

**SB**

**27**

<TARGET><BILL>SB 27</BILL><SUBJECT>SB  
27</SUBJECT><COMM>SFIN27</COMM></TARGET>

# SENATE FINANCE COMMITTEE REPORT

DATE: 3/1/11

FURTHER:

DATE TURNED  
IN TO OFFICE: \_\_\_\_\_

**Finance Committee** considered SENATE BILL NO. 27

## SB 27-FLAME RETARDANTS AND TOXIC CHEMICALS

"An Act relating to flame retardants and to the manufacture, sale, and distribution of products containing flame retardants; relating to bioaccumulative toxic chemicals; and providing for an effective date."

and recommends:

be replaced with CS \_\_\_\_\_ (\_\_\_\_\_)  Same Title  New Title

adopt previous CS SB 27 (HSS)  Same Title  New Title

attached amendment(s)

adopt \_\_\_\_\_ Letter of Intent

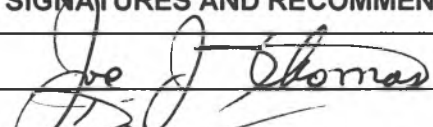
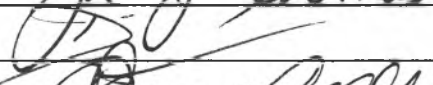
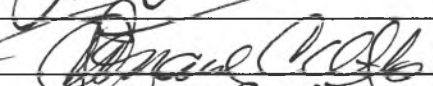
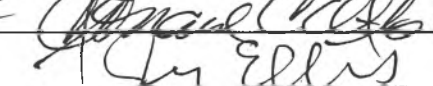
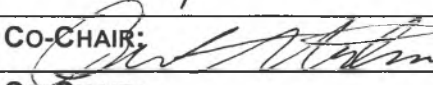
further referral to \_\_\_\_\_ Committee

Dept Abbr.	
ADM	LEG
CED	LAW
COR	LWF
CRT	MVA
EED	DNR
DEC	DPS
DFG	REV
GOV	DOT
DHS	UA

NEW FISCAL NOTE(S)				
Dept.	Fiscal	Indet.	Zero	FN #
DEC	✓			
DHS			✓	
DPS			✓	

PREVIOUS FISCAL NOTE(S)				
Dept.	Fiscal	Indet.	Zero	FN #

APPROPRIATION - no fiscal note

SIGNATURES AND RECOMMENDATIONS:	PRINTED LAST NAME	DO PASS	DO NOT PASS	NO REC	AMEND
	Thomas	✓			
	E Carr	✓			
	OLSON			✓	
	ELLIS	✓			
CO-CHAIR: 	Stedman			✓	
CO-CHAIR:					

# FISCAL NOTE

STATE OF ALASKA cost # codes  
2012 LEGISLATIVE SESSION

Bill Version CS SB 027 (HSS)  
Fiscal Note Number \_\_\_\_\_  
Publish Date \_\_\_\_\_

Identifier (file name) SB027CS(HSS)-DEC-SWM-02-21-12 Dept. Affected Environmental Conserv  
Title Flame Retardants and Toxic Chemicals Appropriation Environmental Health  
Allocation Solid Waste Management  
Sponsor Senator Wielechowski  
Requester Senate Finance Committee OMB Component Number 2344

**Expenditures/Revenues** (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

	FY13 Appropriation Requested	Included in Governor's FY13 Request	Out-Year Cost Estimates				
			FY14	FY15	FY16	FY17	FY18
<b>OPERATING EXPENDITURES</b>	<b>FY13</b>	<b>FY13</b>	<b>FY14</b>	<b>FY15</b>	<b>FY16</b>	<b>FY17</b>	<b>FY18</b>
Personal Services	89.4		107.3	107.3	107.3	107.3	107.3
Travel	5.0		5.0	5.0	5.0	5.0	5.0
Services	30.0		30.0	30.0	30.0	30.0	30.0
Commodities	8.5		1.0	1.0	1.0	1.0	1.0
Capital Outlay	0.0		0.0	0.0	0.0	0.0	0.0
Grants, Benefits	0.0		0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.0		0.0	0.0	0.0	0.0	0.0
<b>TOTAL OPERATING</b>	<b>132.9</b>	<b>0.0</b>	<b>143.3</b>	<b>143.3</b>	<b>143.3</b>	<b>143.3</b>	<b>143.3</b>

FUND SOURCE		(Thousands of Dollars)					
1002	Federal Receipts	0.0		0.0	0.0	0.0	0.0
1003	GF Match	0.0		0.0	0.0	0.0	0.0
1004	GF	132.9		143.3	143.3	143.3	143.3
1007	I/A Rcpts (Other)	0.0		0.0	0.0	0.0	0.0
1037	GF/MH (UGF)	0.0		0.0	0.0	0.0	0.0
1178	temp code (UGF)	0.0		0.0	0.0	0.0	0.0
<b>TOTAL</b>		<b>132.9</b>	<b>0.0</b>	<b>143.3</b>	<b>143.3</b>	<b>143.3</b>	<b>143.3</b>

POSITIONS							
Full-time		1.0		1.0	1.0	1.0	1.0
Part-time		0.0		0.0	0.0	0.0	0.0
Temporary		0.0		0.0	0.0	0.0	0.0

CHANGE IN REVENUES	FY13	FY14	FY15	FY16	FY17	FY18
	0.0	0.0	0.0	0.0	0.0	0.0

Estimated SUPPLEMENTAL (FY12) operating costs 0.0 (separate supplemental appropriation required;  
(discuss reasons and fund source(s) in analysis section)

Estimated CAPITAL (FY13) costs 0.0 (separate capital appropriation required)  
(discuss reasons and fund source(s) in analysis section)

**Why this fiscal note differs from previous version (if initial version, please note as such)**

This fiscal note has been revised to correct a typo, incorrectly including one part-time position. The part-time position has been removed. This fiscal note differs (reduced) from the initial fiscal note put forth by the department in 2011 because the CS SB 27 (HSS) removed several requirements from DEC. Additionally, this fiscal note has been entered into the 2012 form and has been revised to reflect updated personal service costs.

Prepared by Kristin Ryan, Director  
Division Environmental Health  
Approved by Lynn Kent  
Deputy Commissioner

Phone (907) 269-7645  
Date/Time 12/9/11 9:55 AM  
Date 2/21/2012

**FISCAL NOTE**

**STATE OF ALASKA  
2012 LEGISLATIVE SESSION**

**BILL NO. CS SB 027 (HSS)**

**Analysis**

The prohibition and regulation of products containing flame retardants will require a public campaign to educate the public about the risks associated with brominated flame retardants and evaluation and analysis of alternative flame retardants. One position, an Environmental Program Specialist IV, will handle both the toxicology analysis and the information to the public. The position will be filled for 10 months the first year to allow for classification and recruitment time, and for 12 months each year thereafter.

# FISCAL NOTE

**STATE OF ALASKA**  
**2012 LEGISLATIVE SESSION**

Bill Version CSSB027(HSS)  
 Fiscal Note Number \_\_\_\_\_  
 ( ) Publish Date \_\_\_\_\_

Identifier (file name) SB027CS(HSS)-DHSS-EPI-01-13-12 Dept. Affected Health and Social Services  
 Title Flame Retardants and Toxic Chemicals Appropriation Public Health  
 Allocation Epidemiology  
 Sponsor Sen. Wielechowski  
 Requester Senate Finance Committee OMB Component Number 296

**Expenditures/Revenues** (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

	FY13 Appropriation Requested	Included in Governor's FY13 Request	Out-Year Cost Estimates				
			FY14	FY15	FY16	FY17	FY18
<b>OPERATING EXPENDITURES</b>	<b>FY13</b>	<b>FY13</b>	<b>FY14</b>	<b>FY15</b>	<b>FY16</b>	<b>FY17</b>	<b>FY18</b>
Personal Services							
Travel							
Services							
Commodities							
Capital Outlay							
Grants, Benefits							
Miscellaneous							
<b>TOTAL OPERATING</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

FUND SOURCE		(Thousands of Dollars)					
1002	Federal Receipts						
1003	GF Match						
1004	GF						
1005	GF/Prgm (DGF)						
1037	GF/MH (UGF)						
1178	temp code (UGF)						
<b>TOTAL</b>		<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

POSITIONS							
Full-time							
Part-time							
Temporary							

CHANGE IN REVENUES							

Estimated **SUPPLEMENTAL (FY12)** operating costs \_\_\_\_\_ (separate supplemental appropriation required;  
 (discuss reasons and fund source(s) in analysis section)

Estimated **CAPITAL (FY13)** costs \_\_\_\_\_ (separate capital appropriation required)  
 (discuss reasons and fund source(s) in analysis section)

**Why this fiscal note differs from previous version (if initial version, please note as such)**

CSSB027 (HSS) removed two sections in the original bill that required DHSS involvement: Sections 18.31.670 (Review by departments) and 18.31.680 (List of toxic chemicals).

Prepared by Ward Hurlburt, MD, MPH - Chief Medical Officer / Director  
 Division Public Health  
 Approved by Nancy Rolfzen, Assistant Commissioner  
DHSS Finance & Management Services

Phone 269-6680  
 Date/Time 12/29/11 1:00 PM  
 Date 1/13/2012

FISCAL NOTE

STATE OF ALASKA  
2012 LEGISLATIVE SESSION

BILL NO. CSSB027(HSS)

**Analysis**

This bill, which addresses flame retardants, requires the Department of Environmental Conservation under Section 18.31.610 to consult with the Department of Health and Social Services (DHSS) prior to prohibiting by regulation the manufacture, sale, and distribution of flame retardant materials under specified circumstances. This limited involvement of DHSS that would involve the Division of Public Health would result in no fiscal impact and would be accomplished with existing resources.

In the original bill, DEC would seek consultation from DHSS in two situations when: (1) proposing to prohibit a flame retardant under Section 18.31.610; and (2) establishing a list every three years of persistent bioaccumulative toxic chemicals that occur or are used in products used by human beings, under Section 18.31.680. Additionally, DHSS and DEC would perform a one-time review of brominated flame retardants under Section 18.31.670. These previous provisions would have resulted in increased costs to the Division of Public Health of \$26.0 for 0.25 FTE of a Health Program Manager III and \$0.5 for office supplies. However, as mentioned, with the removal of Sections 18.31.670 and 18.31.680 from the original bill, the fiscal impact of the revised bill on DHSS is reduced to zero.

# FISCAL NOTE

**STATE OF ALASKA**  
**2012 LEGISLATIVE SESSION**

Bill Version SB027  
 Fiscal Note Number \_\_\_\_\_  
 () Publish Date \_\_\_\_\_

Identifier (file name) SB027CS(HSS)-DPS-FLS-12-28-11 Dept. Affected Public Safety  
 Title "An Act relating to flame retardants and to the manufac- Appropriation Fire and Life Safety  
ture, sale...bioaccumulative toxic chemicals..." Allocation Fire and Life Safety Operations  
 Sponsor Senator Wielechowski  
 Requester (S) FIN OMB Component Number 2883

**Expenditures/Revenues** (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

	FY13 Appropriation Requested	Included in Governor's FY13 Request	Out-Year Cost Estimates				
			FY14	FY15	FY16	FY17	FY18
<b>OPERATING EXPENDITURES</b>	<b>FY13</b>	<b>FY13</b>	<b>FY14</b>	<b>FY15</b>	<b>FY16</b>	<b>FY17</b>	<b>FY18</b>
Personal Services							
Travel							
Services							
Commodities							
Capital Outlay							
Grants, Benefits							
Miscellaneous							
<b>TOTAL OPERATING</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

**FUND SOURCE** (Thousands of Dollars)

1002	Federal Receipts						
1003	GF Match						
1004	GF						
1005	GF/Prgm (DGF)						
1037	GF/MH (UGF)						
1178	temp code (UGF)						
<b>TOTAL</b>		<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

**POSITIONS**

Full-time						
Part-time						
Temporary						

**CHANGE IN REVENUES**

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Estimated SUPPLEMENTAL (FY12) operating costs \_\_\_\_\_ (separate supplemental appropriation required)  
 (discuss reasons and fund source(s) in analysis section)

Estimated CAPITAL (FY13) costs \_\_\_\_\_ (separate capital appropriation required)  
 (discuss reasons and fund source(s) in analysis section)

**Why this fiscal note differs from previous version (if initial version, please note as such)**

Updated on new fiscal note form.

Prepared by Kelly Howell  
 Division Office of the Commissioner  
 Approved by Joe Masters, Commissioner  
Department of Public Safety

Phone (907) 269-5591  
 Date/Time 12/28/11 7:59 AM  
 Date 12/15/2011

**FISCAL NOTE**

**STATE OF ALASKA  
2012 LEGISLATIVE SESSION**

**BILL NO. SB027** \_\_\_\_\_

**Analysis**

If passed, this legislation requires the state fire marshal ensure the flame retardant alternative satisfies applicable fire safety standards.

Passage of this legislation will have no fiscal impact on the Division of Fire and Life Safety.

# ALASKA STATE LEGISLATURE

## Session

State Capitol, Rm. 101  
Juneau, AK 99801  
(907) 465-2435  
Fax: (907) 465-6615

## Interim

716 W. 4<sup>th</sup> Ave, Ste. 540  
Anchorage, AK 99501  
(907) 269-0120  
Fax: (907) 269-0122

Senator\_Bill\_Wielechowski@legis.state.ak.us



## Chair

State Affairs Committee

## Co-chair

Joint Armed Services Committee

## Vice Chair

Resources Committee

Judiciary Committee

## Member

Administrative Regulation Review

## SENATOR BILL WIELECHOWSKI

### SB 27 SPONSOR STATEMENT

“Still one thing more, fellow-citizens -- a wise and frugal Government, which shall restrain men from injuring one another, shall leave them otherwise free to regulate their own pursuits of industry and improvement, and shall not take from the mouth of labor the bread it has earned. This is the sum of good government, and this is necessary to close the circle of our felicities.”

Thomas Jefferson, First Inaugural Address, March 4, 1801<sup>1</sup>

SB 27 will support Safer Homes and Healthier Families by banning the use of polybrominated fire retardants (PBDEs) in mattresses, upholstered furniture and the plastic housing of electronics. In addition, it will give the Department of Environmental Conservation the authority to prohibit the use of other toxic flame retardants when safer alternatives exist. It will also move Alaska a step forward in protecting people from a variety of toxins by allowing the Department to participate with other states in learning about and sharing information on toxins.

PBDEs are persistent toxins that are included in furniture and electronics found in households to enhance flame retardancy. These toxins bio-accumulate, becoming more concentrated in humans and animals high in the food chain. Fetuses and infants are at particular risk as accumulated toxins are transferred from mother to child in utero and through breast milk. Pre-natal exposure may have lifelong health impacts that are not manifested until decades later.

Alaskans are particularly vulnerable for three reasons: 1) we spend a lot of time indoors with little ventilation, increasing our exposure to and ingestion of the microscopic particles of toxins found in household dust that are released from our furniture and electronics; 2) we eat subsistence foods that may concentrate toxins; and 3) through a process known as global distillation, toxins such as PBDEs are carried in the atmosphere for great distances from points of manufacture and concentrate in cold climates.

The impact and legacy of 30 years of producing and using these chemicals is yet to be fully realized and revealed. Alaska should join the 12 other states that have stepped forward to protect their citizens without delay in the face of federal inaction.

<sup>1</sup> [http://avalon.law.yale.edu/19th\\_century/jefinau1.asp](http://avalon.law.yale.edu/19th_century/jefinau1.asp), emphasis added.

# ALASKA STATE LEGISLATURE

## Session

State Capitol, Rm. 101  
Juneau, AK 99801  
(907) 465-2435  
Fax: (907) 465-6615

## Interim

716 W. 4<sup>th</sup> Ave, Ste. 540  
Anchorage, AK 99501  
(907) 269-0120  
Fax: (907) 269-0122

Senator\_Bill\_Wielechowski@legis.state.ak.us



**Chair**  
State Affairs Committee

**Co-chair**  
Joint Armed Services Committee

**Vice Chair**  
Resources Committee  
Judiciary Committee

**Member**  
Administrative Regulation Review

## SENATOR BILL WIELECHOWSKI

### CS SB 27 (HSS)

#### Sectional Analysis

**Section 1.** Adds a new article on toxic chemicals in products.

**Sec. 18.31.600.** Prohibits a person from manufacturing, selling, or distributing certain products that contain a specified percentage of the brominated flame retardants pentaBDE, octaBDE, or decaBDE. Prohibits a person from manufacturing, selling, or distributing a product that the Department of Environmental Conservation prohibits under sec. 18.31.610.

**Sec. 18.31.610.** Authorizes the department to prohibit the manufacture, sale, and distribution of certain products that contain a flame retardant that is not already prohibited under sec. 18.31.600(a) - (c) if the department makes certain determinations regarding public health, the environment, and alternatives to the flame retardant. Requires the department to consult with the Department of Health and Social Services (DHSS). Requires the state fire marshal to determine whether an alternative satisfies fire safety standards.

**Sec. 18.31.620.** Lists five exemptions from the prohibitions in sec. 18.31.600.

**Sec. 18.31.630.** Requires a person who manufactures products whose sale and distribution are prohibited by sec. 18.31.600 to inform its retailers in the state of the prohibition and the penalty.

**Sec. 18.31.640.** Authorizes the department to request that the manufacturer of a product it suspects of being sold in violation of sec. 18.31.600 either (1) provide the department with a sworn certificate indicating the sale does not violate sec. 18.31.600, or (2) notify its retailers in the state that the sale is prohibited and provide the department with a list of the retailers notified.

**Sec. 18.31.650.** Establishes a civil penalty for violating sees. 18.31.600 - 18.31.640.

**Sec. 18.31.660.** Requires the department to participate in a multistate chemicals clearinghouse to build capacity to identify and promote safer chemicals and products; avoid duplication and enhance efficiency and effectiveness; and ensure access to high quality and authoritative information on chemicals.

**CS SB 27 (HSS) Sectional Page 2**

**Sec. 18.31.670.** Authorizes the department to adopt regulations to implement the new sections.

**Sec. 18.31.690.** Defines terms for the new sections.

**Section 2.** Authorizes the department to begin adopting regulations for these provisions.

**Section 3.** Directs the Revisor of Statutes to make a conforming change to the existing statutes in AS 18.31.

**Section 4.** Gives participation in the chemicals clearinghouse and bill sec. 2 an immediate effective date.

**Section 5.** Gives the Act (except chemical clearinghouse participation and and sec. 2) an effective date of January 1,2013.

Prepared by Karla Hart, 2/28/11

## SB 27 – An Act Relating to Flame Retardants

### CS FOR SENATE BILL NO. 27(HSS) Before the Senate Finance Committee

#### **Q. Why do we need this bill?**

**A.** To protect the health of Alaskans by reducing our exposure to PBDEs .

#### **Q. What are PBDEs?**

**A.** Polybrominated diphenyl ethers (PBDEs) are a class of chemicals added to foams, electrical appliances and other materials to reduce flammability. PBDEs are easily released from products as microscopic dust, which can be ingested, inhaled and absorbed. These toxic chemicals remain in the environment for extended periods of time, build up in fatty tissues, and concentrate as they move up the food chain. PBDEs are neurotoxins that can act as endocrine disruptors and impact thyroid hormone regulation.

#### **FACT. Alaskans are especially at risk from PBDEs because:**

- Seasonally, we spend a lot of time indoors, increasing exposure to PBDE dust in households.
- Cold climates concentrate toxins, including PBDEs, that are carried in global air currents.
- Alaskans eat wild foods that concentrate PBDEs – marine mammals and some fish species are of special concern.

#### **Q. What Alaskans are most at risk from PBDEs?**

**A. Children.** PBDEs are transferred from mother to child during pregnancy and nursing. Exposure to small concentrations of toxins at critical stages of development can have permanent effects on development. A growing body of literature associates PBDEs with neurodevelopmental impairments, thyroid disruption and other adverse effects on humans.

#### **Q. Why isn't the Environmental Protection Agency imposing a ban?**

**A.** They can't. They don't have adequate authority under current law. As a result, states are taking action to protect their residents from PBDEs, including Washington, Oregon, California and Hawaii.

**Q. Will a ban compromise fire safety?**

**A.** No. Changes in product design have reduced the need for chemical flame retardants and resorcinol bis diphenyl phosphate (RDP), identified as a safer alternative, has passed the scrutiny of the Washington state fire marshall.

**Q. Will a PBDE ban hurt Alaskan businesses?**

**A.** No. Existing bans on PBDEs include Washington, Oregon, 11 other states, the entire Walmart/Sam's Club retail chain, and the European Union. Products that are free of PBDEs are now widely available. One major Alaska furniture retailer has surveyed his suppliers and reports that the products his stores carry are already free of PBDEs. The Western Home Furnishings Association, with 1,000 members, reports no complaints with implementation of the PBDE bans in Washington, Oregon, Hawaii and California. The Washington Retail Association also reports no difficulties with implementation of the Washington ban.

**Supporters of an Alaska ban on PBDEs include:**

- Alaska Fire Chief's Association
- Association of Village Council Presidents
- The Arc of Anchorage
- Nome Eskimo Community
- Alaska Professional Fire Fighters
- Alaska Inter-Tribal Council
- Alaska Nurses Association
- Alaska Conservation Alliance
- Native Village of Savoonga
- Kristin Cox, Naturopathic Doctor
- Dr. Lauren Heine, Clean Production Action
- Karen McLane, Nome Health Care Provider
- Roxanne Chan, Spring Wind Acupuncture
- Marc Esslinger, Firefighter/Paramedic
- Peter Brigham, U.S. burn injury community
- Dr. Frank Von Hippel, University of Alaska Anchorage

**Q. How much is it going to cost?**

**A.** About 20 cents per Alaskan per year - \$139,000.

Although Alaska faces human and environmental risks from an array of airborne, waterborne, household and industrial toxins, the State's Division of Environmental Health has no toxicologist. The DEC fiscal note for this bill includes one toxicologist who would leverage resources and exchange knowledge with other toxicologists through the Interstate Chemicals Clearinghouse to better enable Alaska to respond quickly to health threats from other toxic chemicals. DHSS and DPS fiscal notes are zero.

Chairman Stedman  
Senate Finance Committee  
Capitol Building  
Juneau

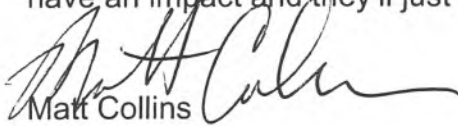
February 21, 2012

Mr. Chairman:

I just want to express a few thoughts on a bill you're considering, SB 27, dealing with the composition of fire retardant materials that some claim unknowingly affect our daily environment and consequently, our health.

I've got a lot of friends who are environmental advocates and most of the time I agree with them but this time I think maybe they are going too far too fast.

As you know, fire is a huge, terrible issue in Alaska, especially in rural Alaska. I'm really not convinced this bill addresses the real solution to our problem here. I think we need to focus our time, energy and money on prevention and awareness and co-ordinate our concerns on this issue with a focus on a national solution to ingredients included in consumer products. Our market is too small to have an impact and they'll just cut us off and things could be even worse.

  
Matt Collins

3201 W. 71<sup>st</sup> Ave.  
Anchorage, Ak. 99502

2/22/12

Alaska State Senate  
Finance Committee  
Capitol Bldg.  
Juneau, Alaska 99801

Dear Senate Finance:

I understand your committee is considering passing SB 27, a bill that would ban the use of a chemical essential for effective fire retardant in building materials and consumer products.

It is my understanding the use of this chemical is being addressed by the federal EPA. It seems silly to me that we are considering creating a state standard that we have little or no expertise in before the EPA, taking into consideration solid scientific evidence, addresses the issue on a national level. Then, after the national experts create a standard, is when we should address how that accommodates Alaska.

The bill is premature. Please don't pass it yet.

  
Kyle Farrell

436 E. 11<sup>th</sup> Ave. #26  
Anchorage, Ak. 99501

Alaska Senate Finance Committee  
State Capitol Building  
Juneau, Alaska 99801

February 21, 2012

Honorable Committee Members:

I'm considering remodeling my home. My contractor tells me the legislature is considering passing a bill, SB 27, that will change the composition of fire retardant components in building materials and end up increasing the cost of construction.

I understand the issue is being addressed by the federal EPA and new national standards developed if in fact it is necessary.

I don't understand why we feel we need to pass SB 27, or legislation like it, until the new federal standards are established. We should wait so we don't have to go through this all over again.

Seems like passing it now is a waist of time and money.

  
Neil Tolpuiano

1431 North Bluff Dr.  
Anchorage, Alaska 99501

February 19, 2012

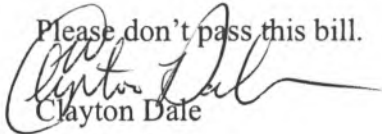
Chairman  
Alaska State Senate Finance Committee  
Juneau, Alaska 99801

Dear Finance Committee

In regard to SB 27, the bill banning a chemical essential to effective fire retardant materials and products.

I don't understand why we in Alaska, who, because of our extreme weather conditions, face extraordinary residential fire challenges that endanger us more than any other state in the country, would even consider legislation that would increase our chance of survival.

Please don't pass this bill.



Clayton Dale

4938 E. 43<sup>rd</sup>. Ave. #B2  
Anchorage, Ak. 99548

February 20, 2012

Sen. Stedman  
Chairman  
Senate Finance Committee  
Capitol Building  
Juneau, Alaska 99501

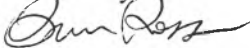
Mr. Chairman & member of the Finance Committee,

SB 27 will put Alaska out in front of the rest of the country when it comes to the composition of fire retardant components included in a myriad of products, both consumer and commercial, sold in Alaska.

I understand the health concerns proponents have raised and share them if they are in fact real. The issue is being addressed on the national level by the EPA and also voluntarily by manufacturers. Their proposed solution is due sometime next year.

I think this bill is premature.

Thank you.



Brian Ross

9715 Independence Dr. #B203  
Anchorage, Ak. 99507

February 21, 2012

Alaska State Senate Finance Committee  
Room 520  
State Capitol  
Juneau, Alaska 99801

Dear Alaska State Senate Finance Committee Members:

We would like to express our opposition to SB 27. The EPA and industry have already reached an agreement to phase out old fire retardant products and safely transition to the next generation of fire safety products. As burn physicians and former presidents of the American Burn Association, we have come to recognize the absolute necessity of flame retardants. The truth is that fire retardants save lives. They add minutes to a would-be victim's escape time. The relationship between time of exposure and the extent of the injury is well known. The greater the surface area burns, the higher the mortality. We are committed to saving lives and preventing burns any way possible. Thus we are deeply concerned about any reckless and unscientific attempt to weaken standards and put millions of people at risk for serious burn injuries and death. Any individual state bill that would immediately ban fire safety protections without the development and proper implementation of alternatives is dangerous.

Devastating fires affect every person in every industry. According to a recent UC Davis study, some 2 million fires occur each year in the United States alone. These fires result in about 5,000 deaths, 54,000 hospitalizations and 1.4 million injuries, including 300 to 400 child deaths. The medical community sees the trauma of burns and the lifelong effect on the lives of victims on a daily basis. The brave firefighters and EMT's that are the first to respond to a scene depend on flame retardants to allow valuable seconds for rescue. The business community will be forced to change their manufacturing process and will incur much higher costs, leading smaller enterprises to bankruptcy. Universities and school systems will face a significantly larger risk for hundreds of thousands of students. Industries simply cannot afford to ban a life-saving product without developing alternatives.

The EPA agreement sets forth a rational, effective transition to newer alternatives, while allowing critical services such as police, fire and airlines to continue to use existing fire safety products that are critically important to saving lives. Manufacturers have already announced the production of environmentally-friendly fire retardants which minimize the use of raw materials, energy, byproducts and waste. We believe that fire safety manufacturers will hold fast to their decision to safely phase out existing products, and we commend them for their proactive development of new technologies.

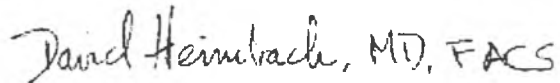
As we make this transition, we must ensure that there is no unsafe lapse in fire protection. Therefore, we oppose any preemptive state bans as we believe the timeline that has been worked out with the EPA is the most appropriate. A national solution considers the interest of all Americans rather than just those of individual states, and this is the only way to safely progress in national fire protection.

Thank you for your time and effort concerning this extremely important matter, and we hope that you will join us as we continue to hold our nation to the highest fire protection standard.

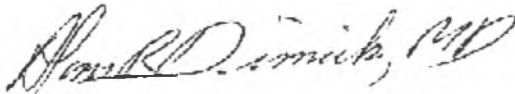
Sincerely,



Roger E. Salisbury, MD  
Westchester Medical Center  
Taylor Care Center Executive Offices- Rm 139  
Valhalla, NY 10595



Past President American Burn Association  
Past President International Society for Burn Injury



Alan Dimick, M.D., FACS  
Past President, American Burn Association

**Alaska Nurses Association (AaNA)**  
**2010 Resolution #7**  
**Resolution on Polybrominated Diphenylethers (PBDEs)**  
**10/17/2010**

*Whereas*, PBDEs are toxic, endocrine-disrupting flame retardant chemicals added to plastics, foam products and textiles; and

*Whereas*, prenatal exposures to PBDEs at levels commonly found in households have been shown in studies to be associated with adverse neurodevelopmental effects in young children; and

*Whereas*, people living in North America have levels of PDBEs that are 10-40 times higher than individuals living in Europe or Japan and people living in northern regions are particularly vulnerable to PBDE exposure; and

*Whereas*, safer and economically viable alternatives are available and are already being used by some manufacturers of computers and other products; and

*Whereas*, the American Public Health Association and International Association of Fire Fighters have urged the phase-out of PDBEs and other harmful chemicals when safe alternatives are readily available;

*Therefore be it resolved*, that the Alaska Nurses Association supports the passage of SB295.

approved       rejected



**American Public Health Association**  
800 I Street, NW • Washington, DC 20001-3710  
(202) 777-APHA • Fax: (202) 777-2534  
[comments@apha.org](mailto:comments@apha.org) • <http://www.apha.org>

## Policy Statement Database

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### Preventing Human Exposure to Polybrominated diphenyl ether (PBDE) Flame Retardants to Protect Public Health

**Policy Date:** 11/9/2004

**Policy Number:** 2004-05

This policy, acknowledging that polybrominated diphenyl ether (PBDE) flame retardant compounds are widely used and chemically similar to PCBs, and noting more recent recognition that PBDEs are environmentally persistent, rapidly bioaccumulate in human tissue including breast milk and function as developmental neurotoxicants in animals, urges proactive steps to reduce human exposure citing especially APHA policy (#200011) encouraging "precautionary action to prevent potential harm to reproductive health, infants, and children, even if some cause and effect relationships have not been established with scientific certainty."<sup>1</sup>

More specifically, PBDEs are commonly used flame retardants found in foam products, textiles, electrical equipment, building materials and transportation. Penta-BDE, octa-BDE and deca-BDE are three of the most common commercial classes, with varying numbers of bromine atoms per molecule. Chemically, they look very much like PCBs, which were banned in 1976 due to their high toxicity and persistence and now conclusive evidence that they cause neurodevelopmental problems in children.<sup>2</sup> Aside from their fire-retardant properties, PBDEs are potent toxins that persist in the environment and bioaccumulate in the food chain and in human tissues.<sup>3</sup> Like PCBs, PBDEs are lipophilic and have been found in fish, bird eggs and marine mammals as well as in human milk, fat and blood. While PCB levels in fish and breast milk have slowly declined since being banned, PBDE levels are increasing at an exponential rate. A 100-fold increase in total PBDEs was noted in Lake Ontario trout between 1978 and 1998.<sup>4</sup> Body burdens of PBDEs in San Francisco Bay Harbor seals increased by a factor of 100 between 1989 and 1998.<sup>5</sup> Total PBDE levels in human milk, blood and tissues have increased by a factor of 100 during the past 30 years, doubling about every five years.<sup>6</sup> PBDE levels in U.S. women's breast milk are typically 10-100 times higher than levels in European women<sup>7,8</sup> and are now approaching concentrations at which health effects have been observed in laboratory animals.<sup>9-17</sup> Although human data on health effects are still lacking for PBDEs, ample data on toxicity are available from animal studies. These studies document that PBDEs are toxic to the brain, reproductive system and liver and disrupt thyroid function.<sup>18</sup> Effects on thyroid function provide a plausible mechanism for PBDEs' possible adverse effects on child development. Human studies already document adverse effects on intelligence and psychomotor skills in children with disruptions in thyroid levels in the womb through the second year of life.<sup>19-22</sup> One study found that workers exposed to PBDEs experienced higher prevalence of hypothyroidism.<sup>23</sup> Concurrent exposure to both PBDEs and PCBs, as from consuming some fatty fish, may present an increased risk since some researchers have found additive or synergistic effects between the two chemicals.<sup>24</sup>

PBDEs have been detected in household dust,<sup>25</sup> food, and in air drawn from a warm TV,<sup>26</sup> but the major human exposure pathways have yet to be identified. PBDEs with fewer bromines, such as penta, have the highest potential for bioaccumulation and are typically the most common classes found in humans, fish and other wildlife. Scientists, however, have increasingly been finding deca-BDEs and other higher brominated congeners in biota.<sup>27-29</sup> Moreover, it is clear that deca can debrominate and convert to the more bioavailable forms in the environment and potentially during metabolism as well, making them a greater health risk than originally thought.

Global PBDE production totaled 150 million pounds in 1999, over 50 percent of which was used in the Americas.<sup>30</sup> Deca-BDE is the most widely used class of BDE at 80 percent of worldwide production.<sup>31</sup> Like PCBs, PBDEs flame retardants are now ubiquitous in the environment. The European Chemicals Bureau estimates that 75 percent of penta-BDE emissions will end up in soil and 24.9 percent in surface water and sediment.<sup>32</sup> Measured levels of PBDEs in U.S. sewage sludge are 40 times that of European sludge.<sup>33</sup>

Eliminating most uses of PBDE flame retardants is possible, and a prudent step to protect public health. Concerns about rising levels of PBDEs in the breast milk of Swedish women led to efforts by industrial users in both Sweden and Germany to phase out the use of these chemicals. These actions have led to a decline in PBDE levels in breast milk of Swedish women.<sup>34</sup> The European Union has enacted a ban on penta and octa-BDEs and is considering a ban on deca-BDEs as well. The states of California, Hawaii, New York, and Maine have enacted phase-outs of penta and octa-BDEs. Minnesota, Massachusetts, Michigan, Washington and Maryland have proposed similar state-level phase-outs.

Alternatives to the use of PBDE flame retardants are available and cost effective. Alternatives include: product redesign to

eliminate the need for added chemicals; use of naturally flame retardant materials like wool and leather or plastics containing sulfur; and use of less toxic alternatives.<sup>35</sup> The German Environmental Agency selected red phosphorus, ammonium polyphosphate and aluminum trihydroxide as alternatives with the least adverse environmental impact.<sup>36</sup> Some computer and electronics manufacturers like Apple, Ericsson, IBM, Intel, Motorola, Panasonic, Phillips, and Sony are using alternatives. For example, Motorola now uses a halogen-free laminate that is cost effective, while meeting fire safety standards.<sup>37</sup> Toshiba has replaced BFR-containing plastic casings in electronic parts with inherently flame-resistant polyphenylene sulfide. IKEA furniture, Crate and Barrel and Eddie Bauer are requesting PBDE-free polyurethane foam from their manufacturer Hickory Springs.

Although global manufacturers of these compounds continue to produce, as well as export, their products to the United States, one of the two U.S. manufacturers of PBDEs, Great Lakes Chemical, has already announced that they will phase out production of penta and octa-BDEs by 2005. The remaining U.S. manufacturer, Albemarle, continues to manufacture deca-BDE. By calling for a reasonable time frame for phase-out of deca-BDEs, impacts on businesses and workers could be minimized. Phasing out these compounds and substituting safer alternatives protects U.S. manufacturers of PBDEs and companies that use them in their products from potential liability and helps maintain a European market for products requiring flame retardant properties. Since exposure to PBDEs may include an inhalation route of exposure, phasing out the manufacture of these chemicals should better protect the health of workers in industries dealing with PBDEs.

A PBDE phase-out may result in job loss for existing production workers. APHA policy statement 9304 acknowledges potential worker impacts and calls for assistance to workers who are displaced by technological changes.<sup>38</sup> New research further supports the need for Work Environment Impact Assessments prior to chemical phase-outs/bans in order to prevent the shifting of risks to workers within the affected industry.<sup>39</sup> A PBDE phase-out also provides economic opportunities for workers in industries which make safer alternatives to PBDE flame retardants.<sup>40</sup>

In light of the aforementioned emerging science on the inherent toxicity and persistence of PBDEs, evidence of adverse health effects on animals and the prevalence and rising levels in fish, biota and human breast milk, immediate action is needed to prevent further environmental contamination and to protect public health.

Therefore, The American Public Health Association hereby:

1. Resolves: That APHA urge state and federal governments to require the use of PBDE flame retardants be phased out in all products manufactured and sold in the United States by a date certain; and
2. Resolves: That APHA urge state and federal governments, in enacting such phase-outs, to consider policies that alleviate short-term economic impacts on the PBDE production workforce, and to also consider economic benefits to workers in industries making safer alternatives; and
3. Resolves: That APHA urge state and federal governments to provide financial incentives for development and use of alternative flame retardants or preferably changes in product design to increase fire resistance without use of chemicals, to assure fire safety, while protecting the public from toxic exposures; that alternative flame retardants be adequately tested for toxicity; and that environmental and health safety must be assured prior to use; and
4. Resolves: That APHA urge state and federal governments to require labeling of chemical flame retardants used in products; and
5. Resolves: That APHA urge state, federal and local governments to regulate the safe disposal of products containing brominated flame retardants and to prohibit land application of sewage sludge until testing can assure that such material does not contain measurable levels of PBDEs; and
6. Resolves: That APHA urge the U.S. Centers for Disease Control and Prevention to expand the national biomonitoring program to include PBDEs and to increase the number of people studied; and
7. Resolves: That APHA urge Congress to increase funding for research on PBDE flame retardants, including monitoring levels of PBDEs in fish, sediments, human milk, blood and tissue, and additional research into exposure routes and human health effects from these exposures.

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Myron P. Naneng, Sr., President  
Steven R. Street, Director

## Association of Village Council Presidents

Department of Cultural and Environmental Sciences

PO Box 219 • Bethel AK 99559

Phone (907) 543-7300 • Fax: (907) 543-5732



Akiachak  
Akiak  
Alakanuk  
Andreafsky  
Aniak  
Atmautluak  
Bethel  
Bill Moore's Sl.  
Chefornak  
Chevak  
Chuathbaluk  
Chuloonawick  
Crooked Creek  
Eek  
Emmonak  
Georgetown  
Goodnews Bay  
Hamilton  
Hooper Bay  
Lower Kalskag  
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Kasigluk  
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Lime Village  
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Mekoryuk  
Mtn. Village  
Napairmiut  
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Napaskiak  
Nawtok  
Nightmute  
Nunakaulyaq  
Nunam Iqua  
Nunapitchuk  
Ohogamiut  
Oscarville  
Paimiut  
Pilot Station  
Pitka's Point  
Platinum  
Quinhagak  
Red Devil  
Russian Mission  
Scammon Bay  
Sleetmute  
St. Mary's  
Stony River  
Tuluksak  
Tuntutuliak  
Tununak  
Umkumiut

February 18, 2011

Senator Bill Wielechowski  
State Capitol  
Juneau, AK 99801

Dear Senator Bill Wielechowski:

As President of the Association of Village Council Presidents we are writing you in support of SB 27, a bill that would prohibit the manufacture and sale of toxic retardants in common consumer products. The Association of Village Council Presidents is a tribally-governed organization advocating on behalf of 56 Federally Recognized tribal governments throughout the Calista region. We recognized increasing evidence that flame retardants, such as polybrominated diphenyl ethers (PBDEs) named in SB 27 are being found in the Arctic. We are concerned about PBDEs leaving a lasting toxic legacy in people and the environment.

PBDEs are potent toxins that persist in the environment and bioaccumulation in the food chain and in human tissues. They can travel long distances and move readily between the water, soil, and air. PBDEs are associated with a variety of negative toxic effects including memory impairment, learning and behavioral problems, the disruption of thyroid hormone balance and reproductive health issues. In Alaska, PBDEs have been detected in seabird eggs, marine mammals, otters, and polar bears. The presence of such chemicals in wildlife is cause of concern, not only for the survival and well-being of wildlife but for the human consequences of bioaccumulative exposure through the food we eat.

We need to enact legislation to phase out PBDEs from consumer product. Fortunately, fire safety can be achieved without the use of toxic chemical because there are safe, economical, and effective alternatives to PBDEs currently in widespread use.

Eliminating most uses of PBDE flame retardants is possible and an important step to protecting public health.

Thank you for sponsoring this bill.

Sincerely,

Myron Naneng, President

ASSOCIATION OF VILLAGE COUNCIL PRESIDENTS



## ALASKA FIRE CHIEF'S ASSOCIATION

2358 Bradway Road, North Pole, Alaska 99705

Phone: (907) 488-3400

FAX: (907) 488-6118

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March 4, 2011

Representative Lindsey Holmes  
State Capitol Room 405  
Juneau AK, 99801

Senator Bill Wielechowski  
State Capitol Room 101  
Juneau AK, 99801

Reference: HB 63 & SB 27

On behalf of the Alaska Fire Chiefs Association I am writing to give our support for HB 63 and SB 27; **TITLE:** "An Act relating to flame retardants and to the manufacture, sale, and distribution of products containing flame retardants; relating to bioaccumulative toxic chemicals; and providing for an effective date."

Polybrominated Fire Retardants (PBDEs) have been proven to be toxic chemicals and hazardous not only to residents in homes with PBDEs but to Fire Firefighters who may be called to fight fires in structures where these chemicals are present.

We support the passage of HB 63 and SB 27.

Sincerely,

A handwritten signature in black ink, appearing to read "Jeff Tucker". The signature is fluid and cursive, with a large loop at the beginning and a long horizontal stroke at the end.

Jeff Tucker, President  
Alaska Fire Chiefs Association



2211 Arca Drive • Anchorage, Alaska 99508

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February 16, 2011

Senator Bill Wielechowski  
State Capitol  
Juneau, AK 99801

Dear Senator Wielechowski:

The Arc of Anchorage would like to thank you for introducing SB 27, *"An Act relating to flame retardants and to the manufacture, sale, and distribution of products containing flame retardants; relating to bioaccumulative toxic chemicals; and providing for an effective date."* The Arc of Anchorage is a private not-for-profit organization that serves people with developmental disabilities and mental health issues so they can lead rich and productive lives. The Arc looks forward to a day when it is no longer needed because all preventable disabilities have been prevented, but we need legislative help to address prevention.

Learning and developmental disabilities influence the quality of life for affected children and their families, and also impose a heavy financial burden on the state through required Special Education, increased health care costs, lost work time for parents, and a lifelong loss of work productivity for severely affected children. Scientific evidence has demonstrated that some chemicals, including decaBDE, can cause learning and developmental disorders. We must not expose our children to toxicants that we know or suspect can harm their developing brains and bodies. We know safe alternatives can replace the need for these toxic chemicals without compromising fire safety.

Developing children are more susceptible to toxic exposures than adults. When certain exposures occur at certain times, sometimes even at very low doses, the development of children's brains, other organs, and reproductive, hormonal, and immune systems can be permanently altered. Recent evidence has shown children who had higher cord blood concentrations of polybrominated diphenyl ethers (PBDEs) scored lower on tests of mental and motor development at 1-4 and 6 years of age. This work was initiated based on a large body of research indicating that prenatal PBDE exposure has the potential to disrupt neurodevelopment.

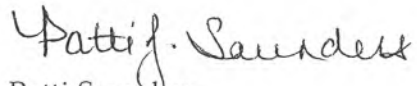
PBDE residues, particularly highly brominated PBDEs such as deca-BDE, have been found consistently in tissue samples of both new mothers and their newborn infants, as well as in mothers' breast milk. Ingestion of contaminated milk is one of the two major routes of PBDE exposure in children, and there are concerns about the high concentrations ingested, given the

***Different Needs. One Dream.***

susceptibility of newborns. This trend has been found to occur around the globe. Yupik women from the Yukon Kuskokwim Delta of Alaska have the highest known concentrations of PBDEs in human populations in the Arctic.

Children rely on adults to keep them safe from harm. Therefore, it is up to us to do everything we can to keep them safe and to minimize their exposures to toxics. SB 27 is important legislation that will help protect children from needless exposures to this persistent, toxic chemical.

Thank you,

A handwritten signature in cursive script that reads "Patti Saunders". The signature is written in black ink and is positioned above the printed name.

Patti Saunders

Director of Development

The Arc of Anchorage



## ALASKA PROFESSIONAL FIRE FIGHTERS

*International Association of Fire Fighters, AFL-CIO, CLC*

P.O. Box 111222, Anchorage, AK 99511-1222

March 3, 2011

To: Honorable Senators and Representatives of the Alaska Legislature  
RE: The Alaska Professional Fire Fighters Associations' position on PBDE's

Dear Legislator –

The Alaska Professional Fire Fighters Association (AKPFFA) is submitting this letter in support of HB63 / SB27 and urges passage of this important public health and environmental measure. We believe passage of this measure is a step in the right direction for improving the health and safety of our firefighters and the community.

Our organization represents 7 affiliated local fire fighter unions and more than 480 affiliated members of the International Association of Fire Fighters (IAFF). We are concerned with providing the safest working environment for our firefighters, and the need to maintain the highest safety standards; a big step towards achieving these goals can be made by banning the use of polybrominated diphenyl ethers (PBDE's).

The elimination of PBDE's is not about compromising fire standards. A fire safety committee comprised of fire professionals will review alternatives identified by the Department of Ecology and the Department of Health as "safer", ensuring that any alternative will meet the same fire standards. This bill is about protecting firefighters and others exposed to these chemicals from the potentially dangerous health implications. 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. Many studies involving firefighter's exposure from these chemicals penetrating protective gear have found that firefighters have a much greater risk of contracting cancer, heart and lung disease, and other debilitating diseases. While we clearly support the use of flame retardant chemicals, there are alternatives already in use that do not contain bromine or chlorine making it safer for firefighters than those that contain PBDE's.

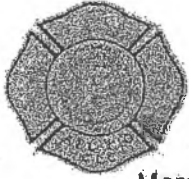
Major manufacturing corporations like Dell, Hewlett-Packard, and IKEA have already moved away from the use of PBDE's in their products. These industry leaders are demonstrating that alternative flame retardant technologies for achieving fire safety standards do exist and are readily available for other manufactured products.

The AKPFFA joins the Alaska State Fire Chiefs Association and the IAFF along with numerous health and environmental groups in supporting this important piece of legislation.

Sincerely,

Tom Wescott  
President AKPFFA  
[tomwescott@gmail.com](mailto:tomwescott@gmail.com)  
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# INTERNATIONAL ASSOCIATION OF FIRE FIGHTERS®

HAROLD A. SCHAIBERGER  
General President

THOMAS H. MILLER  
General Secretary-Treasurer

March 1, 2010

Mark Drygas, President  
Alaska Professional Fire Fighters Association  
PO Box 111222  
Anchorage, AK 99511-1222

Dear President Drygas:

The International Association of Fire Fighters 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 addressing 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 toxic substances. Accordingly, we support the efforts of the Alaska State Legislature on this issue.

Before going ahead, I believe it is important for you to understand what our organization is and whom we represent at these hearings. The IAFF is an international union affiliated with the AFL-CIO and the Canadian Labour Congress. At the present time, we represent over 296,000 paid professional fire service employees in the United States and Canada. The membership of the IAFF is employed by various parties that include the federal government, states, counties, municipalities, fire districts, airports, industrial manufacturers, and so on.

The profession of fire fighting is and has always been a hazardous occupation. Every year the IAFF reviews the deaths and injuries occurring in the fire service, and each year the hazards of fire fighting continue to exist and display ever-varied forms. Fire fighter line-of-duty fatalities have ranked fire fighting among other publicized hazardous occupations in the private sector, such as mining and construction.

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. However, 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 may save 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 are much safer for fire fighters than PBDE's.

The IAFF salutes those companies that have stopped using brominated flame retardants (such as Dell, Hewlett-Packard, Ikea and many others) 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.

Three years ago, as the result of a successful political action initiative led by the Washington State Council of Fire Fighters, Washington State banned PBDEs effective in 2008, pending a study of alternatives.

Maine became the second U.S. state to ban PBDEs, thanks to an initiative led by the Professional Fire Fighters of Maine. The Maine bill specifically targets deca-BDEs and phases them out by the year 2010. Other States examining the PBDE issue include California, Connecticut, Hawaii, Illinois, Maryland, Michigan, Minnesota, Montana, New York and now Alaska. We are certainly appreciative to the Alaska Professional Fire Fighters Association to also address this important issue with legislation for the safety our fire fighters and our citizens.

Further, the IAFF with the assistance of the National Association of State Fire Marshals (NASFM) worked with the National Institute for Standards and Technology and organized a scientific workshop on the potential health effects to fire fighters of flame retardants in the aftermath of a fire. This meeting was held in September of last year. Technical experts from the government and private sector representing the fire services, health sciences, fire science, environmental sciences, and product manufacturers explored our state of knowledge about and stimulated open discussion by the meeting participants on:

- Approaches to reducing the flammability of building products and the rate of fire spread in buildings;
- The composition and nature of products formed during and after an actual building fire, and how they are affected by the presence of a fire retardant;
- Quantification of the concentration of the fire products;
- Routes of exposure by emergency responders and clean-up crews to hazardous fire products;

- The possible relationship between acute and chronic health effects on emergency responders exposed to fire products, and the type and amount of fire retardant involved in the fire; and
- Knowledge gaps and the identification of a possible future research agenda.

Finally, the IAFF has worked with the manufacturing industry on this issue to further protect our membership. Chemtura, one of the nation's largest manufacturers of DecaBDE (Decabrom), has been in opposition to the legislation. However, Chemtura and the IAFF have now agreed to jointly support federal legislation that would establish:

- A time table to ban the production or importation of Decabrom for US consumption;
- A time table to ban the sale of finished products containing Decabrom; and
- A mechanism to compel compliance and enforcement of the respective bans.

Due in part to that effort, the US Environmental Protection Agency announced on December 17, 2009, that the two U.S. producers of decabromodiphenyl ether (decaBDE), Albemarle Corporation and Chemtura Corporation, and the largest U.S. importer, ICL Industrial Products, Inc., have committed to end production, importation, and sales of decaBDE for most uses in the United States by December 31, 2012, and to end all uses by the end of 2013. EPA has long been concerned about these fire retardants' impact on human health and the environment. Again, their studies have shown that decaBDE persists in the environment, potentially causes cancer and may impact brain function.

Any measure that takes a potentially dangerous chemical away from the fire fighters' workplace will enhance fire fighter safety, and as a result, public safety. Let me conclude by addressing the perception of public safety and fire fighter and citizen exposures to toxic products. During the last year's holiday shopping season, there was uproar around the world about 90 ppm of the flame retardant antimony that was found in Zhou Zhou toy hamsters, a popular Christmas toy. What didn't make the news is that currently:

- 30,000 ppm of flame retardants is found in nursing pillows, high chairs, and stroller foam;
- 75,000 ppm of antimony is found in TV enclosures; and
- 150,000 ppm of DecaBDE is found in plastic enclosures.

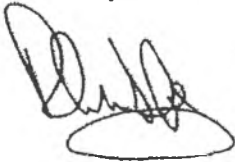
The amount of antimony in the toy hamsters was determined not to migrate out and cause a health problem for children. However the flame retardants in baby products,

Mark Drygas  
March 1, 2010  
Page 4 of 4

furniture and TV enclosures do migrate into dust and as I have discussed can contribute to toxic exposures to citizens and fire fighters. That is why the IAFF and our state and provincial associations, including the Alaska Professional Fire Fighters Association have been addressing these exposures and we are working with federal, state and provincial governments as well as the industry to remove many of these chemicals from common products.

The International Association of Fire Fighters and the Alaska Professional Fire Fighters Association once again appreciate the Alaska State Legislature's proposal to address fire fighter exposures to toxic materials and we support such efforts to protect our members.

Sincerely

A handwritten signature in black ink, appearing to read 'R. Duffy', with a large, stylized flourish underneath.

Richard M. Duffy  
Assistant the General President  
Occupational Health, Safety and Medicine

cc: Ricky Walsh, IAFF District Vice President



NATIVE VILLAGE OF SAVOONGA • P.O. BOX 120, SAVOONGA, AK 99769 • PHONE 984-6414 • FAX 984-6027

March 11, 2010

To: Honorable Senators and Representatives of the Alaska Legislature

From: Native Village of Savoonga

Regarding: Support of HB 385 and SB 295

Dear Legislator:

The Native Village of Savoonga is submitting this letter in support of HB 385 and SB 295, legislation to phase out the manufacturing, sale, and distribution of products that contain polybrominated biphenyl ethers (PBDEs). We believe that action on this class of persistent toxic chemicals is necessary to protect the health and well-being of our people and future generations. We must do everything we can to protect the health of our children who are especially vulnerable because exposure to these chemicals can harm their developing brain and their ability to learn. We know that there is also increasing evidence that links exposure to PBDEs with other serious health problems such as permanent developmental disorders, reproductive harm, thyroid disease, and certain types of cancer.

We are aware that PBDEs are transported on wind and ocean currents into our region and are accumulating in the north/Arctic at an alarming rate. PBDEs are now found in our traditional foods, including fish, seabird eggs, and marine mammals. Our people are also at risk because of the presence of PBDEs in products that we use in our homes and that we may be experiencing higher exposures because our homes are closed in for a greater part of the year than in lower latitudes. We are concerned that in a recent study of the Arctic Monitoring and Assessment Program, Yupik women from the Yukon-Kuskokwim Delta had the highest levels of PBDEs of any human population of the circumpolar Arctic. It is necessary to take action to prevent exposures to PBDEs and other persistent, bioaccumulative and toxic chemicals.

We urge you to take this opportunity to pass this important piece of legislation in order to protect our health and the health of all Alaskans. Thank you for your attention to our

concerns.

Sincerely, *Verna Immingam* Vice President  
For *Kenneth Kingcekuk*

President, IRA Council, Native Village of Savoonga

**From:** Roxanne Chan [mailto:chan.rox@gmail.com]  
**Sent:** Wednesday, March 17, 2010 12:46 AM  
**To:** chan.rox@gmail.com  
**Subject:** support for SB 295

Senator Bettye Davis and Members of the Committee  
Senate Health and Social Services Committee  
State Capitol  
Juneau, AK 99801-1182

March 16, 2010

Dear Chair Davis and Members of the Senate Health and Social Services Committee:

Thank you for taking the opportunity to hear testimony on SB 295, an important bill to phase out octa-, penta-, and decaBDE from certain uses, for which safer, effective alternatives are in widespread, successful use. I am unable to attend the hearing scheduled on Wednesday, March 17, 2010 but appreciate the opportunity to submit written support of this bill. I urge that the Committee support this bill.

My name is Roxanne Chan and I am a Registered Nurse and Licensed Acupuncturist currently residing in Anchorage. Since moving to Alaska in 2005, I have had the opportunity to practice nursing in communities such as Barrow, Nome, and Anchorage. I also recently had the opportunity to participate in a biomonitoring study where my blood was tested for PBDEs.

In October of 2009, the report *Hazardous Chemicals in Health Care: A Snapshot of Chemicals in Doctors and Nurses* (

<http://www.psr-la.org/files/hazardous-chemicals-in-health-care.pdf>), was released documenting the levels of different chemicals of twelve doctors and eight nurses from around the country including myself and a physician from Alaska. My results showed that I have at least 19 different PBDEs in my body including the ones this bill aims to phase out.

As someone who is generally aware of chemical exposure from consumer products, I was alarmed to see my results showing that these chemicals were found in my blood. PBDEs have been linked to a wide range of health problems and it made me wonder if my exposure to chronic low levels due to consumer products could result in adverse health in the future.

As I am sure you are aware, a central tenant of health care is "put simply" first, do not harm. Allowing chemicals on the market which are correlated to adverse health effects is contrary to this principal. Reducing chemical exposures, through policy measures such as SB 295, is an important primary prevention measure to help improve the health of our state overall.

I hope that you will join me and others in supporting SB 295, an important step in reducing Alaskans exposure to toxic chemicals and creating an environment where people can be healthier.

Sincerely,

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Roxanne Chan, RN, LAc

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Roxanne Chan, Licensed Acupuncturist  
Spring Wind Acupuncture  
610 W. 2nd Ave, Suite 100  
Anchorage, AK 99501  
tel: (907) 440-8660  
fax: 1-866-747-3256  
[www.springwindacupuncture.com](http://www.springwindacupuncture.com)

**From:** Karen McLane [mailto:gusskimo@yahoo.com]

**Sent:** Saturday, March 20, 2010 9:17 AM

**To:** Senator\_Bettye\_Davis@legis.state.ak.us; Senator\_Joe\_Paskvan@legis.state.ak.us;  
Senator\_Fred\_Dyson@legis.state.ak.us; Senator\_Johnny\_Ellis@legis.state.ak.us;  
Senator\_Joe\_Thomas@legis.state.ak.us; Senator\_Bill\_Wielechowski@legis.state.ak.us

**Subject:** Senate Bill 295 support

Dear Senators,

I am writing regarding this important piece of legislation that Sen Wielechowski has submitted for approval. I live in Nome and have for most of my life. My family moved here when I was 4 years old and I graduated from Nome Beltz High School in 1984. I continued my education to the Masters level in Nursing Science and am now back in Nome teaching Community Health Aides so we can have medical services in our remotest villages. As health care providers we are acutely aware of the health hazards that toxins have in our environment and how they get there.

We have the highest rates of cancers in Alaska. I have seen many, many thyroid cancers and gastrointestinal types of cancers as well. It is my belief that toxins in our Native people's environment play a part in these high rates as does tobacco use.

SB 295 would require the phase out of polybrominated diphenyl ethers (PBDEs). PBDEs are toxic flame retardant chemicals added to plastics, foam products, and textiles to make them difficult to burn. The EPA is concerned that certain PBDEs are persistent, bioaccumulative, and toxic to both humans and the environment. The American Public Health Association and International Association of Fire Fighters have urged the phase out of PBDEs. Safer and economically viable alternatives are available and are already being used by some manufacturers of computers and other products.

Please think about the affects this particular toxin has on the health of our people and vote to phase it out of use.

Thank you for your help,

Karen McLane FNP-BC  
P.O. Box 1169  
Nome, AK 99762  
(907) 304-3768  
[gusskimo@yahoo.com](mailto:gusskimo@yahoo.com)

**From:** Simon, Clover [mailto:Clover.Simon@ppgnw.org]  
**Sent:** Friday, March 19, 2010 5:46 PM  
**To:** Senator\_Bettye\_Davis@legis.state.ak.us; Senator\_Joe\_Paskvan@legis.state.ak.us;  
Senator\_Fred\_Dyson@legis.state.ak.us; Senator\_Johnny\_Ellis@legis.state.ak.us;  
Senator\_Joe\_Thomas@legis.state.ak.us  
**Subject:** Senate Bill 295

Senators:

On behalf of Planned Parenthood of the Great Northwest, our thousands of supporters in Alaska and the more than 9,000 women and men we provide services to I am writing to urge you to support and pass SB 295. Providing Alaskans with a safe environment in which to raise their children is paramount to our mission and will help ensure that when families do plan to have children they will be the healthiest possible. With safe alternatives that still provide excellent fire protection there is no reason not to pass this important legislation. PPGNW is a proud member of the Healthy Families Alliance with many other agencies across Alaska, formed to promote fundamental reform to current chemical laws to protect children, workers, communities and the environment. As PPGNW 'goes green' in our health centers we hope that we can help promote cleaner, toxic free environments for everyone in the State. This bill is the first step.

PBDEs are toxic, endocrine-disrupting flame retardant chemicals added to plastics, foam products, and textiles. They leach from household products and we are exposed through foods, indoor air, and household dust.

A brand new study conducted by researchers at Columbia University showed that prenatal exposure to PBDEs at levels commonly found in households is associated with adverse neurodevelopmental effects in young children. The researchers found that "children with higher concentrations of PBDEs in their umbilical cord blood at birth scored lower on tests of mental and physical development between the ages of one and six. Developmental effects were particularly evident at four years of age, when verbal and full IQ scores were reduced 5.5 to 8.0 points for those with the highest prenatal exposures. "

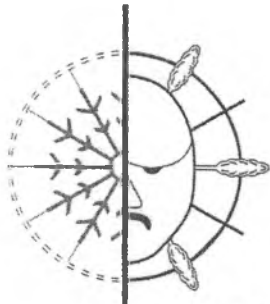
Thank you for hearing this important legislation and please do not hesitate to contact me directly if you would like further information on our position.

Clover

Clover Simon, MSW  
Planned Parenthood of the Great Northwest  
VP of Alaska  
4050 Lake Otis Pkwy Suite 205  
Anchorage AK 99508  
907.770.9705 (office)  
907.240.7449 (cell)

\*\*\*Please note the Anchorage administrative offices have moved, find our new address above\*\*\*\*

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ALASKA INTER-TRIBAL COUNCIL  
Advocating for Tribal Governments Across Alaska

445 East 5th Avenue  
Anchorage, AK 99501

907.563.9334  
907.563.9337 fax  
www.aitc.org

February 17, 2011

Senator Bill Wielechowski  
State Capitol  
Juneau, AK 99801

Dear Senator Bill Wielechowski:


The Alaska Inter-Tribal Council is writing in support of SB 27, a bill that would prohibit the manufacture and sale of toxic flame retardants in common consumer products. The Alaska Inter-Tribal Council is a tribally-governed organization advocating on behalf of 232 Federally Recognized tribal governments throughout Alaska. We recognize increasing evidence that flame retardants, such as polybrominated diphenyl ethers (PBDEs) named in SB 27, are being found in the Arctic. We are concerned about PBDEs leaving a lasting toxic legacy in people and the environment.

PBDEs are potent toxins that persist in the environment and bioaccumulate in the food chain and in human tissues. They can travel long distances and move readily between the water, soil and air. PBDEs are associated with a variety of negative toxic effects including memory impairment, learning and behavioral problems, the disruption of thyroid hormone balance and reproductive health issues. In Alaska, PBDEs have been detected in seabird eggs, marine mammals, otters, and polar bears. The presence of such chemicals in wildlife is cause of concern, not only for the survival and well-being of wildlife, but for the human consequences of bioaccumulative exposure through the food we eat.

We need to enact legislation to phase out PBDEs from consumer products. Fortunately, fire safety can be achieved without the use of toxic chemicals because there are safe, economical, and effective alternatives to PBDEs currently in widespread use.

Eliminating most uses of PBDE flame retardants is possible and an important step to protecting public health.

Thank you for sponsoring this bill,

  
David Harrison  
Executive Director  
Alaska Inter-Tribal Council

**From:** Marc! <[marcslinger@yahoo.com](mailto:marcslinger@yahoo.com)>

**Date:** February 19, 2011 12:57:20 PM AKST

**To:** "Sen. Bill Wielechowski" <[Senator\\_Bill\\_Wielechowski@legis.state.ak.us](mailto:Senator_Bill_Wielechowski@legis.state.ak.us)>

**Subject:** SB 27

Dear Representative Wielechowski,

Thank you for your support in the prevention of toxic exposures! As a member of the Anchorage Fire Department, I proudly protect and serve our community without hesitation. Thank you for doing your part and protecting not only us as public servants, but everyone in our state, current and future.

Support SB 27.

With much gratitude,  
Marc Esslinger  
Firefighter/Paramedic

Representative Lindsey Holmes  
State Capitol  
Juneau, AK 99801

February 18, 2011

Dear Representative Holmes:

I am writing to you in support of HB 63, which would ban polybrominated fire retardants in consumer products, while giving the Department of Environmental Conservation additional powers and encouraging cooperation with other states in such activities. Rather than elaborating on the rationale for this legislation, which is effectively presented in your sponsor statement, I'll describe the issue of PBDE toxicity as it relates to the burn injury community. This is in order because the brominated flame retardant (BFR) chemical industry often seeks our support when their products are challenged by such legislation

I support HB 63 in my role as a founding director (in 1985) and emeritus Board member of the Federation of Burn Foundations (FBF), and as a former major committee chair, honoree (twice) and member of the Board of Trustees of the American Burn Association (ABA).

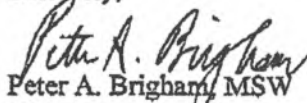
It is understandable that anyone who treats severely burned patients or works closely with both care providers and survivors, as I have for 35 years, would be inclined to support any action which might save a life or prevent such an injury. That was my own position until four years ago, when I first became aware of the increasing public health and environmental threat posed by the accumulating presence of toxic flame retardant chemicals in the environment and human tissue, —along with the lack of any data supporting their effectiveness. Many of us in the ABA share such concerns,

I have also felt a special responsibility to monitor fire and burn injury statistics, as the ABA member trusted with updating the Association's annual burn incidence fact sheet. In tracking the steady decline in fire and burn death and injury over the past 30 years, I have noted the many reasons for those trends. These include numerous safety efforts, such as smoke alarms, more public education, stronger building codes and safer designs of cigarettes, cigarette lighters and candles. Unlike PBDEs, none of these influences on fire casualties have negative side effects, and they have had a far greater positive impact than any that can be claimed for these chemicals.

Other recent changes in society which are not motivated by fire safety have also helped reduce fire casualties. These include the major decline in smoking, the transition in cooking from the stove to the microwave and our growing reliance on restaurants and fast food outlets.

For these reasons, I strongly encourage support for HB 63 in this session of your legislature.

Sincerely,

  
Peter A. Brigham, MSW  
346 Trevor Lane  
Bala Cynwyd, PA 19004

## Bill to ban PBDEs would protect Alaskans

**COMPASS: Other points of view**

By FRANK VON HIPPEL

(02/20/11 17:16:56)

The Alaska State Legislature is considering a bill backed by Sen. Bill Wielechowski and Rep. Lindsay Holmes that would ban the import of furniture and electronics containing a class of toxic flame retardants known as PBDEs (polybrominated diphenyl ethers).

PBDEs are man-made chemicals produced for the manufacture of fire-resistant products. As products break down or release PBDEs into the atmosphere, the PBDEs find their way into the environment. PBDEs are highly persistent; they may remain unchanged for many decades or break down into daughter compounds that are also toxic.

Unfortunately, they are fat soluble and bioaccumulate in the fatty tissues of exposed animals. As these animals are consumed by predators, the PBDEs biomagnify up the food web, resulting in the highest levels in the top carnivores. Many of these top carnivores, such as fish and marine mammals, are important subsistence foods in Alaska.

People are exposed to PBDEs in multiple ways, including through the ingestion of fatty foods as well as contact with household dust. PBDEs have been found in human breast milk and in the blood of mothers and their babies. A Centers for Disease Control and Prevention study found that over 93% of Americans had detectable levels of PBDEs in their bodies, some at levels that are associated with health problems in laboratory animals. PBDEs have been found to disrupt the hormone system of numerous animals and have widespread effects on neurodevelopment and reproductive development.

The laboratory animals chosen for these studies have proven to be excellent models for human medical research time and time again. The hormone system of other vertebrates is almost exactly the same as the hormone system of humans. Therefore, disruption of hormone pathways in laboratory animals indicates that PBDEs likely cause similar developmental and health effects in humans.

PBDEs interfere with thyroid hormone, which regulates many aspects of development, and male and female sex steroids, which regulate sexual development and behavior. For example, PBDE exposure may cause undescended testes in newborn boys and reduced testosterone and sperm counts in men. Some PBDEs may be carcinogens. Although we do not fully understand the mechanisms by which PBDEs disrupt multiple hormone pathways, the evidence is sufficient to take a prudent approach and ban their import to Alaska where feasible.

Washington became the first state to ban all forms of PBDEs in 2007, with key support coming from firefighter associations. Firefighters advocated against PBDEs because when products containing PBDEs burn, they release highly toxic dioxins and furans. Associations of nurses and doctors also supported the legislation.

Maine, Oregon, Vermont, Rhode Island, Illinois and Massachusetts also have banned some or all of the PBDEs, and similar legislation is under consideration in other states. Similar bans are in effect in Canada and most European nations.

The Washington law required that safer and technically feasible alternatives to PBDEs be identified before the ban would go into effect. These alternatives, which meet fire-safety standards, were identified by Washington state agencies in December 2008; the identification of alternative flame

retardants allowed restrictions on the use of PBDEs in electrical products and furniture to take effect Jan. 1, 2011.

Many companies have taken a proactive approach in phasing out PBDE use. For example, Intel, IBM and Ericsson no longer produce products with PBDEs, and Hewlett-Packard, Sony, Motorola, Panasonic, NEC, Samsung and Toshiba are all working to phase out PBDEs.

Alaskans experience unusual levels of PBDE exposure for three reasons: The Arctic is a global sink for persistent pollutants that settle out of the atmosphere in cold temperatures; Alaskans who rely on a subsistence diet eat fish and marine mammals that accumulate PBDEs because of their position at the top of the food web; and we spend most of the winter sealed in our homes, where we are exposed to household dust containing PBDEs.

Therefore, Alaska has extraordinary cause to ban the importation of products containing these chemicals. We cannot control the atmospheric deposition of PBDEs into the Arctic or their delivery by ocean currents, but we can control their importation in consumer products.

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Frank von Hippel is a professor of biological sciences at the University of Alaska Anchorage.

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175 South Franklin Street, Suite 418 +1.907.586.4050  
Juneau, AK 99801 USA www.oceana.org

April 6, 2011

Senator Lyman Hoffman  
Chairman, Senate Finance Committee  
State Capitol, Room 532  
Juneau, AK 99801

Dear Chairman Hoffman and Committee Members:

We strongly urge you to pass Senate Bill 27, an act relating to the manufacture, sale, and distribution of flame retardants and bioaccumulative toxic chemicals, out of the Senate Finance Committee. This legislation will help protect the health and safety of Alaskans and our precious marine resources by curbing the spread of Polybromodiphenyl ethers (PBDEs).

PBDEs fall into a class of pollutants known as persistent organic pollutants (POPs) that includes chemicals such as PCBs and DDT. POPs have gained widespread recognition in the past few decades for their toxicity and for the health risks they pose to both humans and wildlife. PBDEs, like many other POPs, are dangerous for three important reasons: they are able to travel long distances via atmospheric and ocean currents; once released into the environment they are extremely difficult, if not impossible, to remove; and they bioaccumulate, or increase in concentration, as they move up the food web.

Research conducted by the National Oceanic and Atmospheric Administration (NOAA) in 2009 found that PBDEs are prevalent on nearly every coast line in the United States. PBDEs have been found in sediments and soils as well fish, shellfish, seals, sea lions, whales, porpoises, polar bears, and numerous land and sea birds. (NOAA, 2009) Several studies have documented high concentrations of PBDEs in humans in the United States, and over the last three decades, those concentrations seem to be increasing. NOAA's research found that those concentrations were anywhere from 10 to 100 times higher than concentrations found in Europe and Asia. (NOAA, 2009)

In Alaska, where many of us consume large quantities of fish and shellfish, and in some regions high-fat marine mammals, we are particularly at risk for exposure not only through the household goods in our homes, but also through the foods that we eat. PBDEs are a great cause for concern for Alaskans who rely heavily on fish and other marine animals to supplement and often sustain our diets.

In order to protect the health and safety of Alaskans, as well as our valuable marine resources, the Senate Finance Committee should pass SB 27.

Sincerely,

Susan Murray  
Senior Director, Pacific  
Oceana

Reference: National Oceanic and Atmospheric Administration. 2009. An Assessment of Polybrominated Diphenyl Ethers (PBDEs) in Sediments and Bivalves of the U.S. Coastal Zone.



NOAA NATIONAL STATUS & TRENDS

# MUSSEL WATCH PROGRAM

*An Assessment of Polybrominated Diphenyl Ethers (PBDEs) in Sediments and Bivalves of the U.S. Coastal Zone*



Mention of trade names or commercial products does not constitute endorsement or recommendation for their use by the United States government.

#### Citation for this Report

Kimbrough, K. L., W. E. Johnson, G. G. Lauenstein, J. D. Christensen and D. A. Apeti. 2009. An Assessment of Polybrominated Diphenyl Ethers (PBDEs) in Sediments and Bivalves of the U.S. Coastal Zone. Silver Spring, MD. NOAA Technical Memorandum NOS NCCOS 94. 87 pp.

# **An Assessment of Polybrominated Diphenyl Ethers (PBDEs) in Sediments and Bivalves of the U.S. Coastal Zone**

K. L. Kimbrough, W. E. Johnson, G. G. Lauenstein, J. D. Christensen and D. A. Apeti.  
Center for Coastal Monitoring and Assessment  
NOAA/NOS/NCCOS  
1305 East-West Highway  
Silver Spring, Maryland 20910



## Background

NOAA's Mussel Watch Program was designed to monitor the status and trends of chemical contamination of U.S. coastal waters, including the Great Lakes. The Program began in 1986 and is one of the longest running, continuous coastal monitoring programs that is national in scope. NOAA established Mussel Watch in response to a legislative mandate under Section 202 of Title II of the Marine Protection, Research and Sanctuaries Act (MPRSA) (33 USC 1442). In addition to monitoring contaminants throughout the Nation's coastal shores, Mussel Watch stores samples in a specimen bank so that trends can be determined retrospectively for new and emerging contaminants of concern.

In recent years, flame retardant chemicals, known as polybrominated diphenyl ethers (PBDEs), have generated international concern over their widespread distribution in the environment, their potential to bioaccumulate in humans and wildlife, and concern for suspected adverse human health effects. The Mussel Watch Program, with additional funding provided by NOAA's Oceans and Human Health Initiative, conducted a study of PBDEs in bivalve tissues and sediments.

This report, which represents the first national assessment of PBDEs in the U.S. coastal zone, shows that they are widely distributed. PBDE concentrations in both sediment and bivalve tissue correlate with human population density along the U.S. coastline. The national and watershed perspectives given in this report are intended to support research, local monitoring, resource management, and policy decisions concerning these contaminants.



## **Acknowledgements**

The Mussel Watch Team would like to thank those who through their hard work made this document possible. As a result of their efforts, this report has been greatly enhanced.

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## ▼ Mussel Watch Program Background

- Approximately 300 active monitoring sites are located in the continental U.S., Alaska, Puerto Rico, and Hawaii.
- Stations are 10 to 100 km apart along the entire U.S. coastline.
- Approximately 150 contaminants are monitored in resident bivalve populations including: polycyclic aromatic hydrocarbons (69), polychlorinated biphenyls (40), organotins (4), metals and metalloids (15), and historic and contemporary use pesticides and selected transformation products (20).
- Special assessments are used to determine the environmental impacts of new contaminants, extreme events, and oil spills.

# Program Background

NOAA's Mussel Watch Program monitors the status and trends of chemical contamination of U.S. coastal waters. The Program began in 1986 and is one of the longest running, continuous coastal monitoring programs that is national in scope. The Program is based on annual collection and analysis of oysters and mussels. These bivalves are stationary organisms that filter particles from water; thus, contaminant levels in their tissue are a good indicator of local contamination. Mussel Watch data are useful for characterizing the environmental impact of new and emerging contaminants, measuring effects of extreme events (hurricanes and oil spills), and for assessing the effectiveness of legislation, management decisions, and remediation of coastal contamination. As a result of monitoring all major estuaries for chemical contamination, Mussel Watch results can be used to identify geographic areas of concern and potential human exposures to elevated levels in seafood.

NOAA established Mussel Watch in response to a legislative mandate under Section 202 of Title II of the Marine Protection, Research and Sanctuaries Act (MPRSA) (33 USC 1442), which called on the Secretary of Commerce to, among other activities, initiate a continuous monitoring program "to assess the health of the marine environment, including monitoring of contaminant levels in biota, sediment and the water column." As part of the NOAA Authorization Act of 1992, the overall approach and activities of NOAA's National Status and Trends Program (NS&T), including Mussel Watch, were codified under provisions of the National Coastal Monitoring Act (Title V of the MPRSA).

In 1986, the inaugural year of the Mussel Watch Program, 145 sites were sampled. Today, Mussel Watch is comprised of approximately 300 monitoring sites, where about 150 chemical contaminants, chosen



Zebra Mussels



Oysters

through consultation with experts and scientists from academia and government, are measured. Many of these contaminants are listed as Environmental Protection Agency (EPA) Priority Pollutants (Keith and Teillard, 1979). Legislation has been passed to regulate most of the organic contaminants analyzed by the Mussel Watch Program

## Program Goal

To support ecosystem-based management through an integrated nationwide program of environmental monitoring, assessment, and research to describe the status and trends of contaminants in our Nation's estuaries and coasts.

(<http://NSandT.noaa.gov>). The majority are toxic to aquatic organisms, and some are taken up and stored in animal tissues with the potential to be transferred through food webs to humans.

This report utilizes Mussel Watch PBDE measurements of mussels, oysters, and sediment to provide a summary of national PBDE levels, and is intended for use by resource managers, policy makers, scientists, legislators, and concerned citizens. The bivalve mollusks measured included species of the genus *Mytilus* (blue mussels), species of the genus *Dreissena* (zebra mussels), and species of the genus *Crassostrea* (oyster). Some of these species are edible, but no PBDE threshold levels for the protection of human health have been promulgated by the U.S. Food and Drug Administration. This report compares the status of PBDEs at the national level to those found locally or regionally. Comparisons can be used to determine if the

### Highlight

Many Mussel Watch sites are coincident with the 1976-1978 EPA Mussel Watch sites.

Program staff consulted with state officials, academic professionals and others when sites were established.

Some sites are located in or near NOAA-managed areas (National Estuarine Research Reserves, National Marine Sanctuaries).

Sites were selected in shellfish beds large enough for repeated sampling.

Samples are only collected from natural substrates; caged mussels are not used.

concentrations are high relative to the rest of the Nation. Site specific measurements can be found in Appendix 1. More detailed program information can be accessed at <http://NSandT.noaa.gov>.

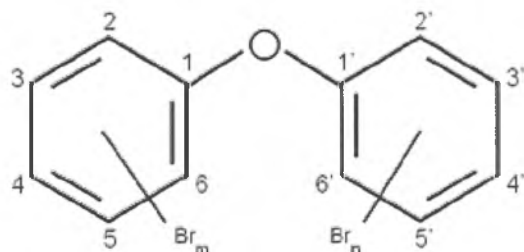




## ▼ Chemical Description

- Production of PBDEs in the U.S. began in the 1970s and peaked in the late 1990s.
- PBDEs are ubiquitous in the U.S. coastal environment.
- In the U.S., PBDE levels in humans have been rising over the past 30 years and are generally 10-100 times higher than levels measured in Europe and Asia. Current concentrations in humans may be leveling off or decreasing.

# Chemical Description



Where  $m + n = 1$  to 10 bromine atoms

**Figure 1.** Chemical structure of polybrominated diphenyl ethers.

Polybrominated diphenyl ethers are persistent man-made aromatic chemicals composed of two phenyl rings linked by an oxygen bridge (ether linkage). Bromine atoms can replace up to ten hydrogen atoms on the phenyl rings (Figure 1). Theoretically, 209 unique PBDE structures (congeners) are possible. Congeners with the same number of bromine atoms are referred to as a homologue, and thus, there are ten homologues ranging from mono- to decaBDE. For example, a PBDE with ten bromines, is called decaBDE; five bromines is a pentaBDE (Tables 1 and 2).

The chemical structure of PBDEs are similar to that of polychlorinated biphenyls (PCBs), another class of globally distributed environmental contaminants that the U.S. banned from production in 1976 (ATSDR, 2001). PBDEs have been referred to as the new PCBs. Consumer product manufacturers have begun using alternative flame retardants; but, in the short term, the current load of PBDEs in buildings, vehicles, and consumer products assures continued release and exposure for years to come.

## Manufacture and Regulation

The industrial production of brominated diphenyl ethers primarily yields a mixture of tetra, penta, hexa, hepta, octa, nona, and deca homologues in various percentages (Siddiqi et al., 2003). Three generic

commercial formulations: Penta, Octa, and DecaBDE, were produced (ATSDR, 2004) under a variety of product names (e.g., DE-71, Bromkal 70-5DE, DE-79, Bromkal 790-8DE, Saytex 102E, and Bromkal 82-0DE). Commercial formulations are mixtures of specific homologues. The relative homologue composition of these three generic formulations is shown in Table 1. The predominant congeners found in the environment are the main congeners found in commercial mixtures.

Flame retardants save lives by inhibiting ignition and subsequent burning of consumer products. Laws and regulations require that consumer products meet minimum fire safety standards. Hence, human exposure to products containing flame retardant chemicals is practically unavoidable.

Production of PBDEs in the U.S. began in the 1970s and peaked in late 1990s (Hardy, 2002a). Global demand for brominated flame retardants doubled during the 1990s (Alaee et al., 2003). In 2004, the European Union (EU) banned the use of PentaBDE and OctaBDE commercial mixtures (BSEF, 2006) and the U.S. chemical manufacturers voluntarily ceased production. Subsequently, the EU banned DecaBDE in 2008, but it continues to be produced and used in the U.S.

Commercial PentaBDE was used mainly in polyurethane foam (mattresses and padding beneath carpets and furniture). Commercial OctaBDE was predominantly used in casings for electronic products (computers, monitors, plastics). Commercial PentaBDE, OctaBDE, and DecaBDE mixtures were also used in nylon, textiles, and adhesives. Today, commercial DecaBDE is used primarily in TV casings.

# Chemical Description

**Table 1.** Percent composition of commercial PBDE flame retardant mixtures. Commercial products contain more than one homologue in a specific range (WHO, 1994).

Product	Mono	Di	Tri	Tetra	Penta	Hexa	Hepta	Octa	Nona	Deca
Penta				24-38	50-60	4-8				
Octa						10-12	44	31-35	10-11	<1
Deca									<3	>97

**Table 2.** Unique PBDE congeners measured in this Mussel Watch Program assessment.

Mono	Di	Tri	Tetra	Penta	Hexa	Hepta	Octa	Nona	Deca
BDE-1	BDE-7	BDE-17	BDE-47	BDE-85	BDE-138	BDE-181	Not measured for this study		
BDE-2	BDE-8	BDE-25	BDE-49	BDE-99	BDE-153	BDE-183			
BDE-3	BDE-10	BDE-28	BDE-66	BDE-100	BDE-154	BDE-190			
	BDE-11	BDE-30	BDE-75	BDE-116	BDE-155				
	BDE-12	BDE-32	BDE-77	BDE-118	BDE-166				
	BDE-13	BDE-33		BDE-119					
	BDE-15	BDE-35		BDE-126					
		BDE-37							

## Exposure and Toxicity

Human exposure to PBDEs occurs through inhalation of contaminated household (Jones-Otazo et al., 2005) and workplace dust (Julander et al., 2005), and eating contaminated food (Schechter et al., 2006; Hale et al., 2001; Hayward et al., 2007).

Women in the U.S. were found to have some of the highest levels of PBDEs in breast milk (Schechter et al., 2003; Norén and Meronyté, 2000), blood (Schechter et al., 2005; Sjödin et al., 2008), and body fat (Johnson-Restrepo et al., 2005a; She et al., 2002). Levels in the U.S. have been rising over the past 30 years, but appear to be leveling off or decreasing (Sjödin et al., 2008). Generally, in the U.S., levels in human samples are 10-100 fold higher than levels measured in Europe, Asia, and New Zealand. Recent evidence suggests that PBDEs can be transferred from mother to fetus and from breast milk to infants (Hooper et al., 2000).

Occupational exposure may be important for some workers. The highest reported concentrations of PBDEs in human blood serum were measured in workers at an electronic waste dismantling facility in China (Qu et al., 2007).

There is a growing body of research describing the toxicology of PBDEs in animals and humans. Thorough reviews on the subject include Darnerud et al., 2001; Hardy, 2002b; and Darnerud, 2003. Toxicological studies in animals indicate that liver, thyroid, and neurobehavioral development may be impaired by these contaminants. The human health effects from exposure to PBDEs are not well documented; however, based on the structural similarity of PBDEs to PCBs, there is reason for concern. The most sensitive populations are likely to be pregnant women, developing fetuses, and infants (McDonald, 2002). Human prenatal and neonatal exposure to PBDEs is being carefully studied

and a recent report suggests an association of reduced thyroxine levels with prenatal exposure to PBDEs and PCBs (Herbstman et al., 2008).

### Environmental Fate and Transport

PBDEs are widely distributed in marine sediments (Wurl and Obbard, 2005; Oros et al., 2005; Allchin et al., 1999) and biota (Environment Canada, 2006; Hites, 2004; de Wit et al., 2004). The major sources of PBDEs to the environment are homes and household dust (Stapleton et al., 2005; Jones-Otazo et al., 2005; Butt et al., 2004), releases during the manufacturing and use of commercial products, and releases during the recycling and disposal of products containing PBDEs. Subsequently, PBDEs may be distributed throughout the environment by atmospheric transport (Stranderg et al., 2001), runoff, industrial point sources, and sewage outflows (Litten et al., 2003). PBDEs are detected in remote places, such as the Arctic (Ikonomou et al., 2002; de Wit et al., 2004), representing further evidence of atmospheric transport and deposition. Other diffuse PBDE pathways include leaching from aging consumer products, incineration of municipal waste, land application of sewage sludge as biosolids, industrial discharge, and accidental spills (EPA, 2008; Hale et al., 2001; ATSDR, 2004).

Relatively high concentrations of PBDEs have been detected in sediments and biota in areas close to industrial sources (Shen et al., 2006; Liu et al., 2005). At high temperatures, PBDEs may form a volatile mixture of polybrominated dibenzodioxins (PBDD) and polybrominated dibenzofurans (PBDF), making the incineration of municipal waste containing plastic and upholstery a source of atmospheric PBDEs, dioxins, and furans (ATSDR, 2004).

PBDEs have low vapor pressures, very low water solubility, and high octanol-water partition coefficients ( $\log K_{ow}$ ) values (Environment Canada, 2006); therefore, they behave like many other persistent organic contaminants that accumulate in biota and sediment. In the environment they are more likely to be associated with particles than dissolved in the water.

In addition to being found in fish (Johnson and Olson, 2001; Hites et al., 2004) and shellfish (Hoenicke et al., 2007; Booij et al., 2002; Oros et al., 2005), PBDEs have been measured in foxes, grizzly bears (Christensen et al., 2005), seals (Ikonomou et al., 2008; Ikonomou et al., 2002), sea lions (Stapleton et al., 2006), polar bears (Verreault et al., 2005; Kannan et al., 2005), porpoises, whales (Weijs et al., 2009; Ross, 2006), land and sea birds (Lindberg et al., 2004; McKinney et al., 2006; Voorspoels et al., 2006; Jaspers et al., 2005; Verreault et al., 2005; Bustnes et al., 2008), and bird eggs (Herzke et al., 2005; Braune et al., 2007).

Since the 1970s, levels of PBDEs in sediments and wildlife, including aquatic species, have increased substantially (Ikonomou et al., 2002). Studies of PBDEs in marine foodwebs (Wan et al., 2008; Xia et al., 2008; Bragigand et al., 2006; Johnston-Restrepo et al., 2005a; Haglund et al., 1997) provide evidence of biomagnification. PBDEs in the environment may be transformed by debromination processes (removal of bromine atoms), including photo-transformation during exposure to sunlight (Stapleton and Dodder, 2008).