





Protecting Michigan's environment through pollution prevention (P2) is a key element in preserving Michigan's natural resources for future generations. The state's P2 programs are administered by the Michigan Department of Environmental Quality (MDEQ) in accordance with Parts 143 and 145 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). This legislation, enacted in 1987 and amended under Act No. 289, Public Acts of 1998, entrusts the MDEQ with the responsibility for:

- Infusing P2 into MDEQ regulatory and permit programs,
- Educating and serving as a catalyst for change within the business community to bring about reductions in the generation of environmental wastes, and
- Providing technical and financial assistance to small businesses and institutions to facilitate in-plant P2.

The MDEQ's P2 programs are a conduit for non-regulatory assistance to businesses, institutions, and local communities to improve the environment and protect workers and citizens from exposure to harmful substances. Under our sector partnerships, specific industries are provided customized assistance, and participating facilities are publicly recognized for their accomplishments. Other initiatives focus on specific waste streams or environmental issues of community-wide concern. Demonstrations and evaluations of P2 technology increase its acceptance and use within industry.

Technical and financial services are offered to assist businesses with identifying and implementing process efficiencies and alternatives to using hazardous and toxic materials. This includes free, confidential, on-site assistance available to businesses of less than 500 employees. Businesses may also be eligible for low-interest loans, technology demonstration grants, and student interns. MDEQ fact sheets and case studies provide information on the application of techniques to further water conservation, energy efficiency, chemical use reduction, and recycling. Pollution prevention staff work with local businesses, trade and professional associations, county health departments, and MDEQ's regulatory staff to offer assistance at the local level.

This annual report fulfills the reporting requirements to the Legislature and showcases Michigan's P2 programs and the importance of taking care of Michigan's resources.

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AUTHORITY: PA 451 OF 1994  
TOTAL COPIES: 500  
TOTAL COST: \$3,993.14  
COST PER COPY: \$7.986  
Michigan Department of Environmental Quality





## Michigan ... Leading the Way in Pollution Prevention

### P2 AWARDS AND HONORS

Michigan is setting the standard when it comes to P2 with national recognition and local initiatives.

- The National Pollution Prevention Roundtable recognized Michigan as a national leader in environmental innovation at its 10<sup>th</sup> Annual Awards Ceremony in Washington, DC. Michigan received two Most Valuable Pollution Prevention Awards:
  - The Michigan Turfgrass Environmental Stewardship Program provides opportunities for and promotes P2 for the turfgrass industry.
  - Steelcase Corporation for its accomplishments toward environmental stewardship, sustainable operations, community engagement and social responsibility outlined in its 2006 Environmental Report.
- Michigan set the bar at the Hospitals for Healthy Environment (H2E) Annual Awards Ceremony in Seattle, Washington, with 5 out of 14 hospitals receiving the nation's highest environmental award, the Environmental Leadership Award. The award is given to hospitals nationwide for maintaining a 46 percent recycling rate, eliminating 5,000 pounds of waste, reprocessing single-use devices, installing energy efficient lighting, and other P2 practices.
  - Borgess Medical Center, Kalamazoo (2005 winner)
  - Bronson Methodist Hospital, Kalamazoo (2000, 2004, 2005 winner)
  - Sparrow Health Systems, Lansing (2005 winner)
  - University of Michigan Hospitals & Health Centers, Ann Arbor (2002, 2004, 2005 winner)
  - W.A. Foote Health Systems, Jackson (2005 winner)
- The Green Team Award is presented by the U.S. Green Building Council (USGBC) to organizations that have implemented green building practices and to promote Leadership in Energy and Environmental Design (LEED) standards.
  - Bronson Methodist Hospital, Kalamazoo, received the award for recycling 75 percent of a 10-story demolition project, in addition to having a total recycling rate of 44 percent.





- Sparrow Health System, Lansing, (runner-up) reduced its biological waste from 12.7 lbs./occupied bed/day to less than 3 lbs./occupied bed/day.
- University of Michigan Hospitals & Health Centers, Ann Arbor, (runner-up) replaced mercury-containing devices (thermometers, sphygmomanometers, switches, and gauges) and recycled batteries and fluorescent tubes.

- The **DEQ Neighborhood Environmental Partners** Gold Award program recognizes businesses or facilities and their community partners for implementing local, voluntary environmental projects. This year's winners were:

*"This is a great honor for Cascade Engineering and recognizes our strides towards environmental sustainability for not only our company, but also the community in which we live and work. Our programs and work are constantly evolving, and we are proud to be one of the state leaders in this extremely important arena of environmental sustainability."*  
*Fred Keller, CEO, Cascade Engineering*

- Cascade Engineering, Grand Rapids
- Consumers Energy - J.R. Whiting Plant, Erie (second time award winner)
- Dow Corning - Midland Site, Midland (second time award winner)
- Fort Custer Training Center, Augusta
- General Motors Powertrain - Warren Transmission, Warren
- Smurfit Stone Container Corporation - Ontonagon Mill, Ontonagon (second time award winner)
- Steelcase Inc., Grand Rapids
- Weyerhaeuser Company - Grayling OSB, Grayling

- Several **Michigan Department of Defense (DoD)** facilities received recognition for their P2 achievements.
  - U.S. Army Garrison Mail Handling Facility, Warren, achieved a Gold rating under the Army Sustainable Project Rating Tool (SPiRiT) for its environmental efficiency design. The facility incorporates natural lighting, a metal roof, energy efficient lighting and mechanics, and a storm water bioswale.
  - Fort Custer in Battle Creek (Michigan Army National Guard) received the DEQ Neighborhood Environmental Partnership (NEP) award for a variety of environmental enhancement projects at the base/facility.
  - Alpena Combat Readiness Training Center received Clean Corporate Citizen (C3) designation in 2006. It was the first DoD facility to receive the award.
- The DEQ Warren District Office, Warren, was designated a silver Leadership in Energy and Environmental Design certification for its green building by the USGBC. Silver LEED certification goes beyond the basic requirements with additional environmental and health aspects.





## P2 IN ACTION

The MDEQ takes action when it comes to P2, providing assistance to businesses, institutions, and the public to improve the environment and save money through P2 accomplishments. Non-regulatory assistance programs offer information, technical assistance, and financial incentives to help facilities reduce pollution.

- **Agricultural Pollution Prevention (AgP2)** is a partnership among the Michigan Department of Agriculture (MDA), MDEQ, Michigan agricultural associations, and farmers to promote voluntary P2 in agriculture. Key goals focus on preventing pollution through increased efficiency while maintaining and improving on-farm profitability.
  - AgriEnergy Alliance was created to coordinate and develop a plan for AgriEnergy efforts.
    - ◆ 300 attended Michigan's first Harvesting AgriEnergy Conference covering Michigan's opportunities for wind, anaerobic digesters, and biofuels.
    - ◆ On-farm program for energy efficiency is being developed.
  - Michigan Agriculture Environmental Assurance Program (MAEAP) ensures that producers are engaging in cost-effective P2 practices.
    - ◆ MAEAP verified farms in Fiscal Year 2006:
      - 75 livestock systems (168 total)
      - 52 farmstead systems (121 total)
      - 36 cropping systems (65 total)
    - ◆ Additional results: 130 agricultural discharges eliminated, 1,315 manure spreading plan components developed (i.e., manure analysis, soil testing, equipment calibration, fertilizer reductions, etc.), 1,010 conservation practices implemented (i.e., sensitive area setbacks, reduced tillage, installed buffer strips, cover crops, etc.), 259 odor management practices adopted (i.e., management plans developed, biofilters and covers installed, shelterbelts, etc.), and 30+ MAEAP partnership supporters.
  - MSU-Extension Partnership
    - ◆ Assisted the Urban Community Youth Outreach in obtaining a grant for a corn furnace-heated greenhouse.
    - ◆ Coordinated Urban Gardening Project for 8 Flint community sites.
    - ◆ Assisted in the Farm to Table, an agriculture literacy program.
    - ◆ Michigan Custom Manure Applicators certification program developed for manure applicators.
  - Saginaw Bay Watershed Initiative Network AgP2 Task Group funded 5 projects in Fiscal Year 2006 addressing agricultural issues including scientific irrigation



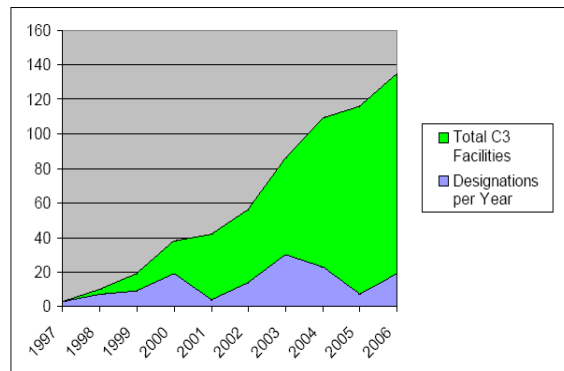


scheduling, organic education and advancement, forage and pasture management, and integrated cropping systems.

- **“Catch the Fever” Mercury Thermometer Exchange** provides incentives for the public to turn in their mercury thermometers as well as other mercury-containing devices in exchange for a digital thermometer.
  - 81 exchanges were held throughout Michigan thanks to a partnership with Michigan Hospital Association, Michigan Association of Local Public Health, and MDEQ.
  - Educational brochures describing the dangers of mercury and a chance to ask questions of a mercury expert were available.
  - More than 41,000 mercury-containing devices and 1,000 pounds of free-flowing liquid elemental mercury have been recovered.

- **Clean Corporate Citizens (C3)** demonstrate a consistent record of environmental compliance, an active P2 program, and a functioning Environmental Management System in their operations.

- Over 100 C3s. New sectors this year include a local unit of government, a hospital, and several federal facilities.
- Program improvements are being developed to add clarity, strengthen the criteria, and reduce administrative burden, enhancing the value of membership and ensuring that only those with the strongest environmental performance will be eligible.



**Clean Corporate Citizen Program Growth 1997-2006**

- **Department of Defense (DoD)/Michigan Environmental Alliance** facilitates P2 information and technology exchange among participating federal defense sites in Michigan. The Alliance partners are 12 U.S. DoD sites in Michigan, MDEQ, and U.S. EPA Region 5.
  - There were approximately 50 attendees at the 5<sup>th</sup> Annual Federal Facilities Environmental Workshop including military affiliates, consultants, and other federal staff.





- Updated the DoD/Michigan Environmental Alliance Charter including its vision, mission, and goals.
- P2 Successes
  - ◆ Selfridge Air National Guard Base ensures compliance with MDEQ storm water regulations to minimize potential pollutants on adjacent surface waters. The Civil Engineering Environmental Team continues to raise the awareness of storm water issues to Selfridge employees and residents through training, awareness, and outreach programs which promote voluntary actions to prevent storm water pollution.
  - ◆ Selfridge Air National Guard F-16 Electric Shop staff were proactive in recovering halon and putting it back in storage for reuse rather than releasing it to the atmosphere per the standard procedures.
  - ◆ U.S. Army Mail Handling Facility, Warren, achieved a \$10,000 cost savings with a total estimated savings of \$196,000 over the life of the building through energy efficient design incorporating natural lighting, a metal roof, energy efficient lighting and mechanics, and a storm water bioswale.

*“The Michigan Army National Guard has always taken pride in its citizen/soldier status. The stewardship we provide for the natural resources at Fort Custer shows our dedication to being good neighbors. We are very proud of the fact that we have been able to ensure our soldiers are trained to the best of their ability, while conforming with environmental laws and regulations. However, this could not be accomplished without the support and dedication of the many community partners who have been willing to work with us. We are honored to be chosen for this (DEQ’s Neighborhood Environmental Partners Gold Award) award.”*

*Greg Huntington, Environmental Manager, Michigan National Guard*

- **Environmentally Preferred Purchasing (EPP)**, a partnership between Department of Management and Budget and MDEQ, promotes the use of environmentally preferred products in state government through various efforts.
  - Updated Green Industry Purchasing Guide.
  - Provided EPP training at several corporate and trade organization workshops
  - Works with task forces, committees, and workgroups as well as P2 partnerships and initiative.
  - Promotes preferred purchasing to schools through community P2 projects.
- **Groundwater Stewardship “Clean Sweep” Program** funded mercury recycling and disposal drop-off through grants provided by the U.S. EPA and a financial contribution from the Alliance of Automobile Manufacturers.

P2 IN ACTION





- 15 Clean Sweep sites for schools, farms, hospitals, small businesses, and the public, were located across the state to drop-off of liquid elemental mercury and mercury-containing devices.
- In the past three years, 43,000 mercury-containing devices were recovered.
- A total of 2,271 lbs. of mercury from devices and liquid elemental mercury were removed from Michigan storerooms, classrooms, basements, attics, closets, and storage sheds.
- **Mercury Switch P2 Recovery Program** promotes mercury switch removal from automobiles at the end of their life cycle.
  - In 2004, Michigan became the first state in the nation to enter into a cooperative, voluntary, two-year agreement with the Alliance of Automobile Manufacturers to offer a statewide collection program for the recovery of mercury automotive switches.
  - An estimated 40,000 mercury switches were recovered from end-of-life vehicles between 2000 and 2006.
- **Michigan Business Pollution Prevention Partnership (MBP3)** is open to all Michigan businesses, regardless of size, interested in initiating or expanding P2 practices and receiving recognition from MDEQ for their efforts.
  - Responded to over 125 specific requests for P2 practices using electronic information network including:
    - ◆ Dunnage alternatives/returnable packaging
    - ◆ Bio-based fuels/lubricants
    - ◆ Green workshops/conferences
    - ◆ Alternative cleaners
    - ◆ Lighting upgrades/tax deduction
    - ◆ Green chemistry
  - 34 new partners in Fiscal Year 2006
  - 325 Registered Partners in 47 counties representing 129 cities resulting in:
    - ◆ Total reduction of pollutants: 617,500 tons
    - ◆ Water resources conserved: 502,977,882 gallons
    - ◆ Percent of Partner Goals [Met or Exceeded]: 96 percent
  - 96 percent of reporting partners submitted their annual reports electronically. Future reporting will utilize a web-based reporting format and database storage.
  - Future training opportunities will be offered through conference calls, web casts, and other web-based technologies.

*“The MBP3 program has been a solid and constant source of good information on what’s happening in the P2 world, as well as providing direction to other resources.”*  
 DENSO Manufacturing





- **Michigan Clean Marinas Pollution Prevention Program** promotes the voluntary adoption of measures that lead to reductions or eliminations in pollutants from marinas, recreational boats, and public access areas.

- Designation of the program's first 9 Michigan Clean Marina facilities with an additional 50+ working toward designation.
- Expansion and enhancement of marina/boater information network.
- Participation by all of Michigan's state-owned marinas and harbors.
- Increased education and outreach to Michigan's 1,000,000+ boaters.
- Implementation of operational best management practices:
  - ◆ Mandatory use of dock-side spill kits, booms, and other spill protection
  - ◆ Increased use of signage and educational brochures
  - ◆ Shrink wrap recycling
  - ◆ Increased storm water management

*"Years ago, we developed a mission statement that included providing our employees a safe, healthy, and enjoyable working environment. The Clean Marina Program provided us with a plan of implementation for this goal. Our employees have all come on board as stakeholders in protecting our water and have even greater attitude knowing that management cares about their working environment and is a responsible steward in the community."*  
 Ward Walstrom, Walstrom Marine, Bay Harbor

- The **Michigan Great Printers Project** is a partnership between MDEQ and participating printers. The partnership provides technical assistance and promotes the implementation of P2.

- Two members received P2 loans to purchase a computer-to-plate imaging system that eliminated the need for chemical solutions, including fixers, developers, activators, and stabilizers (totaling 500 gallons/year); reduced water consumption from 300 gallons per year to 20 gallons per year; reduced prepress solid waste by 80 percent; and eliminated 10,800 feet of film per year and 350 sets of match print proofing material per year.
- 129 partners (8 new) representing 35 counties and 66 cities.
- 85 percent of membership was due for biennial review in FY06, 40 percent of which chose goals equating to source reduction activities.

- **Michigan Turfgrass Environmental Stewardship Program (MTESP)** partners the turfgrass industry, state agencies, Michigan State University, and advocacy groups to advance the environmental stewardship of the industry and to recognize environmental achievements.





*“With all of the environmental challenges golf course superintendents deal with on a daily basis I wouldn’t be comfortable managing the property for the people that own this club without the Michigan Turfgrass Environmental Stewardship Program. The resources that are available to assist me are incredible. How could you afford not to be a member of the MTESP when staff from the Department of Environmental Quality and Michigan State University faculty manage and administer the program? Not to mention the experience shared by 227 other golf course managers.”*  
 Steve Hammon, Golf Course Superintendent, Traverse City Golf and Country Club

- A total of 234 member courses (9 new this year) showed continuing growth and expansion leading to broad-based involvement by golf courses.
- Increased educational opportunities specifically targeting waste management, energy efficiency, habitat enhancement, and native plantings included 5 workshops promoting environmental stewardship in the golf industry.
- Shared success stories through a dedicated electronic bulletin board.
- Increased usage of biobased oils and lubricants and biodiesel fuels for on-site equipment. A number of new courses began to implement the use of bio-based products in their equipment.
- The MTESP promoted pesticide container recycling through the Groundwater Stewardship Program and a project initiated for the turf industry by Turfgrass Inc. The pilot collection program has expanded its area this year and will build on that success by including the entire state during the 2007 season.
- Acknowledgement of success by national partners/ organizations including receiving a Most Valuable Pollution Prevention Award from the National Pollution Prevention Roundtable.
- Continuing to actively engage professional organizations/ associations such as: Michigan Golf Course Owners Association, Golf Course Superintendents Association, Golf Association of Michigan, and the Michigan Turfgrass Foundation.

- **The Pulp, Paper & Products Pollution Prevention (P5) Program** is a voluntary partnership between the Michigan Forest Products Council/Michigan Pulp and Paper Environmental Council and the MDEQ. The Michigan Forest Products Council coordinates the P5 Program.
  - 12 members and 1 affiliate member.
  - Two members were Gold Award winners of the Neighborhood Environmental Partners Program.
  - Decade-long relationship with industry features objective-driven performance and state-of-the-art management systems to reduce emissions and improve environmental quality.
  - This program has been extremely successful at meeting its goals. Twelve of the 19 long-term goals set in 1996 have been met or exceeded, 4 goals were nearly





attained, and significant progress has been made toward the remaining 3. Since the original goals were set in 1996, member paper mills have collectively accomplished significant reductions in the following areas (adjusted for production):

- ♦ Air emissions reductions - 4,660 tons
- ♦ Water use reductions - 28 billion gallons
- ♦ Water emission reductions - 10,200 tons
- ♦ Reduction in hazardous materials usage - 8,620 tons
- ♦ Reduction in hazardous waste generation - 31 tons
- ♦ Beneficial use of wastewater treatment solids - 140,000 dry tons
- ♦ Beneficial use of other byproduct solids - 37,100 tons
- Trends in environmental performance examined over a 10-year period have yielded outstanding results (adjusted for increased pulp and paper production):
  - ♦ Air emissions reduced by 33 percent
  - ♦ Substances discharged in wastewater reduced by 40 percent
  - ♦ Wastewater volume reduced by 22 percent
  - ♦ Hazardous waste generation reduced by 51 percent
  - ♦ Solid waste land-filled reduced by 42 percent
- Celebrated success of the dual-certification of nearly 4.0 million acres of state forestland managed by the Michigan Department of Natural Resources (DNR). Third-party certification recognition from the Forest Stewardship Council (FSC) and Sustainable Forestry Initiative (SFI) – only 4 other states have dual-certification.

● **Retired Engineer Technical Assistance Program (RETAP)**

is a confidential, voluntary, waste reduction and energy assessment program offered to public institutions and businesses with 500 or fewer employees. RETAP assessments now provide P2, energy efficiency (E2), and cost saving estimates with all recommendations.

- Achieved its 1,000th RETAP assessment.
- 96 RETAP assessments
- 105 Total Assessment Reports completed with estimated benefits:
  - ♦ Cost savings = \$2,769,744
  - ♦ Electricity reduced = 16,519,580 kWh
  - ♦ Natural gas reduced = 629,870 ccf
  - ♦ Solid waste reduced = 5,193,524 lbs.
  - ♦ Hazardous waste reduced = 5,060 gallons

**12 Month RETAP Follow-up Measurements**

*Total Follow-ups = 111  
Facilities/Past Assessments*

*Total Recommendations =  
3,121*

*Percent Complete  
Implementations = 29 percent*

*Percent Partial  
Implementations = 14 percent*

P2 IN ACTION





*“The RETAP was the springboard that National Galvanizing needed to look at alternative/more efficient ways of doing things ... there is no doubt that we have saved many thousands of dollars with ideas put into service.”*

*Mark Olson, EHS Manager  
Continental Structural Plastics*

- ◆ Liquid industrial waste reduced = 14,950 gallons
- ◆ Mercury reduction = 136,680 mg
- ◆ Wastewater reduced = 125,000 gallons
- ◆ Toxics use decreased = 20,000 lbs.
- ◆ Water saved = 16,800,219 gallons
- Estimated benefits from Energy Audits (Executive Directive)
  - ◆ Cost savings = \$168,009
  - ◆ Electricity = 1,377,788 kWh
  - ◆ Natural gas = 52,310 ccf
- 190 Technical Assistance Hours with estimated benefits
  - ◆ Cost savings = \$164,535
  - ◆ Electricity reduced = 1,208,369 kWh
  - ◆ Natural gas reduced = 98,225 ccf
- Training sessions related to new contract requirements were held.

- **RETAP Internship program** placed college engineering students at host facilities to assist with research and implementation of P2 initiatives.
  - B&P Process and Equipment, a chemical equipment manufacturer in Saginaw, successfully piloted a “continuous biodiesel process” using soy beans with a prototype device called the Pod developed with the assistance of a RETAP intern. Preliminary testing demonstrated the prototype’s ability to produce 96.5 percent biodiesel fuel. The prototype makes the same quantity of biodiesel as a traditional 6,500 gallon batch in less than half the time. A larger prototype could easily supply enough biodiesel to meet the current market in Michigan with less capital, generate fewer by-products, and reclaim up to 75 percent of the spent methanol than the batch process for reuse in the production process.
  - H & L Advantage, a custom plastic injection molder and assembler facility located in Grandville, successfully implemented a number of projects with the assistance of a RETAP intern that lowered electrical energy consumption. The primary project studied the facility’s electrical power mapping and identified several areas to improve equipment and process changes that lowered electrical energy consumption. Changes included:
    - ◆ Lighting retrofits: Changing metal halide fixtures to more efficient T-8 fluorescent fixtures, saving 100,000 kWh of electricity (56 percent reduction), at \$6,000 annually.
    - ◆ Low power factor correction: Installing switched bank of 150 kVAR capacitance on new and existing presses to eliminate \$3,500 of current





and future electrical utility penalties, with an \$800 refund. The project has a 28-month payback.

- ◆ Compressed air changes: Lowering the air pressure by 10 psi from the compressor will lower electrical energy use by an estimated \$800 per year and will not affect plant operations.
- Department of Natural Resources State Parks utilized a RETAP intern to develop a program for evaluating P2 opportunities to reduce energy and water usage and decrease solid and hazardous waste using standardized practices. The program is scheduled to be completed within the term of one non-camping season within the park system, with measurable results available two years after initial implementation. This program will offer monetary savings and increased efficiency as welcomed benefits.
  - ◆ Evaluation Audit Form evaluates waste generation, product usage, energy, and water consumption.
  - ◆ Self Inspection Pollution Prevention Form (SIP-2) identifies potential P2 and energy conservation ideas that can be applied to park facilities.
- **Shooting Range Environmental Stewardship Program (SRESP)**, through the Michigan United Conservation Clubs (MUCC), assists MUCC affiliates and others in understanding and meeting their responsibilities to manage their shooting ranges in an environmentally sound manner. Operators of shooting ranges have the opportunity to enroll in the SRESP and receive guidance and assistance to minimize potential adverse environmental impacts from lead used at their ranges. Enrollment is for two years and is renewable.
  - 100 Clubs/Ranges attended the educational workshops held in Ingham, Kent, Mackinac, and Oakland counties and at the MUCC State Convention in Lansing.
  - 37 Clubs/Ranges participated in 2nd on-site workshops.
  - 18 Clubs/Ranges enrolled in the SRESP.
- **State Office Paper Recycling** is mandated starting in 1988. Under this mandate, state offices recycle office paper, corrugated cardboard, and newsprint, when feasible.
  - Over 5 million pounds of material were recycled in 2005.
  - State employees in Constitution Hall, Lansing, have developed an expanded recycling program collecting additional recyclables. This program has been emulated by other state agencies, such as DNR's Parks and Recreation Division.





- **MDEQ's State Park Stewardship Initiative** and the DNR Parks and Recreation Green Initiatives promote environmental stewardship and best management practices at state parks across Michigan.
  - Hosted four national park stewardship conference calls with outreach to 60+ representatives from 20 different states covering marketing/benefits, best practices, environmentally preferred purchasing, and renewable energy opportunities.
  - Six parks participated in a pilot self-assessment program developed by a RETAP intern.
  - The Green Initiatives Committee oversaw numerous P2 activities at state parks, such as energy efficiency/conservation projects, Clean Marina designations, environmentally preferred purchasing opportunities, biological control on non-native species, and outreach to visitors.

## P2 FUNDING

Michigan financially assists qualifying companies with P2 projects that eliminate or reduce waste at the business location (source reduction), result in environmentally sound reuse and recycling for the loan applicant's generated wastes, conserve energy or water on-site, or are a qualified agricultural energy production system. Through grant and loan projects, several companies have reported significant reduction of pollution and monetary savings.

- Through the **Michigan P2 Research Grant Program**, Michigan universities partnered with businesses and communities in implementing P2 projects.
  - Wayne State University researched zero discharge systems for cleaning and electroplating metal parts under actual production conditions at the KC Jones Plating Company in Hazel Park.
    - ◆ Conducted extensive analytical analysis of plating line
    - ◆ Identified, modeled, and implemented experimental discharge systems
    - ◆ Estimated annual benefits/savings of 2 million gallons water, 95 percent reduction in chemicals usage, and \$41,500
  - Grants also were awarded to Kettering University to research an innovative emulsion recycling system technology for the steel cold rolling process at a Michigan mill and to Michigan State University to research the reuse of the milking facility wash water at a dairy farm.





● **Small Business P2 Loan Program** awarded \$2,323,912 to Michigan businesses and organizations since 2000.

- Three loans were awarded in FY06 totaling \$563,151 (two printers and one golf course)
- To date the 26 loan recipients report the following P2 results:
  - ◆ Waste reduction results of 438 cubic yards/year manure waste, 550 lbs./year perchloroethylene filter waste, 93 spent filters/year, 75 gallons/year perchloroethylene solvent/sludge waste, over 30,000 lbs. solid waste, 7,200 lbs./year F006 hazardous waste, and 117 gallons of used motor oil
  - ◆ Over 83 million gallons/year water conserved
  - ◆ Over 12,000 kilowatts per year of energy conserved
  - ◆ Over 6,575 gallons of gasoline conserved
  - ◆ Source reduction results include:
    - 3,566 gallons/year of perchloroethylene (over 24 tons)
    - 1,016 gallons/year of x-ray photo developing chemicals
    - 18,300 x-ray films/year
    - 350 sets of match print proofing material
    - 17,550 feet of printer film
    - 1,320 printer plates
    - 2,180 lbs./year plating make-up chemicals
    - \$8,240 saved on agri-chemical use (25 percent reduction)
    - 92,300 lbs. commercial nitrogen fertilizer
    - 116,590 lbs. commercial phosphorus fertilizer
    - 151,440 lbs. commercial potassium fertilizer

*“This loan will help us replace 19 year old equipment that is out-dated and more costly to operate. We appreciate DEQ’s low interest loan program to help a small business like ours ‘green’ our operations.”*  
 Thomas Moleski, owner, Dixie Cleaners, Fenton

P2 FUNDING





## P2 FOR THE PUBLIC

Michigan provides excellent P2 assistance to schools, local government, consultants, and the public.

- **The Community P2 Grant Program** seeks to bring local government, businesses, planning agencies, and residents together to achieve measurable waste reductions of pollutants using innovative, sustainable, P2 practices. For 2004-2006, the program focused on electronics recycling and school chemical clean-up and healthy schools.

- Electronics Recycling Grant

- ◆ Western Upper Peninsula District Health Department

- 83,194 lbs. of e-waste collected
    - 588 individuals and businesses participated
    - 330 volunteer hours contributed
    - 12 collections and 5 counties participated (Baraga, Gogebic, Houghton, Ontonagon, Keweenaw)

- ◆ Leelanau County

- 33 tons of e-waste collected
    - 495 participants
    - 5 collections

- School Chemical Grant funded 20 schools across the state in 2005 and 2006 to implement P2 projects that reduced chemical usage and encouraged proper chemical disposal and clean-up on school campuses.

- ◆ \$211,120 was awarded to 11 schools in 2005

- 6 out of 11 grantees have conducted clean-out campaigns and have properly disposed of over 3,550 lbs. of chemicals including dinitrotoluol, elemental sodium, and mercury.

- ◆ \$191,397 was awarded to 9 schools in 2006

- 1 school district removed over 287 chemicals and maintenance wastes including mercury cancer-causing flammable and corrosive liquids, waste oils and paint thinners, corrosive acids and cleaners, and chemically preserved biology specimens.

*“With school budgets dwindling, without the P2 grant there would have been no way to fund the chemical safety training for staff nor the micro scale and green chemistry training for teachers... Additionally, ...purchasing in the district will be analyzed in an effort to reduce both the amount used and the toxicity of the products we use.*

*Having experts in the field (Chemico) guide us through these decisions, again, is something we never could have afforded... We really see the increase in safety as a result of all of these efforts, as the greatest benefit to the district but the reduction of toxics and reduction of costs and the increase in recycling that we expect to see all run a very close second. Our goal is to be the model that other districts can look to.”*

*Cathy DeShambo, Project Coordinator, Lansing School District*





- **The Michigan Healthy Schools** initiative addresses waste reduction of school chemicals by not only cleaning out excess, legacy, unused, and improperly stored chemicals, but also by going a step further and implementing mechanisms in schools for minimizing the use of toxic chemicals and reducing accumulation of chemicals in the future. As part of both the 2005 and 2006 Community P2 grants, each school is required to implement a program to prevent the accumulation of chemicals in the future. The Healthy Schools Web site provides tools and information to help grantees and all schools develop a chemical management program. Grand Valley State University was awarded \$40,000 to design a model for schools to develop chemical management systems, including training for teachers and staff. These projects improve the safety and health for Michigan's students, teachers and building staff, as well as protect the environment.
  
- **Green Suppliers Network (GSN)**
  - Four new Michigan-based suppliers to the office furniture industry participated in the GSN Technical Review process in 2006 to improve performance and minimize waste.
  - Since the program's inception in 2004, participating suppliers together have realized over \$163,000 of cost savings in the areas of water and energy conservation and also reaped value-added benefits from inventory reduction and the application of lean practices to improve production efficiency.
  - Through the use of state P2 technical assistance resources and programs such as the RETAP internships, suppliers have been able to implement waste reduction and lean recommendations at little or no cost to their organizations.
  - The MDEQ and U.S. EPA are currently participating as collaborative stakeholders with the Business and Institutional Furniture Manufacturing Association (BIFMA) International, a not-for-profit trade association of furniture manufacturers and suppliers addressing issues of common concern, to draft a "Sustainable Furniture Product Standard" for the industry and its suppliers.
  
- MDEQ's Environmental Science and Services Division (ESSD) Field Staff played a significant roll in the launch of two new private sector environmental enhancement programs in 2006.
  - The Southwest Michigan Sustainable Business Forum. Visit [www.naturecenter.org/sbf.htm](http://www.naturecenter.org/sbf.htm)
  - The Crystal Flash Do-It-Yourself oil recycling program. Visit [www.diyusedoil.com](http://www.diyusedoil.com).
  
- The **MDEQ's Environmental Assistance Center (EAC)** is available at 1-800-662-9278 between the hours of 8:00 a.m. and 5:00 p.m. to assist you with the answers to your questions. Last year the EAC responded to 26,250 telephone inquiries.





- MDEQ's P2 program Web sites can be visited at [www.michigan.gov/deqp2](http://www.michigan.gov/deqp2). New P2 Web sites include:
  - Green Construction & Demolition Web site. Visit [www.michigan.gov/deqconstruction](http://www.michigan.gov/deqconstruction).
  - Green Lodging Resources Web site supports the Michigan Green Lodging Certification Program started by the Michigan Energy Office.
    - ◆ For the certification program, visit [www.michigan.gov/greenlodging](http://www.michigan.gov/greenlodging).
    - ◆ For MDEQ environmental resources, visit [www.michigan.gov/deqpartnerships](http://www.michigan.gov/deqpartnerships).
  - Michigan Healthy Schools Web site provides chemical resources to help reduce hazards to school children and staff from hazardous chemicals. Visit [www.michigan.gov/deqp2initiatives](http://www.michigan.gov/deqp2initiatives).

## COMMUNITY RIGHT-TO-KNOW

### ***Toxic Chemical Release Inventory (TRI)***

Each year, facilities in certain industry sectors that manufacture, process, or otherwise use toxic chemicals above certain thresholds must report the quantities released and disposed and managed as wastes.

Results for 2004, the most recent reporting year for which data is available, show that statewide facilities reported just under 100 million pounds of toxic chemicals released and disposed. For 2003, facilities reported 105 million pounds.

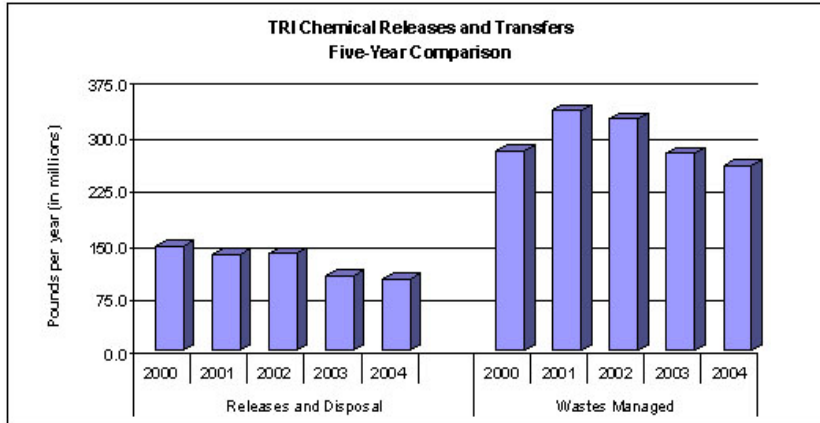
Graph 1 shows the statewide totals for releases and disposal and wastes managed for 2000 through 2004. In the past, the MDEQ has reviewed TRI data to determine whether the information can be used as an indicator of P2 in the state. The review has focused on reductions in the amounts of TRI chemicals released annually, changes in recycling and energy recovery rates, and fluctuations in production information. Results have been difficult to assess due to the difficulty of extracting the impacts of the economy and changes in environmental legislation on TRI.

Facilities also report management of TRI chemicals in wastes both on-site and off-site. Graph 2 show the total amount of production-related wastes managed by Michigan facilities through energy recovery and recycling activities.





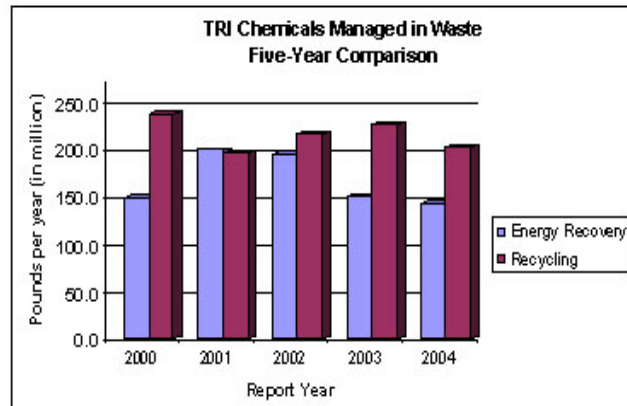
Graph 1



Source: Michigan SARA Title III Program

Note: Releases and Disposal include air emissions, discharges to surface waters, on-site disposal to underground injection wells or landfills, on-site releases to surface impoundment or other land releases, and transfers off-site for disposal or release.

Graph 2



Note: This represents waste used for energy recovery and recycled both on-site at facilities or transferred off-site to other locations.

The MDEQ is currently assessing TRI data for Reporting Year 2005. This information will be available from the MDEQ in March 2007. For additional information, contact the MDEQ SARA Title III Program office at 517-373-8481.

Additional information on individual pollutants and facilities, including historical information, is available on the Web at [www.deq.state.mi.us/tri](http://www.deq.state.mi.us/tri).





## P2 FOR THE FUTURE

Staying in the lead involves keeping Michigan's laws and rules up to date.

- Increased the maximum P2 loan amount from \$300,000 to \$400,000 and provided specific eligibility in the area of agricultural energy production systems.
- **Green Chemistry Executive Directive 2006-6**
  - Established a program to promote Green Chemistry, the development of chemicals and chemical products that reduce or eliminate the use or generation of hazardous substances while producing high quality products through safe and efficient manufacturing products.
  - The MDEQ has been given primary responsibility to implement the Green Chemistry Executive Directive, including convening a Green Chemistry Support Roundtable and establishing a Green Chemistry Support Program. The MDEQ is meeting with stakeholders to seek out ways to promote and foster Green Chemistry research, development, demonstration, education, and technology transfer activities in Michigan.
- **Mercury Regulatory and Policy Initiatives**
  - In December of 2006, Michigan's Legislature passed three mercury bills that were signed into law by Governor Jennifer M. Granholm.
    - ◆ Public Act 492 of 2006 applies a thermostat sales ban.
    - ◆ Public Act 493 of 2006 applies a mercury blood pressure sales and use ban.
    - ◆ Public Act 494 of 2006 applies a mercury esophageal dilator sales and use ban.
  - ESSD and Air Quality Division staff co-chaired the multi-media Mercury Strategy Work Group (MSWG). The MSWG meets twice a month in an effort to exchange technical information, coordinate mercury work, and determine and prioritize future mercury initiatives for the department.
  - In 2005-2006 ESSD staff were instrumental in the development of the national Environmental Council of States (ECOS) publications: 2005 Compendium of States' Mercury Activities (October 2005); Removing Mercury Switches from Vehicles: A Pollution Prevention Opportunity for States (August 2005); and Mercury Product Labeling Information for States (March 2006). ESSD staff have assumed a leadership role in developing an ECOS Quicksilver Caucus "Mercury Products White Paper" which will set future priorities and direction for U.S. EPA's mercury work.





● **Recycling/Electronics Waste in Michigan**

- Support of the Midwest Policy by the Director and the finalizing of the recommendations. MDEQ staff have been involved in regional discussions involving several Midwest states since mid-2005. This effort, called the Midwest Regional Electronic Waste Recycling Policy Initiative, produced a policy statement involving a manufacturer responsibility model to be adopted on a multi-state basis. Model legislation mirroring this policy was produced in the northeast region of the country and is being introduced in several state legislatures. The result is that there is potential for a regional rather than state-by-state approach for managing electronic waste. The Michigan Work Group overwhelmingly supported a national approach to managing electronic waste but understood that despite efforts to develop a national system, none was going to be adopted in the near future.
- Several states, feeling electronic waste is a pressing issue, have passed legislation that adopts either an advanced recycling fee collected at point of sale (California) or variations on a manufacturer responsibility model (Maine, Maryland, and Washington). Both models appear workable, but each has its challenges. It is clear that whichever model is adopted, implementing it on a regional basis and moving toward one national approach should be the highest priority. The MDEQ continues to work toward this goal.

**RECOGNIZING P2 SUCCESSES**

During Fiscal Year 2006, many companies and partners have accomplished or achieved P2 results, received awards, or have some certification status.

**Clean Corporate Citizens (C3)**

(138 members, 28 New and 78 Renewals)

*Corrected April 2007 for Internet version:*

- Subaru R&D - Ann Arbor
- General Motors - Pontiac Assembly Plant, Pontiac
- Flexible Products - Ann Arbor
- Ventura MFG, Zeeland
- Herman Miller, Inc. - 171st Avenue Operations, Spring Lake
- Herman Miller, Inc. - Hickory Operations, Spring Lake
- Herman Miller, Inc. - Midwest Distribution Center, Holland
- Herman Miller, Inc. - Midwest Distribution Center, Spring Lake
- Herman Miller, Inc. - Zeeland Main Site, Zeeland
- Detroit Diesel, Detroit
- Consumers Energy Karn/Weadock - Essexville
- U.S. Army Garrison - Michigan, Warren
- Detroit Edison - Belle River Power Plant, East China Twp.
- Recycling Concepts of West Michigan - Grand Rapids
- Eagle Manufacturing - Shelby Township
- MetroHealth Hospital - Grand Rapids
- Detroit Edison - Harbor Beach Power Plant, Harbor Beach

- General Motors - Flint Metal Center, Flint
- Alpena Air National Guard CRTC - Alpena
- Kent County Waste to Energy Facility - Grand Rapids
- Continental Teves - Auburn Hills
- Consumers Energy J.H. Campbell Plant - West Olive

**Michigan Clean Marina Program**

(65 total members, 53 new, 9 designated Michigan Clean Marina)

- Algonac Harbour Club, Algonac
- Anchor In Marina, Cheboygan
- Anchorage Marina, Holland
- Bay Breeze Yacht Charters, Traverse City
- Bay Harbor Lake Marina, Bay Harbor (Michigan Clean Marina)
- Belle Maer Harbor, Harrison Twp. (Michigan Clean Marina)
- Boyne City Marina, Boyne City
- Bridge Harbour Marina, Port Huron
- Cedar River State Harbor, Cedar River
- City of St. Ignace, St. Ignace

P2 FOR THE FUTURE





Copper Harbor State Dock, Copper Harbor  
 Drummond Island Yacht Haven, Drummond Island  
 Eagle Harbor State Dock, Eagle Harbor  
 East Tawas State Dock, East Tawas  
 Eldean Shipyard, Macatawa (Michigan Clean Marina)  
 Emerald City Harbor, St. Clair Shores  
 Great Lakes Shores Marina, Standish  
 Grosse Pointe Yacht Club, Grosse Pointe Shores  
 Hammond Bay State Harbor, Hammond Bay  
 Harbor Marina, Monroe  
 Harbor Springs Municipal Marina, Harbor Springs  
 Howe Marine, Indian River  
 Indian River Marina, Indian River  
 Irish Boat Shop, Charlevoix (Michigan Clean Marina)  
 Irish Boat Shop, Harbor Springs (Michigan Clean Marina)  
 Kean's Detroit Yacht Harbor, Detroit  
 Klaves Marine, Pinckney  
 Lac LaBelle State Dock, Lac LaBelle  
 Lexington State Dock, Lexington (Michigan Clean Marina)  
 Lost Peninsula Marina, Erie  
 Luna Pier Harbour Club, Luna Pier  
 Mackinac Island State Harbor, Mackinac Island  
 MacRay Harbor, Harrison Twp. (Michigan Clean Marina)  
 Manistee Municipal Marina, Manistee  
 New Buffalo Municipal Marina, New Buffalo  
 Otter Creek Marina, LaSalle  
 Petoskey Marina, Petoskey  
 Pier 1000 Marina, Benton Harbor  
 Pier 33, St. Joseph  
 Port Austin State Harbor, Port Austin (Michigan Clean Marina)  
 Port Elizabeth Marina & Yacht Club, Caseville  
 Port Sanilac Marina, Port Sanilac  
 Presque Isle State Harbor, Presque Isle  
 Saint Clair Boat Harbor, St. Clair  
 South Haven Municipal Marina, South Haven  
 Sundog Marina, Harrison Twp.  
 Torresen Marine, Muskegon  
 Viking Boat Harbor, Cedarville  
 Village of Port Sanilac, Port Sanilac  
 Walstrom Marine, Harbor Springs (Michigan Clean Marina)  
 Whitehall Landing, Whitehall  
 Windjammer Marina, Oden  
 Yacht Basin Marina, Holland

**Michigan Business Pollution Prevention Partnership**

(325 registered, 34 new)

Automotive Components Holdings, LLC Headquarters, Utica  
 Bata Plastics, Inc., Byron Center  
 Classic Computer Recovery, Garden City  
 Continental Teves, Auburn Hills  
 DaimlerChrysler Chelsea Proving Grounds, Chelsea  
 Detroit Diesel Corporation, Detroit  
 Dr. Shrink, Inc., Manistee  
 Eagle Manufacturing Corp., Shelby Township  
 Eaton Corporation Three Rivers Facility, Three Rivers  
 Ford Motor Company - Wayne Assembly  
 Fort Custer Training Center, Augusta  
 Global Engine Manufacturing Alliance, Canton  
 Kent County Waste-to-Energy Facility, Grand Rapids  
 Kettering University, Flint  
 Lakeshore Environmental, Inc., Grand Haven  
 Landfill Avoidance Systems, LLC, Birmingham  
 Lansing Board of Water & Light, Lansing  
 MACSTEEL – Monroe, Monroe  
 Maine Plastics, Inc., Kalamazoo  
 Metro Health, Grand Rapids  
 Michigan State University, East Lansing  
 Nuestro, LLC, Adrian  
 Recycling Concepts of West MI Inc., Grand Rapids  
 Resource Recovery Corporation of West Michigan, Coopersville  
 Standard Sand Corporation, Grand Haven  
 Surplus Coatings, Grandville  
 Sustainable Research Group, Grand Rapids  
 The Brown Company of Ionia, LLC, Ionia  
 The Creation Station, Lansing  
 Unified Industries, Inc., Howell  
 Venchurs, Inc., Adrian  
 Ventura Manufacturing, Zeeland  
 Venture Distributors LLC, Marysville  
 Wexford Sand Company, Harrietta





**Michigan Great Printers Project**

(129 partners, 8 new)

- Allegra Print & Imaging, Lansing
- ASAP Printing, Inc., Okemos
- Capital Imaging, Lansing
- Lindy M. Carter, Detroit
- Inco Graphics, Mason
- Jarob Design, Inc., Grand Rapids
- Messenger Printing Service, Inc., Taylor
- The QC Group, Canton

**Michigan Turfgrass Environmental Stewardship Program**

(234 partners, 9 new)

- Barber Creek Golf Course, Kent City
- Boyne Mountain Resort, Boyne Falls
- Captains Club at Woodfield, Grand Blanc
- College Fields, East Lansing
- Eagle Eye Golf Course, East Lansing
- The Grande Golf Club, Jackson
- Pheasant Run Golf, Canton
- Prairie Creek Golf Course, Dewitt
- Wequetonsing Golf Course, Harbor Springs

**Neighborhood Environmental Program Award Winners**

- Cascade Engineering, Grand Rapids
- Consumers Energy J.R. Whiting Plant, Luna Pier
- Dow Corning, Midland
- General Motors Powertrain - Warren Transmission Plant, Warren
- Michigan Army National Guard Fort Custer Training Center, Augusta
- Smurfit Stone Container Corporation - Ontonagon Mill, Ontonagon
- Steelcase Inc., Grand Rapids
- Weyerhaeuser Grayling OSB, Grayling

**Pulp, Paper, & Products Pollution Prevention Program Members**

(12 members, 1 Affiliate Member)

- Decorative Panels International, Alpena
- Domtar, Port Huron
- Georgia Pacific Corp., Milan
- Menominee Paper Co., Menominee
- NewPage Corporation, Escanaba
- Packaging Corporation of America, Filer City
- Rock-Tenn Company, Battle Creek
- SAPPI Fine Paper North America, Muskegon
- Smurfit-Stone Container Corp., Ontonagon (NEP Gold Winner)
- Verso Paper, Norway
- White Pigeon Paper Co., White Pigeon
- Weyerhaeuser, Grayling (NEP Gold Winner)
- RMT, Inc., Ann Arbor (Affiliate)

**RETAP Student Internship Host Facilities/Organizations**

- B & P Process, Saginaw
- Crystal Filtration, Trenton
- H & L Advantage, Grandville
- Interface Fabrics, Grand Rapids
- La Solutions, Detroit
- Machine Tool & Gear, Corunna
- Michigan DNR – Parks, Lansing

**RETAP Student Internship University Partners**

- Grand Valley State University
- Lawrence Technological University
- Michigan Technological University
- Saginaw Valley State University

**State Park Stewardship Initiative**

- Michigan Department of Natural Resources, Parks and Recreation Division

RECOGNIZING P2 SUCCESSES



