TESTIMONY OF

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TSCA AND PERSISTENT, BIOACCUMULATIVE, AND TOXIC CHEMICALS: EXAMINING DOMESTIC AND INTERNATIONAL ACTIONS

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Thank you for the opportunity to testify today. My name is Linda Greer, and I am the Director of the Health Program at NRDC (the Natural Resources Defense Council). I have a Ph.D. in environmental toxicology and a masters degree in public health. Since 1981, I have worked on a wide range of environmental health issues, including Federal policies for assessing hazardous chemicals, pollution prevention opportunities in U.S. and Chinese manufacturing plants, and global mercury use reduction. My work and research has focused on numerous persistent, bioaccumulative and toxic chemicals, including mercury, dioxin, and PCBs, among many others. As I scientist, I know that PBT chemicals should be a high priority for use and exposure reduction because failure to act will result in ever-increasing contamination, not just of the environment, but also of our bodies.

PBTs are uniquely dangerous because once they are released into the environment (intentionally or accidentally), they don't go away. They linger for years or even decades, accumulating and increasing in concentration over time. PCBs, the only chemicals banned by Congress under the original TSCA, similarly continue to plague both our environment and our bodies. Although levels of PCBs have gradually declined over the past 3 decades, these chemicals can still be found lingering in the blood of nearly everyone in the U.S. Rachel Carson warned about the dangers of persistent chemicals, saying: "This pollution is for the most part irrecoverable; the chain of evil it initiates…is for the most part irreversible."[i]

As if persisting for more than 30 years were not enough, PBT chemicals also increase in concentration in living things over time as they move up the food chain – the "B" property of their PBT classification: bioaccumulation. This means that even low concentrations in environmental media (such as air, water, or soil) can lead to levels hundreds or thousands of times higher in living things. Bioaccumulation is the reason that 43% of the Nation's total lake acreage and 39% of the nation's total river miles in all 50 states now carry fish advisories warning against consumption due to contamination with persistent chemicals such as mercury, PCBs, and dioxin (Figure 1).[ii]

The combined properties of toxicity, persistence and bioaccumulation make quantifying the threat posed by these chemicals extremely challenging. It is not enough to look simply at existing concentrations in air, water, soil or sediment, to evaluate the harm they pose; one must consider that concentrations will continue to rise over time and only decrease very slowly, perhaps taking decades or longer. Similarly one must look beyond environmental concentrations to the concentrations at the top of the food chain for PBT chemicals in order to evaluate effects. Here again, existing concentrations are not necessarily at equilibrium; with or in some cases even without continued loading, they too will continue to rise over time and not go away. The tool that EPA and others use to quantify the harm that chemicals pose – risk assessment – is in fact an inadequate tool for evaluating the harm posed by PBTs for this reason. Because risk assessments require a quantification of exposure levels, and because the levels of PBTs will continue to rise for as long as the contaminant is released into the environment of the food chain, they cannot adequately evaluate the harm posed by this class of compounds.

The application of risk assessment to PBTs is further limited due to the complex movement of PBTs through multiple levels of the food web and the long distance transport of PBTs throughout the global environment. For these reasons, using risk assessment to determine which uses of PBTs should be reduced or eliminated, and to what extent, is fraught with difficulty. Many layers of added uncertainty result, severely limiting the predictive value of such judgments when risk assessment is applied to PBTs.

Common sense tells us that chemicals with a PBT profile are bad actors, and that a law or policy designed to protect people must phase out the use of PBTs and require the use of safer chemicals that degrade easily back into harmless chemicals when treated or discharged into the environment, rather than sequestered in our bones, blood or fat deposits because they cannot be degraded.

It is instructive to look historically at the evaluation of the toxic properties of PCBs to understand why risk assessment doesn't work well for this class of chemicals. Initial small studies of adult male workers done in the 1960s did not detect dramatic health effects, so the chemicals were initially touted as relatively nontoxic and the fact that they were persistent and accumulated in fat was not considered a problem.[iii] Over the decades, larger and more detailed studies on young children have shown that PCBs are neurotoxic, and have anti-thyroid and immunotoxic effects.[iv] These health effects occur at low doses – at levels that many people who consume fish from the Great Lakes and other areas today have in their bodies. But by the time the newer, much more complex and expensive scientific studies were done, it was too late – significant damage was already done because PCBs had persisted and accumulated in the environment, contaminating the entire food web.

PCBs were banned outright by Congress in 1976 (one of the few successes of the Toxic Substances Control Act). In 1978, the United States entered into the binational Great Lakes Water Quality Agreement with Canada, which called for the virtual elimination of persistent toxic chemicals to protect human health and the aquatic environment. Less than two years ago, Congress overwhelmingly voted to ban the export of mercury from the U.S. – an important step toward an international treaty to substantially reduce mercury in commerce and significantly curb emissions and thereby protect our food supply. Unfortunately it will take many more decades before the damage from these persistent chemicals begins to subside.

The history of persistent, bioaccumulative and toxic chemicals has created a compelling case for prevention. Many scientists have pointed out that waiting for clear evidence of harm from these chemicals is tantamount to closing the proverbial barn door long after the animals have scattered far and wide. If we fail to act to reduce or eliminate chemicals in use today that are likely to be the PCBs, dioxins, and mercury of the future, then future generations will be faced with the realization that the food they eat is tainted by health dangers.

Despite the notoriety of PBT chemicals, there are many such chemicals that continue to be used in commerce today —and sometimes in very large quantities. For example, some of the polybrominated diphenyl ethers (PBDEs) are still used as flame retardants in plastics, polyurethane foams, and textiles even though safer alternatives are available. While some PBDEs are no longer used, they remain in products in millions of homes. The chemical structure of the PBDEs is extraordinarily similar to the PCBs, and these chemicals also share structural characteristics of the dioxins. In fact, the toxicologic evidence shows that the PBDEs are thyroid hormone disruptors, that they are neurotoxic to the developing brain, and that they have immunotoxic properties similar to the PCBs.[v]

The PBDEs are environmentally persistent and bioaccumulate rapidly. Levels of the PBDEs doubled every five years in breast milk samples from Sweden, and residues of these chemicals have been detected globally including in the arctic, where they have never been used.[vi] Several U.S. states, including California, Illinois, Maryland, Michigan, Minnesota, Maine, New York, and Washington have restricted major uses of PBDEs based on their inherent properties as PBTs without attempting to apply ineffective risk assessment methods to the task.

EPA has announced plans to take more additional, although limited, action on these chemicals, and urgently requires additional Congressional authority to take immediate action on persistent chemicals such as the PBDEs. Meanwhile many other chemicals are also turning out to be persistent, bioaccumlative and toxic: the di-, tri-, tetra- and pentachlorobenzenes, hexachlorobutadiene, other flame

retardants such as tetrabromobisphenol A and HBCD, and PFOS, and the musk xylenes, to name only a few. All of these chemicals require decisive action, not years of additional study while the levels in the food supply creep upward.

Scientific and regulatory consensus definitions for persistent, bioaccumulative, and toxic chemicals already exist. These criteria are not particularly controversial, and it makes sense for Congress to simply state that, as a matter of U.S. policy, with narrow exceptions, new chemicals with these properties should not be introduced into commerce. Similarly, PBT chemicals that are currently in commerce should be phased out, allowing, of course, for exemptions for essential uses for which no alternatives yet exist.

Before I close, I would like to mention that the hazards posed by PBTs are very personal for me. Three years ago, when I was doing work to reduce global mercury use and pollution, I got a call from my doctor about an abnormality on my mammogram. Soon afterward, I was struggling to come to terms with the diagnosis every woman dreads – breast cancer. I have to tell you, it really threw me for a loop. I found myself thinking what everyone thinks in a situation like this – why did this happen to me? I don't have many of the conventional risk factors for breast cancer, but I'm not alone. Most of the women with this disease don't have known risk factors.

One difference between me and many other women with breast cancer is my familiarity with the science. I know that in the United States between the 1970's and 2000, breast cancer incidence rates increased by more than 40 percent. As of 2008 a woman's lifetime risk of breast cancer in the U.S. was one in eight.

I also know that the belief that breast cancer is mainly a genetic disease is unfounded. In July of 2000, a Scandinavian study of nearly 45,000 twins published in the New England Journal of Medicine tried to separate out genetic vs. environmental factors in cancer. The bottom line of this important study was that the vast majority of cancers are environmental rather than genetic. In the case of breast cancer, only about one-quarter of the risk is due to inherited factors; that leaves the remaining risk of breast cancer linked to environmental factors.

There are numerous known or suspected environmental toxicants that have been linked to breast cancer. In fact, a 2007 study identified 216 chemicals that have been shown to cause cancers of the mammary gland in animals.[vii] Worse still, after more than three decades since the establishment of EPA, only a small handful of the tens of thousands of chemicals on the market have been evaluated for their ability to cause this terrible disease.

Numerous chemicals that have been linked to breast cancers in animals and humans are PBTs, including now-banned pesticides such as dieldrin, aldrin, and heptachlor, as well as the PCBs and dioxins. It's no surprise to a toxicologist like myself that these chemicals might be linked to breast cancer -- since they accumulate in fat cells, and are known to concentrate in breast tissue and even breast milk. Just this fall, an updated study on women exposed to dioxin from a 1976 industrial accident in Italy reported a statistically significant increased risk of breast cancer (by more than 2.5-fold) in dioxin-exposed women.[viii] Meanwhile EPA began an assessment of the health risks of dioxin in 1985, and 25 years later has still not completed the work.

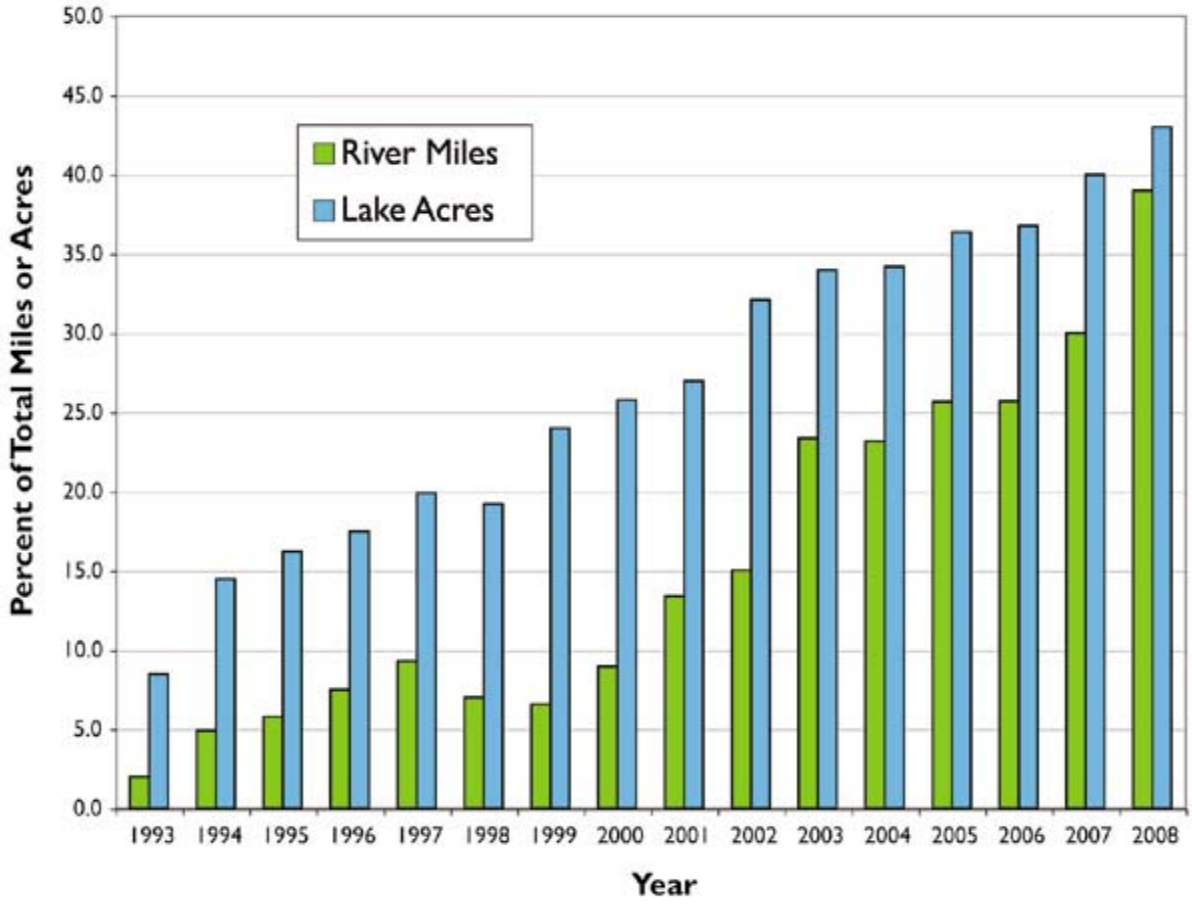
As great as the problems posed by these historical examples of persistent, bioaccumulative carcinogens are, this Committee, Congress, and the Administration, should be thinking seriously about how to address chemicals that are still being used in commerce today, that are known to have these same properties of persistence and bioaccumulation. These are chemicals that are not only used for industrial purposes like PCBs in transformers. We are talking about PBT chemicals used in everyday products that people have in their homes – in their furniture, in their computers, in their cookware. From there, PBT chemicals can easily make their way into our breast milk, our food, and our bodies. Congress must take responsible action to phase out the use of PBTs and put our country on a path toward use of safer chemicals. When

chemicals accumulate rapidly, and then linger on for generations, we don't have the luxury to engage in a lengthy research study or prolonged risk assessments. It should simply be a matter of common sense policy that manufacturers must, where feasible, switch to alternative chemicals that are not persistent and do not bioaccumulate.

I was one of the lucky ones. My breast cancer was caught early and I am doing well. But as I do my work every day, I think of my daughter – who received whatever contaminants I had in my breast milk when I nursed her -- and of her generation. My efforts to reduce or eliminate toxic chemicals are for her. We must protect the next generation by creating responsible and effective chemical policy today.

Thank you for this opportunity to testify.

Figure 1: Fish Advisories for PBT Contamination in the United States



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