 per biennium, or 1 FTE • Makes manufacturers responsible for producing PCB-free products
Ease of implementation	Medium	• Regulatory models (Better Brakes) available • Leverages state PCB products policy • Supports existing state policy and law • Promotes innovation and green chemistry • Some producers will resist and others are interested; all will need time to transition • Enhanced lab methods will be needed to ensure compliance

ACTION 3. PRIORITIZE CHEMICALS FOR THEIR LIKELY IMPACT ON SRKW, THEN DEVELOP AND IMPLEMENT PLANS TO REDUCE HARM

Known and unknown chemicals pose a threat to SRKWs and their prey. Emerging contaminants are poorly regulated.[1] *Many chemicals of emerging concern (CECs) are suspected endocrine disruptors, yet are not fully evaluated for their effects on SRKWs, their prey, and people.*

In this approach, which could begin in July 2019 if funded, Ecology would prioritize contaminants for their likely impact to SRKW, beginning with a Phthalates Chemical Action Plan. Ecology could implement responses such as alternatives assessments, new or current bans, phase-outs, and incentives. Ecology would prioritize expanding existing product laws regarding persistent bioaccumulative toxins (PBTs). Together, these actions would increase the impact of Ecology's current Chemical Action Plan work. Ongoing funding would be needed, beginning with the FY19-20 biennium.

Degree of Certainty: There is high certainty in this action; the ratings for effectiveness and ease of implementation were rated high certainty and the affordability rating was medium certainty.

Criteria	Rating	Justification
Effectiveness	High	• Eliminates pollution source affecting SRKW, which improves SRKW health, prey survival, and overall ecosystem health

[1] For this action, emerging contaminants refers to CECs and persistent bioaccumulative toxics (PBTs) such as PCBs and PBDEs.

		• Immediate action with long-term, sustained toxics reduction • Signals market to make safer products • Benefits all pods, but J Pod more
Affordability	Medium	• Most cost-effective source elimination tool • $1.3-1.7 million needed, depending on cost of alternatives assessment
Ease of implementation	High	• Existing regulatory authority; new authority may be needed for some CEC bans, restrictions, or phase-outs • Good support from interested parties • Rated highly by Toxics in Fish experts • Leverages Ecology & Health resources

ACTION 4. PROVIDE INCENTIVES AND SWAP-OUTS TO REDUCE EXISTING TOXICS SOURCES

Chemical-laden products created before chemical bans or regulations were enacted are still circulating in our economy. These products contain significant legacy sources of PCBs, PAHs, PBDEs, and per- and polyfluoroalkyl substances (PFAS), all of which pose direct threats to SRKW and their prey, and the ecosystems their prey depend upon.

This approach would incentivize removal of the primary legacy sources of PCBs, PAHs, PBDEs, and PFAS and would prioritize action in North Puget Sound where it is most likely to reduce toxic impacts to SRKW prey species—juvenile Chinook and forage fish[2] – where toxics impact survival of prey in addition to impacting SRKW health directly. In Phase 1, Ecology would develop the program, including coordinating with ongoing programs, gathering stakeholder input, and targeted marketing communications and outreach. In Phase 2, the incentive program would be funded and implemented, at an estimated minimum cost of $1 million per chemical class. Recovery response time ranges from 1-2 years for forage fish and juvenile salmon (prey) to decades for adult SRKWs.

Degree of Certainty: There is high-to-medium certainty in this action, depending on the particular toxic chemical class. Effectiveness was rated high for pilot programs that target most intense toxics load reduction, while certainty of affordability and ease of implementation were rated medium.

[2] Priority legacy sources are as follows: PCBs—transformer/capacitor replacement along utility corridors and developed areas with buildings constructed before PCB bans; PAH—pilings and other treated wood in priority forage fish and juvenile Chinook rearing habitat; PBDE—household and office goods made before bans, especially those with fire retardants; PFAS—areas with firefighting activity.

Criteria	Rating	Justification
Effectiveness	High	• Source control prevents need for expensive treatment or clean-up • Reduces loadings to prey: 1-2 years for forage fish and juvenile salmon; 5-7 years for adult salmon • Benefits all pods, but J Pod more
Affordability	High	• Highly affordable to right-size swap-out incentives with pilot programs • Phase 1: 3-5 FTE • Phase 2: $1 million or more
Ease of implementation	High	• Creosote piling removal programs exist • Easy to start and scale pilot programs • Highly feasible across the board (regulatory, social, political, technical) • Reinforces other source control

ACTION 5. IMPROVE EFFECTIVENESS, IMPLEMENTATION, AND ENFORCEMENT OF NPDES PERMITS

NPDES permit implementation and enforcement could be improved, as NPDES discharges from municipal stormwater systems, industrial stormwater runoff, and wastewater treatment systems pose direct threats to SRKW and their prey. Current NPDES regulations may also not be strong enough to protect SRKW and their prey from toxic contaminants.

This approach would set new numeric water quality standards primarily focused on endocrine disrupting compounds and PBTs. New water quality standards could drive increased treatment requirements or source control for permitted dischargers. Along the same lines, this approach would couple deployment of treatment technologies—most importantly for PBDEs and CECs—with already planned or required upgrades to wastewater treatment facilities. More staff paid competitive wages would be needed to implement and enforce this approach. New standards could be implemented on the five-year NPDES permit cycle and could take permittees years to fully implement.

Degree of Certainty: There is high-to-medium certainty this action would reduce toxic pollution loads and low certainty this could achieve human health criteria water quality standards. Effectiveness was rated high for significantly reducing pollution, but low for achieving water quality standards and for CECs due to lack of data. Affordability was rated medium certainty; ease of implementation was rated mixed certainty.

Criteria	Rating	Justification
Effectiveness	High/Medium	• Last chance for permittees to remove toxics before they enter stormwater • Reduces loading to prey and SRKW • Possible nutrient reduction co-benefits
Affordability	High/Low	• High: Regulatory agencies set new standards; increased implementation and enforcement • Low: Permittees implementing new requirements • 6-10 FTEs • About half million to low millions for permitting • High millions to billions each for municipal stormwater and industrial pretreatment and stormwater • Tens of billions for Wastewater Treatment
Ease of implementation	High/Medium/Low	• High regulatory feasibility; well-aligned with current laws and efforts • High technical feasibility, but new criteria for PBDEs and EDCs needed • Low political, social, and financial feasibility; massive Wastewater Treatment upgrades needing ratepayer bonds

ACTION 6. REDUCE STORMWATER THREATS IN EXISTING HOTSPOTS

Stormwater runoff from commercial, industrial, and transportation land uses contains the highest concentrations of numerous toxic chemicals based on extensive monitoring data. Retrofitting existing land use areas with modern stormwater controls is slow because the pace of redevelopment is slow. The region is a center of stormwater innovation, with existing programs in pace that are not adequately funded. Toxics in stormwater pose direct threats to SRKW and prey survival, including early marine survival of juvenile Chinook and forage fish such as herring.

This approach would prioritize source control and treatment, and incentivize redevelopment, in stormwater toxicity hotspots. Hotspots include commercial and industrial lands throughout the region, plus known geographic hotspots such as the Snohomish River and Duwamish River basins. Specific responses include removal of contaminated building materials, stormwater retrofits to provide treatment, and/or incentives to increase the pace of redevelopment. The first phase would be geographic prioritization, followed by planning and incentives programs and then

implementation. Programs are currently in place but would need increased funding to increase the pace.

Degree of Certainty: There is high certainty in this action; ratings on all criteria were rated high certainty.

Criteria	Rating	Justification
Effectiveness	High	• Addresses largest toxics source to SRKWs; may take decades to reduce contaminants • Most benefits J Pod in Puget Sound • Immediate benefits for juvenile Chinook, forage fish, & herring survival when facilities built
Affordability	High	• Highly affordable; funding greatest barrier • $100 - $500 million per biennium, with priority to greatest reduction for lowest cost •
Ease of implementation	High	• Many years' experience • Leverages existing grant programs • Highly feasible across the board (regulatory, social, political, technical) • Supports green jobs • Cleans up areas with disproportionately high pollution

ACTION 7. PRIORITIZE AND ACCELERATE SEDIMENT REMEDIATION AND NEARSHORE RESTORATION BASED ON RISK TO SRKW

Clean-up of legacy sources of toxic contaminants in sediment is slow, not always prioritized, and underfunded. These contaminants—specifically PCBs, PAHs, and PBDEs—pose direct threats to SRKW and prey survival, including early marine survival of juvenile Chinook and forage fish. Nearshore restoration and remediation are highly effective for forage fish and critical to the long-term viability of Chinook salmon populations.

This approach would prioritize and accelerate nearshore restoration and clean-up of hotspots in forage fish and juvenile Chinook rearing habitat (i.e., in sensitive areas), where toxics are impacting prey survival. Hotspots include the Duwamish estuary and river, Commencement Bay, Anacortes, Portland Harbor, Hanford Reach, Sinclair/Dyes Inlet, Lake Union, and in British Columbia, Victoria Harbor and the Fraser Delta.

Degree of Certainty: There is medium certainty in this action. Both effectiveness and ease of implementation were rated high certainty; affordability was rated low certainty of cost-effectiveness.

Criteria	Rating	Justification
Effectiveness	Medium	• Highly effective for forage fish and juvenile salmonids; benefits expected within 1-2 years of restoration or remediation • Response in SRKW unlikely to be fast; J Pod most impacted
Affordability	Low	• Low affordability; accelerating clean-up is expensive • $18-38 million per Puget Sound project for dredging, disposal, and capping • $5-10 million per Columbia River project
Ease of implementation	High/Medium	• Regulations in place; knowledge sufficient, but must compete with other cleanup program priorities • Generally feasible, but funding is low and process is time-consuming and difficult

ACTION 8. SUPPORT MONITORING AND NEW SCIENCE

There are data gaps regarding the amount and toxicity of contaminants entering Puget Sound, their effects on SRKW and their prey, and what standards would be protective of SRKW, their prey, and other species in lower trophic levels. These data gaps make it difficult to develop effective management solutions that address chemicals of emerging concern (CECs) in particular. While we know other toxics impact SRKW and prey survival, the lack of information on CECs lowers our confidence that we are implementing necessary actions.

Priority monitoring and new science includes monitoring air quality and volatilization of toxic chemicals on the water surface; requiring Ecology and EPA to add PBDE monitoring to NPDES permits (e.g., public-owned treatment works); monitoring CECs from freshwater inputs and CEC levels in forage fish and salmonids; and establishing thresholds for CECs that are protective of SRKW and their prey.

Degree of Certainty: There is medium certainty in this action. Both effectiveness and ease of implementation were rated high certainty; affordability was rated low certainty because the numbers are estimates.

Criteria	Rating	Justification
Effectiveness	High	• Effective management requires data • Fills data gaps; provides current conditions • Benefits all SKRW pods
Affordability	Medium	• $3,000: chemical analysis (program exists) • $500,000: pilot program to guide future sampling efforts • Adds new monitoring to existing efforts
Ease of implementation	Medium	• Generally feasible, but new protocols for analytic methods would take time • Supports regulatory decision making

Appendix: Overview of Contaminants

The Contaminants working group is focused on four chemical classes. They enter Puget Sound through stormwater, wastewater, air deposition, direct water contamination, and/or groundwater:

- **Polychlorinated biphenyls** (PCBs): Most SRKWs tested for PCBs have had levels that exceed a health effects threshold in harbor seals, and PCBs may reduce prey survival as well. PCBs are commonly found in caulks, paints, and dyes in old buildings, at toxics clean-up sites, and inadvertently, in low levels in some new paints and dyes.
- **Polybrominated diphenyl ethers** (PBDEs): Most SRKWs tested for PBDEs have had levels associated with altered thyroid hormone levels in young gray seals, and PBDEs are also found in high levels in SRKW prey species. PBDEs are found in many products (furniture, mattresses, hard plastics like television casings, car seats) and are commonly used as flame retardants.
- **Polyaromatic hydrocarbons** (PAHs) are toxic to SRKW prey and have been linked to developmental deformities, impaired immunity, liver toxicity, and a dysfunctional adrenal system. In marine mammals, oil exposure can make hair and fur less water-resistant and insulating, stress fetuses or give them pneumonia, and lead to neural and liver damage, emphysema and lung lesions, stomach ulcers, and higher stress levels. They are commonly found in creosote-treated wood (marine pilings, utility poles, etc.), vehicle emissions and leaks, and wood smoke and industrial emissions.
- **Chemicals of Emerging Concern** (CECs): CECs include a large range of chemical types, and many are known or suspected endocrine disruptors or xenoestrogens and could affect SRKW or their prey by mimicking estrogen. CECs are found in everyday items such as personal care products (soap, lotion, make-up), detergents, plastics, and water-resistant clothing. They include toxic flame retardants (including new variants of PBDEs), phthalates, bisphenols, nonylphenols, and highly fluorinated or per- and polyfluoroalkyl substances (PFAS).