

NORTHWEST ENVIRONMENT WATCH

Embargoed until 5am Thursday, August 25, 2005

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Toxic flame retardants overtaking past chemical threats in Northwest mothers

New analysis by California EPA scientists suggests that toxic flame retardants known as PBDEs are becoming a major environmental health concern

An analysis of persistent chemicals in the breastmilk of Pacific Northwest mothers, released today at an international scientific conference in Toronto, "Dioxin 2005," found that levels of the toxic flame retardants PBDEs may be overtaking those of PCBs, an industrial chemical banned in the late 1970s. PBDEs, which are structurally similar to PCBs, are accumulating rapidly in humans and the environment and may present similar health threats to those of PCBs, which have been linked to developmental delays and cancer.

Thirty percent of the mothers tested in the study—which was coordinated by Seattle-based research center Northwest Environment Watch—had higher levels of PBDEs than PCBs. The breastmilk samples for the study were analyzed in the Hazardous Materials Laboratory of Cal/EPA's Department of Toxic Substances Control (DTSC) in Berkeley, California. The Northwest study is one of several being conducted by DTSC scientists at the Department's Berkeley lab—including one underway involving analyses of California women's breastmilk—indicating that levels of PBDEs in humans may be overtaking those of PCBs.

"The comparison with PCBs suggests that toxic flame retardants have emerged as a major environmental health concern," said Clark Williams-Derry, research director for Northwest Environment Watch (NEW). "PBDEs could be as potent a problem as PCBs, which are still polluting people and the environment decades after they were banned. In order to avoid the same outcome with PBDEs, we need to act quickly."

The PBDE data from the study was originally released by Northwest Environment Watch in 2004, but the PCB data and the comparison between the chemicals are new. NEW found that the 40 mothers in the study—who are from British Columbia, Montana, Oregon, and Washington—had levels of PBDEs 20 to 40 times higher than levels found in individuals from Europe and Japan. PBDEs are widely used as flame retardants in furniture foams, industrial textiles, and consumer electronics.

Williams-Derry emphasized that mothers should continue breastfeeding. Research shows that despite the presence of contaminants, breastfeeding is the healthiest choice. Benefits include reducing the risk of many illnesses in infants, as well as the incidence of anemia and some cancers in women. NEW chose breastmilk as a measure because it is the most convenient body fluid to obtain and study, and because it provides a good proxy for contamination levels in fetuses, pregnant and nursing women, and the general population.

Specific findings from the CAL/EPA analysis and the original NEW study include:

- **Some PBDE levels surpassing those of PCBs:** The CAL/EPA scientists analyzed levels of 12 types of PBDEs, and 80 types of PCBs in the 40 mothers studied by NEW. Of the mothers, 13 had higher levels of PBDEs than PCBs. For the most abundant forms of the chemicals, PBDE-47 and PCB-153, the average PBDE level was higher, and 65 percent of the mothers had more PBDE-47 than PCB-153 in their breastmilk, a trend that could become more common if PBDE levels in people continue to rise.
- **Results by region:** All 40 women in the study had measurable levels of PBDEs and PCBs in their bodies. Oregon mothers had the highest average level of PBDEs, 121 parts per billion (ppb); and British

Columbian women had the lowest average level (60 ppb). Montana had the lowest average PCB levels (92ppb). Further testing is needed to clarify whether these variations are representative of each region's population. (See NEW's regional fact sheet for results for each Northwest region.)

- **PBDE levels rising:** The CAL/EPA study notes that previously, in most biological samples, total levels of PBDEs were less than PCBs, but, "as a consequence of the increasing PBDE levels, this may be changing." Over the past 20 years, rising levels of PBDEs have been found by almost every study that has examined time trends, especially studies in North America. For example, significant increases in PBDE levels have been reported for harbor seals in San Francisco Bay, as well as fish from the Columbia River, the Great Lakes, and San Francisco Bay.
- **Exposure through food and house dust:** The CAL/EPA scientists found no correlation between PBDE and PCB levels in the women, suggesting that the two chemicals enter people in different ways. PCBs are believed to enter the body through food, particularly from consuming fish. Several recent studies suggest that house and office dust may be a significant exposure pathway for PBDEs.
- **Health effects of the chemicals:** PCBs are a known carcinogen and have been linked to developmental delays, including significant IQ deficits that persist at least through age 11. PBDEs are structurally similar to PCBs and while no studies have been done on humans, laboratory studies have shown that PBDEs can impair memory and learning, alter behavior, delay sexual development, and disturb thyroid hormone levels. Research indicates that in combination the two chemicals may be more harmful than individually.

Some action on PBDEs has been taken. Sweden phased out some forms of PBDEs in the 1990s, followed by the European Union and several US states—including California and, in 2005, Oregon. Legislation was introduced in Montana in 2005 to support a phase-out of PBDEs but did not pass. Washington state has developed an interim action plan to phase out PBDEs, though it delayed action on a 2005 bill that would have phased out all PBDEs, including the most widely used form of the chemical, deca. Currently, a ban is set to take effect in 2006 in the European Union for deca-PBDE; and several US states are moving forward to ban deca.

Northwest Environment Watch and other regional groups have recommended that all forms of the flame retardants be banned from commerce; that programs be established to help consumers dispose of PBDE-laden products; and that governments require safer materials and chemicals to achieve flame retardancy. Federal reform of chemical policy is also critical.

80,000 different synthetic compounds have been introduced since the 1940s, yet only a relative handful have been tested for their potential health effects in humans.

"I'm an average person who leads a relatively healthy lifestyle, so there's no reason for these chemicals to end up in my body," said Andrea Riseden-Perry, a Seattle-area mother who participated in the study.

"Studies on chemicals should be done up front. And if there's a safer alternative, it should be required."

"PBDEs are sometimes called 'the next PCBs,' for good reason," said NEW research director Williams-Derry. "It's time to stop using the flame retardants, especially since safer alternatives exist."

[A paper describing the results of the Cal/EPA analysis by Jianwen She, Arthur Holden, Margaret Sharp, and Kim Hooper will be presented today at the Dioxin 2005 conference in Toronto. Northwest Environment Watch is a Seattle-based research center that monitors regional progress. More information on the CAL/EPA analysis and the NEW study is available at \[www.northwestwatch.org/toxics/toxics05.asp\]\(http://www.northwestwatch.org/toxics/toxics05.asp\).](#)

More information

[Abstract of the Cal/EPA analysis](#)

[Regional fact sheet](#) with results for each Northwest region