



Minnesota Pollution Control Agency

Minnesota's Comprehensive Mercury Air Emission Reduction Strategy

Developed to Implement a Statewide Mercury
TMDL

Ned Brooks
November 18, 2009

Overview

- Sources of Mercury in Minnesota Fish
- Establishing Reduction Goals (TMDL)
- Strategies to Reduce Mercury Air Emissions
- Implementation Update

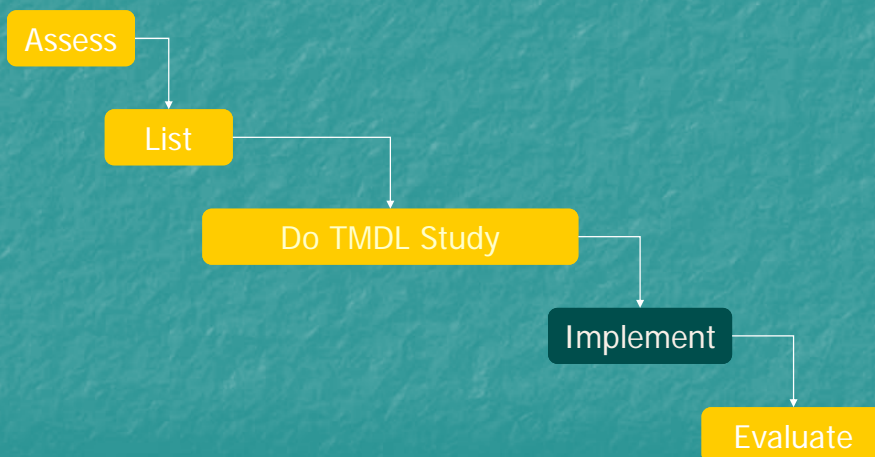


Waters "Impaired" by Mercury in Fish



- >0.2 ppm Hg
- Recommended to eat fish once per month or less
- 2/3 of lakes and rivers tested

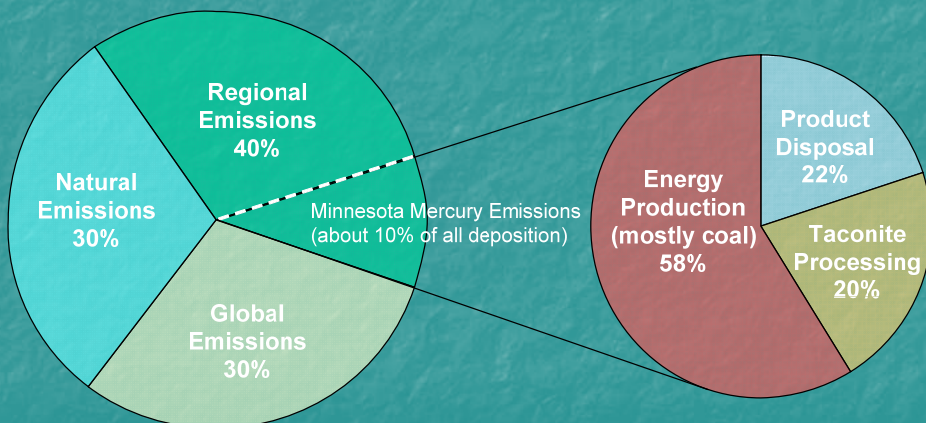
The Impaired Waters Process



Minnesota's Statewide Mercury TMDL

- Most (<99%) of mercury contamination comes from air sources
- 90 % of mercury deposited in state comes from outside of the state
- Total Maximum Daily Load:
 - 93% reduction in manmade deposition (from 1990) to allow more frequent fish consumption
 - Reduce MN air sources to 789 lb/yr
 - Water point sources not to exceed 1% of total mercury load allocation (*24 lb/yr*)
 - <http://www.pca.state.mn.us/water/tmdl/tmdl-mercuryplan.html>

Sources of Atmospheric Deposition to Minnesota, 2005 Minnesota Emissions



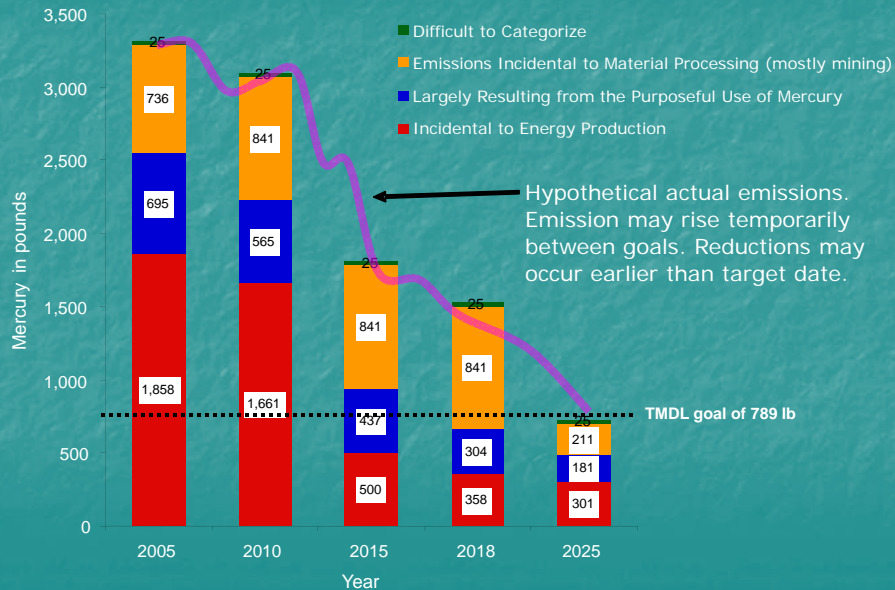
Implementation Planning Process

- June 2007 – May 2008
- Third party hired to convene and facilitate stakeholder-recommended strategies to meet TMDL goals
- Two-tiered stakeholder engagement
 - group of 17 met 16 times during year
 - all known stakeholders invited to attend two input sessions and comment on drafts.
- MPCA role
 - Member of the group, technical support

Implementation Planning Outcomes: Air Reductions

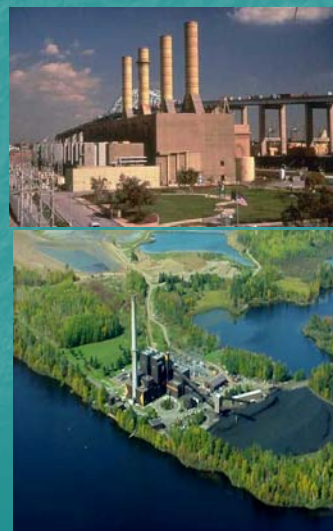
- Stakeholder-developed recommendations to meet reduction target by 2025
- 70-90% reductions from nearly all source categories
- Strategy for new and expanding sources
- Improve measurement and reporting
- MPCA commitment to implement

Projected Mercury Emissions 2005-2025

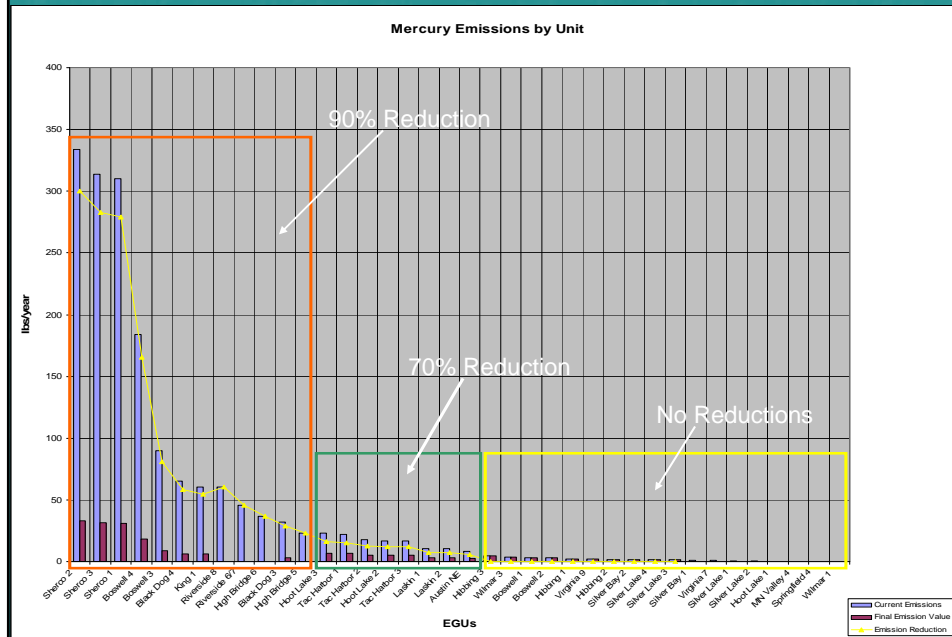


Energy Sector Strategies (2005 Emissions)

- Coal Fired Electric Generation (1,716 lb)
 - various strategies achieve 86% reduction by 2025, mostly sooner
- Industrial/Commercial Boilers (102 lb)
 - Wood and coal
 - 70% reduction at units greater than 2 lb by 2018
- Petroleum (40 lb)
 - Refineries-- 50% reduction by 2018
 - Product utilization-- better quantify and reduce if needed



Hg Reductions Planned at EGUs

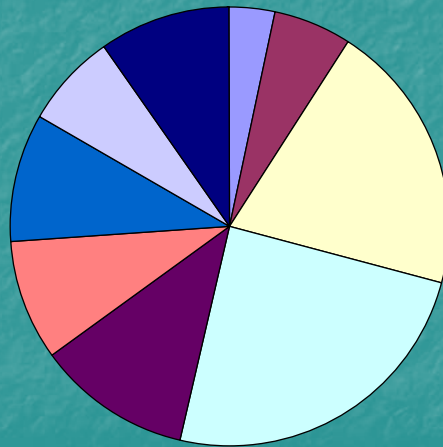


Mining Strategy Highlights

- Six taconite processing facilities emit 800+ lb/yr
- Reduce emissions to 210 lb/yr by 2025 (75% reduction from estimated 2010 levels)
- Continue research to identify reduction/control
- Apply and test possible technologies- 2010-2015
- Provide schedule for implementation at all facilities by 2016

Product-related Mercury Emissions

2005 (est.)



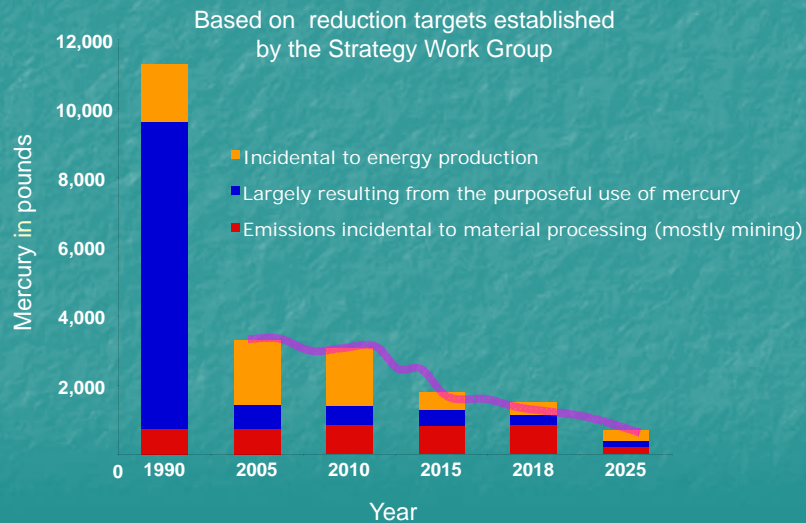
- Spills and land dumping
24 lb
- On-site household waste
incineration 40 lb
- Smelters (cars and
appliances) 139 lb
- Solid waste processing
169 lb
- Crematories 80 lb
- Dental preparations 62 lb
- Recycling mercury
products 65 lb
- Municipal waste
combustion 49 lb
- Other 67 lb

695 lb/yr

2005 Product Emission Sources > 50 lb/year (est.)

- Misc. mercury in waste ~235 lb
 - Collection and processing ~ 169 lb
 - Burn Barrels ~ 40 lb
- Waste Combustion ~ 49 lb
- Smelters recycling cars/appliances ~ 139 lb
- Dental-related
 - Dental preparations ~ 62 lb
 - Cremations ~ 80 lb
- Product recycling (mostly lamps) ~ 65 lb
- Strategies developed to reduce sector emissions to 502 lb by 2025 (28% reduction from 2005)

Projected Mercury Emissions 1990-2025



Factors Contributing to Successful Stakeholder Process

- Clean Water Act requirement to implement TMDL reduction goals
- Previous attempt in 1997-1999 resulted in little progress
- 2006 State legislation requiring reductions at states 3 largest power plants
- Neutral facilitation
- Good timing

Air Implementation Plan Key Elements

- Permitted facilities – proposed rule would require plans to achieve goals
- Unpermitted “point” sources - work with MPCA to improve emissions estimates and implement reduction measures
- Product sources - variety of approaches including outreach, assistance and enforcement
- Guidelines for new sources emitting >3 lb/yr

More Information

- Minnesota Pollution Control Agency web site:

Implementation Plan: www.pca.state.mn.us/air/mercury-reductionplan.html

TMDL: www.pca.state.mn.us/water/tmdl/tmdl-mercuryplan.html

- Ned Brooks, MPCA Mercury Coordinator
ned_brooks@state.mn.us
651-757-2247
- Other MPCA Staff: Bruce Monson, Ed Swain, John Gilkeson, Carol Hubbard