Interagency Pollution Prevention Advisory Team [IPPAT]

Pollution Prevention Summary Report

Fiscal year 2006

October 2007

The Department of Human Services building, designed using the Minnesota Sustainable Design Guide, is nearly 40 percent more energy efficient than is required by code.

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(Front cover: Architect's representation; Ericksen, Roed and Associates.)

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TTY 651-282-5332 or 800-657-3864 | available in alternative formats

Introduction

The Interagency Pollution Prevention Advisory Team (IPPAT) is a group of representatives from state agencies, colleges, and universities that cooperate in the execution of the Governor's Executive Order 99-4. Executive Order 99-4 provides for the implementation of pollution prevention and resource conservation by state government. The group meets four times each year to share information and offer case studies on pollution prevention, including waste reduction and resource conservation. Agency contacts are listed on the inside front cover.

IPPAT is coordinated by the Minnesota Pollution Control Agency. For more information about IPPAT or this report, contact Emily Moore at 651-215-0201, 800-657-3864, www.pca.state.mn.us/ippat.

Purpose of the report

Every year, state agencies are required to prepare a summary of their progress in preventing pollution. These reports are consolidated into a single Pollution Prevention Summary Report, which fulfills the requirements of Governor's Executive Order 99-4. An original signed copy of each agency's report is on file at the Minnesota Pollution Control Agency.

Organization of the report

This report is divided into five parts:

- Description of each agency, including the number of employees, locations of the agencies, and pollution prevention training held during the last year.
- Summary of each agency's policy and regulatory activities that have incorporated pollution prevention in its broader sense.
- Measurements for activities satisfying Executive Order 04-08.
- Summary of each agency's efforts toward pollution prevention within specific category headings. It is designed to facilitate greater use of the document by participating agencies and by others seeking information about pollution prevention opportunities.
- Matrix of the agencies providing activity summaries under the different categories. It allows the reader to identify all the categories in the report for which a particular agency has provided a summary of activities.

Part 1
Agency Descriptions

Part 1 includes general information about the participating agencies, including size of staff, the number of locations, and the amount of pollution prevention training that staff had during fiscal year 2006.

Department of Administration (Admin) – The mission of the Department of Administration is "to improve the quality and productivity of Minnesota government." The department provides a diverse range of business management, administrative, technological and professional services, and a variety of resources to state and local government agencies and to the public. With 17 distinct business units and about 490 employees, the department strives to address the needs of government and citizens, from managing state owned buildings and grounds to establishing statewide technology policy. Throughout its daily and strategic work, Admin is committed to offering the best possible service, enabling state government to work more efficiently.

Information about the department and its environmental services is available at:

- www.admin.state.mn.us
- www.rro.state.mn.us
- www.mmd.admin.state.mn.us

The department's Materials Management Division (MMD) and the Resource Recovery Office (RRO) incorporate pollution prevention in their service to state and local agencies, and outreach through Minnesota's State Resource Recovery Program. The RRO is part of the Department of Administration's Plant Management Division (PMD).

The Resource Recovery Program provides:

- interagency waste reduction and recycling assistance
- on-site consultation and training
- recycling progress measurement and reporting
- management of recycling collection and marketing systems
- operation of the Minnesota State Recycling Center

The RRO also works closely with MMD to implement the program's environmental purchasing and surplus property requirements. The purpose of the program as set forth in Minn. Stat. § 115A.15 Subd. 1 is to:

- promote the reduction of waste generated by state agencies
- separate and recover recyclable and reusable commodities
- procure recyclable commodities and commodities containing recycled materials
- uniformly dispose of recovered materials and surplus property

Eight environmental awards and two scholarships resulted from the Department of Administration's customer services in the last three years, demonstrating public recognition of the program's achievements.

Department of Agriculture (MDA) – The Minnesota Department of Agriculture currently employs 423 people in 10 staffed locations. As of December 1, 2005, MDA is currently co-located with the Department of Health in the Freeman Office Building located at 601 North Robert Street in St. Paul. The department was previously housed at 90 West Plato Blvd. in St. Paul. This report details actions that were taken at the Minnesota Department of Agriculture headquarters in the Freeman Office Building.

Department of Commerce – The department employs 35 staff in downtown Saint Paul (primary), Roseville, and field locations. This report covers the department as a whole. Department of Commerce staff has not received any pollution prevention training during the past year.

Department of Corrections (DOC) – This pollution prevention summary report contains information from fiscal year 2006 for the Department of Corrections. The DOC has approximately 4,100 employees working in 10 juvenile and adult facilities, field offices, a central office, and MINNCOR Industries. Throughout the year, selected facility staff members within the DOC have received pollution prevention training.

Department of Employee Relations (DOER) – The Minnesota Department of Employee Relations, the state's lead human resource management agency, currently employs approximately 150 personnel at its St. Paul office. No specific pollution prevention training was conducted during FY 2006.

Department of Employment and Economic Development (DEED) – DEED has approximately 1,710 employees working in 53 staffed facility locations. This report includes information for our whole agency. DEED staff has not received any P2 training during the past year.

Department of Health – In reference to the Executive Order 04-08 signed by the Governor on August 6, 2004, the Health Department committed to three specific actions identified to help reduce air pollution. We chose three actions which were measurable for us and for which we had the greatest immediate impact. All of the items identified in the Executive Order are important for reducing air pollutants; we support these efforts by implementing them as possible. For instance, while our agency does not specifically purchase electricity, we did place an emphasis on energy use when designing new buildings.

MDH mission: Protecting, maintaining, and improving the health of all Minnesotans.

MDH vision: Keeping all Minnesotans healthy. We do this by:

- Providing leadership and expertise in public health and health policy
- Investing effectively in prevention, early detection, and early intervention
- Using balanced and trusted science- and research-based information to guide policy and decision-making
- Providing guidance and support to local communities and organizations
- Valuing diversity and cultural competency
- Supporting dedicated employees
- Assuring compliance with health regulations and standards
- Advocating for public health programs that benefit all Minnesotans

MDH priorities: The Minnesota Department of Health performs a wide range of critical public health duties every day. The department also regularly identifies public health issues that need special attention. The department is currently focusing on several priorities:

- Preparing for public health emergencies
- Ensuring quality care in nursing homes and other health care facilities
- Improving the quality of health care and controlling rising costs
- Eliminating health disparities
- Maintaining basic responsibilities of public health (such as safe food and water, immunizations, newborn screening, disease prevention and control)

The Health Department maintains four facilities in the metropolitan area, and seven district offices located throughout the state. Approximately 1,300 staff serve these 11 locations.

Iron Range Resources and Rehabilitation Agency (IRRR) – Iron Range Resources is a unique Minnesota state agency charged with the economic development and diversification of a region in northeastern Minnesota defined by Minnesota Statute §273.134 as the Taconite Assistance Area (TAA), including all or parts of Cook, Lake, St. Louis, Itasca, Aitkin, and Crow Wing Counties. Iron Range Resources was created in 1941 as part of a legislative compromise to limit ad valorem taxes on mining. It was funded from occupation taxes for its first 30 years. It is now funded by taconite production taxes, which are paid by mining companies in lieu of local property taxes. The agency receives no direct operational funding from the State of Minnesota General Fund. The production tax essentially replaces the local tax obligations that the taconite producers otherwise would have to local governments. That, coupled with the TAA's dependence on the taconite industry and the cyclical nature of the steel industry it serves, caused the State Legislature to create Iron Range Resources to serve northeastern Minnesota. The agency goals are to:

- Position the agency to be a leader in developing and implementing a strategy for the long-term economic viability of the northeastern Minnesota region.
- Sustain the region's economic base by working with existing businesses to retain existing jobs and expand to create new jobs.
- Diversify the region's economy by growing new businesses and recruiting expanding businesses from outside the area.
- Reclaim mining-impacted lands to create a diverse regional economic development resource.

The agency complement, including all departments and locations, is 55 employees as of August 1, 2006. These employees staff three facilities owned and operated by IRRR. The main administration building is located two miles south of Eveleth on Highway 53. This building provides office space for the Office of the Commissioner, Administrative Services, Marketing and Communications, and Development Strategies.

While economic development of the TAA through loans and grants to businesses and local governments is Iron Range Resources' main focus, the agency also owns and operates two tourism facilities, Giants Ridge Golf and Ski Resort in the city of Biwabik, and Ironworld Discovery Center located in Chisholm. Giants Ridge operates two 18-hole championship golf courses and a winter sports area to standards that have earned national recognition. Giants Ridge offers 35 alpine ski runs, more than 60 kilometers of cross-country ski trails and easy access to lakes, mountain bike trails, and snowmobile trails.

Ironworld Discovery Center is a history museum that preserves the story of Iron Range mining and culture. Ironworld's museum, trolley operation, and living history site are open seasonally while the Iron Range Research Center (library and archives) is open year-round. Ironworld is also home to Iron Range Resources' Mineland Reclamation Program, which undertakes safety, environmental, and economic development projects on abandoned minelands of the pre-taconite era, often in cooperation with adjacent communities. In FY 2006, Mineland Reclamation will grow and plant 300,000 containerized seedlings on the Mesabi, Vermilion, and Cuyuna iron ranges.

Iron Range Resources funds destination marketing activities in cooperation with many community and regional tourism partners in both the public and private sectors. The agency provides technical assistance to tourism development organizations to enhance tourism and quality of life.

Metropolitan Airports Commission (MAC) – The Minnesota Legislature created the Metropolitan Airports Commission in 1943 as a public corporation whose mission is to "provide a system of airports that promotes regional, national, and international transportation of passengers and cargo. This system shall be operated, consistent with the public interest and promote the overall goals of the state's environmental policies and minimize the public's exposure to noise and safety hazards around airports." MAC is governed by 15 commissioners (13 are appointed by the governor and the other two are the mayors of Minneapolis and St. Paul or their designees).

MAC currently owns and operates six reliever airports and the Minneapolis/St. Paul International Airport (MSP). While MSP handles commercial air traffic, the reliever airport system handles the majority of the general aviation traffic. In 2005, MSP serviced more than 37 million passengers and supported 532,000 flight operations. The reliever airport system supports more than 560,000 flight operations per year.

MAC presently employs 550 people responsible for a wide variety of duties. The airport system has been likened to "running a small city." The organization can basically be divided into three areas:

- **Landside** includes Ground Transportation, the Airport Director's office, Energy Management, and Facility Management.
- **Airside** consists of Operations, Carpentry, Communications, Electrical, Fire, Police, Maintenance (field and mechanical), and the Paint Shop.
- **Administration** includes Airport Development, Environment, Commercial Management, Executive, Finance, Human Resources, Insurance/Risk, Labor Relations, Legal, Information Systems, Public Affairs, and Purchasing.

This summary will constitute a report for the agency as a whole. Staffed facility locations include the Lindbergh and Humphrey Terminals at MSP International, as well as Maintenance, Trades, and two administrative locations. The MAC continually reevaluates and updates all pollution prevention methods and practices. Communication and topic-specific training is ongoing.

Metropolitan Council Environmental Services (MCES) – The Metropolitan Council Environmental Services is a division of the Metropolitan Council, the public agency that coordinates regional planning and guides development in Minnesota's seven-county Twin Cities' metropolitan area. The MCES operates the regional wastewater collection and treatment system in most of that same seven-county area. Additional regional environmental responsibilities include industrial wastewater pretreatment and management, air and water quality monitoring, environmental compliance, environmental education, water resources planning, and nonpoint source pollution abatement.

MCES operates eight treatment plants in addition to three maintenance facilities, a field office, and administrative headquarters for a total of 13 staffed facility locations. MCES has approximately 640 staff (full-time equivalent positions). This report describes P2 activities for the entire MCES. A separate report will cover P2 for Metro Transit, the division of the Metropolitan Council that provides public transit, i.e. bus service and a light-rail system, for Minneapolis, St. Paul, and surrounding suburban areas, including 78 cities.

MCES is an active member of the Interagency Pollution Prevention Advisory Team. In addition to this professional contact, interagency exchange, and subsequent internal sharing of information, some informal P2 training occurs at the treatment plants related to maintenance, and all employees in the Industrial Waste and Pollution Prevention Section have been trained.

Metropolitan Council Metro Transit – Metro Transit is a division of the Metropolitan Council, the public agency that coordinates regional planning and guides the development in the seven-county metropolitan area. Metro Transit, the major supplier for mass transit in the metropolitan area, operates more than 800 buses over 109 routes. To accomplish this service, Metro Transit operates five service garages, one overhaul facility, one police station, an office building, and a facility maintenance building with a total staff of approximately 2,400 employees. Metro Transit also controls the light-rail system in the Minneapolis area, running from the Mall of America to downtown Minneapolis. This system currently has 22 light-rail train cars in its fleet. This is being increased in 2007. The system also includes buildings in the shop and yards area and 16 stations.

This report will cover all of the buildings that are operated by Metro Transit during the 2005 calendar year. While Metro Transit is an active member of the Interagency Pollution Prevention Advisory Team, no formal P2 training was conducted by Metro Transit during the past year, but opportunities were given to staff to attend programs put on by other agencies pertaining to P2.

Metro Transit is committed to excellence and leadership in protecting the environment. In keeping with its policy, the objectives are to reduce the amounts of hazardous waste that are generated at any of the facilities and to keep air emissions to a minimum. By successfully preventing pollution at its source, the agency will be able to increase its operational efficiencies and provide a safer and healthier environment for all of its employees and customers.

Metropolitan Mosquito Control District (MMCD) – The Metropolitan Mosquito Control District controls mosquitoes and black flies in the metropolitan counties of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington. The district employs 53 full-time staff and approximately 190 part-time staff during the mosquito and black fly breeding season. The district currently operates a warehouse facility, six field operations facilities, and a central administration building. Additionally, the district owns and operates a small fleet of vehicles. This report covers pollution prevention activities for all the facilities operated by Metropolitan Mosquito Control District for the 2006 fiscal reporting period.

Department of Military Affairs (DMA) – The Department of Military Affairs is composed of the Minnesota Army National Guard (MNARNG) and the Minnesota Air National Guard (MNANG). MNARNG facilities are located throughout the state of Minnesota in approximately 80 locations, including Camp Ripley and the Arden Hills Area Training Site. MNANG has facilities in Duluth (148th Fighter Wing), in Minneapolis (133rd Airlift Wing), and at Camp Ripley. The DMA has approximately 11,000 part-time employees and 2,700 full-time employees, exercising both state and federal missions. This report summarizes the ongoing activities of the DMA throughout the state.

Minnesota Pollution Control Agency (MPCA) – The Minnesota Pollution Control Agency (MPCA) has approximately 864 staff members, an increase from the approximately 750 before the Office of Environmental Assistance merged with it. They are located in the Central Office in St. Paul and in seven regional offices in Duluth, Brainerd, Detroit Lakes, Mankato, Marshall, Rochester, and Willmar. This report covers all activities of the MPCA statewide. Some staff have received pollution prevention training, but most have not. The staff has received three types of pollution prevention (P2) training during the past year: the National Pollution Prevention Roundtable Conference, community-based social marketing, and performance measurement and program evaluation. Performance measurement and performance evaluation involved project managers learning and applying systematic and holistic project design.

The MPCA provides funding for the Minnesota Technical Assistance Program (MnTAP), which helps Minnesota businesses develop and implement solutions to maximize resource efficiency, prevent pollution, reduce water and energy use, and reduce costs. Established in 1984, MnTAP is funded primarily through a grant from the Pollution Control Agency to the University of Minnesota, School of Public Health, Environmental Health Sciences Division. MnTAP provides free technical assistance tailored to business needs. By reducing waste generation and energy use and increasing efficiency, businesses can save on disposal and raw material costs, and decrease regulatory compliance burdens. Businesses can also maintain healthier and safer working conditions for employees.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Alexandria Technical College employs approximately 250 faculty and staff members at seven staffed buildings in two locations: the main campus and also the Interior Design facility, which is located off campus. The campus consists of seven staffed buildings, including the off campus Interior Design facility. For purposes of this report, all buildings shall be considered. Members of the ATC staff receive yearly training on hazardous communications and waste management.

Anoka Ramsey Community College – Anoka Ramsey is a community college with two campuses in Coon Rapids and Cambridge. Our staff consists of an average of approximately 550 personnel. This report covers both campuses. The staff has not received any P2 training.

Bemidji State University (BSU) – BSU employs 560 faculty and staff and 589 student workers in two locations: the BSU main campus and the Center for Research and Innovation. All BSU facilities are included in this report. Staff did not receive any specific P2 training, but members of the administration, faculty, staff, and students did attend the inaugural conference of the Upper Midwest Association for Campus Sustainability (UMACS) on the College of Saint Benedict Campus on May 17-19, 2006. UMACS was established to encourage the sharing of information and resources on campus sustainability through networking, cooperative research, and by hosting regular meetings to bring together academic and operations people from a variety of campuses.

Central Lakes College, Brainerd and Staples – Central Lakes College has four campuses in two cities located in central Minnesota: Brainerd and Staples. This report is for all four sites. The college employs approximately 400 full-time and part-time faculty and staff. Staff has not received any formal pollution prevention training.

Minneapolis Community and Technical College (MCTC) – Minneapolis Community and Technical College employs 800 staff, working at the four sites, including our main campus (Minneapolis), Aviation Center (Eden Prairie), Transportation Center (Minneapolis), and the Center for Criminal Justice and Law Enforcement (St. Paul). Affected staff and faculty have received hazardous waste training and laboratory safety training.

Minnesota State University, Moorhead (MSUM) – Minnesota State University, Moorhead, currently employs approximately 325 full-time faculty, 150 part-time faculty, and 325 staff members. These employees serve more than 7,600 students. MSUM has two facility locations: a 120-acre main campus with 36 buildings, and the Regional Science Center, a 300-acre nature research center located adjacent to Buffalo River State Park. This report reflects both locations and includes all departments within the campus community. Education is ongoing throughout the year for faculty, staff, and students with respect to pollution prevention, waste reduction, and recycling.

Northwest Technical College, Bemidji (NTC) – Northwest Technical College has approximately 70 staff and faculty that work at two location sites with over 1,000 learners. In 2004, NTC became an independent college and is part of an alliance with Bemidji State University. NTC began as a vocational technical institute in 1965 with two program offerings that have expanded to 45 programs in business, health, industrial arts, and technology.

The NTC main campus is located on 26 acres with a one-story main building of approximately 90,000 square feet and two annex buildings at 905 Grant Ave. S.E. in Bemidji. Groundbreaking for a new 12,507-square-foot Allied Health addition on the northeast end is slated for completion in 2006, followed by a remodel of 10,500 square feet of vacated space. Project plans are in place for a new 27,500-square-foot two-story technology center on the northwest end of the main building in 2007. The second satellite site is located at the New Beginnings building in Redby, Minnesota, on the Red Lake Indian Reservation. Northwest Technical College does not operate the facility in Redby so this report is covers only the main campus location. We have not received pollution prevention training in the past year.

Riverland Community College, Albert Lea and Austin – Riverland Community College has four campuses in three cities located in southern Minnesota: Albert Lea, Austin, and Owatonna. This report is for all four sites. The college employees approximately 300 full-time and part-time faculty and staff. Staff has not had any formal pollution prevention training.

St. Cloud State University (SCSU) – St. Cloud State University employs approximately 1,600 full- and part-time administrative, teaching, clerical, and technical maintenance personnel. The campus consists of 42 buildings and is situated on more than100 acres. For purposes of this report, all campus locations will be included. Members of the SCSU staff are receiving an increasing level of training in the areas of pollution prevention and recycling. During the past few years, the services of an outside consulting firm, MacNeil Environmental Inc., have been expanded to better address this training issue. They now provide some MS4 information/training, focusing on education about stormwater pollution prevention on campus and in cooperation with the city of St. Cloud. Consulting costs keep rising, and SCSU is moving to an in-house staff to replace MEI in September 2006.

St. Cloud Technical College (SCTC) – St. Cloud Technical College is located at 1540 Northway Dr. in St. Cloud and has a staff of approximately 206. This report is for St. Cloud Technical College only.

Department of Natural Resources (DNR) –The DNR employs over 2,900 staff at 185 locations. The DNR is divided into four managing regions: Region 1 based in Grand Rapids, Region 2 in Bemidji, Region 3 in Saint Paul, and Region 4 in New Ulm. Conservation of energy and supplies is empowered to all employees with oversight of conservation programs managed through Management Resources. The DNR works with citizens to conserve and manage the state's natural resources, to provide outdoor recreation opportunities, and to provide for commercial uses of natural resources in a way that creates a sustainable quality of life. This

mission requires sharing stewardship with citizens and partners, working together to address often-competing interests. Pollution prevention training is incorporated into our ongoing annual training plans. Sustainability is imbedded into our functional areas of planning and implementation.

Department of Revenue (DOR) – The Minnesota Department of Revenue manages the state's revenue system. We administer 28 different taxes, collecting over $12 billion annually. This money funds education, local government aid, property tax relief, social service programs, highways, and other state programs and operations.

The Department of Revenue has 1,377 full-time and seasonal employees and 41 contractors located in 15 offices: the home office in St. Paul, 14 offices in the metro and out-state Minnesota, one in Dallas, one in New York, and 42 home offices located throughout the country. This report covers all DOR facilities.

Our P2 training is designed around the DOR Commissioner's Forum, supplemented as needed with informational internal publications and a biannually electronic brochure with hints and tips on conserving energy and reducing pollution at home and in the office.

Department of Transportation (Mn/DOT) – The Minnesota Department of Transportation has approximately 5,000 employees. Mn/DOT is a decentralized organization with one central office and eight districts that are subdivided into 16 regions. Mn/DOT has 16 District Management Offices with 135 truck stations, as well as numerous remote salt sheds and gravel pits. The department maintains approximately 12,000 miles of highway and 5,002 bridges. This report represents Mn/DOT as a whole with respect to Mn/DOT's efforts in pollution prevention.

University of Minnesota – The University of Minnesota has 31,923 employees (including part-time and student employees) and 65,489 students on four major campuses: Crookston, Duluth, Morris, and Twin Cities (the Twin Cities' campus, which is counted as a single campus, includes both the Minneapolis and St. Paul campuses), and operates the University Center Rochester in cooperation with MnSCU.

The university has approximately 22 experiment or research stations, 18 regional extension centers, and extension agents in all 87 counties in Minnesota. The university has approximately 50 U.S. EPA ID numbers for hazardous waste generator sites around the state of Minnesota. Total managed space is 28,588,000 square feet. The university manages 27,500 acres for its campuses and research and outreach centers. This report covers the university as a whole. Approximately 2,500 staff and faculty received pollution prevention training during the past year.

Part 2
Policy and Regulatory Activities

Department of Administration (Admin) – Leadership in environmental stewardship is manifested in the mission statements of Plant Management Division and Materials Management Division. PMD employees are directed to use resource conservation and pollution prevention practices:

- in the maintenance of buildings and grounds
- in support operations
- during daily service to customers

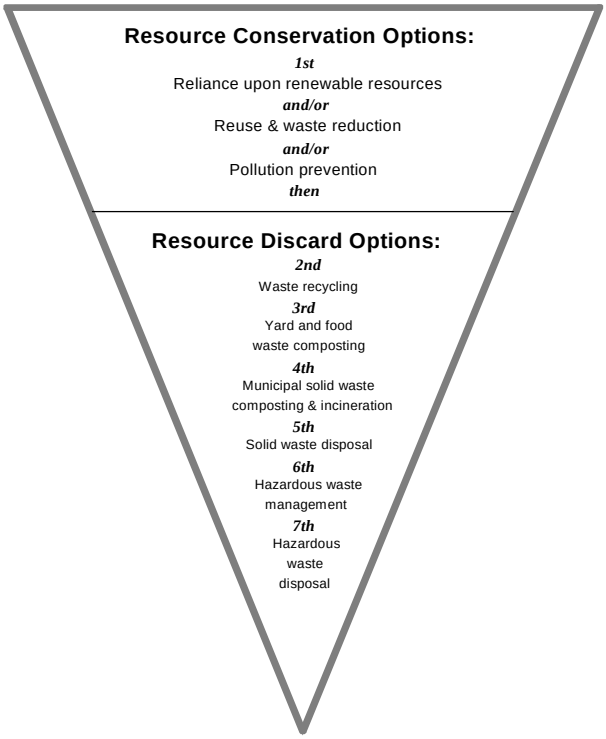
The RRO developed the department's priorities for Environmental Materials Management. These priorities have been in effect since their adoption in 1991 (see Part 4). Public employees learn about them during purchasing training.

The department's focus on environmental partnerships during the past decade has helped it to:

- leverage resources
- reduce pollution
- contribute to a more sustainable quality of life

Minnesota Department of Administration
Priorities for Environmental Materials Management

The acquisition, use, maintenance and discard of materials should first maximize resource conservation options to avoid and reduce waste quantity and volume. Then, resource discard options should be maximized in the order of priority.



The Department of Administration's pollution prevention activities include:

- Treating pollution prevention as a top priority (see sidebar).
- PMD's mission statement encompasses pollution prevention and other environmental concepts (see next page). a
- RRO encourages pollution prevention and promotes preferred waste management practices contained in Minnesota Statutes Section 155A.02 during the acquisition, use, maintenance, and discarding of materials.
- MMD and PMD require that employees be held individually accountable for achieving environmental stewardship as a function of their job responsibilities and as a fulfillment of their position descriptions. Employees are directed to follow state and federal requirements and are asked to identify opportunities to implement environmental values.
- PMD includes language in lease agreements to provide both purge days and coordination services for each building on the Capitol Complex. This annual activity promotes recycling, reuse, and the correct disposal of hazardous materials.
- MMD requires that vendors provide environmental codes on the goods and services they make available for state purchase.
- The State Architect's Office (SAO) publishes and maintains "Sustainable Design Guidelines" on their web and encourages all agencies to use the guidelines on building construction projects. In addition, SAO

manages the Buildings, Benchmarks and Beyond (B3) Program, which includes creating and updating guidelines mandated for use on new buildings.

Plant Management Division Mission Statement (created 1/92)

Our mission is to deliver consistent quality services to ensure clean, safe, and environmentally sound buildings, grounds, and operations.

Our customers are all people who use our services throughout the state of Minnesota.

The services we provide are a continuum of building, grounds, and professional services specific to the customers' needs. They include building maintenance, cafeterias, energy management services, grounds, janitorial, materials transfer, parking, administration of the state resource recovery program, and special use of state facilities permits.

Our core values are:

High-quality professional staff with accountability, honesty and ethics, loyalty, integrity, commitment to teamwork, respect of others and ourselves, and knowledge.

Responsiveness to our customer needs through communication, efficiency, and timeliness.

Provide quality work through modern technology and employee training.

Responsible business practices that encourage professionalism, cost effectiveness, and open communication.

Plan for the future, considering technology, employee development, establishment of long-term goals, and involvement of clients.

Environmental stewardship with conservation of resources, prevention of pollution, promotion and education, and integration into all work places and services

Sustainability goals. Sustainable development is the balancing of economic, equity (community), and environmental considerations. The Department of Administration's State Government Resource Recovery Program uses this model during its partnerships with other entities to deliver customer services for a high quality of life. Goals include:

- Continued resource conservation and recovery as Administration integrates sustainable development into public agency daily operations.
- Continued state agency waste reduction (by toxicity and amount).
- Continued recycling through sustainable development partnerships with state agencies and other entities.

Through the Department of Administration, the State Architect's Office continues work to implement sustainable design and construction guidelines. Sustainable development "meets the needs of the present without compromising the ability of future generations to meet their own needs" and "maintains or enhances economic opportunity and community well-being while protecting and restoring the natural environment upon which people and economies depend."…"Sustainable development insures the quality of life, today and in future generations, by considering environmental, economic, and community linkages and impacts from our actions." (Minnesota Statutes Section 4A.07).

Department of Agriculture (MDA) – MDA's Laboratory Services Division continues to research ways to reduce the amount of hazardous waste it generates by purchasing new technology that reduces the use of hazardous chemicals. In addition to new technology, the division looks for alternative methods that will help reduce its hazardous waste.

The Department of Agriculture has an ongoing waste reduction program and actively looks for ways that it can reduce the amount of non-recyclable/reusable products used on a daily basis. The department continues to educate the public on the responsible use of pesticides and fertilizers within their environment. The Biodiesel Task Force continually works to accelerate the development of Minnesota's biodiesel industry. To learn more about this new alternative fuel, go to the MDA's website at www.mnda.state.mn.us.

The department has sent communication to all of the purchasing agents in our divisions instructing them to purchase Energy Star-rated electronic office equipment and appliances whenever possible. Our agency instructs employees to procure products with the lowest potential to contribute to air pollution whenever possible. The department has also sent out MPCA guidance on exactly how to comply with these directives. The department continually uses both electronic communication and teleconferencing to communicate with its clients.

Department of Commerce

Automotive fuels: The department actively promotes the use of E85 with funding and informational materials, education efforts, and staff support.

E85 FUELING STATIONS AND CONSUMPTION DATA

Year	Number of stations at year's-end	Total yearly volume (in gallons)	Monthly average (in gallons)
1997	11	5,933	225
1998	12	37,521	288
1999	17	74,959	583
2000	56	301,152	780
2001	65	706,228	965
2002	70	1,262,318	1,479
2003	85	2,185,905	2,270
2004	101	2,611,218	2,267
2005	179	8,102,129	4,650
2006*	227	5,725,161	5,612

* through May 2006

Education, communications, and training: The department operates the Energy Information Center, which is staffed by full-time energy specialists who answer consumer inquiries and who staff outreach events.

ENERGY INFORMATION CENTER CONTACTS (FY 2000-2006)

	2001	2002	2003	2004	2005	2006
Contacts*	60,000	61,000	63,000	62,127	54,856	66,096
Printed	240,000	200,000	127,000	unavailable	unavailable	75,277
Website (individual visits)	unavailable	unavailable	94,000	81,204	54,130	160,148
CDs	31,000	40,000	unavailable	unavailable	unavailable	64,685

*phone, in-person, e-mail responses

Energy Production–Solar Electric Rebate Program: The department received competitive funding for and operates the Minnesota Solar Electric Rebate Program, which offers about a 20 to 25 percent buy-down on grid-connected solar electric systems.

MINNESOTA SOLAR ELECTRIC REBATE PROGRAM RESULTS (KILOWATTS)

	FY 2003	FY 2004	FY 2005	FY 2006	Pending
Annual	13	50	104	80.5	66.6
Cumulative	13	63	167	247.5	314.1

Conservation Improvement Programs–Electric and Natural Gas: The department oversees utility investment in energy conservation and demand-side management through implementation of Conservation Improvement Programs (CIP). All electric and natural gas utilities are required to invest a small percentage of their gross operating revenue in energy conservation programs.

ELECTRIC ENERGY SAVINGS AND AVOIDED EMISSIONS DUE TO ELECTRIC CIP

	2001	2002	2003	2004*	2005**
Electricity (kWh)	323,267,204	361,774,831	403,570,318	268,998,041	395,345,173
CO_2 (tons)	265,079	296,655	330,928	220,579	324,183
SO_2 (tons)	805	901	1,005	669	984
NOx (tons)	635	711	793	529	777
Mercury (lbs)	9	10	11	8	11

* Actual reported energy savings.
**2005 CIP data includes investor-owned utility estimated/approved amounts and, for the first time, conservation savings as reported by municipal and cooperative utilities.

NATURAL GAS SAVINGS AND AVOIDED EMISSIONS DUE TO NATURAL GAS CIP

	2001	2002	2003	2004*	2005**
Natural gas (mcf)	1,527,548	1,338,796	1,781,059	1,294,389	1,324,656
CO_2 (tons)	265,079	296,655	330,928	220,579	324,183
SO_2 (tons)	805	901	1,005	669	984
NOx (tons)	635	711	793	529	777
Mercury (lbs)	9	10	11	8	11

*Estimated/approved amounts during regulatory process. Actual amounts are generally higher.
**2005 CIP data includes investor owned utility estimated/approved amounts and, for the first time, conservation savings as reported by municipal utilities.

Tanks: The Minnesota Petrofund Program, housed at the Department of Commerce, provides a reimbursement mechanism to help businesses and citizens clean up areas where petroleum leakage has occurred.

MINNESOTA PETROFUND APPLICATIONS AND FUNDING

	2001	2002	2003	2004	2005	2005
Applications approved	1,630	1,204	1,699	1,575	1,541	1,267
Funding approved (millions)	$13.1	$10.6	$16.6	$14.6	$13.1	$12.3

Electronic filing (eFiling): In July 2006, the Department of Commerce, the Public Utilities Commission (PUC), and the Office of Enterprise Technology launched an electronic filing application for documents filed in utility regulation cases (https://www/edockets.state.mn.us/EFiling/home.jsp).

The goal of electronic filing is to serve stakeholders by simplifying filing by providing an end-to-end electronic process, from document creation through the natural lifecycle of the document. eFiling is efficient, effective and very simple. Since 40 percent of documents filed in utility regulation cases are authored by either Commerce or the PUC, we expect to see an immediate reduction in the volume of paper documents produced

by the agencies. However, old habits die hard, and we consider the reduction in paper to be a learning process for our employees, requiring a marketing effort and education.

One of the best characteristics of the new process is that it was designed to be "replicable," both in our own agencies and elsewhere. The Office of Enterprise Technology, the application host, considers electronic filing to be its first "shared service." The implementation of electronic filing in utility regulation can be extended and expanded throughout state government over the next couple of years. eFiling holds great promise for government, business, consumers, and the environment.

Department of Corrections (DOC) – The following is taken from the DOC policy manual (*DOC Policy 100.010: Mission, Philosophy, and Vision of the Department of Corrections*):

> **Mission Statement:** To develop, provide, and promote effective correctional practices that contribute to a safer Minnesota.
>
> **Values**
>
> - Respect: We value every individual and recognize the need for respect and fairness.
> - Ability to grow and change: We affirm and support every individual's ability to change.
> - Healing and restoring relationships: We believe in restoring individual and community relationships.
> - Staff as our most valuable resource: We are committed to the personal/professional growth of our staff in an inclusive, safe, and healthy environment.
> - Open, two-way communication: We support sharing information and responsive listening through clear, accessible forms of communication.
> - Leadership through partnership: We believe in leading by example, shared decision-making, partnerships, and teamwork.
>
> **Goals**
>
> - humane/safe environment for staff and offenders.
> - offender accountability.
> - community safety through shared responsibility.
> - operational effectiveness.
> - sound public policy.

The mission, goals, and values listed above demonstrate the department's commitment to being a good neighbor and protecting our staff, offenders, and community. Sound environmental, health, and safety practices contribute to these ideals.

DOC policies are in place to help reduce pollution in the areas of alternative fuel vehicle procurement and telecommuting. Department purchasing policy states: "The Travel Management Division of the Minnesota Department of Administration can help answer questions related to State of Minnesota and/or U.S. EPA act requirements regarding vehicle acquisition." In addition, the policy references the Minnesota state statute regarding the purchasing of fuel and vehicles by state agencies. Further, DOC Policy 103.235, *Telecommuting*, lists pollution prevention as one element in the decision-making process.

DOC facilities continue to work with county hazardous waste inspectors, hazardous waste contractors, state agencies, vendors, and all of our employees to reduce the hazardous waste generated at facilities. Inspections and audits are a regular activity undertaken as a result of these partnerships.

Department of Employee Relations (DOER) – DOER has expanded the use of web-based training/meetings through the use of WebEx, which allows state Human Resources personnel to attend training sessions from their own desk, reducing the amount of miles driven by employees annually. DOER administers the Transit Expense Accounts program that allows employees to pay for out-of-pocket bus pass or van pool expenses on a pretax basis.

Department of Employment and Economic Development (DEED) – The following changes were made to our policies and procedures manual to promote pollution prevention efforts within our agency:

1. PPM312 Authority for Local Purchase–Buying Contract Items: Consideration should be given to the purchasing of energy-efficient, Energy Star-rated office equipment.

2. PPM341 Travel Expenses–Fuel: E85 will be used in flex-fuel vehicles when it is reasonably available and the price is comparable to gasoline. For all other gasoline-powered vehicles owned by DEED, it is recommended that the cleanest fuel available be purchased, e.g. Blue Planet® gasoline.

Department of Health – Our agency has employed the use of teleconferencing activities to help reduce the need for travel. Additional information will be made available in the 2007 report.

Iron Range Resources and Rehabilitation Agency (IRRR) – The IRRR is committed to policies and practices that will help educate and encourage employees to continually strive for the prevention of pollution and conservation of energy and environmental resources. The common sense approach to achieve attainable goals has been working very well at the agency. Tips regarding pollution prevention are included from time to time in the *Weekly Resourcer*, the agency's online employee newsletter. IRRR is committed to keeping northeastern Minnesota safe and healthy by encouraging its employees to:

- remain informed of environmental regulations.
- share environmentally friendly ideas that support pollution prevention.
- demonstrate that pollution prevention must be a shared goal among government, communities, and individuals.

Metropolitan Airports Commission (MAC) – The Metropolitan Airports Commission recognizes pollution prevention as an integral part of its services. The MAC's strategic plan reflects its commitment to environmental protection with the stated goal of establishing sound environmental strategies that lessen adverse environmental impacts on the natural environment and the surrounding communities. We encourage our tenants to do the same. The MAC also promotes taking a proactive approach to environmental protection and supports cooperation with other regulatory agencies.

Purchasing/procurement. Several MAC purchasing policies have been effective in preventing pollution. Product reuse is promoted internally through a purchasing policy, including a procedure for disposing of property that the MAC no longer needs. Internal notices are distributed, offering one department's surplus to another. This strategy not only reduces waste, it also holds down costs. An office supply surplus center has also been established, providing a location to store surplus office supplies. These excess supplies are available to any employee for use at the MAC.

Surplus equipment and lost-and-found items were previously sold by mailing lengthy descriptions, bid sheets, and terms and conditions to numerous recipients on a mailing list. Now these items are sold through the Internet and e-mail. This allows the MAC to reach more potential bidders and eliminates the large and frequent mailings, thereby reducing paper usage.

Technology and accepted practices. Use of electronic mail for notices such as job postings, organizational updates, press releases, and human resource announcements has helped reduce the amount of paper used throughout the organization.

Regulatory activities. With the many and varied activities at MSP, as well as at the reliever airports, it is essential that MAC staff work closely with a variety of regulatory agencies in order to ensure pollution prevention. For instance, the MAC works on an ongoing basis with the Minnesota Pollution Control Agency and the Minnesota Department of Health to help the reliever airport tenants maintain or obtain compliance with existing regulations associated with their lease space activities. The MAC also uses the services of the Metropolitan Council Environmental Services for treating glycol-impacted stormwater.

Metropolitan Council Environmental Services (MCES) – The council promotes activities and outcomes that are sustainable in development, transportation, affordable housing, and the environment. This is accomplished largely by policies, partnerships, and grants, and by providing information and technical assistance to local communities, not by enforcement.

The council has a general Environmental Sustainability Policy (Section 1-2) that addresses issues relevant to the entire region. The companion Environmental Sustainability Procedure (Section 1-2a) addresses pollution prevention in day-to-day operations by the staff.

The Industrial Waste and Pollution Prevention Section (IWPPS) controls the use of the public sewer system—largely by the implementation of wastewater pre-treatment standards—in order to ensure compliance with local, state, and federal water quality regulations. See categories 11, 16, and 33 in Part 4 of this report for a complete description of the many activities of IWPPS that are relevant to pollution prevention.

Metropolitan Council Metro Transit – The council promotes activities and outcomes that are sustainable in development, transportation, affordable housing, and the environment. This is accomplished largely by policies, partnerships, and grants, and providing information and technical assistance to local communities and governmental bodies, not by enforcement.

The council has a general Environmental Sustainability Policy (Section1-2), which addresses issues relevant to the entire region. The companion Environmental Sustainability Procedure (Section 1-2a) covers pollution prevention for council staff. Metro Transit does not have any regulatory activities.

Metropolitan Mosquito Control District (MMCD) – The Metropolitan Mosquito Control District is committed to protecting the environment. It's the district's policy to significantly reduce and, whenever possible, eliminate the release of toxic pollutants and the generation of hazardous and other wastes. By successfully preventing pollution at its source, we can improve the quality of the environment we live in and maintain a safe, healthy workplace for our employees.

Environmental protection is everyone's responsibility. The MMCD is committed to being a good neighbor and operates in strict compliance with federal, state, and local environmental laws. Meeting this commitment requires the cooperative effort of all MMCD employees. Technologies and methods that substitute nonhazardous materials and use other source reduction approaches will be given top priority for integration into MMCD operations.

Department of Military Affairs (DMA) – The Department of Military Affairs' vision is to lead the way in protecting and enhancing our natural and cultural resources while maintaining the highest degree of military readiness. The DMA is committed to ISO 14001, Environmental Management System (EMS). The DMA will utilize effective partnerships both within and outside the organization to show continual improvement; develop innovative solutions; to obtain command, soldier, and regulator "buy in;" and to promote success in sustaining compliance with all regulatory requirements. The DMA uses EMS to accomplish the following:

- support the Army transformation
- ensure the viability of training areas
- promote sustainable operations
- reduce overall costs

Minnesota Pollution Control Agency (MPCA) – The Prevention and Assistance Division concentrates on pollution prevention policy and outreach. MnTAP focuses the vast majority of their efforts on technical assistance to other organizations and companies with a goal of preventing pollution. Pollution prevention programs in Minnesota have had a distinct advantage over many other states by having stable, well-funded programs for the past 10 years. The Toxic Release Inventory and other data sources have shown a decrease in emissions and waste generation.

A whole host of new information and tools are available that expand our original pollution prevention vision, including environmentally preferable purchasing, green buildings, design for the environment, and

Environmental Management Systems. The Prevention and Assistance Division programs promote all these initiatives. MnTAP uses these tools in their assistance to Minnesota businesses. With help from MnTAP services over the last year, companies have reduced or reused 12.3 million pounds of waste, resulting in company savings of $2.2 million.

Green Building Program. The Prevention and Assistance Division is working with architects to encourage the use of resource-efficient materials and practices in new state buildings under construction. Minnesota loses 27,000 acres of farm, forest, and open space land every year to new development. In the United States, we generate an estimated 2.8 pounds of building-related construction and demolition debris per person per day. Globally, building construction consumes 25 percent of virgin wood used each year. Therefore, the Prevention and Assistance Division has focused on establishing a "green building" program in Minnesota to reduce the loss of Minnesota's natural and reusable resources.

Green building, also called sustainable or high-performance building, means having a significantly reduced impact on the Earth's resources compared to conventional building. It also means creating a building that is healthier and more comfortable for its occupants, consequently enhancing productivity. We define a sustainable building as one that is healthy and comfortable for its occupants and is economical to operate. It conserves resources (including energy, water, raw materials, and land) and minimizes the generation of toxic materials and waste in its design, construction, landscaping, and operation. A green building also considers historic preservation and access to public infrastructure.

The Green Building Program strives to help communities find creative environmental solutions that are economically viable and meet social needs. These efforts have created a wealth of Minnesota-specific information to guide green building. The agency's in-house and grant-funded projects have supported the creation of design guidelines, product directories, deconstruction and reuse services, local manufacturing of innovative building products, a toolkit for K-12 schools, and demonstration projects such as green affordable housing.

During 2006, the Green Building program focused on facilitating development of a Green Remodeling Program in Minnesota, partnering with the USGBC Mississippi Headwaters Chapter (Minnesota) to mainstream commercial green building, using Minnesota's Sustainable Building Guidelines and Leadership in Energy and Environmental Design (LEED) standards. Staff provided training to expand capacity for green building among design professionals and the building supply industry, and they provided direct technical assistance to government, business, nonprofits, and individuals. The Minnesota Legislature established an environmental assistance grant program to provide financial assistance in the development of environmentally sustainable practices in Minnesota through voluntary partnerships and goal-oriented, economically driven approaches to pollution prevention and resource conservation.

The MPCA conducted a competitive, two-stage application process round in fiscal year 2006 to identify and assist projects that would be most beneficial in meeting its mission of working with Minnesotans to protect, conserve, and improve Minnesota's air, land, and water resources. Approximately $400,000 was available in fiscal year 2006. Sixteen projects from seven categories received awards during fiscal year 2006.

Product stewardship policy. The MPCA's product stewardship policy and initiatives also employ a preventive approach to conserving resources and reducing waste and toxicity. Product stewardship encourages people to think differently about the products they make, buy, and use, so that manufacturers, retailers, and consumers think about and treat products as resources rather than waste. Product stewardship means that everyone involved in designing, manufacturing, selling, and using products takes responsibility for the environmental impacts at every stage of a product's life. In particular, product stewardship asks manufacturers to share in the financial and physical responsibility for recovering and recycling products when people are done using them.

The MPCA's product stewardship policy creates partnerships between government and industry to reduce the environmental impacts of manufactured products throughout their life cycles in an economically efficient and environmentally beneficial manner. When manufacturers share the costs of recycling products, they have an incentive to use recycled materials in new products and to design products to be less toxic and easier to recycle, incorporating environmental concerns into the earliest phases of product design. Minnesota is the first state to develop and implement a product stewardship policy.

P2 Tools Initiative. Several projects spearheaded by the MPCA use the regulatory process, applying prevention and other nontraditional regulatory approaches that can help achieve the MPCA's core regulatory functions. In partnership, staff and leadership from the MPCA media programs and their external partners completed eight prevention-oriented projects as part of the P2 Tools Initiative. The projects were used to demonstrate MPCA's capacity to produce and use prevention metrics and data or information relevant to program continuous improvement. This effort was in response to recommendations from a 2002 internal survey and more recently, the P2 Six Sigma Discovery project, as well as MPCA Strategic Plan objectives related to prevention and excellent business systems. As a result of the P2 Tools Initiative, a working protocol for program or project planning, management, measurement, and evaluation was developed for application to the EPA P2 Grant program. In the past, collecting this type of data from isolated and uncoordinated projects prohibited such assessments. The projects include the following:

Construction Stormwater Compliance Calendar promotes regulatory compliance while educating about infiltration/filtration and low-impact development approaches. It partners the MPCA's Small Business Environmental Assistance Program with local jurisdictions and external technical assistance providers on stormwater program issues.

Conservation Design Toolkit is web-based guidance for builders and developers regarding low-impact development and other stormwater management practices targeted to the North Shore of Lake Superior. It partners the MPCA's stormwater and environmental management assistance programs with the University of Duluth-Natural Resources Research Institute and local technical assistance providers and jurisdictions.

Feedlot Environmental Results Program is a self-assessment program for smaller dairy feedlots to address regulatory compliance and promote stewardship activities associated with whole-farm management. It partners the MPCA's feedlot and environmental assistance programs with local jurisdictions and industry trade associations. Current partners are the Milk Producers Association and the MPCA Feedlot Program.

Multimedia P2 Inspections Program allows inspectors to cover the requirements of their primary program and review those of a second program for referral to program specialists while promoting pollution prevention. It partners the MPCA's enforcement, compliance, and environmental management assistance programs with the Minnesota Technical Assistance Program and local jurisdictions.

Low-impact Development (LID) Design Team assistance and Model Ordinance Technical Assistance Program Design Team makes on-site visits, partnering with developers and cities to prepare LID conceptual plans and with counties to update ordinances to include principles of low-impact development and conservation design. It partners the MPCA's environmental management assistance program with the Minnesota Erosion Control Association, Project NEMO, and design firms.

Community-based Social Marketing Projects focus on changing practices within a targeted sector or community.

Stormwater Management for Construction Impacts Program involves outreach and other strategies for contractors/builders, owners/developers, engineers/designers and regulatory personnel to help decrease environmental impact from construction stormwater runoff, which are being identified and prioritized for implementation. It partners the MPCA's stormwater and environmental management assistance programs with the Builders Association of Twin Cities, external technical assistance providers, such as the University of Minnesota Extension, various Soil and Water Conservation Districts, and other local jurisdictions.

Red River Basin Vegetative Buffer Technical Assistance Program. The Red River Basin Commission and local soil and water conservation districts are assessing current efforts to promote buffers, as a way to increase adoption rate of buffers among farmers and property owners. The MPCA Red River Basin Planner is also involved in the assessment.

Sucker River Watershed Protection Plan identifies and prioritizes strategies for residents, property owners, and others to adopt for the sake of protecting a high-resource value North Shore watershed. It partners the MPCA's water basin management program and the environmental management assistance program with the South St. Louis Soil and Water Conservation District, MPCA Lake Superior Basin Planner and Programmatic Work Group (stakeholder).

Positively MN Biz-Nice is a program initiated through the Governor's Office to promote business development in JOBZ designated areas. In a partnership between the Department of Employment and Economic Development and other agencies, the MPCA staff continues to provide technical assistance to businesses interested in sustainable development.

Measurement and Communication Protocol. Historically, the ability of the Minnesota Pollution Control Agency's regulatory programs to measure, track, and report the results of prevention-oriented activities has been lower than its ability to track control and treatment results. Because prevention results were not being tracked and communicated well, decision makers and program staff were having difficulty justifying specific prevention goals and activities. Early findings from the P2 Tools Initiative described above provided actionable items where improvements could be made in policy and procedures. A protocol has been developed and is now being applied to work conducted under the U.S. EPA Pollution Prevention Grant program plan. The intent is to produce and utilize results in communicating progress toward MCPA strategic goals and prevention metrics from prevention-oriented projects.

Pass-through Grants and Partnerships. The MPCA understands the importance of contextualizing prevention goals and results within the regulatory programs, in contrast to prevention efforts unhampered by the constraints of such programs. MPCA targets opportunities for integrating prevention activities into traditional regulatory programs with funds available through its U.S. EPA Pollution Prevention Grant award. In addition to the eight P2 Tools Initiative projects listed above, these pass-through grants funded a phosphorous management project and a project designed to reduce salt-laden road runoff:

Phosphorous Management Project. The MPCA successfully distributed the Phosphorus Management Plan (PMP) Development Resources packet, finalized in March 2003, through a partnership with Minnesota Technical Assistance Program. The MPCA uses this packet as a compliance tool to assist cities and other publicly owned treatment works (POTW) operators with reducing phosphorus effluent. The MPCA Water Quality staff is in the process of devising a PMP review checklist based on the PMP template contained in the packet. MnTAP, as a partner, will target POTWs and their industrial users in strategic locations within the Mississippi and Minnesota River Basins to help implement phosphorous and other pollutant reduction plans.

Road Salt Management Project. The MPCA's water basin management programs and the environmental management assistance program are partnering with Fortin Consulting to research the barriers to good road salt management practices among smaller commercial providers. Training is being developed and deployed to specifically overcome these barriers and improve knowledge, skills, and abilities of the personnel involved in road salt application.

The amount and source of the pass-through grants were:

- Construction Stormwater Compliance Calendar: $25,000, U.S. EPA P2 Grant.
- Conservation Design Toolkit: $25,000, U.S. EPA P2 Grant.
- Feedlot Environmental Results Program, U.S. EPA Innovations Grant, portion of $150,000.
- Multimedia P2 Inspections Program: $25,000, U.S. EPA P2 Demo Grant to MnTAP directly.
- Low-impact Development Design Team assistance and Model Ordinance Technical Assistance: $33,000, MPCA Stormwater Program.
- Stormwater Management for Construction Impacts Program: approx. $180,000 from U.S. EPA P2 Grant and MPCA Stormwater Program with Builders Association of the Twin Cities matching $75,000
- Red River Basin Vegetative Buffer Technical Assistance Program: $35,000, U.S. EPA P2 Grant.
- Sucker River: $35,000, U.S. EPA P2 Grant.
- Phosphorous Management for POTWs: $25,000, U.S. EPA P2 Grant.
- Road Salt Laden Runoff, $31,000, U.S. EPA P2 Grant

Other MPCA P2 Policy and Regulatory Activities

- The 2004 Minnesota Air, Water and Waste Environmental Conference focused on prevention strategies within its program sessions.
- In March of 2004, the solid waste utilization rules were finalized. These amendments to Minn. Rules ch. 7035 are designed to help solid waste generators identify alternatives to landfilling. In the first few months of the program, the MPCA issued 12 case-specific beneficial use determinations or demonstration research projects that will allow the use of coal ash, wood ash, mixed ash, and municipal solid waste incinerator ash. The rules will help to further the concept of seeing waste as a resource.
- In Duluth, all hazardous waste inspections of hospitals include a P2 checklist now. The effort to create this checklist just started this last year. The checklist is being formalized now into a more comprehensive checklist created in conjunction with Catherine Zimmer of MnTAP. Three hospital hazardous waste inspectors (one in Duluth, one in St. Paul, and one in Mankato) use the P2 checklists during regular hazardous waste inspections. They pass completed forms back to Catherine who follows up with hospitals to encourage more P2 results. This was part of the P2 Tools Initiative Multimedia P2 Inspections described above.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Alexandria Technical College employs a continuous improvement process that promotes excellence in environmental management and encourages energy efficiency by using environmentally friendly products and reducing waste, both internally and with our vendor partners. Alexandria Technical College finds audio and video conferencing, online employee education, and electronic transfer of reports and data to be energy- and time-efficient processes that reduce our energy and consumable product consumption.

Anoka Ramsey Community College – Anoka Ramsey Community College practices pollution prevention in all of our activities including our labs, maintenance, and purchasing environmentally friendly products and those that reduce hazards. Electronic communications are encouraged with all of our business contacts and vendors.

Bemidji State University – Bemidji State University has established an environmental policy statement that states in part:

> In our general operations, Bemidji State University will strive, wherever possible, to:
>
> 1. Conserve natural resources and support sustainable practices.
> 2. Conduct affairs in ways that safeguard the environmental health and safety of students, faculty, staff, and members of the broader community.
> 3. Reduce the generation of wastes and the use of toxic substances and promote strategies to reuse and recycle those wastes which cannot be avoided; and purchase renewable, reusable, recyclable, and recycled materials.
>
> In pursuing our educational and research missions, Bemidji State University will strive, wherever possible, to:
>
> 1. Foster an understanding of and responsibility for the natural environment.
> 2. Convey knowledge regarding environmental and health issues relevant to various academic disciplines.
> 3. Encourage environmental research.
> 4. Conduct teaching and research in an environmentally responsible way.
> 5. Provide a forum for the open flow of information within the university community and the community at large regarding environmental issues and their relationships to other social issues.

The complete statement can be viewed at www.bemidjistate.edu/ehs/content/bsu_env_plcy.pdf. As a 2005 signatory of the Talloires Declaration, BSU has made a formal commitment to protecting the environment and to pursue an environmental agenda. More information about the Talloires Declaration can be found at www.ulsf.org/programs_talloires.html.

Central Lakes College, Brainerd and Staples – Currently Central Lakes College encourages our employees to car pool as an alternative to single-occupancy vehicle commuting. Employees are encouraged to have teleconference meetings between the campuses whenever possible to cut down on travel.

Whenever possible we purchase energy-efficient appliances to reduce energy use at our college. Some lighting fixtures have been retrofitted with energy-efficient ballasts and bulbs resulting in a rebate for the Staples Campus from Todd Wadena Cooperatives. We have an agreement with our local utilities to curtail our electricity and natural gas. We have a propane backup system at Brainerd that we use when asked by the local utilities. Staples Campus has a 1,000-gallon fuel oil reserve. We have finished an energy audit and are currently working with Energy Management Services to re-lamp all our buildings at Central Lakes College.

Over the last few years, we have encouraged the faculty to use environmentally friendly products and chemicals that would not have to be treated as a hazardous waste when disposing of them. We have succeeded in going from a Small Quantity Generator to a Very Small Quantity Generator.

Minneapolis Community and Technical College (MCTC) – In order to regulate pollution prevention, we have updated our Chemical Hygiene plan to control chemical procurement, reduce waste streams, and reduce our hazardous waste generation to a Very Small Quantity Generator. Building and hazardous waste inspections are completed weekly to ensure compliance.

Minnesota State University, Moorhead (MUSM) – Minnesota State University at Moorhead is committed to the preservation, protection, and where possible, the enhancement of our environment in all matters of operation. This includes the obvious goals of meeting or exceeding all applicable local, state, and federal requirements, as well as fostering responsible stewardship by our personnel of all natural resources both in the work place and at home in the community. We promote a proactive policy in environmental matters—one that anticipates and addresses problems before they become a regulatory matter.

MSUM recognizes the strong environmental impact it has and is committed to developing the means to reduce its use of toxic materials, release of pollutants, and generation of hazardous wastes. Maximum results will be achieved through the education of the campus community, and continued investigation and implementation of environmentally friendly products and programs.

MSUM is constantly working toward reducing our environmental impact as a community. Students, faculty, and staff receive education through workshops, newsletters, etc. about environmental policy and awareness to ensure the quality of participation on campus in environmentally healthy practices. Departments are encouraged to purchase recycled goods, reuse materials, conserve energy, and properly dispose of discarded materials. MSUM currently reduces paper volume by using campus e-mail, promoting teleconferencing, using podcasting and vacating, providing classroom materials online, and by making registration and other administrative procedures paperless.

A large part of the environmental duties for MSUM is to set an example for the surrounding community, as well as nationwide academic communities. This model is presented each and every day, and continues to grow and develop as environmental policies improve and gain recognition.

Northwest Technical College, Bemidji – Northwest Technical College does not have a written policy or regulations that dictate or keep track of pollution control. Our desire for energy efficiency has a direct impact on pollution reduction. We have an understanding in our Information Technologies Department that all equipment that is purchased is the most energy efficient available and Energy Star-rated. We encourage the use of electronics for communication in the forms of e-mail, teleconferencing, interactive television, faxing, and hosting meetings on campus to control vehicle usage.

Plant Operations (PO) has an unwritten policy of using only low-VOC water-based paints, floor seals, sealants, and caulks for maintenance and repair. PO also uses only Energy Star-rated replacement motors. PO makes sure that all renovations and building upgrades, remodels, and additions are energy efficient to save operating costs and at the same time reduce our use of energy and its associated pollution generation. The campus recently entered into an energy management and reduction services agreement with Energy Services Group that will guarantee a reduction in our energy consumption and pollution generation. A roofing project that completely replaces the roof with new insulation and a MnSCU standard covering was

started last summer. It was initiated with heat loss and infrared scans that showed considerable heat loss. The entire heating system was upgraded this winter with new high-efficiency boilers, and a new digital HVAC temperature control system. An entire building lighting and electrical retrofit was done this past year that includes new energy-efficient main service board, T8 lighting, occupancy controls, and vending machine controls.

Riverland Community College, Albert Lea and Austin – Currently Riverland encourages employees to carpool as an alternative to single-occupancy vehicle commuting. We request that departments report monthly the number of miles they are carpooling and how many are participating. Employees are encouraged to have teleconference between the campuses whenever possible to cut down on travel.

All lighting fixtures have been retrofitted with energy-efficient ballasts and bulbs. We have an agreement with our local utilities to curtail our electricity use by 163 kW per day in Austin whenever we are requested to. In Albert Lea, we have a propane backup system that we use when asked by the local utilities. In November 2005 in response to the Governor's Executive Order 05-16, we lowered all thermostats to the recommended guidelines. In spring 2006, all thermostats were raised to the recommended guidelines. We will continue this practice as the seasons change. By monitoring academic classes and campus functions we are able to set units back to unoccupied temperatures through our computerized energy management system.

Over the last few years we have encouraged the faculty to use environmentally friendly products and chemicals that would not have to be treated as a hazardous waste when disposing of them. We have succeeded in going from a Small Quantity Generator to a Very Small Quantity Generator.

St. Cloud State University (SCSU) – Pollution prevention continues to be a factor in purchasing and implementation of new procedures. In addition, SCSU procurement policies demand office paper with 30 percent minimum total recycled content and 30 percent post-consumer fiber content. Bath tissue is 95 percent, or more, recycled or post-consumer fiber.

St. Cloud Technical College (SCTC) – We use electronic communications and teleconferencing with our clients whenever possible. We have switched to electronic application procedures when registering for classes. Students are encouraged to use the electronic payment system. High-efficiency office equipment is purchased whenever possible.

Department of Natural Resources (DNR) – The DNR policy is to purchase products and services that have a reduced impact on the environment, which in return preserves our natural resources for future generations. This is in accordance with Minnesota Executive Order 99-4 and Minnesota Statutes §§ 16B.121 and 16B.122.

We ask the following questions when developing our specifications in purchasing:

- Is it less toxic?
- Is it made from recycled materials?
- Is it reusable or more durable?
- Does it conserve energy or water?
- Can it be recycled? Is it difficult to dispose of?
- Is it made from plant materials?

Product categories that DNR uses and examples of DNR activities include:

- **Energy efficient:** Product uses less energy to accomplish its task, e.g., fluorescent lamps, Energy Star-rated office equipment, fuel-efficient vehicles.
- **Less toxic:** Product contains a smaller amount of toxic substances relative to a comparable product, e.g., solvents, paints, natural-based cleaners.
- **Plant-based:** Product derived from renewable resources, e.g., wood waste, fuels (ethanol and biodiesel), soy-based inks.
- **Remanufactured:** Products restored to its original condition by extensive rebuilding, usually given a better warranty than a new product, e.g., laser toner cartridges, office furniture. Thief River Falls' "new" multi-

discipline DNR office refurbished and recycled over $15,000 worth of office furniture. The building incorporates several sustainable products such as wheat fiber cabinetry and recycled tire carpets. Warroad Area Forestry Office used $10,000 worth of recycled furniture.

- **Water conserving:** Products that require less water to operate than a comparable product, e.g., plumbing fixtures, reduced volume flush toilets.
- **Rebuilt:** Products refurbished to a level less than remanufactured, e.g., engines, electric motors, and automobile parts.
- **Recycled-content (post-consumer):** Products containing materials that have been recovered from the solid waste stream after consumer use, such as paper, paints, trash bags, plastic lumber, carpet, re-refined oil, and rags.
- **Repair:** Products that have a defect corrected and can again serve its original function, e.g., vehicle bodywork, transmissions.
- **Used:** Surplus items no longer needed by one unit but are still useful and can be used by another unit, e.g., computers, furniture, audiovisual equipment.

Specifications used in determining what products are purchased:

- Using energy-efficient products can save money.
- Improves employee safety.
- Lowers disposal cost.
- Buying less hazardous products can reduce regulatory liability.
- Products that are reusable save energy.
- Buying in bulk creates less waste.
- Buying recycled products keeps our workplace and home recycling programs going.
- Using refillable items is more cost effective than using disposable or single-use items.
- Saves our natural resources.
- Reduces hazardous materials released in the environment.

Department of Revenue (DOR) – The Department of Revenue has actively pursued electronic communications for several years. Tax collections, income, sales, withholding, etc., have been web-based for some time now. Each year, the percentage of taxpayers using electronic media—and abandoning paper—has increased. New rules require businesses to use electronic technologies to interact, and individual taxpayers are encouraged to use electronic media by the speed of their return. The department is presently reviewing its strategies and mission statements to emphasize these new technologies.

Department of Transportation (Mn/DOT) – The Minnesota Department of Transportation is committed to lowering its waste disposal costs and liability, and protecting the environment. In keeping with this commitment, we strive to use cost-effective and practical methods to prevent pollution. Mn/DOT's environmental guidelines include:

- Lowering expensive disposal costs and liability associated with the use of regulated materials/waste. Reducing and eliminating the generation of waste through research, design, and field operations.
- Identifying and implementing pollution prevention opportunities by involving all employees. These opportunities include new methods, technologies, and product substitution.
- Seeking to demonstrate its commitment by adhering to all environmental regulations.
- promoting cooperation and coordination between government and the public toward the shared goal of preventing pollution and conserving our environment.

University of Minnesota

Board of Regents Policy: Sustainability and Energy Efficiency

Adopted: July 9, 2004
Supersedes: Pollution Prevention and Waste Abatement dated June 12, 1992

Section I. Commitment
Sustainability is a continuous effort integrating environmental, social, and economic goals through design, planning, and operational organization to meet current needs without compromising the ability of future generations to meet their own needs. Sustainability requires the collective actions of the University of Minnesota (University) community and shall be guided by the balanced use of all resources, within budgetary constraints. The University is committed to incorporating sustainability into its teaching, research, and outreach and the operations that support them.

Section II. Guiding Principles
Subd. 1. Leadership. Through excellence in environmental education, research, outreach, and stewardship, the University shall strive to be a world leader by promoting and demonstrating sustainability and energy efficiency and by producing leaders and informed citizens.
Subd. 2. Modeling. The University shall strive to be a model in the application of sustainability principles to guide campus operations by:
(a) meeting and aspiring to exceed all applicable regulatory requirements;
(b) preventing pollution at its source;
(c) reducing emissions to the environment; and
(d) encouraging the use of a life-cycle cost framework.
Subd. 3. Operational Improvements. The University shall undertake a continuous improvement process that seeks to meet the operational performance targets, goals, and objectives designed to achieve sustainability.
Subd. 4. Energy Efficiency. The University shall undertake a process to increase energy efficiency, reduce dependence on non-renewable energy, and encourage the development of energy alternatives through research and innovation.
Subd. 5. Research. The University shall (a) promote innovative, high visibility research projects focused on sustainability and energy efficiency to inform campus operations as a whole as well as the broader community; and (b) promote collaborative projects that include faculty research undertaken in partnership with operations staff, students, public entities, community organizations, and industry.
Subd. 6. Education and Outreach. The University shall promote educational and outreach activities that are linked to operational improvements and innovation principles.

Section III. Implementation.
Subd. 1. Administration. The University shall have sustainability goals that inform administrative policies and procedures in the areas of planning, decision-making, execution, assessment, reporting, and alignment. These policies and procedures shall rely on scientific analysis and support the efforts described in subds. 2-4 of this section.
Subd. 2. Operations. Each University campus shall develop specific sustainability objectives and targets in the areas of:
(a) physical planning and development, including buildings and infrastructure;
(b) operations;
(c) transportation;
(d) purchasing; and
(e) waste management and abatement.
Subd. 3. Accountability. The president or delegate shall develop indicators and measures of success in the implementation of the principles outlined in this policy in consultation with appropriate faculty, staff, students, and experts in the broader community.
Subd. 4. Reporting. The president or delegate shall report to the Board annually on progress toward established targets and standards, using this information to identify opportunities for subsequent improvement.

Part 3

Measurements for Activities Satisfying Executive Order 04-08

IPPAT has been designated as the entity to coordinate implementation of the August 2004 executive order on reducing air pollution (Executive Order 04-08: Providing for state departments to take actions to reduce air pollution in daily operations). The actions that state departments are taking are consistent with the recommendations of Clean Air Minnesota (CAM), a voluntary partnership of businesses, government agencies, and environmental groups working to keep the air clean. CAM promotes voluntary actions to reduce air pollution in the Twin Cities and throughout the state.

State departments, as well as other agencies with membership in IPPAT, have responded to the governor's executive order by committing to at least two of the activities listed below and have made attempts to quantify their reductions, recognizing that better data will be available as our reporting practices improve. Each department needed to pick at least two actions from the following list of eight activities to reduce air pollution.

a. Purchase or lease the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department. Fourteen agencies committed to this activity

b. Refuel state-operated vehicles with the cleanest fuel available. Sixteen agencies committed to this.

c. Encourage employees to consider alternatives to single-occupancy vehicle commuting. Sixteen agencies committed to this activity.

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances. Eleven agencies committed to this activity.

e. Employ energy-conserving strategies in state-owned or leased buildings. Eleven agencies committed to this activity.

f. Procure and use products with the lowest potential to contribute to air pollution, such as cleaning products with low amounts of volatile organic compounds. Six agencies committed to this.

g. Employ landscaping that reduces the need for gasoline-powered maintenance equipment. One agency (the Department of Natural Resources) committed to this activity.

h. Purchase electricity generated from renewable sources. No agencies committed to this activity; however, several agencies have reported quantifiable savings due to the agencies' purchase of renewable electricity.

The total quantities of reductions in all the agencies that reported were calculated using spreadsheets developed for the IPPAT by air quality staff at the Minnesota Pollution Control Agency. Results are summarized in the table on the following page, showing reductions in carbon monoxide, carbon dioxide, mercury, oxides of nitrogen, particulate matter of 10 micrometers in diameter, particulate matter of 2.5 micrometers in diameter, sulfur dioxide, and volatile organic compounds (VOCs). The reductions were achieved from activities listed in the first column of the table.

STATE AGENCIES REDUCTION TOTAL

Action	Total emissions reductions (lb)				
	CO	CO2	Hg	NOX	PM10
Diesel vehicles	291	0.00	0.00	0.00	0.00
Gasoline vehicles	193,090.70	68,899.90	0.00	17,388.20	21.56
Commuter	399,412.70	10,208,729.40	0.02	28,041.04	603.14
EE office equipment	35.03	218,397.77	0.01	4,604.64	44.07
Energy conservation	259.37	1,627,557.64	0.03	3,618.25	1,220.45
Low-VOC products	0.00	0.00	0.00	0.00	0.00
Landscaping	247.97	454.36	0.00	1.37	0.77
Renewable electricity	314.27	1,972,200.20	0.05	4,384.65	397.87
Total	**243,539.6**	**10,125,525.2**	**0.09**	**25,646.04**	**1,129.02**

As shown in the table, agencies achieved the greatest total reductions by encouraging staff to choose alternatives to single-occupancy vehicle commuting, followed by agencies purchasing renewable electricity. Energy conservation efforts and savings resulting from purchasing more efficient office equipment have been difficult to quantify, and the same is true for the commitment to use products with lower concentrations of VOCs. Determining reductions in VOC content requires knowledge of the products that most agencies lack at this time. Reporting these quantities will improve in future years.

Statewide data show that agencies purchased 98,024 gallons of E85 fuel, which was 1.8 percent of all fuel purchased, including diesel and gasoline. In 2006, the same records show that 165,526 gallons of E85 were purchased, or 3.2 percent of the total fuel purchased.

AGENCY PAPER USE (REAMS)

	Virgin	30% PC Recycled	100% PC Recycled	Total (reams)
Department of Administration	50	3,527	2,480	6,057
Department of Agriculture		4,946		4,946
Department of Commerce	20	7,770		7,790
Department of Corrections		58,559		58,559
Dept. of Employment and Economic Development	5,445	5,405		10,850
Department of Employee Relations		2,972		2,972
Department of Health		36,660		36,660
Department of Military Affairs		16,000		16,000
Department of Natural Resources	2,077	20,208	458	22,743
Department of Revenue		18,424*		19,290
Department of Transportation		31,193		31,193
Iron Range Resources		1,525		1,525
Metropolitan Airports Commission	4,830	790		5,620
Metropolitan Council Environmental Services		11,327		11,327
Metro Transit				
Metropolitan Mosquito Control District		580		580
Minnesota Pollution Control Agency		8,418	1,664	10082
Minnesota State Colleges and Universities				
Moorhead State	265	36,043	520	36,828
St. Cloud State	850	46,550		47,400
University of Minnesota	129,000	189,000	11,000	329,000
Total (reams)	142,537	499,897	16,122	659,422
Total (pounds)	712,685	2,499,485	80,610	3,297,110
Total (tons)	356.34	1,249.74	40.31	1,648.56

*866 reams other, probably newsprint for tax booklets

Department of Agriculture

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances.

Prior to the move into the new building the Minnesota Department of Agriculture had surplused/consolidated all office equipment (copiers, printers, fax machines, etc.) it had in the old facility. The new facility employs an open office/"neighborhood center" concept of office equipment usage. Instead of having office equipment stationed at multiple locations (private offices) throughout the building, most office equipment is centrally located in the neighborhood centers. There is a neighborhood center in each main work area of the building (12 total). The neighborhood center design concept has been proven effective in multiple corporate settings when it comes to reducing costs and energy consumption. As a result of this transition, newer, more energy-efficient office equipment was purchased during fiscal year 2006 to be placed in the new facility.

f. Procure and use products with the lowest potential to contribute to air pollution, such as cleaning products with low amounts of volatile organic compounds.

The department has not purchased any products (paints, solvents, cleaners, etc.) containing volatile organic compounds (VOCs) since the inception of the Clean Air Executive Order due to the fact that all cleaning, maintenance, and janitorial services are provided by our current landlord (Plant Management). However, prior to moving into the new facility, the department had finalized a contract with Admin's Plant Management Division to provide cleaning/janitorial services for our agency. The terms of the contract are as follows:

> "The Contract Vendor shall use environmentally safe products as defined by the State. A list of current items that the State has determined to be environmentally safe based on extensive evaluation and review has been compiled by the Department of Administration and included in the RFP.
>
> The Contract Vendor must ensure that all chemicals and instructions for use of cleaning equipment and chemicals be in English and all other languages of persons using the product.
>
> The Contract Vendor must have Material Safety Data Sheets (MSDS) on all cleaning products available at the work location to meet all Right-to-Know requirements. The MSDS must be in English and in the language of the person using the product.
>
> Only janitorial equipment specified for high-quality indoor air environment is used in the buildings. This includes only vacuums equipped with two-stage HEPA filter system, to ensure indoor air quality (IAQ) standards are met.

We believe that the above contract language (specifying the type of products/cleaning supplies/equipment to be used) will significantly reduce the total VOC content in products used within the new facility.

Department of Commerce – The department has the following committed actions:

a. Purchase or lease the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department.

b. Refuel state-operated vehicles with the cleanest fuel available.

FUEL PURCHASES FOR FISCAL YEAR 2006	Diesel	E85	Unleaded
Fuel purchases (gallons)	15,899	1,423	35,339

Uncommitted actions:

c. Encourage employees to consider alternatives to single-occupancy vehicle commuting.

The department provides a comparable incentive for single-occupancy, Metropass, and carpool employees. For FY 2006, the number of employees who use a Metropass or car pool has increased (see part 4, item 10). Bike racks are also available near the building.

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances.

The department completed its multi-year effort to replace CRT-based computer monitors with flat screen LCD devices. In FY 2006, 60 units were replaced, saving an estimated 10,620 kWh/yr (60 monitors x 177 kWh/yr/monitor). Because the monitors emit less heat, the building's cooling cost during the summer peak will also be reduced.

TOTAL EMISSIONS REDUCTION (IN POUNDS)

	CO	CO_2	Hg	NOX	PM10	PM2.5	SO_2	VOC
EE office equipment	3.112	19,528.	0.0	43.415	3.940	3.027	78.407	0.4

We have also configured the multifunction printer/scanner/fax devices in the Market Assurance, Insurance and Licensing Divisions to receive incoming faxes and route them into e-mail boxes instead of printing them. This makes sense because it immediately captures the images, and makes them available for storage on our imaging system. We accept about 2,000 fax transmissions per month in those business areas. Using a conservative estimate of 2.5 pages per fax, we estimate printing 5,000 fewer pages a month.

Department of Corrections (DOC) – The Department of Corrections selected item a. and item f. from the list contained in Executive Order 04-08.

a. Purchase or lease the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department.

The activities for improvement for this item appear in Part 4, section 6, *Automotive Fuels.*

f. Procure and use products with the lowest potential to contribute to air pollution, such as cleaning products with low amounts of volatile organic compounds.

The activities for this item appear in Part 4, section 9, *Cleaning Supplies*. The department's paper consumption summary appears in Part 4, section 22, *Office Supplies.*

Department of Employee Relations (DOER) – DOER's commitment to Executive Order 04-08 includes:

c. Encourage employees to consider alternatives to single-occupancy vehicle commuting.

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances.

g. Employ energy-conserving strategies in state-owned or leased buildings by implementing a computer monitor power management policy.

In FY 2006, DOER continued implementation of our computer monitor power management policy. By the end of FY 2006, 50 percent of the computer monitors within the department have been configured to turn off the monitor after 10 minutes of inactivity (up from 25 percent in FY 2005). Computer monitors set to sleep mode after 10 minutes save an estimated 200kWhr/monitor annually (www.energystar.gov/index.cfm?c=power_mgt.pr_power_manage_reps).

All office equipment purchased/leased during FY 2006 was Energy Star-compliant. In FY 2006, DOER replaced 22 CRT monitors with LCD monitors. DOER only purchased paper with recycled content in FY 2006. The breakdown of paper type purchased is as follows:

FY 2006 OFFICE PAPER CONSUMPTION

30% RC Copy Paper, PCF	2,950 reams
30% RC PCF	10 reams
30% RC 3-hole punch	12 reams

Department of Employment and Economic Development (DEED) – The following lists the commitments that were made by our agency to satisfy Executive Order 04-08:

b. Refuel state-operated vehicles with the cleanest fuel available.

c. Encourage employees to consider alternatives to single-occupancy vehicle commuting.

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances.

e. Employ energy-conserving strategies in state-owned and leased buildings.

Department of Health –The Health Department has committed to the following:

a. Purchase or lease the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department.

Our agency maintains a fleet of 161 vehicles. This fiscal year (2006) we replaced 23 vehicles, of which all 23 were E85. Our agency is committed to this effort, and has determined that all vehicles being replaced or obtained for our use will be E85 compatible.

b. Refuel state-operated vehicles with the cleanest fuel available.

MDH has strived to accomplish this goal. All MDH vehicles contain a map demonstrating where E85 is available in Minnesota. This map is updated when new ones are published. MDH has published information about E85 use in the weekly briefing on May 1, 2006. This included a link to the National Ethanol Vehicle Coalition website. In calendar year 2005, MDH purchased 5.9 percent of its fuel as E85. In CY 2006, MDH increased that percentage to 12.4 percent.

c. Encourage employees to consider alternatives to single-occupancy vehicle commuting.

The Department of Health offers employees a Metro Pass card for $20 per month; 230 MDH staff use this program. We also maintain a website on our intranet for MDH staff. The department is working with Metro Transit and the TMD to establish commuter fairs for staff to commit to using alternative forms of transportation. We encourage staff to vanpool. Data relating to these three have been submitted to IPPAT.

Iron Range Resources and Rehabilitation Agency (IRRR) – Agency-wide energy-conserving practices at our facilities include but are not limited to:

- Replace light bulbs with energy-efficient lamps.
- Lease copy machines with the Energy Star label on them.
- Landscaping projects put some of the land back into its natural condition, reducing the need for gasoline-powered maintenance equipment.
- FEncouraging electronic communication among staff to help reduce paper usage and travel between our three facilities.

To help further measure energy-conserving practices, a baseline regarding energy consumption has been established for the facilities owned by Iron Range Resources. This table below contains the usage of electricity, gas, and water for FY 2006 at Ironworld, Giants Ridge, Eveleth Administration Building, and the Mineland Reclamation Headquarters.

FY 2006 ENERGY CONSUMPTION

Facility	Electricity (kWh)	Gas (therms)	Water (gallons)
Ironworld–Chisholm	1,082,910	50,643	621,000
Giants Ridge–Biwabik	2,016,304	59,847	4,676,700
Administration Building–Eveleth	364,480	n/a	13,400
Mineland Reclamation Building–Chisholm	278,560	Included with Ironworld	216,104

Metropolitan Airports Commission (MAC) – MAC's commitment to satisfying the requirements of Executive Order 04-08 is as follows:

a. Purchase or lease the most fuel-efficient and least polluting vehicles.

Staff identified new vehicle purchases that are capable of being alternative fuel compatible. This will allow MAC to use E85 or other available clean fuel options or technologies.

b. Refuel vehicles with the cleanest fuel available.

MAC staff will transition to biodiesel in existing diesel-powered equipment, which does not require any modifications to the equipment or to fueling tanks. MAC's flexible fuel vehicles will be limited to using only E85. E85 pumps, meters, and a fuel storage tank have been installed on-site for use by MAC vehicles.

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances.

MAC specifies the purchase of computer equipment to be Energy Star-compliant where applicable or have energy-saving sleep modes when not in use. Although MAC has very few other appliances, new purchases are specified to have high-efficiency ratings.

e. Employ energy-conserving strategies in state-owned or leased buildings.

MAC has consistently developed and remodeled facilities using energy-saving strategies. Recent boiler upgrades have resulted in efficiency increases of 20 percent. New chillers consume 33 percent less energy. Other energy-saving activities include strategic seasonal temperature adjustments and reuse of steam for preheating boilers and powering water pumps. MAC also participates in a gas curtailment program that reduces consumption of natural gas during periods of peak demand by using jet fuel to power boilers.

Metropolitan Council Environmental Services (MCES) – MCES has seven dual fuel vehicles, but only one is fueled with E85 on a regular basis. See Part 4, section 10, *Commuting, Transportation*. The use of recycled-content office paper is presented in Part 4, section 22, *Office Supplies*.

Metropolitan Council Metro Transit – Metro Transit is participating in the Governor's Executive Order 04-08 by purchasing ultra-low sulfur diesel fuel for the diesel fleet. This reduces the amount of sulfur dioxides that are released to the atmosphere. In addition to the fuel being low sulfur, it is also 2 percent biodiesel. Metropolitan Transit's purchasing policies for new buses have resulted in reductions of 371 tons per year of nitrogen oxide emissions since 2000 and 18 tons per year of particulate matter emissions since 2000.

During the past year, Metro Transit has changed lighting systems in two of its garages and its main office building to a more efficient fluorescent bulb and ballast. This work will continue for the next two years to convert all of the buildings operated by Metro Transit. This will reduce the electric load at each site and provide an average annual saving of $14,000 per building.

Department of Military Affairs (DMA) – The DMA has selected to implement two air quality pollution prevention actions.

b. Refuel DMA equipment with the cleanest fuel available.

Please note, the DMA is unable to accurately report E85 usage. This is due to the fact that gas stations aren't required to list the fuel purchase as E85. Some stations voluntarily list E85 on the receipt; however, the majority of stations do not indicate whether E85 or unleaded fuel was purchased. Out of necessity, the DMA purchases fuel from hundreds of different stations, and unless all gas stations voluntarily list E85 on their receipts, the DMA will never be able to accurately report E85 usage.

The DMA has several fleets of vehicles available for state and federal personnel's usage. The following fuel usage data lists only verifiable E85 results:

- The Recruiting Retention Command (RRC) has 108 vehicles in their fleet, of which 100 are alternate fuel vehicles. During FY 2006, the RRC purchased 100,900 gallons of fuel and of that total 3,952 gallons was E85. (Please read note above regarding E85 usage).
- GSA vehicle fleet purchased 70,560 gallons of fuel, of which we could only verify 1,660 gallons of E85.

- Tactical vehicles are located across the state. In FY 2006, the DMA purchased 183,000 gallons of diesel fuel. No E85 usage to report.
- The fuel points on Camp Ripley issued 39,348 gallons of unleaded fuel in FY 2006. No E85 tanks are located on Camp Ripley.

e. Employ energy-conserving strategies in buildings.

Many projects undertaken by the JFMN (Army) contributed to increased energy efficiency at our facilities. Where roof membranes were replaced, the underlying insulation was also replaced. New membrane installations typically include greater levels of insulation than what was removed. Where this work has been undertaken in previous years, it has resulted in energy savings of 10 to 20 percent.

Most of the major projects described below include installation of building automation equipment enabling the Facility Management's Department of Public Works to remotely monitor the performance of the installed HVAC equipment from its central location at Camp Ripley. This equipment also provides the ability to schedule operation of the HVAC equipment resulting in the ventilation equipment only operating when it is needed and thus expending energy to temper ventilation air only when the facilities are occupied. The following lists the DMA sites where energy-efficiency projects were undertaken:

Unit housing building rehabilitation projects in buildings 10-138, 10-142, and 10-14: Existing 80 percent efficient natural gas furnaces were replaced with 92 percent efficient furnaces. Air conditioning was installed to serve the sleeping bays of these buildings. The air conditioning units have a SEER of 17, which is one of the highest ratings available. The standard code-required product today has an efficiency of SEER 13. In these buildings, we went from a single furnace heating two or four bays to individual furnaces heating each bay. This will allow for more selective heating of buildings when they are occupied by less than 120 people. As a result, we will save a little gas in the future but we will use more electricity.

Unit housing building rehabilitation projects in buildings 10-145 and 10-146: Mechanical air conditioning was added to the existing air handling units. These systems used the same high-efficiency air conditioning units described above. As a result, we will use more electricity.

Relighting of MATES maintenance bays: We replaced 142 458-watt high-bay fixtures with an equal amount of 224-watt fluorescent high-bay fixtures. This yields a total electrical demand savings of 33.5 kw. Project was completed late June.

Relighting of building 02-207 supply and services warehouse: Fifteen 458-watt high-bay fixtures were replaced with an equal number of 224-watt fluorescent high-bay fixtures, resulting in a savings of 3.5 kw.

Rehabilitation of building 15-001 Old Armory: Steam heating system was replaced with a hot water heating system using forced air to distribute the heat throughout the area. This project included mechanical air conditioning of the main and second floors of the building. All light fixtures were replaced with energy efficient units. As a result, the building will use more energy.

Rehabilitation of building 02-202 into DOIM office: Entire building was gutted and rebuilt. HVAC system includes mechanical cooling throughout the building. New energy-efficient lighting was used throughout, but the lighting density exceeded state code.

Minnesota Pollution Control Agency (MPCA) – The Minnesota Pollution Control Agency selected items a. through f. from the list contained in Executive Order 04-08.

a. Purchase or lease the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department.

The MPCA has 132 vehicles, of which 76 are flex-fuel vehicles and four alternative vehicles. MPCA has representation on the SmartFleet and Drive to Excellence committees coordinated by the Department of Administration. For more details, see Part 4, Section 6 *Automotive Fuels.*

b. Refuel state-operated vehicles with the cleanest fuel available.

Currently, the MPCA is fueling with E85 about 40 to 50 percent of the time each month, compared to 30 to 40 percent each month in 2005, 24 percent in 2004, 17 percent in 2003, and 12 percent in 2002.

c. Encourage employees to consider alternatives to single-occupancy vehicle commuting.

The MPCA has a continuing pollution prevention program of promoting alternative transportation that includes an annual commuter challenge promotion, *Bikeways* and *Bus Fare* e-newsletters, participation in the Guaranteed Ride Home Program, telecommuting, special off-day parking, reserved carpool/vanpool parking, discounted bike lockers, showers, and conducting surveys and planning programs.

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances. The MPCA is beginning to collect purchasing and surplus data to be able to track the energy saved with new office equipment purchases. This year's documented savings are 450 kWh due to the replacement of 10 monitors, and next year much more will be documented. The 450 kWh translate into these savings:

Equipment type	Anticipated annual energy savings (kWh)	Reduction (lb)							
		CO	CO2	Hg	NOx	PM10	PM2.5	SO2	VOC
10 monitors	450	0.132	827.474	0	1.840	0.167	0.128	3.322	0.017

e. Employ energy-conserving strategies in state-owned or leased buildings.

The Minnesota Pollution Control Agency's central building replaced four fluorescent lamps from each fixture with two that are more energy efficient and contain less mercury. Also, each fixture was converted to using one ballast rather than needing two ballasts. In 2004, all closed offices, restrooms, and conference rooms in the St. Paul building were equipped with motion-detecting light switches.

The MPCA Brainerd Office lease specifies that full-spectrum lighting be installed and maintained. It also calls for the installation of additional exterior windows, including some that can be opened, in order to promote daylighting. The floor plan is designed to allow the maximum amount of light to enter workspaces. MPCA installed a revolutionary new daylighting feature (tubular skylights in the Brainerd Office administrative area) to test and measure performance and energy savings. The Brainerd Office also installed motion-detecting light switches in many office areas to help reduce electricity use.

The Duluth Office also installed full spectrum fluorescent bulbs. All the above technologies help minimize the need for additional lighting and its concomitant energy use and air pollution.

f. Procure and use products with the lowest potential to contribute to air pollution, such as cleaning products with low amounts of volatile organic compounds. Six agencies committed to this.

The Minnesota Pollution Control Agency's Brainerd Office features low-VOC paint and finishes, high recycled-content resilient carpeting and flooring, and recycled-content or recycled Styrofoam ceiling tiles. Maintenance staff at the St. Paul office uses only low-VOC paints for internal and external painting projects. In FY 2003, the MPCA remodeled one floor and only low-VOC paints were used.

g. Employ landscaping that reduces the need for gasoline-powered maintenance equipment.

h. Purchase electricity generated from renewable sources.

The MPCA has signed an agreement with the lessor to purchase $27,000 worth of wind source for three years (450,000 kWh per year) beginning in September 2006. Any fuel cost adjustment rebates will be re-applied toward additional wind source purchases. This will result in the annual prevention of 828,000 pounds of carbon dioxide, 2,490 pounds of sulfur dioxide, 1,790 pounds of nitrogen oxides, and 9 grams of mercury to the atmosphere.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – ATC currently participates in the state vehicle lease program. Our current fleet of leased vehicles is being upgraded to include more fuel-efficient models of vehicles. As office equipment is replaced, we strive to find more efficient equipment. More efficient flat screen computer monitors replaced most of the CRTs at our facilities to reduce energy consumption. Seven new energy-efficient roof-mounted HVAC replacement systems were installed during the reporting period.

Energy conservation strategies have been a major focus for ATC's Facilities and Maintenance Department. Our continuous energy conservation program includes winterizing all overhead doors each fall and replacing T-12 fluorescent lighting with T-8 fixtures. The T-8 fixture is 30 percent more energy efficient than the T-12 model. Our team has replaced one-eighth of the exterior windows in our main facility with more energy-efficient models. This is part of a phased plan that will continue until all of the exterior windows have been replaced. More energy-efficient burner units are purchased to replace nonfunctional units on our heating system. A company was contracted to calibrate and tune up all of the heating system boilers during the reporting period.

Our Facilities Maintenance Department has converted most of their cleaning products from aerosol sprays to either pump sprays or squirt bottles to reduce our generation of and exposure to VOCs. This has been communicated to our staff so that they may make informed decisions when purchasing these products. Landscaping of newly developed areas employ xeriscaping designs to reduce the use of gasoline-powered maintenance equipment, fertilizers, and also to reduce fire hazards.

Anoka Ramsey Community College – Last year we committed to two activities to address Executive Order 04-08. They were items a and b, pertinent to purchase or lease of fuel-efficient vehicles/least polluting vehicles and refueling vehicles with cleanest fuel available.

Bemidji State University – Employ energy-conserving strategies in state-owned or leased buildings are in progress. BSU purchases electricity generated from renewable sources and initiated purchase of wind power energy blocks in September 2006.

Central Lakes College, Brainerd and Staples – Central Lakes College's first commitment to Executive Order 04-08 was to purchase or lease the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department. In June, we purchased three vehicles that can burn E85 fuel. We have installed a furnace that will burn corn at our Ag Facility. The payback for the furnace is expected in two to three years.

The second commitment was to employ landscaping that reduces the need for gasoline-powered maintenance equipment. We have reduced our maintained grounds by 4.5 acres by planting prairie grass and building ponds and gardens. We have an ongoing commitment to use prairie restoration plots and gardens college-wide.

Minneapolis Community and Technical College (MCTC)

c. Encourage employees to consider alternatives to single-occupancy vehicle commuting.

2005: MCTC is in the process of encouraging employees to consider alternatives to single-occupancy vehicle commuting. We offer discounted bus passes, free motorized vehicle parking, and bike racks.

2006: MCTC is continuing to encourage alternatives to single occupancy vehicle commuting. We have also installed 50 new bike racks, and employees have the option of four 10-hour days to cut down on commuting.

f. Procure and use products with the lowest potential to contribute to air pollution, such as cleaning products with low amounts of volatile organic compounds.

2005: MCTC is also in the process of procuring and using products with the lowest potential to contribute to air pollution. Our products are low in volatile organic compounds (VOCs). Examples include: Stride Citrus HC which is GS-37 certified and has 0g/L VOC, Glance NA is GS-37 certified and has 0.1 g/L VOC and Freedom Stripper has 100.7 g/L VOC (this was a reduction from the Envirosolution Stripper).

2006: MCTC is continuing to procure and use products with the lowest potential to contribute to air pollution. In addition to those in 2005, we have procured the following: SP Straight Seal which is a non-solvent sealer which lowered VOCs by 22 percent or 105g/L over the previous sealer, and SP Green Solution which will lower the VOCs over JP Freedom by 39 percent.

Minnesota State University, Moorhead (MSUM) – MSUM is actively participating in all eight areas of Executive Order 04-08 and reports quantifiable measurements for two specific areas: landscaping and renewable energy. The remaining six activities for Executive Order 04-08 are discussed in *Part 4: Pollution Prevention Activities during the Fiscal Year 2006*.

Northwest Technical College

a. We have reduced our fleet of travel vehicles from 11 down to 3 in the past two years by reducing off-campus meeting and promoting the use of electronics for meetings and communication. One of the three remaining vehicles in the line-up is E85 rated, and is a Travel Management lease vehicle. The other two are campus owned. A list of all Minnesota E85 fuel stations has been supplied in the Travel Management vehicle, with a note to only refuel with E85. The vehicles are tuned and maintained on a regular basis, and all pollution control equipment is maintained for peak operating efficiency. Reduction in travel has been substantial, but has not been tracked or substantiated due to staff and budget reductions.

b. E85 has been recently introduced in three Bemidji fuel stations.

c. Faculty, staff, and administration are encouraged to use alternative electronic communication. Due to lack of adequate staffing and budgeting there are no reduction figures from a standard to calculate.

d. Energy Star-rated office equipment and replacement/repair for HVAC equipment is being done.

e. In the past year, Energy Services Group (15500 Wayzata Boulevard, Suite 1003, Wayzata, 55391; 952-473-3162) entered into a contract with Northwest Technical College and MnSCU to provide a guaranteed energy- and cost-saving program. They are monitoring usages of all of our recent building, lighting and HVAC upgrades and can provide detailed cost and usage analysis. We removed old boilers and installed three new high-efficiency boilers (90%), and converted from a steam system to hot water. A new computerized, digital, HVAC control system was installed that uses multi-point space occupancy, and time-inputted technology control. A complete building lighting upgrade was done with a new digital controlled main power panel, energy-efficient lighting with motion detector controls, new LED exit lighting, vending machine controls, and one high-efficiency rooftop replacement unit that supplies HVAC to the computer labs. A complete new roof replacement project started this summer that will bring the insulation and skin up to the MnSCU roof standards. Also in the roofing project are windbreaks for the front entry and new energy-efficient windows in the entry and atrium area. Duct work was professionally cleaned in the spring of 2006.

f. We do purchase low-VOC cleaning supplies and use water based-paints, floor sealers, and carpet cleaners. We use a licensed pest control service, (Ecolab). We have not used fertilizers for at least five years. Our Automotive and Automotive Machine Programs have changed from solvent- to water-based parts washers. They have purchased and are using an antifreeze recycling machine. They use absorbents and mats that are recycled. Batteries, tires, metals, and oils/filters are recycled. The Dental program recycles their heavy metals.

g. We use 62" and 90" lawn mowers to reduce the amount of time spent with gas engines running. We have added paver patio areas and sidewalks around the building to reduce the amount of trimming time required. We do not know of any air alert days in our community at the present time. We use a brush-mounted sweeper in the winter to minimize the amount of sidewalk de-icers.

h. We purchase our electricity through Ottertail Power Company.

Riverland Community College, Albert Lea and Austin – Riverland's first commitment to Executive Order 04-08 was to encourage employees to refuel state-operated vehicles with the cleanest fuel available. In May 2005, our Truck Driving Program began using biodiesel fuel (less than 500 parts of sulfur per million) in 45 percent of its trucks, compared to using regular diesel fuel that is 1,300 parts of sulfur per million. This year, we are using it in 100 percent of our trucks. This fuel does not work as well in real cold weather.

The second commitment was to mow some areas of our campus less than usual. Approximately 8 acres in Austin are being mowed less (estimating three hours of tractor use and five gallons of fuel). In Owatonna, four acres are planted in prairie grasses that require very little mowing or care.

St. Cloud State University (SCSU) – SCSU is moving toward commitment to the full range of Executive Order 04-08 activities. Note, much of our progress is general only, (currently very expensive to quantify with hard specifics). As we study and promote system changes to efficiently capture this type of information, we will move toward reliable benchmarking and control within the academic freedom parameters of our university environment.

Virgin paper use of about 850 reams (4,250 pounds) of colored paper used in our student union copy shop was about the same (838 reams) as last year. (Where feasible, recycled color paper was used.) All of the white paper used in that copy shop was standard campus recycled paper of minimum 30 percent recycled content and 30 percent post-consumer fiber content. Campus consumption of this standard recycled paper stayed about the same as last year: 47,400 reams (237,000 pounds). More data will be sought on the possibility of using 100 percent post-consumer fiber content paper.

a. SCSU is focused on purchasing/leasing the most fuel-efficient and least polluting vehicles that meet our operational needs. We've gone from 16 E85 capable motor pool vehicles to 18 of them as we have replaced our two highest mileage and dedicated Public Safety vehicles. (We have 25 total motor pool vehicles after our two new E85 Taurus 2005 purchase. Meanwhile, E85 fuel usage for this fiscal year has remained within 50 gallons of last fiscal years totals of 13,500 gallons. One 15-passenger van was replaced with a 12-passenger unit. Grounds Maintenance and Athletic Departments are experimenting with golf-cart-sized/type vehicles also. Everything is being done within the limitations of overall total cost control and remaining economic life. (This presently limits hybrid considerations; but we are making the effort.) Air emission reduction calculations are not shown because they are pretty much a wash with virtually the same E85 fuel usage (within 50 gallons of last fiscal year's total of 13,500 gallons, in spite of an increase of E85 vehicles from 16 to 18).

b. SCSU is also promoting E85 usage by making campus refueling with it more convenient. This is in addition to two more E85 vehicles as described in item a above.

c. SCSU encourages employees and students to consider alternatives to single-occupancy commuting by co-sponsoring free bus rides with St. Cloud Metropolitan Transit Commission. Ride shares and carpools are also encouraged and promoted.

d. SCSU purchase of Energy Star appliances and office equipment is encouraged to reduce state energy use. Our IT and Computer Store technicians and managers are a vital part of SCSU controls and Energy Star sleep mode encouragement to promote reduced state energy use compliance. There is also strict review of leased or purchased copiers and other office machines. Future SCSU rental unit appliance replacement purchase planning is being challenged to incorporate energy considerations.

e. SCSU employs energy-conserving strategies in our buildings. For instance, Centennial Hall renovation is being planned with special design/engineering contracts and Xcel Energy Utility specialist involvement to ensure life-cycle energy savings. This joint planning has also earned us project rebates of up to $14,000. Memos encouraging heating energy conservation and retrofit projects such as new more energy-efficient dorm window replacement are also underway while we become more focused on better building design. PAC heating control valves are being replaced as part of energy improvement.

f. SCSU actively procures cleaning and painting products based on potential air pollution. Liquids and surface spraying is promoted over aerosols. VOCs are discouraged with a special review committee and O/EHS participation to ensure substitution/replacement. Latex paint is promoted; use of oil-based paint is very limited.

g. SCSU is experimenting with landscaping and prairie growth, which reduces gasoline use.

h. SCSU is experimenting with wind-generated electricity provided through Xcel Energy. Investment is minimal to promote learning opportunities which will help balance higher cost.

St. Cloud Technical College (SCTC)

a. We lease our vehicles from Travel Management Division; what they purchase is what we use.

b. We refuel our leased vehicles with the fuel recommended by Travel Management Division.

c. While staff is on college business, carpooling is encouraged and practiced.

d. We use an energy management system that helps improve the efficiency of the HVAC system and improve indoor air quality. We are in the process of replacing the ballasts in the lights with electronic ballasts. The campus lights are on motion detector sensors so the lights turn off when they are not needed, this conserves electricity. Before building the new St. Cloud Technical College addition, energy design assistance by Conservation Wise from Xcel Energy helped design the new facility with efficiency in mind to lower energy bills by an average of 30 percent. Energy-efficient equipment used included:

- office and classroom occupancy sensor lighting controls
- alternative classroom and office lighting designs
- premium efficiency supply/return fan motors
- CO_2 control of outside air
- Lo E clear2/alum frame windows
- R25 roof insulation
- R16 wall insulation

e. We continually review our products and use the most environmentally friendly products available in our labs, classrooms, and maintenance area.

f. Planting of trees and building expansion have reduced the need for use of gasoline-powered equipment for mowing.

Department of Natural Resources (DNR) – The DNR is implementing the following air quality pollution prevention actions:

a. Purchase or lease the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department.

- DNR continues to explore additional avenues to conserve fuel, reduce pollution, and to preserve the natural resources.
- The DNR-wide fleet policy states:
  - Employees are to carpool to meetings.
  - Use most fuel-efficient vehicle when going to meetings.
  - Promotes the purchasing of the most fuel-efficient equipment.
  - Standardized equipment purchases and promotes the reduction of unnecessary options.
  - Conducted defensive driving courses that promote proper speeds and safe vehicles through proper maintenance.
  - Maintain proper tire pressure based on vehicle specifications (tire gauges issued to all vehicles)
- Purchases alternative fuel vehicles: As of July 15, 2006, our history of fuel-efficient cars is listed below.
  - 1 full electric
  - 12 gas/electric (hybrid)
  - 284 E85 fuel capable:

1997	2
1998	4
1999	28
2000	12
2001	18
2002	23
2003	3
2004	36
2005	87
2006	71

b. Refuel state-operated vehicles with the cleanest fuel available.

DNR is currently working with Mn/DOT, Admin, and the Minnesota Lung Association to increase use and distribution of E85 and biodiesel fuels. The website for E85 fuel sites is distributed to all employees. We have developed a plan to increase or modify on-site storage at about 40 remote sites across the state.

c. Energy benchmarking.

DNR currently has 70 buildings being benchmarked for fuel and electric consumption, four major sites are being further audited to monitor energy-efficiency upgrades, and participating in fuel price hedge program.

d. Encourage employees to consider alternatives to single-occupancy vehicle commuting.

The Minnesota DNR has a policy in place to encourage the efficient and wise use of state transportation. This policy is given to each new employee and distributed to all employees on our intranet website. Metro commuter information is also distributed to all employees.

We have purchased and set up teleconferencing equipment. We have had 12 meetings with participation of from 14 to 25 regional staff at each meeting. This has reduced travel by over 15,000 miles and saved an estimated 800 gallons of fuel.

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances.

Purchase for replacement items are on a scheduled basis. Efficiency is a heavily weighted criterion for selection to purchase.

e. Employ energy conserving strategies in state-owned or leased buildings

- Paper products: Copy paper, file folders, envelopes, "Post it" notes, and cardboard storage boxes are all made with post-consumer recycled content.
- Printing: Use post-consumer or chlorine-free paper, vegetable-based inks.
- Office machines: Copiers are purchased that have duplexing capabilities, which can reduce paper use by up to 40 percent, incorporates energy conservation, is digital (direct link form computer), and can use up to 100 percent post-consumer paper.
- Computers and monitors use energy-conservation mode.
- Laser printers have duplexing capabilities, energy-conservation mode, and can use post-consumer paper. Cartridges can be recycled and recharged.
- Vehicle maintenance: We use refined oil and recycle antifreeze, parts solvent, tires, and batteries.
- Signs: We purchase plastic signs that are made out of post-consumer plastic that can be recycled.
- Janitorial supplies: Our warehouse offers a full line of environmentally friendly cleaners.
- Trash bags are made with post-consumer recycled material and are biodegradable.
- Lights: Purchase energy-efficient fluorescent lights and occupancy sensors.
- Carpet: Purchase carpet that is manufactured with recycled plastic and rubber.
- Paint: Use recycled latex paint in remodeling and new construction.
- Plastic lumber: Park benches, picnic tables, parking curbs, retaining wall timbers, and decking.

f. Procure and use products with the lowest potential to contribute to air pollution such as cleaning products with low amounts of volatile organic compounds.

Department of Revenue (DOR) – The DOR has always had a commitment to reducing waste and pollution. Over the years we have encouraged our employees to shut off lights when not needed, use recycled paper, toner products, mass transit, van pools, etc.

- In FY 2006, 96 percent of the paper we used contained 30 percent recycled materials.

FY 2006 OFFICE PAPER CONSUMPTION	
Total used	19,290 reams
30% recycled content 96% of total	18,424 reams

TOTAL EMISSIONS REDUCTION USING 30% RECYCLED CONTENT VS VIRGIN

Wood	29 tons							
BTUs	186 million							
	Solid waste	**CO_2**	**Water**	**NOX**	**Particulates**	**SO_2**	**VOC**	**Other hazardous compounds**
30% RC paper	12,422 lbs	23,303 lbs	96,728 gallons	45 lbs	56 lbs	6 lbs	41 lbs	22 lbs

- Our vehicle fleet is made up of 15 vehicles designed for E85. Our current E85 usage is less than nine percent of our total fuel purchases. Improving the use of E85 will be one of the key agenda items for the next year. **7361 gallons used, 649 gallons E858 = 8 percent usage**
- We have surveyed our employees to establish a base line for modes of travel, miles driven, car or vanpool participation, etc.
- Our older CRT computer monitors are being replaced with Energy Star LCD displays, which consume half the energy and provide less glare. Our new LCD monitors draw 38 watts versus 85 watts for the older ones that are being phased out. **To date we have replaced 1,146 monitors. Operating 8 hours per day, 250 days per year, this equals a savings of 107,700 kW per year**. Also, fewer watts used produces less heat, which lowers the demand for cooling.
- We have worked with the Department of Administration to institute a lighting program at our largest facility at 600 North Robert in St Paul. We analyzed the building lighting as it was designed and found that we were over-lighting for the changes in our day-to-day operation, which is more computer intensive. The excess available lighting created issues with glare and complaints about eye-strain. In response, we removed one of the three florescent tubes in most of 3,000 light fixtures throughout the building. Management offices and conference spaces will be done in the near future. To date only a few fixtures have been returned to the full set of three tubes. **Approximately 3,000 lights reduced by one 32-watt tube per fixture equates to 240,000 kW per year of electricity.**
- Lighting in the building was designed with occupancy monitoring. When an office has been vacated for several minutes, the lights go off.
- Revenue has restricted the use of coffee makers and eliminated the use of coffee warmers and auxiliary heaters. This not only reduces fire hazards, but it also avoids problems with dozens of electrical appliances operating, many non-productively, throughout the day.

Department of Transportation (Mn/DOT) – Mn/DOT has committed to:

a. Purchase or lease the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department. See below in Part 4, section 6, *Automotive – Fuels.*

c. Encourage employees to consider alternatives to single-occupancy vehicle commuting. See Part 4. section 10, *Commuting, Transportation.*

e. Employ energy-conserving strategies in state-owned buildings or leased buildings. See Part 4, section 13, *Energy – Lighting*, section 14, *Energy Production*, and section 17, *Heating, Ventilation, Air Conditioning (HVAC), Indoor Air Quality.*

University of Minnesota – The university has documented the following pollution prevention activities:

AUTOMOTIVE FUEL: E85 PURCHASE

	FY 2003	FY 2004	FY 2005	FY 2006
Total vehicles	795	830	835	833
E85 vehicles	42	38	71	81
E85 percent of fleet	5.28	4.58	11.8	9.72
Hybrid vehicles	3	4	14	14
Gallons of E85 purchased	19,867	18,636	16,997	13,735

OFFICE PAPER USAGE (WWW.OFEE.GOV/RECYCLED/CALCULAT.HTM)

Office paper purchased by UStores	**2002**	**2003**	**2004**	**2005**
Traditional paper (reams)	150,000	143,000	126,000	129,000
30% post-consumer (reams)	246,000	222,000	201,000	189,000
100% post-consumer (reams)	12,000	15,000	14,000	11,000
Total (reams)	408,000	380,000	341,000	329,000
Traditional paper (tons)	375	358	315	323
30% post-consumer (tons)	615	555	503	473
100% post-consumer (tons)	30	38	35	28
Total (tons)	1,020	950	853	823

Normalized office paper purchased	**2002**	**2003**	**2004**	
Traditional paper (reams/CPE)	2.06	1.89	1.64	1.65
30% post-consumer (reams/CPE)	3.37	3.06	2.62	2.42
100% post-consumer (reams/CPE)	0.16	0.20	0.18	0.14
Total (reams/CPE)	5.60	5.15	4.44	4.22
Full-year student equivalents	56,261	58,729	60,203	61,284
Full-time staff equivalents	16,653	17,012	16,656	16,725
Campus person equivalents	72,914	75,741	76,859	78,009

Paper-related greenhouse gas emissions	**2002**	**2003**	**2004**	**2005**
Traditional paper (lbs CO_2/CPE)	2.92E+01	2.68E+01	2.33E+01	2.35E+01
30% post-consumer (lbs CO_2/CPE)	4.26E+01	3.70E+01	3.31E+01	3.06E+01
100% post-consumer (lbs CO_2/CPE)	1.47E+00	1.80E+00	1.63E+00	1.26E+00
Total (lbs CO_2/CPE)	7.33E+01	6.57E+01	5.80E+01	5.53E+01

Paper-related energy usage	**2002**	**2003**	**2004**	**2005**
Traditional paper (BTUs/CPE)	1.98E+05	1.82E+05	1.58E+05	1.59E+05
30% post-consumer (BTUs/CPE)	2.82E+05	2.45E+05	2.19E+05	2.02E+05
100% post-consumer (BTUs/CPE)	8.91E+03	1.09E+04	9.86E+03	7.63E+03
Total energy consumed (BTUs/CPE)	4.89E+05	4.38E+05	3.86E+05	3.69E+05

Part 4
Pollution Prevention Activities during the Fiscal Year 2006

Part 4 contains information about the pollution prevention activities practiced by the participating agencies. The information is organized by category of material, listed alphabetically. All individual agency summary reports that address pollution prevention measures for a given material are listed in the same order as in Part 1.

1. Absorbents

Department of Administration (Admin) – The Materials Management Division in conjunction with Mn/DOT has a contract for *Hazardous Materials: Used Oil Sorbent and Filter Management for Energy Recovery*. One contractor burns the burnable sorbents for energy recovery. The other handles non-burnable used oil sorbent materials, generally clay and diatomaceous earth, which are reused by extracting the used oil. The oil is burned for energy recovery. This contract is available to other state agencies and members of the Cooperative Purchasing Venture.

Department of Corrections (DOC) – Multiple facilities use a state-approved vendor for disposal and recycling of these materials to help ensure proper handling.

MCF-Moose Lake/Willow River – The facility collected 145 pounds of this hazardous material.

Iron Range Resources and Rehabilitation Agency (IRRR) – Como Oil picks up floor-dry for recycling.

Metropolitan Airports Commission (MAC) – The MAC continually evaluates a variety of absorbents. Currently, corncob fractions, clay floor-dry, and disposable rags are used to absorb oil and grease in the maintenance shop. Also, although the MAC is not responsible for any aircraft fueling operations or related spills, it does provide corncob fractions to its tenants, which are used exclusively to absorb spilled jet fuel. The sorbents are saturated as much as possible before disposal, and then managed as a nonhazardous industrial waste and burned for energy recovery.

Metropolitan Council Environmental Services (MCES) – MCES uses absorbents primarily on hydraulic fluids, crankcase oils, and other lubricating oils. The larger facilities send used bulk paper-based or polypropylene pad absorbents via OSI Environmental, Inc. or Rock Oil to be burned as a fuel for energy recovery. Two MCES facilities have industrial wringers that squeeze the oil from the synthetic pads, allowing their frequent reuse. Two facilities send clay-based absorbent to CRI Recycling Service for cleaning and reuse. Another facility has analyzed its used absorbent for Toxicity Characteristic Leaching Procedure heavy metals. Since none of the listed thresholds were exceeded, the absorbent is handled along with industrial waste (grit) with the approval of the regulating county. For 2005, 165 gallons of used absorbents were sent for energy recovery or recycling, a decrease of 82 percent from 2004.

Metropolitan Council Metro Transit – Metro Transit continues to use the cellulose type of absorbent, which is recycled. The change was made after reviewing the comprehensive studies and report done by the Minnesota Department of Transportation (MnDOT). The current absorbent is collected in 55-gallon drums after use and sent to a processing company that removes the oils from the absorbent and returns the "cleaned" product to the garage. This change has eliminated over 8,000 pounds of clay waste each year from the agencies landfill waste stream.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) – MSUM continues to use cloth-type pads and drip pans whenever possible. Absorbents (cloth-type rags, pads, and socks) are used primarily in Printing Services, Physical Plant, and the Department of Art and Design. Launderable rages are available and used at some locations.

Northwest Technical College, Bemidji – The Automotive and Automotive Machine Programs use absorbents that are recycled.

St. Cloud State University (SCSU) – Absorbent pad and pans or other similar products and launderable rags are increasingly available and used at SCSU. Absorbent materials to contain hazardous chemical spills near floor drains are being supplemented with drain covers and increased training and inspections.

Department of Transportation (Mn/DOT) – The sorbents currently used are either burned for energy recovery as a waste-derived fuel to generate steam and electricity, or the oils are extracted and the sorbents are reused. Mn/DOT continues to use a small quantity of launderable rags as sorbent materials. Mn/DOT reuses its sorbents, since it has found that the single largest factor in reducing an absorbent waste stream is reuse. It is important to use absorbents to their full potential prior to discarding.

University of Minnesota – The Vehicle Fleet Operations use absorbent pads to clean up small routine spills, in place of and/or in combination with floor-dry. The pads are laundered and reused. Absorbent disposal has been cut by five to 10 drums per year.

Printing and Graphic Arts uses rags for printing operations cleaning, and Studio Arts uses rags for cleaning in painting and other art techniques. The rags are centrifuged to remove solvents as needed and then laundered for reuse. Laundering of rags provides a distinct financial advantage to disposing of the rags as hazardous waste.

2. Adhesives

Department of Administration (Admin) – The State Architect Office specifies materials such as fiber-based fabrics, adhesives, carpeting, and upholstery that are free of toxins and formaldehyde.

Department of Corrections (DOC) – *MCF-Red Wing* – Contact cement usage is down in FY 2006 as a result of using less laminate material.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) – MSUM currently enforces the use of only low- or no-VOC products within buildings, to primarily accommodate people with indoor air sensitivities. Products containing VOCs are reviewed prior to use by the Department of Environmental Health and Safety so that proper arrangements can be made to minimize personal exposure and indoor air pollution. Contractors are educated on the Indoor Air Sensitivity Program and are expected to comply.

St. Cloud State University (SCSU) – As a matter of practice, SCSU contractors are required to use adhesives that do not generate hazardous vapors. This is not always possible to enforce as often as we would like; specific products that provide superior adhesion are sometimes warranted. But we keep reducing their usage as we find alternatives. The primary goal is to employ a product that will not produce volatile organic compounds (VOCs) that may cause temporary air quality concerns with building occupants. This last year suspected VOCs from replacement floor tile under a new print shop machine reduced daily initial start-up run quality for weeks.

3. Air Quality, CFCs

Department of Administration (Admin) – The State Architect Office specifies air quality standards as well as statewide asbestos control programs based on federal and state standards.

Department of Corrections

MCF- Lino Lakes – Work performed on equipment containing refrigerant is completed by a certified refrigeration mechanic. Refrigerant is recovered when service and maintenance activities are performed.

MCF-St. Cloud – The facility undertook a retrofit of the food service freezers at a cost of $93,000. This upgrade limits the release of ozone-depleting gases and any excess freon leakage.

Metropolitan Airports Commission (MAC) – Maintenance performed on any system containing CFCs includes complete recovery and recycling of refrigerants by certified technicians. Appliances containing refrigerants are recycled through an approved vendor.

Metropolitan Council Metro Transit – In 1995, the Minnesota Pollution Control Agency (MPCA) required that Metro Transit apply for air discharge permits as mandated by the Clean Air Act Amendments. Subsequently, a complete stack inventory was conducted at all six garage facilities. In 1997, Metro Transit was issued permits for three of those locations. A review of the air emissions has shown that the permits were required at two of those garages because of the size of the dual fuel boilers that were installed. In 2000, Metro Transit was given a Class D air permit for its new garage in St. Paul. The fourth permitted facility, the Overhaul Base, is regulated due to the air emissions from the boilers and the exhaust from the paint shop and paint spray booth.

In 2002, Metro Transit received delivery of its first hybrid bus. This bus uses electric drive motors to power the bus. The electricity is produced by a small diesel engine that is also used for acceleration. In 2003, the agency received two additional electric hybrid buses. These will be tested for the next year, and a report will be issued on the feasibility of this style bus in our environment. Metro Transit plans to increase its hybrid fleet in the coming year. Also, Metro Transit is acquiring and using electric hybrid cars in its fleet for staff use. Currently Metro Transit has five of these vehicles in its fleet.

Metro Transit has started a program to burn low sulfur fuels in its entire fleet. In 2004, Metro Transit was fueling half of the bus fleet with this low sulfur diesel. In July 2005, all buses in the Metro Transit were running on a low sulfur diesel fuel that was 2 percent biodiesel. In 2006, Metro Transit started running a test group of buses on the low sulfur diesel that is 5 percent biodiesel.

Department of Military Affairs – The Minnesota Army National Guard (MNARNG) has purchased new CFC-reclamation equipment to replace and augment current equipment.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) – All air handling units/heating systems and drains are routinely inspected and maintained. Maintenance performed on systems containing CFCs are conducted by certified technicians. CFCs are completely recovered, recycled, and documented. Appliances containing CFCs are recycled through approved vendors.

Minneapolis Community and Technical College (MCTC)

Low VOCs 2005: Purchasing products with the lowest potential to contribute to air pollution is ongoing and will continue in fiscal year 2006. Examples include Freedom Stripper 100.7 g/L VOC changed to Spartan GreenSolutions Stripper 61.0 g/L VOC, Spartan Sheen 17 Floor finish 45.0 g/L to Spartan GreenSolutions finish 0g/L VOC, and Spartan Extraction II 20.9 g/L to Clean By Peroxy 0 g/L.

Low VOCs 2006: MCTC is continuing to purchase products with the lowest potential to contribute to air pollution. In addition to those in 2005, we have purchased the following: SP Straight Seal which is a non-solvent sealer which lowered VOCs by 22 percent or 105g/L over the previous sealer and SP Green Solution which will lower the VOCs over JP Freedom by 39 percent.

St. Cloud State University (SCSU) – SCSU continues to go beyond recycling Freon. A central chiller plant costing over $3 million was recently put online. It has added capacity to existing systems and reduced CFCs by using R22 refrigerant. The university has been able to continue retiring cooling towers and R12 and R113 chillers as more buildings are linked to the chilled water system.

St. Cloud Technical College (SCTC) – In our Automotive Technology and HVAC Technician Programs, students learn to work with refrigerants under direct supervision of the instructor following all regulatory guidelines using proper equipment and reclaiming procedures.

Department of Transportation (Mn/DOT) – Mn/DOT uses environmentally friendly 134-refrigerant in all vehicle air conditioners. CFCs in Mn/DOT vehicles and building air conditioners are phased out as warranted by repairs.

University of Minnesota – The university's Twin Cities' campus has remodeled two of its coal-fired steam plants to use multiple fuel types and shut down a third. The result is a reduction of sulfur dioxide (SO_2) emissions from approximately 600 tons per year (tpy) to approximately 110 to 250 tpy, nitrogen oxide (NOX) emissions from approximately 1,370 tpy down to 280 to 310 tpy, and carbon monoxide (CO) emissions from approximately 280 tpy down to 130 to 150 tpy. Results vary depending on the ratio of fuel types used—gas, coal, and oil—in the modified plants. Use of natural gas maximizes the environmental benefits of reduced air toxics emissions. The current fuel plan is to use a minimum of 70 percent natural gas.

Reducing steam and electrical plant air pollution by conserving energy is a goal of Facilities Management Energy Systems' Energy Efficiency Program. The mission of the Energy Efficiency Program is to reduce the Twin Cities' campus energy consumption while maintaining or improving occupant comfort. Three components are:

- optimum energy management
- building system analysis, repair, and upgrade
- energy awareness campaign: http://www.facm.umn.edu/energyconservation.html).

Optimizing energy use requires the coordinated effort of many Facilities Management staff, including building system technicians, engineers, pipefitters, mechanics, zone supervisors, and energy specialists. Each profession contributes information, skills, and expertise needed to improve building energy efficiency. The technology hub of our optimization program is the Building Systems Automation Center, which electronically monitors and controls heating, ventilation, and fire alarm systems in about 150 campus buildings.

The Energy Efficiency Program has developed *University Building Efficiency Recommended Guidelines* to assist building managers and Building Systems Automated Control operators to maintain building energy use at the lowest level consistent with occupancy scheduling and comfort. Facilities Management employs energy management specialists who are certified energy managers to perform energy audits to identify building system equipment and controls that need updating or calibrating.

Energy-saving projects are typically funded through internal loans and paid back with the savings from the energy budget. The energy awareness campaign promotes energy optimization practices across the Twin Cities' campus. Their efforts have reduced steam use on the Twin Cities' campus central steam system by 24.6 percent, which translates to a corresponding reduction in steam plant air emissions. Through energy optimization and the Energy Efficiency Program, overall energy consumption has decreased 17 percent since 1994, with energy cost savings of $2.8 million. An important part of the program is working with energy suppliers such as Xcel Energy and Reliant Energy to ensure that the university is taking full advantage of energy-saving programs and rebates offered by suppliers.

The university's Center for Diesel Research specializes in reduction of diesel exhaust emissions from mobile

and stationary engines, the physical and chemical characterization of exhaust emissions, evaluation of emission controls, evaluation and demonstration of alternative fuels, certification of on- and off-highway engines, and the evaluation of control technology in the field (www.me.umn.edu/centers/cdr/index.html). The center's mission is to:

- develop new technology to reduce occupational and environmental exposure to internal combustion engine emissions.
- evaluate the application of emission control strategies in confined spaces such as mines and densely populated areas.
- offer unique educational and research opportunities to students.
- provide high-quality research and development services to customers such as engine and exhaust after-treatment manufacturers, the petroleum and alternative fuels industries, and users of internal combustion engines.
- offer educational opportunities through outreach programs and short courses.

The university's Facilities Management has an ongoing program to capture and reclaim CFC and HCFC from cooling units. As units are serviced, their CFCs/HCFCs are captured, and then placed back in the units after service. White goods are shipped to certified recyclers who recover CFC/HCFC prior to disposal. Annually the Twin Cities' campus recycles (recovers, then places into other units) approximately 300 pounds of R22 and 50 pounds of R12. Thousands of pounds of university refrigerants have been recovered and put back into the original units by facilities personnel after servicing, or recovered by off-site contractors.

The campus bus routes and schedules are routinely evaluated and optimized by the Department of Parking and Transportation Services in an effort to more effectively serve the riders while minimizing congestion on the urban campus streets, fuel consumption, and air pollution as buses sit in traffic. Since 2001, these efforts have reduced bus miles traveled by over 200,000 miles annually, which translates into conserving over 10,000 gallons of fuel and significant reduction in air pollution.

With the heating plant modifications, there is a reduction of approximately 1,560 to 1,680 tpy of SO_2, NOX, and CO emissions. Reduced energy usage requires less steam and electricity generation, which means less pollution emitted to the air. Reduction of diesel exhaust emissions makes for a cleaner and healthier air to breathe. The program to capture and reclaim CFC and HCFC reduces emissions of global warming chemicals.

4. Antifreeze

Department of Administration (Admin) – The Travel Management Division replaces antifreeze as needed, rather than as scheduled maintenance. Used antifreeze is collected and recycled. The Plant Management Division also collects and recycles antifreeze on a voluntary program.

Department of Corrections (DOC) – Multiple facilities recycle antifreeze with local vendors.

Iron Range Resources and Rehabilitation Agency (IRRR) – The IRRR collects antifreeze and then sends it to Como Oil of Duluth for recycling.

Metropolitan Airports Commission (MAC) – The MAC maintenance shop is equipped with two antifreeze/engine coolant recyclers. At regular maintenance intervals, coolants are removed, processed, and returned to vehicles. The recycled antifreeze is supplemented with anti-corrosion additives and the pH is adjusted. This meets all manufacturer specifications for engine coolant. Very little new antifreeze is purchased, and virtually no antifreeze is disposed of. Extended-life coolants are used whenever possible.

Metropolitan Council Metro Transit – Metro Transit has long had a formal policy on the handling of all used antifreeze/coolant. The policy calls for storing the used material in 300-gallon containers that are located at each facility and then having the coolant recycled. This procedure has been in place since the mid 1990s.

Department of Military Affairs – The JFMN (Army) recycled approximately 1,500 gallons of antifreeze last year. Two distillation units are being purchased, one to be staged in the Twin Cities' metro area and one at Camp Ripley. All used antifreeze that meets recycling criteria will be distilled and put back into service.

Minnesota State Colleges and Universities (MnSCU)

Central Lakes College, Brainerd and Staples – Central Lakes College has an agreement with Safety Kleen to recycle our antifreeze.

Minnesota State University, Moorhead (MSUM) – All antifreeze products are recycled by contract with a local reclamation service.

Northwest Technical College, Bemidji – Our Automotive and Automotive Machine Programs have purchased and are using an antifreeze-recycling machine.

St. Cloud State University (SCSU) – SCSU is moving away from using antifreeze to winterize cooling coils (they are drained and ducted to warm air) and is using more controls to reduce fleet use of antifreeze.

Department of Natural Resources (DNR) – DNR shops store their used antifreeze in a barrel until the barrel is full, then the antifreeze is recycled. The quantity of used antifreeze produced by DNR shops is small, as it takes the larger shops more than a year to fill a 55-gallon barrel. The total yearly quantity for DNR shops would be less than 100 gallons.

Department of Transportation (Mn/DOT) – Most of Mn/DOT is using an extended life coolant when a system needs to be flushed. The extended life of the coolant protects the cooling system for 600,000 miles or twelve years. Most of Mn/DOT does not produce significant amounts of antifreeze. If a part needs to be changed, the old antifreeze is collected, temporarily held while the repair is being made, then refilled into the vehicle. Mn/DOT has researched, identified, and implemented various recycling options for antifreeze. However, due to cost, most of Mn/DOT's biodegradable antifreeze is disposed of in the sanitary sewer with permission from the POTW.

University of Minnesota – The university's Fleet Services Department, Twin Cities' campus, rarely removes automotive antifreeze; rather they top off radiators with fresh antifreeze, and then sell vehicles after three to five years. The small amount of antifreeze collected is periodically regenerated on-site by an outside contractor.

5. Audits

Department of Corrections

MCF- Lino Lakes – Conducted in-house audit and review to evaluate environmental management systems.

MCF-Moose Lake/Willow River – Facility participated in audits from the Department of Energy (emissions), Department of Natural Resources (H_20 consumption), DNR (drinking water report), and Minnesota Pollution Control Agency (air emissions).

MCF- St. Cloud – Environmental wastewater testing is ongoing to ensure minimal lead, total suspended solids, and BOD enter the waste stream. This also identifies the need to take action to eliminate any existing solids.

Metropolitan Airports Commission (MAC) – The MAC continues to conduct environmental compliance inspections at the six reliever airports. These inspections help identify possible environmental issues and assist reliever airport tenants in achieving and/or maintaining compliance with existing regulations. Reliever airport tenants must pass an environmental compliance inspection in order to transfer or renew a lease. It is also an opportunity for the MAC to educate its tenants on the environmental impacts their actions may have, and to

help them improve their waste management practices. Opportunities for pollution prevention are noted and incorporated in the Capital Improvement Process as indicated by the MAC's strategic plan. MAC routinely inspects and continuously audits its own operations in an effort to recognize and take advantage of any pollution prevention opportunities.

Department of Military Affairs – Three separate audit visits occur at JFMN (Army) facilities. The first is an Internal Performance Assessment System (IPAS) environmental audit. The IPAS audits are performed by full-time staff. The audits are designed to ensure that all regulatory requirements are met at each facility. Deficiencies are noted and immediately remedied if possible. Follow up is conducted to verify that any outstanding deficiencies were remedied in a timely fashion. Last year, all JFMN (Army) facilities were visited by IPAS inspectors.

The second audit, the Minnesota Organizational Readiness Evaluation (MORE), is conducted by the JFMN (Army) Logistics Office. The MORE audits material procurement and shelf life.

The third audit performed every four years by the National Guard Bureau (NGB), is called an Environmental Performance Assessment System (EPAS) inspection. The EPAS reviews the environmental program and policies to determine compliance with all regulatory requirements. The EPAS also does spot checks on environmental regulatory compliance at individual JFMN (Army) facilities.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) –MSUM recently completed a university-wide energy audit. Energy Services Group examined electricity use in both indoor and outdoor lighting, assessed the steam heating system for steam traps, and performed a first-ever water usage audit. Goals include reducing outdoor lighting needs for several hours during the night and implementing motion sensors indoors to save energy. This report's data and campus improvements will be included in the *2007 Pollution Prevention Summary Report* for MSUM.

The Department of Environmental Health and Safety and Physical Plant staff periodically conduct audits of university facilities. These audits cover areas such as hazardous waste, stormwater management, laboratory procedures, and energy consumption. Individual departments are also asked and encouraged to self-audit periodically.

St. Cloud State University (SCSU) – MacNeil Environmental Inc. has performed increased environmental audit functions as part of their Environmental Health and Safety (EHS) contract with SCSU. These relate to elements of hazardous waste disposal, storage tanks, stormwater, and the OSHA laboratory standard, which encompass pollution prevention. The SCSU Chemical Hygiene Officer has received specialized off-site laboratory safety training this past year. He has become increasingly instrumental in hazardous waste audits, waste prevention planning, and hazardous waste removal. Departmental and MnSCU support, staffing focus, and investigative activities in these areas have also increased.

SCSU has continued to implement the suggestions of the latest Minnesota State Colleges and Universities (MnSCU) facilities condition survey. The survey's environmental recommendations included specific purchases and capital/repair projects. These affect HVAC and electrical system revisions and both energy and water conservation measures. The university is continuing to benefit from their insights.

Department of Transportation (Mn/DOT) – Mn/DOT conducts internal waste stream audits of Mn/DOT facilities. The purposes of these audits are to:

- evaluate Mn/DOT's hazardous and problem waste stream management methods throughout department.
- identify various pollution prevention opportunities that warrant further research.
- evaluate potential areas of noncompliance with state and federal hazardous and solid wastes, chemical storage tanks, and water quality issues.
- make recommendations to correct and/or avoid potential areas of noncompliance.
- make recommendations to maintain an effective waste management program.

Mn/DOT annually conducts external environmental audits of facilities that handle Mn/DOT wastes. The purpose of these audits is to:

- evaluate potential and existing waste handling, storage, recycling, and disposal sites. This evaluation is based on a facility's waste management procedures, pollution prevention practices, compliance records, site geology, and financial strength.
- determine if the amount of environmental risk and liability associated with using a particular site is acceptable to Mn/DOT.

Economic and environmental benefits/costs: Both Mn/DOT's internal waste stream and external environmental audit programs have costs associated with them. However, based on Mn/DOT's experience, the cost of the program is minimal compared to the cost associated with potential Minnesota Pollution Control Agency enforcement actions and potential environmental liability (Superfund). Both Mn/DOT's internal waste stream and external environmental audit programs offer environmental benefits in that they ensure that Mn/DOT waste is being managed in an environmentally sound manner.

University of Minnesota – The university's Department of Audits checks departments to see if they have hazardous waste compliance protocols (which includes pollution prevention and OSHA laboratory standard protocols) in place. The Department of Environmental Health and Safety (DEHS) does targeted audits of large and/or non-compliant departments. All chemical waste generators are directed to minimize waste and prevent pollution via training and self-audit. The training and audit form is available on the DEHS home web page (www.dehs.umn.edu/hwd/guidebook/guidebook8.html) and in the *Hazardous Chemical Waste Management* guide.

6. Automotive Fuels

Department of Administration (Admin) – The state purchased 221 alternative fuel vehicles that use E85 (85 percent ethanol fuel) in 2003 (170 passenger cars and 51 bi-fuel passenger vans/SUVs). We exceed the federal requirement of 75 percent E85 vehicles. Materials Management Division is in the process of reviewing all state fuel contracts to determine whether low sulfur is available and can be added to the contract as a less polluting option for end users. The Travel Management Division (TMD) uses E85 fuel as an alternative energy source with reduced emissions. This fuel is available to all state agencies and political subdivisions. The TMD facility has one 2,000-gallon bulk fuel tank used for dispensing E85 fuel. Vehicles at the TMD facility, as well as state vehicles operated in the vicinity of the TMD facility, used 7,736 gallons of E85 from this bulk tank in FY 2004. PMD has purchased three E85 vehicles as replacement vehicles and purchase 87.55 gallons of E85 fuel.

While there are issues with reporting and tracking retail E85 purchases, we are committed to implementing this tracking. We believe that tracking E85 purchases will help agencies know when they are in compliance with Minnesota Statute § 16C.135, which requires the use of E85 in many circumstances.

Department of Agriculture (MDA) – The MDA continues to help promote the use of alternative fuels through their work with the farm community in the production of ethanol-blended and biodiesel fuels. For further information, go to the department's website at www.mda.state.mn.us/. The MDA had a total of 103 E85 vehicles in their fleet out of a total of 126 vehicles during fiscal year 2006.

Total E85 fuel consumed by these vehicles during FY 2006 was 10,176 gallons. This equates to over 100% more E85 fuel used in FY 2006 as compared to FY 2005—MDA had a total of 98 E85 vehicles in the fleet out of a total of 133 vehicles during FY 2005. Total E85 fuel consumed by these vehicles during FY 2005 was 4,574 gallons. (Information taken from IPPAT fuel purchase spreadsheet and Travel Management fleet data.)

Department of Commerce – Currently the department has 58 vehicles, of which 18 are leased through the Department of Administration and 40 are owned directly. Four vehicles are E85 capable. The department does not fall under U.S. EPA act. The department's ability to track E85 fuel use in department-owned vehicles is similar to the issues that other agencies face, and it is not practical to calculate the data by hand. Data on fuel purchases was available through the Department of Administration for the first time for FY 2006 (see part 3).

Department of Corrections (DOC) – Four facilities, the Central Office, and Field Services used E85 vehicles in their automobile fleets. Overall, 83 of 216 vehicles (38%) were reported to be E85 capable. Below is the most recent data available for the type of fuel purchased during FY 2006. E85 represented 4.3 percent of all fuel purchased for DOC vehicles during the past fiscal year. Using 15,148 gallons of E85 in place of regular unleaded fuel resulted in a CO_2 emissions reduction of 318 kilograms and a NOx reduction of 394 grams.

FUEL PURCHASES FOR FISCAL YEAR 2006	Diesel	E85	Unleaded
Fuel purchases (gallons)	34,352	15,148	300,897

Department of Employment and Economic Development (DEED) –As referenced in Part 2 of this report, we have recommended through policy changes that employees traveling on business purchase the cleanest fuel possible when using DEED-owned vehicles.

Iron Range Resources and Rehabilitation Agency (IRRR) – Diesel fuel and gasoline are stored in underground storage tanks (new in 1999) at the agency's administration building. Iron Range Resources uses a blend of ethanol and gasoline in all of the motor pool and agency vehicles. The agency is currently using 27 passenger vehicles: 11 are owned by the agency and 16 are leased from the TMD (Travel Management Division) in St. Paul. Eleven of these vehicles are flex-fuel vehicles.

The closest service station that has E85 fuel is in Virginia, Minnesota, which is 10 miles from our agency. The agency has fuel tanks for unleaded gas and diesel fuel but does not have a state contract available for E85 fuel. That is, there is no bulk supplier in the vicinity that has this product available. The new tanks are equipped with computerized leak detection and spill containment devices.

Metropolitan Airports Commission (MAC) – MAC has eight E85 vehicles (1.3 percent of fleet). This is up from one vehicle in 2005. MAC purchased 1,900 gallons of E85 in 2006, up from 148 gallons in 2005. In 2006, MAC installed an E85 tank and dispenser on-site for use by MAC vehicles. The majority of MAC vehicles are used at the airport only and refueling on-site eliminates the need to drive to an E85 retail station.

Metropolitan Mosquito Control District (MMCD) – As a pollution prevention activity to reduce air pollution under the requirements of the Executive Order 04-08, MMCD adopted the following policy regarding the operation of district-owned vehicles: *Vehicles owned and operated by the district must refuel with the cleanest, least polluting fuel available. MMCD requires that E85 flex-fuel vehicles in the district fleet must refuel with E85 fuel whenever possible and non flex-fuel vehicles in the district fleet must use gasoline that is low-sulfur and low-benzene whenever possible.*

For the 2006 reporting period, MMCD used a total of 41,550 gallons of automotive fuel. Of that total 5,522 gallons (13 percent) was E85 fuel and 423 gallons (1%) was biodiesel. The remaining 35,605 gallons (86 percent) was low-sulfur, low-benzene gasohol fuel. The district is pleased with the increased use of cleaner fuels by our fleet in 2006. MMCD used five times more E85 fuel in 2006 than it did in 2005.

MMCD FUEL USAGE FOR 2006

Fuel type	Gallons	Percent
Gasohol	35,605	86%
E85	5,522	13%
Biodiesel	423	1%
Total	**41,550**	**100%**

Department of Military Affairs – In FY 2005, the JFMN (Army) recycled approximately 3,000 gallons of contaminated JP-8 fuel. The diesel fuel was recycled and reused.

Minnesota Pollution Control Agency (MPCA) – The MPCA has 132 vehicles, of which 76 are flex-fuel vehicles and four are alternative vehicles. MPCA has representation on the SmartFleet and Drive to Excellence committees coordinated by the Department of Administration. Currently, the MPCA is fueling with E85 about 40 to 50 percent of the time each month, compared to 30 to 40 percent each month in 2005, 24 percent in 2004, 17 percent in 2003, and 12 percent in 2002.

The MPCA has taken a number of steps to help encourage staff. The MPCA continues to audit 10 percent of the flex-fuel vehicles to find out if staff are using regular gas when E85 is available at a fueling station. If the audit shows that a staff member did not fuel with E85, his/her supervisor is contacted and asked to talk to the staff member in question. A binder of E85 fueling stations in Minnesota is in each vehicle and updated quarterly. The MPCA will continue to take innovative and creative approaches to encourage the use of alternative fuels in all of its flex-fuel vehicles.

Minnesota State Colleges and Universities (MnSCU)

Anoka Ramsey Community College – We have not replaced any of our fleet vehicles this year. We did outright purchase a security vehicle that is E85 capable from an auction service.

Bemidji State University (BSU) – Bemidji State University has 59 maintenance and fleet vehicles. One is a gas-electric hybrid and six are flexible fuel vehicles. None were operated on E85 fuel during FY 2006 due to limited availability of the fuel in our region, decreased range of travel, and manufacturers' cautions about performance issues during periods of extreme cold and heat. Discussion with a local dealer indicated that the temperature-related performance concerns have not been a problem for E85 users in the area and E85 fuel has become more available. Therefore, we plan to begin use of E85 in FY 2007.

Central Lakes College, Brainerd and Staples – Central Lakes College purchased three vehicles that use E85.

Minnesota State University Moorhead (MSUM) – The automotive fleet is available to faculty, staff, and a large number of students. Due to the broad nature of vehicle use and the lack of area stations providing E85, it is difficult for the university to monitor the amount of E85 fuel purchased. The fleet includes 10 sedans, two minivans, and three 12-passenger vans. Two sedans and two minivans are equipped for E85 use. The use of E85 fuel is encouraged.

To help reduce emissions and save energy, MSUM recently purchased a GEM E-4 electric car for use on the main campus by the Physical Plant staff. The cost to operate is approximately $30 per year, averaging 50 miles per week, whereas a gas automobile would require a cost of approximately $400 for the same use. During summer months, biodiesel is used in the Physical Plant's lawn tractors, skidsteer and pay loader equipment, trucks, and other heavy equipment. During winter months, these same vehicles are fueled with low-sulfur diesel fuel. The Physical Plant also operates a propane-fueled truck.

Northwest Technical College, Bemidji – E85 has been recently introduced in three Bemidji fuel stations.

St. Cloud State University (SCSU) – SCSU has added two 2005 Taurus alternative fuel (E85) 5-passenger autos (new total of 18) to their Motor Pool total of 25 vehicles. They produce limited carbon monoxide. Now, university on-site E85 refueling has pumped within 50 gallons of previous financial year, about 13,500 gallons of it for motor pool use this last fiscal year. The Minnesota Dept. of Commerce/State Energy Office also monitors E85 usage.

Department of Natural Resources (DNR) – DNR is currently working with Mn/DOT, Admin, and the Minnesota Lung Association to increase use and distribution of E85 and biodiesel fuels. The website for E85 fuel sites is distributed to all employees. Where clean fuel is not available, we have developed a plan to increase or modify on-site storage at about 40 remote sites across the state.

Department of Revenue (DOR) – The DOR has always had a commitment to reducing waste and pollution. Our vehicle fleet is made up of 15 vehicles designed for E85, and we encourage our employees to use it.

Department of Transportation (Mn/DOT) – Mn/DOT purchase of E85 fuel is generally increasing annually, however in insignificant amounts. Currently, use of E85 fuels is not cost effective for Mn/DOT for the following reasons:

- limited locations where E85 is available (although this is improving)
- 19 percent loss of vehicle fuel efficiency
- low percentage of E85 vehicles owned by Mn/DOT

This year, the price difference between unleaded gasoline and E85 has become more substantial, making E85 a more cost-effective option. Mn/DOT drivers will be advised to use E85 per Governor's Executive Order 04-10 and Minnesota State Statute 16C.135 when E85 costs are at least $0.35 a gallon less than unleaded gasoline. This cost differential is necessary to overcome the loss of fuel efficiency.

Mn/DOT met the federal standard of purchasing 75 percent of the light-duty fleet as alternative fuel vehicles. Mn/DOT currently has 234 E85 capable units. Mn/DOT's heavy equipment is being purchased with computer-controlled electronic ignition that maximizes vehicle fuel efficiency. Mn/DOT is also working on a plan that would replace its fleet over time with more environmentally friendly diesel engines. Mn/DOT has contracted for commercial oil changes specifying re-refined engine oil.

University of Minnesota – The University of Minnesota Fleet Services is an active participant in the E85 fuel project. Department of Fleet Services, Twin Cities' campus, has E85 fueling stations and purchases flexible fuel vehicles that can use this environmentally friendly fuel. The university is the greatest user of E85 fuel in the state and nationally.

AUTOMOTIVE FUEL: E85 PURCHASE

	FY 2003	FY 2004	FY 2005	FY 2006
Total vehicles	795	830	835	833
E85 vehicles	42	38	71	81
E85 percent of fleet	5.28	4.58	11.8	9.72
Hybrid vehicles	3	4	14	14
Gallons of E85 purchased	19,867	18,636	16,997	13,735

E85 is a renewable fuel made in Minnesota from corn and other agricultural products. E85 has many benefits as a renewable energy source. It helps create a cleaner environment, healthier air, and a stronger U.S. economy, while reducing overseas oil imports. Production and use of E85 instead of gasoline results in a 35 percent reduction in greenhouse gas emissions. E85 also reduces harmful exhaust emissions by more than 50 percent. Fleet Services has Toyota Prius hybrid electric/gasoline cars and Ford Escape hybrid SUVs. The hybrids have an electric motor, which is assisted by a clean, efficient gasoline engine for hard accelerating, higher speeds, and battery charging. Prius's fuel efficiency is 42 miles per gallon overall versus 28 miles per gallon for the fleet's other compact cars.

The Power and Propulsion Division, Department of Mechanical Engineering, Twin Cities' campus, tests engine efficiency and emissions of gasoline and diesel-powered engines and offers technical assistance, for a fee, to agencies or companies researching performance of automotive and diesel engines (www.me.umn.edu/labs/pp/index.shtml). The Center for Diesel Research (www.me.umn.edu/centers/cdr/index.html) is a good resource for information on test procedures and simple maintenance that can greatly reduce diesel emissions from buses and trucks. Proper choices and use of fuels can help reduce air emissions from automobile and bus exhausts and reduce fuel consumption.

7. Automotive Maintenance

Department of Administration (Admin) – The Travel Management Division recovers and recycles automotive refrigerants for air-conditioning units. Both the Travel Management and Plant Management Divisions' preventative maintenance programs are designed to minimize excessive and/or premature replacement of parts. They also use remanufactured parts whenever available. MMD has had a contract for *Ergonomic Seats for Autos* that have been modified to add the option of refurbished seats. This reuses old seats, reducing items in the waste stream, and also saves the state money.

Department of Commerce – The department-leased vehicles receive maintenance through the Department of Administration Travel Management Division service schedule. Department-owned vehicles are maintained by private businesses under contract.

Department of Corrections – Department-wide, much of the regular maintenance is done on site, and wastes generated are recycled or disposed of properly.

Iron Range Resources and Rehabilitation Agency (IRRR) – All automotive maintenance, except for air conditioning systems, is performed in the IRRR shop at the administration building. Vehicle fluids are stored for recycling, and parts are exchanged for remanufactured parts. All metal that cannot be exchanged is recycled by a scrap metal facility.

Metropolitan Airports Commission (MAC) – Several vehicles were upgraded in FY 2006, affording emission reductions associated with increased fuel economy.

ESTIMATED EMISSION REDUCTIONS (IN POUNDS)

CO	NOx	PM10	PM2.5	VOC
6,372	625	0.739	0.637	369

- 1993 K1500 replaced by 2006 F350
- 1998 Ford Expedition replaced by 2006 E85 Ford pickup
- 1999 Dodge pickups (four) replaced by 2006 E85 Ford pickups (four)
- 1997 Ford pickup replaced by 2006 E85 Dodge minivan
- 1997 Ford Expedition replaced by 2006 E85 Dodge pickup

Metropolitan Mosquito Control District – To reduce air pollution under the requirements of the Executive Order 04-08, MMCD purchased 15 new flex-fuel vehicles (FFV) capable of using E85 ethanol and 3 non-flex-fuel vehicles to replace 18 older fleet vehicles. The flex-fuel vehicles purchased by MMCD in 2006 were FFV Ford F150 half-ton pickups. The non-flex-fuel vehicles purchased were Ford F250 three-quarter-ton pickups. Using the Emissions Reduction Workbook provided by IPPAT, the older replaced vehicles were entered as baseline vehicles and the new 2006 pickups as current vehicles. A reduction total was calculated comparing the older vehicle emissions to the new FFV emissions totals. By eliminating the 18 older vehicles from the fleet and replacing them with new vehicles, the district achieved substantial reductions in tailpipe emissions.

2006 TOTAL EMISSION REDUCTIONS FOR GASOLINE VEHICLES (IN POUNDS)

CO	CO_2	NOx	PM10	PM2.5	VOC	SO_2
9,934.6	18,543.9	623.9	1.8	1.1	974.9	2.7

The district's current fleet consists of 41 flex-fuel Chevy Silverado and Ford F150 half-ton pickups and 175 non-flex-fuel vehicles. By using FFVs to replace older vehicles in the district fleet, MMCD hopes to reduce tailpipe emissions that contribute to urban air pollution and ultimately to global warming. MMCD is committed to reducing pollutants generated by its vehicle fleet and plans to continue in the future with a program of replacing older fleet vehicles with more efficient, cleaner running flex-fuel vehicles.

Department of Military Affairs – Ongoing PPOAs are being conducted to monitor several waste generation practices present in vehicle maintenance activities. PPOAs include floor-dry usage, changes in oil dispensers, aqueous washers, and fuel and oil mixing machines.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) – Automotive fleet maintenance is primarily conducted by off-campus vendors. Any on-campus maintenance is conducted in the Physical Plant's auto mechanics shop. All used oil, filters, and antifreeze are recycled by local vendors. The university also uses a citrus-based environmentally friendly parts washing fluid in its auto mechanics shop.

Northwest Technical College, Bemidji – The vehicles are tuned and maintained on a regular basis, and all pollution control equipment is maintained for peak operating efficiency.

St. Cloud State University (SCSU) – The SCSU vehicle repair shop has revamped procedures for brake pad/shoe replacement to ensure asbestos fiber release control by sending doubtful units out. Replacement pads are non-asbestos. The Diesel Repair, Locksmith, Plumbing, Print, and Driving Range shops have been using a water-based parts washer that generates only a small amount of sludge to be disposed of as hazardous waste. Only art in KVAC remains with Stoddard solvent, often forcing us up into Small Quantity Generator status. We are working with them to change this.

Department of Transportation (Mn/DOT) – Mn/DOT is purchasing brake cleaners that are less toxic and easier to manage as a waste. See also sections 24 *Parts Cleaning* and 23 *Oil, Oil Filters.*

University of Minnesota – The Department of Fleet Services, Twin Cities' campus, uses a recycling service for their used oil. Oil and gas filters are crushed, the oil recycled, and the metal scrap recycled. Automotive lead-acid batteries and air conditioning refrigerants are also collected and recycled. Underground storage tanks for fuels have either been removed or upgraded to meet MPCA and U.S. EPA requirements, which will prevent contamination from leaking tanks.

Fleet Services has installed a parts washer system using a proprietary solvent that is non-flammable and is perpetually cleaned by a recirculating filter system. Filters periodically need to be disposed of, but the solvent does not need to be shipped off site for recycling or disposal. This system potentially will eliminate 240 gallons of solvent waste per year.

8. Batteries

Department of Administration (Admin) – The Resource Recovery Office informs agencies that the Rechargeable Battery Recycling Corporation (RBRC) has a Charge Up to Recycle!® program that is free of charge to public agencies. Collection kits are available at no cost, and the RBRC will pay for all shipping, materials, processing, and recycling costs. To obtain information and collection kits, call 678-419-9990. The state also has a vendor for recycling rechargeable batteries and has contracts for hazardous waste disposal. Agencies have statutory responsibility to properly dispose of or recycle single-use and rechargeable batteries. The State Recycling Center does not receive batteries in light of these recycling opportunities. The contract for automotive batteries has provisions for all state agencies to recycle batteries. The Travel Management Division recycles automotive batteries.

The Materials Management Division procures only reduced- or no-mercury batteries in accordance with Minn. Stat. § 115A.965, subd. 2 (see below). The mercury content in flashlight batteries has been either eliminated or reduced to negligible levels due to the U.S. EPA's mandates in the late 1980s and early 1990s.

> Subd. 2. Total toxics concentration levels. The total concentration level of lead, cadmium, mercury, and hexavalent chromium added together in any packaging must not exceed the following amounts:
>
> - 600 parts per million by weight by August 1, 1993;
> - 250 parts per million by weight by August 1, 1994; and
> - 100 parts per million by weight by August 1, 1995.

The Plant Management Division returns batteries from vehicles and janitorial equipment to vendors for recycling; the division also participates in all voluntary internal battery collection and disposal programs. MMD wrote the contracts for the Automatic External Defibrillators to require the contract vendors to accept the expired rechargeable batteries for recycling.

Department of Commerce – A battery recycling bin is located in the employee lunchroom. An employee volunteers to collect the batteries and take them to Hennepin County for recycling.

Department of Corrections (DOC) – All facilities collect used batteries and return them to the vendors for recycling when new batteries are purchased. Overall, a ton of used batteries were recycled in 2006.

Iron Range Resources and Rehabilitation Agency (IRRR) – IRRR collects batteries that can't be recharged and transports them to the Virginia area regional landfill where they are recycled by Arrowhead Battery of Buhl.

Metropolitan Airports Commission (MAC) – All MAC batteries are recycled. Spent lead-acid batteries are returned to the supplier for recycling. NiCad, NiMH, lithium, and alkaline batteries are collected by MAC electricians from the various points of generation and recycled by an approved vendor.

Metropolitan Council Environmental Services (MCES) – Spent lead-acid batteries (SLABs) are collected as a special hazardous waste and sent to battery recyclers. For most over-the-road vehicles, used SLABs are exchanged for new ones at the time of service. The used batteries that do accumulate and are stored for recycling are from heavy equipment, electric carts, and standby emergency electric power diesel-fueled generators. In 2005, 5,785 pounds of SLABs—a 73 percent decrease over the previous year—were recycled from MCES facilities, mostly through A-Battery City in Minneapolis.

Metropolitan Council Metro Transit – Metro Transit continues to recycle all of its spent lead-acid batteries with its supplier. This procedure has been in place since the 1980s.

Department of Military Affairs – JFMN (Army) recycled about 2,300 lead-acid automotive/truck batteries.

Minnesota Pollution Control Agency – The MPCA purchases alkaline rechargeable batteries in the Prevention and Assistance Division and continues to be pleased with their performance. All rechargeable batteries are recharged as many times as possible and then collected for proper disposal. MPCA staff properly disposed of 51 pounds of rechargeable nickel-cadmium, nickel metal hydride, lead acid, vehicle, and button batteries in fiscal year 2006 at an authorized battery collection point.

Minnesota State Colleges and Universities (MnSCU)

Central Lakes College, Brainerd and Staples – It is an ongoing policy of the college to collect used batteries and dispose of them through a recycling center.

Minnesota State University, Moorhead (MSUM) – All batteries, including lead-acid, nickel cadmium, lithium, mercury oxide, and silver oxide, continue to be collected and recycled. Automotive batteries are changed and recycled through a local dealer. Use of alkaline rechargeable batteries is promoted to those departments who use large amounts.

Northwest Technical College, Bemidji – All batteries are recycled.

St. Cloud State University (SCSU) – SCSU stores unreliable automotive lead-acid batteries in a secondary container until recycling pickup and is also recycling smaller sealed lead-acid batteries. Non-special program hazardous waste type batteries are managed for recycling/reclamation quarterly through Batteries Plus and through the University of Minnesota Chemical Safety Day Program, with whom we now have a MnSCU contract.

St. Cloud Technical College (SCTC) – All batteries are recycled. Every effort is made to ensure that when a new lead-acid battery is purchased, the old one is brought in for exchange. Other batteries are recycled through a local supplier.

Department of Natural Resources (DNR) – DNR shops recycle all of the waste automotive batteries that are produced. The dead batteries are either left with the vendor when the new battery is purchased as per Minnesota requirements or the batteries are taken to a local recycling center.

Department of Transportation (Mn/DOT) – Mn/DOT sends all used nickel-cadmium, lead-acid batteries, nickel metal hydride, mercury button, and lithium batteries to recyclers.

University of Minnesota – Facilities Management and the Department of Environmental Health and Safety collect mixed dry cell batteries from all campuses. Several types of waste batteries are considered hazardous waste if not recycled, and most batteries will contribute mercury and other metals to solid waste incinerator air emissions. Batteries are sorted by chemistry type and managed for recycling/reclamation where possible. Lead-acid batteries from various university operations are recycled. Rechargeable battery systems are used for various functions by departments.

During fall 2000, Facilities Management and the Department of Environmental Health and Safety reviewed and updated the battery collection program, purchasing new, colorful collection containers and distributing them to all office recycling sites on the Twin Cities' campus. The goal was to increase participation in the proper management of dry cell batteries, and indeed the amount of batteries collected increased by 55 percent compared to the previous year, by another 18 percent in the second year, and by 3 percent in the third year.

Rechargeable batteries are sent to RBRC for recycling. All non-lithium button batteries are recycled with mercury and other metal recovery. This is a free service for public agencies and institutions (www.rbrc.org/community/index.html).

9. Cleaning Supplies

Department of Administration (Admin) – The Materials Management Division works with the MPCA in awarding the cleaning supplies contract. Criteria used in this award will provide products to agencies that have less impact on public health and the environment. Each product has been screened to see if it meets environmental criteria in several areas:

- The undiluted product must not be toxic to humans.
- The undiluted product must not contain any ingredients that are carcinogens or that are known to cause reproductive toxicity.

- The undiluted product cannot be corrosive to the skin or eyes.
- The product in its application cannot contain more than 0.5 percent by weight phosphorus to help prevent eutrophication (nutrient loading).
- The product's organic ingredients must be readily biodegradable in water.

Other criteria are being considered to ensure greater safety to state agencies and the environment, including aquatic toxicity, combustibility, skin sensitization, photochemical smog, tropospheric ozone production, and indoor air quality. Each solicitation responder is required to have their formulations reviewed by an independent laboratory to verify all ingredients found in their products.

MMD has established contracts for *Rags, Wiping and Sorbent Materials*, and for *Wipers, Industrial Disposable*, whose products are made with recycled content and use reduced packaging in shipping the product to customers. These contracts are available to all state agencies, cities, and local governments.

The Resource Recovery Office uses state contract cleaning supplies that have high environmental attribute scores and that are in bulk form to minimize waste and packaging. The Plant Management Division uses janitorial products that are appropriate to discard in sewers and buys chemicals packaged as concentrates to reduce packaging waste by 85 percent. The division also uses automatic dispensing systems to ensure correct dilutions from concentrates and minimize waste.

Department of Agriculture (MDA) – The MDA has made a commitment to procure and use products with the lowest potential to contribute to air pollution, such as cleaning products with low amounts of volatile organic compounds. The department has done this through establishing specific language in the future cleaning contract and also by sending out a directive to all purchasing agents within the agency. For more information see item f under Part 3*: Quantifiable Measurements for Activities Satisfying Executive Order 04-08.*

Department of Corrections (DOC) – Environmentally friendly products are in use at all facilities. DOC policy helps to ensure the use of the safest possible product, with the lowest potential for generating hazardous waste and polluting the environment. Potentially unsafe products, i.e. hazard rating of more than 0 or 1 on HMIS or NFPA scales, are replaced with a suitable product that will accomplish the same end. Staff places a high priority on using techniques, methods, and products that are nonhazardous or less hazardous, to implement the concept of source reduction.

During FY 2006, the DOC increased their use of environmentally friendly cleaning products through MINNCOR (Green Seal approved). The decision to switch to these products was evaluated with the help of the Office of Environmental Assistance. The corresponding reduction in VOCs could not be calculated as exact amounts and compositions of the materials were not obtained.

Iron Range Resources and Rehabilitation Agency (IRRR) – The shop and custodial staff, as well as the office staff, are made aware that purchasing cleaners through the *Environmentally Preferable Purchasing Guide* will prove to be cost effective, environmentally safe, and less hazardous to the user. Most of these supplies are available through Central Stores.

Department of Military Affairs – Internal audits of DMA facility cleaning supply storage include a review of shelf life. Whenever possible, the shelf life is extended and products are used up. The DMA utilizes a centralized collection point where soiled rags are exchanged for clean rags. Only rags soiled with POL products are sent off for cleaning; all other rags are managed as hazardous waste.

Minnesota Pollution Control Agency – The Minnesota Pollution Control Agency Alliance for Recycling and Reduction of Waste, a group of employees who serve as a point of contact for any recycling (reuse, reduce, or rethink) or composting questions, encourages environmentally preferable purchasing whenever possible. ARROW supports the most recent effort to use greener cleaning products in the MPCA building. The MPCA currently leases the building, and custodial services are provided under that lease through a contracted

vendor. This initiative focuses on piloting greener cleaners that meet environmental criteria, such as products that are nontoxic, water-based, and have low or no odors. Products that meet the criteria are placed on a list for the contracted cleaning company to reference when ordering cleaning supplies. For general desktop cleaning, the MPCA buys the environmentally preferable Restore general purpose and glass cleaning products and uses Restore dishwashing detergent in the lunchrooms.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University – Environmentally preferable cleaning products have been introduced for use in the student residence areas. The products include a floor cleaner, multi-purpose cleaner, glass cleaner, and carpet cleaner. All the products are Green Seal certified

Central Lakes College, Brainerd and Staples – Through an ongoing program with vendors and suppliers, biodegradable products are purchased and used at the college. The paper supplies for shop and restroom areas are of the state's highest "green EPA" rating.

Minnesota State University, Moorhead (MSUM) – All buildings are equipped with general cleaning stations involving instruments that accurately dispense the proper amount of a concentrate needed to reduce waste. The campus has moved away from not only low-VOC cleaners, but many of the products in use are actually Green Seal approved. These products help those individuals in the MSUM community who suffer from multiple chemical sensitivities, in addition to being environmentally friendly. To help reduce volume and waste, cleaning supplies that are no longer used by a department are made available for use to other departments. Improvement continues as cleaning supplies become increasingly safer and are being tested and implemented on a regular basis.

Northwest Technical College, Bemidji – We purchase low-VOC cleaning supplies and use water-based carpet cleaners.

St. Cloud State University (SCSU) – A SCSU committee has been in place for several years that reviews cleaning products that can be substituted for those that pose a hazard to the employee using them or pose a pollution risk. Revamping is being considered to provide more authority to that committee. Cleaning products are purchased in bulk as much as possible and then transferred into hazard labeled reusable/refillable bottles and containers. VOC considerations are very important (as they also are in our painting products).

St. Cloud Technical College (SCTC) – Environmentally friendly cleaning supplies are used. MSDS sheets are maintained in the maintenance office, accessible to all custodians, and safety procedures are adhered to when products are dispersed and used.

Department of Natural Resources (DNR) – Division of Parks and Recreation is conducting a study on using environmental friendly janitorial products in the state parks. This will reduce pollutants released in the air, reduce waste by purchasing cleaners in bulk, and protect their staff and the public by reducing the hazardous chemicals they use.

Department of Transportation (Mn/DOT) – Mn/DOT uses concentrated cleaners, which allows for the reuse of dispensing containers. The department also uses cleaning systems that automatically measure correct amounts of product to prevent costly overuse.

University of Minnesota – Facilities Management (FM), Twin Cities' campus, has a program to centralize purchasing of custodial supplies in an attempt to reduce the number of different custodial products used by their employees. The goal was to optimize supply management and to enhance worker safety and environmental friendliness through a product selection process.

FM formed a committee, the Material Review Board (MRB), composed of both management and labor representation from each zone, safety, and purchasing, for the sole purpose of improving the safety, health, and functionality for FM's custodial work force. A dominant cornerstone of the MRB's platform is to consistently

improve upon, by careful evaluation and reduction, the inventory of approved cleaning products used by custodians. Reducing the number of approved custodial cleaning products:

- improves the safety and health of the end user by eliminating those products that have been evaluated as potentially harmful.
- minimizes or simplifies the specialized training required for each product.

After a successful reduction in 1999 (456 products to 150), the MRB made another impressive stride in FY 2001 by reducing the 150 approved products to 101—a reduction of 33 percent.

The approved custodial list of 101 products represents those products that are only to be used in the custodial cleaning process, any other product not identified on the approved list is considered unapproved and not cleared for use. Each of the approved products went through a stringent evaluation and testing process. The following is the process when an individual or vendor wants a new product to be considered for inclusion on the approved list. The vendor must first approach the supervisory staff and provide a cut sheet of the product, but they do not and are not allowed to drop off any product samples. The supervisor in turn provides the vendor with an evaluation packet called the Safety, Health, and Environmental Attributes Form that is to be completed by the vendor's resident chemist.

This form is an important first step, because the product is evaluated and scored based on categories of operational safety, ecological (environmental) stressors, product delivery/packaging, and existence of artificial dyes and fragrances. The operational safety category looks at components such as the product's toxicological dosage levels, whether or not it is a registered carcinogen, its pH, and flash points. The ecological (environmental) stressors category looks at if the product were disposed of into the waste stream, what effects would the product's constituent chemicals have on the environment based on a compiled list of products called the Minnesota Toxics Indexing System (www.pca.state.mn.us/oea/lc/purchasing/cleaners-criteria-mn.cfm). This category also looks at the percent of the ingredients that are made from plant sources and whether or not the product contains constituents that may have a negative effect on the ozone. The delivery/packaging category analyzes whether the product has dispensing features with easy dilution ratios to minimize handling exposure, material handling issues, and the availability of the product's labeling to meet the specification of the Minnesota Employee Right to Know Act. Finally, the dyes/fragrances category identifies whether the product contains any artificial dyes or fragrances that may cause the end-user hypersensitivity problems. Once the vendor completes the form, it is submitted to the FM Safety Department, where it is in turn checked for accuracy and scored. The score is communicated to the members of the MRB, who then correspond with the vendor.

A product that earns a failing score does not advance in the evaluation process. A passing score indicates that the product can advance to the functional testing phase and will be brought in front of the next MRB meeting. At this MRB meeting, arrangements are made with the FM Purchasing Department to procure samples for which designated zone testing crews will test the product under objective criteria (which includes comparing it to a similar product already on the approved list) and provide their results at the next subsequent MRB meeting. At this meeting, a consensus is reached by the members to determine if the product is to be included on the approved list. In order for a new product to get on the approved list, an existing product must be removed.

In addition, the MRB has embarked on the task of integrating the use of bio-based products into the custodial operations. Bio-based or plant-derived products provide functionality that rival the existing line of approved custodial products while vastly improving the safety, health, and environment for the end user. A 1999 executive order from former president Bill Clinton set a goal of tripling U.S. use of bio-based products by 2010. The MRB intends to accomplish this by 2005, by annually replacing 15 percent of the current approved product list with bio-based products.

Centralized purchasing of a more select list of custodial products leads to the cost efficiency of larger purchases. The custodial product selection process is designed to minimize air and water pollution and improve worker health and safety.

10. Commuting and Transportation

Department of Commerce

METROPASS AND CARPOOL INFORMATION PARTICIPATION (NUMBER OF EMPLOYEES)

	2001	2002	2003	2004	2005	2006
Metropass	50	47	40	unavailable	39	52
Carpool	unavailable	unavailable	unavailable	unavailable	9	15

Department of Corrections (DOC) – All facilities have video conferencing systems that are used to reduce the amount of travel required for meetings.

MCF-St. Cloud – St. Cloud has adjusted some staff members' schedules to allow for car pools.

MCF – Stillwater – The facility purchased an electric transportation vehicle for the maintenance department to reduce the amount of fuel used and the associated maintenance.

Department of Employee Relation (DOER) – DOER expects to create an internal web page providing information to employees on alternatives to single-occupancy vehicle commuting. DOER expects to continue the use of WebEx for training and meetings through FY 2007. Historical data suggests that 1,263 state employees drove 300,000 fewer miles during FY 2006.

Department of Employment and Economic Development (DEED) – Efforts were made to further promote alternatives to single-occupancy vehicle commuting within our agency. Our agency currently subsidizes the Metropass program and has for the past several years. Participation in this bus pass program has remained strong, with a participation rate of nearly 20 percent of our employees (20 percent of the whole agency, which includes a large number of employees who don't have access to Metro Transit bus transportation).

Promotion of alternative commuting was further expanded within our agency by providing information to employees about additional methods of commuting, such as vanpooling, carpooling, biking, and walking. Websites accessible to the Interactive Ride Matching E-tool, Cost of Driving Alone Calculator, and the Guaranteed Ride Home Program were also provided.

Department of Health – The department is committed to continuing efforts for the three items identified earlier. In addition to all new leased vehicles being E85-compatible we are actively pursuing increases in the use of E85 fuel. Our vehicle manager has worked with the American Lung Association to lobby one of our local gas stations to begin carrying E85 fuel. This would help all of our state agencies located in the Capitol area of downtown St Paul.

Department efforts will include holding at least two commuter fairs, asking employees to pledge to commute via alternative transportation for at least one day, publishing at least one article in the weekly briefing for all employees, and continuing to provide training for vehicle drivers.

Metropolitan Council Environmental Services (MCES) – The MCES has made several recent pollution prevention improvements to its fleet of approximately 315 passenger and light service vehicles. There are now 12 vehicles that can run on E85 fuel in addition to unleaded gasoline. E85 contains 85 percent ethanol, which is distilled from grain such as corn. The models using E85 include Ford Taurus, Dodge Caravan, and GMC Yukon. However due to the limited locations of E85 fueling stations in relation to MCES activities, only one vehicle is consistently fueled with the ethanol blend. The Yukon used 531.7 gallons of E85 in 2005.

The MCES also operates three gasoline/electric hybrid vehicles (one added in the last year). The Honda Civic hybrids have two motors—one that is powered by an 85 horsepower, four-cylinder gasoline engine and one

that is powered by a 13 horsepower nickel metal hydride battery. Hybrids achieve an estimated efficiency of 46 miles per gallon in the city and 51 miles per gallon on the highway.

Department of Military Affairs – Video conferencing stations have been placed in all DMA facilities. This helps reduce the energy costs associated with personnel commuting to meetings.

Minnesota Pollution Control Agency – The MPCA has a continuing pollution prevention program of promoting alternative transportation that includes an annual commuter challenge and bike to work day promotion, *Bikeways* and *Peak Fare* e-newsletters, participation in the Guaranteed Ride Home Program, telecommuting, special off-day parking, reserved carpool/vanpool parking, discounted bike lockers, showers, and conducting transportation surveys of employees to improve these programs. MPCA is also part of the interagency Lafayette Park Transportation Committee, which promotes alternatives to single-occupant vehicle use for commuting and work trips among all the agencies located in the Lafayette Park area.

Since 1999, the MPCA has offered to its employees Metro Transit's Metropass. It is an all-you-can-ride bus pass. The idea is that with more transit use, fewer vehicles would be on the road creating air, water, soil pollution, congestion, parking demand, and urban sprawl. The program involves a low-priced all-you-can ride bus pass for MPCA employees. Since the program began, approximately 50 to 65 employees have been enrolled in the program each year. The agency subsidizes the Metropass, and currently employees pay the same rate as contract parking, through pretax payroll deduction. The MPCA also encourages employees to use the Metropass for business trips within the Twin Cities' area. The business travel aspect of the Metropass saves the state money in parking and vehicle expenses. The MPCA was the first state government agency in Minnesota to make the Metropass available to its employees. The Department of Administration has offered a Capitol Complex Metropass for several years, and several other agencies also offer Metropass, including BWSR, DHS, and DNR.

The MPCA has two electric bikes for business use. The MPCA also has one hybrid-electric car in the MPCA fleet and over 60 flex-fuel vehicles.

Minnesota State Colleges and Universities (MnSCU)

Central Lakes College, Brainerd and Staples – It is an ongoing policy of the college's to encourage car pooling whenever possible. Currently Central Lakes College encourages our employees to car pool as an alternative to single-occupancy vehicle commuting. Employees are encouraged to have teleconference meetings between the campuses whenever possible to cut down on travel. Meetings are scheduled ITV whenever possible.

Minneapolis Community and Technical College (MCTC) – **2005:** Discounted bus passes, free motorized vehicle parking, and bike racks are ongoing. **2006:** MCTC is continuing to offer discounted buss passes, free motorized vehicle parking, and bike racks. We have also installed 50 new bike racks, and employees have the option of four 10-hour days to cut down on commuting.

Minnesota State University, Moorhead (MSUM) – Approximately 77 percent of MSUM students are living off campus. This along with faculty and staff equals a large commuter base for the university. University administration continually promotes students to take advantage of on-campus living and promotes new student housing construction projects. Campus Security has begun using bicycles instead of automotive vehicles to patrol campus. The university is increasing the number of bicycles racks around campus promoting their use.

Two programs have been implemented with great success reducing the number of single-car commuters. The Metro Area Transit bus system has arranged a partnership with MSUM to allow free transportation for students, faculty, and staff. Routes run every ten minutes and reduce the number of commuters, especially during inclement weather. During the 2004-05 academic year the program averaged over 50,000 riders per year. For the 2005-2006 year, approximately 60,000 riders used this service ,and it continues to increase in popularity and riders. MSUM Student Senate implemented a Taxi ridership program for MSUM students. The Drive-a-Dragon program allows students to take a taxi (fueled by E85) anywhere in the Fargo-

Moorhead Metro Area for $2 during the hours of 9 p.m. to 6:30 a.m. There are approximately 2,000 students enrolled in this program. Also, due to the diversity of programs at MSUM, any student, faculty, or staff attending off-campus meetings and conferences are strongly encouraged to carpool in order to reach their destination.

Northwest Technical College, Bemidji – We have reduced our fleet of travel vehicles from 11 down to 3 in the past two years by reducing off-campus meetings and promoting the use of electronics for meetings and communication. One of the three remaining vehicles in the line-up is E85 rated, and is a Travel Management lease vehicle. The other two are campus owned. Faculty, staff, and administration are encouraged to use alternative electronic communication. Due to lack of adequate staffing and budgeting, there are no reduction figures from a standard to calculate.

A list of all Minnesota E85 fuel stations has been supplied in the Travel Management vehicle, with a note to only refuel with E85. The vehicles are tuned and maintained on a regular basis, and all pollution control equipment is maintained for peak operating efficiency. Reduction in travel has been substantial, but has not been tracked or substantiated due to staff and budget reductions.

St. Cloud State University (SCSU) – SCSU has moved beyond subsidizing bus passes for students and faculty to joining with student government and St. Cloud MTC to provide a new Free Ride program. This includes evening transportation in the campus area. This partnering with St. Cloud Metropolitan Transit Commission provides free service on 17 bus routes to current SCSU ID cardholders. Over 30 apartment complexes are within 20 bus minutes of campus. Parking congestion is reduced. Clipper West route riders have increased.

St. Cloud Technical College (SCTC) – Carpooling is strongly encouraged when on college business.

Department of Natural Resources (DNR) – DNR has purchased and set up teleconferencing equipment. We have had 12 meetings with participation from 14 to 25 regional staff at each meeting. This has reduced travel by more than 15,000 miles and saved an estimated 800 gallons of fuel.

Department of Transportation (Mn/DOT) – Mn/DOT maintains traffic lanes set aside for vehicles with multiple passengers and has constructed various park-and-ride sites that promote carpooling, busing, or light rail commuting. Mn/DOT continues to promote telecommuting for employees in the Twin Cities' metropolitan area.

Mn/DOT continues to promote various alternative transportation options such as high-occupancy vehicle lanes, commuter rail, bus, bicycling, walking, and light rail. Mn/DOT, city of Minneapolis, and Metro Commuter services jointly encourage and manage carpool parking. Also, Mn/DOT plans to partner with other state agencies, citizens, and local officials in pilot projects to encourage alternative transportation.

University of Minnesota – In 2006, the University of Minnesota became host to the Zipcar, an hourly car rental service that allows subscribers to use conveniently located cars for short periods of time without all of the usual headaches and costs of owning, maintaining, and parking a car on campus. The university hopes this will alleviate some of the congestion on the streets and parking lots in the campus area as well as be a worthwhile service for students and staff.

In June 2004, the University of Minnesota was designated one of the Best Workplaces for Commuters^{SM} by the U.S. EPA and U.S. Department of Transportation (DOT). Best Workplaces for Commuters^{SM}, a voluntary partnership program designed to cut traffic congestion and traffic-related air pollution, recognizes employers that provide environmentally friendly commuter benefits to employees. Offering these commuter benefits identifies the university as an organization committed to reducing pollution, commuting costs, traffic congestion, and employee stress caused by single-occupant vehicle commuting. Best Workplaces for Commuters^{SM} (www.bwc.gov) is a public-private partnership developed by the U.S. EPA and DOT. U.S. EPA and DOT have established a voluntary National Standard of Excellence for employer-provided commuter benefits. The program challenges employers across the country to voluntarily meet the National Standard of Excellence.

The Twin Cities' campus is host to nearly 80,000 arrivals per day. The campus spans nearly five miles from east to west. With a free intercampus bus system and a comprehensive tunnel and skyway system, students do not need a car once on campus. The Department of Parking and Transportation Services is continually studying and implementing new strategies to (1) reduce automobile traffic to the Twin Cities' campus, and (2) more efficiently direct the flow of vehicle traffic and pedestrians when they reach the university. Employee and student population densities are mapped to show critical areas for mass transit lines. Routes for express buses have been maintained, in spite of shrinking state funding. Carpooling is actively promoted through advertisements, reduced parking rates, and preferential surface lot locations. Biking and walking routes are promoted with signage and special lanes on university roads. The Twin Cities' campus uses a mass transit system to bus students, employees, and guests from parking lots to various locations on campus. Mass transit is an environmentally friendly alternative to single-occupancy vehicles, and a bus carrying as few as seven passengers is more fuel-efficient than the average single-occupancy vehicle.

The campus bus routes and schedules have been evaluated and rearranged in an effort to more effectively serve the riders while minimizing congestion on the urban campus streets and fuel consumption and air pollution as buses sit in traffic. Since 2001, these efforts have reduced bus miles traveled by over 200,000 miles annually, which translates into conserving more than 10,000 gallons of fuel and significant reduction of environmental pollution.

The University of Minnesota, Twin Cities, initiated a deeply discounted student, staff, and faculty bus pass program designed to reduce traffic congestion, ease parking shortages, and improve the environment through increased bus ridership. The university is the state's third largest traffic generator; so the increase in bus ridership by university students, staff, and faculty eases traffic congestion throughout the metropolitan region. Since the introduction of U-Pass program, we have realized a positive change in people's travel mode to campus. Before the introduction of this program, 43 percent of those visits were people driving to campus, while 13 percent used the bus as a means of getting to work or school here at the University of Minnesota. Since U-Pass, we estimate that there are now 32 percent driving and 24 percent arriving by bus.

Another encouraging result shows 64 percent of students who buy a U-Pass use it to travel to other destinations in the metro area. This illustrates that students are incorporating mass transit into their daily routine and establishing positive transportation patterns that will continue into their adult lives. The U-Pass program drastically impacts the environment by reducing more than 50,000 vehicle miles traveled per day, saving more than 2,000 gallons of gasoline daily, and by eliminating more than 220 tons of carbon monoxide and 4,500 tons of carbon dioxide emissions from the air annually.

The University of Minnesota-Duluth started their U-Pass program in fall 2000 in cooperation with Lake Superior College, Saint Scholastica College, and the Duluth Transit Authority (DTA). This U-Pass program provides free transit on DTA buses for students and staff. Due to a cooperative effort between UMD administration and the DTA, students, faculty and staff, can ride the DTA anytime, anywhere in the Twin Ports free of charge with a University of Minnesota-Duluth I.D. or U-Pass. The DTA has transported more than 1 million UMD students since the introduction of the U-Pass in September of 2000. The "free-ride" U-Pass contract between the DTA and UMD is in service until the 2005–2006 academic year. The more than 2,000 riders per day is outstanding usage of this program, which decreases traffic congestion, fuel consumption, air pollution, and the need for using up more open space for parking facilities.

The university administration actively promotes Twin Cities' campus students living on-campus and promotes new student housing projects to entice students to live on-campus or in the campus community, rather than commuting. The university continues to support this effort knowing it will not only enhance the campus community but will drastically impact the environment by reducing more than 25,000 vehicle miles traveled per day, saving more than 1,000 gallons of gasoline daily, and by eliminating more than 110 tons of carbon monoxide and 2,200 tons of carbon dioxide emissions from the air annually.

The University of Minnesota's Intelligent Transportation Systems Institute (www.its.umn.edu) was created to conduct a set of federally sponsored studies on how transportation systems can be planned in an increasingly complex social, political, economic, and technological environment. The institute plans and conducts activities that further the mission of the University Transportation Center program of the U.S. Department of Transportation. That mission is to advance U.S. technology and expertise in the many disciplines that make up transportation through education, research, and technology transfer activities at university-based centers of

excellence. The institute's activities are guided by its theme of enhancing the safety and mobility of road- and transit-based transportation through a focus on human-centered technology. To that end, the institute brings together technologists and those who study human behavior to ensure that institute-developed technologies become tools that optimize human capabilities.

How do we improve the ways that we get from here to there without spending all of our resources? Not an easy question, by any means, but there are some good answers. The Center for Transportation Studies (CTS) at the University of Minnesota supports the search for those good answers through research, education, and outreach activities (www.cts.umn.edu). The primary goal of the Center for Transportation Studies is to initiate programs to address critical transportation issues. This process is guided by the participation of Minnesota leaders, transportation professionals, and university faculty and staff. A supporting goal is that this participation reflects the diversity of the various stakeholder groups affected by transportation. The center's mission is as follows: (1) as part of a research and land grant university, actively create new knowledge and insight, and disseminate that knowledge and insight through teaching and service; and (2) be a focal point for strengthening knowledge in transportation. The center identifies critical issues in transportation and uses multidisciplinary approaches to address them.

Center research, education, and outreach programs:

- create an environment for faculty, students, and practitioners from multiple disciplines to collaborate in transportation research and education efforts.
- provide leadership and outreach efforts to government officials, private sector representatives, and the public in the application of new knowledge and the implementation of policies, programs, and technology that improve transportation.

11. Education, Communications, and Training

Department of Administration (Admin)

Resource Recovery Office (RRO)

- Provides educational-work opportunities to St. Paul School students in their "Transition to Independence" school year and summer school programs.
- Provides on-site building assessments of recycling and waste management systems, technical assistance and training, and regularly tracks recycling progress. As a group, Twin Cities' metropolitan area public entities have recycled as much as 68 percent of their discards, with 28 agencies recycling more than 80 percent.
- Conducts tours of the State Recycling Center and of its reusable office supplies area for customers and other interested parties to share recycling and waste reduction successes.
- Prepares Info-to-Know wall postings displayed in Capitol Complex buildings to inform tenants about pollution prevention, office clean outs, electronics recycling, waste reduction, and recycling issues.
- Represents the Department of Administration at Minnesota's Interagency Pollution Prevention Advisory Team meetings. Representatives from MMD and PMD regularly attend this meeting.
- Provides Department of Administration support and representation on the Pollution, Reduction, and Recycling Advisory Council
- Partners with Sentencing-to-Service Programs to provide offenders with recycling-based work and training.
- Provides information to state employees about waste reduction (by toxicity and amount) and recycling opportunities at annual events such as the September Office Supply Connection (OSC) Product Show and the Accounting and Procurement "Spring Fling."
- Prepares environmental purchasing information, tabletop displays, "Info to Know" wall postings, and onsite presentations in response to agency requests.
- Provides conference displays and handouts at various public events, including those sponsored by the Recycling Association of Minnesota, Solid Waste Association of North America, the Minnesota Pollution Control Agency.

- The RRO website, www.rro.state.mn.us, is regularly updated to provide information in lieu of mailing or faxing.
- PMD coordinates departmental pollution prevention information.

Materials Management Division (MMD)

- During FY 2006, MMD, as a part of its Authority for Local Purchasing (ALP) Training, ALP Management Overview, and other training programs, has trained more than 264 state agency staff in pollution prevention and procurement of environmentally responsible goods and services. MMD worked with the Office of Environmental Assistance (now part of the MPCA) to provide additional environmentally responsible information through the purchasing training provided to state employees.
- MMD continues to provide all updates of the ALP training manual that is provided to state employees. All updates are now distributed on the MMD website to eliminate the need to send out paper updates. The entire manual is on the MMD website, greatly reducing the need to print hard copy versions.
- MMD partners with MPCA to identify areas where current or new contracts can be expanded with more environmentally preferable goods or services.
- MMD's Acquisition Management Specialists incorporate environmental considerations into solicitations whenever possible. They accomplish this in a variety of ways, such as solicitation requirements, environmental preferences, or environmental evaluation criteria.
- MMD maintains a list of state contracts that contain environmentally preferable products and services. The list is available on the MMD website: www.mmd.admin.state.mn.us/envir.htm.
- MMD has combined the advisory committee of the Environmentally Responsible Work Group into the Procurement Coordinators Group in order to increase attendance and awareness. This group works to promote environmental purchasing in state government and is a multi-agency group.
- Previous education efforts in the area of recycled paper purchasing have been very successful.
- MMD and RRO contributed to the development of the *Environmental Preferable Purchasing Guide: How to get the stuff you need and still be good to the environment*. The EPPG is a user-friendly resource created to simplify green purchasing. It includes data on product options, sample specifications, existing Minnesota contracts, etc. The guide has been distributed to all certified purchasers and to cities and counties. MMD and RRO promoted this guide on displays and during presentations. The guide is featured at all ALP training sessions. A copy of the guide is available through a link to the MPCA on the MMD website.
- MMD maintains a section on its website dedicated to environmental purchasing, including:
    - Environmentally preferable goods and services lists
    - Minnesota legislative requirements
    - Administration Biennial Report on MMD Purchasing
    - Environmental news about new products and contracts
    - Product experience/case studies on environmentally preferable products
    - Links to other websites helpful in environmental purchasing

- The Materials Management Division implemented a change in MAPS that requires entry of an environmental code on the order lines for goods and services. This code is shown on state contracts so that buyers know what types of products are more environmentally preferable when making purchasing decisions. This code also allows better tracking of the environmentally preferable purchases.

Department of Commerce – Employee and news information is distributed via a paperless process on the department's internal website.

Department of Corrections – Multiple locations deliver staff training on pollution prevention, hazardous waste management, and recycling.

MCF-Faribault – Delivered water treatment training and communicating the recycling instructions to all employees.

MCF-Shakopee has created a "Green and Lean" Committee to promote reuse/reduce/recycle programs and to educate staff.

Metropolitan Airports Commission (MAC) – MAC employees are trained annually on spill prevention, control and countermeasures and stormwater pollution prevention techniques. DOT training is completed every three years. Also, a pollution prevention team monitors the outfalls and detention ponds around the airport. These employees have continuous input on how to improve the site and/or operations. There is also annual hazardous material training where basic pollution prevention methods are addressed.

Metropolitan Council Environmental Services (MCES) – MCES employees volunteer to staff displays and interactive exhibits at events such as the Earth Fest, Earth Day at the Minnesota Zoo, the Living Green Expo, the State Fair, the Children's Water Festival, Tooling for Teaching Watershed Education, and Farmington Pollution Prevention Days. Exhibits are also available to be loaned out, and educational materials are available for distribution.

The IWPPS works in an advisory, or technical, role as well as a regulatory role with its permitted industrial users. Three additional issues of the *Open Channel News* have been mailed to industrial users in 2005. A specific pollution prevention website has been prepared for industries, customers, and other external users: www.metrocouncil.org/environment/PollutionPrevention.

IWPPS staff attends quarterly meetings as regulatory advisors for the Healthcare Environmental Awareness and Resource Recovery Heart Team (HEARRT) that addresses environmental issues within Minnesota's healthcare industry. Additionally, staff meets monthly with the Solid Waste Management Coordinating Board (SWMCB) and the Minnesota Pollution Control Agency (MPCA) representatives to develop consensus on managing hazardous waste from healthcare facilities.

Metropolitan Mosquito Control District – Annually, the district conducts pesticide applicator training sessions for all district employees in conjunction with the Minnesota Department of Agriculture. A portion of these training sessions is used to review source reduction, waste management, and recycling procedures employed by the district. This training includes an overview of regulatory requirements, examples of waste streams produced by the district, handling and disposal procedures, storage requirements, recycling, and emergency spill response plans. Emphasis is placed on reducing the use of hazardous materials, replacing materials with less hazardous counterparts, and recycling.

Additionally MMCD employees must go through training sessions that focus on the proper use, transport, and handling of all the pesticides used by the district. Employees who use pesticides for the control of adult mosquitoes must attend training sessions given by the MDA; they must take and pass a written exam and be licensed by MDA in order to use these control materials.

Department of Military Affairs – The JFMN (Army) has developed a variety of hazardous waste, solid waste, recycling, and spill prevention and cleanup training formats. DMA personnel are provided with literature, CD-ROMs, video cassettes, as well as online training. All of these methods of training are essential due to the high deployment of soldiers as well as the widespread locations of JFMN facilities.

Minnesota Pollution Control Agency – The MPCA has pollution prevention information available to all staff and external customers on their websites. This information is easy to access and includes many suggestions and training tools for the staff to minimize waste at work and at home on a daily basis.

In March 2005, the MPCA sponsored two workshops led by Yvonne Watson and John McLaughlin from the U.S. EPA, National Center for Environmental Innovation, regarding performance measurement. The workshop targeted leadership, staff, and external partners currently or prospectively involved in Pollution Prevention pass-through grants. The impetus was to improve MPCA's capacity for producing and utilizing measurement

results from prevention-oriented efforts. The methodology introduced is based on an internationally recognized approach referred to as logic modeling or outcomes sequencing.

In performance measurement and program evaluation, project managers learn and apply systematic and holistic project design and procedures for identifying performance objective and defining performance measures to ensure prevention tracking. Funding is through a P2 grant pass-through.

The Prevention and Assistance Division continues to use voluntary partnerships as a means to prevent waste. Ongoing efforts with the Minnesota Chamber of Commerce Waste Wise program to help businesses recycle and reduce waste is an example.

The Sustainable Communities team has been working since 1996 to promote sustainability activities at the community level. One important component of sustainability is pollution prevention. The focus of the Sustainable Communities team's activities is the Minnesota Sustainable Communities Network (MnSCN), which has over 2,850 members. The goal of MnSCN is to promote adoption of more sustainable technologies and community design, and encourage networking, information exchange, and better access on the topic of sustainability. MnSCN's major activities currently consist of a free bi- monthly sustainability e-mail newsletter and the NextStep sustainability website. MnSCN's popular bi-monthly newsletter contains most of the following sections: tools and resources, jobs available, events, sources of funding, and news from members. Over 230 issues of the newsletter have been published.

NextStep (www.nextstep.state.mn.us) is an interactive web-based assistance tool, which provides a convenient point of access to information about sustainability, with a Minnesota focus. It allows for entry of information by any site user. The site features descriptions of approximately 1,400 resources, dozens of case studies, a searchable online member directory, job listings, an events calendar, an archive of past e-newsletter issues, and more. NextStep is divided into 12 major topic categories related to sustainability, each with its own volunteer "topic guide" and with a list of selected top resources. The Prevention and Assistance Division also manages www.reduce.org and www.seek.state.mn.us, both of which have information relevant to pollution prevention.

Based on the successful pilot of a marketing campaign related to green pricing, the MPCA implemented a successful Buy Green Power campaign to encourage Minnesotans to buy green power through their electric utility. During FY 2006, 1,319 people pledged to buy green power, and the documented purchases of 493 households of over 2 million kWh of green energy will annually prevent of 3,745,000 pounds of CO_2, 11,267 pounds of SO_2, 8,111 pounds of nitrogen oxides, and 41 grams of mercury. The 2 million kWh of electricity purchased in FY 2006 was enough to finance the installation of one new turbine!

The MPCA Learning Resource Center and Library distributes the following materials:

- *Source Reduction Now*, a detailed guide to implementing source reduction programs in companies and agencies
- *Retail Hardware-Best Practices for Waste Management Guidebook* and video
- *Transport Packing: Cost-Effective Strategies to Reduce, Reuse, and Recycle in the Grocery Industry*
- *Mercury and the Healthcare Professional* video for mercury reduction in the healthcare industry
- Junk mail campaign materials
- Reducing Toxicity in Your Home
- Creating Less Trash at School
- Composting Organic Waste
- How to Grow a Healthy No-waste Lawn and Garden
- Reduce the Need for Pesticides and Herbicides
- Reducing Trash When You Shop
- Reducing Waste at Home
- Reducing Waste in the Workplace
- Reducing Waste When Traveling
- Using Phosphorus-free Lawn Fertilizer

- Minnesota GreenPrint
- Minnesota Report Card on Environmental Literacy
- Environmental Literacy Scope and Sequence
- Getting the lead out – a fact sheet for sport fishermen
- Household Hazardous Waste: Pharmaceutical Waste
- Household Hazardous Waste: Safe Disposal Options for Needles and Syringes fact sheet
- Global Warming and Climate Change in Minnesota
- Buy Green Power fact sheet
- Buying Green Products checklist
- Buying recycled-content paper
- Green Cleaners fact sheet
- Nontoxic Cleaning Recipes
- Toxicity Reduction and Backyard Burning Resources

In addition, the Learning Resource Center loans out various educational displays and kits. For further information, contact the LRC at 651-215-0232.

Design for the Environment (DfE)—the design stage of product development is an unparalleled window of opportunity for championing the environment. This is the time when the materials and energy used to manufacture a product are determined. Once these decisions are made, the environmental impacts of the product for its entire lifecycle are largely set. A number of Minnesota companies, IBM (Rochester), Medtronic, Tennant Company, BAE Systems, and 3M recognize the significance of this stage of manufacture and have integrated design for the environment into their product design processes. Continued support of this emerging trend is occurring through the recent development of additional DfE resources including a "Better by Design" video and implementation guide book. These resources complement pollution prevention grants, such as those awarded by the Prevention and Assistance Division to the General Mills-Chanhassen facility and Perfusion Systems, a Medtronic cardiac business. The pollution prevention grants helped these businesses implement and integrate DfE into their product design processes.

Prevention and Assistance Division staff continues to work with MnTAP, representatives from the Minnesota healthcare community, and state and county environmental staff to promote pollution prevention within the healthcare sector. The Healthcare Environmental Awareness and Resource Reduction Team (HEARRT) meets quarterly, with presentations covering mercury reduction, water and energy conservation, national programs such as the Hospitals for a Healthy Environment (H2E) program and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), and local sustainability efforts in healthcare facilities.

Prevention and Assistance Division staff coordinates the Interagency Pollution Prevention Advisory Team (IPPAT), developing agendas and facilitating quarterly meetings, recording minutes, and maintaining a mailing list. IPPAT continues to implement the executive order for pollution prevention, including pollution prevention, waste reduction, and energy and resource conservation. Agencies that regulate activities that generate significant quantities of hazardous waste or use significant quantities of resources and/or toxic chemicals, or whose policies have important effects upon such activities, are required to develop policy statements indicating that pollution prevention is a priority. These agencies are further required to integrate pollution prevention into their regulatory and policy activities as a primary means of meeting standards and report annually on their progress. IPPAT meets quarterly to share successes and learn about pollution prevention initiatives others are taking.

IPPAT has been designated as the entity to coordinate implementation of the August 2004 executive order on reducing state agency contributions to air pollution. One requirement of the order is to pick at least two actions from a list of eight to prevent air pollution. That list of actions is shown in Part 3 of this report. IPPAT developed a system of metrics to track the effectiveness of agencies' actions and placed it on the Internet for all the agencies to use when developing the *Pollution Prevention Summary Report*.

The Minnesota Government Reaching Environmental Achievements Together (MnGREAT!) Awards recognize environmental achievements by government employees in the areas of pollution prevention, toxicity reduction, waste reduction, energy conservation, water conservation, recycling, reuse, and composting. The Interagency Pollution Prevention Advisory Team, which sponsors the program, recognizes projects that demonstrate a high degree of commitment and leadership and provide substantial benefit to the environment.

Last year, there were a few changes made to the MnGREAT! program. MnGREAT became the public sector of the Governor's Awards program. MnGREAT is now called the Governor's MnGREAT awards. The private sector is the Governor's Award for Excellence in Waste and Pollution Prevention. The two programs maintain separate judging panels and criteria. These changes will continue for the 2007 award program. However, this year, the award program will be evaluated to see if stakeholders are satisfied with the ceremony and current structure of the program. The evaluation will determine if changes need to be made to the 2008 program. The ceremony will be held in conjunction with the Governor's P2 Awards at the 2007 Minnesota Pollution Control Agency's Air, Water, and Waste Environmental Conference in February.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University (BSU) – Bemidji State University continues to require environmental courses for satisfactory completion of the Liberal Arts core. Focus on the Environment is one of seven areas in the university's Liberal Education Program. Students pursuing a bachelor's degree must take a minimum of one 3-credit course from this area.

In conjunction with the 2005 Earth Day, the Environmental Advisory Committee began issuing brief tips to faculty and staff about ways to reduce waste, both at work and at home. The messages are posted to the faculty/staff e-mail list. They were originally planned as an Earth day promotion but have been continued with a new tip being posted periodically. BSU became a member of the National Wildlife Campus Ecology program in the spring of 2006.

BSU Environmental Studies major, Tessa Haagenson, was selected as a 2005 National Wildlife Federation Campus Ecology Fellow. She was awarded a $1,000 fellowship to support her project to educate students and the community about global warming and related issues and to explore a student fee to support wind energy development at BSU. She will be doing global warming presentations to community audiences beginning in the fall of 2006.

BSU has established an endowment fund through the BSU Foundation that allows individuals and/or groups donating money to the foundation to designate it for support of environmentally sustainable programs. The fund will be used for student scholarships and to support projects related to environmental sustainability at Bemidji State University. The fund was approximately 70 percent endowed as of July 2006.

Central Lakes College, Brainerd and Staples – Annually the staff and faculty of Central Lakes College are trained in Right-to-Know, Blood-borne-Pathogens, crisis management, etc. Programs and departments that need additional training (such as hazardous chemicals and wastes, lock-out/tag-out, confined spaces, ladders and lifts, etc.) are trained annually as needed.

Minnesota State University, Moorhead (MSUM) – The Department of Environmental Health and Safety continues to educate the university community regarding hazardous waste management, pollution control measures, stormwater runoff, spill prevention, and other requirements throughout the year. Due to the diverse community and resources on our campus, MSUM offers many classes with respect to environmental education. These classes follow strict curricula of current and past issues, events, and a complete understanding of environmental processes. Recently students have taken initiative to form groups of their own that help raise awareness within the community as well. Some of those groups include the Sustainable Campus Committee, MSUM Environmental Action Network, Support International, GEO, Tri-Beta, and Volunteer Visions. These groups help educate the community by becoming involved in yearly events such as Earth Week Speakers, campus cleanup day, and many more.

A new environmental class, *People and Environment*, is added to the incoming freshman core curriculum. The goal of the class is to develop students' understanding of the concept of sustainability and the

challenges in responding to environmental problems. Students will examine how societies and the natural environment are intimately related and develop a better understanding of ecosystems and the ways in which different groups interact with their environments.

In fall 2003, a group of MSUM students came together to create a Sustainable Campus Initiative. This document contained a list of goals and recommendations for MSUM to help university evolution toward a more sustainable future. This document was taken to MSUM student senate, and work began on creating a student fee to be used for sustainable campus projects. The fee was implemented in fall 2004. The environmental fee is $3 per semester and is charged to each full-time student during the fall and spring semesters. This money goes into a fund that generates approximately $45,000 per semester. Of those funds, 100 percent are directed toward the development of sustainable procedures, programs, facilities, and curriculum. Projects currently under way include a wide variety of tasks that affect facilities, policy, curriculum, services, and education of the MSUM community. The development of a student-owned wind turbine, which would provide power for student facilities including the student union, wellness center, and health center, has taken first priority. Other projects included developing and implementing a residence halls' recycling program, becoming a member of National Wildlife Federation's Campus Ecology Program, and working with architects to ensure that the construction of the student wellness center follows LEED (Leadership in Energy and Environmental Design) certification recommendations. A task force was formed to manage the money and to research options for improving the MSUM environment. The Sustainable Campus Initiative Committee evolved from that task force and is now managing the funds. The Sustainable Campus Initiative Committee has MSUM students as a majority and contains university staff members, faculty members, and administrators. Regular meetings are held bimonthly during the academic year.

The students' main outreach efforts were their Earth Day events. Their major accomplishment was signing of the Talloires Declaration by MSUM President Dr. Roland E. Barden and Student Senate President James Cailao. This declaration states the university is willing to incorporate sustainability in its teaching and business practices. President Dr. Roland Barden, Student Senate President James Cailao, and Sustainable Campus Committee co-chair Dr. Karen Branden all gave speeches regarding sustainability and the university. Two videos were shown as well: *Koyaanisqatsi* is a non-verbal movie on our world and the changes that it is going though, *Case Study on Interface and Corporate Social Responsibility* is an online video of Interface CEO Ray Anderson giving a speech to attendees of the Corporate Social Responsibility Summit in 2005, which was held in Sydney, Australia.

St. Cloud State University (SCSU) – The Environmental and Technological Studies Department of SCSU reflects increased opportunities for pollution prevention emphasis in the region of laboratory procedures. This last year, a professor and six of her students attended our joint city/SCSU public stormwater input meeting and asked about several complex best management processes (BMPs).

An internship program has expanded hazardous waste controls. An online degree in aviation maintenance management is now available. A Masters of Science program in Environmental and Technical Studies, begun six years ago and serving a wide variety of backgrounds, finds about a third of program students are licensed teachers returning to school. Other research interests include recycling, landfills, and public perceptions of fuel cell technology.

After the charter class of 20 nursing students received their baccalaureate degrees on May 9, 2004, the program continues to grow.

St. Cloud Technical College (SCTC) – Training is being provided to staff on proper handling of hazardous materials. A hazardous waste program is in place, and the appropriate staff was trained on its contents.

Department of Transportation (Mn/DOT) – Mn/DOT continually conducts training within the department and occasionally to counties, cities, and the private sector.

University of Minnesota – Education of the current and future generations on the importance of pollution prevention, resource conservation, and sustainability is one of the most important thrusts in developing a sustainable world. The University of Minnesota offers over 500 environmental courses from 54 different

departments, many of which deal directly with pollution prevention. The University of Minnesota has one of the largest environmental biology research programs in the world. At last count, it included 19 academic departments and 23 centers, whose work could be classified as sustainable. Programs are as diverse as the Minnesota Landscape Arboretum to the Minnesota Sea Grant to the Raptor Rehabilitation Center to the graduate program in microbiology, immunology, and cancer biology. The efforts of this research, teaching, and outreach not only reach every corner of the state, but also include world-class research with potential global implications. The University of Minnesota has baseline data on fields and forests that cover more than 100 years. This data will be invaluable as new plants are developed and diseases fought. Much of the university's efforts involve developing methods to maximize state resources without depleting them.

The University of Minnesota established the Precision Agriculture Center in 1995 (http://precision.agri.umn.edu/index.htm) to foster the use of site-specific management techniques through collaborative research, education, and outreach programs. The center's greatest contribution will be its legacy of practitioners, researchers, and educators. In development is an undergraduate minor in precision agriculture and a graduate program. Both efforts will emphasize multidisciplinary instruction in spatial and temporal variability, management, engineering, and environment protection. Research projects and internships with farmers and agribusiness will give students the practical experience and relationships they need for future success. The center conducts research on a variety of issues through multi-disciplinary on-farm studies conducted in many states and around the world. Graduate students use and develop innovative techniques to study spatial and temporal variability in crop yield and quality, soil and landscape attributes, and precision crop management practices. The outreach program partners with industry, farmers, and academics to develop content for training modules. Present areas of emphasis include yield map interpretation, intensive soil sampling methods, on-farm experiment design, and precision farming profitability studies. The center also hosts the International Conference on Precision Agriculture, in cooperation with the Minnesota Extension Service. The biennial conference attracts more than 650 academics and industry representatives from 20 countries who share findings and preview technology.

The university's College of Architecture and Landscape Architecture (CALA) is working to cultivate the interest of future architects in studying and building environmentally friendly design and construction. "Greening CALA" is a project developed by a combination of faculty, staff, and students to incorporate these ideas and keep communication active among campus groups working toward a similar goal—sustainable development. CALA has implemented some of its ideas of sustainable design into the renovation of the architecture building, Ralph Rapson Hall. The new building is an opportunity to show that humans can inhabit it in a more sustainable way. The goal is to be able to use the building as a living lab to find out which methods of sustainability work most efficiently. On the roof of Ralph Rapson Hall, three 24-panel arrays of photovoltaic solar panels provide electricity to the building. The 15 kW system was formerly on the Science Museum in St. Paul and was moved and reinstalled at the university by Xcel Energy. A new project is underway in which the energy from the PV collectors will be used to power an electrolyzer that separates water into hydrogen and oxygen. The hydrogen is used to power a fuel cell that generates electricity. One advantage of such a system is that by converting solar energy to hydrogen, it can be stored and used when needed. The generation of electricity in this manner produces no carbon emissions or air pollutants. Xcel Energy and the MPCA jointly sponsor this project. Along with physical changes to the school, "Greening CALA" has also brought new courses to the curriculum. Undergraduate and graduate students can both take classes dedicated to building and designing in an environmentally friendly manner. While no sustainable development design major is offered yet, CALA is working toward this goal.

The *Minnesota Sustainable Design Guide*, developed by the Center for Sustainable Building Research (www.csbr.umn.edu), educates and assists architects, building owners, occupants, educators, students, and the general public about sustainable building design. This design tool can be used to overlay environmental issues on the design, construction, and operation of both new and renovated facilities. It can set sustainable design priorities and goals; develop appropriate sustainable design strategies for a particular project; and determine performance measures to guide the design and decision-making process. It can also organize and structure environmental concerns during design, construction, and operations phases. The goals of the *Minnesota Sustainable Design Guide* are to:

- educate designers, building owners, operations staff, and occupants about the concepts, goals, and significance of sustainable design

- develop an orderly decision-making process with measurable outcomes along with a database of decisions and outcomes
- provide flexibility in the way priorities are set and outcomes are measured within the system, so it can be adapted for different clients or agencies, regions, and building types;
- organize information in a hierarchy that permits users to easily understand the sustainable design process
- create a system that can easily grow and change as more experience and new information becomes available

The Department of Environmental Health and Safety conducts annual training in hazardous waste management. Approximately 2,500 employees are trained annually. The training, offered through classroom presentations and over the Web, covers the basics of pollution prevention. The web-based training program is available on the Environmental Health and Safety home page (www.dehs.umn.edu/training/labsafety/waste).

The Waste Abatement Committee, made up of members from many key departments, coordinates and monitors pollution prevention projects at the University of Minnesota. The committee communicates information to new employees through orientation programs and to existing employees through in-house vendor trade shows sponsored by the Purchasing Department. The committee is working toward a pollution prevention /resource conservation web page that will promote and provide instruction and information about self-audits and other pollution prevention /resource conservation techniques.

The Minnesota Technical Assistance Program (MnTAP) is a grant program at the University of Minnesota, School of Public Health, funded by the MPCA. MnTAP helps Minnesota businesses protect the environment and stay competitive by providing practical alternatives to prevent pollution of our land, air, and water. By reducing waste and increasing efficiency, you can save on disposal and raw material costs, decrease regulatory compliance burden, and make working conditions healthier and safer for your employees (www.mntap.umn.edu). MnTAP provides technical assistance to Minnesota businesses through telephone assistance, site visits, intern programs, presentations and workshops, technical publications, library, and materials exchange.

The University of Minnesota's Sustainable Forests Education Cooperative (www.cnr.umn.edu/CCE) has since 1997 alerted natural resource professionals to continuing education opportunities in a broad range of fields—forest ecology and management, wildlife biology, forest hydrology, botany, best management practices, technology transfer, human dimensions, and others. The cooperative, originally named the Institute for Sustainable Natural Resources, grew out of the Sustainable Forest Resources Act of 1995 and was created to be a world-class continuing education program, which developed principles for the sustainable management, use, and protection of Minnesota's forest resources. The act recognizes continuing education as one important component of this mission. The University of Minnesota's College of Natural Resources provided the matching funds to create the institute. The cooperative provides continuing education opportunities: skill building and special topics information for foresters and other resource professionals, as well as forest-related education opportunities pertaining to fisheries biology, wildlife biology, park resource management, and other fields. The cooperative emphasizes an integrated, systems approach—designing educational programs based on the understanding that natural resource management is part of an interdependent system. Social, economic, and ecological values must work together to sustain healthy, productive ecosystems. By focusing on emerging issues, the cooperative will bring current research, new technologies, and state-of-the-art practices to natural resource professionals.

The University of Minnesota Extension Service (www.extension.umn.edu/) is the major educational outreach arm of the University of Minnesota, with offices in every county of the state. Campus-based extension specialists work with county-based extension educators to deliver educational programs through meetings, demonstrations, workshops, publications, and electronic delivery methods such as interactive TV, satellite teleconferences, and computer networks. Programs range from water quality to sustainable agriculture, from urban horticulture to youth development, from natural resource management to tourism development. Environment and natural resources educators and specialists develop and implement a broad range of programs with information on shoreland issues, agricultural systems, residential systems, forestry/wood products, and on all aspects of environment and natural resource management, from water quality, forestry and wood products, solid waste and wastewater management, to indoor environmental issues such as air quality, radon, housing materials, and systems.

The Institute for Social, Economic and Ecological Sustainability (ISEES) (www.fw.umn.edu/ISEES/) was initiated in July 1996 to strengthen the University of Minnesota's capacity to analyze sustainability issues and recommend options for moving toward sustainability. Our vision is based on the fundamental idea that sustainable relationships among the social, economic, and ecological spheres of the world are possible and desirable.

ISEES brings together people from the natural and social sciences and practitioners to analyze sustainability issues and recommend options for moving toward sustainability. We believe that the development of options for sustainability requires integrating social, economic, and ecological factors. ISEES supports transdisciplinary research and education on sustainable environments, ranging from the urban community and watershed to the regional and global scale. In our seminars, workshops, and annual publication competition, we bridge divisions between the natural and social sciences and between scholars and practitioners. Contemporary research questions and societal debates about sustainability revolve around a number of rich and interconnected themes. To address these themes, the research, education, and outreach goals of ISEES include:

- generate a new transdisciplinary synthesis of concepts and methods for research on sustainability issues
- understand forces influencing sustainability at local, regional, and global scales
- develop and evaluate techniques for assessing conditions for sustainability
- generate policy options for moving communities toward sustainable conditions
- facilitate information exchange among scholars, practitioners, and citizens

12. Electronics

Department of Administration (Admin) –MMD electronic equipment contracts provide Energy Star-compliant computers, copiers, fax machines, monitors, and printers. In the new electronic equipment contracts, MMD requires that all energy-efficient equipment be identified.

The Materials Management Division promotes the reuse of computers and other electronics through its Surplus Services program. Computers are provided to Minnesota K-12 schools in collaboration with the Department of Corrections. The program accepts personal computers no longer needed by state agencies and private businesses. Through the use of prison inmate labor, the computers are refurbished and distributed throughout K-12 schools. Surplus computers are also distributed to township government offices. The Materials Management Division extended the contracts for leasing computer equipment. This will reduce the amount of surplus and used equipment that requires hazardous waste management.

The Materials Management Division, working with other states that are members of the Western States Contracting Alliance, developed a Request for Proposal for computer hardware. The RFP took into consideration several environmental issues.

- Take-back and recycling programs.
- Compliance with environmental improvement programs for reduction/minimization/avoidance of the use of toxic and hazardous constituents.

- Compliance with international directives such as the European Union's directive, Restriction of Hazardous Substances.
- Certification by independent third-party eco-labeling programs such as TCO and Blue Angel.
- The migration to the use of recyclable, nontoxic packaging.
- Compliance with energy-efficiency programs such as Energy Star.

The Materials Management Division, in conjunction with other agencies and Cooperative Purchasing Venture members, maintains a statewide computer/electronics recycling disposal contract with Asset Recovery Corporation of St. Paul. The contract is *Hazardous Materials: Computers/Electronics: Recycling and Waste Management,* contract release number H-90 (5), contract number 426350. This contract is available to all state agencies and CPV members.

Materials can be dropped off at Asset Recovery, or Asset Recovery can pick up the materials from customers. Asset Recovery can also assist with special event collections, etc. This past year, approximately $800,000 was paid to Asset Recovery to recycle computer/electronic waste. As of July 1, 2006, cathode ray tubes cannot be disposed of in the trash.

Department of Commerce – Computer equipment is either surplused or disposed of according to state guidelines.

Department of Corrections

MCF-Moose Lake/Willow River – Recycled 3.7 tons of waste electronics.

Department of Employee Relation (DOER) – All office equipment purchased by DOER in FY 2006 was Energy Star-compliant.

Iron Range Resources and Rehabilitation Agency (IRRR) – The Information Systems Program recycles outdated computer equipment. In 2006, 2,055 pounds of computer equipment was transported to the Asset Recovery Corporation in St. Paul. I.S. also replaced 31 CRT monitors with the thin panel LCD types. These monitors use approximately a third of the power as the old type. Information Systems also recycles used printer toner cartridges and purchases recycled printer toner cartridges when available.

Metropolitan Airports Commission (MAC) – MAC purchases computer equipment that is Energy Star-compliant with features such as sleep mode that reduce energy consumption for computer monitors. High-efficiency ratings are specified for purchases of electronic equipment and appliances. Obsolete electronic equipment is recycled by an approved vendor. Lack of specific data prevents quantifying the reduction of VOC, NOx, and PM emissions resulting from increasing the use of energy-efficient appliances and electronic equipment.

Metropolitan Council Environmental Services (MCES) – The MCES sends used office electronics—computers, cathode ray tubes, disc drives, printers, etc.—to a vendor for evaluation. The vendor salvages what it can for resale. Unsalvageable units are dismantled, and the components are recycled. In 2005, 480 units were recycled.

Minnesota Pollution Control Agency –The state of Minnesota contract ensures proper management of used electronics discarded by government agencies and public entities. The contract includes a provision specifying that no component materials from used electronics are exported overseas for management.

In 2003, 2004, and 2005, the MPCA donated or recycled the following electronic equipment (weights in parentheses):

2003		2004		2005	
55 laptops	440 lbs	34 laptops	272 lbs	4 laptops	32 lbs
588 computers	26,460 lbs	212 computers	9,450 lbs	95 computers	4,275 lbs
121 monitors	4,235 lbs	114 monitors	3,990 lbs	81 monitors	2,835 lbs
15 printers	600 lbs	13 printers	520 lbs	14 printers	560 lbs
7 printers	784 lbs	5 printers	560 lbs	2 printers	224 lbs
2 scanners	100 lbs			3 scanners	150 lbs
4 modems	12 lbs			2 digitizers	8 lbs
		1 docking station	5 lbs	1 label writer	2 lbs
		4 UPS	40 lbs	2 tape drives	4 lbs
		2 disk drives	2 lbs	1 router	70 lbs
		1 power supply	30 lbs	1 HUB	8 lbs
		1 switch	15 lbs	1 UPS	8,000 lbs
				1 tape backup	50 lbs
				1 storage system	45 lbs
Total weight	**32,631 lbs**		**14,884 lbs**		**16,484 lbs**

This represents a total of 65,000 pounds of electronics that were reused or recycled in an environmentally acceptable manner since 2003.

The MPCA continues its leadership in state and federal environmental policy initiatives in the computers and electronics manufacturing sector. These efforts include environmentally preferable purchasing for electronic equipment, market development, and end-of-life management strategies for electronic appliances. In 2003, the Minnesota Legislature enacted a disposal ban for cathode ray tubes that was implemented in July 2006. The MPCA will continue to work with local governments, manufacturers, retailers, and others to offer collection events and develop the necessary processing infrastructure in Minnesota. The Legislature considered proposals to implement a statewide e-waste collection and recycling program that institutes manufacturer responsibility for discarded electronic products during the 2006 session and will do so again in 2007. The MPCA continues to provide technical assistance and policy analysis to assist legislators in their consideration of the issue.

The MPCA participated in the development of the Electronic Product Environmental Assessment Tool (EPEAT) to promote the purchasing of environmentally preferable IT equipment by public entities and other large institutions. The project, sponsored by the U.S. EPA, involves manufacturers, recyclers, federal and state government representatives, and NGOs. EPEAT is a tool for evaluating the environmental performance of electronic products throughout their life cycle, and it addresses many environmental issues associated with the design, use, and end-of-life management of IT products. The tool became available for use in July 2006, and the MPCA worked with the Department of Administration and Office of Enterprise Technology to include EPEAT in IT purchasing specifications.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University (BSU) – All Apple and Gateway computers and HP printers purchased through the University Computer Support Services are Energy Star compliant.

Minnesota State University, Moorhead (MSUM) – Reuse of PCs on the MSUM campus is very much encouraged. There is a strong program toward department trading of PCs and donation to student and nonprofit organizations. This program reduces the number of required new PCs and extends the service life of older machines. Also, most of the electronics on the MSUM campus have been updated to meet Energy Star requirements that helps reduce campus-wide consumption of resources. All unwanted electronics are recycled through the Department of Environmental Health and Safety that in turn works with recycling vendors from the state contract list.

Northwest Technical College, Bemidji – Energy Star-rated office equipment and replacement/repair for

HVAC equipment is being done.

St. Cloud State University (SCSU) – The SCSU business office provides for the reuse of some computers, electronic equipment, and other property through the surplus property resale program. E-mail announcements also help relocate electronic equipment from surplus to reuse in another department. Other electronic equipment (shipments totaling about 49,950 pounds and net cost of about $14,620) was recycled for somewhat offsetting commodity and precious metal credits. Styrofoam from computer, electronic, and other shipping cartons was also recycled.

St. Cloud Technical College (SCTC) – All electronics (circuit boards, computer monitors, computers, etc.) are properly disposed of through licensed contractors.

Department of Natural Resources (DNR) – Computers and monitors all use energy-conservation mode.

Department of Revenue (DOR) – Revenue has restricted the use of coffee makers and eliminated the use of coffee warmers and auxiliary heaters. This not only reduces fire hazards, but it also avoids problems with dozens of electrical appliances operating, many non-productively, throughout the day. Our older CRT computer monitors are being replaced with Energy Star LCD displays, which consume half the energy and provide less glare. Our new LCD monitors draw 38 watts versus 85 watts for the older ones that are being phased out. To date, we have replaced 1,146 monitors. Operating 8 hours per day, 250 days per year this equals a savings of 107,700 kW per year. Also, fewer watts used produces less heat, which lowers the demand for cooling.

Department of Transportation (Mn/DOT) – Mn/DOT has been continually expanding its use of light-emitting-diode (LED) traffic signal heads. These devices use about 10 percent of the electric power as compared to incandescent lamps. Mn/DOT has been using red LEDs for some time, but we have also expanded the use of LEDs for the yellow and green indications. Mn/DOT's road weather information system consists of 93 sites throughout the state that collect data from atmospheric and pavement sensors and transmit this information to servers in St. Paul, which use the Internet to deliver information to Mn/DOT staff. The system is used primarily to monitor winter road conditions to aid in more efficient use of anti-icing and deicing chemicals and equipment.

The highways traffic management system was evaluated extensively in the 1970s and 1980s. Several programs were implemented as a result of these studies; the most noticeable to the traveling public are metered ramps. Mn/DOT conducts a traffic management and development program to evaluate high occupancy vehicles lanes and programs, incident management research, new product evaluation, traveler information research, simulation and modeling, and traffic management studies.

University of Minnesota – The University of Minnesota statewide system collects all unwanted electronic equipment, redistributes what it can within the university, and then pays to have the rest sent to a licensed demanufacturer. The demanufacturer markets a portion of the equipment (sells the equipment as is or as components), recycles a portion (particularly scrap and precious metals), and properly disposes of the remainder. The university recycles approximately 400,000 pounds of electronic material annually. The university has worked extensively with the Department of Administration and other agencies to develop a statewide computer/electronics recycling contract.

The University Computer Services (UCS, www1.umn.edu/ucs/pickup.htm) and Como Recycling Facility both provide collection of unwanted computer systems. Both programs market the usable computers back to the university community employing web page (www1.umn.edu/ucs/usedcomp.htm) and showrooms (UCS for a charge).

The university offers electronics recycling service to educational institutions throughout the state via its Chemical Safety Day Program (www.dehs.umn.edu/csdp). The Chemical Safety Day Program, which has operated since 1981, was already providing fluorescent lamp recycling in addition to chemical waste management services to Minnesota schools.

It typically costs to recycle electronic equipment. A typical personal computer and monitor contains 6 pounds of lead and various other environmentally hazardous constituents that can be reclaimed and reused. Proper management of these electronics protects the university from future environmental liability, provides resource conservation, and avoids heavy metal contamination of soil, surface waters, and groundwater.

13. Energy – Lighting

Department of Administration (Admin) – The State Architect Office specifies automatic turn-off switches for all overhead lighting in its remodeled offices. The Plant Management Division (PMD) recycles incandescent bulbs to prevent solid waste disposal. PMD coordinates building lighting retrofits with the State Architect Office and Xcel Energy to reduce energy consumption, thereby decreasing pollution levels.

The Materials Management Division procures only reduced or non-mercury fluorescent lamps. Mercury content in fluorescent lamps has been either eliminated or reduced to negligible levels as required by U.S. EPA mandates in the late 1980s and early 1990s and Minn. Stat. § 115A.965, subd. 2.

In conjunction with the Minnesota Pollution Control Agency, the Department of Transportation, and the University of Minnesota, the Materials Management Division has developed a statewide contract to recycle fluorescent lamps and HID (high-intensity discharge) lamps and light ballasts that contain PCBs (polychlorinated biphenyls). The Materials Management Division purchased solar-powered highway warning signs for the Department of Transportation. Signs of this type were subsequently added to a state contract. The Travel Management Division minimizes lighting through the use of energy-efficient lights.

Department of Corrections

MCF- Lino Lakes – Lighting systems use electronic ballasts and are programmed for automatic shut off when not in use.

MCF-Moose Lake/Willow River – Recycled 3,000 bulbs.

Iron Range Resources and Rehabilitation Agency (IRRR) – In 2006, the Eveleth Administration building upgraded their lighting system by installing nine new fluorescent fixtures on T-55 dimmer switches in the Graphic Arts Department. Also, 18 motion sensor light switches were installed. Four new insulated energy-efficient overhead doors were installed at the Eveleth Shop. The fluorescent tubes are collected and recycled at Mercury Waste Solutions in Roseville. The ballasts are shipped to the Clean Shop Program in Duluth. Three fans and five electric space heaters were also removed.

Metropolitan Council Environmental Services (MCES) – Several retrofits to energy-efficient fluorescent lamps or high-intensity vapor lamps have taken place at MCES facilities. However, unlike incandescent lamps, these alternatives are considered a special hazardous waste due to their mercury content. In 2005, 3,715 lamps were recycled through Retrofit Recycling in Little Canada, a reduction of 14 percent over the previous year. Various fluorescent lamp change-out programs have been underway to replace older lamps with the new, thinner varieties (F30T8) that contain less mercury and are even more energy efficient. Some facilities have installed motion sensor switches that turn off room lights if no motion is detected within 15 minutes.

Metropolitan Council Metro Transit – Several retrofits of lighting systems have been accomplished at two of the facilities. Installation of energy-efficient fluorescent lamps and high-intensity vapor lamps has been done. These retrofits also included replacing the lamp ballast with high-efficiency electronic systems. These efficient upgrades have been completed in the south, overhaul base, and Heywood garages; the final two garages will be competed in 2007. Metro Transit is also looking at replacing the HID and high-sodium lamps in the garages with new technology of fluorescent lamps and fixtures.

Minnesota Pollution Control Agency – The Minnesota Pollution Control Agency's central building had four fluorescent lamps removed from each fixture and replaced two into each fixture. The lamps are more energy efficient and contain less mercury. Also, each fixture was converted to using one ballast rather than needing two ballasts. In 2004, all closed offices, restrooms, and conference rooms in the St. Paul building were equipped with motion-detecting light switches.

The MPCA Brainerd Office lease specifies that full-spectrum lighting be installed and maintained. It also calls for the installation of additional exterior windows, including some that can be opened, in order to promote daylighting. The floor plan is specifically designed to allow the maximum amount of light to enter the workspaces. The MPCA installed a revolutionary new daylighting feature, tubular skylights in the Brainerd Office administrative area, to test and measure performance and energy savings. The Brainerd Office also installed motion-detecting light switches in many office areas to help reduce the amount of electricity used. The Duluth Office also installed full spectrum fluorescent bulbs. All the above technologies help minimize the need for additional lighting and its concomitant energy use and air pollution.

MnTAP's energy-efficiency efforts have been effectively integrated with pollution prevention activities in 2006. MnTAP has formed partnerships with various organizations that will help provide resources to offer energy-efficiency assistance. The Minnesota Department of Commerce has supported MnTAP's efforts in Department of Energy Best Practices training courses and the Industries of the Future Program. Partnering and training has helped build MnTAP's expertise in energy-efficiency assistance for site visits and intern projects. Two MnTAP visits resulted in documented energy savings of 1,375,800 kWh, 17,000 therms, and $55,000.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University (BSU) – BSU continued an ongoing program of replacing T-12 fluorescent lights and ballasts and incandescent lights with T-8 high-efficiency lamps and electronic ballasts and compact fluorescent lighting. During FY 2006, the replacements resulted in a net reduction of approximately 32,472 watts of lighting, which will reduce electrical energy consumption by about 142,000 kWh. BSU also received a rebate of $6,500 for the project through Otter Tail Power Company's participation in the Minnesota Conservation Improvement program.

EMISSIONS REDUCTIONS (IN POUNDS)

CO	CO_2	Mercury	NOX	PM10	PM2.5	SO_2	VOC
41.673	261,531.274	0.006	581.424	52.766	40.535	1,050.062	5.405

BSU continued an on-going process of installing motion detectors in campus bathrooms and rooms with intermittent use. The sensors automatically turn on lights when the room is entered and turn them off after a period of inactivity. Sensors will continue to be installed on an ongoing basis as funding and time permits.

It should be noted that total energy use is influenced by a number of variables, such as occupancy loads, temperature, humidity, and hours of operation. Therefore, observed changes in energy consumption cannot be attributed solely to any one activity such as reducing lighting wattage. Normalization for these variables is necessary for accurate analysis of energy use. The values in this report have not been normalized.

Central Lakes College, Brainerd and Staples – The college has an ongoing agreement with the local utilities to curtail usage when required. We are also phasing out T-12 lighting to retrofit to T-8 lighting. Some lighting fixtures have been retrofitted with energy-efficient ballasts and bulbs, resulting in a rebate for the Staples Campus from Todd Wadena Cooperatives. We have an agreement with our local utilities to curtail our electricity and natural gas. We have a propane backup system at Brainerd that we use when asked by the local utilities. Staples Campus has a 1,000-gallon fuel oil reserve. We have finished an energy audit and are currently working with Energy Management Services to re-lamp all our buildings at Central Lakes College.

Minnesota State University, Moorhead (MSUM) – To help better understand ways the university community can save on energy consumption, the campus is currently conducting an energy audit. This audit will examine lighting, heating, and will include a first-ever water usage assessment. Recommendations following the energy audit will most likely include additional lighting sensors in academic and campus residence halls, steam trap reductions in the heating system, reducing water usage in restrooms, and implementing energy-saving procedures for the indoor pool area.

Abiding with Executive Order 05-16, *Providing for energy conservation measures for state-owned buildings*, MSUM implemented operational changes to conserve energy and reduce state energy costs by lowering heating temperatures, raising cooling temperatures, and other measures as defined in the executive order by Governor Pawlenty.

Design and planning of a new Student Wellness Center will center on adopting practices of LEED Certification. LEED (Leadership in Energy and Environmental Design) Green Building Rating System® is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. When purchasing new electronic office equipment and appliances, MSUM continues to purchase Energy Star-rated devices through state contracts or select vendors.

Northwest Technical College, Bemidji – In the past year, Energy Services Group located in Wayzata, entered into a contract with Northwest Technical College and MnSCU to provide a guaranteed energy and cost saving program. They are monitoring usages of all of our recent building, lighting, and HVAC upgrades and can provide detailed cost and usage analysis. We removed old boilers and installed three new high-efficiency boilers (90 percent), and converted from a steam system to hot water. A new computerized, digital, HVAC control system was installed that utilizes multi-point space occupancy, and time-inputted technology control. A complete building lighting upgrade was done with a new digital controlled main power panel, energy-efficient lighting with motion detector controls, new LED exit lighting, vending machine controls, and one high-efficiency rooftop replacement unit that supplies HVAC to the computer labs. A complete new roof replacement project started this summer that will bring the insulation and skin up to the MnSCU roof standards. Also in the roofing project are windbreaks for the front entry and new energy-efficient windows in the entry and atrium area. Duct work was professionally cleaned in the spring of 2006. We purchase our electricity through Ottertail Power Company.

St. Cloud State University (SCSU) – As part of a $3 million energy conservation project with NSP, SCSU has shaved peak demand by about 25 percent. Occupancy sensors, LED exit lights, high-efficiency fluorescent lights, and variable frequency motor drives also reduce consumption and pollution as does the computerized energy management system. More efficient lights are planned for our main athletic facilities. Florescent bulbs were recycled. Trash was burned in Elk River to produce electricity.

St. Cloud Technical College (SCTC) – Our college campus uses clean burning natural gas for heating and #2 fuel oil as a backup fuel only. Our building maintenance supervisor has instituted a regular preventative maintenance program to ensure the boilers are operating at peak efficiency. This ensures the fuel is burned efficiently, releasing less pollutants into the air. Lights are on automatic motion sensors; when not required, the lights turn off to conserve energy.

Department of Revenue (DOR) – We have worked with the Department of Administration to institute a lighting program at our largest facility at 600 North Robert in St Paul. We analyzed the building lighting as it was designed and found that we were over-lighting for the changes in our day-to-day operation, which is more computer intensive. The excess available lighting created issues with glare and complaints about eye-strain. In response, we removed one of the three florescent tubes in most of 3,000 light fixtures throughout the building. Management offices and conference spaces will be done in the near future. To date, only a few fixtures have been returned to the full set of three tubes. Approximately 3,000 lights reduced by one 32-watt tube per fixture equates to 240,000 kW per year of electricity.

Lighting in the building was designed with occupancy monitoring. When an office has been vacated for several minutes the lights go off.

Department of Transportation (Mn/DOT) – Mn/DOT has replaced old PCB ballasts and lights with non-PCB ballasts and energy-efficient lighting in all of its buildings. Mn/DOT also has motion detectors throughout many of its facilities to turn off lights when rooms are not in use. Most Mn/DOT computers have a sleep mode, which turns off the screen when not in use.

University of Minnesota – The university has updated its Standards and Procedures for Construction to address energy conservation (www.cppm.umn.edu/standards.html) in lighting systems:

- Select and design lighting systems and controls to ensure minimum consumption of energy while providing quality illumination for the visual tasks in each room or space.
- Avoid general high levels of illumination except in the most critical applications.
- Provide specialized supplementary lighting sources at the task area in lieu of uniform high level illumination throughout.
- Switching or other lighting control devices shall provide for flexible levels of lighting.
- Minimize decorative lighting.
- Consider the principles of daylighting for new buildings.

The university has an ongoing green lights program to change out older, less efficient lighting as remodeling of buildings is undertaken at all campuses and facilities. Switching from 40-watt lamps to 32-watt lamps coupled with more efficient electronic ballasts saves energy. Other energy-saving lighting strategies are evaluated for use on a site-by-site basis.

14. Energy – Production

Department of Administration –The State Architect Office specifies and incorporates, where possible, the use of energy-efficient triple-glazed windows to save on energy loss and heat gain in facilities.

The Materials Management Division created a contract for window-mounted self-contained room air conditioners to emphasize performance, rather than design, establishing a minimum energy-efficiency rating requirement for each size unit.

Department of Corrections

MCF- Lino Lakes is under contract with Xcel Energy (Tier 1) to provide peak shaving on an on-call basis, using the facility diesel generator to pick up the entire electrical load during utility curtailment. The facility uses alternative fuel for heating as we switch to fuel oil during times of natural gas shortage.

MCF- Moose Lake/Willow River installed Energy Star clothes washers at CIP in Willow River.

MCF- St. Cloud installed new windows in the segregation "D" living units, resulting in more energy efficiency. In addition, central air was installed in living unit R-annex to eliminate the need for individual wall units.

MCF-Shakopee implemented a cold-water washing program for offender laundry, and a centralized laundry program, shipping bed linens and other repetitive laundry to Faribault. The facility changed out 60 shower heads; reducing flow from 3 to 2.5 gallons per minute to 1.5 gallons per minute.

MCF-Stillwater is in the process of converting its primary energy source from high-pressure steam to low-pressure steam. When this is complete, the facility will be producing its own steam, rather than purchasing this resource.

Department of Employee Relation (DOER) –DOER will continue to expand its computer monitor power management policy with a target of at least 75 percent of its monitors included by the end of FY 2007.

Metropolitan Council Environmental Services (MCES) – The largest treatment plant consumed the following energy:

	Electricity (kWh)	Natural gas (therms)	Fuel oil (gallons)
Metro WWTP	156,000,000	800,000	20,000

There was a 9 percent reduction in electricity use in 2005 which was the result of 8,000,000 kWh offset by the operation of a new turbine started up in March 2005. The use of natural gas was 80 percent less than the previous year and fuel oil consumption decreased by 93 percent. Xcel Energy worked with the staff in determining energy savings from the operation of the fluidized bed reactors in the new solids management building. As a result of energy-efficiency improvements, MCES received a total of $958,000 in rebates ($366,000 for electricity and $592,000 for fuel).

For the Seneca WWTP, dramatic changes occurred in the operation of the incinerators. Smaller afterburners allow the adjustment of airflow to where these pollution control units can be operated in an idle "pilot" mode and still allow permit operating conditions to be met. The natural gas use of 18,836,612 cubic feet represents a reduction in fuel use of 53.4 percent in 2004. The same efficient operation continued in 2005.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University (BSU) – In February 2005, the Bemidji State University Student Senate passed a resolution supporting the purchase of wind-generated electricity through participation in Otter Tail Power Company's TailWinds, wind energy program. In September 2005, the university began purchasing 61,600 kWh per month of wind-generated electricity for $2.60 per 100 kWh block above the regular cost,. In May 2006, the rate was reduced to $1.60, retroactive to September 2005. The university is considering using the savings to purchase additional wind energy blocks. The wind-generated electricity reduces annual emissions by the following amounts:

ESTIMATED EMISSION REDUCTIONS (IN POUNDS)

CO	CO_2	Hg	NOx	PM10	PM2.5	SO_2	VOC
216.586	1,359,263.136	0.032	3,021.850	274.243	210.672	5,457.514	28.090

Minnesota State University, Moorhead (MSUM) – As a charter member of the Capture the Wind program, MSUM has been purchasing renewable wind energy since 1999 and currently has a 10-year agreement with Moorhead Public Service to purchase a block of 333,332 kWh per year of wind-generated electricity—this represents 2 percent of the campus's power needs.

ESTIMATED EMISSION REDUCTIONS (IN POUNDS)

CO	CO_2	Hg	NOx	PM10	PM2.5	SO_2	VOC
97.666	612,940.882	0.014	1,362.6661	123.666	95	2460.990	12.667

This commitment has a substantial impact on the environment, reducing the amount of greenhouse gases emitted into the air by an estimated 723,000 pounds each year. That is equivalent to planting 99 acres of trees each year or taking 72 cars off the road each year by reducing pollution. At the end of 10 years, MSUM will have prevented an estimated 7.3 million pounds of greenhouse gases from being emitted into the air, which is equivalent to planting 986 acres of trees or removing 723 cars from the road over that 10-year period. Following the implementation of a Student Green Fee during 2004, the Sustainable Campus Committee continues to strongly pursuing the construction of a $1.5 million wind turbine. It is proposed that electricity produced will be equal to the amount needed to operate the Student Union, Student Healthcare Center, and proposed Student Wellness Center complex.

St. Cloud State University (SCSU) – As with the SCSU lighting improvements identified above in section 13, NSP also conducted an audit into all other phases of energy savings. These recommended improvements have been made as well. For instance, a new boiler was installed and is now frequently operated. This boiler operates on #2 oil, and MPCA-required air pollution testing has shown minimal (far below any action level) pollution particles being emitted from the stacks when this boiler is being operated.

Department of Transportation (Mn/DOT) – Mn/DOT has 55 waste oil burners in its maintenance shops. The waste oil burners allow Mn/DOT to burn waste oil as a supplemental heat, resulting in lower utility bills. Some used oil sorbents are being burned to generate steam and electricity.

University of Minnesota – The University of Minnesota Initiative for Renewable Energy and the Environment (IREE) will provide the foundation for the effective use of renewable resources in Minnesota and around the globe. The initiative will draw scientists from across the university to work collaboratively on high-impact, problem-solving deep science in critical issue areas. The College of Biological Sciences, the Institute of Technology, and the College of Agricultural, Food, and Environmental Sciences are leading this effort. The initiative will also bring together university expertise with experts from the private, public, and nonprofit sectors to foster research, discovery, technology transfer, and market development of new energy sources and products from renewable resources. The initiative will serve as a point of synergy for funding, collaboration, and communications on energy-related topics. The IREE mission is to promote statewide economic development; sustainable, healthy, and diverse ecosystems; and national energy security through development of bio-based and other renewable resources and processes.

One of the innovative projects sponsored by IREE involves fuel cell generation of hydrogen from ethanol. The University of Minnesota's discovery appears to position corn-based ethanol as an appealing alternative. Lanny Schmidt, professor of chemical engineering, headed the project along with assistants Gregg Deluga and James Salge. The team's prototype reactor was able to produce hydrogen from ethanol after two simple adjustments to a process already used to get hydrogen from methane, natural gas, and gasoline. The first step was to use an automotive fuel injector to vaporize an ethanol-water mix. The second required altering the composition of the reactor's ceramic catalyst material, a combination of the elements rhodium and cerium, for the vaporized ethanol to pass through and be converted. Schmidt says other researchers had tried similar methods but gave up because fires often developed in the reactor. Schmidt's team adjusted the process enough to avoid the fire problem.

Why turn ethanol into hydrogen rather than burn it? The answer is efficiency, Schmidt says. "Ethanol in car engines is burned at 20 percent efficiency because you have to remove the water first. But if you use ethanol to produce hydrogen, the efficiency is 50 to 60 percent because you don't need to remove the water. Hydrogen comes from the ethanol and the water." Throw wind power into the mix, and ethanol-based hydrogen becomes an even more practical energy source.

The University Outreach Center in Morris is looking at ways of using wind-generated power in conjunction with fuel cells. Facility director, Greg Cuomo, explains that using wind power to collect hydrogen is one way to store the energy of the wind. Wind power is a key part of hydrogen economy research in Europe. In many rural Minnesota and other Corn Belt communities, using wind and corn, two abundant and renewable resources, could create revitalized local economies. A rural-based hydrogen energy economy would create new jobs and income for local residents. At some point, each community or business might have its own fuel cell power plant, creating a distributed power network to make communities more energy independent.

The University of Minnesota Renewable Energy Research and Demonstration Center at Morris is a collaborative project between the West Central Research and Outreach Center (WCROC), the University of Minnesota-Morris (UMM), and the University of Minnesota Initiative for Renewable Energy and the Environment (IREE) with two primary objectives: provide a model for rural communities and agricultural producers to integrate renewable energy systems into their economies, and establish systems research that provides information to stimulate the renewable energy industry. The project currently focuses on four community scale renewable energy research and demonstration systems.

- **A hybrid wind energy system located at the WCROC**. A 1.65 MW wind turbine was completed March 2005. The turbine generates more than enough electricity for the entire UMM campus. This system has opened the possibility of developing a globally unique and important wind-to-hydrogen demonstration and research platform with leveraged funds from the Legislative Commission on Minnesota Resources. This is phase one of a three-phase plan to demonstrate and conduct vital research in the areas of stored wind energy with hydrogen, fuel mixing, and value-added products such as producing fertilizer from wind energy. Partners in this project include the Legislative Commission on Minnesota Resources, the Upper Midwest Hydrogen Initiative and member companies, Windustry, and the National Renewable Energy Lab.
- **A biomass district heating and cooling system at the UMM**. The Morris campus 2004 bonding bill has received funding to construct a $6 million biomass gasification demonstration/research system. The plant scale project will provide up to 80 percent of the campus heating and cooling needs. In additional to being a model for commercial application of biomass in heating and cooling systems, this facility would also enable University of Minnesota research to address important collection, processing, and storage issues, enable improved permitting, establish Best Management Practices to insure environmental sustainability of biomass systems, enable further development of the synthesis gas stream, and provide valuable information on the economic impact of using biofuels on rural economies. The Agricultural Utilization and Research Institute (AURI) and Minnesota Corn Growers are partners in this project.
- **The development of a Community Anaerobic Digester System** in the Morris area. This unique system proposes to produce methane at nearby livestock farms and either pipe or truck the methane into Morris for use at the local ethanol plant and/or the industrial park. This system is currently undergoing a feasibility study in partnership with the Minnesota Soybean Research and Promotion Council, the Minnesota Corn Research and Promotion Council, AURI, and the Center for Producer-Owned Energy, the City of Morris, Riverview and West River Dairy, and the University of Minnesota IREE.
- **A Renewable Energy Research and Education Wing** to the WCROC Office Building. This addition will feature sustainable building design, renewable energy building technologies, and will also serve as a research and demonstration platform. The expansion is listed in the University of Minnesota's 2006 Capital Request to the Minnesota Legislature.

The systems in development at the University of Minnesota Renewable Energy Research and Demonstration Center exemplify the application of research-based knowledge utilizing local and state resources and innovative partnerships to solve real-life issues in energy, the environment, and rural development.

The University of Minnesota, Morris (UMM) was one of the first institutions in western Minnesota to purchase wind-generated electricity through Otter Tail Power Company's TailWinds program, which allows customers to choose wind power to supply at least a portion of their electricity. UMM purchased 614 blocks of wind power each month to fully cover the electric needs of the student center. According to the American Wind Energy Association, using this amount of wind energy reduces carbon dioxide emissions equivalent to planting 200 acres of trees. The project began when Otter Tail Power promoted wind power at a table in the student center and hundreds of students signed a petition to bring wind-generated electricity to the Morris campus. "Students have been very consistent in helping make environmentally responsible purchasing decisions for the campus, so we are excited to be able to power our Student Center with renewable wind energy," says Anne Olson, a junior from Falcon Heights serving on the UMM energy task force. UMM is no stranger to innovative conservation efforts. Prior to taking part in the TailWinds program, the campus implemented energy-efficient lighting and variable-speed drives on electric motors. "Because we're a large consumer of electricity, our decision to use wind power is important to advancing renewable energy resources," says UMM Associate Vice Chancellor, Lowell Rasmussen. "And the University of Minnesota, Morris, always has been on the cutting edge when it comes to pursuing conservation efforts." Despite the fact that wind energy costs an additional $1,600 a month, Rasmussen says the university will not increase its spending on electricity. Instead, conservation efforts to reduce electricity usage across campus will begin, and students will be asked to come up with ways of cutting back on electricity across the campus.

A 15 MW co-generation steam turbine has been installed at the university's S.E. Steam Plant. The steam production is gas fired at least 70 percent of the time. This environmentally friendly electricity will displace the need for 15 MW otherwise generated by more environmentally problematic coal and nuclear plants. A

2003 marketing agreement with Xcel Energy will allow the co-generated electricity to be sold to the grid, saving the university tens of thousands dollars per month on utility costs.

The university has installed a 15 kW photovoltaic system on the roof of the Architecture Building. The unit will provide electricity to the building and be a training resource for future architects and engineers. A coordinate project is underway in which the energy from the photovoltaic collectors will be used to power an electrolyzer that separates water into hydrogen and oxygen. The hydrogen is used to power a fuel cell that generates electricity. One advantage of such a system is that by converting solar energy to hydrogen, it can be stored and used when needed. The generation of electricity in this manner produces no carbon emissions or air pollutants. Xcel Energy and the MPCA jointly sponsor this project.

The university, through the Department of Biosystems and Agricultural Engineering, provides research, education, and guidance in the area of anaerobic digestion of organic waste to produce methane as a fuel for energy generation (http://manure.coafes.umn.edu/research/treatment.html).

15. Groundwater Wells

Department of Corrections (DOC) – *MCF-Red Wing* – The facility has two deep well pumps for domestic water supply. The Wellhead Protection Rule governs the facility.

Minnesota State Colleges and Universities (MnSCU)

Central Lakes College, Brainerd and Staples – We use our own well to supply water to irrigate the grounds at the Staples Campus.

Minnesota State University, Moorhead (MSUM) – MSUM currently obtains water from only one well site. This well is located at the Buffalo River Science Center and provides water to that facility only. The well at the Science Center is an 83-foot well that utilizes groundwater from the Buffalo aquifer. This well is regularly monitored by the Minnesota Department of Health. The main campus of MSUM is supplied by Moorhead Public Service. They obtain 85 percent of their water supply from the Red River, and only 15 percent from seven groundwater wells.

St. Cloud State University (SCSU) – SCSU has a small number of groundwater monitoring wells used for research purposes. This last year, one was repaired after being struck by an unknown automobile. Earth Science (Bret Allie) was very involved in the process.

St. Cloud Technical College (SCTC) – The wells on SCTC campus are used for lawn irrigation.

16. Heavy Metals

Department of Administration (Admin) – All Materials Management Division bid documents now require vendors to indicate whether their products contain mercury. This information will allow us to work with customer agencies and ascertain whether future specifications should require mercury-free products or award preferences based on mercury content. Any mercury content can then be shown on the contract release document, allowing the buyer to choose the most environmentally friendly product. In many cases, the solicitation specifications do not allow vendors to bid a product that contains mercury. MMD continues to work to reduce mercury from contracted medical products.

Department of Corrections (DOC) – Multiple facilities have properly disposed of mercury and lead over the past year.

MCF-Moose Lake/Willow River eliminated more than 99 percent of all radiographic lead.

Metropolitan Council Environmental Services (MCES) – The MCES IWPP section is responsible for administering the pretreatment program for over 800 permitted industrial users of the region-wide collection and treatment system. Substantial reduction has occurred in heavy metals released to the system due to enforcement and technical assistance efforts.

Environmental benefits of heavy metals load reduction include compliance with effluent limits, compliance with receiving water quality standards, improved biosolids quality, reduced air emissions from biosolids incineration, and compliance with biosolids land application metals criteria. Economic benefits include reduced use of treatment chemicals and reduced disposal costs for biosolids that can be beneficially reused.

METALS LOADING TO METRO WWTP FROM INDUSTRIAL USERS

Metal	1980 (pounds)	2005 (pounds)	Reduction (pounds)	Reduction)
Cadmium	4,585	111	4,474	97.7%
Chromium	64,755	4,159	60,596	91.0%
Copper	66,714	4,931	61,783	91.7%
Lead	10,600	850	9,750	89.7%
Nickel	43,128	3,213	39,915	93.0%
Zinc	90,931	7,952	82,979	90.3%
Total	**280,713**	**21,216**	**259,497**	**92.4%**

Despite reductions of mercury discharged to the collection and treatment system since 1980, mercury is still of concern. In January 2003, the Metropolitan Council and the MDA established a jointly managed Voluntary Dental Clinic Amalgam Recovery Program. The goal of the program is to have all 760 dental clinics in the MCES service area install separators to remove amalgam from clinic wastewater prior to discharge to the sewer system. As of mid-June 2006, 98 percent of the dental clinics have made a commitment to do so, and 84 percent have installed a separator. The MDA is also promoting this program statewide with a similar success rate.

Department of Military Affairs – The Camp Ripley Combined Support and Maintenance Shop (CSMS) de-paint facility will be converted to an aqueous paint strip system. This will eliminate the need for the current sandblast system, and will tremendously reduce the shop's largest waste stream.

Minnesota Pollution Control Agency – In fiscal year 2006, the MPCA Prevention and Assistance Division staff continued work on several mercury pollution prevention and management initiatives begun in earlier years.

- **The Mercury-Free Zone program**, which educates students and school personnel about mercury, and removes and replaces mercury products in schools, continues. In fiscal year 2006, 46 schools pledged to be mercury-free and staff removed 183 pounds of mercury from the schools in that time period. The program does a free exchange of lab, fever and max/min thermometers, blood pressure units, sling psychrometers and barometers that contain mercury. All of these things have been found, but mostly lab thermometers, which MPCA staff exchange one-for-one. The lab thermometers given to schools contain isoamyl benzoate and the exchange barometers are digital or the mercury-free Eco Celli barometer. Exchange fever thermometers are digital fever thermometers and fever thermometers containing gallium. Our blood pressure units are mercury-free aneroid units, and MPCA staff give schools, on average, about 100 to 300 dollars worth of free equipment, if they recycle their elemental mercury and mercury-containing items.
- Prevention and Assistance Division staff continued to work with the Product Stewardship Institute, other states, and thermostat manufacturers **to improve collection for end-of-life mercury thermostats and promote non-mercury alternatives**. Minnesota and several other states participated in a pilot project for

mercury thermostat collection at household hazardous waste (HHW) facilities, to evaluate the feasibility of collecting thermostats at HHW facilities nationwide.

- Through the Environmental Council of the States, MPCA and several other states developed technical and outreach materials for a series of 50-state conference calls on automotive mercury switch recovery programs. In January 2006, U.S. EPA convened a second round of negotiations on a voluntary national vehicle mercury switch recovery program, and MPCA staff participated in the negotiations as one of three representatives of the 50 states. A national agreement was successfully negotiated and signed in August 2006, **establishing a national program for recovery of vehicle mercury switches.**
- In October 2005, MPCA joined the Interstate Mercury Reduction and Education Clearinghouse, a national organization of states **working together on mercury use reduction and phaseouts**.
- **Lead sinkers.** The Prevention and Assistance Division again sponsored a Let's Get the Lead Out! booth at the March 2006 Northwest Sportshow. The booth is part of a larger educational campaign to encourage anglers and outdoor enthusiasts to switch to non-lead environmentally friendly fishing tackle. The Prevention and Assistance Division maintains a page on its website at www.moea.state.mn.us/sinkers providing information on available non-lead alternatives, scientific research and reports, and useful links to other organizations involved with this issue. Another component of this initiative was to continue our strong interagency working relationship with DNR on this issue.

  In addition during the summer of 2006, MPCA partnered with retailers, conservation, and outdoors groups to offer lead tackle exchanges across the state. Over 30 lead tackle exchange events were held from June through August in 2006. Anglers were able to bring lead sinkers and jigs to an event to trade for nonlead ones. Thousands of anglers came to the events and almost 1,000 pounds of lead tackle were collected.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) – Within the photo development areas on campus, silver continues to be reclaimed. Also, all mercury-bearing thermometers have been replaced by nontoxic alternatives.

Northwest Technical College, Bemidji – The Dental Program recycles their heavy metals.

St. Cloud State University (SCSU) – Campus-wide, efforts are underway at SCSU to minimize mercury use and mercury thermometers. Waste photographic paper and chemicals are processed off-site to render them nonhazardous and recover silver. Conversion to a bulk storage and transfer process for spent photo-fixer has cut costs. Several conventional darkrooms across campus, including ones in Environmental and Technological Studies, have been removed. (They were replaced with electronic imaging systems.) Only KVAC Art (Ted Sherarts) now has an active teaching darkroom.

Also, about 20 pounds of video and audio film have been recycled through Generic Media of Minneapolis thanks to MnTAP's source materials exchange listings. Minor amounts of gold, silver, copper, and palladium were recovered from our electronic recycling program. Containers of heavy metal compounds were removed from SCSU using the University of Minnesota's Chemical Safety Day Program.

St. Cloud Technical College (SCTC) – During the past year, the individuals working at the SCTC campus made a commitment to remove as much mercury metal from the classrooms and labs as possible. As a result almost all classroom equipment is now mercury free. As thermostats, gauges etc, need replacing, we are replacing them with non-mercury-containing parts.

Department of Transportation (Mn/DOT)

– Mn/DOT developed a manual (see section 33, *Technical Support)* for removal of lead paint and is researching ways to recycle lead-contaminated waste generated through various removal technologies. Mn/DOT has changed from paints and inks containing heavy metals to lead-free products. See also section 24, *Paints, Coatings, Stripping*.

University of Minnesota

– Proactive programs of minimizing mercury and other heavy metals on campus and capturing heavy-metal-containing waste at its source should result in a reduced potential for mercury and other heavy metal discharge to the environment.

DEHS started its second mercury thermometer exchange in 2006 in an effort to remove most of the mercury thermometers from the university's labs. The Chemistry Department has pledged to exchange out 2,300 mercury thermometers in calendar year 2007.

The University of Minnesota is cooperating with MCES in a pilot study to reduce mercury in dental clinic wastewater. The Boynton Health Center Dental Clinic has installed a micro-screen system in its chair-side wastewater system to capture fine particles of mercury amalgam filling material before they enter the sanitary sewer. University Facilities Management has installed a cloth filter system at the outflow of the dental school clinic's (350 chairs) central chair-side wastewater collection tank to capture fine particles of mercury amalgam filling material before they enter the sanitary sewer.

The university's updated steam plant can burn a fuel mix which is 70 percent or more natural gas rather than the traditional mostly coal fuel mix. The displacement of coal, the major source of atmospheric mercury, as the primary fuel can eliminate several pounds of mercury from the steam plant's annual air emissions. Facilities Management's continued effort to reduce steam and electricity use at the university also reduces the amount of mercury released at the coal-burning steam and power plants.

The University Purchasing Department has a contract with a distributor that will provide low-mercury fluorescent lamps as the default choice for most lighting applications to university customers. This will cut down on the amount of mercury on campus. The university collects spent fluorescent lamps from all of its campuses and has them recycled for mercury recovery. Some 95,000 fluorescent lamps (eight pounds of mercury) are recycled annually. The university offers fluorescent lamp recycling service to educational institutions throughout the state via its Chemical Safety Day Program (www.dehs.umn.edu/csdp). The Chemical Safety Day Program, which has operated since 1981, provides chemical waste management services to Minnesota schools.

17. HVAC, Indoor Air Quality

Department of Administration (Admin) – The State Architect Office specifies and administers proper flame spread materials for interior finishes to reduce or eliminate the spread of fire and toxic fumes. The State Architect Office also specifies indoor air quality standards of the Minnesota State Mechanical Code in state-owned facilities and additional requirements in their design guidelines.

The Building Codes and Standards Division continues to administer and enforce indoor air quality standards of the Minnesota State Mechanical Code in:

- state-owned facilities
- public schools
- hospitals
- nursing homes
- supervised living facilities
- correctional facilities
- prefabricated construction

The Building Codes and Standards Division enforces flame-spread-rating for materials on interior finishes. PMD recovers and recycles all refrigerants. TMD collects all automotive refrigerants and recycles them on-site.

Department of Corrections – Facility HVAC equipment is maintained on a regular schedule to help ensure efficient operation.

MCF-Lino Lakes – A new front end for the building automation control system was installed, and night and weekend set backs have been installed wherever possible. CO_2 monitoring has been installed into the new programming units so that fresh air is supplied as needed by the HVAC system. In addition, a heat recovery ventilation unit is use in the new 416 bed housing unit.

Metropolitan Airports Commission (MAC) – MAC has consistently developed and remodeled facilities using energy-saving strategies. Recent boiler upgrades have resulted in efficiency increases of 20 percent. New chillers consume 33 percent less energy. Other energy-saving activities include strategic seasonal temperature adjustments and reuse of steam for preheating boilers and powering water pumps. Additionally, MAC participates in a gas curtailment program that reduces consumption of natural gas during periods of peak demand by using jet fuel to power boilers. Lack of specific data prevents quantifying the reduction of VOC, NOx, and PM emissions resulting from increasing the efficiency of HVAC equipment.

Metropolitan Council Metro Transit – Metro Transit has worked in this area since 1991 when it conducted its first study of the air handling systems at the Ruter Garage. That study focused on the new standards required by the MPCA and when changes would have to be made to meet those standards. Based on that study, a complete new system was installed in 1995 to allow the garage to operate within the required standards.

In the design of the newest garage in St. Paul, Metro Transit used the latest technology in controlling the air quality in the facility by installing NOX and CO sensors throughout the building to insure proper air quality. In 2004, Metro Transit upgraded the steam heating coils at the south and Heywood garages and improve the controls for these systems. This will increase the efficiency of the main air-handling units in these buildings and help reduce the energy used to heat the buildings. The boilers in two of the garages have be upgraded with higher efficiency burners to help reduce gas and oil usage.

Metropolitan Mosquito Control District (MMCD) – To reduce energy usage in district facilities and to meet the requirements of Executive Order 05-16, MMCD raised thermostat settings to 76° F in all district-owned facilities during the summer cooling season.

Department of Military Affairs – The JFMN (Army) has performed several asbestos, mold, and lead remediation projects at facilities around the state. In all cases, the purpose of the remediation was to improve the overall air quality in these facilities.

Minnesota Pollution Control Agency – The MPCA St. Paul office selected as low VOC carpet adhesive as possible during a recarpeting of the second floor. During this process building maintenance crews ran the 24-hour air exchange equipment to reduce VOCs that may have been emitted as a result of the carpet installation and use of adhesives. A pilot project is underway to use low-toxicity and low-VOC cleaners in the St. Paul office. See section 20 *Procurement* for more information.

The MPCA Brainerd Office lease requires the use of American Society of Heating, Refrigerating and Air-Conditioning Engineers approved minimums for fresh air intake, filter efficiency, and filter replacement to be incorporated into the heating, ventilating, and air conditioning system. Other requirements are specified to ensure that the building maintains good indoor air quality and operates efficiently, thus producing fewer emissions from any coal-fired power plants that serve it.

Minnesota State Colleges and Universities (MnSCU)

Central Lakes College, Brainerd and Staples – We contracted with Energy Savings Groups to purchase new boilers and controls at the Brainerd Campus to reduce and save energy. We have also upgraded our system at the Staples Campus.

Minnesota State University, Moorhead (MSUM) – The Department of Environmental Health and Safety, in collaboration with the Physical Plant, reviews any carpeting plans prior to installation, insuring low-VOC adhesives are used and the carpet meets the Carpet and Rug Institute's indoor air quality emission guidelines. The Department of Environmental Health and Safety also oversees the Indoor Air Sensitivity Program that involves the monitoring of adhesives, paints, cleaning products, etc. that may contain VOCs when used in campus buildings.

Northwest Technical College, Bemidji – Energy Star-rated office equipment and replacement/repair for HVAC equipment is being done.

St. Cloud State University (SCSU) – SCSU is using a carbon dioxide chart recorder to assist in ventilation troubleshooting. Custodial staff, HVAC staff, HR personnel, and DOER Industrial Hygienists have become much more involved in complaint and mold response. Many special forms are being used to procure and track occupant data. MacNeil Environmental Inc. (MEI) has performed six air sampling surveys expanding to seven buildings. The painting department not only uses water-based paints and varnishes but is also upgrading ventilation controls to improve indoor air quality. A paint spray booth was added to Performing Arts Scene Shop. Strict carpet emission controls are used extensively to limit volatile organic compounds (VOCs). Chemistry stockroom chemical storage shelves were replaced with ventilated units. Art ceramic wet wiping/HEPA vacuum controls were improved.

Minnesota Department of Administration, Facilities Management Bureau *Building Air Quality 5/95* guidelines for building owners and facility managers have been extensively studied and implemented. High-efficiency vacuum cleaners, special bags, and HVAC filters help. SCSU Health Services, Maintenance, Public Safety, and Lindgren Child Care Center heads are taking the lead on disaster planning and participated on campus in a large-scale simulated mustard gas release as part of a community drill. Over 100 campus volunteers also participated in the toxic gas release mock disaster simulation.

St. Cloud Technical College (SCTC) – Indoor air quality at St. Cloud Technical College is a high priority. A regular preventative maintenance program is in place to ensure the HVAC system is clean, filters are changed periodically, and the system is operating at peak efficiency. This ensures good indoor air quality for the employees and students.

Department of Transportation (Mn/DOT) – Mn/DOT buildings use air-to-air heat exchangers in the laboratory and rest stop areas. This is done to save energy and condition the building environment. Building automation systems maximize energy savings and comfort.

University of Minnesota – The university hosts an indoor air quality web page (www.dehs.umn.edu/iaq) and web links (www.dehs.umn.edu/outsidelinks) to disseminate information about various aspects of indoor air quality (design, health effects, contaminants, etc.). The information includes both chemical and microbiological agents and covers home, school, and business situations. Check these sites for terrific fungal pictures and information.

The university has started a project to replace aging building chiller units on the St. Paul campus with an energy-efficient centralized chiller plant. If a plant is not built, most of the chillers on campus would have to be replaced and that would be much more costly. Buildings on the St. Paul campus have their own chillers, but many of them are nearing or beyond their functional lifespan. Of 38 chillers used on the St. Paul campus, 32 are in dire need of replacement in the next six years. The plans call for a plant to house five large chillers that would be linked to campus buildings. Because of energy codes and the space existing chillers occupy, new chillers would have to be electrically powered. This is expensive and would mean those buildings would have little power for other needs. There are efficiencies to be gained by centralizing all that cooling. Much of the efficiency would come in maintenance and operation cost savings. Without accounting for inflation, a central plant, rather than replacing the chillers, would save the university $9 million over the next 25 years. Furthermore, the new buildings on campus have stand-alone systems but were built so they could eventually be connected to a central plant. Over the next eight years in three more phases and funding requests, three more chillers would be installed and more buildings would be connected under the plan.

The HVAC system at the IWMF hazardous waste facility was tested and modified to properly balance the air flow to design specifications and to reduce or remove air flow where appropriate to make the building more energy efficient. The project was able to reduce annual energy costs/use by 15 percent with a project payback of approximately three years.

18. Ice Control, Sanding

Department of Administration (Admin) – The Materials Management Division and the Department of Transportation have developed a contract for alternative blend deicer used in a mixture with alternative deicer, regular salt, and sand. This blend reduces salt use and can be used successfully at lower temperatures. The contract will be expanded to include more plant-based alternative products. The Department of Transportation is continually reviewing new products and as approved, MMD adds them to the state contract. Some of these alternative deicers are corn-based.

MMD in conjunction with Mn/DOT has added treated road salt to the state salt contracts. The salt is pretreated to prevent corrosion to the roadways, bridges, cars, and trucks, therefore reducing the aging of vehicles and increasing the time before they appear in junkyards, and the time needed before replacement. This contract is also available to city and local governments.

The Plant Management Division is currently testing various programs to reduce chemical usage during the winter season. MMD is continuing to work with the Department of Transportation to develop an approved products list for alternative chemical deicers. Alternatives are sought that will reduce groundwater contamination and be less harmful to plants, shrubs, and trees, thereby reducing the amount of plant debris sent to landfills, etc.

Department of Corrections (DOC)

MCF – Lino Lakes – The facility uses magnesium chloride for ice control as needed. Sand is the principal product used during snow and ice conditions. Lots and streets are swept each spring.

MCF- St. Cloud – We use no salt-based products on sidewalks into the facility.

Metropolitan Airports Commission (MAC) – The MAC's Field Maintenance personnel continually evaluate ice control methods for runways, taxiways, and roads. A number of products are approved for use by the Federal Aviation Administration on airport runways and taxiways. The MAC has chosen two products that are as environmentally friendly as possible while also performing to exacting standards. Solid sodium acetate and liquid potassium acetate are applied depending on specific conditions, including the type and amount of precipitation, as well as the temperature.

Since mechanically removing ice and compacted snow can be more effective in some cases than the use of chemicals, MAC has added runway brooms to its fleet of snow removal equipment. In a single pass, an 18-foot-wide rotating broom essentially strips the pavement bare of any ice or snow. The use of these brooms greatly reduces the need for chemical deicing, and in many cases eliminates it entirely. It is estimated that using runway brooms has halved MAC's use of chemicals for pavement deicing. Evaluation of new snow removal equipment and methods is ongoing.

Another form of ice control is aircraft deicing, using glycol-based deicing fluid. A glycol containment system at MSP has been designed to significantly reduce the amount of glycol-impacted stormwater finding its way to the Minnesota River. Most aircraft deicing takes place on concrete deice pads located near the runway ends. Runoff from the pads is collected and contained on site until it can be recycled or discharged to the sanitary sewer for treatment under an Industrial Discharge Permit with Metropolitan Council Environmental Services. The airline tenants also use glycol recovery vehicles to vacuum-sweep deicing area surfaces that are outside the deice pads or the designated "plug and pump" containment area.

Minnesota Pollution Control Agency – In May 2003, the agency renegotiated its lease on its St. Paul office building. As part of that lease, the MPCA required the use of deicing products that do not contain high levels of chlorides or urea. This does not affect criteria air pollutants, but does contribute to less toxic runoff for water quality.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) – The university's Physical Plant aggressively removes ice and snow and uses sand-only methods of ice control on campus sidewalks, parking lots, and other susceptible areas. Each spring, the remaining residue is swept up and recycled at the city compost site.

Northwest Technical College, Bemidji – We use a brush-mounted sweeper in the winter to minimize the amount of sidewalk deicers.

St. Cloud State University (SCSU) – Masonry sand works well by not being too abrasive on our SCSU equipment. Salt use in sanding mix was minimized by controlling salt content based on outside temperature. An additional sanding unit allowed improved sidewalk sanding response. Very little mix was stockpiled indoors in a garage bay.

St. Cloud Technical College (SCTC) – The Building Maintenance employees use environmentally friendly ice melt on our sidewalks. This cuts down on the use of straight salt.

Department of Transportation (Mn/DOT) – Mn/DOT conducts extensive research annually on ice control equipment, materials, and methods. This research has shown some dramatic results.

- The largest success to date comes from the research into anti-icing and pre-wetting of salt or salt/sand mixes for snow and ice control. Pre-wetting methods have shown a 20 percent or more reduction in salt/sand usage. Pre-wetting has been implemented statewide to various degrees and is still expanding. Anti-icing was initiated in 2002 to 2003. The procedure has the potential to reduce overall snow and ice expenditure by reducing material equipment and labor.
- In the past few years, new alternative deicers have entered the marketplace. Mn/DOT actively evaluates these alternatives to determine what products present the least harm to the environmental while maintaining or increasing roadway safety.
- Mn/DOT Maintenance has developed a Snow Plow Operator Training Program. The program provides consistent, statewide training for operators with established standards for performance. Trainees spent 10 days participating in classroom and field training exercises.
- The Circuit Training and Assistance Program provides training in the latest transportation-related technologies to personnel from townships, cities, counties, and the state. The Snow and Ice course will utilize the new *Snow and Ice Field Guide.* This guide will help promote the understanding of the tools, best practices, and limitations for snow and ice control. In addition, it encourages progressive changes in snow and ice control practices that will help reduce salt and sand use and reduce environmental impacts.

Mn/DOT anticipates that with equipment innovations such as zero velocity spreader, greater use of road weather information, anti-icing and pre-wetting, as well as operator training, deicing chemical and sand usage can be reduced even further.

University of Minnesota – The university's Facilities Management Grounds service group closes off unnecessary walkways and stairs in the winter months to reduce the snow removal and ice control efforts at the university. Less salt is used and therefore less salty runoff is generated. Less snow removal means fuel savings from snow removal machinery. Less labor, less sand, and less fuel burned are balanced against very little loss in utility or safety.

19. Laboratory

Department of Administration (Admin) – The Materials Management Division's hospital and medical supplies contract is consistently updated to introduce environmentally appropriate products. Recent additions include non-latex alternatives, such as gloves, syringes, bandages, and blood pressure cuffs. Sharps containers made from recycled plastic, and non-PVC-produced tubing and intravenous bags are now also available.

The Materials Management Division's laboratory supplies contract provides alternatives to laboratory media containing formaldehyde and heavy metals where scientifically possible. MMD, in conjunction with the Minnesota Pollution Control Agency, has four full-service state contracts and will have four regional limited-service contracts for environmental sampling and analysis. These contracts are available to all state agencies.

The Materials Management Division, in conjunction with the Department of Transportation, has developed a contract for the purchase of n-propyl bromide, which is used in place of 1-1-1 trichloroethane for testing bituminous road aggregate. This is a much safer and environmentally friendly process, and produces less toxic waste and vapors.

The Plant Management Division and State Architect Office:

- operates high-efficiency, energy-saving hoods for the laboratory floor of the Bureau of Criminal Apprehension building.
- operates total heat recapturing technologies for the Department of Agriculture and Health Laboratory building presently under construction.
- operates high-efficiency, energy-saving hood controls for the laboratory areas of the Department of Agriculture and Health Laboratory building presently under construction.

Department of Agriculture (MDA) – The Agronomy work unit's inductively coupled plasma mass spectrometer has helped reduce the heavy metals mercury waste stream that was created by the use of the Kjeldhal apparatus. By continuing to reduce use of this apparatus during the past year, the amount of mercury waste generated remained constant at 15 gallons, saving on the cost of hazardous waste removal this year. Method development and additional equipment is being investigated to further reduce this waste stream.

In FY 2003, the laboratory's Environmental Analysis waters section acquired a solid phase extraction system, which has reduced the amount of methylene chloride used within this area. The benefit to this system is a reduction in both hazardous waste generated as well as reduced employee exposure to the product.

Department of Commerce – The Weights and Measures Division receives petroleum samples from various Minnesota petroleum distributors and retailers for testing. The waste remaining after testing is either returned to the petroleum company for further refining or added to the division vehicle tanks.

Department of Corrections (DOC) – All facilities collect and dispose of medical and biological waste as required, utilizing approved methods and vendors.

Minnesota Pollution Control Agency – The Minnesota Pollution Control Agency's Air Quality Lab has a temperature and humidity controlled room for the handling of PM2.5 filters and additional refrigerator space for the storage of PM2.5 filters to meet U.S. EPA guidelines and tank tie downs in the tank/hazard storage room to comply with State Fire Marshall Code. These requirements do increase energy use, but do save on materials being discarded needlessly.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) – Extensive safety and procedural training/testing are required of all students participating in chemistry and Bioscience labs. Chemical neutralization is taught and incorporated in many experiments, producing a sewer-friendly product. Chemicals continue to be centralized and tracked with an electronic inventory system. This system allows faculty/staff to track and

inventory chemicals at MSUM facilities eliminating the need for duplication of chemicals and providing less waste.

St. Cloud Technical College (SCTC) – As the laboratories and classrooms are being updated at SCTC, new and updated equipment (air filtering systems in paint booths, welding areas, and labs) is being installed to prevent pollutants from being released into the air.

St. Cloud State University (SCSU) – MacNeil Environmental Inc. (MEI) trained science staff and faculty last winter on pollution prevention and waste minimization at SCSU as part of OSHA Laboratory Standard training. MEI's role has expanded to include principal consultants, special audits, and having a Certified Industrial Hygienist on campus almost daily. There is a bigger focus on radiation controls. Chemistry Stockroom ventilation and storage unit ventilation were improved. Jim K. (DOER CIH) surveyed the storage also checking for VOCs. Health Services is improving policies and laboratory controls as a result of voluntary OSHA Industrial Hygiene inspection partnering. They have been very proactive in upgrading blood-borne pathogen controls, and both written response plans and cleaning/disinfection schedules.

The Chemistry Safety Committee (CSC), Chemical Hygiene Officer (CHO), and new CHO assistant have been instrumental in fostering better lab user training, labeling, eyewash/shower inspection and hazardous waste control. They have assisted the expansion of SCSU's hazardous waste disposal and recycling program to identify and remove over 25 unknowns. A staff member (recently added to the SCSU Chemistry Department) has made major progress in hazardous waste controls and better utilizing local city sewer system (POTW) contacts and treatment criteria to save over $7,000. Peers have teamed with the University of Minnesota to recycle surplus laboratory glassware.

After-hours-work controls and the Chemical Hygiene Plan reviews have received special emphasis in all College of Science and Engineering Departments that have labs. Renovations have included the addition of more plumbed eyewashes. Better formaldehyde and mercury controls are being used.

Department of Transportation (Mn/DOT) – Mn/DOT materials laboratories have replaced 1,1,1-trichloroethane, which is hazardous and very expensive to manage and dispose of, with n-propyl bromide used with asphalt extraction waste. N-propyl bromide waste is nonhazardous and can be recycled in-house and reused. One Mn/DOT materials laboratory has substituted vinegar for muriatic acid. Muriatic acid was used to clean air pots and other laboratory equipment. Mn/DOT staff discovered that if the equipment were allowed to soak in vinegar overnight, the equipment would wipe clean the next day.

University of Minnesota – The University of Minnesota includes pollution prevention as part of the chemical waste management training for all laboratory workers. The training manual provides suggestions, information resources, and reporting documents (www.dehs.umn.edu/hwd/guidebook).

DEHS started its second mercury thermometer exchange in 2006 in an effort to remove most of the mercury thermometers from the university's labs. The Chemistry Department has pledged to exchange out 2,300 mercury thermometers in calendar year 2007.

The University of Minnesota Department of Environmental Health and Safety did a pilot project to identify and recycle via distillation laboratory waste solvents that are amenable to distillation and are marketable to university laboratories. Initial successes have produced marketable hexane, acetone, and acetonitrile. The solvent recycling means not only that less virgin solvents must be produced but also that less waste solvents need to be disposed of. The projected cost savings to the university, if the distillation and marketing focused solely on acetonitrile, would be $800 in avoided disposal costs and $30,000 in avoided solvent purchases for the annual system capacity of 1,200 liters of recycled acetonitrile. Total projected annual costs are $10,800, yielding a net annual saving of $20,000. Benefit is totally dependant on the price of virgin material that is being replaced and the quality of product from the distillation process.

20. Landscaping

Department of Administration (Admin) – The Plant Management Division composts yard waste whenever practical.

Department of Corrections (DOC) – *MCF-St. Cloud*– Planted a five-acre area of native grasses/wild flowers in May. The result will be a reduction in water use and fertilizer required for former up keep.

Minnesota Pollution Control Agency – The Minnesota Pollution Control Agency's central office landscaping volunteer group maintains a natural garden area in the front of the building in place of mowed grass. This garden meets several goals: less watering, fewer pesticides, colorful/attractive seasonal entrance, and an extra benefit for wildlife (butterflies, birds, and insects).

The MPCA Brainerd office will be reviewing and approving all exterior landscaping plans. The staff has requested that native, drought-tolerant landscape plants be used around the building.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University (BSU) – An 860-square-foot planting area previously planted with annuals was planted with native perennial plants. The university has a goal of expanding native perennial plantings across campus. The university continues to maintain over 600 feet of Lake Bemidji shoreline with native plants and rocks as part of a lakeshore restoration and stabilization project that was completed in 2003.

Central Lakes College, Brainerd and Staples – We reduced our maintained grounds by four acres by planting prairie grass and building ponds and gardens. We are in an ongoing reduction phase.

Minnesota State University, Moorhead (MSUM) – Current procedures for lawn, tree, and flower maintenance for the university campus continue to be reviewed in order to reveal areas where improvement is needed. Due to the large grassy mall area in the center of campus, it remains difficult to make improvements without drastic changes to its aesthetics and character. During the past year, approximately 0.7 acres of perennial and annual gardens have replaced lawn grass areas in and around buildings, including areas disturbed while replacing/upgrading underground water supply lines to campus buildings and around the newly constructed Science Lab Building. These new gardens equate to a total emissions reduction:

ESTIMATED EMISSION REDUCTIONS (IN POUNDS)

CO	CO_2	NOx	PM10	PM2.5	SO_2	VOC
345.488	628.955	1.837	1.060	0.976	0.129	11.244

MSUM's Regional Science Center implements a minimum landscaping policy. The Science Center is home to natural prairie and large wooded areas. Very little mowing is provided, which not only reduces fuel consumption and emissions, but also allows the Science Center to promote an environmentally friendly image. Weed control with invasive leafy spurge is being done without the use of pesticides. Instead, MSUM continues to implement a control program that uses *Aphthona nigriscutis*, the Black Dot Leafy Spurge Flea Beetle, to help control leafy spurge. As adults the beetles feed on the foliage, but do not severely harm the plant. However, the larvae live in the root system and feed on the roots, thus killing the plant. So far, the beetles are colonizing and results in weed control have been noted. This program not only saves money and labor, but is also extremely environmentally beneficial due to the close proximity to the Buffalo River and Buffalo State Park.

Northwest Technical College, Bemidji – We use 62-inch and 90-inch lawn mowers to reduce the amount of time spent with gas engines running. We have added paved patio areas and sidewalks around the building to reduce the amount of trimming time required.

St. Cloud State University (SCSU) – SCSU has joined with the city of St. Cloud on many of their stormwater control plan initiatives, including community outreach/education and public meetings. These initiatives are now being combined with MnSCU ones developed by Don Beckering with MPCA's Scott Fox to improve

our stormwater plan. Many initiatives involve landscaping, catch basin overflow, and construction project runoff controls. Leaves, sand, silt, curb drains, and point outfalls are also being monitored and better controlled.

St. Cloud Technical College (SCTC) – Building expansion and planting trees is reducing the amount of grass that needs to be cut. However, green areas are left intact to prevent pollution from stormwater runoff.

Department of Transportation (Mn/DOT) – Mn/DOT uses wood mulch in and around various plantings to conserve water and help control weeds, which reduces, if not eliminates, the need for a pesticide. Mn/DOT's specification for wood mulch promotes the use of locally generated non-treated wood waste. The department developed a new construction specification (3882 Type 5) for coarse-ground slash mulch for soil protection, sediment control, and organic carbon sequestration. To eliminate the burning of grubbed materials generated during construction, new specifications have been developed that uses slash mulch for stormwater pollution control for stabilizing construction exit dusts and sediments, filtering sediments, and keeping sediments and pollutants on slopes and out of Minnesota's lakes and rivers.

Mn/DOT uses an integrated vegetation management approach that combines the use of appropriate herbicides, bio-control organisms, precision mowing, and ongoing training through internal workshops and annual conferences. This limits the use of herbicides, fuel, and labor. Mn/DOT uses native plant materials in storm-water ponds, vegetative swales, micro-detention cells for mechanical and biological capture of transportation origin solids, metals, and chemicals. The department continues efforts to retain existing large specimen trees and shrubs for perceived noise reduction, thermal pollution reduction, and particulate matter capture.

Living snow fencing placement continues to reduce the need for deicing materials and maintain steady traffic flows. Sixteen miles of standing corn snow capture fencing and six miles of collaborative snow fencing installation with the U.S. Department of Agriculture, in addition to continued living snow fence programs result in reduced chemical and fuel consumption.

Mn/DOT is developing new training materials for the MS4 program and partnering with district maintenance personnel on developing temporary plans for routine storm-water facility management. Mn/DOT is continuing to develop environmental and construction standards for wetland restoration and storm-water treatment technologies including infiltration recharge basins, bio-swale ditches, belowground storage, and fore bay treatment. The integrated approach to storm-water management reduces the discharge of pollutants to waters of the state.

The Roadsides for Wildlife program reduces the need for mowing by integrating native plant communities and education. Sustainable management of best management practices foster reuse of devices over the life of contracts. Mn/DOT is completing studies on deep ripping of different soil textures for water infiltration and plant establishment reduce the need for ponds by treating the stormwater where it falls.

University of Minnesota – Composting is an important effort of the University of Minnesota Landcare Department, making our campus more sustainable. All of the yard waste and refuse collected from the campus greenhouses is composted. This compost is then used around campus to control the weed-seed germination, conserve water, moderate soil temperature extremes, and reduce the compaction effects of heavy rains and sprinkler irrigation. Composting keeps this waste out of the waste stream and incorporates it back into the environment.

The University of Minnesota Landcare Department partners with Xcel Energy to recycle woody materials. The university provides space on campus to store the woody material and the wood waste. Xcel chips all the wood that is collected, and the University uses the wood mulch around campus. This partnership saves the university about $10,000 a year in materials alone, in addition to the labor saved by Xcel taking over the wood chipping.

CUES, Center for Urban Ecosystems and Sustainability (www.entomology.umn.edu/cues) was created in 1995 with a grant from the Minnesota Extension Service. CUES is an interdisciplinary program with participants from the Colleges of Agriculture, Food, and Environmental Sciences; Biological Sciences; Natural Resources; and Landscape Architecture. The CUES resource center is located in the Andersen Library at the Minnesota Landscape Arboretum. CUES mission is to educate landscape managers and urban residents about ways to

embrace environmental stewardship by practicing sustainable management. A landscape managed through sustainable methods requires low inputs of labor, fertilizers, herbicides, insecticides, and fungicides. Excessive use of these chemicals can pollute surface and groundwater and disturb natural ecosystem processes. Sustainable management embraces four major principles:

- **Conserving bio-diversity.** The naturally diverse landscape discourages outbreaks of disease or insects. Such a landscape also attracts birds and butterflies.
- **Restoring native vegetation.** Consider using native vegetation in landscapes. Restore native vegetation to shorelines to reduce nutrient enrichment through stabilizing sediments and shorelines.
- **Promoting nutrient recycling through composting.** Backyard and community composting is an ecologically sound way of disposing of yard wastes and increasing nutrients in urban soils.
- **Using integrated pest management to control insects and diseases.** Inspect and monitor your plants' health on a regular basis, before problems are out of control. Instead of routinely spraying for insects, spot treat problems with soft pesticides such as soaps, oils, and bio-rational products such as Bt (commercial formulations of *Bacillus thuringiensis*). Adopt these bio-rational practices, which target the pest and not the naturally occurring biological control agents such as parasitoids and predatory insects. Use naturally resistant plants. When necessary use hard pesticides, timed to the vulnerable stage of the insect, so the application has a major impact on the pest.

The Sustainable Urban Landscape Information Series (SULIS) has developed a Sustainable Lawn Care Information Series (www.sustland.umn.edu/maint) to assist homeowners to create a sustainable lawn. According to one estimate, 40 million acres of land is devoted to turfgrass in the United States with nearly 75 percent in home lawns and more than $30 billion spent on annual lawn maintenance. It is no wonder that the large amount of resources allocated to lawn care and the impact that they have on the environment has called the sustainability of lawns into question. This critical attention has challenged lawn managers and turfgrass research programs across the country to develop and work toward more sustainable, lower input turf/lawn ecosystems. While SULIS defines sustainability in a general way, sustainability as it relates to lawns can be defined as a lawn area that requires few material inputs while having a positive impact on the environment. Creating and maintaining a more sustainable lawn begins with proper selection of the best-adapted grass species and varieties. Proper site preparation, lawn installation, and appropriate follow-up care will help reduce the need for inputs of the established lawn.

In 1999, a small group of faculty, staff, and students started the Sustainable Campus Initiative Committee (www.cnr.umn.edu/sci), an ad hoc committee with a mission to use the campus and its physical facilities as a tool for environmental learning. One of the pilot projects is the Sarita Wetland restoration on the Twin Cities' campus. The building of raingardens and other pollution preventing landscape stormwater management projects will be championed by the committee as future new construction and building renovation projects provide opportunities to change the landscaping of the campus (www.stormwatercenter.net and www.dakotaswcd.org).

The University of Minnesota Extension maintains Sustainable Urban Landscape Information Series (www.sustland.umn.edu/). This outstanding website offers a detailed guide to designing, creating, and maintaining sustainable urban landscapes. Aimed at both the public and the horticulture/ landscape industry, the site is composed of four main sections. *Design* takes users on a detailed trip through the process of envisioning, planning, and designing landscapes that are cost effective, visually pleasing, and easy on the environment. *Plant Selection* overviews the basics of selecting plants for landscapes and includes an excellent plant selection database. With detailed information and photos of over 1,200 plants, the database is worthy of an annotation in itself. The *Implementation* section covers preparation, planting, installation, and construction of urban landscapes, with several illustrated how-to projects. *Maintenance* offers a comprehensive guide to lawn care, with additional features on tree, shrub, and plant care planned for the future. A collection of links to related land-grant university and extension sites rounds out the site.

The University of Minnesota's College of Architecture and Landscape Architecture provides landscape training and research (www.cala.umn.edu/landscape_architecture). Landscape architecture is the design, planning, and management of the landscape to create environments that embody ecological function and realize human aspirations for community, health and safety, and beauty. Landscape architects are concerned with a wide range of projects: large-scale regional landscape planning; design of exterior environments for

working, living, and recreation; commercial, institutional, and industrial development; transportation systems; and multiple-use areas. Professional services include studies of land-use feasibility, suitability, and capability; site selection studies; proposals for site layout and regional land use allocation and management; detail grading; construction drawings; and planting plans. Landscape architects often interact with other professionals such as architects, planners, engineers, geographers, physical scientists, social scientists, and others in developing projects.

The cornerstone of the university's Landscape Architecture Program is design informed by ecological understanding. National leadership in research and active testing of design ideas locally and nationally give the department a powerful springboard for innovation in design. Collaborative opportunities within the college and university offer a further means of realizing the potentials of landscape architecture as well as a means of asserting the necessity for ecological responsibility in design and planning. The mission of the Department of Landscape Architecture is to foster sustainable relationships between people and their environment. Fundamental to this commitment is the belief that design skills forged from a deep understanding of the intrinsic physical and aesthetic characteristics of natural processes is the best way to help people conserve, rebuild, and steward the natural and cultural places within which their lives and communities unfold. The department pursues this mission through teaching, carrying out research, and actively working with communities to develop and apply place-based solutions to local and regional landscape issues. Specifically, the department:

- Teaches students to be professional landscape architects who use ecological thinking as the basis for artistic design.
- Develops new knowledge about the interrelationships between human and natural systems through scholarly and applied research.
- Helps communities and public groups understand, shape, and manage local places using participatory thinking and incremental planning.
- Collaborates with other professionals within and outside of the university to seek effective design solutions to landscape issues.
- Fosters design literacy based on ecology, technology, history, behavior, place theory, and art.
- Teaches students a working knowledge of Minnesota's natural and cultural ecosystems.

21. Materials Exchange

Department of Administration (Admin) – The Materials Management Division through its Surplus Services administers Minn. Stat. §16C.23, subd. 6, which directs the commissioner of Administration to dispose of state surplus, obsolete, and recyclable property to obtain optimum property utilization within all state agencies and governmental units or nonprofit organizations in Minnesota. Any remaining property is subsequently sold by public auction, sealed bid, pre-priced sale, or by negotiation as deemed most advantageous to the state and in accordance with state law and guidelines. Property that has outlasted its effective usefulness and is considered beyond economical repair with no further utility value to the state, governmental unit, or nonprofit organization in Minnesota is recycled in accordance with MPCA's Product Stewardship policy proposal.

The Travel Management Division's material exchange is accomplished through Surplus Property when property has useful life remaining. The State Architects Office writes recycling and reuse of materials and proper handling of hazardous materials into all building construction specifications.

Department of Corrections

MCF-Moose Lake/Willow River recycled 158 tons paper and cardboard.

MCF- St. Cloud recycled 52 tons of cardboard, 300 wood pallets, 38,000 pounds of scrap metal, and 22,000 pounds of aluminum.

Metropolitan Airports Commission (MAC) – MAC promotes reuse internally through a purchasing department policy. An established procedure outlining the steps to take when MAC-owned property is no

longer needed ensures that MAC employees/departments are aware of the availability of surplus items, eliminating redundant purchases. Countless items have been kept out of the waste stream and reused in this manner.

Department of Military Affairs – Materials not being used by a unit due to mission change or other reasons are being exchanged with units that have a need for the materials. This eliminates the potential for shelf life expiration and the need to order materials that are available through other units.

Minnesota Pollution Control Agency – The Minnesota Materials Exchange Alliance includes a materials exchange infrastructure in Minnesota that fosters coordination and greater utilization of reuse in the hierarchy. The use of the materials exchange program resulted in a total of 451 successful exchanges of 8.2 million pounds of solid and hazardous materials, saving companies $1,296,400 in avoided purchase and disposal costs.

Exchanges are successful across various types of organizations, with the greatest number in the commercial services sector, which includes retail, offices, real estate, recyclers, printers, dry cleaners, and others. The top five materials exchanged include pallets, plastic drums, office furniture, packing peanuts, and plastic buckets. Materials exchange staff responded to over 202 calls in 2006 and helped facilitate over 19,100 Web self-referrals to the online database. Website and database support continued for the nine exchange sites including:

- **Minnesota Technical Assistance Program 612-624-1300 or toll free 800-247-0015**
- **Chisago County Materials Exchange 651-213-0879**
- **North Central Materials Exchange 218-547-7428**
- **Northeast, St. Louis County 218-749-9703 or 800-450-9278**
- **Northeast, WLSSD 218-740-4784**
- **Otter Tail County Materials Exchange 218-998-8598 or 218-998-8597**
- **Southeast Minnesota Recyclers Exchange (SEMREX) 507-529-4526**
- **Southwest Minnesota Materials Exchange 507-532-8210**
- **West-Central Materials Exchange 218-299-7329**

Eureka Recycling, which developed and maintains the Twin Cities' Free Market waste exchange program, received a 2003 to 2004 grant from the Prevention and Assistance Division to expand and update the program as part of their efforts to improve multi-family recycling in Minnesota. The service area for the program was limited to the City of Saint Paul and Washington and Anoka Counties, but, under the grant, was expanded to cover the entire metro area. The final product of the grant included materials for metro communities to promote the website to their citizens.

At least twice a year (during Earth Week and the Holiday Season), the Alliance for Recycling and Reduction of Waste (ARROW), a group of MPCA employees which serves as a point of contact for any recycling (reuse, reduce, or rethink) or composting questions, organizes a "treasure table". Usable, but unwanted, items from staff are brought in and placed on a table for others to take and reuse. In 2004, participation in this activity had increased, and the treasure table was extended for an additional week. In 2005 and 2006, staff showed great interest in the table for the two times it was in operation.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) – Used PCs are reallocated to other departments on campus to reduce the need for additional and/or new machines. Recently used PCs have also been made available to student organization and nonprofit use. This program reduces the number of discarded computers on campus and saves budget money for many departments.

St. Cloud State University (SCSU) – Glass, plastics, aluminum cans, steel, carpet, some building materials, Styrofoam, and cardboard are recycled at SCSU; also lard and cooking oil. A local farmer's hogs are fed leftover food.

University of Minnesota – The University Department of Environmental Health and Safety operates a chemical redistribution program (www.dehs.umn.edu/hwd/recycle), which finds users for unwanted but usable

chemicals and laboratory glassware within the university community. The program distributes approximately 1,000 kilograms of chemicals per year that would otherwise be disposed of as hazardous waste.

University Facilities Management, Waste Management/Recycling operates a reuse program for redistribution of unwanted computers, office furniture and equipment, and laboratory furniture and equipment (www1.umn.edu/reuse). The target audience is the university community, nonprofits, and the general public. Available items are listed and often shown on their webpage.

22. Office Supplies

Department of Administration (Admin) – The Resource Recovery Office obtains office supplies and paper from its reusable office supplies area at the State Recycling Center.

Material Management Division's OSC has recycled At-A Glance dated products available. The products are advertised on the website and a special spring flyer is distributed with a recycle logo identifying these recycled products containing 30 percent post-consumer waste. Also, all 35 At-A-Glance products that are offered through OSC are printed with 100 percent soy-based inks and packaged in cartons containing recycled content. These products can be purchased by placing a web order, or can be purchased by printing an easy-to-use website form and faxing this form to OSC.

OSC stocks recycled papers including eight white papers in various sizes and various post-consumer waste contents. One of these white papers contains 100 percent post-consumer content, is processed chlorine-free, is acid-free for a long bright life, and has outstanding opacity for two-sided copying. This product exceeds all state and federal requirements for recycled content. Because of the higher cost of this product, OSC subsidizes the price to its customers by charging a smaller markup to cost. This allows the environmentally friendly and waste-reducing paper to be competitively priced. The stocked colored papers at OSC contain 30 percent post-consumer waste.

OSC offers an electronic online catalog that reduces paper consumption by allowing customers to order online without the need to fax or mail an actual order form. A convenient, express order form allows faster order placement without the need to have a printed catalog. Also, since all special prices and/or discounts are automatically reflected on the online order form, all web customers are assured of getting up-to-date competitive pricing as well as the most current product information. OSC's invoices are printed on recycled paper. In addition, all newsletters and price lists are available online. MMD buys only 100 percent post-consumer recycled paper for all of its printers and copiers.

The Risk Management Division continues to request soy-based ink for printing orders, and recycles printer and typewriter toner cartridges. MMD recycles laser printer cartridges and only buys remanufactured printer cartridges.

FY 2006 PAPER USE AND ASSOCIATED ENVIRONMENTAL IMPACTS

Paper type	Reams	Energy (BTUs)	CO_2 emissions (lbs)	Wood use (lbs)
Virgin paper	50	961.59	141.99	173.99
30% post-consumer	3,527	299,543.86	45,264.38	43,497.79
100% post-consumer	2,480	134,276.5	22,209.02	0

Department of Agriculture (MDA) – The Minnesota Department of Agriculture has made a commitment to reduce state energy use through purchasing energy-efficient office equipment and appliances. The department has done this through adopting a "neighborhood center" design concept in its new facility, thereby significantly reducing the number of office appliances needed. See item d under Part 3: *Quantifiable Measurements for Activities Satisfying Executive Order 04-08.*

FY 2006 PAPER USE AND ASSOCIATED ENVIRONMENTAL IMPACTS

Paper type	Reams	Energy (BTUs)	CO_2 emissions (pounds)	Wood use (pounds)	Water (gallons)	Solid waste (pounds)
30% post-consumer	4,810 reams					
30% post-consumer	106 reams					
Virgin	30 reams					
Total	**4,946 reams**	**412 million**	**62,359**	**60,000**	**203,406**	**24,004**

Department of Commerce

PAPER CONSUMPTION (REAMS UNLESS NOTED)

Paper type	Virgin	30% post-consumer	100% post-consumer	Total	Wood use (pounds)	Greenhouse gas emissions (pounds)
FY04	0	6,790	0	6,790	82,385	85,731
FY05	0	7,681	0	7,681	93,196	96,981
FY06	20	7,770	0	7,790		

Department of Corrections (DOC) – The following data represents the impact of paper use reported for all DOC facilities and the corresponding energy use and greenhouse gas emissions associated with that use.

MCF-Faribault – 5,020 reams (12 tons) of 30 percent post-consumer-content paper.

MCF-Lino Lakes – 7,000 reams (18 tons) of 30 percent post-consumer content paper.

MCF-Moose Lake/Willow River – 6,200 reams (15 tons) of 30 percent post-consumer content paper.

MCF – Oak Park Heights – 3,000 (8 tons) reams of 30 percent post-consumer content paper.

MCF-Rush City – 4,160 reams (10 tons) of 30 percent post-consumer-content paper

MCF-SHK – 4,517 reams (11 tons) of 30 percent post-consumer-content paper

MCF-St. Cloud – 5,652 reams (14 tons) of 30 percent post-consumer content paper.

MCF-Stillwater – 11,590 (29tons) reams of 30 percent post-consumer content paper.

Field Offices and Central Office: 11,420 reams (39 tons) of 30 percent post-consumer-content paper.

Corrections total 30 percent post-consumer-content paper use: 58,559 reams (146 tons).

Utilizing 146 tons of 30 percent post-consumer-content paper instead of virgin paper resulted in the following environmental impact (Source: Paper Calculator.Org):*

FY 2006 PAPER USE AND ASSOCIATED ENVIRONMENTAL IMPACTS

	Virgin paper	30% Post-consumer paper	Environmental impact equivalent savings	
Wood use	506 tons	354 tons	152 tons	1,051 trees
Total energy	5,601 million BTUs	4,869 million BTUs	732 million BTUs	8 homes/year
Sulfur dioxide (SO2)	3,809 pounds	3,786 pounds	23 pounds	4 eighteen-wheelers/year
Greenhouse gases	830,769 lbs CO_2 equiv.	738,435 lbs CO_2 equiv.	92,334 lbs CO_2 equiv.	8 cars/year
Nitrogen oxides (NOx)	2,689 pounds	2,514 pounds	175 pounds	<1 eighteen-wheelers/year
Particulates	1,815 pounds	1,592 pound	223 pounds	20 buses/year
Hazardous air pollutants	314 pounds	226 pounds	88 pounds	
Total reduced sulfur	50 pounds	35 pounds	15 pounds	
Wastewater	2,784,979 gallons	2,401,720 gallons	383,259 gallons	<1 swimming pools
Biochemical oxygen demand	918 pounds	908 pounds	10 pounds	<1 homes/year
Total suspended solids	1,481 pounds	1,339 pounds	142 pounds	<1 homes/year
Chemical oxygen demand	13,395 pounds	10,585 pounds	2,810 pounds	6 homes/year
Absorbable organic halogens	136 pounds	95 pounds	41 pounds	
Solid waste	332,639 pounds	283,423 pounds	49,216 pounds	2 garbage trucks

Department of Health - **FY 2006 paper use:** We purchased 33,660 reams, or 168,300 pounds of paper, all of which is 30 percent post-consumer content. Using 146 tons of 30 percent post-consumer-content paper instead of virgin paper resulted in the following environmental impact (Source: Environmental Defense's Paper Calculator.Org):*

FY 2006 PAPER USE AND ASSOCIATED ENVIRONMENTAL IMPACTS

	Virgin paper	30% Post-consumer paper	Environmental impact equivalent savings	
Wood use	292 tons	204 tons	88 tons	606 trees
Total energy	3,228 million BTUs	2,807 million BTUs	422 million BTUs	5 homes/year
Greenhouse gases	478,830 lbs CO_2 equiv.	425,611 lbs CO_2 equiv.	53,219 lbs CO_2 equiv.	5 cars/year
Wastewater	1,605,178 gallons	1,384,279 gallons	220,899 gallons	<1 swimming pools
Solid waste	191,723 pounds	163,357 pounds	28,366 pounds	1 garbage trucks

Iron Range Resources and Rehabilitation Agency (IRRR) – The purchasing/accounting staff also obtains agency office supplies from Central Stores. The agency purchased 1,525 reams (240 reams less than FY 2005) of Domtar 30 percent total recovered fiber paper in FY 2006 for our copiers, printers, and fax machines. The amount of wood and energy used, as well as information concerning atmospheric emissions to produce 1,525 reams (3.87 tons) of paper, is in the table below.

FY 2006 PAPER CONSUMPTION (3.87 TONS)

Wood use	9 tons

Total energy	129 million BTUs
Purchased energy	75 million BTUs
Sulfur dioxide	100 pounds
Greenhouse gases	19,591 pounds CO_2 equiv.
Nitrogen oxides (NOx)	67 pounds
Particulates	42 pounds
Hazardous air pollutants	6 pounds
Volatile organic compounds (VOCs)	17 pounds
Wastewater	63,720 gallons
Biochemical oxygen demand	24 pounds
Chemical oxygen demand	281 pounds
Adsorbable organic halogens (AOX)	3 pounds
Solid waste	7,519 pounds

Resource Recovery furnishes our agency with a box at each work station in which we deposit our recyclable office paper. Our waste paper, which consists of 6,000 pounds of newsprint and office paper as well as 2,000 pounds of cardboard, is transported to Northern Minnesota Recycling of Virginia for processing. When the procurement staff issues printed literature solicitations, they require bidders to use paper containing at least 10 percent post-consumer material by weight. Printing contractors are required to use soy-based or other agra-based ink.

Metropolitan Airports Commission (MAC) – Paper consumption has decreased by 480 reams over 2005 levels. The amount of recycled-content paper used, as a percentage of the whole, has been flagged as an area of improvement for the next year.

Paper type	Reams	Energy (BTUs)	Greenhouse gas emissions (CO_2 equivalents in pounds)	Wood use (tons)
Virgin paper	4,830			
30% post-consumer paper	790			
100% post-consumer paper	0			
Total paper used in 2006	**5,620**	**529,000,000**	**68,719**	**47**

Metropolitan Council Environmental Services (MCES) – In 2005, MCES used 11,327 reams or 28.77 tons of 30 percent recycled-content office paper. Using the Environmental Defense Fund's web-based paper calculator (www.ofee.gov/recycled/calculat.htm), this results in 145,512 pounds of net greenhouse gases and 70 tons of wood. For paper without recycled content, 2.823 reams or 7.06 tons were used in 2005. Using the calculator, this results in 40,173 pounds of net greenhouse gases and 24 tons of wood.

Metropolitan Mosquito Control District (MMCD) – MMCD used approximately 580 reams or 1.45 tons of office paper in 2006. This is a decrease from 2005 when the district used 660 reams of office paper. The average post-consumer content for all the paper used was 30 percent. Using the paper calculator on the IPPAT webpage, the energy used to make 580 reams of paper was 48 million BTUs. The net greenhouse gas emissions in CO_2 equivalents was 7,334 pounds while the wood used to make the paper was 8,000 pounds. The table below compares district office paper usage for 2005 and 2006.

METROPOLITAN MOSQUITO CONTROL DISTRICT OFFICE PAPER USAGE 2005-2006

Reporting period	Quantity used (reams)	Recycled content	Energy used (BTUs)	Greenhouse gases (lbs)	Wood used (lbs)
FY 2005	660	30%	56,817,000	8,586	8,251
FY 2006	580	30%	48,000,000	7,334	8,000

Staff are encouraged to use voice mail and e-mail more for internal correspondence and to resist the urge to print e-mail messages. We hope that these and other process changes in our printing habits will continue to reduce paper usage in the future.

Department of Military Affairs – JFMN (Army) uses 30 percent post-consumer recycled office paper. Approximately 80,000 pounds of 30 percent post-consumer recycled office paper was recycled throughout all JFMN (Army) facilities. Utilizing the Environmental Defense website calculator comparison between virgin paper and 30 percent recycled, the following savings or decreased generation were achieved: 42 tons of wood, 200 million BTUs of power, 26,000 pounds of greenhouse gases, 105,000 gallons of water, and 14,000 pounds of solid waste.

Minnesota Pollution Control Agency – The MPCA uses Savin IKON copier machines, which have removable toner cartridges that can be refilled and are made of high-density polyethylene plastic. Many of the cartridges use soy ink.

The MPCA uses a combination of 30 percent and 100 percent post-consumer copy paper processed without chlorine. The MPCA purchased a total of 10,082 reams in 2006, compared with 9,626 reams of paper in FY 2005, 8,995 reams of paper in fiscal year 2004, 9,299 reams in fiscal year 2002, 13, 901 reams in fiscal year 2000, and 16,985 reams in fiscal year 1995. The following data represent the impact of the MPCA's paper use in 2006:

FY 2006 MPCA PAPER USE

	Quantity used (reams)	Weight (tons)	Energy saved (BTUs)	Greenhouse gases (lbs)	Wood used (lbs)
Virgin paper					
30% post-consumer paper	8,418	21.045	105 million	13,309	22 tons
100% post-consumer paper	1,664	4.16	69 million	8,770	14 tons

The MPCA saved 174 million BTUs of energy by using recycled paper instead of virgin and avoided 22,709 pounds of carbon dioxide emissions to the air. In addition, the MPCA saved 36 tons of wood by using 30 and 100 percent post-consumer recycled-content paper instead of purchasing virgin paper. In April 2006, MPCA staff decided to pilot 100 percent recycled-content copy paper in a few frequently used copiers and printers in the St. Paul building to determine whether the paper caused increased jams, accumulated dust, or other problems. There were no reported or suspected problems from the use of the paper; therefore, a decision was made to purchase 100 percent recycled-content paper for use in all agency copiers and printers.

Over 75 percent of the office supplies purchased are reusable, less toxic, or contain recycled content. Examples include Post-it-notes, refillable pens and pencils, file folders, 3-ring binders, note pads, etc. MPCA staff members visit the Resource Recovery Office on a regular basis to obtain reusable office supplies that have been discarded by other agencies. All documents are printed and copied whenever possible on two sides to reduce the amount of paper consumption to half.

Recycled paper is used exclusively in the office, whenever it is available. Letterhead, business cards, and envelopes contain 100 percent post-consumer recycled-content paper. The MPCA continues to use water-based correction fluid instead of solvent-based fluid. MPCA computers are cleaned with pressurized carbon dioxide instead of chlorofluorocarbons. MPCA audio, video, and digital tapes are reused, as well as computer discs.

For all internal meetings, staff specifies and purchases lunches and break food and beverages from vendors who offer low- or no-waste packaging and reusable dishware. This reduces waste and supply costs. The MPCA/DNR cafeteria supplies compostable dishware. Prevention and Assistance Division uses washable linens in the kitchen and restrooms and uses environmentally preferable cleaning products (Restore) in the kitchen and in a refillable spray bottle throughout the office.

The MPCA St. Paul Office uses reusable visitor badges. The many advantages to reusable badges are that they waste less paper, provide improved security, are easily distinguishable, and do not damage clothing. The MPCA makes extra efforts to provide information for internal and external customers electronically to reduce paper consumption, including putting some annual reports on its webpage.

Efforts continue to reuse existing supplies, whenever possible. Recently, a central MPCA supply center has been established. The creation of the MPCA supply center was set up on the first floor of the building to share office supplies and reusable items in one location. Having the supplies in one location gives MPCA staff better control over ordering, allows for the ordering of environmentally preferable products and easier inventory management, and avoids duplication and overstocking. The central supply center also reduces the total number of shipments of supplies to the MPCA.

The Alliance for Recycling and Reduction of Waste (ARROW), a group of MPCA employees which serves as a point of contact for any recycling (reuse, reduce, or rethink) or composting questions, encourages staff to make one-sided paper pads with experienced paper.

The Brainerd Office of the MPCA reuses mailing envelops. It also has a tray in its copier filled with used paper to use for copies that stay in the office. ARROW recently implemented a plan to encourage environmentally preferable purchasing. This initiative focuses on purchasing products that are nontoxic; water-based, have recycled or post-consumer content, and have no odors. Products that meet the criteria are placed on the list for all individuals who order office and cleaning supplies to reference when ordering. There are 67 items on the list, including Simple Green concentrated all-purpose cleaner, Nature Saver recycled paper clips, Earth Smart recycled notebooks, and many more.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) – Online resources have greatly reduced the amount of office supplies used by MSUM. University e-mail is provided and encouraged to reduce paper for memos, announcements, and correspondence. Many educators have chosen to use online resources for classes including assignment and note postings, exams, syllabi, and announcements. The administration is taking steps toward reducing mass-produced items such as student bulletins, and liberal studies worksheets, billing and financial account information, and registration materials. These items have instead been made available online to all students. Last academic year, MSUM used approximately 36,828 reams of office paper. This amount included 36,043 reams of 30 percent post-consumer-content paper, 520 reams of 100 percent post-consumer-content paper, and 265 reams of virgin paper.

Northwest Technical College, Bemidji – Energy Star-rated office equipment and replacement/repair for HVAC equipment is being done.

St. Cloud State University (SCSU) – SCSU extensively uses paper with 50 percent recycled-content and 30 percent post-consumer fiber content and has held usage to about the same as last year (47,400 reams). Office and computer paper is recycled. An exception is most of about 850 reams of colored paper used in our student union copy shop. (Whenever feasible, recycled color paper was used; and all white paper used in that copy shop was standard 30 percent minimum post-consumer-content recycled paper included in our bulk campus supply counts.) Recycled photocopier toner cartridges are purchased. Ink and toner cartridges are recycled. Using e-mail to post surplus supplies for use in other departments has been very successful about 25 times this past year. Desks, plants, pesticides, produce, chemicals, furniture, computers and cooking oil for biodiesel were also recycled.

Department of Natural Resources (DNR) – Copy paper, file folders, envelopes, Post-It notes, and cardboard storage boxes are all made with post-consumer recycled content.

Department of Transportation (Mn/DOT) – Mn/DOT purchased 30 percent post-consumer-content paper in the following volumes: 35,283 reams in FY04, 34,270 reams in FY05, and 31,193 reams in FY 2006. Mn/DOT recycles computers, cardboard, paper, and toner. Mn/DOT copies on both sides of paper whenever possible, purchases printer toner with biodegradable inks, and recycles the cartridges.

University of Minnesota – University Stores sells copy paper to the university departments. The pattern of paper sales and environmental impacts by type for 2002 thru 2005 are presented in Part 3 of this report. The use of recycled-content paper decreases energy and wood usage and reduces the greenhouse gas production related to paper production. The decrease in paper sold by University Stores could be due to many factors including the "paperless U" initiative to eliminate paper with electronic records where possible and to the relaxed purchasing policies that include quick and easy credit card purchases by departments directly from stores. The "paperless U" initiative as a resource conservation effort has avoided the use of millions of sheets of paper by the university in recent years.

23. Oil, Oil Filters

Department of Administration (Admin) – The Materials Management Division has established statewide contracts to purchase re-refined motor oil and oil change services, which include re-refined oil as a choice. Re-refined motor oil and changing services purchased through state contracts contain a minimum of 25 percent re-refined base oil, and also contain the required additives to provide optimal engine performance.

The Materials Management Division has a contract for bulk re-refined motor oil. The division, in conjunction with the Department of Transportation, also has a contract to manage used oil sorbents and filters for processing for energy recovery. The Travel Management and Plant Management Divisions' oil filters are drained for 24 hours in order to qualify as solid waste, as opposed to hazardous waste. Re-refined oil is also used for oil changes. The Travel Management Division uses a 100 percent re-refined brand of engine oil when servicing vehicles. A vendor licensed under state contract collects the used oil for recycling. The Plant Management Division participates in a used oil recycling program.

Department of Corrections (DOC)

MCF – Lino Lakes recycled 1,925 pounds of used oil and filters.

MCF-St. Cloud eliminates oil and grease rags from trash dumpster to Metro-Furnace per MPCA regulations.

Iron Range Resources and Rehabilitation Agency (IRRR) – The IRRR collects oil and oil filters and then sends them to Como Oil of Duluth for recycling.

Metropolitan Airports Commission (MAC) – The MAC fleet/vehicle maintenance shop is equipped with an oil/fluid change pit that employs a mobile collection tray to catch spent lubricants. The spent lubricants are pumped directly into a large storage tank, eliminating the possibility of spills. Oil filters are crushed on site and recycled by the same permitted vendor that removes the used oil for re-refining. Overhead service reels provide oils and grease through hoses connected to bulk storage tanks eliminating the need to pump liquids from drums into containers and then carrying them to the service bay only to be dispensed again. Spills are rare and absorbent use is minimal.

As a service to its tenants, MAC also collects used oil from non-commercial tenants at the reliever airports. Collecting used oil from these tenants reduces the possibility of groundwater and soil contamination from the oil being improperly managed. Used oil generated at the Reliever Airports by non-commercial tenants and MAC operations is stored in tanks provided by the MAC. It is collected periodically and re-refined by a permitted vendor.

Metropolitan Council Environmental Services (MCES) – Used oil and used oil filters are handled as special hazardous wastes. The used oil is collected and stored at MCES facilities and is transported by licensed haulers for burning as fuel. Used oil filters are drained and, at the larger facilities, crushed. The residual oil is collected and the crushed metal filters are eventually recycled with scrap iron and steel by a licensed hauler such as OSI Environmental, Inc. In 2005, for all facilities, 6,100 gallons of used oil were transported, virtually the same as the previous year. Approximately 899 pounds of used oil filters were recycled, a decrease of 20 percent since 2004.

Metropolitan Council Metro Transit – All used oil and oil filters are recycled. Used oil has been sold as a fuel since 1985. Used oil filters have been eliminated from the waste stream and recycled since 1993.

Department of Military Affairs – The JFMN (Army) recycled approximately 6,000 gallons of used oil. The DMA generated fifteen 55-gallon containers of crushed used oil filters that were sent to a recycler.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) – All oil and oil filters currently used by MSUM are recycled through an approved vendor.

Northwest Technical College, Bemidji – Automotive and Automotive Machine Programs use oils/filters that are recycled.

St. Cloud State University (SCSU) – SCSU oil filters are drained for over 24 hours to qualify as special hazardous waste. Motor oil is collected and recycled.

St. Cloud Technical College (SCTC) – Used oil is collected and recycled; oil filters are drained for 24 hours and recycled.

Department of Natural Resources (DNR) – DNR shops recycle all used oil and used oil filters. Most oil is picked up by a used oil recycler at no cost , but one shop gives their used oil to the local Mn/DOT facility, that has a used oil burning heating plant, to use as a fuel source. Used oil filters are allowed to drain, stored in a barrel, and then picked up by a recycling company.

Department of Transportation (Mn/DOT) – Mn/DOT recycles all used oil and oil filters. See section 14, *Energy Production.*

University of Minnesota – The University of Minnesota collects its used oil and oil filters for energy recovery and materials reclamation.

24. Paints, Coatings, Stripping

Department of Administration (Admin) – The Materials Management Division specifies non-lead paint for traffic marking and equipment paint. The Plant Management Division makes solvent-free paint available to state agencies and political subdivisions through its state contracts.

Metropolitan Airports Commission (MAC) – The MAC Paint Department is responsible for painting/striping many acres of pavement, runways, and taxiways in addition to parking lots and roads. Annually, more than 10,000 gallons of pavement-marking paint is purchased in reusable 250-gallon totes. Once emptied, the totes are returned to the supplier for reuse, eliminating the need to manage hundreds of single-use, 55-gallon steel drums.

Most interior painting and all exterior painting for buildings and pavement is done with solvent-free water-based paint. Any use of solvent-based paint is restricted to the paint booth. The paint booth uses water

filtration in addition to standard paint booth filters, which actually makes the exhaust cleaner than the air taken in. Paint booth filters are managed as nonhazardous industrial waste and are burned for energy recovery. Exclusive use of high-volume, low-pressure spray technology for solvent-based paints reduces overspray by 40 percent, uses less paint, and provides a more even coat of paint. Sandblasting has been replaced by shotblasting with a self-recycling system that filters and reuses the blasting media.

Department of Military Affairs – The CSMS switched from a solvent-based, chemical-agent-resistant paint to a water-based, chemical-agent-resistant paint. Paint cleanup can now be done with water. A distillation unit will soon be in place that all wash water will run through.

Paint removal: Purchase of an aqueous paint strip system is in the process. This system uses high-pressure water (40,000 psi) to strip paint off all metal surfaces. The system is closed loop, and all water is filtered and deionized and then reused. Paint chips will be the only waste stream.

Minnesota Pollution Control Agency – The Minnesota Pollution Control Agency's Brainerd office features low-VOC paint and finishes, high recycled-content resilient carpeting and flooring, and recycled-content or recycled Styrofoam ceiling tiles.

Maintenance staff at the St. Paul office of the MPCA uses only low-VOC paints for internal and external painting projects. In FY 2003, the MPCA remodeled one floor and only low-VOC paints were used.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University – BSU maintenance procedures continue to reduce the use of organic solvent-based wood sealers. Water-based paints and finishes are used whenever possible.

Minnesota State University, Moorhead (MSUM) – MSUM has developed a policy to purchase and use only chemicals with low or no VOCs while addressing the issue of indoor air quality and multiple chemical sensitivities. Some of the products that MSUM uses are Glidden's Lifemaster 2000 paint and Buckeye cleaning products. Glidden's Lifemaster 2000 is a no-VOC line of paint and is virtually odorless. The Buckeye products currently used are biodegradable and one, Star Spray, is even Green Seal approved.

Northwest Technical College, Bemidji – We purchase low-VOC cleaning supplies and use water-based paints, floor sealers, and carpet cleaners.

St. Cloud State University (SCSU) – SCSU has converted almost all possible paint coatings to water-based products to limit volatile organic compounds.

St. Cloud Technical College (SCTC) – The instructors of our auto body class use lead-free, low-VOC paints in the auto body lab. Latex paints are used by our maintenance department whenever possible.

Department of Natural Resources (DNR) – Uses recycled latex paint in remodeling and new construction.

Department of Transportation (Mn/DOT) – Mn/DOT districts are using 110-gallon returnable paint totes instead of 55-gallon single-use drums, which eliminates waste 55-gallon paint drums. Mn/DOT uses lead-free latex or epoxy pavement marking/striping paint. All vehicles purchased by Mn/DOT are specified to have heavy-metal-free coatings/paints. Mn/DOT is planning to use stainless steel dump boxes and sanders to prevent future re-furbishing and sandblasting. See also section 16, *Heavy metals*.

University of Minnesota – The university's *Standards and Procedures for Construction* "recommends and supports" the use of reblended paint and has developed reblended paint specifications (www.cppm.umn.edu/standards.html).

25. Parts Cleaning

Department of Administration (Admin) – The Plant Management Division does not use solvent-based parts cleaning solution. The Travel Management Division has an aqueous-based parts cleaner machine that generates no hazardous waste. The Travel Management Division has an OSHA-approved brake cleaning system to handle any possible asbestos contact or contamination.

Department of Corrections (DOC) – *MCF-Faribault* has discontinued the use of the parts washer.

Iron Range Resources and Rehabilitation Agency (IRRR) – Parts cleaning fluid is temporarily stored on site, then recycled by Como Oil of Duluth.

Metropolitan Airports Commission (MAC) – MAC continues to use parts washers that employ a built-in distillation apparatus that cleans and reuses dirty solvent. The only waste is an oily by-product that tests nonhazardous and is approved for disposal under a used oil profile. Parts washer waste has been reduced from over 400 gallons annually to less than five without increasing costs.

Metropolitan Council Environmental Services (MCES) – There are over two dozen parts washers at MCES facilities and 380 gallons of solvent were recycled in 2005, an increase of 20 percent from the previous year. The solvent is petroleum-based and is serviced by Safety-Kleen, Inc. or WRR Environmental Services as a hazardous waste largely due to its low flash point. Some plants will use a high flash point, and therefore nonhazardous, solvent on a trial basis. If successful, this will eliminate hazardous waste generation and the plants will not have to be licensed by a county.

Department of Military Affairs – The JFMN (Army) continues to use parts cleaning machines with ultra filtration baffle system technology that greatly reduces the need for solvent change out. Only small amounts of sludge are removed and disposed of; the life of the solvent is greatly extended.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University (BSU) – The Industrial Technology Department has eliminated print screening activities and the 65 to 70 gallons per year of parts cleaning waste it generated.

Central Lakes College, Brainerd and Staples – The programs that have parts washers have switched to a more environmentally friendly product that can be cleaned and recycled. Over the last few years, we have encouraged the faculty to use environmentally friendly products and chemicals that would not have to be treated as a hazardous waste when disposing of them. We have succeeded in going from a Small Quantity Generator to a Very Small Quantity Generator.

Minnesota State University, Moorhead (MSUM) – The university uses a citrus-based, environmentally friendly parts washing fluid in the automotive mechanic shop.

Northwest Technical College, Bemidji – Our Automotive and Automotive Machine Programs have changed from solvent-based to water-based parts washers. They have purchased and are using an antifreeze recycling machine. We purchase low-VOC cleaning supplies and use water-based paints, floor sealers, and carpet cleaners.

St. Cloud State University (SCSU) – SCSU has experimented with more environmentally friendly brake cleaner and parts washer fluids in the auto repair shop. The Art Department and print shop use a solvent recycling service, which provides them pollution prevention WE CARE® training.

St. Cloud Technical College (SCTC) – Our Automotive Department has a contract with Safety-Kleen to provide and recycle parts cleaners.

Department of Natural Resources (DNR) – Most DNR shops now have parts cleaners that do not use a petroleum-based solvent, but instead use a citric-acid-based solvent. This solvent is recycled through filters internally in the parts washer and the solvent is used over and over. When the filters have become full, they can be disposed of in the garbage. The remaining DNR shop that uses the petroleum-based solvent is looking into converting to the citric-acid-based solvent.

Department of Transportation (Mn/DOT) – Mn/DOT has replaced nonrecyclable vehicle parts washers with aqueous-based vehicle parts washers and high flash point petroleum vehicle parts washers. The vehicle parts washers are retrofitted with filtration systems so the product can be used over and over again. These recyclable parts washers can go three to five years without a change out, compared to every two weeks to a month with the old non-recyclable parts washer.

University of Minnesota – The University of Minnesota Studio Arts Department has installed a parts washer system for paintbrush cleaning, which uses a naphtha-based proprietary solvent that is non-flammable and is perpetually cleaned by a re-circulating filter system. Filters periodically need to be disposed of, but the solvent does not need to be shipped off site for recycling/disposal. This system eliminates 120 gallons of solvent waste per year. Fleet Services has installed a parts washer system using a proprietary solvent that is non-flammable and is perpetually cleaned by a recirculating filter system. Filters periodically need to be disposed of, but the solvent does not need to be shipped off site for recycling/disposal. This system eliminates 240 gallons of solvent waste per year.

University of Minnesota-Duluth Facilities Management switched from a solvent recycling service to a product (ZEP Z-143) that is non-flammable and is perpetually cleaned by a recirculating filter system. Filters periodically need to be disposed of but the solvent does not need to be shipped off site for recycling/disposal. They have been able to eliminate 120 gallons of solvent waste per year.

26. Personal Care

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) –Through an Indoor Air Sensitivity Program, MSUM provides education to users of buildings that have chemically sensitive occupants. This program informs occupants about the potential negative impacts of perfumed soaps, fragrances, air fresheners, residual cigarette smoke, etc.

27. Pesticides, Fertilizers

Department of Administration (Admin) – The Plant Management Division follows pollution prevention practices during the planting and care of landscaping by its Grounds Services staff. The Plant Management Division participates in a Public Land Task Force addressing integrated pest management practices. MMD, in conjunction with the Department of Corrections, has established a Biohazard Waste Cleanup contract.

In conjunction with the Department of Agriculture, the Materials Management Division has a contract for the handling of hazardous materials, pesticide packaging, transportation, and disposal. This contract primarily involves collection of waste pesticides in the rural areas of the state, but it also provides for the transportation and disposal of pesticides from household hazardous waste facilities throughout the state.

The Materials Management Division has undertaken a process change in the area of pest control services by moving to integrated pest management, to achieve long-term, environmentally sound pest suppression and prevention through the use of a wide variety of technological and management practices. The Resource Recovery Office has not needed to use pest control services at the State Recycling Center by ensuring clean facilities that do not attract vermin.

Department of Agriculture (MDA) – The Pesticide and Fertilizer Management Division's projects are instrumental in educating rural, suburban, and urban Minnesota in the proper best management practices of pesticide use and disposal. The Sustainable Agriculture program, now in its 15th year, continues to help farmers learn alternative practices to pesticide application. A copy of this year's Greenbook can be obtained from the Minnesota Department of Agriculture. The pesticide and fertilizer management information can be obtained from the MDA's website at www.mnda.state.mn.us.

Department of Corrections (DOC) – DOC facilities that use pesticides or fertilizers only apply them at set times throughout the year and only use what is needed for that application.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) – MSUM uses very few pesticides. Products that are used produce residues with a short active residence time in the environment. These products are measured accurately and are diluted according to manufacturers' instructions when in use. At the Regional Science, Center, minimal landscaping practices are standard. Minimal mowing and use of very few chemicals helps preserve the natural prairie and wooded areas. Weed control with invasive leafy spurge is being done without the use of pesticides. Instead, MSUM has implemented a control program that uses *Aphthona nigriscutis*, the Black Dot Leafy Spurge Flea Beetle, to help control leafy spurge. While adults, these beetles feed on the foliage, but do not severely harm the plant. The larvae, however, live in the root system and feed on the roots, thus killing the plant. So far, after introduction, the beetles are colonizing and results in weed control have been noted. This program not only saves money and labor, but is also extremely environmentally beneficial due to the close proximity to the river.

To help prevent harmful spills and to ensure that any spills are taken care of properly, a new Spill Response Program has been implemented for the Physical Plant in conjunction with the university's stormwater program. This deals specifically with pesticides and herbicides, as well as with other spills such as petroleum-based substances. The program included education to staff as well as a centralized location for all spill response supplies.

Northwest Technical College, Bemidji – We use a licensed pest control service (Ecolab). We have not used fertilizers for at least five years.

St. Cloud Technical College (SCTC) – We try to use the minimum levels of pesticides and fertilizers necessary to maintain attractive grounds. Application staff is trained to properly and safely use these products.

St. Cloud State University (SCSU) – At SCSU, we try to use the minimum levels of pesticides and fertilizers necessary to maintain attractive grounds. Application staff is trained to properly and safely use these products and to avoid phosphates. Special emphasis is given to proper mixing of quantities and to cleanup in the event of an accidental spill. Concerns about phosphate use were addressed in MS4 actions and public community concern/outreach meetings.

Department of Transportation (Mn/DOT) – Mn/DOT has developed specifications and clarification of fertilizer types, and how it is incorporated and paid. There are four general categories of fertilizers: commercial, phosphate free, slow release, and natural (organic) base types. These categories allow maximum retention into biomass and soil health cycles, customized to the seed mixture and site location.

Several new herbicides have been tested in stormwater conveyance systems. The goal is to best fit program delivery of ditch function using chemical mowing rather than just mechanical mowing and excavation equipment ditch clean-out. While aquatic labeled herbicides for ditch maintenance can add risk to the protection of waters of the state, reduced costs of digging and hauling and restoration of ditch biomass lowers the cost of maintenance.

University of Minnesota – The University of Minnesota is a world leader in agriculture research and education that includes extensive efforts in the development of and safe and environment-friendly use of

pesticides and fertilizers. Special areas of expertise are integrated pest management (www.ipmworld.umn.edu), sustainable agriculture (www.misa.umn.edu), and precision agriculture (http://precision.agri.umn.edu/index.htm).

The Elwell Agroecology Farm (http://swroc.coafes.umn.edu/eaf.html) is a 160-acre parcel in Lamberton Township that has a 30+ year history of minimal pesticide and fertilizer application, and limited tile drainage. These characteristics present researchers with unique opportunities for developing cropping systems studies, as well as studies on fertility, water quality, low input and organic input, management, and tile drainage—all in close proximity to the University of Minnesota's Southwest Research and Outreach Center.

Agroecology is the study of relationships between organisms (including humans) and their environment, involving landscapes that are defined by a significant presence of agricultural activity. The main distinctions of agroecosystems, compared to natural ecosystems, are deliberate human intervention to modify the spatial and temporal species composition, altered energy and resource dynamics, and greater levels of disturbance. Agricultural ecosystems are defined by environmental, biological, and sociological factors and can be described using properties such as productivity, stability, sustainability, and equity.

The management of the Elwell Agroecology Farm (EAF), will emphasize a team-based planning process that includes researchers, farmers, SWROC staff, extension faculty, and others interested in agriculture. Research and education activities will foster an environment that respects and rewards individuals and teams, and enhances the communities in which people live. Efforts will be made to develop an ongoing research and educational environment that has opportunities for people with diverse interests to participate. Current and future research projects conducted on the EAF emphasize the development of cropping systems that efficiently cycle water, nutrients, and energy, while at the same time enhancing profitability. Multi-disciplinary approaches to research and educational activities will be encouraged, and projects will be designed to further our understanding of systems properties and processes.

Current studies at EAF include:

- There are two ongoing, long-term cropping systems research studies on the EAF. The Variable Input Crop Management Systems (VICMS) study was established in 1989 to evaluate the productivity and profitability of a corn-soybean rotation, as well as a corn-soybean-oat-alfalfa rotation under different management systems, including high purchased chemical inputs, low purchased chemical inputs, organic inputs, and minimum inputs. Native prairie strips were also established in conjunction with the minimum input plots in order to compare changes in soil conditions in the other management systems with these two conditions. A companion study, located on the SWROC, evaluates the same systems but from an initially high fertility status.
- The Organic Rotation Plots (ORP) were established in 1990 to study the effect of both fertility and crop rotation on corn production under organic management. Composted turkey manure is used to supply nutrients, and weeds are controlled mechanically. The four crop rotations evaluated are continuous corn, corn-soybean, corn-soybean-oats, and corn-soybean-oats/alfalfa-alfalfa. Unfertilized companion plots are maintained in order to allow comparisons of crop yields and soil conditions resulting from both the manure applications as well as the different crop rotations.
- In 1994, a study was established in a poorly drained soil on the eastern portion of the EAF to evaluate the quantity and quality of water entering surface tile inlets and subsurface tile drains. Sediment, nitrogen, and phosphorus contents are monitored in tile drained water from treatments that compare moldboard plowing vs. ridge-tilling, and synthetic vs. organic forms of fertilizer. The information gained from this study will aid our understanding of surface and subsurface tile drainage effects on crop production and water quality in the Minnesota River watershed. Approximately one-third of the EAF acreage is not currently in research plots. This acreage is being preserved under previous minimal input management for future research.

The university's College of Agriculture, Food and Environmental Sciences (www.coafes.umn.edu), Extension Services (www.extension.umn.edu), and Biosystems and Agricultural Engineering (www.bae.umn.edu) are major providers of training, research, and outreach services to Minnesota and the world in the area of safe and environment-friendly use of pesticides and fertilizers and other sustainable agriculture practices.

The university's Precision Agriculture Center (http://precision.agri.umn.edu/index.htm) in St. Paul was the first of its kind when it was founded in 1995. The new agriculture was born in Minnesota more than 20 years ago

when Control Data and other companies began developing the technology. In 1993, tech-savvy farmers in the Red River Valley were among the first to use what's called precision agriculture. The goal of precision agriculture is to help farmers gain more value per acre while leaving a lighter footprint on the earth.

> *A combine rolled over a dying patch of Canada thistle, the purple-flowered weed that farmers fight. Reaching to his right, the farmer tapped a button on a small computer linking him to the global positioning system. That tap recorded the precise location of the thistle patch in his Red River Valley navy bean field. Next spring, he'll use that information when his computer-generated maps guide him in spraying herbicide. For six years, the farmer has been using GPS to map patterns of crabgrass, wild oats, or the fast-spreading thistle. That's just one of the ways this Minnesota farmer is using technology to increase profits while reducing chemicals that can leach into the environment.*

Scientists at the University of Minnesota are at the forefront of a new era in farming that is changing the way the world grows food. For centuries, farmers used a pinch of soil, a keen eye, and their memory of the land. Today's farmers are turning to lasers, digital technology, and satellite images to better manage crops. A growing number of farmers are treating yards of earth individually to grow healthier plants, rather than using the traditional one-size-fits-all approach to their fields. Better management of information is helping farmers decide on the best possible use of their land as well as on seed varieties, drainage, fertilizer, fungicides, and insect control. There's no quick payback for much of this technology, which requires a few seasons before the farmer builds a reliable base of information. And for some farmers, it wouldn't pay. If, for example, a field is fairly uniform with no variability in nutrient conditions, there's no need to vary rates of fertilizer application. But for Red River Valley farmer, Gary Wagner, the high-tech field practices are paying off big time. He figures that in two recent years, he applied $54,000 less in pesticide on 6,000 acres that he and his two brothers farm. The farm saves money and less pesticide is released to the environment.

28. Policy Statement

Department of Agriculture (MDA) – In compliance with Executive Order 99-4, pollution prevention is a priority for the Minnesota Department of Agriculture. The department's objective is to undertake activities to reduce the generation of hazardous waste and use of toxic solvents and pesticides. The primary goal is to prevent pollution at its source and to reduce waste and emissions that can have an adverse impact on the environment.

Department of Commerce – The department considers protection of the environment to be a high priority. We provide leadership in developing, advocating, and implementing equitable, cost-effective policies regarding departmental agendas. We are committed to lead by example through the reduction of energy use, the use of toxic pollutants, and the generation of hazardous waste in our own department.

Department of Corrections (DOC) – DOC-wide policy exists. See Part 2 *Policy and Regulatory Activities*.

Metropolitan Airports Commission (MAC) – The Metropolitan Airports Commission recognizes pollution prevention as an integral part of its services and understands this requires the cooperative efforts of both its staff and tenants. The MAC, through its strategic plan, has committed itself to providing excellence and leadership in the protection of the environment. The MAC accomplishes this by establishing environmentally friendly strategies that lessen adverse environmental impacts on the natural environment and the surrounding communities, while encouraging our tenants to do the same. The MAC also promotes a proactive approach to environmental protection and supports cooperation with other regulatory agencies. (See also Part 2 *Policy and Regulatory Activities*.)

Metropolitan Council Environmental Services (MCES) – Section 1-2a, *Environmental Sustainability*, of the Metropolitan Council's Administrative Policies and Procedures contains a subsection with policies that are consistent with the Governor's Executive Order 99-4.

Department of Military Affairs – The JFMN (Army) is committed to the ISO 14001 standard of Environmental Management System. In accordance with ISO 14001 standards, the JFMN (Army) is committed to integrating innovative environmental solutions into processes and systems so that they become "a way of life" in order to prevent pollution, achieve or exceed regulatory compliance, minimize procedural burdens, reduce costs, conserve resources, enhance safety, foster community support, and increase time available for the soldier's mission.

Minnesota Pollution Control Agency (MPCA) – "One of the drivers for creating our new MPCA was to more effectively integrate pollution prevention into our work. For the past seven months, a team…has been characterizing why pollution prevention has not been more systematically integrated. One of the key recommendations from the study was that leadership—at all levels—must actively advance the development and implementation of pollution prevention goals and objectives. In response to this, our new strategic plan will show a clearer commitment to pollution prevention through new mission, vision, values, goals and objectives…The characterization study also recommended better use of pollution prevention technical support and better measurement of pollution prevention results. Our Prevention and Assistance Division…and our Environmental Outcomes Division…will be working on strategies focused on technical support and measurement. In addition, our Regional Environmental Management Division is ready to roll-out a water protection strategy designed to prevent the kind of water impairments we are dealing with today."

The most recent MPCA Strategic Plan includes the following objectives, which provide direction for the prevention efforts at the agency and the business systems necessary to track the measurable results from prevention-oriented projects:

- Goal E2e: Provide a reliable information management system that meets the data and information needs of the agency, citizens, and stakeholders.
- Goal E3d: Create frameworks that measure pollution prevention results within the top 10 priority programs by January 1, 2008.
- Goal E2b: Build a system to link the agency's strategic plan, budget, and work plans to evaluate progress toward achieving environmental goals.
- Goal E2c: Implement a system of managing the agency's resources consistent with the agency priorities and all applicable laws.
- Goal R2d: By January 1, 2008, work to reduce the generation of Toxic Release Inventory chemicals—and the number of facilities in targeted sectors required to report—by 10 percent from 2002 levels.
- Goal R2e: By January 1, 2011, reduce the number of regulated facilities—or level of regulation required at facilities—by 5 percent from 2005 levels, within selected program areas (selection to be made by January 1, 2007).
- Goal R3b: By January 1, 2011, voluntary pollution prevention actions increase by 10 percent from 2006 levels.
- MPCA Goal R3d: By January 1, 2007, work with local governments to leverage their efforts to prevent stormwater pollution and contribute to an annual progress report.
- Goal L.1: Reduce or eliminate the use of environmentally harmful substances in manufacturing products or delivering services." (; and
- Goal L.2: Conserve resources and prevent land pollution that reduces options for desired land use.

In addition, the MPCA Goal Tree in the Strategic Plan notes that it is an MPCA goal to conserve resources and prevent land pollution. Listed as objectives under that goal are:

> By 12/31/09, 500 tons of lead per year removed from disposal system; Waste growth does not exceed population growth by 2006. 43 percent recycling and 27 percent organics or waste-to-energy rates by 12/31/06. 50 percent recycling and 35 percent WTE/organics rates by 12/31/10.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) – The Department of Environmental Health and Safety at MSUM is a strong advocate for protecting the environment. Pollution prevention is a component of our effort to deliver a safe work environment. Successful pollution prevention activities rely on the cooperation and participation of the campus community to ensure a safe and healthy workplace. The EHS Department is committed to the preservation, protection, and where possible, the enhancement of our environment in all matters of operation. This includes the goals of meeting and exceeding all applicable local, state, and federal requirements, as well as fostering responsible stewardship of all natural resources by personnel in the work place and in the community. We promote a proactive policy in environmental matters; one that anticipates and addresses problems before they become regulatory matters.

St. Cloud State University (SCSU) – The leadership of St. Cloud State University recognizes the strong environmental impact it has and is therefore committed to developing the means to reduce its use of toxic materials, release of toxic pollutants, and generation of hazardous wastes. The university strives to reduce, and, where possible, eliminate toxic materials, damage, and waste, while realizing that there are limits to its ability to move toward that goal. Maximum results will be achieved through the education of its employees and clientele, continued investigation and implementation of environmentally friendly substitute products, and dedication to its recycling program.

St. Cloud Technical College (SCTC) – St. Cloud Technical College endeavors to comply in every way with all local, state, and federal environmental regulations. SCTC recycles and reuses products whenever possible to help prevent pollution of the environment.

Department of Transportation (Mn/DOT) – See Part 2: *Policy and Regulatory Activities*.

University of Minnesota – The University Board of Regents approved a new policy: *Sustainability and Energy Efficiency*, which broadens the scope of existing policy to include positioning the institution as a leader in campus sustainability through teaching, research, outreach, and operations. The policy requires that the administration develop sustainability objectives and performance measures in the areas of physical planning and development, operations, transportation, purchasing, and waste management and abatement; develop appropriate indicators and measures of success; and report annually to the board.

The policy directs the administration to operate within the principles of balancing financial resources and constraints while trying to be good stewards of the environment and a model for society. The policy will supersede Board of Regents Policy: *Pollution Prevention and Waste Abatement*. A Sustainability and Energy Conservation Policy Work Group (SEC Work Group), appointed by the president, was charged with developing a policy framework that would translate into long-term, systematic strategies for integrating sustainability practices and energy conservation across research, teaching, operations, and outreach. The SEC Work Group consulted with university, state of Minnesota, national and international institutions on sustainability policies in place, reviewed past and present sustainability efforts, and developed policy goals and a timeline for implementation. See Part 2 for text of *Board of Regents Policy: Sustainability and Energy Efficiency*.

29. Printing

Department of Administration (Admin) – The Materials Management Division continues to require post-consumer recycled paper content on all printed material paper to be at least 30 percent. In addition, the Materials Management Division includes the following statement in all solicitations for printing:

Environmental Health and Safety Requirements: *By responding to this solicitation, the vendor certifies that it is in compliance with applicable state and federal laws related to environmental health and safety. If you have any questions, you should contact the Minnesota Technical Assistance Program (651-627-1910 or 800-247-0015). They can also provide a compliance checklist that outlines federal, state, and local environmental regulations affecting printers in Minnesota.*

MMD requires soy-based or other agra-based inks as the standard on all printing orders or contracts. Resource Recovery Office promotes the use of environmental standards such as those used by print shops that are designated Great Printers.

Department of Commerce –See section 22 *Office Supplies*.

Department of Corrections (DOC)

MCF-Moose Lake eliminated 110 gallons of fixer.

MCF-Red Wing– No photo fixer was used in FY 2006, compared to approximately 10 gallons in previous years.

Iron Range Resources and Rehabilitation Agency (IRRR) – Printing contractors are required to use soy-based or other agra-based ink.

Minnesota Pollution Control Agency – The Prevention and Assistance Division uses a number of strategies to reduce waste and pollution from printing.

- **More online, less in print:** Increasingly, the Prevention and Assistance Division uses smaller, less-detailed printed pieces and limits the number of copies printed, directing audiences to websites for pdfs for download. For example, the Prevention and Assistance Division produces a printed postcard about green building resources that points readers to the Prevention and Assistance Division's Green Building webpages for detailed and up-to-date information.
- **Direct-to-plate:** Although limited by the state's purchasing rules, the Prevention and Assistance Division tries to send offset print jobs to printers that use direct-to-plate technology (sometimes called computer-to-plate). This process allows printer to eliminate all film and chemicals associated with a traditional film process. Unfortunately, most of the state's targeted vendors do not offer this technology.
- **We specify vegetable-based ink on print jobs** though most printers now use it by default.
- **Short-run laser printing:** Prevention and Assistance Division does many of its short-run print jobs (less than 1,500 double-sided 8.5 x 11 or equivalent) in house on a high-speed color laser printer. This saves Prevention and Assistance Division money, and it reduces waste associated with sending jobs to a film-based offset printer (film, developing chemicals, ink, and cleaners/solvents). Using a laser printer to print jobs on stock sizes (8.5 x 11, 11 x 17) eliminates paper waste from trimming, which is usually a required part of an offset job. Doing smaller runs on an as-needed basis also allows for revisions to be made between runs.
- **Recycled consumables:** Most of the consumables (toner cartridges, imaging units, etc.) that the Prevention and Assistance Division's Xerox color laser printer uses are recycled through the Xerox Green World Alliance program. Via a website, pre-paid shipping labels can be printed and applied directly to the original boxes for shipment to a Xerox recycling facility.
- The Prevention and Assistance Division does a lot of informational displays and signage for events, and wherever possible we avoid vinyl, use recyclable materials, such as paper or tyvek, and use display materials and structures that can be repurposed for future uses.

Since 1995, the MPCA has reduced its paper consumption by nearly 50 percent. Since the Canon machines have been networked to the PCs of staff, savings have resulted from lower overage charges and reducing the amount of paper used by forwarding print jobs directly to the copier. This new technology saves paper through two-sided printing and fewer jam occurrences.

In June 2006, the MPCA staff revised its process for printing individual business cards using a high speed color copier in the Service Center. All requests to print business cards are sent electronically to one location to ensure consistent color quality and uniform appearance. In the past, the MPCA bought a box of 500 cards from

the state contract vendor each time a staff person changed their position or job title. This new option reduces the use of paper and saves the MPCA a significant amount of money.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University (BSU) – The Industrial Technology Department has eliminated print screening activities and the 65 to 70 gallons per year of parts cleaning waste it generated.

Minnesota State University, Moorhead (MSUM) – Campus Printing Services has moved to using vegetable-based inks and is using paper products containing a high percentage of recycled material. Press/roller washes and fountain solutions that are water-based and low in VOCs are currently used. Printing Services is also using a safer plating chemistry and recycles their aluminum plates, litho film, and reclaimed silver. The student newspaper, which is printed off-campus, also uses soy inks and is printed on 20 percent post-consumer paper.

St. Cloud State University (SCSU) – SCSU exceeds all requirements for use of soy-based inks in materials that are printed either in its campus print shop or those which are processed by a private company. Plastic film is recycled for silver recovery. Recycled paper products are used in the majority of all printing requests. SCSU Printing Services also recycles books, directories, and newsprint.

Department of Natural Resources (DNR) – DNR uses post-consumer or chlorine-free paper and vegetable-based inks. Copiers are purchased that have duplexing capabilities (can reduce paper use by up to 40 percent), energy conservation, digital (direct link from computer), can use up to 100 percent post-consumer paper. Laser printers have duplexing capabilities, energy conservation mode, and can use post-consumer paper. Cartridges can be recycled and recharged.

Department of Transportation (Mn/DOT) – The Mn/DOT sign shop is using lead-free ink and nonhazardous screen wash. The sign shop also uses recycled signs.

University of Minnesota – Printing Services is a member of Minnesota Waste Wise. Printing Services recycles, reclaims, and reuses production materials throughout the printing process. Two initiatives have made Printing Services a greener operation. A direct-to-plate process was installed in spring 2001. It eliminates film and all the chemicals involved in the developing process. They continue to use some film, but where they formerly used up to 24 rolls a month they will now use one roll.

On-demand printing is an initiative that allows and encourages departments to have materials scanned and stored electronically. Materials are then printed as needed. This process eliminates waste, saves money, and allows for flexibility in updating materials frequently. Several university departments, including the University of Minnesota Extension Service and Distance Learning, use this process. The following initiatives have made Printing Services more environmentally responsible:

- Installed an X Rite silver recovery machine that recovers silver from photo fixer. The department recovers 28 pounds of silver annually.
- Installed a Devek system that allows recycling and reuse of developer in their film processing. The developer can be used four times instead of once as in the past.
- Migrated some presswork to Xerox machines. Use of toner process eliminates ink and press-wash wastes.
- Metal press plates are collected and sold for scrap.
- Wood pallets are sent back to paper companies for reuse.
- Paper and cardboard are collected and recycled throughout operations.
- Recycled paper options and soy inks are made available to customers.

The university continues to replace its administrative paper systems with electronic reports, forms, and communications. Several million sheets of paper have been saved so far through these efforts.

30. Procurement

Department of Administration (Admin) – The Materials Management Division (MMD) has undertaken a comprehensive effort to increase purchases of environmentally responsible products without resorting to mandates. A key strategy was development of a close working partnership with the MPCA. Our goal was to increase awareness of the need for environmentally preferable purchasing throughout state government and to educate purchasers to make green procurement a smart and easy choice from a "best value" perspective.

The Materials Management Division has been proactive in its efforts to identify and obtain environmentally preferable goods and services that result in less waste, less pollution, and that operate more energy efficiently, reducing the demand on other pollution producing sources. The division has numerous contracts to encourage sustainability in state government daily activities. These contracts include hazardous waste management, pesticide collection, hazardous spill emergency response, fluorescent and HID lamp recycling, waste paper sales, hazardous materials used oil, filter, sorbent and antifreeze management, and hazardous materials, electronic and electronic component recycling and management.

The Materials Management Division continues to require state purchasers to code each purchase order line with the environmental code. MMD with the Environmentally Responsible Work Group developed environmental definitions to code all items on purchase orders and contracts. This is a required field, which will allow MMD to more effectively track environmental purchases made by the state and can be used to generate reports that capture the types of environmental purchases made. The MMD contract solicitation documents require responding vendors to code the goods and service offered with the state's environmental codes. The codes are required when the state's buyer completes an order in MAPS. MMD contract release documents now shows the environmental code for each item.

All Materials Management Division bid documents now require vendors to indicate whether their products contain mercury. This information will allow us to work with customer agencies and ascertain whether future specifications should require mercury-free products or award preferences based on mercury content. Any mercury content can then be shown on the contract release document, allowing the buyer to choose the most environmentally friendly product.

Through the information gained from the requirement for environmental codes, the Materials Management Division is gaining valuable information on the marketplace. This information can be used to structure future specifications so contracts will have goods and services that are more environmentally preferable.

The Materials Management Division has developed environmentally preferable goods and services contracts estimated in excess of $264 million per year. The list of contracts can be viewed at www.mmd.admin.state.mn.us/pdf/environ.pdf. MMD works continually with state agencies and outside environmental groups to discover mutually satisfactory solutions to increase environmentally responsible purchasing. Our newest strategy is to allow agencies, vendors, and environmental advocates to review statewide contracts and make recommendations on more environmentally responsible products or services to be added or substituted. Contracts up for rebid or extension are publicized online to encourage input.

MMD has proactively developed statewide contracts in concert with a knowledgeable user committee to perform environmental services—including hazardous waste recycling and disposal—for the state and other governmental agencies. The committee has, for example, assisted with audits of end sites and transporters to reduce potential superfund liability. Several years ago, MMD developed a contract for the hazardous waste recycling of excess computers and electronic equipment. MMD is also analyzing options that would place a greater responsibility for take-back and recycling on the manufacturers.

MMD recently developed a more flexible approach to an existing legislative mandate. State statutes allow a price preference of up to 10 percent for goods containing recycled content. In most solicitations, MMD awards a one percent preference for each 10 percent of recycled content documented by the manufacturer. For example, a product containing 40 percent recycled content receives a four percent bid preference over a product with no recycled content. The Resource Recovery Office provides technical assistance regarding environmental purchasing.

Automobiles. MMD contracts for vehicles manufactured without mercury. The solicitations require the vendor to specify if there is mercury in the vehicle, and all responses received in FY 2006 have been checked to ensure that no mercury is present in the vehicles.

Carpet and vinyl flooring. The Materials Management Division, in conjunction with the SAO and the MPCA, has developed a contract for carpet and vinyl flooring with products containing post-consumer recycled content. The contractor is directed to not dispose of removed carpet and vinyl in landfills or by incineration. Contractors have been strongly encouraged to recycle all carpet and vinyl flooring removed from agency locations.

Telecommunications. MMD, in conjunction with the InterTechnologies Group Telecommunications Division, has established a contract for Lucent equipment that offers both new and refurbished telecommunications equipment. Agencies can choose to purchase refurbished equipment.

Furniture. The Materials Management Division developed furniture contracts featuring only those items having a longer useful life. Increasing the life cycle of items reduces solid waste. The Materials Management Division developed new specifications for the seating contract that requires contract vendors to offer fabrics made from recycled product. The division has contracts for remanufactured Herman Miller and Steelcase system furniture that allow state agencies and Cooperative Purchasing Venture members to purchase refurbished products rather than new product. This allows the reuse of furniture parts. This contract requires remanufacture to meet BPIA standards for office furniture recycling (February 1994) and allows trade-ins of Herman Miller and Steelcase system products. The Materials Management Division has created contracts with MINNCOR for furniture refinishing, reupholstery, and refurnishing. This contract is available to all state agencies and CPV members. Materials can be dropped off at Asset Recovery, or Asset Recovery can pick up the materials from customers.

The Materials Management Division's systems furniture contract with MINNCOR also has refurbished furniture. The Materials Management Division has established contracts to clean and repair existing furniture, allowing items to stay in service longer. In addition, the cleaning products used are environmentally friendly. The Materials Management Division, through the Furniture Users Group, acts as a clearinghouse for systems furniture, notifying members of the availability of used systems furniture that other agencies may need for used systems furniture. This facilitation leads to increased reuse of on-hand furniture, reducing waste. The Materials Management Division has specified in the general and ergonomic furniture seating contract for the products on contract to be recyclable, for the vendor to accept product stewardship, and that the products are able to be remanufactured.

Department of Agriculture (MDA) – MDA uses 20-liter nowpack containers for methylene chloride within the laboratory, which has helped reduce glass waste and the release of hazardous fumes into the laboratory. Energy-efficient Energy Star office equipment is purchased/leased when available. For more information see item d, *Reduce state energy use through purchasing energy-efficient office equipment and appliances* in Part 3.

When available, CFC-free laboratory freezers/refrigerators are purchased by the Laboratory Services Division. Whenever possible, vendors are requested to remove or eliminate excessive shipping materials when deliveries are made. This will help in reducing the amount of waste material place in local landfills.

Department of Corrections (DOC) – All DOC facilities follow Minnesota Statutes §§ 16B.121 and 16B.122, along with Minnesota Executive Order 99-4 requirements via their purchasing departments.

Department of Employee Relation (DOER) – DOER supports and follows all environmentally friendly procurement policies by purchasing/leasing Energy Star-compliant office equipment and office paper that has at least 30 percent post-consumer content. DOER will continue to follow all environmentally friendly procurement policies established by the state.

Department of Employment and Economic Development (DEED) – As referenced in Part 2 of this report, employees involved with purchasing of office equipment were encouraged through policy changes to select energy-efficient, Energy Star-rated items.

Iron Range Resources and Rehabilitation Agency (IRRR) – Purchasing/Accounting staff obtains agency office supplies from Central Stores.

Metropolitan Airports Commission (MAC) – Environmental implications are considered when procuring goods and materials for the airports. MSDSs are reviewed and durability, reusability, and disposal costs, etc. are evaluated in addition to following policies and procedures. (See Part 2: *Policy and Regulatory Activities.*)

Department of Military Affairs –The DMA recycled approximately 52,000 pounds of used textiles, such as old uniforms.

Minnesota Pollution Control Agency – Prevention and Assistance Division's outreach efforts:

- The Prevention and Assistance Division provided financial assistance to all SWMCB counties to host EPP workshops in each county over the next year.
- The Prevention and Assistance Division hosts the Governments for Responsible EPP and Environmental Networking Group (GREEN Group) to increase metro-wide EPP.
- The Prevention and Assistance Division continues to advocate environmentally preferable industrial and institutional cleaners available on state contract.
- The Environmentally Preferable Purchasing Guide is online at www.swmcb.org/EPPG/. The EPPG provides information to public entities on environmentally preferable products and how they can be purchased.
- The Prevention and Assistance Division attended procurement workshops/conferences throughout the year to promote green purchasing at the state and local level.

Since the creation of its market development program, the Prevention and Assistance Division has promoted buying recycled products as a means of supporting the recycling infrastructure. Over the years, Prevention and Assistance Division staff have held Buy Recycled trade shows and conferences, developed fact sheets, trained state purchasers about recycled-content products, and much more. The Prevention and Assistance Division strives to purchase environmental products whenever possible.

The Prevention and Assistance Division's expanded procurement focus continues to include products and services that have a lesser or reduced impact on human health and the environment, such as toxicity reduction, durability, recyclability, energy efficiency, etc. This is referred to as environmentally preferable purchasing (EPP). The Prevention and Assistance Division is working with the Department of Administration to promote environmental purchases and building practices in state-leased buildings by incorporating better specifications into state contracts.

- The Prevention and Assistance Division has worked with the Department of Administration to incorporate compostable food service items and bags onto state contract.
- The Stakeholder Work Group standards for cleaners have been incorporated into the state contract for cleaning supplies and floor care products. Prevention and Assistance Division continues to advocate for the purchase of these items.
- The state contract for flooring includes several environmental specifications. The most recent solicitation set higher air quality standards for carpet; increased the use of related glues and adhesives with lower toxicity; required vendors to recycle old carpet; and encouraged vendors to bid carpet, tile, and rubber flooring made with recycled materials.
- Added a less toxic cleaner to the Office Supply Connection catalog.
- Continues to advocate for increased recycled-content office supplies available through Office Supply Connection (OCS).
- A mercury component disclosure and phase-out requirements in the 2002 motor vehicle request for bids (RFB), in partnership with MPCA and INFORM, Inc. The RFB, issued in October 2001, includes a disclosure requirement and statement of intent to purchase only mercury-free vehicles through 2004.

The Prevention and Assistance Division promotes environmentally preferable contracts to state agencies and local political subdivisions. The Prevention and Assistance Division has made procurement information available via its website and links to the Department of Administration's site. When appropriate, the Prevention and Assistance Division documents and shares its results with other states as well as Minnesota businesses, schools, and general consumers. The Prevention and Assistance Division is working with the Department of Administration to encourage the use of reusable crates, rather than disposable boxes, when state agencies contract with professional movers.

The Prevention and Assistance Division is working with architects to encourage the use of resource-efficient materials and practices in new state buildings under construction. Minnesota loses 27,000 acres of farm, forest, and open space land every year to new development. In the United States, we generate an estimated 2.8 pounds of building-related construction and demolition debris per person per day. Globally, building construction consumes 25 percent of virgin wood used each year. Therefore, the Prevention and Assistance Division has focused on establishing a green building program in Minnesota to reduce the loss of Minnesota's natural and reusable resources.

Green building design, construction, and deconstruction can have a substantial impact on removing reusable, recyclable, and toxic materials from the construction and demolition waste stream. Green building practices also achieve reduced greenhouse gas emissions, resource and energy conservation, market development of recycled-content products, and an overall more sustainable approach to our structures and their operations. To help communities find creative environmental solutions that are economically viable and meet social needs, the Prevention and Assistance Division has created a wealth of Minnesota-specific information to guide green building efforts.

The Prevention and Assistance Division defines a green building as one that is healthy and comfortable for its occupants and is economical to operate. It conserves resources (including energy, water, raw materials, and land) and minimizes the generation of toxic materials and waste in its design, construction, landscaping, and operation. A green building also considers historic preservation and access to public infrastructure systems, as well as the entire life cycle of the building and its components.

In 2003, the MPCA signed a 10-year lease that incorporates the new State of Minnesota Sustainable Building Guidelines and many specific sustainable remodeling, maintenance, and operations practices. It contains the requirement for a commercial energy audit of the building and the implementation of cost-effective recommendations derived from the audit.

Prevention and Assistance Division contributed to the development and implementation of the Sustainable Building Guidelines, which are mandatory beginning with the 2004 bonding cycle. The Prevention and Assistance Division continues to help to promote environmentally preferable chemicals via the Internet. The website address for the Carbohydrate Economy Clearinghouse is www.carbohydrateeconomy.org.

Prevention and Assistance Division's website has been expanded to include information to help local purchasers buy recycled products, and Prevention and Assistance Division, along with the metropolitan counties, provides the Environmentally Preferable Purchasing Guide, a resource for state, local, and school purchasers to help them identify a variety of environmental products.

The MPCA's St. Paul office took the following pollution prevention measures in construction work on its building and grounds as requirements of the lease in 2004 and 2005:

- A contractor replaced a defunct wooden staircase with a poured large concrete staircase made with coal fly ash amended concrete. The ash content is between 15 to 20 percent.
- In the fall of 2004, the roof was replaced with a built-up type roof.
- Elevator floors were replaced with Norament rubber, which meets indoor air quality standards. Rather than replacing elevator side panels, only the edging was replaced.
- Restrooms have received new sink counters made of Corian. The faucets were Delta 501 faucets matching the existing style. One gooseneck faucet was added to each bathroom.
- The MPCA building floors will be recarpeted over the next eight years, using carpet squares that contain recycled content manufactured by Shaw Carpet. The advantage of this carpeting is that worn spots in the carpet will be able to be replaced without replacing the whole carpet.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University (BSU) – Paper use was as follows:

Paper use 2006

Paper type	Reams	Pounds	Energy (BTUs)	Greenhouse gas emissions (CO_2 equivalents in pounds)	Wood use (pounds)
30% post-consumer paper	4,400	22,000	376 million	55,635	54,000
Virgin paper	6,424	32,120	616 million	91,385	112,000

Paper use 2005

30% post-consumer paper	4,400	22,000	368 million	55,555	53,386
Virgin paper	6,810		655 million	96,725	118,074

Use of 30 percent post-consumer recycled paper remained the same as compared to FY 2005. There were 386 fewer reams (1,930 pounds) of virgin paper used in FY 2006. The associated energy reduction is approximately 39 million BTUs.

BSU continues to support and encourage campus departments to incorporate waste reduction and pollution prevention into their daily operations. The Purchasing Office holds office supply vendor fairs for university departments each year. The events provide an opportunity to make contacts and establish relationships with office supply vendors. Vendors who specialize in remanufactured toner cartridges are invited and several departments on campus use their products. All used toner cartridges are either returned to the vendor or picked up by a vendor who remanufactures toner cartridges.

In addition, remanufactured printing cartridges are available from office supply vendors, recycled-content copy and computer printer paper are supplied through Central Stores, and double-sided copying is encouraged throughout campus.

Minnesota State University, Moorhead (MSUM) – As a state agency, MSUM has a procurement department in conjunction with the state of Minnesota Materials Management Division. We also utilize Central Stores, which is an expansion of state surplus services. The Physical Plant has centralized all of its chemicals and supplies. This has created less volume in storage and enables university staff to use improved products that are constantly coming onto the market. University personnel have been educated about purchasing materials that are highly environmentally compatible. Pollution risk and hazardous waste disposal costs are emphasized. All departments have also been encouraged to purchase on an as-needed-only basis to reduce stock and storage time.

St. Cloud State University (SCSU) – SCSU uses toilet paper and towels of 100 percent total recycled fiber content and up to 20 percent post-consumer fiber content. Some carpet fibers are recycled.

Department of Natural Resources (DNR) – We purchase plastic signs that are made out of post-consumer plastic that can be recycled. DNR purchases carpet that is manufactured with recycled plastic and rubber and purchases plastic lumber for park benches, picnic tables, parking curbs, retaining wall timbers, and decking.

Department of Transportation (Mn/DOT) – Mn/DOT is continually in the process of eliminating and/or reducing waste streams and finding new products and technologies that reduce toxicity and conserve the environment. Mn/DOT uses purchasing preferences to encourage use of products with recycled content.

University of Minnesota – The University of Minnesota Facilities Management has developed revised construction standards, which include Sustainable Design Requirements and other concepts from the Minnesota Sustainable Design Guide (www.develop.csbr.umn.edu/msdg2/). The university's current Standards and Procedures for Construction address energy conservation elements:

- **Design objectives**
  a. Architects, engineers, and other design consultants shall design energy-efficient buildings in compliance with the latest version of ASHRAE 90.1 that provide the environment required by our teaching and research faculties to carry out their work in an effective manner.
  b. The architect/engineer shall utilize the Xcel Energy Assets Custom Energy Assistance Program to assist in its efforts to design an energy-efficient project. These services consist of modeling the projected energy use of proposed designs, suggesting strategies to reduce the projected energy use, and projecting the construction costs and energy savings associated with the suggested strategies. Review the suggested, project-specific energy conservation strategies with the Facilities Management Energy Conservation Group.
  c. The Xcel Energy Assets Custom Energy Assistance Program shall suggest energy-efficient design strategies, which consist of state-of-the-art, proven design principles and technologies. Strategies not proven under field operation conditions are not acceptable.
  d. The responsibility for choosing and incorporating energy-efficient strategies into the design remains that of the design team and the university.
  e. Include the means to measure the results of the energy-efficient design strategies in all projects.
- **Glass area.** Where glass is employed, consideration shall be given to the economic feasibility of insulating glass, reflective glass, and blinds or other shading devices.
- **Mechanical systems.** Plumbing, heating, cooling, and ventilating systems, and control strategies shall be selected and designed to ensure minimum consumption of energy, consistent with necessary environmental conditions. Consider heat recovery and recycling where economically feasible.
- **Lighting systems.** Select and design lighting systems and controls to ensure minimum consumption of energy while providing quality illumination for the visual tasks in each room or space. Avoid general high levels of illumination except in the most critical applications. Provide specialized supplementary lighting sources at the task area in lieu of uniform high-level illumination throughout. Switching or other lighting control devices shall provide for flexible levels of lighting. Minimize decorative lighting. Consider the principles of daylighting for new buildings.
- **Evidence of compliance.** The architect/engineer shall submit calculations and other data with the Design Development Documents to demonstrate compliance with the conservation policy and the estimated cost impact on construction and operation.

The Center for Sustainable Building Research is developing sustainable building guidelines for the state of Minnesota that will be used on all new state buildings. The guidelines are a part of the Buildings, Benchmarks and Beyond (B3) Project that also includes project management led by LHB Engineers and Architects, Public Building Benchmarking led by the Weidt Group, and project delivery process led by the Adams Group. The guide that results from the B3 project will eventually replace the existing Minnesota Sustainable Design Guide. (www.csbr.umn.edu/B3/). The purpose of sustainable building guidelines is to encourage environmentally responsible design practices by rating facility performance in areas like energy efficiency, indoor air quality, and waste management.

The system provides strategies that are organized according to six environmental topics: site, water, energy, indoor air quality, human factors, materials, and waste. The strategies are phrased to achieve a specific design solution or practice, such as “Use recycled content in building materials.” To integrate environmentally responsible design easily and effectively into the building process, it became important not just to indicate what to do, but what actions to take. Within each strategy are series of actions organized by design phases and a performance indicator for scoring (www.sustainabledesignguide.umn.edu).

31. Remanufactured Parts

Department of Administration (Admin) – The Materials Management Division has a contract for refurbished Herman Miller system furniture that allows state agencies and Cooperative Purchasing Venture members to purchase refurbished products rather than new product. This contract requires reupholstery to meet BPIA standards for office furniture recycling (February 1994) and allows trade-in of Herman Miller System

products. The Materials Management Division has created contracts with MINNCOR for furniture refinishing, reupholstery, and refurnishing.

The Materials Management Division specifies remanufactured automotive products. The Materials Management Division has developed contracts for remanufactured automotive products for state agencies, which include diesel engines, transmissions, alternators, and starters. The Travel Management Division uses remanufactured parts for vehicle repair whenever they are available.

Metropolitan Airports Commission (MAC) – MAC fleet/vehicle maintenance uses remanufactured starters, alternators, water pumps, calipers, turbo chargers and injectors, and relined brake shoes. Rebuildable cores are exchanged for the newly remanufactured parts. Other parts are sent out for rebuilding/overhaul whenever it is a suitable alternative to new parts.

Minnesota Pollution Control Agency – A single allotment number was established for purchasing toner cartridges for fax and laser printers. The office administrators identified three vendors that provide remanufactured cartridges and provided that information to the purchasing staff. A majority of the office machines use remanufactured cartridges; however, a few laser printers have experienced problems. The vendor provides toner cartridges for the leased photocopiers. The MPCA has an arrangement with a local vendor to pick up used toner cartridges from fax machines, printers, and typewriters to be reused or refilled. The Brainerd Office of the MPCA also uses remanufactured toner cartridges for its printers.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University (BSU) – The maintenance and purchasing departments are continuing to work together to limit the need to purchase new electric motors and plumbing and steam valves by having worn and defective units reconditioned or rebuilt for reuse whenever possible. The Purchasing Office holds office supply vendor fairs for university departments each year. The events provide an opportunity to make contacts and establish relationships with office supply vendors. Vendors who specialize in remanufactured toner cartridges are invited, and several departments on campus use their products. All used toner cartridges are either returned to the vendor or picked up by a vendor who remanufactures toner cartridges.

In addition, remanufactured printing cartridges are available from office supply vendors, recycled-content copy and computer printer paper are supplied through Central Stores, and double-sided copying is encouraged throughout campus.

St. Cloud State University (SCSU) – SCSU uses remanufactured photocopier cartridges.

Minnesota State University, Moorhead (MSUM) – MSUM currently uses remanufactured printer cartridges and Xerox copier dry ink and toner cartridges.

Department of Natural Resources (DNR) – Remanufactured parts are used in repairs whenever they are available.

Department of Transportation (Mn/DOT) – Mn/DOT purchases several remanufactured parts for vehicle parts replacements.

32. Tanks

Department of Corrections – All tanks are currently reported under MPCA requirements.

Iron Range Resources and Rehabilitation Agency (IRRR) – Diesel fuel and gasoline are stored in underground storage tanks (new in 1999) at the agency's administration building.

Metropolitan Airports Commission (MAC) – All existing tanks are fully compliant with federal regulations. Tank monitoring systems ensure inventory control, and regular inspections prevent problems from developing that could result in a spill or release. At MSP, a fuel island was installed for all MAC vehicles and heavy equipment. This monitoring/inventory control system can track fuel usage per vehicle mile or hour. This information is incorporated into maintenance records and often assists in determining the need for making repairs.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) – MSUM has two 20,000-gallon underground tanks classified as aboveground elevated tanks. These tanks are equipped with continuous slab vaults, alarms, overfill protection, leak detection, and are inspected weekly. Also at the Physical Plant are one 1,000-gallon gasoline tank and one 560-gallon diesel tank. These are aboveground, double-walled tanks equipped with overfill protection, etc. A vital part in managing these tanks is the emergency spill response procedures. We currently have updated procedures in place and training provided to respond towards spills, overfill, puncture, and other such emergencies.

St. Cloud State University (SCSU) – A single unused underground storage tank was found under Richard Green House decking and removal is underway. A single unused underground storage tank will remain at SCSU. It is empty and below the basement floor of AH, an occupied house. Monitoring and perhaps removal is being planned. Spill containment control was expanded outside the dike to the delivery connections of our twin #2 fuel oil aboveground storage tanks. Further SPCC plan and training action is underway.

Department of Transportation (Mn/DOT) – Many Mn/DOT districts use salt brine tanks, which are used to produce and store salt brine. Currently, salt brine production systems are of double-walled fiberglass construction, which is resistant to degradation from salt. Mn/DOT fueling systems are composed of double-walled underground or aboveground petroleum tanks and pipes. They are equipped with leak detection, spill prevention, and overfill prevention equipment to reduce the probability of a release to the environment.

University of Minnesota – The university has reviewed and updated its Spill Prevention Control and Countermeasures (SPCC) plan (www.epa.gov/superfund/contacts/sfhotlne/opa.htm). The university's Twin Cities' campus has hundreds of fuel storage tanks, emergency generator fuel tanks, oil-filled transformers, and drums containing petroleum products that fall under this plan.

The U.S. EPA developed the Oil Spill Program as mandated by the Oil Pollution Act of 1990, which amends CWA Section 311(j). There are four main goals of the Oil Spill Program: preparedness and prevention; response; compensation and liability; and research and training. Preparedness and prevention is the best defense against mitigating the damage caused by oil spills. U.S. EPA requires high-risk facilities to prepare and implement SPCC plans to achieve the goal of preventing oil spills from reaching navigable waters.

The SPCC plan requirements have three goals:

- **Prevent oil spills.** Operating procedures, such as inspections, recordkeeping, security, personnel training, and tank specifications, address this goal (40 CFR Section 112.7(e)).
- **Prevent spills from reaching navigable waters or adjoining shoreline.** All SPCC facilities must install appropriate containment and/or diversionary structures to prevent spills from reaching waters, unless installation is impracticable (40 CFR Section 112.7(c)). In addition to the minimum requirement for appropriate containment and/or diversionary structures, other secondary containment requirements are specified in 40 CFR Section 112.7(e). For example, bulk storage tanks must have sufficient secondary containment to hold the contents of the largest single tank, allowing for precipitation.
- **Prepare for responding to an oil spill.** Facilities that cannot install appropriate containment and/or diversionary structures must be able to clearly demonstrate the impracticability of installation, and must have a strong oil spill contingency plan and a written commitment of response manpower, equipment, and materials (40 CFR Section 112.7(d)).

33. Technical Support

Department of Administration (Admin) – The Resource Recovery Office provides waste reduction and recycling technical support to government agencies, which includes referrals to Minnesota Technical Assistance Program.

Department of Corrections

MCF-St. Cloud – St. Cloud is participating in a first of its kind Resource Management contract with a local waste vendor. The facility works closely with the contractor to find ways to reduce waste and increase recycling. Any resultant savings are then shared between the two parties. In addition, the facility has utilized Braun Intertech and Traut Well for testing wastewater and other environmental concerns.

MCF-Stillwater has finalized an interagency agreement with the MPCA to have representatives from RETAP assess the environmental programs at the facility.

Metropolitan Airports Commission (MAC) – The Environment Department provides technical support to all MAC offices/divisions, as well as airport tenants and surrounding communities whenever possible. Assistance for the MAC's tenants is accomplished through phone calls, acting as a regulatory liaison, informational meetings, and providing resources.

Metropolitan Council Environmental Services (MCES) – In its participation with IPPAT, MCES is part of an information network that is very useful in the pollution prevention support offered to other public agencies. As a regulatory agency, MCES is active in pollution prevention technical support through the Industrial Waste and Pollution Prevention Section (IWPPS). This section continues to promote pollution prevention to its more than 800 permitted industrial users. During on-site inspections, IWPPS staff members regularly discuss pollution prevention issues and point out process areas where pollution prevention would result in waste reduction. Although MCES collects fees based on volumes and characteristics of wastewater through its Service Availability Charge (SAC), wastewater reductions associated with cost savings are encouraged for its users.

Specific examples of these efforts are that when permit renewal notices are sent out, there is a written recommendation that the industrial user contact the Minnesota Technical Assistance Program (MnTAP) for assistance in reducing wastewater volumes and to address any other pollution prevention concerns. Work on mercury reduction continues with the Minnesota Dental Association through distributing recycling fact sheets and the evaluation of amalgam separation equipment (see detailed discussion in section 16, *Heavy Metals*).

The IWPPS has participated in national, regional, and local pollution prevention conferences and has cooperated as a member with Wakota CAER (Community Awareness and Emergency Response), North Metro CAER, and MnTAP in the sharing of information and public displays. Conferences in the past year include the MPCA Air, Water, Waste Environmental Conference, the MPCA Collection Systems Operators' Seminar, Minnesota Wastewater Operators Association, and the American Electroplaters and Surface Finishers Society. The section participates in the Great Lakes Regional Pollution Prevention Roundtable through its website.

An intranet site is in place for the Environmental Quality Assurance Department within MCES, which includes pollution prevention pages to promote pollution prevention and encourage new ideas. This publicly accessible Internet site can be found at www.metrocouncil.org/environment/PollutionPrevention/. Additional information, including an online version of the Waste Discharge Rules and a table of user rates and fees can be found at www.metro.council.org/environment/IndustrialWaste/.

The NPDES discharge permit for the Hastings WWTP required the preparation and submittal of a phosphorous management plan by February 2005. An internal team identified influent and effluent concentrations and mass loadings and reduction opportunities in plant operations. IWPPS created a phosphorous profile by examining past data, conducting a survey of dischargers, and from monitoring and analysis. A single permittee, a creamery, was identified for pollution prevention action in order to reduce phosphorus. The MPCA needs to respond to this plan for further action to occur.

Department of Military Affairs – In the event of an environmental emergency, an 800 number has been established to contact the JFMN (Army) Public Works Department or the Environmental Office. There is also a department webpage for sharing information throughout the organization.

Minnesota Pollution Control Agency (MPCA) – MnTAP helps businesses implement pollution prevention by helping them become more efficient and find alternatives to using hazardous materials. Technical assistance is tailored to individual businesses through a variety of services, including site visits, student interns, materials exchange, pollution prevention teams, workshops, and industry-specific resources. Each year, MnTAP works to achieve its goal of reducing four million pounds of waste (as solid/hazardous waste, air emissions, and wastewater discharge), and saving companies two million dollars. Overall in 2006, MnTAP documented reductions of 4 million pounds of waste and wastewater loading, reuse of 8.3 million pounds of waste, and 8.3 million gallons of water conserved, resulting in a total cost savings of $2.2 million to businesses.

- **Site visits.** Site visits provide companies with a one-on-one assessment of pollution prevention opportunities and serve as a practical way to help businesses put pollution prevention practices in place by promoting team formation, scoping out potential student intern projects, and identifying potential grant/loan opportunities. Approximately 117 site visits were conducted this past year, primarily with industrial facilities related to food processing, healthcare, metal finishing, and utilities. Site visits helped companies reduce 264,500 pounds of waste, conserve just under one million gallons of water, and nearly one million kWh of electricity, and save $735,000.
- **Student interns.** Implementing pollution prevention takes time and commitment. MnTAP's work with seven intern companies in 2006 resulted in pollution prevention documentation of 24 pounds of waste, 400,000 kWh and 1,121 therms of energy, and savings of $74,800. Past intern projects from 2000 to 2005 documented an additional reduction of 4 million pounds of waste, 347,000 gallons of water, and 15,900 therms of energy conserved and cost savings of $103,500. Additional waste reduction from the 2006 projects is projected in the next one to two years, including 38 pounds of solid and hazardous waste, 13.8 million gallons of water, 14.1 million kWh, and 861,200 therms. These additional projected reductions, if implemented, will result in additional cost savings of $861,200. The 2006 intern companies included:
    - Alexandria Finishing
    - Federal Cartridge/ATK
    - Hennepin County Medical Center
    - Metropolitan Council Environmental Services
    - QX, Inc.
    - Tennant Company
    - Tri-County Hospital

Success stories

- MnTAP helped companies reduce 8.3 million gallons of water.
- MnTAP's work with 2006 intern companies, along with follow-up with 2000 through 2005 intern companies, resulted in pollution prevention documentation of 4 million pounds of waste, 7.4 million gallons of water, and first-year savings of $178,350.
- Materials exchange activities totaled 8.2 million pounds of waste exchanged, saving companies $1.3 million achieved by the Minnesota Materials Exchange Alliance, which includes MnTAP and seven local exchange sites.
- Site visits helped companies reduce 264,500 pounds of waste, conserve 890,000 gallons of water, and save $735,000.
- Energy efficiency has been effectively integrated into MnTAP's pollution prevention technical assistance services. There were two intern projects and several site visits addressing energy. Total energy conservation documented includes 1,375,794 kWh and 17,000 therms.

Brainerd/Baxter Area Phosphorus Reduction Project (MPCA through U.S. EPA Pollution Prevention Grants)

When the upgraded Brainerd/Baxter wastewater treatment plant begins operation in 2009, it will need to meet a 1 mg/L phosphorus limit. It currently discharges 3 mg/L. Their Phosphorus Management Plan (PMP) is due in early 2007. One way to reduce phosphorus discharges is to reduce what is entering the wastewater plant from business and industry.

Under a U.S. EPA Pollution Prevention Grant through the MPCA, MnTAP supported a student worker to provide phosphorus reduction education and assistance to area businesses during summer 2006. Approximately 112 site visits were made to businesses out of 131 businesses contacted, including restaurants, manufacturers, car washes, nursing homes, hospitals, dental offices, and schools. Other pollutants addressed included biological oxygen demand, total suspended solids, fats/oils/greases, and mercury. The student identified 35 businesses using products that contained phosphorus, and will be exploring a switch to a no- or low-phosphorus product. A survey conducted (19% response rate) following the student work concluded:

- Businesses gained a greater understanding of the impacts of phosphorus on water quality and on the alternatives to the use of phosphorus.
- Of those indicating they had phosphorus products, eight were able to reduce or eliminate it in the products they use.
- Reduction of phosphorus from those eight businesses would be equivalent to 876 pounds per year. If the other 27 businesses that indicated they had phosphorus also made a switch, this would equal a potential reduction of 2,965 pounds per year.
- Some survey respondents (25%) indicated they no longer put food waste down the drain.
- Survey respondents (25%) indicated they encountered no barriers to making a switch to low- or no-phosphorus products; a few others indicated cost as a barrier.

Information from this project will be shared with other communities. A fact sheet is being drafted which shows how a city-wide sweep of businesses can be effective in reducing phosphorus to the wastewater treatment plant. MnTAP plans to work with other communities using staff to help with site visits. Recently Lake City has identified 13 manufacturers where it plans to conduct site visits with MnTAP staff.

Steam Trap Assessment (Xcel Energy)

Xcel Energy contracted with MnTAP to provide steam trap assessments to Xcel Energy customers, and then subsequently take advantage of rebate opportunities. Steam traps are part of a steam system that act as automatic valves allowing condensed steam (condensate) to be released while preventing the loss of live steam. When a steam trap fails, live steam is wasted and the boiler has to work harder to deliver energy where it needs to be used.

MnTAP's focus is on high pressure process steam (not low pressure heating system steam) with potentially higher losses, and where staff process experience and industrial contacts can be utilized. For each site, MnTAP conducts roughly two days of steam trap testing, then identifies, documents, and tags failed traps. In addition, MnTAP trains maintenance staff on use of the equipment and drafts a report for the customer and Xcel account representative. The report or worksheet calculates the estimated energy savings, so that it can be used as an application for rebates.

The initial steam trap testing was conducted during fall 2006 at the Metropolitan Council Environmental Services Pig's Eye wastewater treatment plant on their process steam lines. Potential savings of $45,000 and 10,400 MM Btu were identified from steam trap leaks and steam leaks. MnTAP hopes over time to gather enough data that allows for some benchmarking with other facilities. An additional eight Xcel customers have expressed interest and are awaiting assessments. Technology diffusion activities in 2006 focused on the fiberglass, powder coating, metal casting, and metal finishing sectors. These activities included site visits, vendor visits, technology demonstrations, and pilots or trails, addressing input from industry stakeholder meetings.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) – Currently MSUM is undergoing a professional energy audit being conducted by the Energy Services Group. For more information on the audit, please refer to the section 5, *Audits* of this report. Routine assessments are performed internally at MSUM. The involvement of faculty, students, and staff on campus lends a high level of expertise to this assessment. Also, currently the Sustainable Campus Committee is working on a campus-wide environmental assessment through the National Wildlife Federation's Campus Ecology Program.

St. Cloud Technical College (SCTC) – Technical support is provided through MPCA, DOER Safety and Industrial Hygiene Unit, University of Minnesota Chemical Safety Day Program, and other agencies as needed.

St. Cloud State University (SCSU) – St. Cloud State University frequently has highly accredited technical support provided by its Occupational/Environmental Health and Safety consultant, MacNeil Environmental Inc. (MEI). MEI has several Masters level O/EHS specialists on staff and has maintained a Minnesota Licensed Professional Engineer (Civil and Environmental) on campus for eight years in an office in the Buildings and Grounds Management center. The ready availability of this Certified Safety Professional/Certified Industrial Hygienist engineer has aided SCSU recycling, renovations, and waste minimization efforts. It has also fostered close support to the contractors and maintenance and custodial employees, supervisors, and managers most at risk on campus and most involved in pollution prevention projects and efforts. This has also aided substantial reductions in costs associated with hazardous waste and battery recycling.

Department of Transportation (Mn/DOT) – Mn/DOT conducts periodic meeting with district/division personnel who serve as waste management coordinators in addition to their other duties. This group actively integrates waste minimization/pollution prevention into all of the Ddepartment's functions.

Mn/DOT has developed a waste management procedure manual, which incorporates general waste minimization techniques for each hazardous or problem waste generated. Procedures in the manual increase the likelihood that wastes are managed according to federal and state regulations, and in a manner that is practical, cost effective, and minimizes risk to the environment. These manuals were distributed to all Mn/DOT facilities.

Mn/DOT has developed a bridge paint removal manual designed as a guide to comply with Minnesota air quality rules, waste management regulations, and to minimize risk to the environment. The manual is available on the Mn/DOT website at www.dot.state.us/environment.html by accessing *Publication* and selecting *Removing Paint From Bridge Steel Structures.*

Mn/DOT has developed an asbestos removal and building demolition manual designed as a guide to comply with Minnesota air quality, waste management regulations, and minimize risk to the environment. The manual is on the Mn/DOT website at www.dot.state.us/environment.html, go into *Publication* and select *Asbestos and Regulated Waste Material Manual for Building Demolition or Relocations for Construction Projects.*

Mn/DOT is dedicated to studying, coordinating, and evaluating pollution prevention opportunities (as they relate to toxicity reduction) within Mn/DOT. The key task is to research and evaluate new products and/or procedures as they relate to Mn/DOT and recommend changes to existing products and/or procedures when they prove to be more effective from an environmental, economical, and/or regulatory standpoint. Mn/DOT has formalized this hazard evaluation process by issuing a technical memorandum.

Mn/DOT conducts workshops to assist staff in complying with federal and state environmental regulations. Mn/DOT provides ongoing guidance for local communities interested in designing and/or improving bicycling, walking, and telecommuting programs or initiatives.

University of Minnesota – The Regional Sustainable Development Partnerships unite citizens and their university working together to strengthen rural Minnesota (www.regionalpartnerships.umn.edu). The mission of

the Regional Sustainable Development Partnerships is to support sustainable development in greater Minnesota through community and university partnerships in outreach, education, and research.

The three bedrock principles of this initiative are:

- develop and sustain a richer and more vibrant partnership with the citizens of each region and their land grant university.
- address agricultural, natural resources, and tourism issues consistent with sustainable development principles identified as central to our work.
- promote the concept of active citizenship, which calls on us to think first as citizens with a commitment to working through issues and exploring opportunities in an integrated and democratic manner.

We are also guided by principles of sustainability—in other words, what can help us meet needs of the present without compromising the ability of future generations to do so. The Regional Sustainable Development Partnerships work to sustain Minnesota's natural resource-based communities and industries by addressing community-identified agriculture, natural resources, and tourism issues in partnership with the University of Minnesota.

Three core goals shape the work of the Regional Partnerships, and form the basis on which we evaluate our effectiveness:

- build and strengthen effective relationships between citizens, communities, and the university of Minnesota.
- promote active citizen leadership in strengthening the long-term social, economic, and environmental health of greater Minnesota.
- invest in research, education, and outreach projects that advance the understanding and achievement of regional sustainability.

Regional partnerships have been established in northwest, northeast, central, west central, and southeast Minnesota. Additional partnerships are anticipated in the future. Each Regional Sustainable Development Partnership funds research, education, and outreach projects that address issues affecting the long-term sustainability of their regions' natural resource-based industries and the communities that depend on them. Focusing on agriculture, natural resources, and tourism, regional projects reflect the concerns and interests of engaged citizens and partner those citizens with University of Minnesota faculty and students.

Each regional partnership has a board made up of citizens with backgrounds and interests in agriculture, natural resources, tourism, and sustainability as well as university faculty and staff from a wide range of departments. A Statewide Coordinating Committee composed of staff and citizens from each region, at-large citizen representatives, and representatives of the three partnership colleges provide leadership for the program's coordinated efforts. To date, the Regional Partnerships have funded over 180 projects for a total of $3 million. The five regions are also currently collaborating on three major community/university ventures:

- **Energy Self-Reliance Community/University Venture** works to increase farm and community energy self-reliance through renewable fuels, energy conservation, and community ownership and governance of energy resources.
- **Local Food Economies Community/University Venture** works to get wholesome and delicious foods—produced locally—into the hands of consumers and to do it in a way that yields a fair profit for the producer or farmer by creating regional food systems that sustain production, distribution, and marketing opportunities.
- **Appreciating Rural Assets Community/University Venture** works to identify and capitalize on the natural, human, and financial resources of rural communities through community and economic development programs related to tourism, land use, rural policy, and local business development.

The University of Minnesota Center for Sustainable Building Research (CSBR: www.csbr.umn.edu), was established as an official unit within the College of Architecture and Landscape Architecture (CALA) in 2001 although the staff has been conducting building research in CALA since 1997. There is a substantial and growing amount of building research activity in the following areas: sustainable design, energy-efficient

buildings, windows and glazing research, building design process and evaluation, human factors, and building science. Sponsors of CSBR projects include the U.S. Department of Energy and state agencies such as the Minnesota Departments of Natural Resources and Transportation, and the MPCA. Other sponsors include building industry sources such as Aspen Research Corporation. The interdisciplinary nature of CSBR is reflected in the staff that includes architects, mechanical engineers, and psychologists. In addition, there are several affiliated faculty in CALA as well as in other units such as the College of Natural Resources and the College of Human Ecology. The Center for Sustainable Building Research is a place for organizing and effectively growing the research and outreach missions of the college, as well as working with other units to enhance CALA's teaching mission. CSBR serves as a resource for Minnesota, the design professions, and the building industry.

Dynamics, management, and sustainable use of northern forest ecosystems

For nearly a century, research at the Cloquet Forestry Center has provided valuable information to help guide the appropriate use and management of northern forest ecosystems. The Cloquet Forestry Center (www.cnr.umn.edu/cfc), founded in 1909, supports multiple research projects covering many disciplines initiated by University of Minnesota and other researchers. Research conducted at the Cloquet Forestry Center focuses on sustainable use and management of northern forest ecosystems, thus helping citizens and communities balance the ecological, economic, and social demands placed on forests. The center plays a key role in offering a secure location, logistics, and/or technical support to the projects. "The center's combination of cutting-edge and long-term projects offers insights about natural resource management unequaled in the region," said center coordinator, Bob Stine.

While protecting ongoing research, the center is managed to maintain a variety of forest ecosystems and other sites for teaching, research, and outreach activities. Much of the research conducted at the center is aimed at developing forest management practices that integrate multiple values, including fiber, wildlife, air and water quality, recreation, aesthetics, and ecosystem function. Factors evaluated include:

- **Environmental details:** Sustainable management of Minnesota's forest lands is important for current and future generations.
- **Economic details:** Sustainable forest management includes economic benefit across all levels of society, from landowners (both the 140,000 private woodland owners and also public owners), to processors (loggers, bough buyers, gatherers, etc), to manufacturing industries. There are hundreds of small and large primary and secondary wood products firms.
- **Quality of life details:** Forests play an integral role, either directly or indirectly, in the lives of most Minnesotans.

Research at the Cloquet Forestry Center is grouped in the following categories:

- monitoring the response of forest ecosystems to activities such as planting, thinning, harvesting, prescribed burning, genetic tree improvement, vegetation management, and natural disturbances.
- establishing and evaluating long-term ecological studies to assess the dynamics of change and to understand natural processes.
- developing and applying forest genetic resource management techniques, including gene conservation, selection, breeding, and deployment.
- characterizing the hydrometeorological characteristics of watersheds on and near the Cloquet forest.
- evaluating residential construction products and techniques in cold climate conditions.
- expanding wilderness research capabilities in collaboration with the Wilderness Research Center.
- using the center's data bases for development of multiple resource management models.
- using the center and its research and management activities as a field laboratory for the training of natural resource professionals and for the demonstration and communication of research to interested publics.

34. Tires

Department of Administration (Admin) – The Materials Management Division has contracts for tire recovery and for retread tires utilizing old tire casings. The Travel Management Division, Plant Management Division, Department of Transportation, and other state agencies may purchase from these contracts. The state and CPV members purchased in excess of $900,000 in retread tires in FY 2005. The Materials Management Division's *Waste Tire Pickup, Transportation, Processing, and Disposal* contract recycles waste tires. The tires are processed into chips, which are then recycled for use in road surfaces. The Travel Management Division's used tires are recycled through a vendor licensed under state contract.

Department of Corrections (DOC) – Multiple facilities recycle used tires.

Iron Range Resources and Rehabilitation Agency (IRRR) – Used tires are transported to the regional landfill in Virginia, and from there the tires are brought to R and J Tire in Meadowlands to be shredded and recycled into various rubber products such as rubber mats for truck boxes and solid fuel for burners.

Metropolitan Airports Commission (MAC) – High-mileage tires have provided the most economical service in many applications and utilizing these tires reduces both the number of tires purchased and the number of tires requiring disposal. Tractor tires that can no longer be used by MAC Maintenance on the paved surfaces of the airport are reused in off-road (agricultural) applications instead of being disposed of. All vehicle and heavy equipment tires are transported to and recycled by a permitted vendor when no longer useable.

Department of Military Affairs – The MNARNG recycled 68,000 pounds of tires through the Defense Reutilization Marketing Office (DRMO) in Duluth.

Minnesota State Colleges and Universities (MnSCU)

Central Lakes College, Brainerd and Staples – We encourage our heavy equipment and diesel programs to have suppliers take the used tires when purchasing new.

Minnesota State University, Moorhead (MSUM) – All used tires are replaced and recycled at an off-campus vendor.

Northwest Technical College, Bemidji, MN – All tires are recycled.

St. Cloud State University (SCSU) – About 95 tires are recycled each year at SCSU at a cost of about $1.25 each. They are ground up and become components in other products.

St. Cloud Technical College (SCTC) – All tires are recycled through local vendors.

Department of Natural Resources (DNR) – All used tires at DNR shops are recycled through the contract vendor on state contract. The tires are stored until there is sufficient number for the vendor to come and pick them up.

Department of Transportation (Mn/DOT) – Mn/DOT recycles all waste tires generated by Mn/DOT as well as the tires that are found along Mn/DOT right-of-way. Mn/DOT recaps a small percentage of waste tires. However, due to the conditions under which Mn/DOT vehicles are operated, (plowing snow) only a limited amount of re-capped tires can be safely used.

35. Water Treatment and Conservation

Department of Administration (Admin) – The Plant Management Division rebuilds parking lots and structures to meet water division guidelines. The Materials Management Division developed a contract for salmon and trout feed that reduces the effluent produced by excess feeding of fish. The water quality downstream from state hatcheries will improve as a result of this contract.

Department of Corrections – All facilities continue to install low-flow toilets in new unit construction projects.

MCF-Lino Lakes – Installed a new chemical feed system to minimize chemical usage and ensure better control of water treatment.

Metropolitan Airports Commission (MAC) – The truck/equipment wash bay in the Field Maintenance building uses a complete water recycling system. This greatly reduces the amount of wastewater generated. Restrooms in the Lindbergh Terminal use water-conserving devices such as water saver urinals and toilets with electronic flush valves and sinks with electronic faucets and aerators. Standards for new construction require these water-saving devices. The Humphrey Terminal and the MAC general office were built to these standards.

Metropolitan Council Environmental Services (MCES) – The MCES is the division of the Metropolitan Council that treats wastewater. The system collects and treats over 300 million gallons of wastewater per day from 103 communities and over 2 million people. The MCES operates about 600 miles of interceptor sewers, 63 lift (pumping) stations, 190 metering stations, and eight treatment plants. The current annual operating budget of the MCES is $170 million with a capital budget of $199 million. Clean effluent is discharged to four area rivers—the Mississippi, Minnesota, St. Croix, and Vermillion. From the Metro WWTP alone, over 74 billion gallons of treated wastewater were discharged to the Mississippi last year. Pollution prevention effecting the quality of effluent was described in the section on heavy metals.

One area that clearly falls under pollution prevention in MCES operations is the beneficial reuse of residual solids from the wastewater treatment process. Biosolids, or sewage sludge, at the two largest treatment plants are incinerated in multiple-hearth furnaces, resulting in an 80 percent reduction in volume of residual solids. The ash utilization program has been suspended while at the same time analyses and feasibility studies are being conducted for possible approval by the MPCA's case-specific beneficial use determination program. All ashes are presently being landfilled.

Straight biosolids (without any blended components) are typically landspread on farm fields. The Empire WWTP spread a total of 4,766 wet tons and 775 dry tons of biosolids directly to approved sites. A total of 11,812 tons of heat-dried biosolids in the form of pellets from the Blue Lake WWTP in Shakopee was produced for land application in 2005.

Minnesota Pollution Control Agency – The Minnesota Pollution Control Agency's Brainerd office has leased premises that feature water conservation fixtures including low-volume flush toilets. In May 2003, the MPCA renegotiated its lease on its St. Paul office, and as part of that lease the MPCA installed low-flow water-conserving plumbing fixtures.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University (BSU) – Water conservation devices installed in 2002 continue to reduce water consumption by approximately three million gallons per year as compared to pre-installation usage. That represented a savings of approximately $25,000 in FY2006.

Minnesota State University, Moorhead (MSUM) – A computer managed watering system has been installed on the athletic field, in addition to the systems installed on the campus mall area and surrounding landscaped areas. This system initiates watering at night, thereby reducing water evaporation. A stormwater detention pond and underground drainage system was recently completed and is managed

under the university's stormwater pollution prevention program. This system significantly reduces the amount of contaminated runoff water directly flowing into the city's storm sewer. An energy audit was recently conducted by Energy Services Group with a focus on a water usage assessment.

St. Cloud State University (SCSU) – This past year, progress continued at SCSU on replacing systems to reduce water use. Extensive lead-in-water testing has been completed in the campus houses being used for office space. Results were all well below the action level and most were below 5.0 ug/l. A MnSCU survey resulted in some water conservation improvements. A dorm (SBH) flushing retrofit project cut water usage by half. However, the lower flows put SBH into a subsequently higher rate, which resulted in anticipated saving becoming a wash.

Department of Transportation (Mn/DOT) – Mn/DOT uses low-consumption toilets, urinals, and sinks that use one-third of the water as compared to traditional fixtures, thereby saving thousands of gallons of water each day. Mn/DOT developed a waste trap and sediment trap management procedure for disposing of wastewater that meets regulatory requirements while being practical, cost effective, and minimizes risk to the environment.

Mn/DOT practices and promotes the use of native plants such as grasses, trees, and shrubs. By using native plantings, maintenance demands are reduced, which includes less watering and energy use.

University of Minnesota – The Water Resources Center (WRC) (http://wrc.coafes.umn.edu) is a multifaceted center with active programs in research, outreach, and education. The WRC works to help coordinate, conduct, and fund research and outreach related to water resources in the state of Minnesota enabling more effective delivery of research results to decision-makers and citizens; opening new avenues for multi-disciplinary and interdisciplinary partnerships; and providing a critical link between students and water resources professionals, allowing students maximum access to the university's water programs. The graduate program in Water Resources Science also is administered by the WRC. The WRC's creation in 1996 united three long-standing University of Minnesota water programs, the Water Resources Research Center, the Center for Agricultural Impacts on Water Quality, and the Extension Water Quality Program, into a larger enterprise. The goal of the WRC is to integrate the missions of the three water programs.

36. Other

Department of Administration (Admin) – The Materials Management Division, in conjunction with the Minnesota Pollution Control Agency, has developed a contract for the technical operation and maintenance of closed landfills. This contract prevents air pollution by burning off gas through flares, and helps prevent groundwater pollution near the landfills by collecting and removing condensate and leachate produced in the landfills.

The Materials Management Division has developed contracts for using the waste food from the correctional facilities for feed for farm animals, thereby reducing the amount of solid waste going into landfills.

Department of Corrections (DOC) – DOC has made a significant effort to reduce waste. Multiple facilities have arrangements with local farmers to have food waste picked up and used for feed. This reduces the amount of waste sent to landfills and the amount of treatment required for water that would contain an elevated level of BODs and suspended solids.

MCF-Oak Park Heights– The facility is recycling all foam mattress and pillows, thus reducing the amount of material needing to be landfilled.

MCF-Stillwater recycled 247,520 pounds of paper in FY 2006.

Iron Range Resources and Rehabilitation Agency (IRRR) – Aluminum cans at all of the agencies facilities are collected and brought to various recycle locations.

Metropolitan Council Environmental Services (MCES) – Odor control is a significant activity in the wastewater treatment process. Traditional odor control involves the collection of air that is passed over inert media that is sprayed with sodium hydroxide (caustic) or sodium hypochlorite (bleach), which destroys sulfur-bearing air borne compounds. Other traditional odor control technologies involve the oxidation of compounds over potassium permanganate pellets or scrubbing though activated carbon.

An alternative odor control technology passes this same air though a biofilter. The biofilter is a blend of compost and a bulking agent, such as wood chips, which enhances the growth of naturally occurring microorganisms that consume and break down the sulfur-bearing compounds. At the metro WWTP, it is estimated that the biofilter reduces the need for 100 gallons of caustic and 100 gallons of bleach every day. Operating costs of the biofilter include electrical fans for air pressure and periodic media replacement. The estimated cost of energy and media replacement at $220,000 per year is slightly more than half of the cost of operating an equivalent chemical scrubber. 2005 is the second year of successful biofilter operation.

Department of Military Affairs – The JFMN (Army) has established a recycling account that is used to fund pollution prevention and other environmental projects. Money is generated from the sale of recyclable materials and from an account established with the Defense Reutilization and Marketing Office, which markets hazardous materials received from JFMN facilities and returns a portion of the money to this account. The Environmental Quality Control Committee, made up of senior DMA staff, controls these funds. Pollution prevention projects funded by this account include the purchase of new garbage and recycling trucks.

Minnesota Pollution Control Agency – Several regional MPCA offices have specific reduction programs in effect, including composting food waste, vermicomposting/leachate used as indoor plant fertilizer in office, using refillable soda bottles, and promoting paper reduction initiatives.

The Alliance for Recycling and Reduction of Waste (ARROW), a group of MPCA employees who serve as a point of contract for any recycling (reuse, reduce, or rethink) or composting questions, has maintained an extensive composting project since September of 1999. The project allows all compostable materials (including cafeteria food waste, napkins, biodegradable utensils, and paper towels from restrooms) to be collected and managed separately from non-compostable refuse. Through the first eight months of the program, 28 percent of the solid waste generated was composted. In 2005, 25 tons of solid waste was discarded and 13 tons of material was composted.

In May 2006 the ARROW Committee conducted a survey of St. Paul staff regarding their personal efforts to reduce, reuse, and recycle at the work place. Results were shared with staff in July 2006 along with general conclusions from the survey. The number of responses received was 354 with good representation from all floors. The ARROW Committee intends to follow up on ideas generated by the survey in 2006-2007 to improve the current composting and recycling programs.

The MPCA Brainerd office has found homes for used office items in 2004, including credenzas, desks, and file cabinets.

The Duluth MPCA office started composting food waste using worms in 2000 and continues that practice. As of August 2005, the office has composted just over 700 pounds of food waste. In 2004, the Duluth office composted 90 pounds, and so far in 2005, 43.17 pounds. Staff then use the worm by-products as fertilizer and soil amendment for gardens at their homes. The Duluth office also had a Green Power Campaign. The campaign was aimed at encouraging state employees to purchase environmentally friendly power from local power companies. Over 10 percent of the office signed up.

The Rochester office has for years taken envelopes sent to it, and reused them by converting them into interoffice mail envelopes. Rochester also makes a concerted effort to carpool to St. Paul as much as possible. The Rochester office also reuses old furniture. Rochester keeps a compost bucket for coffee grounds and vegetable waste. A staff member takes it home and uses it on his garden. Two staff members team up and get soda directly from the Coca-Cola bottler in Winona so there is no waste aluminum to recycle. Paper shredded in the Rochester MPCA and Minnesota Health Department offices is bagged and taken home by a staff member for use as bedding by his neighbor's calves. One staff member located by the printer tries to use paper for printing that had been printed previously only on one side.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM)

Stormwater management. MSUM has developed a stormwater pollution prevention program (SWPPP) in order to minimize the harmful effects of stormwater runoff and its potential to affect the water quality of the Red River. The SWPPP includes public outreach, education, and involvement; controlling illicit discharges; maintaining clean construction sites; and pollution prevention and good housekeeping measures. Some of the year's activities are listed in the following paragraphs.

Students helped post stormwater informational pamphlets, brochures, and other educational materials at several public locations throughout the university campus. This past year, a student intern created a brochure specific to the university's stormwater program, including hotline numbers to call for both the university and the city of Moorhead so community members can report concerns of potential stormwater pollution. The Department of Environmental Health and Safety's stormwater website, featuring not only the university's programs and information, but also local, state, and federal stormwater information, was further developed and updated by students. Student interns assisted in updating a specific Emergency Spill Response Program for the Physical Plant addressing any potential large spills that might enter the stormwater drainage system. Physical Plant staff attended the training sessions, which also included tabletop discussions on various spill scenarios and response procedures.

In cooperation with the Sustainable Campus Initiative Committee, featured speakers included stormwater education at public lectures during Earth Week. In conjunction with Earth Week, MSUM had its annual campus cleanup event involving students, faculty, staff, and administrators helping clean lawns, parking lots, landscaped areas, storm drains, boulevards, etc., promoting the event as a means to also minimize potential stormwater pollution from runoff. University community members attended public informational sessions involving stormwater educational presentations, brochures, pamphlets, and open discussions. All campus parking lots and roadway storm drains were stenciled by students educating the general community warning not to dump anything into the drains, as it may eventually drain into the Red River. Students put up posters around campus, educating university community members to monitor parking lots and grounds and report potential sources of stormwater contaminants by calling a hotline phone number. Students working with the Department of Environmental Health and Safety were trained on stormwater drain inspections and took part in assisting the Physical Plant with the process.

Physical Plant employees responsible for university grounds received training on stormwater impacts from lawn care, landscaping, and pest control applications. Procedures are in place for vehicle and lawn equipment washing, requiring it be accomplished within interior wash bays. Procedures are in place involving regular parking lot and sidewalk cleaning with machine sweeping and vacuuming removing surface sediment and debris. MSUM has in place an on-going storm drain inspection and cleaning program that includes storm drain grates, detention pond, pump station, catch basins, and other appurtenances. Evaluation in the use of alternative products, primarily pesticides and herbicides, continues to be investigated to minimize contaminated stormwater. MSUM primarily utilizes sand as an alternative to salt when addressing icy sidewalks and parking lots, minimizing pollutant runoff, and in addition, the sand is swept up each spring and recycled in use. Hazardous material storage areas are inspected on a regular basis. Hazardous material storage areas are enclosed, utilize spill prevention, and are provided with secondary containment systems and spill response. This past year, an Emergency Spill Response Program was further developed that included updated training with Physical Plant staff in providing better preparation toward addressing hazardous material spill response. Exterior signs are placed in problem areas reminding neighboring pet owners to collect and place in a proper receptacle their animal's fecal waste. A vehicle maintenance program reminds drivers of both fleet and service vehicles to regularly inspect their vehicles and report any maintenance concerns to the Physical Plant.

St. Cloud State University (SCSU) – SCSU has recycled glassware from the Biology stockroom due to the ongoing initiative of a very supportive faculty member.

Department of Transportation (Mn/DOT) – Mn/DOT has expanded the Hazard Evaluation Process for evaluating waste materials before use in roadway infrastructure to include virgin products not containing waste materials. Through extensive safety review, Mn/DOT has developed a specification approving the use of all-steel guardrail posts. Steel guardrail posts are recyclable, save installation time, and eliminate the disposal and chemical leaching concerns associated with treated woods. Mn/DOT is constructing salt sheds made of recyclable materials, eliminating the disposal and chemical leaching concerns associate with treated woods.

Mn/DOT recycles approximately 1.5 million tons of asphalt and 2 million tons of concrete annually. Mn/DOT developed a procedure to address all containers found in Mn/DOT right-of-way. The department developed a safe, practical, and cost-effective procedure to manage this material, much of which is recycled. Mn/DOT is a strong advocate of electronic communication (e-mail and teleconferencing), which results in energy and product savings.

University of Minnesota

Clean Air Minnesota partnership: The University of Minnesota became a partner in Clean Air Minnesota. The university's Waste Abatement Committee and Facilities Management staff has started working with Clean Air Minnesota staff to evaluate, plan, and implement air pollution strategies for the university.

Clean Air Minnesota is a voluntary partnership of businesses, environmental groups, government agencies, and citizens working together to achieve significant, measurable reduction in air pollution. Clean Air Minnesota's approach unites partners to craft voluntary pollution solutions before Minnesota violates federal air quality standards. This groundbreaking program follows a Minnesota tradition of leadership on environmental and health issues. Leveraging the resources and expertise of its partners, Clean Air Minnesota works to achieve real emissions reductions. Clean Air Minnesota's action plan centers on improving air quality by reducing emissions generated by individuals and businesses.

Water quality – stormwater pollution prevention plan: The university has developed a stormwater pollution prevention plan and submitted to the Minnesota Pollution Control Agency a municipal separate storm sewer system permit application for the Twin Cities' campus (www.dehs.umn.edu/iead/stormwater) in order to meet stormwater regulations of the National Pollutant Discharge Elimination System permit program. This 1987 amendment to the Clean Water Act developed a program to minimize or eliminate pollutants from entering water runoff. Finalizing the stormwater pollution prevention program was only the first step in protecting stormwater runoff on campus.

Over the next few years, the prevention plan shifts into an improvement plan that could change a few aspects of the university environment. The improvement plan will probably change how university workers keep grass green during the summer and deice sidewalks in winter. In response to the federal requirements, a university stormwater task force of six faculty and staff brainstormed, studied data, and discussed strategies for protecting the environment against further pollution. The regulations required applicants to submit proposals in six areas to further minimize contaminates from entering stormwater. From extending public outreach and education to controlling illicit discharges and maintaining clean construction sites, the university task force followed permit guidelines and laid groundwork to save the environment from further degradation. The task force will continue meeting to make sure the university meets the stormwater pollution prevention plan.

The Commission on Environmental Science and Policy: The Commission on Environmental Science and Policy (www.cnr.umn.edu/enviro) was created by Executive Vice President and Provost Robert L. Bruininks in recognition of a need to capitalize on the effort expended by the university on environmental issues by enhancing the conditions for new synergistic activities both within the university and between the university and the communities it serves. Environmental science and policy are potentially the largest single unifying subjects across the broad spectrum of administrative units and faculty of the University of Minnesota. This is a response to the great societal need to identify alternatives and inform decisions that address the serious environmental challenges facing Minnesota, the United States, and the world community. Numerous University of Minnesota components have demonstrated their commitment to address the needs of Minnesota communities through active pursuit of research, teaching, and outreach programs that address their needs at a variety of scales. Environmental science, ethics, and policy—and the concepts they embody—can be a unifying principle for a wide range of interdisciplinary problems and solutions.

The overarching goal of the commission is to enhance, foster, and make more visible our efforts in research, education, and outreach in environment at the University of Minnesota. We want to improve the environmental literacy of our students, of the citizens of our state, and of the world community. We also need to help society make well-informed judgments about the social and biophysical options, and associated consequences, that are critical to the decision-making process. Over the longer term, our vision is to achieve an international reputation as the recognized leader in this field. Achieving this goal will require a more cohesive, synergistic organization of the university's environmentally related resources. Creation of such a system would allow the university to transcend the mere sum of its leading programs and scholars.

The 32-member commission carefully considered the university's many strengths and opportunities in the broadly defined environmental arena. They found the university can be justifiably proud of its efforts in environmental science and policy, but it is missing opportunities and falling short of its potential. More importantly, it is falling short of society's need for environmental awareness, understanding, and action guided by science. Their report identifies 27 recommendations clustered in three areas: communication, coordination, and capacity. The recommendations are viewed as a starting point for further discussion. With refinement they could become a new academic initiative for the university.

Water quality–field drainage research: University research hopes to find ways to plan and manage farm drainage operations in a way that doesn't affect crop yield but does improve water quality. University professor Gary Sands invented a new agriculture drainage calculator that saves users time and headaches through a partnership with Prinsco, Inc., the largest drainage pipe manufacturer in Minnesota. The calculator will help drainage system designers determine the amount of water needed to be drained in a day, based on area size and slope grade. A drainage system is a network of plastic pipes laid beneath the ground's surface to funnel water away from an area. There are millions of feet of drainage pipe in the state, most of it located on southern Minnesota farms.

Professor Sands is conducting a long-term study that examines the relationship between pipe depth and water quality in agricultural drainage systems. He hypothesizes more shallowly laid pipes will increase water quality by draining less water, thus allowing nitrogen to reach the saturated soil where bacteria will convert it to nitrogen gas. His study might help solve some disputes between farmers and environmentalists by lowering the amounts of nitrogen drained into drinking water but not compromising crop yields.

Ever since the earliest settlers staked out their land, farmers in southern Minnesota have depended on artificial drainage systems to rid fields of excess water that prevented optimum crop production. But modern drainage systems are now combined with modern farming practices, which include adding nitrogen to the land to increase productivity. As a result, drained water is carrying high levels of the water-soluble form of nitrogen into the nation's water system. Some surface water contains 15 ppm to 40 ppm of nitrogen. Acceptable drinking water should only contain 10 ppm. Ideally, we can find ways to manage farm operations in a way that doesn't affect yield but does improve water quality. Nitrogen is also the major contributing factor to the spread of hypoxia, oxygen depletion, in nation's waters. At the mouth of the Mississippi River in the Gulf of Mexico, hypoxia occurs where aquatic life is severely compromised because of chemical runoff.

Activity type	Department of Administration	Department of Agriculture	Department of Commerce	Department of Corrections	Department of Employee Relations	Dept. of Employment and Economic Development	Department of Health	Iron Range Resources & Rehabilitation	Metropolitan Airports Commission	Met Council–Environmental Services	Met Council–Metro Transit	Metropolitan Mosquito Control	Department of Military Affairs	Minnesota Pollution Control Agency	Minnesota State Colleges and Universities (MNSCU)	Department of Natural Resources	Department of Revenue	Department of Transportation	University of Minnesota
Absorbents	FY06 O/P			FY06 O/P		O		O	O	FY06 O	FY06 O		O		O/Q	O		O	O
Adhesives	FY06 O/P					O							O			O			
Air quality, CFCs	FY06 O/P	O		FY06 O/P		O			O		FY06 O/P		FY06 O		O	O		O	O
Antifreeze	FY06 O/P			FY06 O/P		O		O	O		FY06 O		FY06 O/Q		O/Q	O		O	O
Audits	FY06 O/P			FY06 O/P		FY06 O/P			O		O/P		O		O	FY06 O/P		O	O
Auto fuels	FY06 O/P/Q	O	FY06 O/P/Q	FY06 O/P/Q		O/Q		O	FY06 O/P/Q			FY06 O/P	O/Q	O	O/Q	FY06 Q	FY06 O/P/Q	O	FY05 O/Q
Auto maintenance	FY06 O/P		FY06 O/P	FY06 O/P		O		O	FY06 O/P/Q			FY06 O/P	O		O/Q	O	FY06 O/P/Q	O	O
Batteries	FY06 O/P		FY06 O	FY06 O/P		O		O	O	O/Q	FY06 O		FY06 O/P/Q	O	O/Q	O		O	O
Cleaning supplies	FY06 O/P	O		FY06 O/P/Q		O/Q		O			FY06 O		O	O	O/Q	P/Q		O	O/P
Commuting & transportation	FY06 O/P		FY06 O/Q	FY06 O/P	FY06 O/P	O		O	FY06 O/P	O/Q	FY06 O/P			O	O/Q	O		O	FY05 O/P/Q
Education, comm. & training	FY06 O/P	O		FY06 O/P		O			O	O	P	FY06 O/P	FY06 Q	O/P	O	O	FY06 O/P/Q	O	FY05 O/P
Electronics	FY06 O/P		FY06 O	FY06 O/P	FY06 O/P	O		FY06 Q	O	O/Q			FY06 O	O	FY06 O/Q	O	FY06 O/P/Q	O	O
Energy– lighting	FY06 O/P			FY06 O/P	FY06 O/P/Q	O		FY06 Q	O	O/Q	FY06 O/P		FY06 O/P/Q	O	FY06 O/P/Q	O	O	O	O
Energy – production	FY06 O/P		FY06 O/P	FY06 O/P				O		O/Q	O			O	FY06 P/Q		O	O	FY05 O/P
Groundwater wells	FY06 O/P			FY06 O/P		O/Q					O		O		O	O/Q	O		
Heavy metals	FY06 O/P	O		FY06 O/P						O/Q			FY06 O	O	O/Q		O	O	O
HVAC, indoor air quality	FY06 O/P			FY06 O/P		O		O	O/P		FY06 O/P	FY06 O/P	FY06 O	O	FY06 O/P	O	O	O	FY05 O/P
Ice control, sanding	FY06 O/P			FY06 O/P				O	O		FY06 O/P		O	O	O/Q		O	O	O
Laboratory	FY05	O	FY06 O	FY06 O/P										O	O/Q			O	O

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Landscaping	FY06 O/P			FY06 O/P		O		O					O	O	O/Q	O		O	FY06 O/P
Materials exchange	FY06 O/P			FY06 O/P					O		FY6 P		O	O					O
Office supplies	FY06 O/P/Q	O	FY06 O	FY06 O/P/Q		O		FY06 Q	FY06 O/P/Q	O/Q		FY06 O/P	O	O	O	O	FY06 O/P/Q	O	O/Q
Oil, oil filters	FY06 O/P			FY06 O/P		O		O	O	O/Q	FY6 O		FY06 O/Q		O/Q	O		O	O
Paints, coating, stripping	FY06 O/P			FY06 O/P		O			O		FY6 O		FY06 O	O	O/Q	O		O	O
Parts cleaning	FY06 O/P					O		O	O	O/Q	FY6 O		O		O/Q	O		O	O/Q
Personal care						O										O			
Pesticides, fertilizers	FY06 O/P	O		FY06 O/P		O							O		O/Q	O		O	O
Policy statement	FY06 O/P	O	FY06 O	FY06 O/P		Q		O	O	O			O/Q	O	O	Q	FY05 O/P/Q	O	O
Printing	FY06 O/P		FY06 O/P/Q			O								O		O		O	O
Procurement	FY06 O/P	O		FY06 O/P	FY06 O/P	O		O	O		FY06 O		O	O	O/Q	O		O	O
Remanufactured parts	FY06 O/P					O		O	O		O			O	O	O		O	
Tanks	FY06 O/P		FY06 O	FY06 O/P		O		O	O		FY06 O/P		O		O/Q	0		O	O
Technical support	FY06 O/P			FY06 O/P		O		O	O	O			O/Q	O	O	O		O	O
Tires	FY06 O/P			FY06 O/P		O		O	O		FY06 O/P		O/Q		O/Q	O		O	
Water treatment, conservation	FY06 O/P			FY06 O/P		O			O	O/Q	FY06 O/P		O	O	O	O		O	O
Other	FY06 O/P			FY06 O/P						FY06 O			O	O	O			O	O