January 16, 2013

To: Governor Jay Inslee,
Speaker Frank Chopp,
Majority Leader Senator Rodney Tom,
Senator Doug Ericksen, Chair Senate Committee on Energy, Environment and Telecommunications,
Senator Kevin Ranker, Senate Committee on Energy, Environment and Telecommunications,
Representative Dave Upthegrove, Chair House Environment Committee,
Representative Shelly Short, House Environment Committee

We are writing to call your attention to the problem of toxic chemicals in Washington.

We came together in September 2012 at the request of Department of Ecology then-Director Ted Sturdevant as a diverse group of government, business, and non-governmental leaders to discuss this issue of toxic chemical management. Our goal was to transcend our typical legal and political silos to look for creative new approaches to toxics that offer better human health, environmental and economic outcomes. The attached paper outlines our sense of the challenge, offers some principles for action, and describes our ideas for moving forward.

Some of our ideas—such as establishing a Green Chemistry Center—can be implemented now. Others—such as developing a voluntary, simple, positive label designed to draw consumers' attention to products that are comprised of safer ingredients than comparable alternatives, and evaluating significant changes to the liability scheme for toxic chemicals—would need significant further study and development before a decision to implement them could be made. Although we each individually have our preferences, and concerns, across this suite of ideas, we all share a belief that we, as a society, can do a better job reducing the adverse health, environmental, and economic impacts of toxic chemicals.

In whatever way we proceed on this issue, it is clear that there is not a one-size-fits-all solution. Moving forward successfully will require a variety of new approaches and ideas. We have discussed and collaborated on these ideas, and present them here as a package representing the type of new and creative thinking that can help us better address toxics in Washington, and a starting place for moving forward.

Our quality of life in Washington depends on a healthy environment and a robust economy. Our current regime for addressing toxic chemical releases is inadequate on both counts. We have an opportunity and a responsibility to do better.

We hope you will continue the dialogue about how to put these ideas into practice, and work with us to reduce exposures to toxic chemicals in Washington. We would welcome the opportunity to discuss these ideas with you further and stand ready to help you in moving our state forward toward these goals.

Respectfully,

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Affiliations are for identification purposes only; signers participated as individuals.

Copy: Governor Gregoire
Washington State Congressional Delegation
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Toxics Policy Reform for Washington State

Much progress has been made to address toxic chemicals in Washington State, both through state regulations and through other public and private action and investments. Despite this progress, people and the environment in Washington continue to encounter harmful toxics through a variety of sources. These include airborne toxics such as from car exhaust, contamination in water and soil, and toxic chemicals present in consumer products.

Exposure to toxics has real consequences for the health of Washington citizens and the environment, and for the health and viability of Washington businesses. Continuing to work toward toxics reduction through individual chemical-specific efforts, and attempts to make sense of laws and regulations that are inadequate to address the quantity and complexity of exposures to toxic chemicals, will simply not get the job done. We need the ability and commitment to bring common sense, focused intention, and smart prioritization to toxics reduction efforts, both to better protect people and the environment and support the success and growth of Washington business and industry.

This paper gives an overview of the problems we face, outlines some principles for action, and makes twelve recommendations to improve toxics reduction efforts in Washington. It is by no means a comprehensive description of the issue or a comprehensive set of recommendations. We set out to test the idea that a small group of individuals with expertise and experience in toxics reduction efforts, and a deep commitment to the welfare of the State—its people, its environment and its economy—could think through and pose new, creative solutions to toxics reduction. We found that not only are new ideas badly needed—new ideas are possible. We are hopeful that this work will serve as a foundation for future efforts.

The Problem of Toxics

Our current approaches to protecting people and the environment from toxic chemicals fall short in a number of ways.

- Far too many toxic chemical releases and exposures still occur—many of which are avoidable.
- While they have yielded significant gains in reducing releases from wastewater and air emissions, existing regulatory tools can require dischargers to take costly source

reduction actions to address toxics they did not produce, manufacture, or even use. Responsible parties at cleanup sites experience extraordinary costs when they are required to clean up contaminants that originate from a wide variety of sources outside their control such as consumer products and stormwater runoff, and are now widespread throughout the environment at concentrations that often are above cleanup standards. When applied to widely distributed sources of toxics, these actions can extract a large economic toll—both on businesses and public entities, and through higher utility rates for everyone—without providing commensurate environmental or human health benefits.

- Laws like the Clean Water Act and the Clean Air Act have enabled great progress and real protections over time; however, relying on statutes designed to address end of the pipe "point-source" pollution to reduce toxic releases from distributed and diffuse "non-point" pollution is inefficient, extraordinarily costly, and limits our ability to fully protect against many toxic exposures.
- Toxics in products, if they are addressed at all, are regulated unevenly and by different statutes and different agencies at different stages in a product's life cycle, and can result in exposures to toxics during product use even when products are used as intended. When products are used in unforeseen or unintended ways the risk of exposure can grow.
- Incentives to design toxic chemicals out of our manufacturing and industrial processes are often weak or non-existent.
- Information on toxics can be lacking in general—understandable, actionable information for the public and consumers is almost entirely non-existent.
- Federal law underpinning toxic chemicals management is outdated and deficient and unable to keep pace with the development of new chemicals. At the state and local level, we are forced to make the most of a dysfunctional regulatory system.

As a result of these shortcomings, toxic chemicals continue to be released into the environment and people continue to be exposed to potential harmful chemicals in Washington. Over time we find ourselves unsuccessful in completely cleaning up the toxic chemicals that have existed historically (legacy pollutants), and playing catch up as the number of new chemicals and releases grows.

People and the environment continue to be exposed to a wide variety of toxic chemicals from multiple sources. For example, people in the United States have 10 to 100 times more polybrominated diphenyl ethers (PBDEs), a group of chemical flame retardants, in their bodies than people in other countries.[1] EPA negotiated a voluntary agreement with domestic manufacturers of PBDEs to cease production, yet in the absence of full toxicologic information, we cannot be sure that the replacement flame retardants are benign.[2] This illustrates the potential promise of non-regulatory solutions, but also the challenge of incomplete information

on the toxic effects of chemicals. After almost $100 million was spent to clean up toxic chemicals in the Thea Foss Waterway in Commencement Bay, it is being re-contaminated with chemical plasticizers called phthalates. There are no direct discharges of phthalates to the Bay; rather it appears that the source of these chemicals is from consumer products.[3] This illustrates the twin challenges of non-point source pollutants, and the presence of toxic chemicals in widely dispersed pathways such as consumer goods. Similarly, decades after the ban on PCBs, and after millions have been spent on cleanup of PCB contaminated sites, we are still trying to address legacy sources of this toxic chemical such as electrical transformers and caulk and finding new sources in unregulated products or byproducts of manufacturing.

In the face of such challenges—incomplete information about chemical toxicity, widely dispersed sources of toxic chemicals through consumer goods and other pathways, legacy contamination—the the public and the environment bear the risk and burdens of toxic chemical exposures.

People can absorb toxic chemicals through a variety of pathways, including ingestion (taking in food and water), inhalation (for airborne contaminants), and absorption through the skin. Some pathways are obvious, such as when air emissions blow into people's breathing zone, or when toxic chemicals are conveyed by stormwater or air deposition and get into the drinking water supply. Other pathways are more complex and subtle, such as when chemicals migrate from consumer products or household dust onto people's hands and then into their mouths through normal hand-to-mouth behavior, or when people or animals excrete endocrine disrupting chemicals that then enter the water supply.

Children are especially prone to toxic effects for several reasons. First, their normal behavior (such as placing things in their mouths) can increase exposure. Second, children eat and breathe more than adults per pound of body weight, so the relative doses they sustain are larger. Third, because children's protective mechanisms are immature, and their bodies are still developing, even small exposures during early childhood development can result in negative effects that can result in substantial and long-term damage.

Trends in children's health are concerning, and for several important health outcomes, chemical exposures may play a role. The following information is summarized from Focus Sheets prepared by the Washington State Department of Health, available at: http://www.doh.wa.gov/DataandStatisticalReports/EnvironmentalHealth/ChemicalsandChildren.aspx.

Learning and brain development. The developing nervous system is exquisitely sensitive to perturbation by chemicals and other insults. Environmental chemicals thought to be associated with impaired brain development include lead, methyl mercury, polychlorinated biphenyls (PCBs), manganese, organophosphate insecticides, arsenic, Bisphenol-A (BPA), PBDEs, and phthalates.[4] Autism and ADHD appear to result from a complex interaction between genetics

and environmental factors. In Washington State in 2010, more than 75,000 children (1 in every 14 kids) ages 3–21 were receiving special education services through school districts for learning disability, emotional or behavioral disability, autism, intellectual disability, or developmental delay.[5] Based on national data, an estimated 900–1000 children are diagnosed with autism every year in Washington.[6] [7] Researchers have estimated that $74.3 billion in annual U.S. costs are attributable to childhood impairments caused by environmental chemicals.[8] Lowered intelligence from early childhood exposure to lead alone was estimated to result in about $675 million per year in income lost to those affected in Washington State.[9]

Reproductive health. Like the nervous system, the reproductive system is complex and sensitive to perturbation by chemicals. For example, exposure to BPA may be linked to early puberty in girls, which is associated with an increased risk of breast cancer, infertility, and menstrual problems, as well as psychological difficulties that can lead to behavioral problems such as alcohol and drug use.[10] Hypospadias (a birth defect in which the opening of the urethra in boys is on the underside of the penis instead of the tip) has been linked to exposure to phthalates and other chemicals; it is one of the most common birth defects, affecting about 1 in 200 boys in Washington, or about 215 boys each year.[1112] In 2003, more than $162 million in hospital charges were associated with about 13 thousand cases of hypospadias in the U.S.[13]

Cancer. Childhood cancers account for about two percent of all cancer cases in the U.S.; however, except for injuries, it is the most common cause of death in children age 1 to 14 years.[14] Exposure to carcinogenic chemicals is thought to play an important role in development of some cancers. In 2009, U.S. hospital costs related to childhood cancer were about $1.9 billion, and the average cost for these hospitalizations was five times higher than for other conditions ($40,400 per stay versus $8,100).[15] Known human carcinogens that are found in and around many homes include: tobacco smoke, arsenic (from drinking water and legacy treated wood), benzene (from vehicle exhaust), formaldehyde (from furniture and cosmetics), and radon.[16]

Asthma. Asthma is the most common chronic disease in children, affecting nearly 1 in 10 U.S. children under age 18.[17] Almost 110,000 children in Washington have asthma[18], and it is the leading cause of hospitalization for children under 15.[19] Estimates are that 10 to 35 percent of asthma attacks can be attributed to outdoor environmental pollutants such as those in car exhaust or industrial emissions.[20] Asthma attacks also can be triggered by known indoor exposures; while allergens such as dust mites and pet dander are important, chemicals such as second-hand smoke and formaldehyde also play a role. In 2002 the total cost of asthma in Washington was estimated at $406 million, $240 million of that in direct medical costs.[21] In 2008, indirect costs of asthma included 14.4 million missed school days for children and 14.2 million lost work days in adults.[22] Rates of asthma in children and adults continue to rise.

ADULTS

Adults also are impacted by exposures to toxic chemicals. Neurodegenerative diseases such as Parkinson's disease and dementia are growing problems, and evidence suggests that chemical exposures may play a role; for example, pesticides, solvents, PCBs, PDBEs, and heavy metals such as lead and manganese have all been linked to an increased risk of Parkinson's disease.[2324] Based on national estimates, about 8,500 people in Washington have Parkinson's disease, and many more suffer from Parkinsonian symptoms. Because these are strongly age-related conditions, these numbers are increasing in our aging society.[25] Many childhood diseases have impacts for the rest of a person's life. According to the Washington State Cancer Registry there were about 37,000 new cases of adult cancer diagnosed in Washington and almost 12,000 adult deaths from cancer in 2009.[26] Approximately 400,000 adults in Washington State have asthma, and asthma prevalence has increased nearly 40 percent since 1999.[27] Of course, these diseases are influenced by a complex set of genetic, behavioral, and environmental factors, and toxic chemicals are not solely responsible for all these outcomes; but, we know they play a role. These are common diseases, in some cases becoming more common—a compelling reason to reduce exposures to toxic chemicals.

ENVIRONMENT

There are troubling toxics releases in the environment as well. More than 1,700 water body segments in Washington are impaired due to high levels of toxic chemicals or metals. The Puget Sound Toxics Loading Assessment found that the vast majority of toxic chemicals in Puget Sound come from non-point sources and are released to Puget Sound through stormwater. This includes:

- Copper, cadmium, zinc, and phthalates, from various sources.
- Copper from pesticide and fertilizer use in urban areas, brake pads in vehicles, and boat paint.
- Polycyclic aromatic hydrocarbons (PAHs) from wood smoke, legacy creosote-treated wood, and vehicle exhaust.
- Petroleum-related compounds from minor fuel and oil spills, and drips and leaks from personal vehicles.

Other pathways of concern include direct air deposition (where chemicals fall directly into the water; this is the most common pathway for PBDEs and some PAHs), and wastewater treatment plants, which often are not able to effectively remove some contaminants such as pharmaceuticals and endocrine disrupting chemicals present in municipal wastewater. Although the study focused on Puget Sound, it gives an indication of the types of toxic substances and pathways that may be present in other areas of the state.

The people or organizations that one might expect to "fix" these problems often lack the authority and/or resources to do so fully. Municipal wastewater treatment facilities typically do not generate toxic chemicals, but they are tasked with treating contaminants that enter the plants through conveyance systems carrying wastewater and stormwater that act as collectors of toxic chemicals that are released from consumer products, transportation activity, and air deposition. Once in wastewater or stormwater, these chemicals can be difficult or impossible to remove and are very costly to treat using best available control technologies. Non-point sources include runoff from agricultural, urban, transportation, construction, mining and forest lands. Depending on the specific source, nonpoint source runoff, in particular stormwater, may contain fertilizers, pesticides, oil, grease, and toxic chemicals from consumer products. Such non-point sources can be a significant contributor of toxic contaminants to our watersheds, but the Clean Water Act is not adequately designed to address pollution from non-point sources and so is difficult and inefficient to use to address these problems.

Like many other problems we face, the problem of toxic chemicals contains within it a set of opportunities. There are opportunities to help ensure Washington children have the chance to reach their full potential by preventing harmful exposures to toxic chemicals. There are opportunities to save healthcare costs by reducing unhealthy impacts of exposure to toxic chemicals. There are opportunities to build Washington industries, and recast Washington as a global leader in developing innovative green technology, including design and production of safer alternatives to toxic chemicals in products and manufacturing. There are opportunities to prevent future problems through the development and use of safer chemicals and green design. And there are opportunities to create incentives and improve the regulatory system to discover better solutions for industry, better information for consumers, and more effective and economical protections for all Washington citizens.

Our Principles for Action

The challenges we face from unintended consequences of widespread use of toxic chemicals are not new, and there are a variety of principles for toxics reform that have been developed by different entities including states, industry, and NGOs. We did not try to duplicate that work or create a comprehensive set of principles for chemical reform. Rather, we sought to articulate our common understanding and perceptions of what it would take to address this problem in a fair and robust way. The principles are intended for Washington State decision-makers as guidelines to identify and implement strategies and actions to reduce toxic exposures in the State.

1. **Shared Responsibility:** Industry, government, non-governmental organizations, and individual consumers share responsibility for addressing toxics.

    - Industry's role includes addressing chemical safety through better product design, providing information to the government to support chemical safety claims and chemical health and safety information, disclosing information about chemicals in products and potential hazards, taking responsibility for cleaning up toxic releases, and using safer chemical alternatives when viable.
    - Government's role includes protecting people and the environment from harmful exposures to toxic chemicals by establishing priorities based on chemical hazards, setting and enforcing standards, regulatory reforms, educating consumers and businesses, and providing public access to chemical safety and health information.
    - The role of non-governmental organizations, such as environmental organizations and universities, includes developing safer alternatives, conducting research, and educating the public about toxics and alternatives.
    - Individuals' responsibilities include considering chemical safety and health information when choosing products, and using products containing potentially harmful ingredients as directed.

2. **Prevention:** It is cheaper, more efficient, and safer to use less toxic or non-toxic alternatives when they are viable, rather than to rely on regulating waste streams or cleaning up contaminants after people or the environment are exposed to them.

3. **Set Priorities:** Identify and prioritize problems to guide effective actions.

4. **Chemical Safety:** Products should be safe for people and the environment. The unknowns and the complexities in understanding chemical exposures and the effects on human health and the environment warrant a precautionary approach. A precautionary approach is not meant to eliminate all risks; rather it denotes that when there is credible evidence that a chemical or product may harm humans or the environment, protective measures should be taken even if some cause-and-effect relationships or toxicity levels are not fully established scientifically. As the evidence becomes stronger, more intensive or costly measures are justified. Precaution should encourage innovation and development of safer alternatives. It is intended to reinforce that the producer or manufacturer of a chemical or product, rather than the public, should have the responsibility to ensure that the chemical or product is safe and that toxicity (if present) is effectively communicated.

5. **Chemical Information:** People have a right to know what is in the products they buy. The public should have access to clear, transparent, and actionable information about chemical and safety hazards associated with chemicals in all products; this should be presented in a careful way to avoid information saturation and fatigue.

6. **Disclosure:** Producers and manufacturers have a responsibility to provide hazard, exposure, and use data about chemicals in products and processes to government and to companies in their supply chains so that safety can be demonstrated or enhanced through redesign. Government agencies and manufacturers should share responsibility for providing public access to chemical health and safety information.

7. **Account for All Costs:** The full lifecycle costs of toxic chemicals should be internalized so that prudent financial decisions may be made across the value chain. The responsibility for the costs of toxics in products should be shared by producers, manufacturers, and consumers and not generally borne by external parties and taxpayers.

8. **Effective Laws and Regulations:** The current laws and regulations have made great gains in reducing toxic chemical releases from discrete sources, but we still confront major shortcomings, particularly when it comes to the Toxics Substances Control Act (TSCA), the law that is supposed to regulate the safety of chemicals before they enter commerce. In addition, laws such as the Clean Water Act are not adequately designed to address toxic chemicals present in and released from consumer products, despite the fact that they are a major source of pollution in our waterways. We need to identify where current laws and regulations are cumbersome, cost-inefficient, and incomplete and otherwise unsatisfactory and implement reforms accordingly. Ultimately, some of the needed reforms will take Federal action. But, there is much we can do here. In Washington State we should build on the successful laws and regulations we have, make reforms where needed, and pursue a comprehensive system that achieves a fair, proportionate approach to toxic chemicals.

Moving Forward

It is clear that we need new, more thoughtful and innovative approaches to address toxic chemicals in Washington State. Our current system allows for the release of too many toxic chemicals into the environment and exposure to people, and places too much of the burden of reducing releases of the toxic chemicals we do regulate on ratepayers and businesses who were not responsible for producing, manufacturing, or using them in the first place.

We need to take a more holistic approach to addressing toxic chemicals. We make twelve recommendations to reduce exposures to toxic chemicals in Washington. Some recommendations —such as establishing a Green Chemistry Center—can be implemented now. Others—such as establishing a statutory liability standard for harm caused by toxic chemicals—would need significant further study and development before a decision to implement them might be made.

Many of these ideas would represent big changes in how we deal with toxic chemicals in Washington—and we think big changes are needed. At the same time, we recognize the need to walk before we run. As a result, a number of our recommendations suggest developing a better understanding of the problems in Washington and how different ideas and potential solutions might address our challenges. A better system for managing toxic chemicals in Washington will not be built overnight, but we can make important progress now to address known problems with creative solutions and put us on the path to fewer toxic problems in the future.

ESTABLISH A POLICY THAT SAFER ALTERNATIVES ARE BETTER

There are over 84,000 chemical substances in EPA's TSCA inventory, and new chemicals are introduced into commerce regularly. It is difficult to imagine a regulatory program, such as the one run by the Food and Drug Administration for example, that could catch up and keep pace with this reality. At the same time, we must improve our approach.

Sometimes a potentially harmful chemical is used because its harmful properties are needed in a product; pesticides, for example. Other times a potentially harmful chemical is used because a safer alternative isn't readily available or hasn't been developed yet— for example, zinc in tires or, until recently, copper in brake pads. Still other times, potentially harmful chemicals are used simply because they always have been, and we aren't paying attention to them. For example, when one Northwest company decided to evaluate their use of toxic chemicals in their products, they found out they used five high priority toxic chemicals. Of these, four could be replaced with safer alternatives and the other could be dramatically reduced—this is where real gains truly can be made quickly.

We need a system that encourages and rewards innovators for continuously working to make each product as safe as it can be through design and manufacturing choices.

The best, most reliable, and most efficient way to reduce exposures to toxic chemicals is to reduce the use of toxic chemicals in favor of non-toxic or less-toxic alternatives.

1. Washington State should establish a clear policy that with respect to toxic chemicals, safer is better. Just as the Washington State waste management hierarchy (established in 1984) has driven waste management policies and behavior towards waste minimization, reuse, and recycling, a state chemical policy that prefers safer alternatives would be an anchoring point for subsequent policy decisions and provide a guiding mechanism for driving state toxics reduction efforts, program development, state policies, and state purchasing.

A preference for safer alternatives is not intended to say that we can eliminate all toxic chemicals. We recognize that toxic chemicals will continue to be needed when their toxicity is an inherent part of their performance (e.g., pesticides must possess some toxicity to kill pests), or when viable non-toxic alternatives are not available or are not feasible. At the same time, we will only get so far by managing exposures—and we likely will never have the information or understanding needed to predict how multiple exposures to different chemicals over time might interact or add up to create harm. The simplest, most effective and most durable way to reduce exposures to toxics is to use the safest chemicals that can efficiently do the job and to continuously make chemicals safer over time.

SET THE RIGHT PRIORITIES

We need to set priorities to ensure that we work on the chemicals of most concern in Washington, and invest in the programs and actions that are most effective at reducing toxics.

Currently Washington prioritizes toxic chemicals in a variety of ways. Some priorities flow from traditional state and federal environmental programs such as the Clean Water Act and the Clean Air Act. These are and will remain important foundations to the work of environmental protection, but they do not address the whole picture of toxic chemicals. To begin with, most of these environmental programs address only a subset of chemicals and cannot quickly add new or emerging toxic chemicals to their schemes. In addition, most traditional environmental programs are focused on a single exposure route or impact, generally where chemicals have already been or are being released to the environment. Except in limited cases, such as pesticides, they do not directly address toxic chemicals that are released from consumer products during product use. This is important enough to reiterate: *there currently is no comprehensive state or federal safety standard for chemicals in consumer products.*

The State also has made strides to identify and address toxic chemicals based on some specific areas of concern for Washington. We have priorities in place to: reduce persistent, bioaccumulative and toxic chemicals; gather information on the use of toxic chemicals in children's products; and reduce key sources of toxic chemicals to Puget Sound. To date this has resulted in:

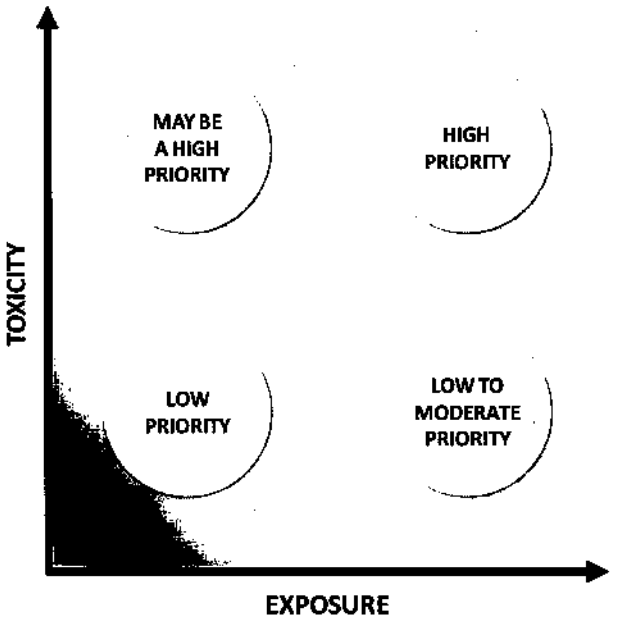
- Chemical Action Plans for lead, mercury, polybrominated diphenyl ethers (PDBEs) which are flame retardants, and polycyclic aromatic hydrocarbons (PAHs) which are byproducts of incomplete combustion, and a commitment to complete a CAP for PCBs, which continue to be identified in the environment and in products such as inks, dyes, and caulks despite being banned almost 40 years ago.
- A list of 66 chemicals of high concern in children's products and associated disclosure and reporting requirements.

- Initiation of actions to significantly reduce three of four priority chemicals with basin-wide impacts to Puget Sound: copper, PAHs, and petroleum.

These prioritization efforts represent important progress, but they are not a holistic approach. In the long term,

2. Ecology should work with partners to develop a more comprehensive system for establishing chemical priorities, building on existing efforts. This system should both identify high-priority toxic chemicals and should prioritize toxics reduction strategies, in a two-step process.

Figure 1: Prioritizing Chemicals of Concern



To identify high-priority toxic chemicals we should rely on authoritative evidence of concern and consideration of potential exposure routes, and should consider both the potential level of harm a chemical might create and the potential level of exposure in Washington. Priority should be given to chemicals with high potential for harm and high potential for exposure, and to chemicals, such as endocrine disrupting chemicals, that can be very toxic at low doses. In addition to PBT chemicals, this priority setting system should focus on other toxic chemicals that people and the environment are most likely to be significantly exposed to, especially those that may impact sensitive sub-populations such as children, and sensitive environmental receptors, particularly those of special importance in Washington, such as salmon. Care should be taken to consider chemicals and exposure routes that might be specific to Washington. This might be done by looking at Washington-specific information about the chemicals people have been exposed to through use of bio-monitoring data to better understand exposures, and by looking at chemical use in Washington industries to illuminate opportunities for development of safer chemical alternatives that would be relevant here. Prioritization should consider all Washington residents, including populations or cultures that might have more potential for exposure.

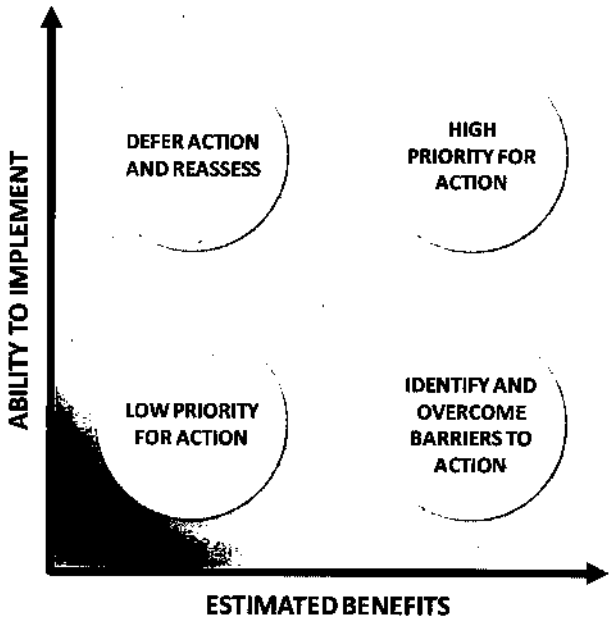
In a second step, once the chemicals of highest concern for Washington are identified, Ecology also should prioritize toxics reduction strategies and actions. This effort should consider feasibility (our technical, legal, and societal ability to implement the strategy) and effectiveness

(our level of confidence that, if implemented, the strategy would make a difference and the amount of different we think it would make). Ideally, we want strategies and actions that we are confident we can implement and that will make a difference. We do not need to assume a zero-sum game in this effort; we should recognize that, although resources are never unlimited, one outcome of such a prioritization effort for actions could be to identify situations that warrant seeking additional funding or partnerships.

Ecology used a step-wise process like this in its implementation of the PBT program, where they first identified priority chemicals, then identified sources of these priority chemicals, and then identified and evaluated potential actions. This is a useful exercise that should be used as a model for other toxics reduction efforts.

Over time, efforts should be made to improve prioritization through better and more specific data and information both on chemicals of concern and on toxics reduction efforts. For example, broader use of bio-monitoring could help us understand which chemicals Washington residents are most exposed to. Ongoing analysis assessments of toxics reduction actions could help us improve the focus and performance of those efforts. Later in this paper we make recommendations on evaluating and improving toxics reduction programs that will support improving prioritization efforts.

Figure 2: Prioritizing Actions



In the shorter term, as a more holistic system is developed and implemented,

3. Ecology, its partners, and sister agencies should continue to take actions to reduce releases of and exposures to priority chemicals that have already been identified, and should continue to refine these priority lists. Ecology should also add chemicals that are widely distributed and can have toxic effects at very low doses (such as endocrine disrupting chemicals) to its priorities. While not a complete approach, we are comfortable focusing on chemicals of concern for children, chemicals of concern to Puget Sound, and the PBT chemicals in the short term because they address one of our most fragile and sensitive subpopulations (children), one

of our most critical ecosystems (Puget Sound), and the legacy cleanup problems of tomorrow (PBTs). Pursuing these priorities should include the following.

- Assess the information on chemicals of concern present in children's products to identify if there are types of chemicals or types of products that could be improved by identification and use of safer alternatives.
- Accelerate and complete recommended actions identified in existing Chemical Action Plans, complete the PCB Chemical Action Plan, and accelerate additional PBT Chemical Action Plan activity. This includes updating the list of PBT chemicals if needed and ensuring plans are based on sound and up-to-date information, and would involve working with stakeholders, reprioritizing the updated list, developing new plans, and communicating PBT recommendations to the public and other actors.
- Continue to develop and implement strategies to reduce key sources of toxic chemicals to Puget Sound, as identified in the Puget Sound Toxics Loading Assessment Report.

CHANGE THE WAY WE MAKE THINGS

We need to build the capacity and expertise to support producers, manufacturers, and retailers to identify and develop safer products. Green chemistry— the design of chemical products and processes that reduce or eliminate the use and generation of hazardous chemicals—is an important framework that can support the transition to a less-toxic future.[28]

One of the initial efforts of the Green Chemistry Center might be to collaborate with five or six large Washington industries to identify specific opportunities to reduce toxics. This could be based on application of the Green Screen method for comparing hazardous chemicals.

The BlueGreen Institute has researched the economics of a green chemistry industry and writes that a shift to the production of chemicals that are safer for workers, the environment and human health, supported by reform of the 1976 Toxic Substances Control Act (TSCA), can create American jobs and new market opportunities. They estimate that if, for example, 20 percent of current production of plastics was to shift from petrochemical-based plastics to bio-based plastics, 104,000 additional jobs would be created in the U.S. economy even if the output of the plastics sector remained unchanged.[29]

As a leader in toxics reform efforts, and a state with significant natural resources, Washington is well positioned to be on the leading edge of growing this economy. We can—and should—become the home for the innovators, inventors, and investors who will create and bring to market safer alternatives to toxic chemicals. In addition to saving money now spent on managing the effects of toxic chemicals through pollution control, health care, and special education, better approaches to toxics can improve our economy and add high-quality jobs for

Washington residents. Already Weyerhaeuser is working with Ford to develop thermoplastic composite materials made with cellulose. These materials weigh less and can be produced faster, using less energy, than fiberglass-based materials, and can be produced from sustainably-managed forests. Ford has said these cellulose-based plastic composites could become just as important as soybeans currently are to the automaker (Ford uses soybean-based cushions in all of its North American vehicles, such as the new Fusion). On the horizon could be safer replacements for asbestos and petroleum-based carbon fibers made from wood-derived compounds. A study from Utrecht University in the Netherlands finds that bio-based polymers could technically substitute for up to 90 percent of the polymers currently in use that are derived from petrochemicals and estimates that the production of bioplastics will grow at approximately 37 percent per year until 2013 and at a rate of 6 percent between 2013 and 2020.

4. Washington should become a national leader in green chemistry, making these innovations a trademark of the State just like apples, wheat, software and airplanes. Ecology should explore strategies for realizing "triple bottom line" benefits for Washington's economy, environment and human health with leaders in business, government, academia, and other sectors to investigate how and whether Washington could become a leader in green chemistry. This should build on industries, resources, and expertise we already have in Washington.

Washington State is already moving forward with green chemistry, and recently solicited proposals to establish a Green Chemistry Center. As an initial step towards green chemistry leadership, the State should maximize its support for and investment in the Green Chemistry Center. The role of this Center should be to:

- Support the design and advancement of new, safer chemicals and manufacturing techniques that are useable by industry and are environmentally benign.
- Help producers and manufacturers with green chemistry and green design approaches and promote industry cross-sector collaboration and the development of tools to advance the adoption, implementation, and value of green chemistry.
- Support toxics-free manufacturing efforts consistent with cradle-to-cradle approaches and incubate new businesses that can help grow the economy in Washington.
- Identify barriers to safer alternatives, and work with stakeholders to develop strategies to overcome barriers and to reduce the transaction costs of getting safer alternatives to market.
- Provide ready access to information about safer alternatives in products and supply chains.
- Consolidate information about toxics in products and conduct independent testing, verification, and research to help identify priorities for development of safer alternatives.

- Convene university researchers and educators, industry, government, and nongovernmental partners to prioritize green chemistry research needs, integrate green chemistry curricula, and support continued education and student learning opportunities.

The Center also might sponsor contests to draw attention to the need for safer alternatives and reward their development. For example, the Center might work with Ecology and the business and academic communities in Washington to identify a product or product ingredient where a safer alternative is needed. The Center might then compile relevant information on the product or product ingredient and the specifications for a successful safer alternative and use that information to create a contest that would reward (with a monetary honorarium or other award) creation of the safer alternative. Such a contest might be aimed at students to reinforce the need for green chemistry expertise.

Ideally, a Green Chemistry Center would be a public/private partnership. The Albany College of Nanoscale Science and Engineering in Albany NY (http://cnse.albany.edu/Home.aspx) provides a model of what such a partnership might look like. A $1 billion state investment was used to attract another $13 billion in investment from the computer industry to develop a nanotechnology research consortium. The college provides 2,700 local jobs, and statewide it is estimated to support nearly 13,000 jobs. In Washington State we also have models that might serve as a starting place for a Green Chemistry Center. The Washington Stormwater Center (www.wastormwatercenter.org) provides independent support to NPDES permittees and stormwater managers as they navigate the complexities and challenges of stormwater management. They carry out independent research on stormwater and stormwater treatment technologies and provide tools for stormwater management by supporting municipalities, stormwater permittees, and businesses in their efforts to control stormwater and protect water quality.

GIVE PEOPLE ACTIONABLE INFORMATION TO SUPPORT SAFER CHOICES

Ultimately, people exercise a lot of influence over the types of products that are manufactured through the types of products that they buy. Consumer pressure can change retail and manufacturing processes, as was illustrated recently with the switch to non-BPA plastics in baby bottles and other children's products. But too often information for consumers is incomplete or poorly presented, and results more often in confusion rather than clarity around choices.

Education

All of the toxics reduction efforts we looked at in other states include within them some emphasis on consumer and public education. In Washington we invest in numerous education efforts around toxics reduction already—from public health-led efforts on reducing exposure to

lead and arsenic, to Washington State University Extension led efforts to promote use of less toxic pest management practices and household cleaners, to the Puget Sound Starts Here campaign aimed in part at changing behaviors that contribute to toxics in stormwater runoff. Clearly, education and information are important to any effort to reduce exposures to toxic chemicals in Washington; however, to be effective, education campaigns should be clearly focused on the specific behavior they seek to change. As with labeling efforts, simply providing more information does not always change behavior—the information must be relevant and it must be actionable.

5. We recommend development of targeted education campaigns aimed at changing specific consumer behaviors around priority toxics. A reasonable starting place for this effort might be around behaviors to reduce use and exposure to PBTs. The existing Chemical Action Plans contain a number of recommendations that rely on behavior change to be successful, including:

- Addressing lead paint in older homes, which are the largest source of ongoing lead exposure for children.
- Reducing engine idling and addressing woodstoves to reduce sources of PAHs.
- Fixing automobile drips and leaks to reduce contamination to Puget Sound and other waters.
- Reducing use of mercury.
- Reducing backyard burning, a source of dioxins.[30]

Labeling

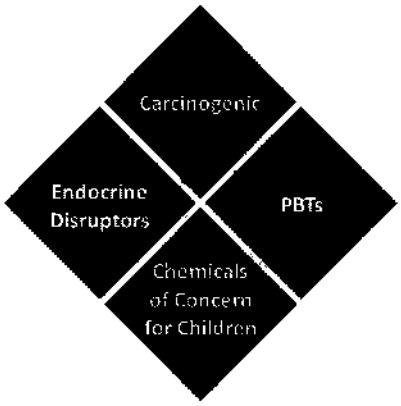
Labeling can be informative, trusted, and actionable (e.g., Consumer Reports, or Energy Star) or obscure, hard to understand, and overwhelming (think food labeling). Ideally, labeling provides consumers with easy-to-use, relevant information that helps them make more informed decisions—but just putting a label on a product doesn't guarantee those outcomes. Effective labeling programs are difficult to craft. These programs should not require consumers to achieve advanced levels of understanding of chemistry or toxicology in order to make everyday purchasing decisions; at the same time, labels are only useful when they convey substantive, meaningful information. An effective label should transmit information people actually want, in a way they can understand and act on.

Labeling has the potential to be an important and meaningful element of a toxics reduction strategy. Effective product labeling can encourage consumers to protect themselves from potentially harmful toxic chemicals and, through their actions, influence producers' and manufacturers' behaviors. A positive labeling system that enables consumers to seek out products that are acknowledged as less toxic rewards the use of safer alternatives and encourages innovation.

6. We recommend further work to evaluate a voluntary, simple, positive label designed to draw consumers' attention to products that are comprised of safer ingredients than comparable alternatives.

It may be fruitful to explore the concept of labeling in the context of specific products or classes of products—for example, children's products and the presence or absence of the identified chemicals of high concern for children.

Figure 3: Example Product Label



We acknowledge that establishing a labeling program, even a simple one, is a complex effort. Care should be taken to explore:

- Label focus, including what chemicals, classes of chemicals, and types of products should be highlighted and whether the existing priorities are the right starting place.
- Label design, including assessment of evidence-based information on what types of labels are most likely to influence consumer behavior.
- The labeling process, including identifying the organization or partnership that should administer the label.
- Costs of establishing and maintaining a labeling program and potential benefits in terms of toxics reduction.
- The potential to build on, or complement, existing, effective labeling programs.

We also believe that labeling is an opportunity to work collaboratively with other states in the region—to establish something that would benefit consumers and innovative manufacturers more broadly. Similarly, a labeling effort might focus on existing labeling or third-party certification programs, to take advantage of work that has already been done.

BUILD CONNECTIONS BETWEEN UPSTREAM DECISIONS AND DOWNSTREAM COSTS AND IMPACTS

In our current system, the people who make decisions about toxics in products and manufacturing (producers, manufacturers, and retailers) often are different and disconnected from those who bear the responsibility to manage and clean up toxic contamination in the environment. This is especially true for distributed sources of toxics, those toxics that come from a variety of small individual sources rather than a single discharge pipe or smoke stack, such as toxics in stormwater runoff or consumer products. For example, some of the phthalates

that are re-contaminating the Thea Foss Waterway in Tacoma are coming from polyvinyl plastics such as car undercoatings, PVC pipes, and household shower curtains. The phthalates off-gas into the air from plasticized sources, attach to airborne particulates, fall to earth, and are picked up again by rainwater and deposited to sediments in the waterway through stormwater flows.[31] The burden for addressing this type of distributed release currently falls largely on those managing urban stormwater and is not generally shared by those entities that introduced the phthalates in the first place: producers, manufacturers, and retailers.

Liability

The broad liability associated with the Superfund program caused enormous changes in how companies manage wastes, but it was not designed to reduce the toxicity of products or address exposure and potential harm from exposure to toxic chemicals in products. Legal liability for harm from toxic chemicals in products is largely addressed through the tort system. This system is costly, slow, inefficient, and has unpredictable results. Both plaintiffs and defendants complain that the system is subject to abuse.

7. We recommend a Legislatively-directed study of whether there is a more efficient and effective way to more equitably and predictably require some or all of the entities in a product's supply chain (producers, manufacturers, and retailers) to assume responsibility for harm caused by toxic chemicals in products they produce and sell; this study would include review of potential combinations of both statutory liability and reforms to the current tort system. This approach could offer a number of advantages: (1) it could apply universally to toxic chemicals, avoiding the need for some kind of chemical-by-chemical review; (2) it could provide a durable incentive for innovation to make chemicals and products safer; (3) it could protect manufacturers that are making products that do not cause harm from toxic chemicals, based on the best available information, from potentially frivolous, but nonetheless costly, claims; and, (4) when products cause harm to people or the environment it could more equitably and efficiently place the financial responsibility on those who created and benefited from the product in commerce.

To encourage innovation and minimize unnecessary transaction costs, the study should explore creating a safe harbor where products or classes of chemicals would not be subject to liability under certain situations.

Establishing a statutory liability scheme for toxic chemicals in products raises a number of issues that would need to be explored and addressed. These include:

- How would responsibility be distributed between producers, manufacturers, and retailers or others responsible for toxic chemicals?

- Should a standard or other mechanism be put in place to trigger some entity to require action to address a product with toxics? (E.g., the way safety recalls for products can be triggered by the Consumer Products Safety Commission.) If so, what scientific information would be needed to require evaluation and action?
- What types of actions would producers, manufacturers, and retailers be expected to take—in addition to financial responsibility for any environmental or health impacts that may be caused? We discussed an approach where products containing toxics would need to be recalled by the producer and a safer alternative provided or a refund given (similar to product safety recalls).
- How should a safe harbor be defined, and what standards or other means would be used to identify chemicals and products that are protected from liability by a safe harbor?

Consumers share responsibility for protecting public health and our environment from chemical hazards in some important ways. First, consumers should use products containing chemicals according to product-safety directions (e.g., avoid over-application) and should recycle or dispose of the products appropriately (e.g., take unwanted electronics to electronics recycling companies, bring unused prescription drugs to pharmacies participating in take-back programs, etc.). Second, consumers can themselves prevent exposures to toxic chemicals and speed the transition to safer alternatives by purchasing toxic-free products when possible. The full cost of products containing toxic chemicals, including externalities such as health and environmental impacts, is not now reflected in most product costs. Over time, as taxes and liability are adjusted, people should expect to pay more for products that lead to toxic exposures.

Taxes

In situations where safer alternatives are available but a choice is made not to use them, a tax or fee provides an opportunity to internalize the costs of the harmful impacts of toxic chemicals in products to producers, manufacturers, retailers and consumers who benefit from the product, and use the revenue to help the people who are stuck with managing the effects of those toxics downstream—through costly spending on pollution control or cleanup, health care, and special education. For example, in the case of PCBs in inks and dyes, if after a reasonable amount of time voluntary efforts to reduce sources of PCBs have not resulted in significant progress, a tax on inks and dyes containing PCBs might be imposed and the revenue used to offset some of the cost of waste water treatment plants' and permittees' PCB water quality control and cleanup efforts, and to support continued source reduction programs.

8. We recommend a Legislatively-directed effort to evaluate the feasibility, potential to encourage development and use of safer alternatives, potential investments in toxic source reductions, and responses to alleviate impacts from toxic chemical releases that could be supported by a tax on priority toxics. This might be carried out in conjunction with the Legislatively-directed study on liability recommended above and should flow, at least in part,

from an evaluation of where additional investment would be appropriate to help dischargers address sources of toxics that they did not produce or use.

Relief for Dischargers who are Stuck with Distributed Sources of Toxics

Under the Clean Water Act and state water quality human health criteria, municipal and industrial dischargers are required to meet stringent and often costly discharge limits for toxic contaminants, even when their facilities are not the initial or primary source of the contaminants. As toxic chemicals have become more common in society and our economy, our tools for preventing releases have not kept pace. We continue to use laws and regulations created to address removal of toxics from wastewater and air emissions (so-called point sources) to address much more distributed problems such as toxic chemicals released from consumer products.

Water quality permittees (dischargers) and responsible parties at cleanup sites increasingly find themselves responsible for removing toxics they have little or no control over. Dischargers to watersheds regulated by Total Maximum Daily Load water cleanup plans can find that the incoming water they draw from the system is at, or sometimes over, the contaminant concentrations established in their discharge permits. Wastewater and stormwater permittees must treat contaminants that enter the treatment facilities from other sources, including consumer products, stormwater runoff, air deposition, legacy compounds, and naturally occurring elements. They increasingly can find themselves faced with responsibility to clean up toxics that come from products that they did not design, manufacture, or use, and for which safer alternatives may not be used or readily available.

PCBS

Despite the fact that the U.S. banned the manufacture of PCBs in 1979, PCBs still are widespread in Washington State at levels that pose a threat to human health from legacy contamination and new sources including electrical equipment, paints, caulks, inks and pigments, and consumer products that are allowed to contain PCBs under Federal law. Hundreds of water body segments in Washington State violate national water quality standards for PCBs, and Washington has hundreds of PCB cleanup sites statewide. Ecology first documented elevated PCB levels in fish tissue over 20 years ago. PCB-contaminated fish are the primary source of PCBs for people. Ecology and the Department of Health have issued Health Advisories for fish consumption in the Yakima River, Wenatchee River, Lower Columbia River, Upper Columbia River and Lake Roosevelt, Green Lake, Lake Washington, Lower Duwamish River, Okanogan River, Puget Sound, Walla Walla River, and Spokane River. Because PCBs are such a problem statewide, Washington will prepare a PCB CAP in 2013 that will examine the sources of PCBs and make recommendations to reduce releases and exposures. The Spokane Tribe of Indians have set water quality standards for PCBs in the Spokane River that are more than 95 percent lower than federal standards.

Ecology completed a PCB Source Assessment Study for the Spokane River in May 2011. This study lays the technical groundwork for a PCB reduction strategy in that Basin. Ecology is pursuing a straight-to-implementation approach to reducing PCBs in the Spokane River, as a more efficient and effective process in this situation than the conventional Total Maximum Daily Load (TMDL) process. This approach requires establishing performance-based PCB limits on wastewater treatment plants, and requires the establishment of a regional Toxics Reduction Task Force to reduce PCBs at their source in the watershed.

At the Port of Seattle, for example, they are challenged to manage stormwater contaminated with zinc from steel roofs coated with zinc-aluminum alloy, as well as galvanized metal fences and tires used on trucks and other vehicles involved in shipping. At Inland Empire Paper Company, a paper manufacturer and recycler in Spokane, they are faced with managing PCBs that come from the inks and pigments used to print the newsprint that is in their recycled feedstock.

These types of situations are untenable for three reasons. First, they illustrate how significant and widespread the use of toxic chemicals are and the resulting impacts and accumulation of toxics in the environment. We are not well served by toxics-impaired water bodies, or by zinc in Puget Sound, or PCBs in inks and dyes. Second, they place the burden, and sometimes significant financial costs, of addressing toxics on dischargers who may have very little, if any, control over the contaminant sources and limited ability to effectively remove toxics from the waste stream. And finally, removal at the end of the waste stream is the most costly strategy for toxics management.

Limitations on the number and types of implementation tools available under the Clean Water Act, which was not designed to address these types of situations, further exacerbate these problems.

9. We recommend Ecology consider the dilemma of distributed sources and develop and, where dischargers are actively participating in source control efforts, proactively use a menu of innovative approaches and implementation tools—such as compliance schedules, intake credits, phased implementation, phased permitting, variances, stralght-to-implementation efforts, and other techniques—to protect and clean up water bodies in ways that recognize the difficulty inherent in addressing sources that are not under direct control of permittees. By "actively engaged in source control" we mean that dischargers should be taking appropriate actions to address toxic chemicals regardless of source. At the same time, we acknowledge that, in some situations where a discharger does not have control over the sources of the toxic chemical in question, we perhaps should not require dischargers to fund disproportionately costly wastewater and stormwater treatment protocols at least in the short term, while actions to address the actual source of the chemical are pursued. This recommendation is intended to provide appropriate relief for dischargers that are working towards toxic chemical reduction while higher value source reduction efforts are pursued.

10. We also recommend that dischargers take an active role and use their influence to promote efforts to reduce distributed sources of toxics and to identify and implement safer alternatives. We believe that full participation and support for source control efforts should be a consideration when determining what sorts of implementation strategies might be made available to dischargers managing toxics from distributed sources. For example, while a permittee is working productively on source reduction and safer alternatives, they might qualify

for a phased-in schedule for discharge limits or some funding to support source reduction efforts for sources that are not under their control.

This alternative implementation approach for permittees pursuing source-reduction efforts to address distributed sources would incorporate implementation of available technologies but also recognize the difficulty permittees face in addressing sources that are not under their control and acknowledge the value of the permittee's participation in source reduction. If the source control efforts fail, numeric permit discharge limits could be imposed and efforts made to recoup some of the cost of compliance from producers, manufacturers, and retailers through a fee or tax on products that create these sources. What constitutes active participation in source control efforts for sources outside the control of the discharger may not be the same for every discharger. For some, it might simply be aggressively implementing available control technologies to reduce the contaminant in wastewater, and publicly supporting/requesting efforts to reduce the toxic chemical at the source. Others might take a more active role in working with product manufacturers to reduce incoming sources of toxics; however, we recognize that not all dischargers will have the resources to participate in dialogues or other efforts aimed at reducing toxic chemicals in products they do not produce, manufacturer, or use, but simply are faced with managing because the toxic chemical has become widely distributed in the environment.

ZINC

In high enough concentrations, zinc can kill many adult fish species. Rainwater containing zinc from roofs, roads, and other hard surfaces runs into ditches and storm drains and flows — mostly untreated — into lakes, streams, rivers, and eventually Puget Sound. The majority of zinc that enters Puget Sound and its freshwater tributaries comes from human-caused sources and products including roofing materials, tires and galvanized products. Because zinc in stormwater comes largely from distributed, consumer product sources, it is ubiquitous in stormwater runoff and can be very difficult to control.

Some municipalities, ports, and businesses face expensive source control and treatment measures to ensure that stormwater discharges don't contain harmful levels of zinc. While they may be able to make purchasing decisions to reduce some zinc sources on their sites (e.g., selecting non-galvanized roofing or fencing materials), they do not make decisions about the composition of certain consumer products that can affect stormwater quality, such as tires. In the case of tires, there may not be low- or non-zinc alternatives available.

ENSURE A RELIABLE BACKSTOP OF REGULATION

We believe in the power of incentives, market forces, and other drivers to shift behavior over time and reduce toxics in Washington. At the same time, we know that sometimes these approaches will not go far enough, or will not achieve results fast enough. It is the responsibility of the Department of Ecology to work to protect people and the environment in Washington, and they need additional tools to do this effectively for toxics.

Many states, including Washington, rely on individual chemical bans to address high-priority toxics. For example, 25 states have laws restricting mercury, 17 states have banned or restricted lead in products, 12 states have laws limiting PBDEs, and 11 states ban BPA in children's or other products. In Washington, Ecology is implementing a variety of chemical-specific bans that apply to particular products, including laws that limit:

- Mercury in thermometers, manometers, thermostats, and automotive switches
- Polybrominated diphenyl ethers (PBDEs) flame retardants
- Lead wheel weights
- Coal tar sealants
- Bisphenol A in baby bottles and cups
- Copper in brake pads and boat paint

Because we know that incentives, market signals, and other voluntary efforts to support safer alternatives will not achieve a level playing field and may not always reduce toxic exposures quickly or enough, we need to give regulatory agencies charged with the responsibility to protect human health and the environment adequate tools to get the job done.

11. We recommend Ecology be given clear authority to ban or restrict priority toxic chemicals in manufacturing and products in appropriate and well-defined circumstances. Chemical bans or restrictions should be part of a comprehensive program that includes establishing priorities and working proactively with producers, manufacturers and retailers on identification and implementation of safer alternatives. Restrictions or bans should be used only for high-priority toxic chemicals, products and/or processes, where exposure occurs as a result of their use.

PBDES

Washington's 2007 law restricting PBDE flame retardants resulted from the Chemical Action Plan (CAP) for PBDEs published in January 2006. As part of the CAP, Syracuse Research Corporation produced a report on the health and environmental impacts of alternatives to deca-BDE. Under the law, which became effective in January 2008, the following restrictions are in place:

- **The manufacture, sale, and distribution of products that contain PBDEs is prohibited. Exemptions include transportation equipment, medical devices, and certain recycled materials, and the law treats deca-BDE differently.**
- **Deca-BDE is prohibited in mattresses.**

Beginning in January 2011, deca-BDE is also prohibited in televisions, computers, and residential upholstered furniture after a determination that safer and technically feasible alternatives that meet fire safety standards were available. Ecology and DOH produced a report, "Alternatives to Deca-BDE in Televisions and Computers and Residential Upholstered Furniture," which describes the findings of that assessment and identifies safer alternatives, and a committee of fire safety experts appointed by the Governor determined the alternatives meet applicable fire safety standards.

Chemical bans and restrictions should not strand people or businesses by banning or restricting chemicals before safer alternatives are viable, and should include adequate notice, public participation, and lead time so that users have the ability to phase out chemicals and shift to safer alternatives deliberately. In appropriate situations, they should include carefully crafted exemptions to address circumstances where a toxic chemical might be needed for a certain process or product, even as it might be more generally banned or restricted. An imminent threat to public health or the environment may justify a chemical ban before a clear safer alternative is identified.

EVALUATING AND IMPROVING TOXICS REDUCTION PROGRAMS OVER TIME

Ecology has more than a dozen separate programs or initiatives that are intended to reduce or control sources of toxics. These have grown up over time and in response to different priorities or imperatives. There also are toxics reduction efforts and responsibilities in the Department of Health and other state agencies. As we work towards a more comprehensive and integrated approach to toxics reduction it will be important to adapt and refine these programs so they work effectively together.

12. We recommend an independent inventory and evaluation of toxics reduction program activities, goals, and accomplishments, and identification of recommendations for program improvements. This should specifically look at ways to optimize current toxics reduction efforts—such as Chemical Action Plans, education efforts, extended producer responsibility efforts, and pollution prevention planning—and to make toxics reduction programs an ongoing center of innovation in Washington State.

This evaluation also should look at the information we have on toxic chemicals in products and toxic chemicals use, release, and exposures in Washington. Very little is known about the vast majority of the tens of thousands of chemicals produced and used in the US. Over the past three decades under federal chemical laws, the EPA has required testing on just 200 existing chemicals and restricted only five. This lack of information impedes efforts to prioritize toxic chemical reduction efforts, identify safer alternatives, and target public health responses.

Finally, it should identify opportunities for regional coordination and collaboration on toxics reduction efforts. Regional approaches have the potential to increase the amount and speed of toxics reduction, leverage resources, improve consistency, provide economies of scale, and reduce any unintended leakage of our economy to neighboring jurisdictions.

The evaluation should be refreshed regularly, as part of an adaptive management strategy to ensure that toxics reduction programs are well-focused, effective, and improved over time.

Conclusion

The recommendations we have made will help continue Washington's leadership in protecting our communities and ecosystems from toxic chemicals. They address different aspects of the problem—from lack of information about chemical hazards and safer alternatives to inadequate liability schemes and regulations that fail to target the original sources of toxic chemicals. No single action will completely solve the problem; however, we believe that all of the ideas we've proposed are worthy of serious consideration, both as parts of a solution and a more comprehensive package. We deserve to have sensible chemical policy that supports a healthy and thriving economy, and we look forward to continuing to work to achieve that vision.

Summary of Recommendations

1. Washington State should establish a clear policy that with respect to toxic chemicals, safer is better.
2. Ecology should work with partners to develop a more comprehensive system for establishing chemical priorities, building on existing efforts.
3. Ecology, its partners, and sister agencies should continue to take actions to reduce releases of and exposures to priority chemicals that have already been identified, and should continue to refine these priority lists. Ecology should also add chemicals that are widely distributed and can have toxic effects at very low doses (such as endocrine disrupting chemicals) to its priorities.
4. Washington should become a national leader in green chemistry making these innovations a trademark of the State just like apples, wheat, software and airplanes.
5. We should develop targeted education campaigns aimed at changing specific consumer behaviors around priority toxics.
6. We should evaluate a voluntary, simple, positive label designed to draw consumers' attention to products that are comprised of safer ingredients than comparable alternatives.
7. There should be a Legislatively-directed study of whether there is a more efficient and effective way to more equitably and predictably require some or all of the entities in a product's supply chain (producers, manufacturers, and retailers) to assume responsibility for harm caused by toxic chemicals in products they produce and sell; this study would include review of potential combinations of both statutory liability and reforms to the current tort system.
8. There should be a Legislatively-directed effort to evaluate the feasibility, potential to encourage development and use of safer alternatives, potential investments in toxic source reductions, and responses to alleviate impacts from toxic chemical releases that could be supported by a tax on priority toxics.

9. Ecology should consider the dilemma of distributed sources and develop and, where dischargers are actively participating in source control efforts, proactively use a menu of innovative approaches and implementation tools—such as compliance schedules, intake credits, phased implementation, phased permitting, variances, straight-to-implementation efforts, and other techniques—to protect and clean up water bodies in ways that recognize the difficulty inherent in addressing sources that are not under direct control of permittees.
10. Dischargers should take an active role and use their influence to promote efforts to reduce distributed sources of toxics and to identify and implement safer alternatives.
11. Ecology should be given clear authority to ban or restrict priority toxic chemicals in manufacturing and products in appropriate and well-defined circumstances.
12. There should be an independent inventory and evaluation of toxics reduction program activities, goals, and accomplishments, and identification of recommendations for program improvements.

Endnotes

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