6.0 PARTNERS AT WORK

This section presents summaries of some of the key stakeholder activities that have contributed to the progress in achieving Strategy goals. These summaries focus specifically on efforts to reduce mercury from the environment.

National Wildlife Federation

Excellent progress has been made in enhancing state-level pollution prevention work.

- Mercury reduction scenarios demonstrating how Michigan can achieve 90 percent mercury reduction by 2010 and virtual elimination by 2020 have been drafted and refined.
- A report has been drafted that explores different mercury reduction strategies feasible in each source sector and the comparative costs of each. This report should be available for peer review soon.
- Based on the research conducted for the report, NWF presented the mercury reduction and cost research to a binational stakeholder forum sponsored by US EPA and Environment Canada in May 2002. Much lively debate and feedback to improve the report was received.
- Michigan leaders, including Lieutenant Governor Richard Posthumous, Attorney General Jennifer Granholm and State Senators Joe Schwartz and Stille, endorse a mercury phaseout.
- In related work that supports this progress, NWF has published two reports entitled, "Getting Serious About Mercury: A Guide for Developing Comprehensive Mercury Reduction Programs" and "Mercury Products Guide: The Hidden Dangers of Mercury". Both are available from NWF's Great Lakes office. Contact Kathleen Eales at 734-769-3351, eales@nwf.org, or National Wildlife Federation, Great Lakes Natural Resource Center, 213 W. Liberty St, 2nd Floor, Ann Arbor, MI 48104-1398 to request copies.

Michigan Department of Environmental Quality (MDEQ)

Pollution prevention (P2) continues to be the primary strategy for reducing anthropogenic (human derived) sources of mercury within Michigan. MDEQ documented more than 11,000 pounds of mercury that have been reduced by P2. MDEQ predicts additional reductions will exceed 114,000 pounds by 2005. Activities being undertaken by the Environmental Science and Services Division, MDEQ, to reduce mercury include:

- Mercury Switch Study – MDEQ staff is participating in a study with auto companies to evaluate the technical, logistical, and procedural factors associated with the removal of mercury convenience light switches from scrapped automobiles. More than 1200 vehicles will be evaluated for mercury switches and cataloged. Switch removal times will be correlated with make, model, and year of vehicle. The most efficient tools and techniques will also be reported. The final report is due December 2002.
- Legislation – HB 4599 (passed by both House and Senate) will ban the sale of mercury thermometers in Michigan after January 1, 2003.

- Education/Outreach Tools – MDEQ developed an award-winning video and interactive compact disk for schools. The Mercury P2 CD received a National NPPR MVP2 (Most Valuable P2 Program/Publication) Award. The CD was sent to 11,000 school libraries and 500 school superintendents. Nearly 2,000 schools have already reported eliminating mercury, well in advance of the 2004 statutory requirement.
- Thermometer Exchange – The highly popular "Catch the Fever", Thermometer Exchange Program, has recovered over 29,000 mercury thermometers through 44 exchange 'events'. Participants turn in mercury thermometers and receive a free digital thermometer in its place. In addition, people are also turning in jars of liquid elemental mercury, switches, thermostats, relays, manometers, barometers, and other devices containing mercury.
- Mercury Spill Workshops – Nine workshops were conducted during which 386 first responders were trained on proper procedures and techniques for addressing mercury spills. This training effort is a cooperative partnership with MDEQ, Michigan Department of Community Health, US EPA, and the Detroit Medical Center.

WE Energies

Pollution Prevention Work

- A resurvey completed in 2001 showed that mercury-containing equipment in WE Energies' power plants and Steam Services System totaled approximately 150 pounds and 59 pounds, respectively. The remaining mercury-containing equipment in WE Energies' power plants is largely contained in hundreds of switches and thermostats located throughout the five major coal-fired power plants and three combustion turbine complexes. The remaining mercury-containing equipment in the Steam Services System is comprised of flow meters. One-half of these meters were scheduled for replacement in 2002.

Emission Reduction Work

- A key assumption used by US EPA in their assessment of costs to reduce mercury emissions from coal-fired boilers involves the perceived "collateral benefits" of NOx and SO_2 control strategies to also control mercury. Preliminary work completed at WE Energies' Pleasant Prairie Power Plant suggested that catalysts employed by an SCR (NOx control) can oxidize elemental mercury, thus making it more likely to be captured by wet scrubbers or existing particulate collectors (e.g., ESPs or fabric filters). However, research at operating SCRs funded by the Electric Power Research Institute (EPRI), US EPA, and the Department of Energy (DOE) in 2001 found that SCR oxidation of elemental mercury appeares to be fuel-specific and SCR-design-specific. More research was conducted in 2002 to better understand this very important reaction, including a long-term evaluation of catalyst performance using a slip-stream of flue gas at the Pleasant Prairie Plant.
- In 2001, a "full scale" test of activated carbon was conducted at Pleasant Prairie Power Plant. This site was selected by the DOE to be one of four existing power plants where sorbent injection was tested as a potential mercury control strategy. The results of this

test are as follows:

1. It is possible to design, build, and operate equipment at a scale capable of treating power plant flue gas.
2. Depending on the amount of sorbent injected, between 40 percent and 70 percent of mercury is removed from the plant. Beyond 50 percent removal, the mercury reduction benefit of increased carbon injection begins to rapidly decrease.
3. Between 1 and 10 pounds of activated carbon per million cubic feet of flue gas is required to remove 40-70 percent of the mercury.
4. While flue gas cooling enhanced mercury removal efficiency under laboratory and limited field testing conditions at other sites, it has minimal effect at the test site.
5. No adverse impacts on ESP performance were found during the week-long testing.
6. Injection of even small amounts of activated carbon will prevent fly ash from being beneficially re-used in concrete and may require that the ash be landfilled instead.

Wisconsin Department of Natural Resources

Wisconsin's Department of Natural Resources (WDNR) started a mercury reduction program in 1998. Its goals are to 1) reduce the public's use of mercury-containing products by promoting alternatives, 2) promote recycling of mercury products that continue to be used, and 3) reduce the potential for mercury spills. The program focuses on sectors where mercury products have historically been used. These include healthcare facilities, dental facilities, schools, HVAC contractors, dairy farms, auto scrap yards, and households. The WDNR is partnering with 22 of Wisconsin's largest municipalities in implementing mercury education and recycling programs.

During 1998-1999, a "Mercury Roundup" was conducted in the communities participating in the mercury reduction program. Free recycling of mercury and mercury devices was offered to medical, dental, and educational facilities. The total amount of mercury collected was 5,100 pounds. During 2000-2001, a similar "Wisconsin Mercury Recycling Program" was offered to households and businesses in the mercury reduction communities. All devices were accepted except fluorescent bulbs; the recycling was offered for free or low cost. This collection generated a total of 6,600 pounds of mercury.

In the dairy manometer program, over 500 manometers have been removed or replaced by non-mercury manometers and about 375 pounds of mercury have been collected. The auto switch sector recently completed their first round of collections, which totaled 4,980 auto switches or 11 pounds of mercury from auto scrap yards. A substantially greater number of switches are anticipated to be collected in the next collection. All of these programs are supported by federal and state grants, both to WDNR and to the mercury reduction communities.

Superior Wastewater Treatment Plant

The Superior Wastewater Treatment Plant (Superior WWTP) has been a motivated participant in mercury and other toxin reduction activities in the past year.

- Targeting dioxin, Superior WWTP developed a program to discourage the use of burn barrels. A unique PowerPoint presentation was created and recorded onto CDs that are

given to any interested parties.

- Many of Superior WWTP's programs target mercury. To date, over 7,200 items (estimated 363 pounds of mercury) have been collected from various mercury sectors. Superior WWTP hosts various mercury collections, including: fever thermometer exchanges at fairs and other events, thermostat collections at eight local businesses, and a permanent mercury drop-off site at the Superior Wastewater Treatment Plant. Superior WWTP has also gathered 120 mercury fever-thermometers from 17 northern Wisconsin camps.
- Over 50 schools have participated in Superior WWTP's Mercury-Free Schools program. The program offers a mercury curriculum, class presentations, collection and recycling of any mercury items, and rewards for mercury items turned in. All five new-car auto dealers in Superior began to switch out mercury switches in the hoods and trunks of all cars sold at their lots. The City of Superior and Douglas County have removed switches from their auto fleets as well.
- Superior recently passed an ordinance banning the land-filling of fluorescent bulbs. Superior WWTP sent coupons (funded by two local businesses) to residents to cover the cost of recycling 10 fluorescent bulbs.
- Recently, Superior WWTP initiated a Dental Mercury program to educate dental offices on Best Management Practices, in order to reduce amalgam in the waste stream. Education certificates are rewarded to those who participate, and one participant will win an amalgam separator.

Western Lake Superior Sanitary District Near Achieving Great Lakes Mercury Limit

A newly approved low-level test method for mercury (US EPA Method 1631) shows that the Western Lake Superior Sanitary District (WLSSD) in Duluth, Minnesota, is approaching the water quality-based limits described in the Great Lakes Water Quality Agreement. The new method, which can measure mercury concentrations under one part per trillion in water, has been a useful tool in showing how close WLSSD's effluent is to meeting the limit. The old test method could not accurately measure mercury concentrations as low as that in the WLSSD effluent and skewed the old data high. WLSSD was pleasantly surprised by the new data.

The lower mercury concentrations in WLSSD's effluent are not only due to the new testing method. Comprehensive programs at all levels are starting to show their effects. Federal regulation of mercury in paint, batteries, and mildewcides and reduced use of mercury in consumer products are starting to show benefits. WLSSD has been working with customers of all sizes to reduce or eliminate mercury discharges at the source. Demonstration grants from US EPA, Great Lakes Protection Fund, and the Great Lakes National Program Office have allowed WLSSD to demonstrate that source reduction can be effective.

WLSSD has several source reduction programs. The latest effort is the voluntary installation of amalgam removal equipment at dental offices. Presently, 80 percent of dental practices in the WLSSD service area are using simple on-site treatment that captures 95-99 percent of the mercury that historically would have been discharged to the sewer. WLSSD is also working with industrial customers to substitute cleaner raw materials containing less mercury. In

addition, a large educational effort is being directed to households and schools to promote the use of alternatives to mercury-containing products.

National Electrical Manufacturers Association

The National Electrical Manufacturers Association (NEMA) reports the following mercury reduction accomplishments.

Batteries:

The NEMA battery section continues to document the decline in mercury levels from batteries in the waste stream. In the 1980s the battery industry used over 1,000 tons of mercury in household batteries, well over half of the mercury used in consumer products. The industry eliminated its use of mercury in all batteries except button cells by 1993. In an analysis of batteries collected in Hennepin County, Minnesota, conducted in fall 2001, mercury levels dropped to 336 ppm, down from the historical level of 10,000 ppm, and 91 percent of collected batteries were mercury free. NEMA projects the remaining old batteries will be out of the waste stream by 2008.

Lamps:

NEMA lamp manufacturers continued to reduce their use of mercury in energy efficient mercury-containing lamps. Manufacturers used 9 tons of mercury in lamps sold in the US in 2001, down from an estimated 27 tons in 1990. The average mercury level in a standard four-foot lamp declined to 8.2 mg in 2001, in contrast to 41.6 mg in 1990 and 23 mg in 1994. NEMA lamp manufacturers also were instrumental in obtaining Congressional appropriation of $2 million to promote lamp recycling.

Thermostats:

In 2001, the Thermostat Recycling Corporation (TRC) recovered over 48,000 thermostats containing over 400 pounds of mercury nationwide. In the first half of 2002, the TRC collected nearly 29,000 thermostats containing 231 pounds of mercury. To date the TRC has recovered nearly 1,300 pounds of mercury.

Indiana Department of Environmental Management

The Indiana Department of Environmental Management (IDEM) continues to hold mercury thermometer exchanges with various partners. For three years (since 2000) Cinergy has partnered with IDEM and Eli Lilly to purchase thermometers for exchanges held around the state. These exchanges were held at Earth Day celebrations, child care facilities, Cinergy offices, health fairs, county fairs, and the Indiana State Fair, at hospitals, solid waste management districts, Black Expos, and many more unique places. Since 2000, more than 45 mercury exchange events have been held, and more than 8,800 mercury fever thermometers have been collected. Other mercury devices, including 154 large thermometers and 89 thermostats, and more than 172 pounds of elemental mercury have also been collected. Visit www.in.gov/idem/mercury for a detailed list of events for 2000-2002 and the amount of

mercury-containing items that were collected at each event.

The Indiana Mercury Reduction Pledge Program for Hospitals has transitioned into a national program, and IDEM no longer has its own separate hospital pledge program for mercury.

IDEM, in partnership with the Indiana Department of Health, the Indiana Dental Association, and Indiana Solid Waste Management Districts, is working to schedule an elemental (liquid) mercury sweep for Indiana dentists in early 2003. IDEM and its partners have also agreed to work together to create an environmental pledge program for Indiana dentists. The anticipated completion date of the pledge is late 2003. More information can be found at: http://www.in.gov/idem/mercury/programs/dentalmercury.html

IDEM, in partnership with the U.S. Geological Survey (USGS), has set up four mercury deposition stations throughout Indiana. Data are being collected for both wet and dry deposition. Mercury released into the air (from natural sources and from human sources such as coal-fired power plants, municipal incinerators, and industrial boilers) is for the most part transported to the surface of the earth through precipitation. Mercury has been detected at precipitation monitoring stations throughout North America. The USGS, in cooperation with IDEM, established and currently operates the precipitation-monitoring network for mercury in Indiana. This monitoring program is coordinated through the IDEM Mercury Workgroup and is funded by USGS and IDEM's Office of Air Quality and Office of Water Quality. An overview of the IDEM/USGS Monitoring Program, as well as currently available data summaries for the Indiana monitoring network, are available at: http://www.in.gov/idem/mercury/air/index.html

IDEM created a mercury cleanup and spill guidance document that can be found at: http://www.in.gov/idem/ctap/mercury/spill.pdf

The Indiana Mercury Reduction and Recycling for Schools pledge includes 58 Indiana schools. The school pledge can be viewed at: http://www.in.gov/idem/kids/mercury/schoolpledge.pdf.

The Mercury Thermostat Reduction and Recycling Pledge Program is the beginning of several initiatives to voluntarily reduce the amount of mercury-containing devices that may be found in homes. Since the beginning of the program in September 1997, nearly 200 Heating, Ventilation and Air-Conditioning (HVAC) suppliers and contractors have signed up to participate in the voluntary program. Program participants are working with the Thermostat Recycling Corporation to utilize free recycling of discarded mercury-containing thermostats. For more information, visit our web site at: http://www.in.gov/idem/mercury/programs/hvac/index.html

Great Lakes United

Due in part to the outreach efforts of Great Lakes United (GLU) and the Clean Car Campaign, including the 2001 report *Toxics in Vehicles: Mercury*, the North American auto industry has committed to phasing out mercury switches from all models by the end of 2002.

In 2002, GLU continued to pursue a comprehensive solution to the problem of mercury in automobiles through the development of an action plan calling for: 1) a manufacturer-sponsored

collection and recovery program to capture mercury switches currently in commerce; 2) a manufacturer commitment to design for recycling and stop the introduction of new mercury uses; and 3) leadership on the issue by government entities through adoption of "mercury free" preferential purchasing policies.

GLU also set up a workgroup to determine the best means for recapturing mercury in existing vehicles before they are scrapped and recycled. The workgroup, comprised of non-governmental organizations, end-of-life industry, and state agency partners, developed model legislation for mercury recovery from automobiles, surveyed U.S. states for their mercury and "extended producer responsibility" regulations and programs, and developed a toolbox of legislative and incentive opportunities for states to pursue mercury reductions. The "toolbox" will be used in a series of videoconferencing sessions being held to help the stakeholders determine next steps for achieving high recovery rates of mercury from vehicles.

Through 2003,GLU and its partners will continue to work with governments and the auto sector on cost-effective ways to eliminate mercury from cars.