



CLEAN WATER ACTION

CONNECTICUT

Written Testimony of Sarah A. Uhl
On behalf of Clean Water Action
Before the Connecticut General Assembly Environment Committee
March 2, 2009

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Testimony in Support of:

SB 919

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An Act Phasing Out the Use of Polybrominated Diphenyl Ethers

Dear Senator Meyer, Representative Roy, and honorable members of the Environment Committee,

Clean Water Action submits this testimony in support of Raised Bill S.B. No. 919, *An Act Phasing Out the Use of Polybrominated Diphenyl Ethers*. This legislation would address a widespread public health hazard by requiring that polybrominated flame retardants be gradually phased out and replaced with safer alternatives in certain electronics, upholstered furniture, mattresses, and bedding products.

Flame retardants are widely used in a variety of products to prevent and slow the spread of fire. While fire retardancy is important, some flame retardants, known as polybrominated diphenyl ethers or PBDEs, used in electronics and other products are leaving a lasting toxic legacy in the environment and in human beings. The good news is safer alternatives are available at a comparable cost. Connecticut should phase out the unnecessary use of these toxic chemicals.

- The highest volume commercial flame retardant mixture, deca-BDE, is used in television enclosures, some computers, wire and cable and some textiles.
- Deca is widely found in the environment, and builds up in fish and the human body, including cord blood and breast milk. It is also present in household dust.
- Deca is a developmental toxin and children are most highly exposed.
- The European Union has already restricted the use of deca in electronic devices.
- Many electronics companies have found safer substitutes and have phased out the use of deca, including in 95 percent of computer products and 57 percent of televisions.

WHAT ARE TOXIC FLAME RETARDANTS?

Polybrominated diphenyl ethers are flame retardants used in foam products, textiles, electrical equipment, building materials and transportation. **Penta** (pentabromodiphenyl-

ether), **octa** (octabromodiphenyl-ether) and **deca** (decabromodiphenylether) are three of the most common commercial classes. Chemically, they are very similar to PCBs, which were banned in 1979 due to their high toxicity, persistence, and evidence that they can cause developmental problems in children. Like PCBs, PBDEs accumulate in the environment, in fish and meat, in breast milk and in humans. They are also commonly found in household dust.

INCREASING LEVELS

While PCB levels in fish and breast milk have slowly declined since being banned, PBDE levels are increasing at an exponential pace, as they are still largely unregulated in the U.S.

- PBDE levels in Great Lakes lake trout, including from Lake Superior, doubled every 3-4 years between 1980 and 2000.¹
- Levels of PBDEs in U.S. women's breast milk are 10–100 times higher than levels in European women.^{2,3}
- Total PBDE levels in breast milk, blood and tissues have increased by a factor of 100 during the past 30 years, doubling about every five years.⁴

We are exposed to PBDEs through house dust, indoor air, direct contact with consumer products, and food. PBDEs do not fully bind to the products they are used in so they escape into the air in our homes and workplaces and adhere to dust.⁵ Because people spend more than 80% of their time indoors, indoor dust is considered a major route of exposure.⁶

DECA OF GREATEST CONCERN

Chemtura, the only U.S. manufacturer of penta and octa, has already phased out these formulations, so the main concern now is deca. The widest use of deca (50-80 percent) is in plastic polymers commonly used to make computer and audio/video equipment, cell phones, fax machines and televisions. Deca also has textile and wire and cable applications.

Although penta and octa have the highest potential for bioaccumulation and are typically the most common classes found in humans, fish, and other wildlife, scientists are increasingly finding deca in animals and plant life. Deca can also degrade to more toxic forms in the environment in soil, sediment, house dust and fish tissue.^{7, 8, 9, 10, 11} Studies are also finding deca in humans.

- One study found deca in the breast milk of 24 of 40 women studied.¹²
- Deca has been identified in the cord blood of newborn babies.^{13, 14}

HEALTH IMPACTS

Laboratory studies in animals indicate that PBDEs, like PCBs, are toxic to the brain, reproductive system and liver and disrupt thyroid function.

- Learning, behavior, and memory problems:

Studies in rodents indicate exposure to PBDEs during brain development has permanent effects on learning, memory, and behavior.¹⁵ Deca has the ability to cause the same effects on developing brains of mice as penta,¹⁶ which has already been banned in nine states and Europe.

- Liver toxicity and cancer:

The U.S. Environmental Protection Agency considers deca a "possible human carcinogen."¹⁷ Rodents exposed to deca developed pre-cancerous nodules on their livers.¹⁸

- Thyroid Problems:

Studies show PBDEs decrease thyroid hormone levels.¹⁹

- Reproductive Problems:

PBDEs have been found to cause birth defects, reduced weight gain during pregnancy, changes in ovary cells, and reduced sperm count.²⁰ As of 2005, an estimated 5 percent of American women had levels of PBDEs in their body greater than levels that have been shown to cause reproductive problems in laboratory animals.²¹

CHILDREN AND WORKERS BEAR A LARGER BURDEN

Unfortunately, studies indicate that children's exposure to PBDEs are much higher than adults. For example:

- Studies suggest young children are receiving up to 300 times greater exposure than adults, primarily from breast milk and dust ingestion.^{22,23}
- In a study of a family of four, researchers found the children had much higher levels of PBDEs than the adults, indicating a larger exposure for children.²⁴
- Workers who work with or manufacture PBDEs also have a high level of exposure. Studies have found alarming levels of PBDEs in workers who recycle, repair, and maintain computers, as well as those who recycle printed circuit boards.^{25, 26}
- The International Association of Fire Fighters (IAFF) supports phasing out PBDEs (see attached). The IAFF recognizes that when combusted incompletely (as happens during building fires), the chemicals turn into brominated dioxins and furans, which are the most toxic substances ever identified. Many studies involving fire fighters exposed to these and other toxic gases during active fire fighting, overhaul, and long term exposure from these chemicals penetrating protective gear, have found that fire fighters have a much greater risk of contracting cancer, heart and lung disease, and other debilitating diseases.

SAFER ALTERNATIVES ARE AVAILABLE

Connecticut can achieve the same fire safety benefits without the use of brominated flame retardants. This is the central conclusion that led the governments of Washington, Maine, and others in Europe to pass new legislation that modernizes their standards and sets new restrictions regarding flame retardants. In total, 14 governments have taken some level of action to ban octaBDE and pentaBDE, and phase out decaBDE. Examples include:

⇒ **Sweden:** DecaBDE restriction came into effect on January 1, 2007, and

applies to all articles except electrical and electronic products already covered under Directive 2005/95/EC (RoHS)

- ⇒ **Norway:** Effective April, 2008, Norway has extended an existing ban on deca-BDE in electronic and electrical products to include textiles, furniture filling and cables.
- ⇒ **Washington:** In 2007, Washington passed ESHB 1024, a ban on decaBDE in certain products. In January of 2009, the Washington Department of Ecology finalized their report, "Alternatives to Deca-BDE in Televisions and Computers and Residential Upholstered Furniture," concluding, in collaboration with the Fire Safety Committee and the Office of the State Fire Marshall, that alternatives exist that meet applicable fire safety standards.
The report can be found at: <http://www.ecy.wa.gov/biblio/0907041.html>
- ⇒ **Maine:** Following a 2005 report from Bureau of Health and Department of Environmental Protection recommending a deca ban, Maine passed a bill in 2007 (LD 1658) which bans decaBDE in mattresses & upholstery by January 2008, in televisions & computer enclosures in 2010, requires ongoing reporting of decaBDE use, and continued evaluation of safer flame retardants.
- ⇒ **Hawaii:** 2004 – HB 2013 restricted manufacture and distribution of pentaBDE and octaBDE (took effect Jan. 1st, 2006). In 2007, H.B. NO. 461 passed which bans decaBDE in television & computer enclosures, mattresses, mattress pads, home furniture & textiles. Takes effect July 1st, 2010.

In addition, market forces have already begun to shift away from use of octa, penta and decaBDE. Safer, cost- and performance-effective flame retardant solutions are in widespread use, particularly in electronics and furnishings. In the Washington state assessment that was published in advance of their phase out legislation, they estimated that *"about 57% of TVs and 95% of computer products are PBDE-free"*. Acer, Apple, Dell, Hewlett Packard . IBM, IKEA, LG Electronics, Intel, Motorola, Panasonic, Philips, Samsung, Sealy, Serta, Sharp, Simmons, Sony, Tempur-pedic, Toshiba , Xerox, and other leading manufacturers have established and some have already implemented policies resulting in octa, penta and decaBDE phase out. In a statement made in December of 2005, the Dell Corporation noted that the company, "currently avoid[s] the use of BFRs (brominated flame retardants) by using plastics that can be flame retarded with non-halogenated compounds and by using design strategies that reduce the need to use flame retarded plastics at all." A representative of Sony stated that "all virgin plastic presently used by Sony are 'deca-free' (Decabromodiphenyl ether). These products meet all relevant fire safety standards."

Government reports from Illinois, Maine, and Washington prove availability of alternatives and have all recommended substitution of octa, penta and decaBDE with a range of alternatives. Some alternatives are: product redesign to eliminate the need for added chemicals; use of natural flame retardant materials like wool and leather or plastics containing sulfur; and use of less toxic chemicals, like red phosphorus, ammonium polyphosphate and aluminum trihydroxide. Self-extinguishing plastics that don't need added flame retardants are now available e.g. polysulfone, polyaryletherketone, and polyethersulfone. **A commonly used phosphorus-based alternative to deca,**



INTERNATIONAL ASSOCIATION OF FIRE FIGHTERS®

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January 26, 2007

Kelly Fox, President
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RECEIVED

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WSCFF

Dear Brother Fox:

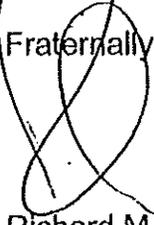
The International Association of Fire Fighters, headquartered in Washington, DC, represents more than 280,000 full-time professional fire fighters and paramedics who protect 85 percent of the nation's population. More than 3,100 affiliates and their members protect communities in every state in the United States and in Canada. There are 6,500 IAFF members in the State of Washington. Our union is concerned about health and safety of our members as well as the health and safety of all our citizens. Accordingly, the IAFF believes that the passage of legislation banning brominated flame retardants (Polybrominated diphenylethers (PBDEs) including Penta-, Octa-, and Deca-BDEs) is a step in the right direction for improving the health and safety of our fire fighters and the citizens who are exposed to these

One of the primary applications of PBDE's is as a flame retardant applied onto or in many common household goods (furniture foam; plastic cabinets; computers and small appliance; consumer electronics; wire insulation; and back coatings for draperies and upholstery) to reduce and retard the amount of flame spread. While these chemicals inhibit the formation and spread of flames, they do not completely prevent fires. Unlike other flame retardants, when PBDE's burn they release dense fumes and black smoke that reduce visibility and a highly corrosive gas known as hydrogen bromide. In addition, PBDE's produce highly toxic byproducts of incomplete combustion. Although use of flame retardants saves lives and property, there have been unintended consequences. There is evidence that PBDEs persist in the environment and accumulate in living organisms, as well as toxicological testing that indicates these chemicals may cause liver toxicity, thyroid toxicity, and neurodevelopmental toxicity. Many studies involving fire fighters exposed to these and other toxic gases during active fire fighting, overhaul, and long term exposure from these chemicals penetrating protective gear, have found that fire fighters have a much greater risk of contracting cancer, heart and lung disease, and other debilitating diseases. While we support the concept of flame retardant chemicals, there are alternatives that do not contain bromine or chlorine and our much safer for fire fighters than PBDE's.

Kelly Fox
January 26, 2007
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The IAFF salutes those companies that have stopped using brominated flame retardants (such as Dell, Hewlett-Packard and Ikea) and are now using safer alternative fire retardants. These companies demonstrate that alternative flame-retardant technologies for achieving fire safety standards do exist and are readily available for other manufactured products.

Fraternally



Richard M. Duffy
Assistant the General President
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Cc: Ricky Walsh, IAFF District Vice President
Keven Rojecki, WSCFF

resorcinol bis(diphenyl-phosphate) or RDP meets Underwriters Laboratories recommended fire safety standards for television components.

COSTS OF IGNORING THE HEALTH EFFECTS OF PBDEs ARE HIGH

Not only are the health effects of PBDEs devastating to individuals and their families, the societal costs of ignoring PBDEs are extremely high. Costs of medical care, special education, and lost economic productivity are enormous. For example, the costs of cognitive impairments due to lead, a known neurotoxin similar to PBDEs, are estimated to approach \$43 billion per year nationally.²⁷

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