

## Wis Wildlife Fed. (Geo. Meyer)

- WWF has been split on the issue -
- Suggest to advance the bill but don't suspend it.

## Mercury: WWF

- Support rules from DVR.
  - Sporting groups support
  - Horse Shows supports to Resort people
  - Fish advisories is a Big Deal!
  - DVR did substantially compromise

Reduction not 80%. reduction from out of  
stock. It's 80%. " out of the coal.

EASY  
TO  
MEET

→ (65-65%) is the actual reduction out of  
the stock  
N. Carolina stages

**Kedzie**

8/11/03

Bob  
Clark  
Mercury  
Guns

05-

JENNY NOONAN - EPA

CALLED TO DISCUSS

QUESTIONS YOU RAISED

IN DC REGARDING

MERCURY. YOU TALKED

TO ROBERT CUNNINGHAM

919-541-0193

STATE OF WISCONSIN

To Neal

Date 8/12 Time 9:34 am

WHILE YOU WERE OUT

M Chuck Quirnbach  
of WI Public Radio  
Phone 414-227-2040

Telephoned	<input checked="" type="checkbox"/>	Please Call	<input checked="" type="checkbox"/>
Called to See You	<input type="checkbox"/>	Rush	<input type="checkbox"/>
Returned Your Call	<input type="checkbox"/>	Will Call Again	<input type="checkbox"/>

Message would like to talk  
to you briefly regarding  
the mercury rule.



Party Receiving Call

Bob Wayland - Mercury Emission

2 programs

Clean Skies (not)

2 phase cap program

I do too

Musell yr. 2015 = 15 ton by 2 reduction of 1999 level

Dec. 15<sup>th</sup>

- EPA prefers Clean Skies 112 F

- PM Transport rule ~~MACT~~ unit to late  
MACT October

Syrs to make use (2010)

Dec. 15<sup>th</sup>

signed or  
in violation of  
ct. order

Feb/March

Compliance period

## **Recommendation and Rationale on Legislative Modifications**

At the October 2003 NRB meeting in Baraboo an informational presentation was made regarding three areas of concern that the Senate Environment and Natural Resource Committee identified in the mercury rule adopted in June 2003. The presentation was to provide a foundation for the NRB to consider modifications to the rule to address these concerns. The staff recommendation presented for consideration at the October meeting was as follows:

- Authorize the Secretary to send a letter to the Chairs of the Assembly Natural Resources Committee and the Senate Environment and Natural Resources Committee that addresses rule modifications in three areas of concern expressed by the Senate committee.
- Approve modifications to the provisions in the rules that address Periodic Evaluation and Reconciliation Reports to the NRB – *The potential for duplication when a federal emission standard is implemented.*
- Decline to consider modifications in two other areas of concern identified by the Senate committee – *The ability of utilities to achieve an 80 percent reduction by 2015 with current available technology and The exclusion of a comprehensive emission credits and trading program.*

### ***The ability of utilities to achieve an 80 percent reduction by 2015 with current available technology.***

ISSUE: Wisconsin utilities oppose an 80% reduction because they believe that technology is not available now to reach that reduction level. Industry opposes any commitment that isn't a federal requirement.

NRB RECOMMENDATION: Do not change the 80% reduction requirement.

### **RATIONALE:**

- The adopted rules establish a final 80% reduction requirement by January 1, 2015, based on a technical analysis that demonstrates that the application of the most promising mercury control technology for Wisconsin's major utilities can achieve an overall 88% reduction from a baseline based on mercury content in the coal.
- Information from the Electric Power Research Institute (EPRI), the most prominent research institute for the nation's electric utilities, served as the basis for our technology assessment and cost analysis.
- USEPA and DOE have a major development program underway with the goal of having cost-effective mercury control technology available for electric utility boilers that can achieve 90% reductions by 2010.
- At their Pleasant Prairie Plant, WE Energies pilot tested activated carbon injection with success. They are now initiating a full-scale test of the surrogate technology we assumed in our rule (activated carbon injection with dedicated fabric filter) at their Presque Isle Plant in Michigan.
- This level of mercury emission reductions in the rule is designed to be met without requiring fuel switching to natural gas, however fuel switching is a compliance choice.
- The schedule for achieving mercury reductions anticipates and minimizes threats to electric reliability.
- The periodic rule evaluations will adjust the required reduction levels if necessary. There are three evaluations that are scheduled at critical points in the compliance schedule.

### ***The exclusion of a comprehensive emission credits and trading program.***

ISSUE: Trading opportunities were scaled back in the rule adopted in June 2003. The proposed rule allowed emission credits to be created from all industrial sources and from the collection of mercury

- State statutes do not allow us to have a state standard more restrictive.
- There is simply no possibility of duplication.

**NR 446.12 Periodic evaluation and reconciliation reports.** (1) The department staff shall submit reports to the natural resources board by January 1, 2006, by January 1, 2009 and by January 1, 2013. Each report shall include:

(a) An evaluation of the scientific and technology developments in relation to the control or reduction of mercury emissions.

(b) An evaluation of whether the requirements of s. NR 446.06 are achievable, given the scientific and technological developments.

(c) Recommendations for revisions to this subchapter or other actions based on the scientific and technological developments.

(d) An assessment of the impact of the compliance alternatives on mercury concentrations in locally affected water bodies.

(2) In addition to the reports required under sub. (1), the department staff shall report to the natural resources board within 6 3 months of the date of the proposal or the promulgation of a federal regulation under section 112 of the Act or the enactment of a federal law that has mercury reduction requirements for mercury emission sources affected by this subchapter. The report shall include:

(a) A comparison of the requirements. If the EPA administrator proposes or promulgates a federal regulation under section 112 of the Act, the comparison shall include an analysis of whether this subchapter should be submitted for EPA approval as a substitute for the section 112 regulation.

(b) Recommendations for revisions to this subchapter or other actions to reconcile the requirements.

(3) The natural resources board shall review these reports and, if they include recommendations for rule revisions or other actions, determine whether the department should proceed with actions based on the recommendations.

## **Background on Mercury Rule Development**

**Citizen Petition** - On May 18, 2000, the Department received a citizen petition to adopt administrative rules requiring reductions in mercury air emissions from the largest sources of emissions in the state. The petition was signed by a broad spectrum of stakeholders including lake associations, fishing groups, public interest groups, physicians, environmental organizations, and legislators of both political parties. In September 2000, the petition was amended to request a change from 90% mercury reduction by the year 2015 to a 90% reduction by the year 2010. In December 2000 the Natural Resources Board granted the petition through a resolution that authorized the development of proposed rules.

**Advisory Groups** - In June 2001, the Natural Resources Board authorized public hearings for proposed rules. Department staff conducted five public hearings in the fall of 2001. The Department received over 2,000 letters in support of the rule and over 60 detailed written responses were submitted during the comment period. After the comment period a Citizen Advisory Committee and Technical Advisory Group were formed to review significant issues and attempt to develop a consensus resolution, and if that was not possible, a list of options to resolve these issues. These advisory groups met for nine months in facilitated meetings and completed a report in September 2002. All principal stakeholders participated in these two groups.

**Significant Issues** - The issues of significant identified by stakeholders and discussed extensively in the advisory groups included:

1. The schedule and level of mercury emission reductions for major utilities.
2. The potential for the proposal to affect electric reliability.
3. Industry's responsibility to limit mercury air emissions.
4. The environmental benefit of reductions.
5. The interaction of the proposed rule with potential federal requirements yet to be enacted.

**Adoption** - The Department made significant changes to the proposed rule to address most of the significant issues (see the attached table). In June 2003, the Natural Resources Board unanimously adopted the proposed mercury reduction rule that included a mercury reduction schedule of 40% by 2010 and 80% by 2015.

**Mercury Control Technology** - Mercury control technology for an electric utility boilers is on the threshold of commercial application. USEPA and DOE are conducting a major development program with the goal of having cost-effective mercury control technology for electric utility boilers that can achieve 90% reductions by 2010. The Electric Power Research Institute (EPRI) is a partner in the USEPA and DOE efforts. Preliminary results from this development program confirm that the "surrogate" technology evaluated by the Department in the development of the mercury rule could effectively provide 90% or greater reduction for all coal types. WE Energies has initiated a full-scale test of the surrogate technology (activated carbon injection with dedicated fabric filter) at their Presque Isle Plant in Michigan. This is a five-year program that will be considered in the periodic evaluations established in the rules to look at the reduction requirements and other provisions in the rules. There are three evaluations scheduled - January 2006, January 2009, and January 2013.

**Controversial Areas Addressed in the Adopted Rules**

	<b><i>Proposed Rule – June 2001</i></b>	<b><i>Adopted Rule June – 2003</i></b>
<b>Mercury Emission Reductions</b>	Major utilities must reduce their mercury air emissions in three steps over a fifteen -year period – 30% five years, 50% in ten years and 90% in fifteen years.	Reduction requirements modified to a two-step mercury reduction requirement over a twelve-year period with an initial reduction at seven years of 40% and a final reduction at twelve years of 80% based on mercury content of the fuel.
<b>Baseline Determination</b>	Baseline emissions determined by a procedure that includes evaluation of historical mercury air emissions. This requirement affects major utilities (>100 pounds per year) and other significant sources (>10 pounds per year).	Only major utilities are required to set baseline emissions. Procedure simplified and supports methodology favored by utilities – fuel mercury content and recent coal use are the basis for baseline determination. The need for historical data is minimized and this method avoids the issues of determining current equipment performance and lack of credit for recent changes at a facility.
<b>Emission Cap</b>	Emission cap is placed on sources with mercury emissions greater than 10 pounds per year.	Only major utilities will have a mercury emission cap.
<b>Trading</b>	Emission reduction credits can be used by major utilities to meet reduction requirements in the rules. These are credits that are created by pollution reduction projects initiated by industrial and commercial sources or by mercury containing product collection program.	Trading provisions limited to utility sector only. Additional analyses have determined that you cannot accurately measure the amount of credit from a product collection program or reduction at a source of process emissions.  Additionally, the amount of credit that was initially felt to be available from industrial combustion sources is much less than anticipated. One source, Vulcan, may be in a position to set the market price.
<b>Offsets</b>	New utility sources that have mercury emissions greater than 10 pounds per year are required to obtain offsets at a ratio of 1.5 to 1.0.	Offset requirement eliminated. New sources with mercury emissions greater than 10 pounds must apply control technology.



## Periodic Evaluation and Potential Rule Adjustment

Required at three times before the final mercury reduction requirement. Evaluation reports to the NRB are required January 1, 2006, January 1, 2009 and January 1, 2013. We plan on convening a stakeholder advisory panel to participate in each evaluation.

Each evaluation will focus on the effectiveness and costs of mercury control technology for existing coal-fired utility boilers. Recommendations for rule changes could result. The mercury reduction requirement could be adjusted, downward if control performance doesn't meet expectation and upward if warranted by cost and performance.

## Reconciliation Reports

Report to the NRB to ensure that duplication does not occur between state and federal requirements. These reports would be performed within 3 months of proposal or promulgation of a federal regulation.

## Compliance Flexibility

### 1. *Setting the Starting Point for Reductions*

- Alternate years may be used to establish a baseline if the years of 2002, 2003 and 2004 are not determined to be representative years of operation.
- No penalty for actions already taken to reduce mercury emissions in establishing a baseline (e.g. WP&L Rock River conversion to natural gas).

### 2. *Meeting Emission Limits*

- Reduction requirements can be averaged throughout the entire system.
- Utilities can choose their compliance approach (i.e. technology, retirement, fuel change, etc.).
- Actions taken to reduce mercury emissions from the baseline count toward meeting the 2010 and 2015 reduction requirements (e.g. repowering WE Port Washington).

### 3. *Trading*

- Excess emission reductions can be traded to achieve annual compliance.

### 4. *Multi-pollutant Control* *Don't like this approach*

- Pursuing a multi-pollutant approach may allow for relief from the 40% reduction requirement.

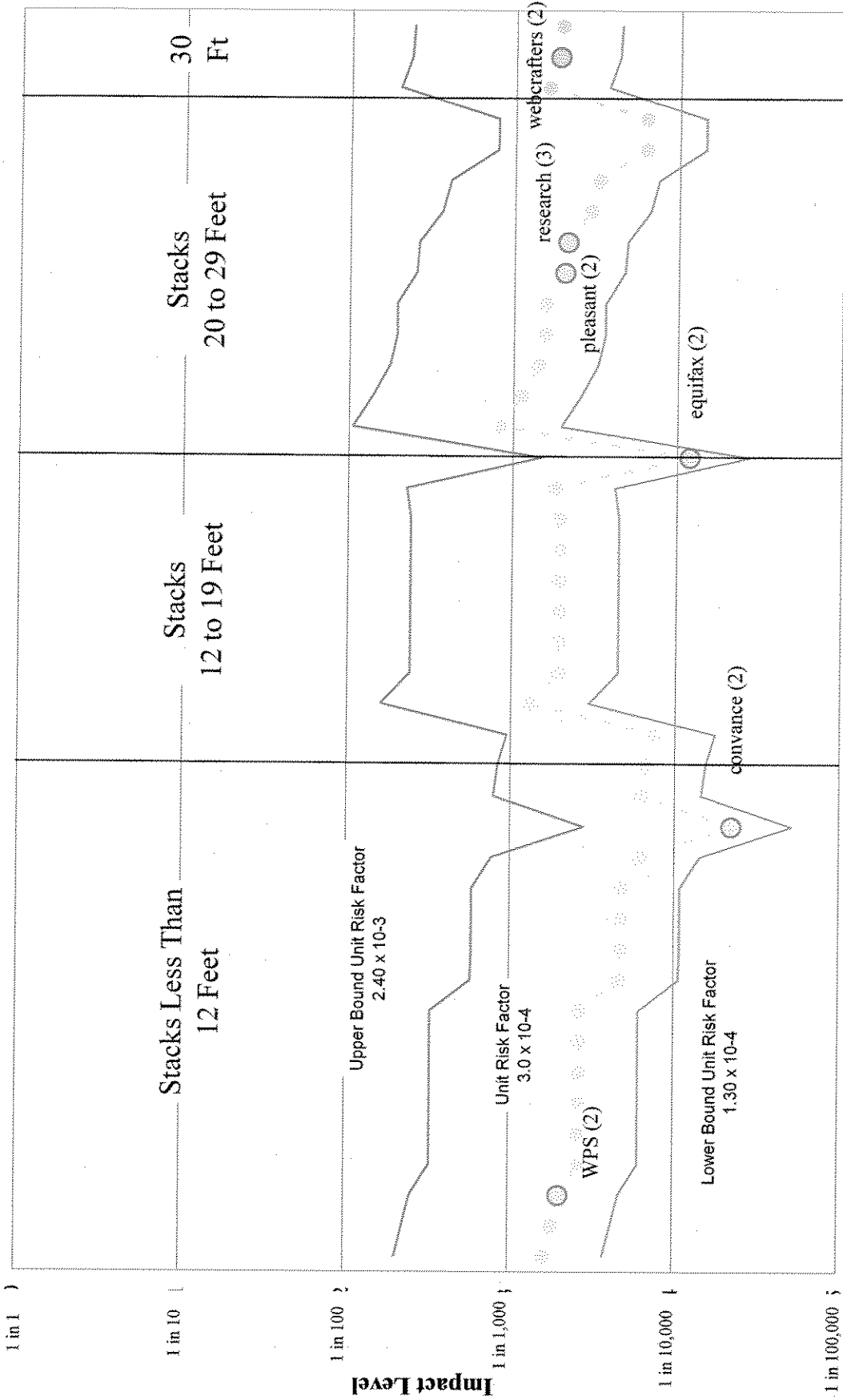
### 5. *Variance*

- Allows an alternative reduction level or extended compliance deadline, or both, if technological or economic barriers prevent a major utility from meeting the reduction requirements in the rule (the PSC is consulted regarding variance requests).

### 6. *Electric Reliability Waiver*

- Provides a waiver from meeting a reduction requirement if an unforeseen event such as a fuel supply disruption or an electrical supply emergency causes noncompliance.

# 48 Diesel Generator Source Specific Impacts



Each point on the UFR = 3.0x10<sup>-4</sup> curve represents a facility with one or more diesel generators on/nearby site.



# Wisconsin Wildlife Federation

720 ST. CROIX ST., SUITE 101, PRESCOTT, WI 54021 • (715) 262-9279 • 1-800-897-4161

*AFFILIATED WITH NATIONAL WILDLIFE FEDERATION*

## **Testimony before the Natural Resources Board for Mercury Air Emission Reductions**

Good afternoon Secretary Hassett, Mr. Vice-Chair and Members of the Board. The Wisconsin Wildlife Federation would like to thank you for the opportunity to testify on this important new health regulation. The Wildlife Federation is the largest conservation organization in Wisconsin made up of 82 hunting, fishing and trapping groups located throughout the State of Wisconsin. We are also the Wisconsin affiliate of the National Wildlife Federation.

The Wisconsin Wildlife Federation was one of the initial petitioners for mercury emission reduction rules. While we are testifying in support of the rule, in all candor, we believe that the rule does not go nearly far enough to protect Wisconsin citizens. We respectfully request that you strengthen the rules by increasing the rate of emission reductions to 90%, basing the reductions on actual current emissions rather than coal content and restoring the 150% offset for future increased mercury emissions.

This is a health issue to our members. They are very active anglers and they are concerned that the fish that they bring home to their spouses and children are heavily contaminated by mercury. They are concerned that studies by the National Academy of Science and the Center for Disease Control indicate that 1 out of 12 women in the United States have blood mercury levels in excess of that deemed safe from a health standpoint and that 60,000 children born each year in the United States may have their health impaired by the presence of mercury in their bodies. The source of mercury in most humans is the ingestion of fish contaminated with mercury. You have the responsibility to act to reduce this health hazard to Wisconsin citizens.

Some will argue for no or weak mercury regulations in Wisconsin because of potential adverse economic impacts to business. However the absence of strong mercury regulations is very harmful to the many small resorts, bait shops, gas stations and restaurants that depend on fishing for their tourism business. The traditional first question to resort owners is: How is the fishing? The current second question is now: What is the fish advisory on your lake? Businesses should not be able to harm human health or the livelihood of other businesses by emitting dangerous pollutants into the air. Furthermore during my thirty-two years experience in environmental protection, those dire projected business costs have never borne out.

You will hear from some that Wisconsin should not act because state emissions are a small percentage of total global emissions. That ignores the fact that Wisconsin sources

9? 39? according to Geo. Meyer.

contribute the substantially highest percentage of the mercury that falls in our waters. If we reduce our emissions we can make a significant contribution to the reduction of mercury in our lakes and streams. Secondly, the Federation does advocate for strong federal regulations to improve the health of our citizens---stronger than those currently proposed by the Federal Administration. How can Secretary Hassett or the Wisconsin Congressional delegation fight for tough new federal regulations for Wisconsin citizens if Wisconsin does not act or if it only adopts a 60 % to 65% mercury reduction level--- which is the actual reduction of mercury in the rule before you today-----it is not an 80% reduction or the 90% reduction so strongly called for by the public at the hearings on this rule.

In the similar situation in 1986, Wisconsin led the nation by adopting strong acid rain regulations. Not only did they work well in Wisconsin from both an environmental and economic standpoint, they became the model for the acid rain provisions of the Clean Air Act Amendments of 1990. That is the opportunity and I would argue the responsibility that you have before you today.

You are not alone in making this decision. Both the states of Connecticut and North Carolina have adopted mercury emission reduction provisions more protective of human health than those before you today.

The Wisconsin Wildlife Federation, while supporting the proposed rule, strongly requests you to modify its provisions by requiring the reduction of mercury emissions by 90% of the current emissions and by requiring the offset of 150% for new mercury emissions.

In conclusion, in April of this year, 82% of Wisconsin voters spoke loudly by adopting the Constitutional Amendment for the Right to Fish. Two weeks ago one of my members said to me, "you know, when we adopted the constitutional right to fish, I thought that included the right to eat the fish." It is up to you to determine whether our rights include the right to eat our fish.

**Revised Mercury Rules  
June 2003**

Critical Considerations

- *Planning and Design Period* – The proposed rules do not require mercury emission reductions until seven years after promulgation (2010). This provides time for refinement of mercury control technologies, planning and design for controls, and initiating the installation of equipment.
- *Staged Installation Schedule* – There are 42 coal-fired boilers at the four utilities affected by the proposal. The schedule we are proposing does not require all these units to be controlled at the same time. We recognize that equipment installation must be staged to avoid disruption in service. Thus the proposal has an initial reduction at year seven (2010) and a final reduction at year twelve (2015).
- *Compliance Flexibility* – Each of the four major utilities is allowed to average their mercury emission reduction requirement across their entire system allowing flexibility in the deciding how the mercury reductions will be achieved. In addition, the four major utilities can enter into agreements with each other to exchange excess mercury reductions to meet the rule requirements.
- *Multi-pollutant Approach* – The proposal allows relief from the initial reduction requirement if a major utility is interested in pursuing a multi-pollutant approach.
- *Fuel Mix* – The proposal does not force utilities to switch to natural gas to meet mercury reduction requirements. The reductions proposed can be met by installation of controls on existing coal-fired units. Fuel switching is an option not a mandated action.
- *Electric Reliability Waiver* – It is recognized that unanticipated events beyond the control of a utility may result in mercury emissions above the proposed limitations. The proposal includes a provision that would allow a waiver under these circumstances. The Public Service Commission would be consulted as part of any waiver request.
- *Variance* – In addition to the waiver there is provision for a variance that could specify a different schedule or reduction level or both based on a showing of technological or economic infeasibility. The Public Service Commission would also be consulted as part of the variance review.
- *Periodic Evaluation of Requirements* – At two specific times a report to the Natural Resources Board is required that would allow for revision to mercury reduction requirements based on control technology development and other factors.

Summary Table

<b>PROPOSED RULES</b>	<b>REVISED RULES</b>
<b>Utilities Affected</b> – Affects all major utilities in the state (mercury emissions greater than 100 pounds per year) – Dairyland Power Cooperative, WE Energies, Wisconsin Public Service Cooperation and Alliant Energy.	No change
<b>Determining Baseline Emissions</b> – Baseline emissions must be determined by a procedure that includes evaluation of historical fuel mercury content and use information from the years 1998 through 2000. This requirement affects major utilities (>100 pounds per year) and other significant sources (>10 pounds per year). Stack emissions of mercury are the foundation for establishing the baseline.	Only major utilities are required to set baseline emissions. Mercury content in fuel and fuel consumption are the foundation for establishing the baseline. <i>Supports methodology favored by major utilities. The need for historical data is minimized and this method avoids the issues of determining current equipment performance and lack of credit for recent changes at a facility. This method puts all major utilities on a uniform footing with good quality control on mercury testing. Facilities keep good records of coal consumption so using current and historical basis is fair. No penalty for already having made improvements</i>

PROPOSED RULES	REVISED RULES
<b>Emissions Cap</b> – Beginning in the 4 <sup>th</sup> year after promulgation a cap is placed on mercury emissions from each major utility and other significant commercial and industrial sources.	<i>since the baseline is from uncontrolled emissions.</i> Cap becomes effective in 2008 for major utilities. Industry mercury emissions would not be subject to emission caps. A voluntary program to reduce mercury emissions will be developed. Progress on this voluntary program would be provided to the NRB.
<b>Major Utility Reduction Requirement</b> – Three reductions required over a fifteen-year period – 30% five years, 50% in ten years and 90% in Fifteen years.	The fifteen-year 30/50/90 percent reduction requirement for major utilities is replaced with a two-step reduction requirement that results in 80% reduction of uncontrolled mercury emissions in 12 years (2015). An initial reduction of 40% is required at seven years (2010).
<b>Electric Reliability</b> – Variance process provided in the proposed rules	Specific electric reliability waiver that may provide short-term relief if certain circumstances are met is added. PSC would be consulted. A variance for economic or technological hardships would be retained.
<b>Emission Offsets</b> – New utility sources that have mercury emissions greater than 10 pounds per year are required to obtain offsets at a ratio of 1.5 to 1.0.	The requirement for offsets for new mercury emission sources is eliminated. Significant new sources would be required to limit mercury emissions through application of control technology if not covered by a federal requirement under section 112 of the Clean Air Act.
<b>Trading</b> – Emission reduction credits can be used by major utilities to meet reduction requirements in the rules. These are credits that are created by pollution reduction projects initiated by industrial and commercial sources or by mercury containing product collection program.	<i>Trading provisions are largely eliminated. Additional analyses have determined that you cannot accurately measure the amount of credit from a product collection program or reduction at a source of process emissions. Additionally, the amount of credit that was initially felt to be available from industrial combustion sources is much less than anticipated. One source, Vulcan Chemical, may be in a position to set the market price.</i>
<b>Compliance Flexibility</b> – Major utilities can average their mercury emissions across their entire system to demonstrate compliance. In addition, ½ of required reductions may be achieved by obtaining emission reduction credits from the trading provisions.	System-wide averaging is maintained. Emission reduction credits are not available to meet rule requirements. Major utilities can enter into agreements with each other to share reductions to meet rule requirements.  Utilities would be required to comply annually with the reduction requirements. However, they will have opportunity to true-up over two years if a timely commitment is made.  A multi-pollutant option is included that would allow relief from the initial reduction requirement of 40% to accommodate those major utilities that desire additional time for comprehensive planning if they choose this approach.
<b>Periodic Evaluation</b> – Proposed rules include a review every 18 months.	Evaluation report provided at 6 years (2009) and 10 years (2013). In addition, a NRB report would occur upon the promulgation of a federal regulation or enactment of a federal law that addresses utility mercury emissions in the state.



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Good morning Mr. Vice-Chair and Members of the Board. The Wisconsin Wildlife Federation would like to thank you for the opportunity to testify on this important new regulation. The Wildlife Federation is the largest conservation organization in Wisconsin made up of 82 hunting, fishing and trapping organizations located throughout the State of Wisconsin. We are also the Wisconsin affiliate of the National Wildlife Federation.

The Wisconsin Wildlife Federation was one of the initial petitioners for mercury emission reduction rules. We are testifying here today in support of the rule, but in all candor, we barely support the proposed regulations and request that this Board strengthen the rules by increasing the rate of reductions to 90%, basing the reductions on actual current emissions rather than coal content and restoring the 150% offset for future increased mercury emissions.

This is a health issue to our members. They are very active anglers and they are concerned that the fish that they bring home to their spouses and children are heavily contaminated by mercury. They are concerned that studies by the National Academy of Science and the CDC indicate that 1 out of 12 women in the United States have blood levels in excess of that deemed safe from a health standpoint and that 60,000 children in the US have had their health impaired by the presence of mercury in their bodies. The source of mercury in most humans is the ingestion of fish contaminated with mercury. This Board has the responsibility to act to reduce this health hazard to Wisconsin citizens.

Some will argue for no or weak mercury regulations in Wisconsin because of adverse economic impacts to business. However the absence of strong mercury regulations is very harmful to the many resorts, bait shops, gas stations and restaurants that depend on fishing for their tourism business. The traditional first question to resort owners is: How is the fishing? The current second question is now: What is the fish advisory on your lake? Businesses should not be able to harm human health or the livelihood of other businesses by emitting dangerous pollutants into the air.

You will hear from some that Wisconsin should not act because Wisconsin emissions are a small percentage of total global emissions. That ignores the fact that Wisconsin sources contribute the substantially highest percentage of the mercury that falls in our waters. If we reduce our emissions we can make a significant contribution to the reduction of mercury in our waters. Secondly, we do need strong federal regulations to ultimately improve the health of our citizens---stronger than those currently proposed. How can

Secretary Hassett or the Wisconsin Congressional delegation fight for tough new federal regulations for Wisconsin citizens if Wisconsin does not act or if it only adopts a 60 % to 65% mercury reduction level----which is the actual reduction of mercury in the rule before you today----it is not an 80% reduction or the 90% reduction so strongly called for by the public at the hearings on this rule.

In the similar situation in 1986, Wisconsin led the nation by adopting strong acid rain regulations. Not only did they work well in Wisconsin from both an environmental and economic standpoint, they became the model for the acid rain provisions of the Clean Air Act Amendments of 1990. That is the opportunity and I would argue the responsibility that you have before you today.

You are not alone in making this decision. Both the states of Connecticut and North Carolina have adopted mercury emission reduction provisions stronger than those before you today.

The Wisconsin Wildlife Federation, while supporting the proposed rule, strongly requests you to modify its provisions to require the reduction of mercury emissions by 90% of the current emissions and require the offset of 150% for new mercury emissions.

In conclusion, in April of this year, 82% of Wisconsin voters spoke loudly by adopting the Constitutional Amendment Right to Fish. Two weeks ago one of my members said to me, "you know, when we adopted the constitutional right to fish, I thought that included the right to eat the fish." It is up to this Board to determine whether our rights include the right to eat our fish.



## Interfaith Leaders' Letter to the U.S. Senate in Support of Bold Energy Conservation Program

February, 2002

Dear Senator:

As leaders of major faith communities, we write to you, our senators, at a moment of great moral urgency for our nation and the planet - God's children and God's creation. We caution Congress not to adopt an energy policy based on short-term regard for long term solutions. On May 18, 2001, 41 heads of major denominations and senior religious leaders joined in issuing "*Let There Be Light: An Interfaith Call for Energy Conservation and Climate Justice.*" In this document, they lifted up these moral stakes of a sustainable energy policy:

*"At stake are: the future of God's creation on earth; the nature and durability of our economy; our public health and public lands; the environment and quality of life we bequeath our children and grandchildren. We are being called to consider national purpose not just policy."*

Drawing upon scripture, the statement affirmed the importance of considering long-standing principles of faith and values concerning all of creation - stewardship, covenant, justice, prudence, solidarity, and intergenerational equity. Today, more than ever, these precepts should guide our action. Recent events remind us of the intimate link between the safety of people and the reliability of our energy system. Efforts to preserve the environment are ever more clearly necessary in order to protect human life. Security and sustainability are inextricably linked.

We agree with President Bush's statement on October 11 that said, "The less dependent we are on foreign sources of crude oil, the more secure we are at home." Yet, it is clear that we do not have sufficient domestic reserves to replace foreign oil supplies. Conservation and reducing our dependence on oil and other fossil fuels is critical to achieving energy independence and can be accomplished in economically responsible and economically beneficial ways.

Concerning energy use, we believe that conservation and the development of the cleanest technologies possible are the wisest, most just, and most prudent means to fulfill our moral obligations to ensure the health and well-being of the American people and people around the world, now and for generations to come. We have established Interfaith Climate and Energy campaigns in 21 states that are educating congregations on the link between energy conservation and renewable energy sources that benefit climate change reduction.

Rooted in moral values and concern for God's creation and God's children, we support the following energy policy initiatives:

- Raise substantially vehicle fuel economy across the board in the shortest feasible timeframe, and require SUVs, minivans, and passenger cars to meet the same standard.
- Develop strategies to encourage the auto industry to further design and produce vehicles using hybrid-electric, fuel cell, and other promising clean technologies, and provide incentives for their purchase.
- Support substantially increased funding for inter-city rail and metropolitan mass transit to provide attractive and functional alternatives to single occupancy autos.
- Fill the Strategic Petroleum Reserve and increase it with the least possible environmental damage.

We strongly oppose policies that would allow drilling or mining in our nation's dwindling wild lands and places important to the traditional cultures of indigenous peoples. We specifically oppose drilling in the Arctic National Wildlife Refuge. Conservation is a morally superior alternative to drilling in such places. Furthermore, conservation is also more effective, providing much greater benefits that are more permanent, rather than a modest and short-lived increase in oil supply.

Alongside energy concerns that relate directly to oil, we have longstanding distress about other health and environmental effects of energy policy, including global climate change. Therefore, we support policies that would:

- Invest significantly more resources in renewable energy research and development with a focus on wind, geothermal, solar and biomass technologies.
- Include carbon dioxide as a regulated pollutant from power plants.
- Apply the strictest feasible energy efficiency standards to consumer products, including air conditioners.
- Increase funds for the Low Income Energy Assistance Program and other programs to alleviate economic hardship on low-income people caused by high energy prices.

Now is the time to embrace energy conservation and efficiency and alternative energy development as the central strategies of our nation's energy policy. The energy policies we adopt in the coming debate must reflect our resolve as a nation to be faithful to our values and to fulfill our obligations at a time of national crisis.

God calls humans to strive toward peace, justice, and harmony for all of creation. We have called on our congregants and communities to practice energy conservation as part of our values. Now we urgently call on the United States Congress and the Administration. As this critical issue comes forward for legislative action, we call upon our senators to reflect and act as God's stewards. The same energy policies that will help achieve peace for humankind by reducing our dependence on oil will create greater harmony within creation by protecting the environment.

Together, we can achieve energy solutions that embody and promote justice, stewardship, and intergenerational responsibility. We urge you to consider and consult these values as you evaluate the energy policy options before the nation and work to pass responsible and effective legislation.

Yours faithfully,

## **1,200 signatures including:**

### **Wisconsin Religious Leaders**

Organizations and affiliations are listed for identification purposes only

#### **AU SABLE ENVIRONMENTAL INSTITUTE**

Dr. Calvin B. DeWitt, Director and Professor of Environmental Studies  
Au Sable Environmental Institute and UW-Madison, Madison

#### **AMERICAN BAPTIST CHURCH**

Rev. Arlo R. Reichter, Executive Director, American Baptist Churches of Wisconsin

#### **BUDDHIST**

Rev. Toshu John Neatrou, Buddhist Priest, Milwaukee Zen Center, Milwaukee

#### **CHURCH WOMEN UNITED**

Ms. Beverly Ferguson, State President

#### **EVANGELICAL LUTHERAN CHURCH IN AMERICA**

Rev. Dick Blomker, Pastor, ELCA, Lake Edge Lutheran Church, Madison  
Rev. Sue Moline Larson, Director, Wisconsin Lutheran Office of Public Policy, Madison  
Bishop Peter Rogness, Greater Milwaukee Synod, Evangelical Lutheran Church in America

#### **GREEK ORTHODOX CHURCH**

Fr. Ted T. Trifon, Sts Constantine and Helen Greek Orthodox Church, Milwaukee

#### **INTERFAITH**

Rev. Dave Steffenson, Ph.D., Executive Coordinator, Wisconsin Interfaith Climate Change  
Campaign of WI Interfaith IMPACT  
Rev. Aden Ward, President, Policy Board, Wisconsin Interfaith IMPACT  
Mr. Marcus White, Executive Director, Interfaith Conference of Greater Milwaukee

#### **JEWISH**

Rabbi Marc E. Berkson, Congregation Emanu-El B'ne Jershuir, Milwaukee  
Rabbi Jay R. Brickman, Emeritus, Congregation Sinai, Milwaukee  
Rabbi David Brusin, Congregation Shur Hadash, Milwaukee  
Rabbi David B. Cohen, Congregation Sinai, Milwaukee  
Rabbi Dena Feingold, Beth Hillel Congregation, Kenosha  
Ms. Barbara I. Kuhn, Wisconsin Jewish Conference, Milwaukee  
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Mr. Rich Bogovich, National Co-Organizer, Catholics for Ecological Conversion  
Sister Miriam Brown, OP, Director, Churches' Center for Land and People, Sinsanawa  
Sister Mary Christine, CSA, Congregation of St. Agnes, Fond du Lac  
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Rev. Jude Peters, OCD, Discalced Carmelite Friars, Washington Province  
Sister Mary Francis Gebhard, Justice and Peace Coordinator, St. Bede Monastery, Eau Claire

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TOURISM

WISCONSIN DEPARTMENT OF TOURISM

Jim Doyle, Governor

Jim Holperin, Secretary

Senate Committee on Environment and Natural Resources  
Assembly Committee on Natural Resources  
Joint Meeting, Wednesday, August 13, 2003  
Topic: Clearinghouse Rule 01-081

-Thank you for providing an opportunity to articulate the Wisconsin Department of Tourism's support for Clearinghouse Rule 01-081 relating to requiring the reduction of inorganic mercury emissions from electric utility power plants in Wisconsin over the next 12 years.

-Secretary Hassett and perhaps others earlier today made the point that tourism, including recreational angling or sport fishing, contributes \$11.7 billion annually to our state economy. That, obviously, is a substantial amount.

-One main reason that Wisconsin enjoys such a strong recreation economy is that, traditionally, this state has paid attention to basics regarding the protection and promotion of our priceless natural resources.

-Historically, it has been the Wisconsin way to set aside land and water for recreation, to protect these assets from degradation, and then to make the resources open and available for multiple use by the public...including and especially visitors to our state.

-This strategy has paid off year after year in increasing revenues from recreational travelers.

-So, I am here to urge your committees to advance this rule so that mercury emissions from at least one major point source will be significantly reduced over the next 12 years.



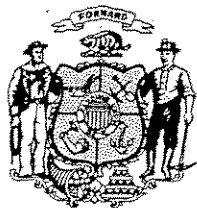
page two

-As recent research shows, continuing declines in inorganic atmospheric mercury should have almost immediate effects on levels of methyl mercury in game fish...and that holds out strong hope that the fish consumption advisories currently applied to nearly all of Wisconsin's waterways can be relaxed or even lifted...and maybe sooner rather than later.

-Fishing is an anchor sport for this state's recreation economy. I think everyone recognizes its significance. Positive action on this mercury emission rule will have positive effects on fishing and tourism in Wisconsin.

-Advancing this rule is the right choice and I thank committee members for your action.

Jim Holperin, Secretary  
Wisconsin Department of Tourism



# Public Service Commission of Wisconsin

Ave M. Bie, Chairperson  
Joseph P. Mettner, Commissioner  
Robert M. Garvin, Commissioner

610 North Whitney Way  
P.O. Box 7854  
Madison, WI 53707-7854

October 2, 2001

Mr. Jon Heinrich  
Department of Natural Resources  
Bureau of Air Management  
P.O. Box 7921  
Madison, WI 53707

Re: Department of Natural Resources Proposed Revisions to Wis.  
Admin. Code Relating to the Control of the Atmospheric  
Deposition of Mercury

AM-27-01

Dear Mr. Heinrich:

The following are comments from the Public Service Commission (Commission) in opposition to the Department of Natural Resources (DNR) proposed administrative rules (Chapter NR 446 Control of Mercury Emissions) to regulate mercury emissions from power plants in the state of Wisconsin. The proposed rule targets coal-fired generation as the principal source of the mercury reductions, although the draft regulations also identify waste incinerators, industrial boilers, and other stationary emissions that release more than ten pounds of mercury a year. The DNR's proposed rules would compel our state's energy providers to reduce their current level of mercury emissions by 90 percent over the next twelve to fifteen years.

No one disputes the DNR's lofty policy objectives nor its laudable efforts to ensure Wisconsin is the "first in the country" to take affirmative steps to establish rules designed to reduce the level of mercury in our streams and lakes. We recognize that increasing mercury levels in our lakes is a real environmental problem. We have all read or heard about the numerous fish consumption advisories issued by health officials in Wisconsin and our neighboring states at least partly due to mercury contamination in fish. It is also an issue that both sportsmen and traditional environmental groups can agree upon, and they have formed an unusual alliance that generally is in support of the DNR's proposed regulations.

While we share the concerns of the public over the increased levels of mercury in our lakes, rivers, and streams, our agency is taking this unusual step of actively opposing these proposed rules on the grounds that such rules would:

- present unacceptable future impacts on the reliability of the state's electric supply portfolio;
- present adverse future impacts on the state's electric generation fuel mix;
- result in unreasonable rate increases for Wisconsin's electric consumers;
- produce insignificant environmental and health benefits;

Mr. Jon Heinrich  
DNR Bureau of Air Management  
Page 2

- represent an endorsement of a fundamentally flawed state-based mercury reductions program.

The Natural Resources Board, at its meeting on December 6, 2001, directed the DNR staff to promulgate rules that protected the public health and the environment, but are cost-effective, reasonable, and do not interfere with the ability of electric utilities to supply the state's energy needs. The proposed rules simply fail to comply with the Board's directive—the rules are not cost-effective, are not reasonable, and will interfere with the ability of electric utilities to supply the state's energy needs.

On July 31, 2001, the Commission issued a Notice of Investigation under docket 05-EI-130 to solicit comments from electric utilities, independent power producers, and interested persons on the potential impacts on the reliability, fuel mix, and cost of the state's existing and planned generation portfolio as a result of the Mercury Emissions Rules being proposed by the DNR. The investigation was commenced pursuant to the authority of the Commission under Wis. Stat. §§ 196.02(7) and 196.28.

The concerns expressed by the public in our informal investigation were generally in opposition to the proposed rule.

While our agency supports mercury emissions standards that are based on established science and provide a clear benefit to the environment, the proposed rules establish a completely unrealistic timetable to achieve mercury reductions in light of the uncertainty regarding the availability to commercially viable control technologies to address this important problem. Like many of the commenters in our investigation, our agency simply does not believe that proven technology yet exists to control mercury emissions from coal-fired power plants to the extent mandated by the proposed rule. The proposed rule is simply not realistic given the current state of reduction technologies available. The proposed reduction requirements of 30 percent in five years, 50 percent in ten years, and 90 percent in fifteen years from a baseline would drive electric utilities to fuel switch from coal to natural gas. This would require massive capital expenditures to prematurely retire coal-fired production facilities and result in the construction of many new natural gas-fired replacement facilities. This type of dramatic "switching" of fuel sources would cost the consumers in our state millions of dollars over a relatively short period of time. For these reasons, if the DNR believes that a state-based program is desirable over the federal efforts to deal with mercury, it should focus its efforts on achieving a more realistic ten percent reduction in mercury emissions by 2007 and a 40 percent reduction by 2012. In addition, we believe that a much better approach would be a multi-pollutant reduction program that would require emission reductions in multiple pollutants with environmental benefits beyond existing regulations.

Currently, coal-fired power plants provide well over half of our state's electrical generation. Our state's valuable and reliable fossil fleet has helped our state's energy companies deliver low cost



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DNR Bureau of Air Management  
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and reliable electricity to our citizens for several decades. The unforeseen cost consequences of this rule, if implemented too rapidly, may see coal-fired generation significantly decline as a viable fuel source in our economy.

Our agency is deeply concerned that the proposed offset provision would have a chilling effect on future development of coal-fired generation in the state. It is extremely doubtful that sufficient offsets would be available after ten years and most certainly after fifteen years to allow development of new coal-fired generation. The state's current fuel mix of approximately 70 percent coal, 15 percent nuclear, and 10 percent natural gas would be drastically changed. If these rules were to ever be promulgated, our state's fuel mix would be predominately natural gas. This would negatively impact both the reliability and cost of the state's generation portfolio. The potential shut down of existing coal-fired power plants and replacing them with natural gas-fired technology would be very costly. Equally important, it is questionable that sufficient gas pipeline capacity exists or could be built to satisfy such a high percentage of natural gas fueled electric production capacity over such a short period of time. A more reasonable and technically feasible approach would be to require a Maximum Available Control Technology (MACT) for new coal plant emissions consistent with developing federal standards.

There is no doubt that the DNR and our state's utilities and other industries have worked to reduce emissions of nitrous oxide (NO<sub>x</sub>) and sulfur oxides (SO<sub>2</sub>). In order to comply with tighter environmental regulations, our utilities have installed a variety of technologies at their coal-fired plants including scrubbers, which are used to remove acid rain-causing sulfur oxides from smokestacks. In addition, they are currently in the process of installing catalytic converters, similar to those used in automobiles, to remove nitrous oxide, which contributes to ground-level ozone pollution.

But achieving mercury reductions is a much more difficult and expensive task than either sulfur oxides or nitrous oxide. The DNR has not adequately addressed the impact of a "Wisconsin only" strategy ahead of federal regulations. The United States Environmental Protection Agency (USEPA) is moving forward to implement mercury reduction standards by 2003. Regional contributions to mercury deposition need to be better understood along with their impacts on Wisconsin's environment, and it is therefore unwise to move forward with a Wisconsin-only rulemaking before the USEPA rules are set.

Apart from the tremendous financial consequences on businesses and ultimately ratepayers these rules would have, our agency is concerned about the effectiveness on the ultimate goal—which is to reduce the level of mercury in our lakes and streams. Even if Wisconsin adopts stringent and costly regulations to limit mercury emissions from its power plants, will they actually achieve the reductions?

There may be factors that are entirely out of Wisconsin's control that are driving the increased mercury levels in our lakes. Again, this argument is more for a federal, rather than a state-based,

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DNR Bureau of Air Management  
Page 4

initiative that will do little to address the problem we face in our state. For these reasons, creating a balkanized mercury emissions policy in Wisconsin makes little sense at the present time.

### CONCLUSION

While we share the DNR's interest in addressing this important environmental issue, we have deep reservations about the economic, reliability-related, and practical consequences that such a rule, if adopted now, would have on our state's economy and its citizens. As members of the Public Service Commission, our regulatory responsibility is to the "consuming public." We believe policymakers at all levels should be careful about a "regulate first, study later" approach to an emissions policy that strikes at the heart of Wisconsin's traditional diverse fuel mix (coal, gas, nuclear, renewables) for producing electricity. For these reasons, the Public Service Commission of Wisconsin urges the Board to reject the current proposed rules or direct the staff to substantially modify these proposed rules.

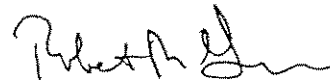
Sincerely,



Ave M. Bie  
Chairperson



Joseph P. Mettner  
Commissioner



Robert M. Garvin  
Commissioner

NR 446.01 is amended to read:

NR 446.01 Applicability; purpose. (1) APPLICABILITY. This chapter applies to all air contaminant sources which may emit mercury and to their owners and operators. This chapter does not apply to sources subject to federal mercury emission limitations.

NR 446.08 (2) is amended to read:

NR 446.08 (2) Nothing in this section precludes the owner or operator of a major utility from achieving compliance with the emission limits of s. NR 446.06(1)(a), (2), and (3) by obtaining excess mercury emission reduction credits generated by another major utility. Excess mercury emission reduction credits generated by a major utility that are not used for compliance purposes in the year generated may be banked for use for compliance purposes in future years. Excess mercury emission reduction credits may be generated by a major utility for excess reductions below the requirements of s. NR 446.06(1)(a) during the time between October 1, 2005, and January 1, 2008.

## Multi-emission Alternative

NR 446.07 is amended to read:

NR 446.07 Multi-pollutant reduction alternative. (1) The owner or operator of a major utility may request the department to approve a multi-pollutant alternative that provides relief from meeting the mercury reduction requirement specified in s. NR 446.06 (2) and (3). Existing multi-pollutant agreements established pursuant to s. 299.80 Wisconsin Statutes shall qualify as a multi-pollutant reduction alternative and not be subject to sub. (2) through (6).

JACKSON ELECTRIC COOPERATIVE

Wisconsin

# ENERGY COOPERATIVE

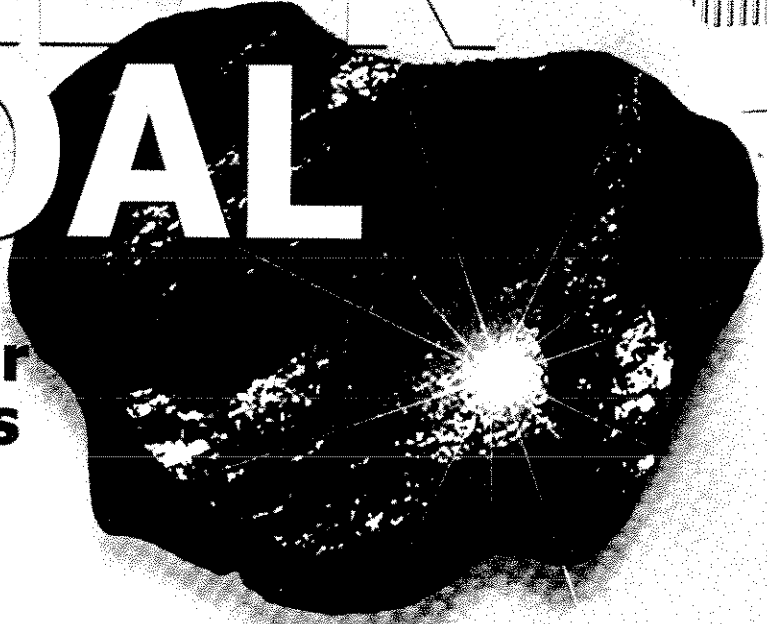
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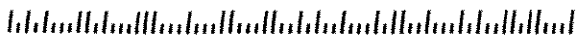


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## Lawmakers Tackle Mercury Regulation

After more than two years in the Agency rulemaking process, a Department of Natural Resources proposal to regulate power-plant mercury emissions came before a joint hearing of the Legislature's two natural resources committees in mid-August.

Though the committees had not yet acted at press time for this month's *Wisconsin Energy Cooperative News*, they were expected to send the proposed rule back to the DNR with a request for further modifications.

The draft called for elimination of 80 percent of mercury emissions from four Wisconsin utilities, including Dairyland Power Cooperative, by 2015.

No one who spoke at the August hearing questioned the desirability of reducing environmental mercury, but many disputed the effect of the proposed rule.



Committee members listen intently to testimony on the Department of Natural Resources' proposed mercury emissions rule. Shown left to right are State Reps. Scott Gunderson (R-Union Grove); DuWayne Johnsrud (R-Eastman), Assembly Natural Resources Committee chair; State Sen. Neal Kedzie (R-Elkhorn); and Committee Clerk Dan Johnson of Kedzie's staff.

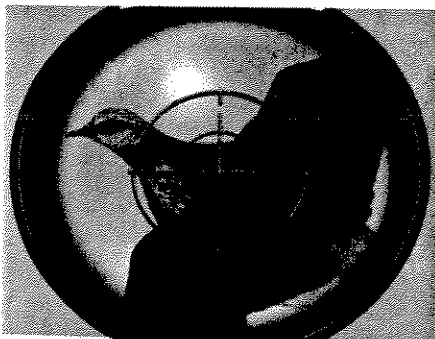
One was Dave Hoopman of the Wisconsin Federation of Cooperatives, who noted that atmospheric mercury comes from worldwide sources, and only about half of total emissions are subject to human control.

Of that half, he said, U.S. power plants account for between 1 and 2 percent, and of that small amount, per-

cent, and of that small amount, Wisconsin power plants produce about 2 percent. The proposed rule would affect a scant 0.00016 percent of global mercury emissions, he calculated.

Dairyland has estimated implementing the rule as proposed would mean about a 5-percent addition to consumers' monthly bills. ■

## Hunt Safely, Co-ops Caution



Mourning doves like to perch on power lines, and that could be a dangerous combination as the state opens its first dove hunting season this month, Wisconsin Electric Cooperative Association Statewide Manager

David Jenkins says.

Noting that the association supports the right to fish and hunt wild game, Jenkins cautioned hunters to avoid shooting at doves on power lines for their own safety as well as the sake of electric reliability.

"It's illegal to shoot at the equipment on power poles and power lines," he observed. "Doing so jeopardizes the shooter in more ways than those specified by the law."

Damage to wires, poles, and related equipment runs up maintenance costs for co-op members, and a shot doesn't have to bring down a line for lives to be in danger, Jenkins said. ■

## Oconto Welcomes New Manager

Byron C. Nolde assumes the duties of general manager at Oconto Electric Cooperative September 2.

In announcing Nolde's appointment to succeed Tony Anderson, who left to take the manager's post at Cherryland Electric Co-op in Michigan, the board of directors credited Nolde with "the experience and leadership skills necessary to lead Oconto Electric ▶



Byron Nolde



44 East Mifflin Street • Suite 202 • Madison, Wisconsin 53703 • 608/257-3151

For Immediate Release

**Research shows mercury rules would have little effect on Wisconsin lakes**  
*"Wisconsin Mercury Deposition Case Study" forwarded to state for review*

Contact: Bill Skewes, WUA  
608-231-6814

May 31, 2002

**MILWAUKEE** - Mercury deposition in most areas of the state would decline by less than five percent even if emissions from the state's power plants were completely eliminated. That is a key finding from the "Wisconsin Mercury Deposition Case Study" conducted by Atmospheric and Environmental Research, Inc., managed by the Electric Power Research Institute, and sponsored by the Wisconsin Utilities Association (WUA). WUA announced these findings today and is requesting that the Wisconsin Department of Natural Resources (DNR) consider this information as it determines state mercury reduction requirements.

Last year, the DNR proposed rules that would require the state's major utilities to reduce mercury emissions from coal-fueled power plants by 30, 50 and 90 percent over five, 10 and 15 years, respectively. WUA supports reductions of 10 and 40 percent over five and 10 years, respectively, for these affected sources.

"We think it's a good idea to reduce the level of mercury in the environment and we support reasonable state rules for reducing mercury from coal-fueled power plants," said Bill Skewes Executive Director of the Wisconsin Utilities Association. "However, this case study shows that there would be limited environmental benefit achieved from the DNR's proposal. We think it is important that utility customers be informed of the level of environmental improvement that can realistically be accomplished by the state-only rules."

The "Wisconsin Mercury Deposition Case Study" simulated the transport, chemical, and physical transformations of mercury emissions using detailed chemical, meteorological, precipitation, and geographic data. The model simulations focused on the upper Midwestern and Northeastern United States. The DNR's inventory of in-state sources of mercury emissions was a primary input to the model. The DNR estimates that slightly less than one third of mercury released in the state comes from Wisconsin's coal plants.

The principal modeling result is that mercury deposition in Wisconsin declines by one to four percent, even when the state's coal plant emissions are completely eliminated. These results are based on comparing modeling simulations with and without Wisconsin utility emissions of mercury included. The model was verified using actual mercury deposition data measured through the Mercury Deposition Network (MDN). Four of the 30 MDN monitors are located in Wisconsin.

-more-



These findings are consistent with a study conducted by the U.S. Environmental Protection Agency (EPA) in the mid 1990's that estimated that less than seven percent of mercury emissions from large coal-fueled utility boilers is deposited within 50 kilometers of the facility and a study funded by the Lake Michigan Air Directors Consortium (LADCO) released this year. LADCO is a consortium comprised of the DNR and other state air regulatory agencies of the upper Midwest. The LADCO study estimated that utility sources in Wisconsin contribute one to five percent of mercury deposition. Both studies employed the most recent EPA models of mercury deposition then available.

Model performance for the current modeling simulations was considered very good. The simulations did, however, over-predict the amount of mercury being deposited in Wisconsin compared to the measured data from the MDN monitors. Therefore, the estimates contained in the current modeling are likely to represent an upper limit on the contribution of local and regional sources to mercury deposition in Wisconsin.

Utilities say that they would like their customers and state policy-makers to be more informed of the science behind this environmental issue.

"Decision makers need to have a more realistic understanding of how much of the mercury in Wisconsin lakes comes from the state's coal plants. We hope the DNR will review this data and use it in the rule-making process," said Skewes. "The final rules must achieve an acceptable balance among environmental, energy and economic objectives and impacts."

The proposed mercury control actions are intended to reduce in-state mercury deposition, and ultimately mercury levels in the state's fish. Much of the support for the rule has been based on the potential to reduce state mercury fish advisories.

Although the study did not specifically evaluate the direct impact that reducing in-state mercury reductions would have on state fish advisories, since the expected reduction in the level of mercury deposited to lakes is so low, no reduction in fish advisories is anticipated.

The Wisconsin Utilities Association (WUA) represents the state's investor-owned power providers before the Legislature and state regulatory agencies.

###

**Editor's note: For more information about the study contact:**

**Leonard Levin, Ph.D.**

**Program Manager, Air Toxics Health & Risk Assessment**

**Electric Power Research Institute**

**3412 Hillview Ave.**

**Palo Alto, California 94303 U.S.A.**

**phone: (650) 855-7929**

**fax: (650) 855-1069**

**e-mail: llevin@epri.com**

## Wisconsin Mercury Deposition Case Study - Summary of Results

### Study Purpose

The purpose of the mercury modeling is to provide state policy makers with insights as to the potential outcome of proposed NR446 mercury emission reduction regulations. The proposed mercury control actions are intended to reduce in-state mercury deposition, and ultimately mercury levels in the state's fish. Because information about potential rule impacts was not available, Wisconsin utilities contracted for this work to be conducted as part of the public involvement process for the proposed rule-making.

The study was developed in cooperation with the Electric Power Research Institute (EPRI) and conducted by Atmospheric and Environmental Research, Inc.

### Objectives

The objective of this work was to estimate the effect of various emission sources on the atmospheric deposition of mercury in Wisconsin. This project focused on the upper Midwest, and in particular the state of Wisconsin. The project relied on well-characterized inventories of mercury atmospheric emission sources in Wisconsin and the other states in the upper Midwest to calculate deposition in the region.

### Model Specification and Performance

For this effort, EPRI simulated the global atmospheric cycling of mercury as well as its deposition on a finer continental and regional scale. The modeling system used incorporated models at three spatial scales: a global scale model for initial conditions, with  $8^{\circ} \times 10^{\circ}$  grid cells encompassing a global source inventory; and the TEAM (Trace Element Analysis Model), consisting of both a continental-scale dispersion model, with 100 kilometer (km) grid spacing; and a sub-continental simulation at 20 km spacing.

Model performance was evaluated by comparing model results at the finest 20 km scale with actual monitored 1998 deposition data from the Mercury Deposition Network (MDN) for Wisconsin and surrounding states. The MDN database includes 27 sites in the United States (including four in Wisconsin) and three sites in Canada. Compared with these values, the model tends to slightly over-predict deposition at the Wisconsin monitoring stations. The normalized error ranges from four percent to 36 percent at the four Wisconsin sites. Overall, the normalized gross bias (and error) is 22 percent, which is well within reasonable performance parameters and considered a reputable modeling effort.

Model bias is believed to be due to inexact mercury emission inventories (and their unknown mercury chemistries) and to uncertain power plant plume chemical reactions involving mercury. In the latter case, both laboratory and field measurements suggest that the ionic form of mercury in power plant plumes undergoes reactions that rapidly convert it into the elemental form, which, in turn, does not significantly deposit locally or regionally. Thus, the mercury deposition simulations conducted in this study are likely to represent an upper bound on the contribution of local and regional sources to mercury deposition in Wisconsin.

The study used a national mercury inventory developed by EPRI for the entire United States, but modified for Wisconsin to incorporate the DNR's 1997 mercury emissions inventory. The study mapped the estimated inventory of both point sources (e.g., coal-fueled power plants) and area (e.g., mobile) sources within the state. Area sources of mercury were distributed in the inventory according to population density.

### Modeling Results

In addition to a base case, three emission reduction simulations were conducted. In the first, all anthropogenic (man-made) mercury emissions from Wisconsin were set to zero. In the second, all anthropogenic mercury emissions from Wisconsin plus all coal utility boiler emissions from Minnesota, Iowa, Illinois, Indiana, Michigan, Missouri, and Ohio were set to zero. In the third, all Wisconsin coal utility boiler emissions were set to zero. The modeling generally concluded that one to four percent comes from Wisconsin power plant emissions, four to 10 percent of mercury deposited in-state comes from the combined total of Wisconsin sources, and that 6-18% comes from Wisconsin sources plus regional power plant emissions:

### Estimated Reductions in Mercury Deposition at Model Locations Corresponding to Wisconsin MDN Measurement Stations

MDN Site	No Wisconsin mercury emissions	No Wisconsin mercury emissions and no regional power plant mercury emissions	No power plant mercury emissions in Wisconsin
WI08 – Brule River	-6%	-9%	-1%
WI09 – Popple River	-5%	-8%	-1%
WI36 – Trout Lake	-4%	-6%	-1%
WI99 – Lake Geneva	-10%	-18%	-4%

These estimates are consistent with the results of two other studies using U.S. Environmental Protection Agency (EPA) mercury models that have been conducted by state and federal regulatory agencies. The first study was conducted by EPA in the mid-1990's as part of the comprehensive Mercury Study Report to Congress, required as part of the 1990 Clean Air Act Amendments. This study estimated that less than seven percent of mercury emissions from large coal-fueled utility boilers is deposited within 50 km of the facility.

The second study was funded by the Lake Michigan Air Directors Consortium (LADCO), and was released in January of this year. It estimated that utility sources in Wisconsin contribute one to five percent of the simulated wet deposition as measured at the four Wisconsin MDN monitors.

A key overall finding can be reached by comparing the major modeling efforts completed to date by both regulatory agencies and EPRI, including this study. Even when acknowledging all the differences in model structure and years simulated, the models are in general agreement in their attribution of coal-fueled utility boiler mercury sources to deposition. A common finding across the three modeling simulations – the Wisconsin Mercury Deposition Case Study, the LADCO study and the EPA study - is that over most of the state all of the models attribute less than 10 percent of local or regional deposition to utility sources.

#### Conclusions

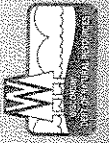
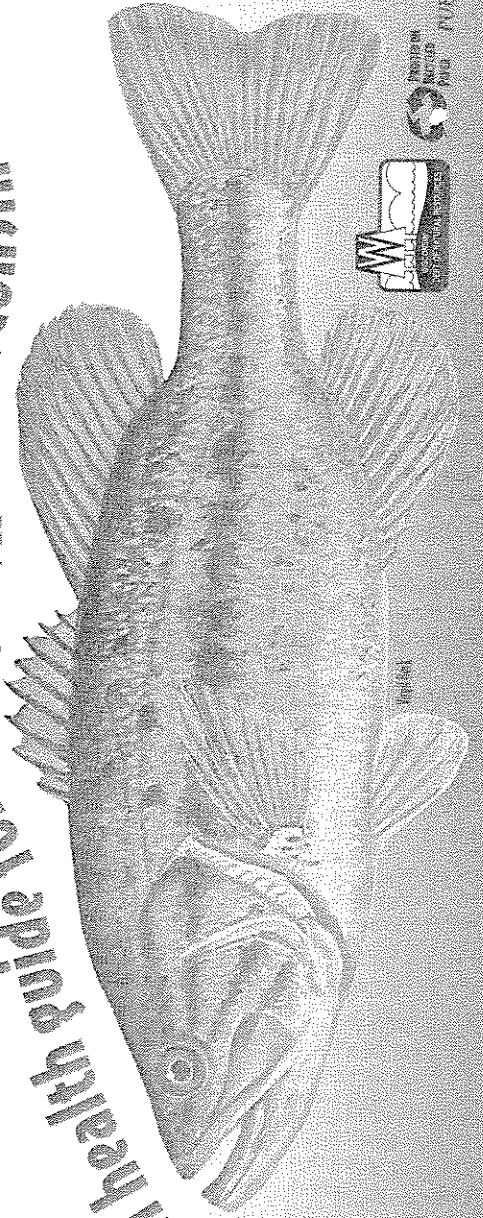
The Wisconsin Mercury Deposition Case Study estimated the effect of various emission sources on the atmospheric deposition of mercury in Wisconsin. Applying this study to the proposed NR446 mercury emission, the most important finding is the low (one to four percent) estimate of mercury deposited in-state that is attributed to Wisconsin's coal-fueled utility boilers. This is key given that the proposed mercury control actions are intended to reduce in-state mercury deposition, and ultimately mercury levels in the state's fish. While this study did not specifically evaluate the direct impact that reducing in-state mercury reductions would have on state fish advisories, some general conclusions can be drawn. The study's low estimates of mercury deposition that would be accomplished from in-state mercury control actions strongly suggest that the resulting impact on mercury levels in fish is also low, and that no reduction in fish advisories can be expected.

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**Choose wisely**

**A health guide for eating fish in Wisconsin**



2002 F28-111 8/01

**DNR  
Bureau of Fisheries Management  
and Habitat Protection  
P.O. Box 7921  
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*Total Lakes in WI = 15,000  
Total Mi. Rivers & Streams = 40,000 mi.*

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### Wisconsin Department of Natural Resources

Scott Hassett, Secretary  
Bill Smith, Acting Deputy Secretary  
Elizabeth Kluesner, Executive Assistant

### Acknowledgements:

Wisconsin Department of Health and Family Services - Division of Public Health  
Great Lakes Fish Advisory Task Force  
Wisconsin Department of Natural Resources staff

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12/03

# Choose wisely

# A health guide for eating fish in Wisconsin

2003

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## Health benefits from eating fish

When properly prepared, fish provide a diet high in protein and low in saturated fats. Many doctors suggest that eating a half-pound of fish each week is helpful in preventing heart disease. Almost any kind of fish is a healthy replacement for a high-fat source of protein in the diet. You can get the health benefits of fish while reducing unwanted contaminants by following this advisory. You and your family should determine the type and amount of fish you eat and compare that to the advice in this guide. After consulting the advisory, you may find that you do not have to change your consumption habits at all, or you may choose to eat different fish or space fish meals farther apart.

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Fishing is a Wisconsin tradition. It is a sport anyone can participate in and is a great reason to get outdoors anytime of the year. Fishing is fun and fish are good for you to eat in moderation. However, fish may take in contaminants from the water they live in and the food they eat. These contaminants can build up in the fish, sometimes to levels that can be harmful to fish consumers - including humans.

Fish are good for you to eat and fun to catch. But fish may take in contaminants from the water they live in and food they eat. If you enjoy eating fish, the information in this brochure will help you plan how much fish you can safely eat. This information is not intended to discourage you from eating fish, but should be used as a guide to selecting fish that are low in contaminants.



People should put their consumption habits in context with the advice found in this brochure. Most people will find they do not have to drastically alter their current fish-eating habits.

*Dr. Henry Anderson, Wisconsin Division of Health*

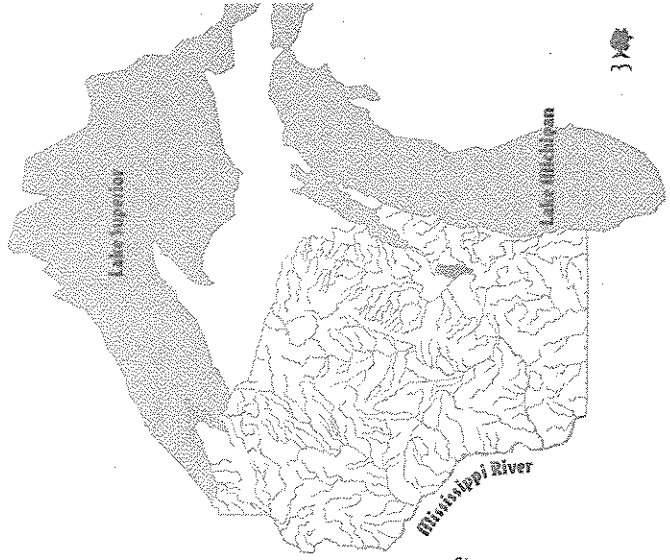
## Fish testing sites

Wisconsin's fish collection and testing program is frequently adjusted to meet changing needs. New lakes and rivers are tested each year, along with some previously tested waters to determine trends in contaminant levels.

Wisconsin is rich in water resources. There are nearly 15,000 lakes and 32,000 miles of rivers located within the state, as well as Lakes Michigan and Superior and the Mississippi River on its borders. Since it is too expensive to test fish from every Wisconsin water, the state focuses its sampling program in:

- waters with known or suspected pollution;
- lakes that may be susceptible to mercury contamination;
- popular angling waters;
- waters where changes with time are being tracked.

You can still eat fish from waters that the state has not yet tested. Just follow the guidance on page 9.



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## Advisory -- Statewide and Specific Advice

Recent studies found that low levels of mercury affect the developing nervous systems in fetuses. Wisconsin's fish consumption advisory for mercury reflects the latest scientific findings to better protect human health.

Nearly all of the 1,200 Wisconsin waters that have been tested in the last 20 years contain fish with mercury levels exceeding the amount that calls for consumption advice. Therefore, the state is issuing the same general advice for most inland waters, even if fish have not been tested for mercury. Specific guidance is also provided for waters that require more restrictive

advice because of higher mercury levels in one or more species from those lakes.

For fish containing PCBs, specific advice is given on how many meals of fish a person may safely eat. The number of recommended meals falls into categories based on the average contaminant levels for a given fish size, species and location.

Wisconsin's fish consumption advisory is based on the work of public health, water quality and fisheries experts from eight Great Lakes states and the Canadian province of Ontario.

Based on the best available scientific evidence, these scientists have determined how much fish is safe to eat over a lifetime based on the average amount of contaminants found in the fish and how those contaminants affect human health. In developing the recommendations presented in this guide, health officials considered a range of possible health risks such as cancer, hormonal and immune system effects, but placed the most weight on fetal/child developmental problems.

Although this advisory is based on reproductive risks rather than cancer, some contaminants do cause cancer in animals. Your risk of cancer from eating contaminated fish cannot be predicted with certainty. Cancer currently affects about one in every two men and one in every three women by the age of 70, primarily due to smoking, diet and hereditary factors. Exposure to contaminants in the fish you eat may not increase your cancer risk at all. If you follow this advisory over your lifetime, you will minimize your exposure and reduce whatever cancer risk is associated with these contaminants. At worst, using Environmental Protection Agency (EPA) methods, it is estimated that approximately one additional cancer case may develop in 10,000 people who follow this advisory over their lifetime.

## Contaminants of concern

Two main contaminants are responsible for fish advisories in Wisconsin. They are **polychlorinated biphenyls (PCBs)** and **mercury**. Where these contaminants come from, where they accumu-

late in fish, and how they affect human health differ between the two. Therefore, the advice in this booklet is divided into two sections, one for consuming fish contaminated with mercury and the other for consuming fish containing PCBs.

Contaminants such as PCBs and mercury build up in your body over time. It may take months or years of frequently eating contaminated fish to build up amounts that are a concern to health. Health problems which may result from the contaminants found in fish range from changes in subtle effects that are hard to detect, to birth defects and cancer.



## Contaminant

## PCBs

**What is it?  
Where does  
it come from?**

Polychlorinated biphenyls (PCBs) are synthetic (man-made) substances that were used in the manufacture of electrical transformers, carbonless papers, cutting oils, and hydraulic fluids. The use of PCBs was banned in 1976. However, because PCBs are slow to break down in the environment, they remain a problem.

**What water  
bodies  
contain the  
contaminant?**

PCBs released into the environment accumulate in sediments at the bottom of lakes and streams. The Great Lakes and rivers with heavy industrial use, are more likely to have PCB contaminated fish than inland lakes. This is because industries associated with past PCB use are often located on major rivers and Great Lakes tributaries.

**What types  
of fish contain  
the most  
contaminants?**

Fish absorb PCBs from contaminated sediments suspended in the water and from their food. The amount of PCBs found in fish varies depending on species, age, size, fat content and diet. Larger and older fish will contain more contaminants than smaller, younger fish. PCBs accumulate in the fat of fish. Therefore, fatty fish like carp and catfish may contain higher levels of PCBs.

**Where  
is it found  
in fish?**

Fortunately you can reduce (not eliminate) the amount of PCBs in a fish meal by properly trimming, skinning and cooking your catch to reduce fatty tissue (page 16).

Cooking does not destroy PCBs but heat from cooking melts some of the fat in fish and allows some of the contaminated fat to drip away. Broil, grill or bake the trimmed, skinned fish on a rack so the fat drips away. Do not use the drippings to prepare sauce or gravies.

**What is  
its effect  
on human  
health?**

Studies indicate that people exposed to PCBs are at greater risk for a variety of health problems. Infants and children of women who have eaten a lot of contaminated fish may have lower birth weights and be delayed in physical development and learning. PCBs may affect reproductive function and the immune system and are also associated with cancer risk.

Once eaten, PCBs are stored in body fat for many years. Each time you ingest PCBs the total amount of PCB in your body increases.

## Mercury

Mercury occurs in the environment naturally and as a result of human activity. It is released into the air when rocks erode, volcanoes erupt and soils decompose. It is also released into the air when power plants burn coal, incinerators burn mercury-containing waste and during the production of other chemicals. Airborne mercury attaches itself to water and dust particles and enters lakes and other waters in rain, snow and runoff.

Mercury is found in all waters. Lakes and wetland areas are more likely to contain bacteria which changes the mercury into a form that is easily absorbed by fish and other organisms. Therefore those waters tend to have fish with higher mercury concentrations.

Walleyes and other larger, older predatory fish often contain relatively high mercury levels compared to smaller fish such as bluegills, crappie and yellow perch, or smaller fish of the same species from the same lake or river. Fish absorb mercury directly from water passing over their gills or by ingesting other mercury contaminated organisms.

Mercury accumulates in the muscle of fish, the part that you eat. Therefore, trimming, skinning, and cooking do not reduce mercury levels in fish.

Fetuses and children under the age of 5 are more sensitive to mercury than adults. Mercury, unlike PCB, poses a short-term health risk to people who frequently eat fish that contain this contaminant. The human body can eliminate mercury. Therefore, spacing your meals out over time can help reduce the amount of mercury in your system.

Mercury affects the human nervous system. Symptoms of prolonged exposure include numbness, slurred speech, loss of coordination, and vision disturbances.



## How to use this advisory

This publication explains which fish species in Wisconsin lakes and rivers are known to contain certain toxic pollutants. The charts on the following pages describe precautions you should consider before you decide to eat fish you've caught from waters where contaminants pose a problem.

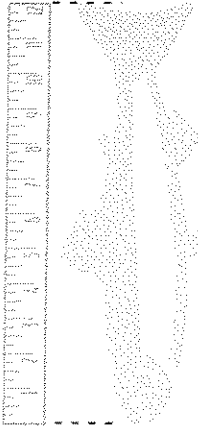
It's important to note that this guide features safe-eating guidelines and two different sets of health advice for specific waters: one for fish contaminated with mercury and another for fish containing PCBs and other pollutants.

Generally, people who should take the most precautions are women of childbearing years who are pregnant, think they may become pregnant at some time, women who are breastfeeding an infant, and children under the age of 15.

### Follow these steps to use this advisory

- 1) Read the safe-eating guidelines on the following pages. **This advice applies to most waters in Wisconsin.**
- 2) Note the name of the waterbody you are fishing. Check both the mercury (by county) and PCBs (alphabetically) tables for the water body name.
  - a) Determine the fish species that you've caught.

- b) Measure your fish from the tip of the nose to the end of the tail.



- c) Determine the eating advice for the fish from the table.
- 3) If the waterbody or fish species does not appear in either table, follow the safe-eating guidelines on the next page.

## Safe-eating guidelines - for most of Wisconsin's inland (non-great lakes) waters

Women of childbearing years, nursing mothers and all children under 15 may eat:

1 meal per week - Bluegill, sunfish, black crappie, white crappie, yellow perch or bullheads,

and

1 meal per month - Walleye, northern pike, smallmouth bass, largemouth bass, channel catfish, flathead catfish, white sucker, drum, burbot, sauger, sturgeon, carp, white bass, rock bass or other species.\*

\*Muskie should not be eaten by this group of people due to high mercury content

Women beyond their childbearing years and men may eat:

Unlimited amounts - Bluegill, sunfish, black crappie, white crappie, yellow perch, or bullheads,

and

1 meal per week - Walleye, northern pike, smallmouth bass, largemouth bass, channel catfish, flathead catfish, or other species.

## Safe-eating guidelines

On certain waters more restrictive advice is needed because fish have been found to contain higher levels of mercury or PCBs. Please check the tables on the following pages. Advisories apply only to eating your catch and in no way restrict your fishing or other water activities.

## Commercial fish

People often ask about the levels of contaminants in fish bought in stores or restaurants. The Food and Drug Administration (FDA) sets tolerance levels for contaminants to regulate the interstate sale of fish. FDA and commercial fishers are responsible for ensuring the safety of commercially sold fish. FDA tolerance levels are based on a nation-wide average fish

consumption rate and assume the fish come from a variety of waters. FDA acknowledges that their tolerance levels may not be appropriate for consumers who regularly eat locally caught fish.

Because fish bought in a store or restaurant do not come with labels that tell you the contaminant levels, or even

**Most ocean fish are low in contaminants. However, some fish contain higher amounts of mercury. The following guidelines for some popular species can be followed to allow you to enjoy commercial fish and at the same time reduce your risk to mercury:**

Ocean Species	Women of child-bearing age and children under 15	Women beyond child-bearing age and men
Salmon, canned salmon, and shellfish	2-3 meals per week	Unlimited Consumption
Cod, pollock, haddock, canned tuna (6 oz. can)	1 meal per week	Unlimited Consumption
Tuna steaks, halibut, orange roughy	1 meal per month	1 meal per week
Shark, swordfish, king mackerel, tilefish	Do Not Eat	1 meal per month

where the fish came from, it is up to the consumer to ask about the source of the fish. Because there are few requirements for tracking fish once they leave the dock, it is not always possible to know the source of the fish you are buying. Therefore, if you enjoy frequent meals of commercially caught fish, it is

important to eat a variety of fish species to ensure that you are not getting a steady diet of fish that may have been taken from the same waters. If you regularly eat sport or commercial fish from a particular local water, you may want to inquire about consumption advice.

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## Eating crayfish, clams and turtles



Some people may be interested in eating other organisms

besides fish caught in Wisconsin waters. Crayfish, clams and snapping turtles may be harvested from Wisconsin waters as long as rules and regulations affecting these species are followed.

These aquatic or semi-aquatic animals can accumulate the same contaminants that occur in fish, but the levels aren't necessarily the same. For example, clams generally have lower contaminant levels because they filter food particles from the water and do not eat

organisms higher on the food chain. Snapping turtles eat higher on the food chain, but have very defined fat deposits that can be removed during cleaning to reduce any fat-soluble contaminants that might be present, such as PCBs.

Some sites have "Do Not Eat" warnings for many species of fish. Before catching and dining on wild fare from these sites, it's best to contact a local DNR office for more information on species from specific sites.

## Parasites and tumors in fish

Anglers sometimes catch fish that contain worms, grubs, cysts, or nodules in the flesh. When cleaning fish, anglers may notice worms in or around the

intestines of the fish. Common parasites seen in fish are black spot, yellow grubs and tapeworms.

Fish parasites are a normal part of the ecosystem. While unattractive, parasites do not present a health hazard if the fish is thoroughly cooked. Pickling will not always kill tapeworm common to northern pike. Therefore, canning methods that include a boiling water bath are recommended.

Occasionally fish have external growths, tumors, sores or other lesions, due generally to viral or bacterial infections. Damaged or infected tissue should be removed. Select the healthy tissue for cooking and eating.

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## Specific advice for mercury

While all fish contain some mercury, large fish, especially walleye contain more mercury than small fish, like perch. In certain lakes and rivers, the sensitive natural water chemistry allows the mercury to bioaccumulate more easily, leading to higher levels of mercury in the fish. The following table contains special advice for fish that have been found to contain mercury at higher levels. Women of childbearing age who intend on becoming pregnant and children under 15 should be especially careful to follow the guidance in the table.



Walleye

## Important note regarding fish on the mercury portion of the advisory:

Mercury is distributed throughout a fish's muscle tissue (the part you eat) rather than in the fat and skin. The only way to reduce mercury intake is to reduce the amount of contaminated fish you eat.

The lakes and rivers listed in the table have been tested and found to contain fish with higher levels of mercury. **This advice is just for the species and sizes of fish listed below.** Other species caught from these waters but not listed below or in the specific advice for PCBs can still be eaten according to the safe-eating guidelines on page 9.



Yellow Perch



County	Water body	Women of childbearing age and children under 15 DO NOT EAT	County	Water body	Women of childbearing age and children under 15 DO NOT EAT
Baldwin	English Lake	Walleye larger than 17"	Douglas	St. Croix Reservoir	DO NOT EAT Black Garpie
Baldwin	Spillertown Lake		Douglas	St. Louis River/Superior Harbor	Walleye larger than 25"
Bayfield	Diamond Lake	Walleye larger than 26"	Florence	Brule River Reservoir	Walleye larger than 26"
Bayfield	Long Lake (148 R3W56)	Walleye larger than 15" Largemouth Bass larger than 14"	Florence	Sand Lake (138 R10W 524)	Walleye larger than 18"
Bayfield	Siskiyou Lake	Walleye larger than 18"	Fond du Lac	Mauville Lake	Yellow Perch
Bayfield	Tahkondah Lake	Walleye - all sizes	Forest	Deep Hole Lake	Walleye larger than 18"
Chippewa	Horseshoe Lake (132 R0W 533)	Walleye larger than 20"	Forest	Julia Lake (138 R12 506)	Walleye larger than 17"
Chippewa	Round Lake (132 R0W 514)	Walleye larger than 20"	Forest	Leitchman Pike larger than 25"	Bluegill
Chippewa	Sand Lake (133 R0W 534)	Walleye larger than 21"	Forest	Walleye larger than 23"	Bluegill
Clark (Jackson)	Black River Lake Hibitus	Walleye larger than 22" Channel Catfish larger than 25" Smallmouth Bass larger than 17"	Forest	Van Lake	Largemouth Bass - all sizes Northern Pike larger than 24"
Clark	Sherwood Lake	Walleye larger than 17"	Iron	Beaukill Lake	Walleye larger than 15"
Douglas	Lymant Lake	Walleye larger than 17"	Iron	Gale Reservoir	Walleye larger than 17"
Douglas	Mineswing Lake	Walleye larger than 17"	Iron	Island Lake (144 R1E 525)	Walleye larger than 18"
			Iron	Lake Six	Yellow Perch

\* Women beyond their childbearing age and men are advised to eat no more than 1 meal per week of these panfish species.

Continued on next page

County	Water body	Women of childbearing age and children under 5 DO NOT EAT	County	Water body	Women of childbearing age and children under 5 DO NOT EAT
Iron	North Bass Lake	Largemouth Bass - all sizes	Lincoln	Spirit River Flowage	
Iron	Owl Lake	Walleye larger than 17"	Manitowish	Pigeon Lake	Largemouth Bass larger than 17"
Iron	Hurtle-Hambean Flowage and Hude Lake	Walleye larger than 18"	Manitowish	Big Bass Lake	Walleye larger than 18" Largemouth Bass larger than 17"
Jackson	Combs of Flowage - Upper	Largemouth Bass larger than 18"	Manitowish	Lake Duquesne	Walleye larger than 19"
Jackson	Harkner Flowage		Manitowish	Menominee River at Lower Scott Flowage	Walleye larger than 19"
Jackson	Potter's Flowage	Largemouth Bass larger than 18"	Manitowish	Pontigo River at Coldwater Falls Flowage	Walleye larger than 20"
Jackson	Loumline Flowage		Manitowish	Pontigo River at High Falls Flowage	Walleye larger than 20"
Jackson	White Tail Flowage	Northern Pike larger than 22"	Manitowish	North Flowage	Black Crappie
Laporte	Greater Bass Lake	Largemouth Bass - all sizes	Manitowish	Ranch Creek at Lost Lake	Largemouth Bass larger than 15"
Laporte	Summit Lake	Northern Pike larger than 22"	Manitowish	Cumie Lake	Walleye larger than 19"
Lincoln	Peabick Lake	Largemouth Bass - all sizes	Manitowish	Dog Lake (138 Rte 515)	Walleye larger than 20"
Lincoln	Sono Lake	Largemouth Bass - all sizes	Manitowish	Emma Lake	Walleye larger than 20"
			Manitowish	Franklin Lake	Walleye larger than 21"
			Manitowish	Hemlock Lake	Walleye larger than 17"



\* Women beyond their childbearing age and men are advised to eat no more than 1 meal per week of these panfish species.

Oreida	Hodstrait Lake	Walleye larger than 19"	Pike	Solberg Lake	Walleye larger than 20"
Oreida	Long Lake (131 Rte 510)	Walleye larger than 21"	Rock	Hambour River at Oatland Flowage	Walleye larger than 17"
Oreida	McCraith Lake	Largemouth Bass larger than 18"	Sauger	Black Lake	
Oreida	Elloets Lake Chain (includes Moonis, Second, Third, Fourth, and Fifth Lakes)	Walleye larger than 19"	Sauger	Ghost Lake	Walleye larger than 20"
Oreida	Sugar Camp Chain of Lakes (includes Chain, Dam, Echo, Sand and Stone Lakes)	Walleye larger than 17"	Sauger	Winairo Lake	Walleye larger than 19"
Oreida	Sugar Camp Lake	Walleye larger than 16"	Shosson	Big Elkhart Lake	Walleye larger than 19"
Oreida	White Fish Lake	Smallmouth Bass larger than 17"	Sugar	Sackett Lake	Walleye larger than 16"
Oreida	Willow Flowage	Smallmouth Bass larger than 20"	Sugar	South Harper Lake	Walleye larger than 19"
Oreida	Willow Lake (137 Rte 509)	Walleye larger than 20"	Wabas	Himabelle Lake	Walleye larger than 18"
Oreida	Collins Lake	Walleye larger than 20"	Wabas	Broken Bow Lake	Largemouth Bass larger than 15"
Oreida	Bass Lake (140 Rte 515)	Walleye larger than 15"	Wabas	Ike Watson Lake	Walleye - all sizes
Oreida	Hambour River at Troutley Flowage	Walleye larger than 23"	Wabas	Jag Lake	Walleye larger than 20"
Oreida	Hambour River at Pixley Flowage	Walleye larger than 22"	Wabas	Kennett Lake	Walleye larger than 23"
Oreida	Abwehr Lake	Walleye larger than 24"	Wabas	Lynn Lake (143 Rte 508)	Walleye larger than 18"
			Wabas	Shannon Lake	Largemouth Bass larger than 16"
			Wabas	Snope Lake	Walleye larger than 15"
			Wabas	White Birch Lake	Walleye larger than 21"



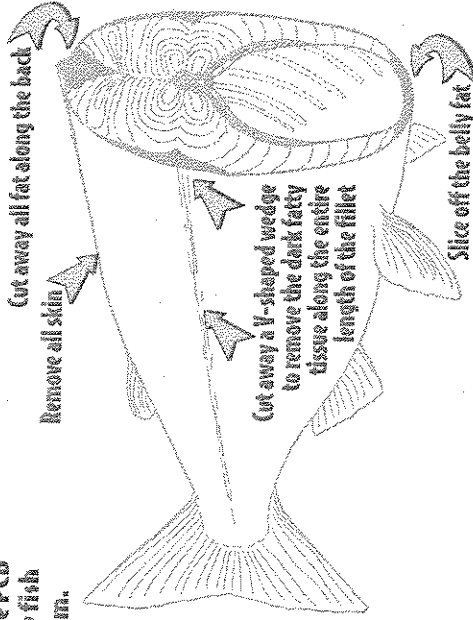
\* Women beyond their childbearing age and men are advised to eat no more than 1 meal per week of these panfish species.

## Specific advice for PCBs and other chemicals

**Important:** The meal advice in the PCB portion of this guide is for eating fish prepared according to this diagram.

One meal is assumed to be one-half pound of fish before cooking for a 150-pound person. This meal advice is equally protective for larger people who eat larger meals, and smaller people who eat smaller meals.

If you are a woman of childbearing age who intends to become pregnant, or are under the age of 15, you should be especially careful to space fish meals out according to these advisory tables.



Women beyond their childbearing years and men face fewer health risks from contaminants. However, if you are in this group you should still follow the advisory to reduce your total exposure to contaminants. You can space your meals more closely, but it is still important not to exceed the total number of meals per year, as specified in the advisory. For example, if you are on vacation and most of the fish you eat fall into the "One meal a week" category, you could eat several of these meals within the same week as long as you do not exceed 52 total meals the rest of the year.



Waterbody/species	Unlimited	Eat no more than 1 meal a week or 52 meals/year	Eat no more than 1 meal a month or 12 meals/year	Eat no more than 1 meal every 2 months or 6 meals/year	Do not eat
<b>Kinnapee River</b>					
Carp			All sizes		
All other species		Follow the  eating guidelines			
<b>Badfish Creek in Dane County</b>					
Brown Trout		All sizes			
Carp			All sizes		
<b>Black River below Black River Falls down to its mouth at the Mississippi River</b>					
Channel Catfish			Larger than 16"		
All other species and/or sizes		Follow the  eating guidelines			
<b>Branch River in Manitowoc County</b>					
Trout and Salmon		Follow the Lake Michigan PCB advisory			
<b>Cedar Creek from the Milwaukee River up to Bridge Road in the Village of Cedarburg, including Zeunert Pond</b>					
All Species					All sizes

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Waterbody/Species	Unlimited	Eat no more than 1 meal a week or 52 meals/year	Eat no more than 1 meal 2 months or 6 meals/year	Do Not Eat
<b>Chippewa River - downstream of dam at Holcombe to confluence with Mississippi River</b>				
Carp				
Sturgeon				
All other species				
<b>Fond du Lac River</b>				
<b>Fox River - Swan Lake downstream to Portage</b>				
Carp				
All other species				
<b>Fox River from Portage downstream to, but not including Buffalo Lake</b>				
Black Crappie				
Bluegill				
Largemouth Bass				



Smallmouth Bass				
Bullhead				
White Sucker				
Carp				
All other species				
<b>Fox River at Buffalo Lake</b>				
Carp				
Panfish				
All other species				
<b>Fox River from Little Lake Butte des Morts to the dam at DePere</b>				
Walleye				
Northern Pike				
White Bass				
Yellow Perch				
White Perch				



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Waterbody/Species	Unlimited	Eat no more than 1 meal a week or 52 meals/year	Eat no more than 1 meal a month or 12 meals/year	Eat no more than 1 meal every 2 months or 6 meals/year	Do Not Eat
Smallmouth Bass			All sizes		
Carp					All sizes
<b>Fox River from the mouth up to DePere Dam</b>					
Walleye			Less than 16"	16-22"	Larger than 22"
Northern Pike			Less than 25"	Larger than 25"	
White Sucker				All sizes	
White Bass					All sizes
Black Croppie			Less than 9"	Larger than 9"	
Bluegill			All sizes		
Rock Bass			All sizes		
Yellow Perch			All sizes		
Smallmouth Bass				All sizes	
White Perch				All sizes	



Carp					All sizes
Channel Catfish					All sizes
Sheepshead			Less than 10"	10-15"	Larger than 15"
<b>Fox (H.) River (including Lake Michigan)</b>					
Channel Catfish					
Northern Pike			All sizes		
Carp			All sizes		
<b>Green Bay south of Marinette and its tributaries (except the Lower Fox River) including the Menominee, Oconto, and Peshtigo Rivers from their mouths up to the first dam</b>					
Northern Pike			Larger than 22"		
Walleye			Less than 17"	17-26"	Larger than 26"
White Bass					All sizes
Yellow Perch			All sizes		
Carp					All sizes
White Perch					All sizes
Smallmouth Bass			All sizes		



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Waterbody/Species	Unlimited	Eat no more than 1 meal a week or 52 meals/year	Eat no more than 1 meal 2 months or 6 meals/year	Eat no more than 1 meal every 2 months or 6 meals/year	Do Not Eat
Channel Catfish			All sizes		
White Sucker		All sizes			
Rainbow Trout		All sizes			
Chinook Salmon		Less than 30"	Larger than 30"		
Whitefish			All sizes		
Splake		Less than 16"	16-20"	Larger than 20"	
Brown Trout		Less than 17"	17-28"	Larger than 28"	
Sturgeon				All sizes	
<b>Jackson Park Pond - Milwaukee County</b>					
Largemouth Bass		All sizes			
Bluegill/Pumpkinseed		All sizes			
Black Crappie		All sizes			
Carp		All sizes			





Yellow Perch	Follow the  eating guidelines				
<b>Kewaunee River</b>					
Channel Catfish		Less than 13"	Larger than 13"		
Carp		All sizes			
Trout and Salmon	Follow the Lake Michigan PCB advisory				
All other species	Follow the  eating guidelines				
<b>Lac La Belle</b>					
Bigmouth Buffalo		All sizes			
All other species	Follow the  eating guidelines				
<b>Lake Mendota</b>					
Carp		Larger than 23"			
All other species and/or sizes	Follow the  eating guidelines				






Waterbody/Species	Unlimited	Eat no more than 1 meal a week or 52 meals/year	Eat no more than 1 meal a month or 12 meals/year	Eat no more than 1 meal every 2 months or 6 meals/year	Do Not Eat
<b>Lake Michigan and its tributaries up to the first dam including the Root River, Milwaukee River, Sheboygan River, Manitowoc River and Kewaunee River</b>					
Chinook Salmon			Less than 32"	Larger than 32"	
Coho Salmon			All sizes		
Brown Trout			Less than 22"	Larger than 22"	
Lake Trout			Less than 25"	23-27"	Larger than 27"
Rainbow Trout		Less than 22"	Larger than 22"		
Yellow Perch		All sizes			
Whitefish			All sizes		
Chubs			All sizes		
Smelt		All sizes			
<b>Lake Monona</b>					
Carp			All sizes		
fill other species	Follow the  eating guidelines				

<b>Lake Superior including tributaries up to their first impassable barrier (e.g. dam or falls). Also see St. Louis River</b>					
Lake Trout		Less than 21"	21-34"	Larger than 34"	Larger than 25"
Siscowet			Less than 25"		
Chinook Salmon		Less than 25"	Larger than 25"	(Mercury & PCBs)	
Coho Salmon		Less than 25"	Larger than 18"	(Mercury)	
Rainbow Trout		Less than 18"	All sizes (Mercury)		
Brown Trout			All sizes		
Lake Whitefish			All sizes		
Lake Sturgeon				Larger than 30"	
Lake Herring			All sizes		
Burbot		Follow the  eating guidelines			
Smelt		All sizes			
Walleye		Follow the  eating guidelines			
<b>Lake Winnebago including Lake Poyzen, Lake Butte des Morts, and the Wolf River upstream to Shawano Dam</b>					
Carp				Larger than 20"	

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Waterbody/Species	Unlimited	Eat no more than 1 meal a week or 32 meals/year	Eat no more than 1 meal a month or 12 meals/year	Eat no more than 1 meal every 2 months or 6 meals/year	Do Not Eat
Channel Catfish			Larger than 17"		
All other species and/or sizes	follow the  eating guidelines				
Manitowoc River (south branch) and its tributaries below Chilton to Hayton Millpond (including Pine Creek)					
All Species					All sizes
Manitowoc River below Hayton Dam down to Clarks Mills Dam					
Carp					All sizes
Rock Bass					All sizes
White Sucker					All sizes
Northern Pike			All sizes		
Bullhead			All sizes		
Manitowoc River from the mouth up to the dam at Clarks Mills					
Carp					
Channel Catfish				Less than 20"	Larger than 20"



Smallmouth Bass			All sizes		
Northern Pike			All sizes		
Trout and Salmon	follow the Lake Michigan PCB advisory				
Menominee River from Pier's Gorge to Lower Scott Flouage					
Redhorse			All sizes		
Carp			All sizes		
Walleye	see specific advice for mercury, Marinette County				
Milwaukee River—Estuary to Estabrook Falls including Menomonee River, Kinnickinnic River and Lincoln Creek					
Carp					All sizes
Northern Pike					All sizes
Walleye			Less than 18"	Larger than 18"	
Smallmouth Bass					All sizes
Redhorse					All sizes
White Sucker					All sizes
Rock Bass					All sizes

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