

# Mercury Reduction Activities in Washington and National Hot Topics

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# Presentation Outline

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- ❑ Overview of Ecology/Health Mercury Chemical Action Plan
- ❑ Overview of Mercury Education & Reduction Act (Ch. 70.95M RCW)
- ❑ Upcoming Ecology Mercury Reduction Activities
- ❑ Why is this important?
- ❑ National Hot Topics

# Overview of Ecology/Health Mercury Chemical Action Plan

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# Elements of the Mercury Chemical Action Plan

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- ❑ Overview of what we know about human-caused sources of mercury in Washington
- ❑ List possible mercury reduction options with recommendations
- ❑ Identify research needs
- ❑ Reduction actions will be staggered based on
  - Resources
  - Knowledge
  - Availability of non-mercury alternatives

# Estimated Hg in Products Disposed of in WA Annually

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Mercury Products	Estimated lbs. of Hg disposed annually
Fluorescent Lamps	437 - 505
Thermostats	412
Amalgam from Dental Offices	>404
Auto Light Switches	253
Button Cell Batteries	88
Dental Amalgam in Feces & Urine	61
Household Fever Thermometers	11 - 300
<b>Total</b>	<b>1,666 – 2,023</b>

# Estimated Annual Release from Point and Area Sources of Hg in WA

Source	Est. Annual Release (lbs.)	Receiving medium
Distillate Fuel #2	733	Air
Coal-fired power plants	436	Air
Manufacturing	337	Air, Land, Water
POTWs	331	Land
Oil Refineries	125	Air, land, Water
Medical Waste Autoclaves	106	Air, Land
Crematoria	57	Air
Sewage Sludge Incinerators	32	Air
Residual Fuel	29	Air
Municipal Waste Incinerators	18	Air
Gold Mining	0-777	Air, Land, Water
<b>TOTAL</b>	<b>2,180 - 2,957</b>	

# Mercury Chemical Action Plan

## Conclusions

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- ❑ Significant amount of mercury released into WA's environment from disposal of common consumer products (i.e. fluorescent light tubes, thermometers, thermostats).
- ❑ Many WA residents are not aware of products that contain mercury, and are likely to dispose of certain mercury containing products with their garbage.
- ❑ There is a need to educate WA residents about mercury in products and a need to provide clear disposal/recycling/and mercury management options
- ❑ Mercury pollution is a global environmental problem (i.e. many fish consumption advisories, including some here in WA)

# Key Recommendations in MCAP for Implementation in 03-05

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- ❑ **Develop MOU with WA State Dental Association to encourage installation of amalgam separators and development of BMPs. Use existing rules after two year timeline.**
- ❑ **Adopt Universal Waste Rule for largest feasible number of mercury-added products**
- ❑ **Work with medical waste facilities and WSHA on mercury management and disposal practices.**
- ❑ **Work with GA on ensuring state agency compliance with Universal Waste Rule**
- ❑ **Work with Legislature and stakeholders on eliminating non-essential uses of mercury and improvements on recycling remaining mercury**

# 2003 Legislation

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- In April 2003, Legislature passed the Mercury Reduction and Education Act (Chapter 70.95M RCW)....,
- but provided no funding to implement the Mercury Chemical Action Plan or do other PBT related activities for the 03-05 Biennium

# Ecology/WSDA Memorandum of Understanding

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- MOU adopted 8/1/03 by Ecology and WSDA
  - Voluntary compliance program until August 2005
  - Recommended Best management Practices, including installing separators by August, 2005  
(Amalgam separators required in King Co – METRO)
  - Provide information on updated BMP's for dental offices (presentations, website, mailing poster)
  - Ecology & WSDA will cooperate to monitor voluntary compliance

# Ecology-WSDA BMPs

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- **By July 31, 2005, install, use and maintain ISO 11143 certified amalgam separators**
  - **Installation applies to all offices regardless of sewer disposal types (sewer or septic)**
  - **Does not apply to practices which are restricted exclusively to these dental specialties:**
    - **Orthodontics and Dentofacial Orthopedics**
    - **Oral and Maxillofacial Surgery**
    - **Oral Medicine and Pathology**
    - **Oral and Maxillofacial Radiology**
    - **Periodontics**
    - **Endodontics and Prosthodontics – if amalgam fillings placed/removed < 10 days/year**

# Ecology-WSDA BMPs

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- ❑ **Collect all amalgam waste (both scrap and contact amalgam) in separate containers. No dangerous waste or amalgam is to be placed in the infectious waste "red bag". This would include extracted teeth with amalgam.**
  - **As ADA recommends, used precapsulated alloys and recycle the used capsules.**
- ❑ **Properly manage and dispose of all other dangerous waste streams generated by the dental office (e.g., x-ray wastes, or lead foils/aprons).**
- ❑ **Properly dispose of all scrap amalgam waste from traps, filters and separators with a licensed treatment, storage, disposal or recycling facility.**
- ❑ **Keep amalgam out of sinks and never rinse amalgam waste down the drain.**

# Ecology-WSDA BMPs

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- ❑ **Consider keeping different types (e.g. contact and non-contact) of amalgam wastes in separate containers – talk to your recycler about any advantages in doing so.**
- ❑ **Clean or replace chair-side traps on a regular schedule and properly dispose of amalgam waste.**
- ❑ **Clean vacuum pump filters regularly, according to the manufacturer's recommendations.**
- ❑ **Maintain all disposal records on site for three (3) years.**

# Overview of Mercury Education & Reduction Act (Ch. 70.95M RCW)

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# Mercury Education & Reduction Act

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- **Chapter 70.95M RCW – Hg Education & Reduction Act**
  - **Requires “Contains Hg” label on fluorescent lamps effective Jan '04**
  - **Bans sale of Hg containing novelty products, thermometers, manometers, thermostats, vehicle light switch Jan '06**
  - **Bans use of bulk elemental Hg and Hg compounds in K-12 schools by Jan '06**
  - **Directs Department of Health to educate schools, local governments, businesses & public on proper disposal methods for Hg-added products**
  - **Directs Ecology to join “multistate clearinghouse”**
  - **Directs Ecology to petition EPA requesting development of a national mercury repository site**

# Critical Deadlines:

## Mercury Education and Reduction Act

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- 1/1/04 All fluorescent lamps and packaging made after 11-30-03 must be labeled with the HG symbol
- 1/1/05 Washington State government (GA) must begin to place priority on purchasing equipment and products with lower mercury content
- 1/1/06 No sale of these mercury containing items:  
Thermometers  
Manometers  
Residential and commercial thermostats  
Novelty items containing mercury  
Newly manufactured cars with Hg switch
- 1/1/06 K-12 Schools can no longer purchase and must properly dispose of bulk elemental mercury

# Role of Department of Ecology in Implementing Ch 70.95 RCW

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- Assisting Department of Health in developing education/outreach strategy
- Fluorescent lamp labeling requirement effective 01/01/04 – technical assistance to lamp manufacturers
- Joined Interstate Mercury Education and reduction Clearinghouse (IMERC)
- To send petition letter to EPA regarding need for national mercury repository facility

# Role of Department of Health in Implementing Ch. 70.95M RCW

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- Develop an Education Plan for:
  - Businesses
  - Local Government
  - Schools, and the
  - Public.
- Form working groups to advise on the plan elements for each sector
- Begin implementing the Education Plan

# What else is Dept. of Health doing to protect the Public's Health?

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- Fish advisories
  - Focus of OEHA
- Tuna sampling
  - Environmental health tracking grant
  - Light tuna is identified as much lower in mercury than albacore
- Asian and Pacific Islander study
  - EPA grant to study high-end fish consumers
  - Blood and hair analysis
- Mercury labeling
  - Fluorescent bulbs must be labeled with Hg
  - No elemental mercury in schools > 6-06

# New Developments at Department of Health

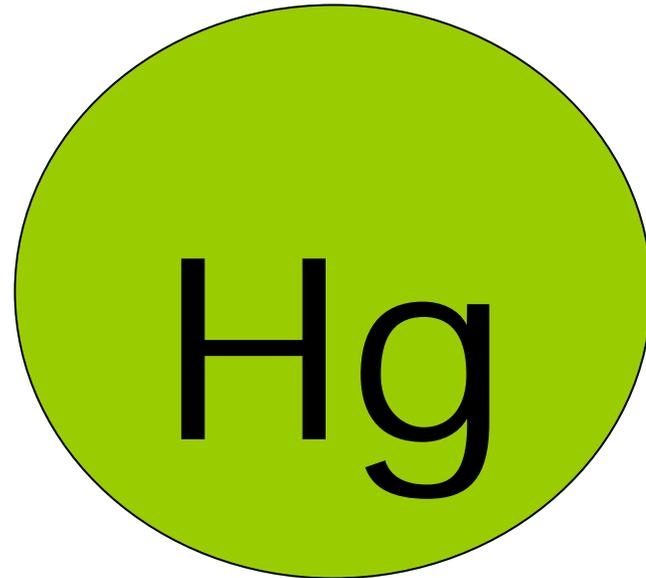
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- Mercury Education and Reduction Act
  - Fact Sheet
- Ongoing research on dental amalgams
  - Fact Sheet
- National Fish Advisory Meeting
  - WA tuna data presented to national leaders

# Labeling of Mercury Items

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All fluorescent bulbs made after 11-30-03 must have the Hg label attached.



# What's Next for Department of Health?

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- **Education**
  - Development of a Mercury Education Plan for businesses, schools, local government and the public
- **Evaluation**
  - Efforts underway to evaluate the effectiveness of fish advisories
  - Evaluate effectiveness of mercury reduction efforts
  - Harvard assessment of EPA mercury advisory
- **Assessment and Analysis**
  - More work required to better define the risk/benefit trade-off
- **Collaborations**
  - With business, local government, schools

# However in 2004...

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- Governor signed an Executive Order,
- and State Legislature provided funding for remainder of 03-05 Biennium

# Upcoming Ecology Mercury Reduction Activities

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# Executive Order #04-01

## Persistent Toxic Chemicals

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- Ecology (with involvement of DOH) shall:
  - Develop a chemical action plan for toxic flame retardants (PBDE's) and recommend actions by December 1, 2004.
  - Begin implementing the plan no later than July 1, 2005.
- Fully implement the mercury chemical action plan to the extent that funding is provided by the legislature.
- Establish through rule specific criteria to identify PBTs, and a clear process for developing chemical action plans to address those impacts.

# Starting Immediately

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\$100K Governor's Emergency Fund

**\$50 K for PBDE CAP Start**

**\$50 K for Rule Start**

**(provides funding through 6/30/04)**

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# Supplemental Budget for PBT Strategy

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"\$325,000 of STCA provided to:

- Implement the mercury chemical action plan (**\$159 K**)
  - \$84K for Hospital and Auto recyclers MOU
  - \$75K for fluorescent lamp recycling
- Establish specific criteria by which chemicals may be included on a PBT List develop a list of PBTs, and establish criteria for selecting chemicals for chemical action plans (**\$83 K**) , *and*
- Develop PBDE chemical action plan (**\$83 K**).
  
- **IN ADDITION - \$250K of LTCA \$\$ in Govs. Capitol Budget for local government CPG Grants for lamp collection/recycling.**

# Mercury Activities planned for July 2004 – June 2005

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- ❑ Implement Ecology/WSDA MOU to encourage installation of amalgam separators and development of BMPs. Use existing rules after two year timeline.
- ❑ Increase fluorescent lamp recycling rate from current 20% to 40% by 2005. (\$75K)
- ❑ Work with WA State Hospital Association on mercury management and disposal practices. (\$42K)
- ❑ Work with auto recyclers on implementing mercury-containing product removal practices. (\$42K)

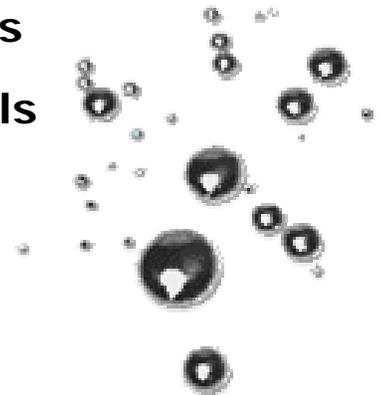
# Why is this important?

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# Some Facts about Mercury

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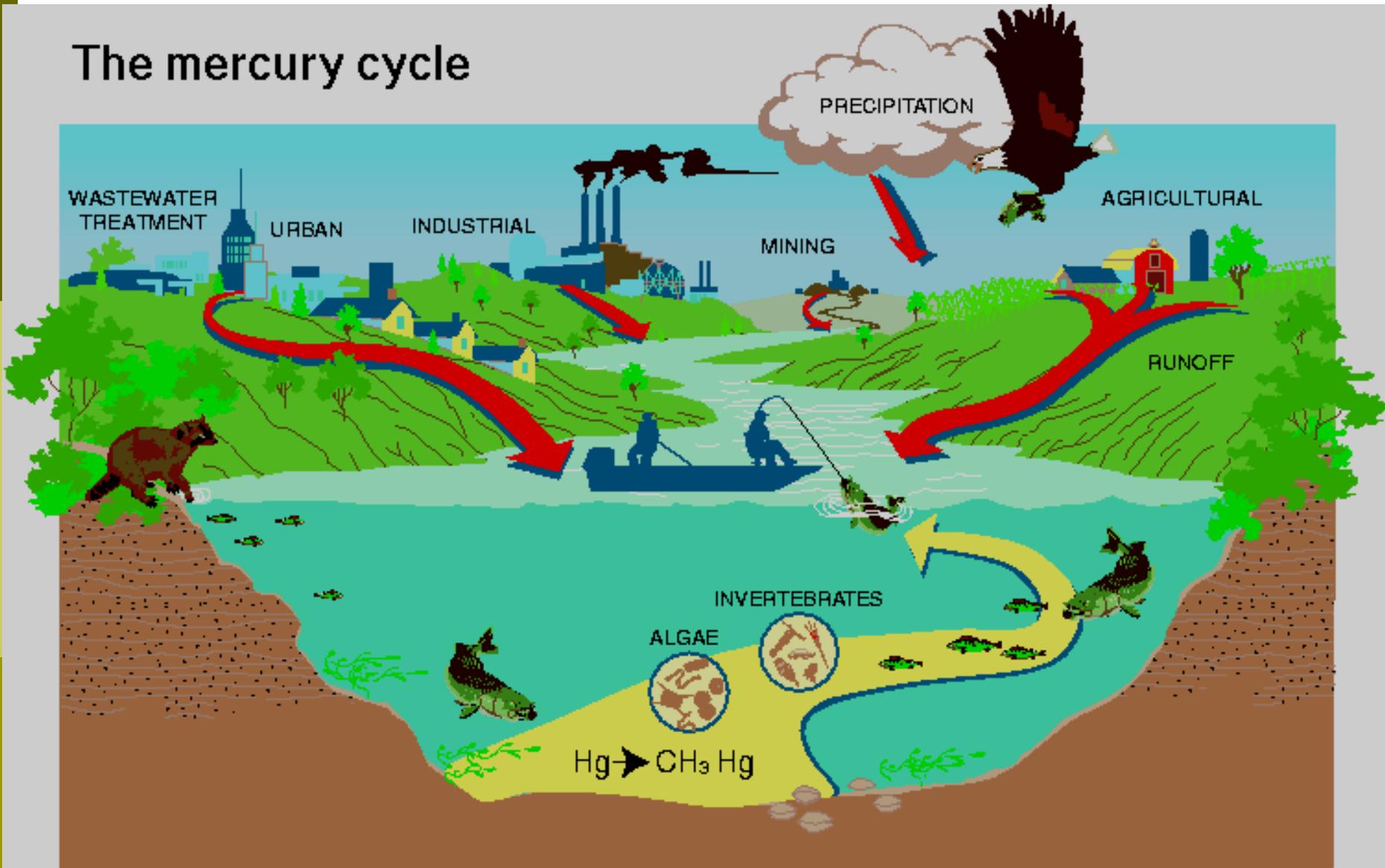
- ❑ Naturally occurring element (Hg) in the earth
- ❑ The amount of mercury entering the environment today due to coal/diesel combustion, industrial uses, consumer products, and medical/dental uses is 4 times higher than a century ago
- ❑ Mercury is a potent neurotoxicant that can damage liver, central nervous system, kidneys, even at low levels
- ❑ Methyl-mercury crosses the “blood-brain barrier” in humans
- ❑ Majority of mercury pollution globally and locally is from human-caused sources – NOT natural sources
- ❑ The Centers for Disease Control and Prevention has estimated that one in eight women have mercury concentration in their bodies that exceeds safety levels
- ❑ And CDC recently said that of some four million babies born a year, 630,000 — double the previous estimate — might have been exposed as fetuses to unsafe levels of mercury.



# MERCURY IN THE ENVIRONMENT

- **Forms--Three different forms: Elemental (metallic), inorganic (mercuric salts), and organic.**
- **Natural Source: cinnabar ore.**  
**Released through weathering and volcanic activity.**
- **Human Activities as a source:**  
**Careless use, disposal of elemental Hg**  
**Solid waste incineration/disposal.**  
**Fossil fuel combustion.**  
**Mining and smelting.**  
**Industrial processes such as chlor-alkali production.**  
**Use of fertilizers and fungicides.**

# The mercury cycle



(Illustration by Connie J. Dean, U.S. Geological Survey)

# Mercury Chemistry

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- ❑ Elemental Hg (as found in thermometers) is poorly absorbed from the gut (0.01%).
- ❑ Elemental Hg can vaporize and be inhaled.
- ❑ Elemental & inorganic mercury can be transformed into methylmercury ( $\text{CH}_3\text{Hg}$ ) by bacteria.
- ❑ Methylmercury is almost completely absorbed by the gut.

# Elemental Mercury Toxicity

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- ❑ **Metallic mercury is rapidly absorbed by lung; 80% retained; very little absorbed by gut**
- ❑ **Passes blood brain barrier (conjugated to L-cysteine);**
- ❑ **Toxic to the lung, brain, kidney at high levels**
- ❑ **Inflammation of gums, oral mucosa; tremor, erethrism (memory loss, emotional lability, depression, insomnia, shyness, changes in mood)**

# Methylmercury

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- ❑ Quickly enters the aquatic food chain.
- ❑ In fish ~ 99% of mercury is CH<sub>3</sub>Hg.
- ❑ Methylmercury is found primarily in fish muscle bound to protein.
- ❑ Skinning and trimming the fish does not reduce mercury concentration, nor is it removed by the cooking process.
- ❑ Methylmercury levels in predator fish are 7 million times higher than surrounding water.

# National Hot Topics

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- EPA Rule regarding Hg emissions from coal power plants
- Maine Hg auto switch removal law upheld by federal judge
- EPA/FDA issues new guidelines regarding Hg in fish

# EPA Rule regarding Hg emissions from coal power plants

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- ❑ In December 2003, EPA proposes draft Hg reduction regulation with a 2018 target for reducing those emissions by 70 percent.
- ❑ The proposed rule would allow power plants to buy and sell among themselves, starting in 2010.
- ❑ Clean Air Act currently requires all coal-burning power plants to install state-of-the-art pollution controls, which are projected to reduce annual mercury emissions by 90 percent over the next five years.

# Maine Hg auto switch removal law upheld by federal judge

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- ❑ In 2003 Maine passed law requiring auto manufacturers to reimburse auto recyclers for removal of Hg switches.
- ❑ Alliance of Auto Manufacturers (BMW, DaimlerChrysler, Ford, GM, Mazda, Mitsubishi, Porsche, Toyota, VW) sued in Federal Court.
- ❑ Federal judge upheld Maine's law.

# EPA/FDA issues new guidelines regarding Hg in fish

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- ❑ On March 19, 2004 a joint FDA and EPA guidance directs women of childbearing age to avoid **shark, swordfish, king mackerel and tilefish** because of high mercury levels
- ❑ Low-mercury fish that can be eaten more frequently -- shrimp, canned "light" tuna, salmon, pollock and catfish.
- ❑ The advisory recommended eating as much as 12 ounces (or two average meals) of these fish per week.
- ❑ *This new advisory did not reflect some of the expert panels view that children and childbearing women should not eat albacore tuna, and should eat less light tuna than the advisory recommends.*

# Additional Information

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## Department of Ecology:

Ecology's PBT/Mercury Web Page:  
[www.mercurymess.org](http://www.mercurymess.org)

Or contact

Mike Gallagher P: 360-407-6868  
E: [mgal461@ecy.wa.gov](mailto:mgal461@ecy.wa.gov)

## Department Of Health:

Health's Mercury Web Page:  
[www.doh.wa.gov/ehp/oehas/EHA\\_fish\\_adv.htm](http://www.doh.wa.gov/ehp/oehas/EHA_fish_adv.htm)

Or contact

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