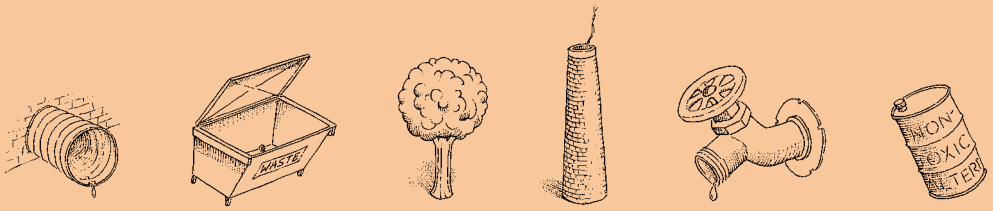
Interagency Pollution Prevention Advisory Team [IPPAT]



Pollution Prevention Summary Report

Consolidated from reports submitted by members of the Interagency Pollution Prevention Advisory Team

Fiscal year 2008

POLLUTION PREVENTION
Right From The Start

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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 back cover.

IPPAT is coordinated by the Minnesota Pollution Control Agency. For more information about IPPAT or this report, contact Linda Countryman at 651-757-2292, 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.

Please note that the text for Parts 1-4 was taken directly from the responses received from the various state agencies, and inserted as submitted—length, style, and content varies from agency to 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 2008.

Department of Administration (Admin) – The mission of the Department of Administration (Admin) is "to help its customers succeed." 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 12 distinct business units and about 500 employees, the department strives to address the needs of government and citizens, from managing state-owned buildings and grounds to establishing statewide technology purchasing policy. Throughout its daily and strategic work, the 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 from the following Internet sites:

- http://www.admin.state.mn.us
- http://www.RRP.state.mn.us
- http://www.mmd.admin.state.mn.us

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

Five environmental awards resulted from the Admin's customer services in the last eight years, demonstrating public recognition of the program's achievements.

Department of Commerce – The department employs approximately 305 full-time staff in downtown St. Paul (primary), Burnsville (Weights and Measures division), and field locations. This report outlines the P2 activities of the department as a whole. The staff has not received any formal P2 training in the past year.

Department of Agriculture – The Department of Agriculture is currently co-located with the Minnesota Department of Health in the Freeman Office Building located at 625 North Robert Street, St. Paul, Minnesota 55155. The Department of Agriculture currently has approximately 420 employees at approximately 11 staffed locations. This report details actions that were taken at the Department of Agriculture headquarters in the Freeman Office Building.

Department of Corrections (DOC) – This pollution prevention summary report contains information from fiscal year 2008 for the Department of Corrections (DOC). The DOC has approximately 4,300 employees working in 10 juvenile and adult facilities, field offices, a central office, and MINNCOR Industries. Throughout the year, selected facility staff within the DOC has received pollution prevention training, including waste, water, air, and hazardous waste.

Department of Employment and Economic Development (DEED) – DEED has approximately 1,600 employees working in 48 staffed facility locations. This report includes information for our whole agency. DEED staff has not received any P2 training during the past year.

Iron Range Resources and Rehabilitation Agency (IRRR) – Iron Range Resources is a state agency that strives to enhance the economic vitality of the Taconite Assistance Area (TAA) through value-driven, cost-effective projects and programs designed for the long-range benefit of the area. 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 divisions and locations is 57 employees as of August 2008. These employees staff three facilities owned and operated by Iron Range Resources. The main administration building is located two miles south of Eveleth on U.S. Highway 53. This building provides office space for the staffing needs of Administrative Services, Development Strategies, Marketing & Communication, and Community Development.

The second facility is the Mining, Minerals, and Reclamation Division located in Chisholm. The program helps make today's iron ore mining lands usable for future generations, both for recreation and economic development. Mining and Reclamation grew 83,000 containerized seedlings in an onsite growth chamber. The seedlings were planted on the Mesabi and Vermilion iron ranges.

The third facility is Giants Ridge Golf and Ski Resort located near Biwabik, Minnesota. It is set in the rugged beauty of Minnesota' northwoods, Giants Ridge is a first-class, four season family-orientated resort owned by Iron Range Resources. The agency bought the facility in 1984 to accomplish four goals: create economic development; provide recreational facilities to enhance the quality of life for people of the Iron Range; attract private sector development; and, create a year-round destination resort. Giants Ridge features two nationally recognized 18-hole championship caliber golf courses and a ski resort ranked number one in Minnesota.

Metropolitan Airports Commission (MAC) – The Minnesota Legislature created the Metropolitan Airports Commission (MAC) in 1943 as a public corporation and established as its mission 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." The MAC is governed by 15 commissioners. Thirteen are appointed by the Governor of the State of Minnesota. The remaining two are the mayors of Minneapolis and St. Paul or their designees.

The MAC 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 2007, MSP serviced more than 35 million passengers and supported 449,149 flight operations. The Reliever Airport system supports more than 500,000 flight operations per year.

The MAC presently employs approximately 566 people responsible for a wide variety of duties. The airport system has been likened to "running a small city." The organization can be divided into three areas—Landside, Airside, and Administration. 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, IS, 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, as well as Maintenance, Trades, and two administrative locations. The MAC continually re-evaluates and updates all pollution prevention methods and practices. Communication and topic-specific training are ongoing.

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

The 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 645 staff (full-time equivalent positions). This report will describe 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 the light-rail system, for Minneapolis, St. Paul, and surrounding suburban areas including 78 cities.

The MCES is an active member of the Interagency Pollution Prevention Advisory Team (IPPAT). 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 Mosquito Control District (MMCD) – The Metropolitan Mosquito Control District (MMCD) controls mosquitoes and black flies in the metropolitan counties of Anoka, eastern Carver, Dakota, Hennepin, Ramsey, Scott, and Washington. MMCD employs 55 full-time staff and approximately 200 part-time staff during the mosquito and black fly breeding season. MMCD operates a warehouse facility, six field operations facilities, and a central administration building. MMCD also owns and operates a fleet of vehicles. This report will cover pollution prevention activities for all the facilities operated by Metropolitan Mosquito Control District for the 2007/2008 reporting period.

Minnesota Army National Guard (MNARNG) – The Department of Military Affairs (MNARNG) has facilities located throughout the state of Minnesota, including Camp Ripley and the Arden Hills Area Training Site (AHATS). The MNARNG has approximately 11,000 part-time employees and 2,700 full-time employees exercising both state and federal missions. This report summarizes the on-going pollution prevention (P2) initiatives and activities of the MNARNG throughout the state.

Minnesota Pollution Control Agency (MPCA) – The Minnesota Pollution Control Agency (MPCA) has approximately 1,000 staff members. 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.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – Alexandria Technical College (ATC) employs approximately 250 faculty and staff members at two locations: the main campus and 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, Cambridge and Coon Rapids – Anoka Ramsey is a community college with campuses located in Cambridge and Coon Rapids. This report covers both campuses. Our staff has not received any P2 training. The Coon Rapids campus consists of 100 acres and 11 buildings. The Cambridge campus consists of 110 acres and four buildings. Combined staff is approximately 550.

Anoka Technical College, Anoka – Anoka Technical College (ATC) employs approximately 166 faculty and staff (including adjunct faculty). This report will cover the activities at our campus. Our employees did not receive any formal P2 training in the past year.

Century College, White Bear Lake – Century College campus covers 160 acres in Mahtomedi and White Bear Lake. The college employs approximately 700 faculty and staff providing a wide range of technical and general education programs at three operating locations. This summary covers all operating locations.

Dakota County Technical College – Approximately 250 staff and faculty members work at Dakota County Technical College. We have four sites. We are reporting as a whole. Approximately 40 staff members have received P2 training.

Itasca Community College, Itasca – Itasca Community College employs approximately 150 faculty and staff on one campus. This report covers the entire campus. Employees did not receive any P2 training in the past year.

Hennepin Technical College, Brooklyn Park and Eden Prairie – Hennepin Technical College (HTC) employs approximately 600 faculty and staff at our two campuses in Brooklyn Park and Eden Prairie, plus our customized training offices in Plymouth and Bloomington. This report will cover the activities at our two campuses. Employees did not receive any formal pollution prevention (P2) training in the past year.

Minneapolis Community and Technical College, Minneapolis – Approximately 800 employees work at the three Minneapolis Community and Technical College (MCTC) sites, including our main campus (Minneapolis), Aviation Center (Eden Prairie), and the Center for Criminal Justice and Law Enforcement (St. Paul). Affected staff and faculty have received Employee Right to Know, Hazardous Waste, and Laboratory Safety training.

Minnesota State University Moorhead – Minnesota State University Moorhead (MSUM) currently employs approximately 325 full-time faculty, 150 part-time faculty, and 325 staff members. These employees serve an enrollment of over 7,650 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.

Normandale Community College, Bloomington – Normandale Community College is a two-year college located in Bloomington, serving primarily the southwest suburbs of the Twin Cities. Normandale has a staff of approximately 550 serving approximately 13,400 students per year. This report represents Normandale Community College's efforts to reduce pollution. Our staff has not attended any P2 training.

North Hennepin Community College (NHCC) – North Hennepin Community College is committed to educating a diverse community of learners to maximize their intellectual, creative, and leadership potential. NHCC has approximately 400 employees working at this agency, with two locations: North Hennepin Community College campus, plus off-campus classes at Buffalo High School in Buffalo. We are

reporting only for North Hennepin Community College campus. P2 training is required of Plant Services staff and certain other staff, voluntary on part of other staff.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC employs approximately 350 employees (administration, faculty, and staff) at two campuses in East Grand Forks and Thief River Falls, plus the airport, Roseau, and Mahnomen sites and the Swenson House. This report will cover the activities at our two campuses and the airport site. There was no formal employee training for pollution prevention in fiscal year 2008.

Riverland Community College, Albert Lea, Austin, and Owatonna – Riverland Community College has three buildings in two cities located in southern Minnesota—one in Albert Lea and two in Austin. We also have an outreach site in Owatonna. This report is for all four sites. There are approximately 300 full-time and part-time college employees employed as faculty or staff. No staff has had any formal P2 training.

St. Cloud State University, St. Cloud – St. Cloud State University (SCSU) employs full-time and part-time approximately 1,500 administrative, teaching, clerical, and technical maintenance personnel. The campus consists of 43 buildings and is situated on over 100 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. In September of 2006, the university hired its first permanent in-house safety administrator. We still bring in outside help to cover some of our training needs and to help with environmental needs in special areas.

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

South Central College, Faribault and North Mankato – South Central College has two buildings located in south-central Minnesota, North Mankato and Faribault. This report is for both sites. South Central College employs approximately 230 full-time and part-time faculty and staff.

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 fulltime and seasonal employees and 41 contractors located in 15 offices: the home office in St. Paul, 14 offices in the metro and greater 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) – Mn/DOT has approximately 4,550 employees and is a de-centralized 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, has numerous remote salt sheds and gravel pits, and maintains approximately 12,000 miles of highway and 5,000 bridges. This report is intended to represent Mn/DOT as a whole with respect to Mn/DOT's efforts in pollution prevention.

University of Minnesota (UM) – The UM employs 9,274 and has 6,312* students (including part-time students) enrolled. The University of Minnesota has five major campuses: Crookston, Duluth, Morris, Rochester, and Twin Cities (the Twin Cities campus, which is counted as a single campus, includes both the Minneapolis and St. Paul campuses). There are approximately 22 experiment or research stations, 18 regional extension centers, and extension offices in all of the 87 counties in Minnesota. The university has approximately 50 EPA ID numbers for hazardous waste generator sites around the state of Minnesota. Total managed building 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 of Minnesota as a whole.

Approximately 2,500 staff and faculty staff 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 PMD and MMD. 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 RRP 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

Included in the Admin's pollution prevention activities are:

- Its treatment of pollution prevention as a top priority in its Policy on Environmental Materials Management and its Priorities for Environmental Materials Management (Exhibit 1).
- PMD's Mission Statement encompassing pollution prevention and other environmental concepts (Exhibit 2).
- Resource Recovery Program (RRP) encouragement of pollution prevention and promotion of preferred waste management practices contained in Minnesota Statutes Section § 155A.02 during the acquisition, use, maintenance, and discarding of materials.
- Admin requires 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 inclusion of language in lease agreements to provide both purge days and coordination services for each building on the Capitol Complex. This activity promotes recycling, reuse, and the correct disposal of hazardous materials.
- MMD requirement that vendors provide environmental codes on the goods and services they make available for state purchase.
- Real Estate and Construction Services (RECS) publishing and maintenance of "Sustainable Design Guidelines" on its web and encourages all agencies to use on building construction projects. In addition, RECS manages the Buildings, Benchmarks and Beyond (B3) Program that includes creating and updating guidelines mandated for use on new buildings.
- Real Estate and Construction Services (RECS) includes terms and conditions in lease agreements requiring landlords to follow "Sustainable Building Guidelines" when feasible, to provide recycling services and space, to comply with ventilation and environmental quality provisions, and to comply with all applicable laws, statutes, rules, ordinances, and regulations regarding pollution control and recyclable materials.

Department of Agriculture –The Laboratory Services Division continues to research ways that it can reduce the amount of hazardous waste it generates by purchasing new technology that reduces the use of hazardous chemicals. In addition to new technology, it looks for alternative methods that will help reduce hazardous waste streams.

The department 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 Bio-diesel Task Force continually works to accelerate the development of Minnesota's bio-diesel 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 whenever possible purchase electronic office equipment and appliances that are Energy Star rated. Our agency has also sent out communication instructing employees to whenever possible procure products with the lowest potential to contribute to air pollution. 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 – The department considers protection of the environment to be a high priority, providing leadership in developing, advocating, and implementing equitable, cost-effective policies regarding departmental agendas. Commerce is committed to lead by example through the reduction of energy use, the use of toxic pollutants, and the generation of hazardous waste in its own department.

Department of Corrections (DOC) – *DOC Policy –100.010 –Mission, Philosophy, and Vision of the Department of Corrections* is as follows:

Mission Statement: to hold offenders accountable and offer opportunities for change while restoring justice for victims and contributing to a safer Minnesota.

Philosophy: The Minnesota Department of Corrections is committed to the development and provision of sound, cost-effective correctional programming that protects the public, reduces the risk of reoffending, prepares offenders for productive, crime-free roles in society, and holds offenders accountable for their actions. The department is also committed to strengthening community partnerships by involving the community in the criminal justice and reintegration process, and to ensuring that accurate information, research, and evaluation of programs is provided to stakeholders.

Vision: FOCUS on reducing risk.

- **F**ostering community partnerships
- **O**ptimizing best practices
- **C**reating a respectful, diverse culture
- **U**tilizing effective communication
- **S**trategic and efficient use of resources

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. The department's 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. EPAct 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, other 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 Employment and Economic Development (DEED) – The following lists the policies and procedures included in our 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 Revenue – The DOR has actively pursued electronic communications for several years. Tax collections, income, sales, withholding etc., have been Internet based for some time now. Each year, the percentage of taxpayers using electronic media and abandoning paper has increased.

The Minnesota Department of Revenue reports that 2,022,500 total income tax returns and property tax returns have been received as of April of 2008, representing an 11 percent increase over this time last year. Electronic filing began in 1991, with only 3,000 returns e-filed. Last year, the total number of e-filed returns was 1,923,496. 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 DOR recycling levels fell from 434,538 pounds in 2007 to 204,375 pounds in 2008. The reduction is due to fewer paper records being maintained (scanned) and the increase in electronic filing.

The department continuously reviews its strategies and mission statements to emphasize these new technologies. During the month of August, the department reduced its computer timeout from 30 to 15 minutes and started a program to encourage turning off equipment, nights and weekends.

Iron Range Resources and Rehabilitation Agency (IRRR) – Iron Range Resources 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 *Water Cooler*, an online employee newsletter. Iron Range Resources 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 (MAC) is committed to keeping Minneapolis-St. Paul International (MSP) as the airport of choice for travelers, airlines, and the aviation industry. The MAC strives to make sure, on a daily basis, that MSP and its six Reliever Airports operate as safe, secure, customer-oriented, economically sound and environmentally responsible airports.

The MAC's Vision Statement includes the ongoing commitment to sustainability and stewardship – "MAC sets the standard in environmental stewardship in the development and operation of its airport system." Being good stewards means operating and developing the MAC's airports in ways that meet the needs of the present without compromising the ability of future generations to meet their needs. Sustainable solutions are those that address long-term environmental, operational, financial, and social needs.

The MAC has been a longtime leader in proactively responding to environmental concerns across a wide spectrum ranging from a standard-setting noise mitigation program to the preservation of Minnesota wetlands. In an era when air travel is forecast only to increase, the MAC views environmental sustainability as integral to its mission. The MAC is committed to minimizing impacts to air and water quality, to reducing noise impacts, to continuing and improving recycling, and to preserving natural resources.

The MAC's environmental goals are to:

- Minimize impacts to air quality
- Minimize impacts to water resources
- Reduce waste generation and hazardous materials use
- Minimize impacts to and seek opportunities to enhance natural resources
- Reduce energy consumption
- Purchase electric energy from sustainable sources

The MAC's sustainable activities are grouped in the following major categories:

- Energy conservation/renewable energy
- Green buildings, facilities, and infrastructure
- Water quality and conservation
- Air quality
- Waste management and recycling
- Noise abatement
- Natural resources management
- Financial

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, 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) which addresses issues relevant to the entire region. The companion Environmental Sustainability Procedure (Section 1-2a) addresses P2 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 Sections 11, 16, and 33 of this report for a complete description of the many activities of IWPPS that are relevant to P2.

Metropolitan Mosquito Control District (MMCD) – The Metropolitan Mosquito Control District is committed to protecting the environment. It is the policy of the district 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.

The MMCD is committed to being a good neighbor and operate 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 non-hazardous materials and utilize other source reduction approaches will be given top priority for integration into MMCD operations.

Minnesota Army National Guard (MNARNG) – The MNARNG vision is to lead the way in protecting and enhancing our natural and cultural resources while maintaining the highest degree of military readiness. The MNARNG is committed to ISO 14001, Environmental Management System (eMS). The MNARNG utilizes 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 MNARNG utilizes eMS to accomplish the following: support the Army transformation, ensure the viability of training areas, promote sustainable operations, and reduce overall costs.

Minnesota Pollution Control Agency (MPCA) – The MPCA Prevention and Assistance Division concentrates on pollution prevention policy and outreach. 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 information and tools are available that expand our original pollution prevention vision, including environmentally preferable purchasing, green buildings, and design for the environment. Prevention and Assistance Division programs promote all these initiatives. The Minnesota Technical Assistance Program also uses these tools in their assistance to Minnesota businesses. (For details on these programs and accomplishments, refer to the MPCA's *2008 Pollution Prevention Evaluation Report* found at http://www.pca.state.mn.us/oea/p2/p2evaluation2008.cfm)

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – Alexandria Technical College employs a continuous improvement process that promotes excellence in environmental management and stewards towards energy efficiency by using the implementation of environmentally friendly products and waste stream reduction programs both internally and with our vendor partners. ATC finds audio and video conferencing, on-line employee education products, 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, Cambridge and Coon Rapids – ARCC has implemented "green" practices wherever we can and encourages pollution prevention in our labs, facilities, and contracting efforts. Environmentally friendly products are purchased and provided for campus use. Certain procurement documents are both hard copy and electronic with an emphasis on electronic communications with suppliers and contractors.

Anoka Technical College, Anoka – We have a plan implemented for stormwater runoff. We follow our SWWP plan as directed. We have worked with our Horticulture program to implement rain gardens on our property, as a means to control roof run off. We also implement energy savings strategies in heating and cooling the building.

Century College, White Bear Lake – Century College continued participating in the Mercury Free Project to greatly reduce the use of mercury and mercury products on the campus. The college continued to replace mercury instruments with non-mercury equipment. The move of science department into their new building will be mercury free.

Century College formed a committee that meets several times per year called R3 (reduce, reuse, recycle). This committee monitors recycling and environmental initiatives. The committee has a prominently displayed bulletin board that educates viewers. This committee promotes reduction and responsible handling of waste products.

All staff and students have an email address to reduce paper memorandums. The college continues to expand its online learning, class registrations, and other transactions to paperless methods. Century College is upgrading office printers that will print back-to-back to reduce paper consumption.

The college completed construction and opened a new Science/Library Building. This building was built to exceed state energy-efficiency standards by 30 percent. It features highly efficient roof insulation systems, energy recovery systems, mechanical systems, displacement ventilation, science lab exhaust system, occupancy sensor lighting, and wetland restoration. In addition, the college recycled about 65 percent of the waste generated by the new construction. This includes nearly 300 of the 450 tons of debris generated since construction of the three-level building began in 2006.

Dakota County Technical College, Rosemount – On June 18, 2007, Dakota County Technical College (DCTC) President Dr. Ron Thomas signed the American College and University Presidents' Climate Commitment. The ultimate objective of the Presidents' Climate Commitment is for the college to set goals and take steps to become carbon neutral. A baseline study to determine current energy consumption and related energy emissions is necessary to establish what steps need to be taken. This Emissions Inventory and Baseline Determination Report is meant to inform the college of its current performance levels, identify opportunities, and recommend next steps toward becoming carbon neutral.

This is a living document. The intent is that the data will be updated annually, and the report updated every two years. This is especially relevant for this college because the student body largely changes every two years based on the degrees offered. This allows the college to respond more rapidly than other institutions of learning in adapting their curriculum and student culture. Dakota County Technical College has been updating the campus buildings over the past several years, changing lighting and control systems and improving the mechanical efficiencies of the buildings on the main campus. Through these efforts, energy consumption has decreased, but the overall consumption remains significant. As energy efficiency improves, emissions are reduced. This baseline report will be the starting point to track the success of implemented projects, improving energy efficiency, reducing energy consumption, and decreasing carbon emissions.

This report will identify and break down the sources of these emissions and offer suggested next steps. DCTC's educational efforts and outreach activities go above and beyond the contents of this report, but are no less significant. The enthusiasm of many of the instructors to incorporate sustainable subject matter into their courses encourages the overall success of the college. In the summer of 2007, Dakota County Technical College founded three "green" committees to guide the college in sustainable decision-making and implementation. The Green Executive Committee was founded to create policies to guide the college in high-level planning and assist in finding sources of funding to implement initiatives. The Green Instructional Action Team was established to incorporate environmentally conscious initiatives into the curriculum and student experience. The Green Operations Action Team was set up to implement sustainable design and construction initiatives for the buildings. The president oversees and helps orchestrate all decisions and activities toward the goal of reducing emissions and greening up the college. The college plans to create and implement a climate neutral plan that includes a target date and interim milestones for achieving campus climate neutrality within two years.

Hennepin Technical College, Brooklyn Park and Eden Prairie – Hennepin Technical College encourages our employees to car pool whenever possible as an alternative to single-occupancy vehicle commuting. We established an electronic invoice approval process and have expanded the use of video conferencing as a conscious effort to reduce travel between campuses for meetings. The college uses online work orders for both the Maintenance and IT departments. We have established a formal recycling committee and are

investigating ways to expand and improve our recycling efforts. As an initial effort to reduce the amount of paper we use, we issued a challenge to each program and department to reduce the number of copies they make in the copy centers by 25 percent. At least two winners will have their copy charges for FY 2010 waived. The committee regularly sends e-mail tips on pollution prevention and recycling.

Minneapolis Community and Technical College, Minneapolis – In an ongoing effort to regulate pollution prevention, we have updated our Chemical Hygiene Plan to control chemical procurement, reduce waste streams, and reduce our hazardous waste generation from a Small Quantity Generator to a Very Small Quantity Generator. Building and Hazardous Waste Inspections are completed weekly to ensure compliance. MCTC has also recently signed the College Presidents Climate Commitment in an effort to address global warming by neutralizing greenhouse gas emissions.

Minnesota State University, Moorhead – Minnesota State University, 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, electronic 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 unwanted materials. MSUM currently reduces paper volume by using campus e-mail, promoting teleconferencing, utilizing podcasting and vod-casting, providing classroom materials and education 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.

Normandale Community College, Bloomington – The following regulatory policies have been put in place: Building Services staff now has to justify travel off campus to purchase materials. Not only is this a prudent use of employees' time, but this policy also minimizes risk and leads to efficient delivery practices by vehicles already on the road.

Our recycling efforts have improved. Our scrap metal (including copper wiring) and recycled paper and cardboard are being compensated for directly on the billing from our waste haulers. For us that has meant savings of over $5,000 per year as a direct credit. These items are a line item on our bills with the weight of the product along with the compensated price. All fluorescent lamps will be 25 watt, low-mercury. Metal halide bulbs will be replaced wherever possible. The college is committed to all aspects of our MS4 Stormwater permit, focusing strongly on best practices.

North Hennepin Community College – The college identified the waste-generating sources on campus, and evaluated the waste stream from these sources. Plans have been developed and implemented to separate recyclable/recoverable items in these waste streams to make better use of our resources. Recyclable items like aluminum, glass, cardboard, etc. have been recycled for several years here on campus.

Northland Community and Technical College, East Grand Forks and Thief River Falls – Online resources have greatly reduced the amount of office supplies used by NCTC. E-mail is the official means of communication for both students and employees. All employees and students are provided e-mail access and encouraged to reduce paper for memos, announcements, and correspondence. Many instructors have chosen to use online resources for classes, including assignment and note postings, exams, syllabi, and announcements.

The administration continues taking steps towards reduction of mass-produced items such as student bulletins, worksheets, billing and financial account information, and registration materials. In addition, expanded use of video conferencing and WebEx occurs as a conscious effort to reduce travel between campuses for meetings.

St. Cloud State University, St. Cloud – 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/post-consumer fiber.

St. Cloud Technical College, St. Cloud – 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 whenever possible. High-efficiency office equipment is purchased whenever possible.

South Central College, Faribault and North Mankato – South Central College will commit to car pooling in FY 2009. Although many of our employees car pool between our campuses which is approximately 46 miles, South Central is committed to recording the carpooling activities in FY 2009. South Central College is also committed to maximizing the use of Video-IP for college-wide meetings instead of meeting on a particular campus.

Department of Transportation (Mn/DOT) – Mn/DOT is committed to lowering costs, 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 the following:

- Lowering expensive disposal costs and liability associated with the use of regulated materials/waste by reducing or 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 use of alternative products.
- Seeks to demonstrate its commitment by adhering to all environmental regulations.
- Promotes cooperation and coordination between government and the public toward the shared goal of preventing pollution and conserving our environment.

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 attempted 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.

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 or leased buildings

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.

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

h. Purchase electricity generated from renewable sources.

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.

FY 2008 state agencies reduction total								
	Total emissions reduction (in pounds)							
Action	**CO**	**CO_2**	**Hg**	**NOX**	**PM10**	**PM2.5**	**SO_2**	**VOC**
Diesel vehicles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gasoline vehicles	27,815.75	190,457.14	0.00	2,255.45	18.81	12.22	4.56	2,335.61
Commuter	70,880.78	1,922,714.96	0.00	4,827.62	112.80	52.39	37.89	4,271.53
EE office equipment	31.56	198,097.16	0.00	440.40	39.97	30.70	795.37	4.09
Energy conservation	2,009.87	11,353,961.69	0.26	24,725.61	2,239.37	1,725.72	44,098.00	243.98
Low VOC products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	343.30	619.92	0.00	1.70	1.05	0.97	0.13	9.22
Renewable electricity	2,677.81	14,253,824.28	0.10	29,456.90	858.25	659.30	57,079.33	87.91
Agencies total	103,759.06	27,919,675.15	0.37	61,707.67	3,270.24	2,481.30	102,015.28	6,952.33

As shown in the table, agencies achieved the greatest measurable total reductions from energy conservation, followed by renewable energy. Energy conservation and savings resulting from purchasing more efficient office equipment remain 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 still lack.

The Department of Administration reports that the state fleet currently includes approximately 1,700 flex-fuel vehicles that are capable of using E85 fuel, and there are more than 350 E85 retailers across the state. Statewide data show that during the first half of calendar year 2008 agencies used 273,000 gallons of E85 fuel. This is up from 166,000 gallons during the same time period in 2007. Altogether, state agencies are using 10.3 percent E85 fuel and 89.7 percent petroleum-based gasoline in their vehicles.

FY 2008 Paper reams purchased by reporting agencies										
IPPAT reporting agency	**Virgin (8.5x14)**	**Virgin (8.5x11)**	**10% (8.5x11)**	**30% (8.5x11)**	**30% (8.5x14)**	**30% (8.5x11, 3-hole)**	**30% (11x17)**	**100% (8.5x11)**	**30% (8.5x11, 24 lb)**	**Total reams**
MPCA	0	0		732	124	120	26	10,372	333	11,707
Admin	0	270		4,850	109	120	21	3,070	0	8,440
DOT	12	310		14,986	310	902	4,374	21,550	1,327	43,771
MNSCU	0	0		4,000	75	0	45	340	0	4,460
Revenue	1	50		14,832	88	93	23	3,205	136	18,428
Iron Range Resources	0	0		90	0	0	0	730	0	820
DEED	45	7,437		19,187	97	140	15	15,720	47	42,688
Corrections	0	590		23,460	244	68	133	34,460	96	59,051
Commerce	30	2,800		3,380	40	30	5	20	912	7,217
Agriculture	0	0		1,170	180	10	40	3,650	0	5,050
DMA	5	0		710	8	0	3	20	80	826
MMCD			850							
MCES		1,600		13,040						
MAC		5,610		1,230						
Total (reams)	93	18,667	850	101,667	1,275	1,483	4,685	93,137	2,931	202,458
Total (pounds)	595.2	93,335	4250	508,335	8,160	7,415	46,850	465,685	17,586	1,152,211
Total (tons)	0.2976	46.6675	2.125	254.168	4.08	3.708	23.425	232.8425	8.793	576.1056

The Department of Administration reported that sales of 100 percent recycled-content paper went extremely high in FY 2008. In August 2007, Office Supply Connection (OSC) began offering 100 percent recycled content paper at a price cheaper than virgin and 30 percent recycled content paper. As a result, state agencies and Cooperative Purchasing Venture (CPV) members increased their purchases of 100 percent recycled content paper in FY 2008 by almost 800 percent.

By purchasing more 100 percent recycled content paper and less virgin and 30 percent recycled content paper, state agencies and CPV members reduced greenhouse gas emissions equivalent to taking almost 90 cars off the road for a year and saved almost 8,000 trees, over 3.5 million gallons of water, and enough energy to power almost 80 homes for a year. 100 percent recycled content paper remains the cheapest copy paper available on state contract and is available through OSC.

Department of Administration – **Priorities for Environmental Materials Management-Plant Management Division Mission Statement**

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
- Grounds
- Janitorial
- Materials transfer
- Parking
- Administration of the state resource recovery program
- Special use of state facilities permits
- Central Mail

Our core values are high quality professional staff with:

- Accountability
- Honesty and ethics
- Loyalty
- Integrity
- Commitment to teamwork
- Respect of others and ourselves
- Knowledge

Responsiveness to our customer needs through:

- Communication
- Efficiency
- Timeliness

Provide quality work through:

- Modern technology
- Employee training

Responsible business practices that encourage

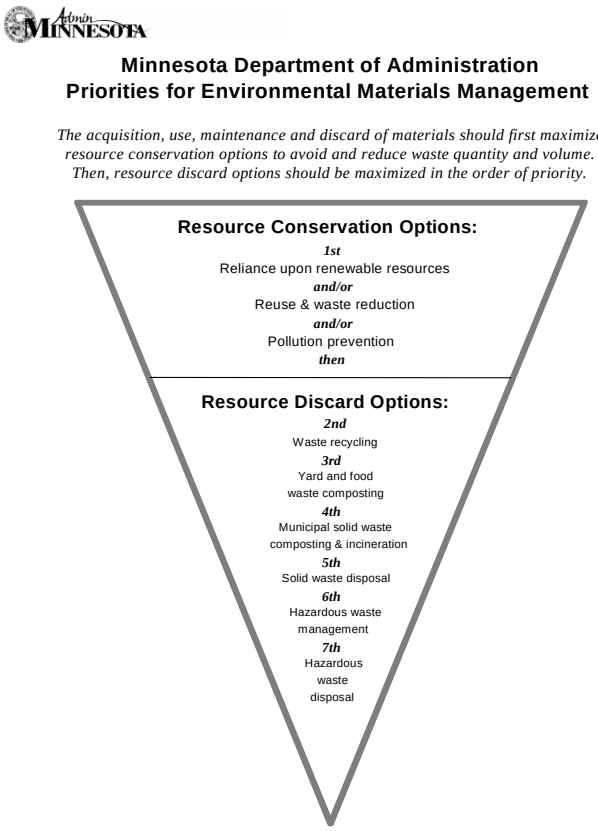
- Professionalism
- Cost effectiveness
- Open communication

Plan for the future, considering:

- Technology
- Employee development
- Establishment of long term goals
- Involvement of clients

Environmental stewardship with:

- Conservation of resources
- Prevention of pollution
- Promotion and education
- Integration into all work places and services



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Department of Agriculture –The Department of Agriculture follows Executive Order 04-08 by identifying the following activities to which it has committed:

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

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 Commerce –The Department of Commerce follows Executive Order 04-08 by identifying the following activities to which it has committed:

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.

Department of Commerce fuel purchases (in gallons)

	Diesel	E85	Unleaded
FY 06	15,899	1,423	35,339
FY 07	17,126	1,760	37,335
FY 08			

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 06, 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.

Department of Corrections (DOC) – The Department of Corrections selected items a and 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.*

In addition, the department has rolled out an electric inter-office requisition system, (EIOR). This new purchase request system is web-based and will replace the paper purchase request forms that were being used previously.

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.

Other: Reduce paper consumption.

Department of Revenue (DOR) –The DOR activities are:

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.

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 or leased buildings.

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 (In FY 2007, 98 percent of the paper we purchased contained at least 30 percent recyclable materials), toner products, mass transit, van pools, etc.

Iron Range Resources and Rehabilitation Agency (IRRR)

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

Agency-wide practices that employ energy-conserving practices at our facilities include but are not limited to:

- 263 energy-saving ballasts were installed
- 534 new 28-watt T-8 fluorescents were installed, replacing the old 20-watt fluorescents
- 1,200 pounds of cardboard were recycled
- 3,360 pounds of paper were recycled
- 1,600 pounds of shredded paper were recycled

Recycled Internet technology equipment in FY 2008 (sent to Asset Recovery for recycling):

- 300 pounds of PCs
- 873 pounds of miscellaneous electronics (printers, phones, faxes, etc.)
- 1,596 pounds of monitors

To help further energy-conserving practices, energy consumption is monitored for the facilities owned by Iron Range Resources. Included under Part 4 are the FY 2008 energy consumption figures for Giants Ridge, Eveleth Administration Building, and the Mining and Reclamation headquarters.

Information Technology staff recommends that all employees change their computer power settings to initiate the power-saving mode that is built in to the unit. Our agency leases Toshiba e-studio copying machines and all copiers have the Energy Star label on them. IRRR also encourages electronic communication among staff to help reduce paper usage and travel between our three facilities.

Metropolitan Airports Commission (MAC) – The 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 – To meet this requirement, staff has identified new vehicle purchases that are capable of being alternative fuel compatible. This will allow the MAC to use E85 and other clean fuel options or technology that is available.

b. Refuel vehicles with the cleanest fuel available – To meet this requirement, MAC staff will transition to bio-diesel in the existing diesel-powered equipment, which does not require any modifications to the equipment or to fueling tanks. The 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 – The MAC specifies that purchased computer equipment be Energy Star compliant where applicable or have energy

saving "sleep modes" when not in use. Although the MAC has very few other appliances, new purchases are specified to have high efficiency ratings.

e. Employ energy saving strategies in state-owned or leased buildings – The 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, the 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.

Metropolitan Council Environmental Services (MCES) – The MCES has 15 dual fuel vehicles. See *Section 10, Commuting, Transportation* for more information. The use of recycled content office paper is presented in *Section 22, Office Supplies*. MCES does not participate in centralized materials management and resources tracking as provided to other state agencies by the Department of Administration-Fleet Management or Central Stores.

Minnesota Army National Guard (MNARNG) – The MNARNG has selected to implement the following two air quality P2 actions:

b. Refuel MNARNG equipment with the cleanest fuel available. – The MNARNG has a fleet of GSA and state motor pool vehicles that are available for federal and state employee usage. These vehicles are driven all across the state and many are flex-fuel vehicles. Efforts are made to replace older vehicles with as many flex-fuel vehicles as budgets permit.

e. Employ energy conserving strategies in buildings – Energy has become a prime focus for the MNARNG. Efforts are underway or in planning that will continue to reduce energy usage, and to find better ways of using energy. All new construction is being designed to implement energy conservation ideas. Newer facilities in Faribault and Cambridge were designed and built to better use natural lighting.

Minnesota Pollution Control Agency (MPCA) – The MPCA selected items a. through f. and h. 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 been a member of the SmartFleet Committee since 2005. The SmartFleet Committee has been working to help state government move toward compliance with Executive Orders 04-10 and 06-03, which call for decreasing our dependence on petroleum fuel. Currently, the MPCA owns or leases 160 vehicles, 98 of which are flex-fuel and 11 hybrids to reduce petroleum consumption.

b. **Refuel state-operated vehicles with the cleanest fuel available. –** Refer to *Part 4, item 6, Automotive Fuels,* for details**.**

c. **Encourage employees to consider alternatives to single-occupancy vehicle commuting. –** Refer to *Part 4, item 10, Commuting and Transportation*.

d. **Reduce state energy use through purchasing energy-efficient office equipment and appliances. –** Refer to *Part 4, item 12, Electronics,* for details.

e. **Employ energy-conserving strategies in state-owned or leased buildings.** The MPCA's goal is to provide a reasonable, comfortable working environment while meeting the Governor's Executive Order #5-16 to reduce energy consumption. At the St. Paul central office, the landlord implemented a program to selectively turn off the heat pumps at certain times. The fans remained on, circulating already-cooled air throughout the building. This is similar to the "Saver's Switch" program offered by Xcel Energy.

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 MPCA'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.

g. Employ landscaping that reduces the need for gasoline-powered maintenance equipment. See *Part 4, item 20, Landscaping*, for details.

h. Purchase electricity generated from renewable sources. See *Part 4, item 14, Energy – Production*, for details.

Minnesota State Colleges and Universities (MnSCU)

Anoka Ramsey Community College, Cambridge and Coon Rapids – We continued our efforts to: a. replace vehicles with the most fuel efficient vehicles whenever that becomes necessary. Last year we did not replace any vehicles or buy new. Our current vehicles (owned, leased, and state) that are E85 capable use that fuel whenever we could find it.

Itasca Community College, Itasca – Itasca Community College's 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 campus. We encourage employees to refuel state-operated vehicles with the cleanest fuel available.

Minneapolis Community and Technical College, Minneapolis – The two activities MCTC is committed are: c. encouraging employees to consider alternatives to single occupancy vehicle commuting and 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.

Minnesota State University, Moorhead – MSUM is actively participating in all eight areas of Minnesota Executive Order 04-08. However, reporting of quantifiable measurements is provided for only two specific areas: landscaping and renewable energy. The remaining six activities for Executive Order 04-08 are discussed in *Part 4: Pollution Activities during the Fiscal Year 2008.*

St. Cloud State University, St. Cloud – SCSU continues to move toward commitment to the full a-h range of Executive Order 04-08 activities as follows. Note: much of our progress is general, it is currently very expensive to quantify with specifics. As we study and promote system changes to efficiently capture this type of information, we move toward reliable benchmarking and control within an academic freedom parameter environment.

Virgin paper use of about 817 reams (4,085 lb.) of colored paper used in our student union copy shop was close to the 838 reams used 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 declined from 52.7 tons (42,194 reams) to about 40,000 reams.

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

Alexandria Technical College, Alexandria – Alexandria Technical College currently participates in the State vehicle lease program. Our current fleet of leased vehicles has been upgraded to include vehicles that are more fuel efficient.

Century College, White Bear Lake – Campus added three new leased vehicles to the fleet this year. All three vehicles are E85 / Flex-Fuel equipped.

Hennepin Technical College, Brooklyn Park and Eden Prairie – Hennepin Technical College didn't purchase any fleet vehicles the past 12 months, but the vehicles we own were the most fuel-efficient available at the time of purchase that met our operational needs.

Normandale Community College, Bloomington – Building Services has eliminated one truck and is having the majority of supplies shipped to the college. Currently, Normandale is leasing or owns the following vehicles:

- 2004 Dodge Caravan-E85
- 2006 Ford Taurus-E85

- 1999 Ford Crown Victoria
- 2000 Ford Crown Victoria
- 2007 Ford F350 truck

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC purchased the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department. In fiscal year 2008, eight vehicles were purchased that have capabilities to burn E85 fuel.

- 2008 Chevrolet Impala, 4
- 2008 Dodge Caravan, 1
- 2008 Chevrolet Uplander, 1
- 2008 Dodge PT Cruiser, 1
- 2008 Chevrolet Suburban, 1

Riverland Community College, Albert Lea, Austin and Owatonna – Currently, Riverland encourages employees to car pool as an alternative to single-occupancy vehicle commuting. Last year we requested departments report monthly the number of miles they are carpooling and how many are participating. Employees are encouraged to have teleconference meetings between the campuses whenever possible to cut down on travel. This past year, we developed a car log form for our fleet of college vehicles that requests how many riders in the car. Over the past year (2008), we have seen a lot more carpooling efforts. The new logs show 2 to 5 employees carpooling over 49,900 miles together. In 2007, we were only able to account for 5,000 miles.

St. Cloud State University, St. Cloud – SCSU has gone from 18 E85 capable motor pool vehicles to 20 of them. E85 fuel usage for this fiscal year totals 12,606 gallons. Grounds Maintenance and Athletics Department 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.)

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

Alexandria Technical College, Alexandria – ATC has eliminated vehicles from their fleet to reduce fleet capacity of fuel inefficient vehicles.

Century College, White Bear Lake – Century purchases approximately 5,000 gallons of 10 percent ethanol gasoline per year for on-campus vehicles.

Hennepin Technical College, Brooklyn Park and Eden Prairie – Hennepin Technical College is using the cleanest fuels available for our vehicles.

Normandale Community College, Bloomington – All staff are encouraged to fill with E85 fuel. Maps of gas stations selling E85 have been placed in each vehicle.

North Hennepin Community College – When purchasing or leasing vehicles for college use, we look at overall efficiency based on projected usage and needs. An example of this is our use of a leased 12-passenger van for class outings where only one vehicle is needed, versus using two or three other vehicles to transport the same number or people.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC encourages employees to refuel state-operated vehicles with the cleanest fuel available.

Normandale Community College, Bloomington - This amount has been sent as a whole number based on use for all colleges to MnSCU. Our specific numbers are not available to us. As stated in *Part 3 section b*, we have requested that our vehicles be filled with E85 and have placed an E85 locator map showing filling stations that sell E85 in our vehicles.

Riverland Community College, Albert Lea, Austin and Owatonna – The college leases vehicles from Travel Management for each building's use and our Farm Management program. We are using E85 fuel or vehicles with a 30-35 mpg rating. Riverland Community College'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 bio-diesel 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.

St. Cloud State University, St. Cloud – SCSU is promoting E85 usage also by making campus refueling with it more convenient.

South Central College, Faribault and North Mankato – The college leases vehicles from Travel Management for our staff and faculty use along with our Farm and Small Business Management programs. We are currently leasing E85 vehicles. Any vehicles that South Central College will purchase in FY 2009 will be E85 fuel.

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

Century College, White Bear Lake – Students may purchase discounted bus fares for the semester through the College Connection. The connection also has an "I Need a Passenger" operation. Century maintains a bridge between the East and West Campus to reduce commuting between the East and West Campuses.

Hennepin Technical College, Brooklyn Park and Eden Prairie – Employees are encouraged to utilize video conferencing as an alternative to driving to intercampus meetings and to ride-share whenever possible.

Minneapolis Community and Technical College, Minneapolis – MCTC is continuing the activities from 2005, 2006, and 2007. This year we will receive an additional 10 bike racks, and are considering bike lockers. We are implementing a Faculty/Staff discounted bus pass. We also have the opportunity to switch summer work hours to four 10-hour days to eliminate commuting one day a week.

Normandale Community College, Bloomington – Normandale is participating in the 494 Corridor Commuter Services Project. Normandale employees and students are offered subsidized bus service to participate. Employee use is generally minimal; student use however has increased some. Still, a reasonable estimate of bus use would remain under 1 percent of those using our campus.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC encourages employees to car pool as an alternative to single-occupancy vehicle commuting. In addition, employees are encouraged to have teleconference meetings between the campuses whenever possible to cut down on travel. In order to promote car pooling for students, a vehicle has been provided for students to travel between campuses for classes and student activities. Twelve-passenger vans are available for use by instructor/student groups for field trips. Students on the East Grand Forks campus are able to ride the city bus free of charge and a bus stop shelter is in place on the campus.

St. Cloud State University, St. Cloud – SCSU encourages employees and students to consider alternatives to single-occupancy commuting by co-sponsoring free bus rides with St. Cloud Metropolitan Transit Commission (MTC). Ride shares and car pools are also encouraged and promoted.

South Central College, Faribault and North Mankato – South Central College will commit to car pooling in FY 2009. Although many of our employees car pool between our campuses which is approximately 46 miles, South Central is committed to recording the carpooling activities in FY 2009. South Central College is also committed to maximizing the use of Video-IP for college-wide meetings instead of meeting on a particular campus.

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

Alexandria Technical College, Alexandria – As office equipment is replaced, we strive to find more efficient equipment. More efficient flat screen computer monitors have replaced most of the CRTs at our facilities to reduce energy consumption.

Anoka Technical College, Anoka – We are replacing older versions of desktop computers with flat screen and laptop computers.

Hennepin Technical College, Brooklyn Park and Eden Prairie – Hennepin Technical College is reducing energy use by purchasing energy-efficient office equipment and appliances, including continued replacement of CRT computer monitors with low energy-consuming LCD flat-screen monitors.

Normandale Community College, Bloomington – Appliances are already purchased with energy efficiency in

mind and have been for several years.

Northland Community and Technical College, East Grand Forks and Thief River Falls – The college purchases Energy-Star rated computers and LCD panels. Computer settings are optimized to take advantage of energy-reducing capabilities and scheduling systems power down all units. An energy management system is utilized to help improve the efficiency of the HVAC system and improve indoor air quality. The Thief River Falls campus is currently in the process of replacing the ballasts in the lights with electronic ballasts. Currently there are 25 lights connected to motion detector sensors so the lights turn off when they are not needed, thus conserving electricity.

St. Cloud State University, St. Cloud – 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. Energy Star sleep mode is encouraged to reduce state energy use, as is 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. Employ energy-conserving strategies in state-owned or leased buildings.

Alexandria Technical College, Alexandria – New energy-efficient roof-mounted HVAC replacement systems have been 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 and exterior doors each fall and replacing T-12 fluorescent lighting with a T-8 fixture. The T-8 fixture is 30 percent more energy efficient than the T-12 model. 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.

Anoka Technical College, Anoka – **Electricity:** We use T8 energy-efficient ballast and employ energy-saving techniques (i.e., we are in the early stages of installing sensors which automatically turn off lights when rooms are not in use and shut down HVAC motors when area is not in use; also use variable drive motors throughout the campus).

Natural gas: We work with the course scheduler to see what areas aren't being utilized and apply the energy management systems to reduce run hours of the gas-fired boiler system.

Reduction (in pounds)							
CO	**CO_2**	**Hg**	**NOx**	**PM10**	**PM2.5**	**SO_2**	**VOC**
0.253	1,588.749	0	3.532	0.321	0.246	6.379	0.033

Century College, White Bear Lake – Construction of a new Science/Library Building was completed. This building was built to exceed state energy-efficiency standards by 30 percent. It features highly efficient roof insulation systems, energy recovery systems, mechanical systems, displacement ventilation, science lab exhaust system, occupancy sensor lighting and wetland restoration. Century also follows state guidelines for building temperatures.

Hennepin Technical College, Brooklyn Park and Eden Prairie – Hennepin Technical College employs energy-conserving strategies in its buildings through its continued use of computer-controlled HVAC systems for lab, classroom, and office areas. The original cooling system (30+ years old) at our Eden Prairie campus was replaced in 2006 with the most energy efficient available.

Itasca Community College, Itasca – Itasca Community College continues 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. We use an energy management system that helps improve the efficiency of the HVAC system and improve indoor air quality. We have an agreement with our local utility to curtail our natural gas during colder weather. We have a fuel oil back-up to help during these times. Also, we have a wood boiler that burns chips that will heat the campus.

Normandale Community College, Bloomington – We currently are using an energy management system to manage the day-to-day operation of our HVAC system and parking lot lighting. In addition, our mechanical equipment is being reviewed for energy efficiency, including the way electricity is delivered

through our transformers. Some of the current projects that the college has significant interest and has started investigating include:

- "Right sizing" the amount of transformers on campus. These are large energy sinks. Each building on our campus was built as a stand-alone building. We are using existing transformers instead of adding additional units.
- Creating a loop system with our HVAC units. Again, each building was built as a stand-alone building. Many of our units are working at only 20 percent of their capacity. This loop system builds in redundancy and energy efficiency by not requiring us to have all of our units working at the same time.
- Upgrading our cooling units to a closed system, which will minimize the use of chemicals.

FY 2008, as the calculator shows, we have not reduced emissions. Part of this is due to the inefficiency of operating buildings during construction as well as the addition of 1,800 square feet of new space to our newly remodeled Fine Arts Building.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC continued an ongoing program of replacing aluminum metal haploid lights with T-8 high-efficiency lamps and electronic ballasts and compact fluorescent lighting. Note 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.

NCTC adheres to the five-year Inspect Compliance Plan and conducts annual inspections of roofing to ensure continued high efficiency. A HEAPR project for the Thief River Falls campus was developed and submitted in fiscal year 2008 for fiscal year 2010 funding. The project will continue to be promoted throughout the fiscal year. Air handlers and boilers throughout the college are inspected quarterly to ensure continued high efficiency.

East Grand Forks campus: A rebate was received from the local utility company as a result of installation of high-efficiency boilers. Grant funding was received in the amount of $5,000 to research the feasibility of wind-generated electricity in partnership with the U.S. Department of Agriculture. The efforts will continue to be explored in fiscal year 2009. An agreement exists with Xcel Energy to curtail use of natural gas. A fuel oil back-up system exists and it is utilized at the request of Xcel Energy.

Thief River Falls campus: Contracted with Climate Control to research and assess possible energy savings. In fiscal year 2008, several aspects of the assessment were implemented such as variable drive motors for air handlers and power monitors for electricity usage.

Airport campus: An electric boiler serves as back up to the natural gas boiler, which allows for off-peak rates for electricity.

St. Cloud State University, St. Cloud – SCSU employs energy-conserving strategies in our buildings. For instance, B51, Riverview, and Brown Hall are to be remodeled; Centennial Hall Renovation has been completed 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.

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

Alexandria Technical College, Alexandria – The 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 staff so that they may make informed decisions when purchasing these products.

Century College, White Bear Lake – The majority of the paint that Century purchases is Harmoney and Duration, which are low VOC paints.

Hennepin Technical College, Brooklyn Park and Eden Prairie – Hennepin Technical College continues to replace VOC parts cleaners in its college programs with aqueous cleaners. We also are continuing to evaluate products in both our college program areas and in our Maintenance Department that utilize the lowest levels of volatile organic compounds (VOC) to replace higher polluting compounds.

Itasca Community College, Itasca – Itasca Community College continually reviews our products and uses the most environmentally friendly products available in our labs, classrooms, and maintenance area. The Facilities Maintenance Department has converted most of its cleaning products from aerosol sprays to either pump sprays or squirt bottles. Latex paint is promoted with oil-based paint use very restricted.

Minneapolis Community and Technical College, Minneapolis – MCTC is continuing to procure and use products with the lowest potential to contribute to air pollution. Between 2005–2007, we continued to use low-VOC products. This year, we have switched companies from Dalco to Hillyard in an effort to use chemicals with low VOCs and that are more environmentally friendly. Green Seal certified products include Super Shine-All, Suprox, and Carpet Pre-Spray & Extraction.

Normandale Community College, Bloomington – We have been looking at using products with low VOCs. Currently we have switched all of our interior wall paints to low voc paint. Our cleaning chemicals are now set up in pre-measured units, a huge improvement over past practices.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC is a very small generator of hazardous waste. The Maintenance Department utilizes latex paint with oil-based paint use very limited. The Maintenance Department has converted most of its cleaning products from aerosol sprays to either pump sprays or squirt bottles to reduce generation of and exposure to VOC. This has been communicated to departmental employees so that they may make informed decisions when purchasing these products.

St. Cloud State University, St. Cloud – SCSU actively procures cleaning and painting products based on potential air pollution. Bleach is being restricted. Surface wetting and liquid pump sprays are promoted over aerosols. VOCs are discouraged with a special review safety committee participation to ensure substitution /replacement. Latex paint is promoted with oil-based paint use very restricted.

South Central College, Faribault and North Mankato – All of our cleaning supplies are environmentally friendly products.

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

Alexandria Technical College, Alexandria – Landscaping of newly developed areas employ xeriscaping designs to reduce the use of gasoline-powered maintenance equipment, fertilizers and reduce fire hazards.

Century College, White Bear Lake – The college maintained natural grasses in the vicinity of the bridge. The college campus also has wetland and wooded areas that remain in their natural state. In FY 2008, the college added two new bio-retention areas on campus. We have hired a master gardener and in process of developing a master landscaping plan.

Hennepin Technical College, Brooklyn Park and Eden Prairie – HTC is looking at ways to employ landscaping ideas to reduce the need for gasoline-powered maintenance equipment.

Itasca Community College, Itasca – Itasca Community College has reduced the area that it maintains by having the Forestry Department plant different areas with native plants and trees. Not only has this reduced the area that we maintain, but it also gives the Forestry students an area where they can learn plant identification.

Normandale Community College, Bloomington – Currently we mow 23 acres of lawn. We have transformed 4.5 acres of lawn to native plantings. Normandale also uses IPM as its method for pest control. By doing this, we have significantly reduced the amount of pesticides used on our campus. “Blanket” applications of herbicides are rarely used and are timed to the life cycle of the plant when they are most effective. Algae in Normandale Community College’s Japanese Garden are controlled by using bacteria instead of chemical algaecides. We do not mow on air alert days.

North Hennepin Community College – We continue to look for ways to reduce areas requiring commercial

lawn maintenance activities while continuing to preserve our existing nature areas. We have also made some changes in the operations of our central plant that allow us to better operate systems that are running on a 24/7 basis.

Riverland Community College, Albert Lea, Austin and Owatonna – Riverland Community College mows some areas of our campus less than usual. Approximately eight acres are being mowed less in Austin (estimating three hours of tractor use and five gallons of fuel per time). In Owatonna, four acres are prairie grasses that require very little mowing or care.

St. Cloud State University, St. Cloud – SCSU is experimenting with landscaping and prairie growth, which reduces gasoline use.

South Central College, Faribault and North Mankato – South Central College-North Mankato has a two to three-acre wooded area that is left untouched.

h. Purchase electricity generated from renewable sources.

Hennepin Technical College, Brooklyn Park and Eden Prairie – HTC did not purchase any electricity from renewable sources.

Normandale Community College, Bloomington – Refer to page 70 of this report regarding the College's source of energy.

St. Cloud State University, St. Cloud – SCSU has committed this April to experiment with wind-generated electricity provided through Xcel Energy. Investment is minimal to promote learning opportunities which will help balance higher cost. SCSU has formed an agreement with St. Cloud MTC to pick up reprocessed campus vegetable oil from campus (approximately 75 gallons per week).

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 *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

Automotive fuel -E85 purchased	FY 2003	FY 2004	FY 2005	FY 2006	FY 2008
Total vehicles	795	830	835	833	536
E85 vehicles	42	38	71	81	75
E85 % of Fleet	5.28	4.58	11.8	9.72	14
Hybrid vehicles	3	4	14	14	37
Gallons of E85 purchased	19,867	18,636	16,997	13,735	20,021

In FY 2007, the University of Minnesota E85 fleet and tanks were used for a state-funded E20 test so no E85 results are available.

Alternative energy: Wind power: In March 2005, University of Minnesota West Central Research and Outreach Center (WCROC) began operating a 1.65MW wind turbine. This 230-foot turbine provides the University of Minnesota-Morris with 5.6 million kilowatt hours of power each year; this is more than half of University of Minnesota-Morris's annual electricity requirement thereby cutting in half the coal burned to power the campus. The University of Minnesota-Morris use of wind-generated electricity dramatically reduces air pollution (5,000 tons CO_2, 20 tons SO_2, 10 tons NOx, 1 ton CO per year).

Part 4
Pollution Prevention Activities during the Fiscal Year 2008

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.

Metropolitan Council Environmental Services (MCES) – Note: In the following sequence, categories for which the MCES does not have new significant P2 activities for the 2007 calendar year are simply skipped, although many activities are successfully ongoing.

1. Absorbents

Department of Administration (Admin) – MMD, in conjunction with the Department of Transportation (Mn/DOT), has a contract for Hazardous Materials: Used Oil Sorbent and Filter Management for Energy Recovery. The burnable sorbents may be burned for energy recovery, while non-burnable used oil sorbent materials, generally clay and diatomaceous earth are reused by extracting the used oil with the oil burned for energy recovery. Contract users receive the equivalent amount of cleaned non-burnable sorbents in exchange. Cleaned used sorbents are also available for purchase under this contract. This past year, we added a contract vendor to the new issue of Rags: Wiping and Sorbent Materials that uses 100 percent recycled material in the manufacture of its sorbents. These contracts are available to other state agencies and members of the CPV.

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

> *MCF-Lino Lakes* – Recovered 273 pounds of absorbents in FY 2008 and will continue to look for ways to minimize this waste stream.

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. In addition, 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. Spent absorbent materials are managed as a non-hazardous industrial waste and are burned for energy recovery. Absorbents are used to their full potential before disposal.

Metropolitan Council Environmental Services (MCES) – Products that are absorbed primarily are 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, which squeeze the oil from the synthetic pads, allowing their frequent reuse. For 2007, 185 gallons of used absorbents were sent for energy recovery or recycling, a decrease of 81 percent from 2006.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – ATC uses absorbents primarily on hydraulic fluids, crankcase oils, and other lubricating oils. Absorbents used include pads, socks, and granular absorbents. They are used in the Diesel, Marine and Small Engine, campus garages, Maintenance and Warehouse departments. Our Diesel Shop continues to use a lava ash absorbent in addition to a clay-based absorbent, which has resulted in reduced waste material, time that the material must lay on the oil, and cost.

Anoka Technical College, Anoka – We use oil absorbent products such as floor-dry, napkins, and oil absorbent cloths in our Physical Plant and Automotive program.

Dakota County Technical College, Rosemount – DCTC does not use clay-based floor-dry at our facilities. We use a cellulose type of absorbent. All used products are incinerated. Our college mechanic uses rags that are laundered.

Minnesota State University, Moorhead continues to use cloth-type pads and drip pans whenever possible. These absorbents, cloth-type rags, pads, and socks, are used primarily in Printing Services, Physical Plant, and Department of Art & Design. Launderable rags are available and used at some locations.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC uses absorbents primarily on hydraulic fluids, crankcase oils, and other lubricating oils. Absorbents used include pads, socks, and granular absorbents. Absorbents are utilized in various occupational program areas and by the Maintenance Department.

St. Cloud State University, St. Cloud – 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. Our used oily rags are being collected and disposed of with a local vendor for incineration.

Department of Transportation (Mn/DOT) – 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 sorbents reused. It is important to use sorbents to their full potential prior to discarding. The single largest factor in reducing sorbent waste is reuse. Mn/DOT continues to use a small quantity of launderable rags as sorbent material.

University of Minnesota – 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 several (5 to 10) drums per year. Printing & 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) – RECS specifies materials such as fiber-based fabrics, adhesives, carpeting, and upholstery that are free of toxins and formaldehyde.

Department of Corrections (DOC) – *MCF-Lino Lakes* – Work performed on equipment containing refrigerant (primarily R22) is completed by a certified refrigeration mechanic. Refrigerant is recovered when service and maintenance activities are performed.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College – Adhesives are used by the Facilities Maintenance, Carpentry, Art and Interior Design Departments. Adhesives are used in a manner to reduce waste and exposure. MSDS sheets are retained for each adhesive product used at our sites.

Minnesota State University, Moorhead – MSUM continues to enforce 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 & 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.

North Hennepin Community College – Several types of adhesives are used at this college. Every effort is used to properly control product use and follow manufacturer recommendations to ensure all adhesives are maintained to allow product to be completely used and not allowed to be wasted because of poor handling.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC continues to use only low- or no-VOC products within buildings to primarily accommodate people with indoor air sensitivities.

St. Cloud State University, St. Cloud – 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.

3. Air Quality, CFCs

Department of Administration (Admin) – RECS specifies statewide asbestos control programs based on federal and state standards. It also specifies air quality standards. PMD retrofitted one existing chiller at the History Center with non-ozone depleting 134a refrigerant.

Department of Agriculture –The department has not purchased any products containing VOCs (paints, solvents, cleaners, etc.) 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 Minnesota Department of Agriculture 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."

The department believes that the above contract language (specifying the type of products/cleaning supplies/equipment to be used) will continue to reduce the total VOC content in products used within the facility.

Department of Corrections –*MCF-Lino Lakes* – Work performed on equipment containing refrigerant (primarily R22) is completed by a certified refrigeration mechanic. Refrigerant is recovered when service and maintenance activities are performed.

Metropolitan Airports Commission (MAC) – The MAC has implemented comprehensive air quality enhancements that address air quality impacts ranging from idling taxi fleets to ground service equipment. Since air emissions are closely linked to ozone and greenhouse gas generation, the MAC's air quality enhancement initiatives benefit not only the local community but also the global community at large.

The MAC's air quality enhancements at MSP include:

- Redesigned the inbound and outbound roadways
- Expanded Lindbergh Terminal and Humphrey Terminal parking ramps
- Operate flex-fuel vehicles and fueling facilities
- Installed 400Hz ground power system at terminal gates
- Implemented light rail transit
- Established a cell phone lot
- Implemented ePark and SurePark
- Replaced boilers and chillers
- Improved terminal rental car facilities

Minnesota Army National Guard (MNARNG) – JFMN (Army) HVAC personnel reclaim and reuse CFCs.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – As HVAC funds become available, Freon-based cooling units are replaced with roof-mounted, energy-efficient cooling systems further reducing the potential for CFC emissions. Maintenance performed on any system containing CFCs includes complete recovery and recycling of refrigerants by licensed, certified service technicians.

Anoka Technical College, Anoka – Maintenance performed on systems containing CFCs are conducted by certified technicians. CFCs are completely recovered, recycled, and documented. Plans of a chiller upgrade will reduce CFCs by using a new refrigerant.

Itasca Community College, Itasca – All air handling units/heating systems and drains continue to be routinely inspected and maintained. Appliances containing CFCs are recycled through approved vendors.

Minnesota State University, Moorhead – All air handling units/heating systems and drains continue to be 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.

North Hennepin Community College – CFC refrigerants are in use on campus in Central Plant chillers (R-134), and several smaller air conditioning (R-12), and refrigeration units (R-408, 22). No supplies or stocks of refrigerant are kept on campus. Refrigeration units that are found to be leaking are repaired and a more ozone friendly replacement refrigerant retrofitted is made. This type of work is performed by qualified outside contractors.

Northland Community and Technical College, East Grand Forks and Thief River Falls – All air handling units/heating systems and drains continue to be 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. In the 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. Air conditioning refrigerants are recycled to prevent them from entering the atmosphere.

St. Cloud State University, St. Cloud – SCSU continues to go beyond recycling Freon.

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

University of Minnesota – In March 2005, WCROC began operating a 1.65MW wind turbine. This 230 foot turbine provides the University of Minnesota, Morris with 5.6 million kilowatt hours of power each year; this is more than half of University of Minnesota, Morris's annual electricity requirement thereby cutting in half the coal burned to power the campus. Of equal or greater interest is the wind turbine's potential to generate additional energy sources and to provide a platform for this research. WCROC has received funds from the Legislative Commission on Minnesota Resources to institute a three-phase plan to demonstrate and conduct vital research in areas of stored wind energy with hydrogen, fuel mixing, and value-added products such as wind-produced fertilizer.

In December 2004, the University of Minnesota joined the Chicago Climate Exchange (CCX), a voluntary, legally binding multisector market for reducing and trading greenhouse gas emissions. The university is the fourth educational institution and the largest public research university to join CCX. The action places the university in a small but growing group of organizations committed to the development of a rules-based North American greenhouse gas emission reduction program, and involves the Energy Management division of Facilities Management, the Initiative for Renewable Energy and the Environment (IREE), the College of Biological Sciences, and many scholars from across our campus.

The Chicago Climate Exchange is a pilot program for reducing and trading greenhouse gas emissions in the United States, Canada, and Mexico. Members with direct emissions have agreed to reduce their emissions of greenhouse gases by four percent below the average of their 1998-2001 baselines by 2006, the last year of the pilot program. Members that make further reductions can be compensated by selling reduction credits to members for whom a four percent reduction would be technically or economically difficult. Greenhouse gases covered by the agreement are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

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 to 280 to 310 tpy, and carbon monoxide (CO) emissions from approximately 280 tpy 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 energy consumption on the Twin Cities campus while maintaining or improving occupant comfort. Three components of the Energy Efficiency Program 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 (BSAC), which can electronically monitor and control 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. They 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 24.6 percent 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 (http://www.me.umn.edu/centers/cdr/index.html). The center's mission is to: 1.) Develop new technology to reduce occupational and environmental exposure to internal combustion engine emissions; 2.) Evaluate the application of emission control strategies in confined spaces such as mines and densely populated areas; 3.) Offer unique educational and research opportunities to students; 4.) 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; and 5.) Offer educational opportunities through outreach programs and short courses.

University Facilities Management has an on-going program to capture and reclaim CFC and HCFC from cooling units; as units are serviced, their CFC/HCFC are captured, and then placed back in the unit after it is serviced. 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 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 avoidance of air pollution each year.

The University of Minnesota, Morris use of wind generated electricity dramatically reduces air pollution (5,000 tons CO_2, 20 tons SO_2, 10 tons NOx, 1 ton CO per year). 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 mobile diesel exhaust emissions makes for a cleaner and healthier air to breathe. CFC and HCFC capture and reclamation program reduces emissions of global warming chemicals.

4. Antifreeze

Department of Administration (Admin) – PMD completed the conversion of cooling coils at all Capitol Complex Buildings to prevent freeze-ups by using warm air from the air handlers rather than antifreeze, and it collects and recycles antifreeze on a voluntary program. MMD has a contract to recycle used antifreeze (H-94(5)).

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

Iron Range Resources and Rehabilitation Agency (IRRR) – Como Oil of Duluth picks up the antifreeze 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 then returned to the 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.

Minnesota Army National Guard (MNARNG) – The JFMN (Army) recycled approximately 1,000 gallons of antifreeze last year. A distillation unit is used for recycling of the antifreeze. Pure glycol, water, and a minor amount of waste are the result of the distillation process. With antifreeze ranging in cost from $7 to $10 per gallon, this results in a cost savings of $7,000 to $10,000.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – Antifreeze is used mainly in the Diesel Mechanic, Marine and Small Engine and Truck Driving programs and is collected and disposed of according to local waste management regulations. Our fleet vehicles are maintained by an independent contractor who collects and recycles antifreeze when it is replaced in vehicles on an as-needed basis.

Dakota County Technical College, Rosemount – DCTC collects all used antifreeze in a 55-gallon drum and Edel Oil picks it up for recycling.

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

North Hennepin Community College – This college no longer uses antifreeze to winterize cooling coils. A different method has shown favorable results and will be continued. Small quantities of automotive antifreeze from lawn equipment are brought to a local recycler.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC generates waste antifreeze which is recycled as part of the hazardous waste disposal.

St. Cloud State University, St. Cloud – SCSU generates approximately 10 to 15 gallons of waste antifreeze per year and it is recycled at Eastside Oil Company.

South Central College, Faribault and North Mankato – All oil and antifreeze products are recycled by the appropriate vendors.

Department of Transportation (Mn/DOT) – Mn/DOT uses an extended life coolant when a system needs to be flushed. The extended life coolant protects the cooling system for 600,000 miles or 12,000 hours, with the addition of an extender at 300,000 to 400,000 miles of on-road use (3 years or 6,000 hours of off-road use).

Mn/DOT typically does not produce significant amounts of antifreeze. For example, if part of the coolant system needs to be changed, the old antifreeze is collected and stored while the repair is made, and then placed back into the vehicle.

Mn/DOT has researched, identified, and implemented various recycling options for antifreeze. However, due to the relatively high cost of current recycling options, 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 3 to 5 years. The small amount of antifreeze collected is periodically regenerated onsite by outside contractor.

5. Audits

Department of Corrections – Safety audits are conducted DOC-wide on a regular basis and In FY 2008 an environmental section was developed and added as a portion of regular audits.

MCF – Willow River/Moose Lake – Audits were performed by the Department of Energy for emissions and the DNR to evaluate water consumption.

MCF-Lino Lakes – Conducted Stormwater Pollution Prevention audit.

MCF-Shakopee – Center Point Energy completed a lighting audit in July 2007 and recommended the installation of more efficient lights with occupancy sensors. After work is completed, it is expected that energy use will be one-half the current level.

Metropolitan Airports Commission (MAC) – The MAC continues to conduct environmental compliance inspections at its six Reliever Airports in addition to environmental facility inventories at MSP. These inspections and inventories help identify possible environmental issues and assist 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. The inspections are also an opportunity for the MAC to educate its tenants regarding the environmental impacts their actions may have and to help them improve their waste management practices. Opportunities for pollution prevention are noted and incorporated into the Capital Improvement process as indicated by the MAC's strategic plan. The MAC routinely inspects and continuously audits its own operations, as well, in an effort to recognize and take advantage of any pollution prevention opportunities.

Minnesota Army National Guard (MNARNG) – Internal Performance Assessment System (IPAS) environmental audits are conducted at all JFMN facilities. The National Guard Bureau (NGB) performed a separate assessment of Minnesota's environmental program in 2008; their assessment is called the external performance assessment system. Their assessment reviews all aspects of a state program, to ensure compliance with all regulatory programs and especially focuses on P2 and waste management programs.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – Audits mandated by OSHA, RECA, and the MPCA are conducted and recorded as outlined in the regulations.

Anoka Technical College, Anoka – Anoka Technical College has had an updated audit for stormwater management.

Dakota County Technical College, Rosemount – CHESS (Complete Health, Environmental & Safety Services) performs monthly inspections as part of its environmental health and safety contract with DCTC, we have joined Minnesota Waste Wise and we also employ a Health and Safety Coordinator.

Minnesota State University, Moorhead – The Department of Environmental Health and Safety and Physical Plant staff periodically conduct internal audits of university facilities. These audits cover such areas as hazardous waste, stormwater management, storage tanks, laboratory procedures, and energy consumption. Individual departments are also asked and encouraged to self-audit periodically. Most recently, a campus-wide audit was conducted in partnership with the city of Moorhead wastewater treatment engineers and MnTAP looking for phosphorus-containing cleaning products in order to find alternatives.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC periodically conducts internal audits of college facilities to ensure a safe environment for employees and students. These audits cover such areas as hazardous waste, stormwater management, storage tanks, laboratory procedures, and energy consumption.

St. Cloud State University, St. Cloud – Ross Environmental Inc. performs environmental audit functions as part of their Environmental Health & Safety (EHS) contract with SCSU. The Safety Administrator is instrumental on hazardous waste audits, waste prevention planning, and hazardous waste removal. Departmental 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. Survey 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.

University of Minnesota – The university's Department of Audits checks departments to see if they have hazardous waste compliance protocols (which include 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. DEHS also initiated chemical waste audits of all labs on the Twin Cities Campus. All chemical waste generators are directed to minimize waste and prevent pollution via training and self-audit.

The training and audit form is currently available on the web through the DEHS homepage http://www.dehs.umn.edu/hazwaste_chemwaste_umn_cwmgbk.htm

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 the department.
- Identify various pollution prevention opportunities that warrant further research.
- Evaluate potential areas of noncompliance with state and federal requirements regarding hazardous and solid waste management, 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 conducts external environmental audits of facilities that handle Mn/DOT wastes. The purposes of these audits are 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 and costs: Both Mn/DOT's internal waste stream and external environmental audit programs have costs associated with them. Based on Mn/DOT's experience, the cost for the program is minimal compared to the cost associated with potential Minnesota Pollution Control Agency enforcement actions and potential environmental liability (superfund). However, staff reductions over the years have reduced Mn/DOT's ability to complete both internal and external audits.

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.

6. Automotive Fuels

Department of Administration (Admin) – Fleet and Surplus Services purchased 349 model year 2008 vehicles. Of these vehicles 321, or 92 percent, were flexible fuel models capable of using E85 fuel.

Fleet and Surplus Services tracks E85 fuel usage for the state. This is accomplished by analyzing fuel purchasing records supplied by the contract fuel card vendor. The state purchased 412,000 gallons of E85 fuel in calendar year 2007. This is 7.5 percent of the total gasoline/E85 fuel purchased in calendar year 2007.

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.

PMD has 11 E85 vehicles as replacement vehicles and purchased 2,419 gallons of E85 fuel in FY 2008, compared to only 87.55 gallons of E85 fuel in FY 2007.

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 have been checked to ensure that no mercury is present in the vehicles. MMD is soliciting the automobile industry for the potential acquisition of plug-in electric hybrid cars. If the industry can provide the vehicles that meet our specifications and the price doesn't exceed 10 percent of a normal internal combustion engine vehicle, the state will procure electric hybrid vehicles as state fleets needs dictate for a minimum period of five years.

When establishing contracts for automobiles, MMD requires state agencies only purchase vehicles that burn clean fuel, E85 and bio-diesel. If a need cannot be met by a clean fuel vehicle, the agency must request an exception from MMD, (on a case-by-case basis) to purchase a non-clean fuel vehicle. Contract Vendors are prohibited from selling non-clean fuel vehicles to state agencies without the written authorization from MMD.

Department of Agriculture –The MDA continues to help promote the use of alternative fuels through its help with the farm community in the production of ethanol-blended and bio-diesel fuels. More information on these programs can be found by going to the department's web site. The MDA had a total of 124 E85 vehicles in its fleet out of a total of 131 vehicles during FY 2008.

The total E85 fuel consumed by these vehicles during FY 2008 was 25,907 gallons. This equates to almost 35 percent more E85 fuel used in FY 2008 as compared to FY 2007. The department also had a 42.5 percent E85 usage rate compared to the amount of regular gasoline purchased (currently the third highest rate as indicated by the Fleet Council-Smart Committee). The MDA had a total of 116 E85 vehicles in its fleet out of a total of 127 vehicles during FY 2007.

The total E85 fuel consumed by these vehicles during FY 2007 was 19,388 gallons. This equates to almost 100 percent more E85 fuel used in FY 2007 as compared to FY 2006. The department also had a 17.1 percent E85 usage rate compared to the amount of regular gasoline purchased (currently the fourth highest rate as indicated by the Fleet Council-Smart Committee.)

Department of Commerce – The department actively promotes the use of E85 throughout Minnesota with the use of federal funding, information materials, education efforts, and staff support.

E85 station and consumption data

Year	Stations	Total (gal/yr)	Station avg. (gal/month)
FY 97	11	5,933	225
FY 98	12	37,521	288
FY 99	17	74,959	583
FY 00	56	301,152	780
FY 01	65	706,228	965
FY 02	70	1,262,318	1,479
FY 03	85	2,185,905	2,335
FY 04	101	2,611,218	2,270
FY 05	179	8,102,129	4,650
FY 06	290	18,058,365	6,133
FY 07	320	21,394,620	5,824
FY 08	344	11,493,889	5,645

Data on fuel purchases was provided through the Department of Administration.

Currently, the department has 54 vehicles, 14 of which are leased through the Department of Administration and 36 of which are owned directly. Four of the department's vehicles are E85 capable. The department does not fall under EPAct.

Department of Corrections (DOC) – Multiple facilities, Central Office, and Field Services reported the use of E85 vehicles in its automobile fleets. Overall, 119 of 249 (48 percent) vehicles were reported to be E85 capable. That represents a 2 percent increase in the number of vehicles that are E85 capable. Below is the most recent data available for type of fuel purchased during FY 2008.

Fuel purchases (in gallons)			
Year	Diesel	E85	Unleaded
FY 06	34,352	15,148	300,897
FY 07	31,278	18,312	301,507
FY 08	15,998	24,227	155,532

Utilizing the 24,227 gallons of cleaner burning E85 in place of regular unleaded fuel resulted in a CO_2 emissions reduction of 33,000 kilograms and a NOx reduction of 11.91 kilograms[1].

MCF-Rush City – Purchased a hybrid vehicle (Ford Escape) for perimeter patrol. This saves approximately 9 gallons of unleaded gasoline each day, a total of approximately 3,200 gallons each year.

MCF-St. Cloud – The facility has purchased flex-fuel vehicles.

MCF-Shakopee – The percentage of E85 fuel being purchased went from a low of 2 percent in November 2007 to a high of 46 to 49 percent in May and June 2008, reflecting a more focused effort to look for and find stations that handle E85 fuels across the multi-state region where offenders are picked up.

Department of Employment and Economic Development (DEED) – As referenced in Part 2 of this report, we have recommended through policies and procedures that employees traveling on business purchase the cleanest fuel possible when using DEED-owned vehicles. DEED also challenged their flexible-fuel state car drivers to participate in the Department of Administration's E85 promotional event held in May 2008 by offering an incentive prize to the person (or office for pooled vehicles) that received the largest E85 credit on their May invoice. Employees were provided with an electronic link to a list of the closest E85 gas stations.

Department of Revenue (DOR) –Our vehicle fleet of 20 units is made up of vehicles designed for E85. Our fleet has increased due to growth in the number of auditors located throughout the country and on staff. We continue to strive to increases our use of E85, and improving the use of E85 will be one of the key agenda items for the next year.

Iron Range Resources and Rehabilitation Agency (IRRR) – Iron Range Resources uses a blend of ethanol and gasoline in all of the motor pool and agency vehicles. The agency is currently using 21 passenger vehicles. Ten are owned by the agency and 11 are leased from the TMD (Travel Management Division) in St. Paul. Ten of these vehicles are FFV (flex-fuel vehicles).

Metropolitan Airports Commission (MAC) – In 2006, the MAC installed an E85 tank and dispenser at an existing on-site fuel island for use by MAC vehicles. The majority of MAC vehicles are used on airport only and the ability to refuel on-site eliminates the need to drive to an E85 retail station.

Fuel purchases			
Year	E85 (gallons)	Number of E85 vehicles in the MAC fleet	Percentage of E85 vs. gasoline
FY 06	1,900	8	1.3%
FY 07	10,324	19	7.74%
FY 08	19,937	35	15.7%

"Comparison of Carbon Dioxide Emissions from Gasoline and E85," Ronald Timpe & Ted Aulich, University of North Dakota Energy & Environmental Research Center, January 12, 2005; http://www.cleanairchoice.org/outdoor/pdf/E85C02Report2004.PDF

Metropolitan Council Environmental Services (MCES) – The MCES has made several recent P2 improvements to its fleet of 315 licensed, over-the-road vehicles. There are now 15 vehicles that can run on E85 fuel as well as unleaded gasoline. E85 contains 85 percent ethanol, which is distilled from grain, such as corn. The models capable of 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 two vehicles are consistently fueled with the ethanol blend. The Yukon used 354 gallons and the Caravan 170 gallons of E85 in 2007. The MCES installed its first underground storage tank (2,500 gallons at the Metropolitan Wastewater Treatment Plant) dedicated to E85 in late 2007. The use of ethanol fuel should increase significantly.

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.

MMCD fuel usage for fiscal year 2008

Total gallons used	E85 fuels	Bio-diesel fuels	Blue Planet fuels
81,500	25,500	500	55,500

For the fiscal year, MMCD used 81,500 gallons of automotive fuels. Of that total 25,500 gallons (31 percent) was E85 fuel and 500 gallons (>1 percent) was bio-diesel fuel. The remaining 55,500 gallons of fuel was low-sulfur, low-benzene fuel. MMCD has increased the usage of E85 fuel in the district fleet more than 300 percent during the last two years.

Minnesota Army National Guard (MNARNG) – In FY 2008, 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) – MPCA exceeds the requirements of the federal Energy Policy Act of 1992, by leasing or purchasing 85 percent alternative fuel vehicles. For the first quarter of 2008, January to March 2008, the MPCA has purchased 24.3 percent E85 fuel, ranking 12 out of the 43 state agencies reporting. In May 2008 as an encouragement for using E85 in the flex-fuel vehicles leased, the Department of Administration offered an incentive program call “E85 Bucks”. For every gallon of E85 fuel our agency purchased in May, it would receive $1 credit. Normally we receive 10¢ for every gallon of E85 we purchase. The MPCA was one of the top-participating state agencies, and we received a $2,206.10 credit.

In August 2008, the MPCA joined the other cabinet level state agencies and enrolled in a new fleet management information system called “M5” that will help track fleet costs and fuel usage for all state agencies.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – ATC currently has one E85 vehicle in its fleet. The total gallons of E85 fuel used in this vehicle is not available to our campus at this time. ATC has specified that vehicles leased in the future should be E85 compliant.

Anoka Ramsey Community College, Cambridge and Coon Rapids – We did not replace any of our fleet vehicles this year. We do not have a method of tracking E85 fuel purchased. Obtaining E85 fuel is very difficult. There are limited stations that carry E85 fuel in the Twin Cities area and even more limited outside the Twin Cities area.

Some of our employees are car pooling, however our effort to work with the light rail (NorthStar) in the northern suburbs holds the most promise. We continue to meet with the county and city leaders as well as transportation sources to plan for transportation of our students, staff, and faculty utilizing the NorthStar Rail as soon as the stations are completed. One is near completion in Coon Rapids and plans are in place

for a future site that would service our Cambridge campus.

Dakota County Technical College, Rosemount – Some college-owned automotive maintenance and major vehicle repairs are performed by auto dealerships. Preventative maintenance on trucks and lawn equipment such as oil and filter changes are performed by qualified staff on campus. We purchase bio-diesel fuel and we own a Smart Car and Prius. The used oil, filters, and antifreeze are sent to a local recycler.

Itasca Community College, Itasca – Itasca Community College refuels our vehicles with the cleanest fuel available.

Minnesota State University, Moorhead – The automotive fleet is available to faculty, staff, and students. Due to the broad nature of vehicle use and the lack of area stations providing E85, it continues to be difficult for the university to monitor the amount of E85 fuel purchased. The fleet includes 10 sedans, one minivan, and six 12-passenger vans. Two sedans are equipped for E85 use. The use of E85 fuel is encouraged. To help reduce emissions and save energy, Campus Security recently purchased an electric car for use on the main campus while the Athletics Department uses three electric cars to travel throughout campus. The cost to operate the electric cars is approximately $30 per year averaging 50 miles per week, whereas a gas automobile would require a cost of approximately $800 for the same use. During summer months, bio-diesel is primarily used in the Physical Plant's lawn tractors, skid steer 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.

North Hennepin Community College – Fuel for grounds equipment is stored in an aboveground 285-gallon diesel tank having spill containment. Gasoline for small equipment is kept in approved safety cans and stored in an approved safety cabinet. E85 fuels have not been used on our older vehicles.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC purchased the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department. In FY 2008, eight vehicles were purchased that have capabilities to burn E85 fuel.

St. Cloud State University, St. Cloud – SCSU has 13 2005/2006 E85 5-passenger Ford Tauruses, four E85 seven-passenger Dodge Caravans, and five 12-passenger Ford Club wagons on the Motor Pool Fleet for a total of 22 vehicles. They produce limited carbon monoxide. The university has on-site E85 refueling and has pumped 12,606 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 Transportation (Mn/DOT) –Mn/DOT purchase of E85 fuel is generally increasing annually to meet Executive Order 06-03. Mn/DOT is purchasing light-duty fleet as alternative fuel vehicles. Its heavy equipment is being purchased with computer controlled electronic ignition that maximizes vehicle fuel efficiency. The department is working on a plan that would replace its fleet over time with more environmentally friendly diesel engines, and it 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 flex-fuel vehicles (FFV) that can use this environmentally friendly fuel. The university pumps over 20,000 gallons annually, the greatest user of E85 fuel in the state and nationally. In FY 2007, the University of Minnesota's E85 fleet and tanks were used for a state-funded E20 test so no E85 results are available.

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 a fleet of 37 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 fuel efficiency is 42 mpg overall versus 28 mpg 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). Center for Diesel Research (www.me.umn.edu/centers/cdr/index.html) is a good resource of information on test procedures and simple maintenance that can greatly reduce diesel emissions from buses and trucks. Proper choices and use of fuels help reduce air emissions from automobile and bus exhausts and reduce fuel consumption.

7. Automotive Maintenance

Department of Administration (Admin) – FSSD and PMD preventative maintenance programs are designed to minimize excessive and/or premature replacement of parts. They also use remanufactured parts whenever possible. 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, which reduces items in the waste stream and 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 – Agency-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 vehicle maintenance, except for air conditioning systems, is done in the Iron Range Resources' 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 picked up and recycled by a scrap-metals facility.

Metropolitan Airports Commission (MAC) –Twenty-three vehicles were upgraded in FY 2008, affording emission reductions associated with increased fuel economy.

- 1989 Ford F-150 (three) replaced by 2008 *E85* Ford F-150 (three)
- 1996 Ford F-150 replaced by 2008 *E85* Ford F-150
- 1999 Dodge 1500 replaced by 2008 *E85* Ford F-150
- 1993 Chevy K-1500 replaced by 2008 *E85* Ford F-150
- 2001 Ford F-150 replaced by 2008 *E85* Ford F-150
- 2000 Ford F-250 replaced by 2008 Ford F-250
- 2005 Crown Victoria (three) replaced by 2008 Crown Victoria (three)
- 2006 Crown Victoria replaced by 2008 Crown Victoria
- 2000 Ford Expedition replaced by 2008 *E85* Chevy K-1500
- 2001 Ford Expedition replaced by 2008 *E85* Chevy K-1500
- 1996 Ford F-250 (two) replaced by 2008 Ford F-350 (two)
- 2000 Ford Expedition replaced by 2008 *E85* Tahoe
- 1999 Dodge Durango replaced by 2008 *E85* Dodge Durango
- 1998 Ford Explorer replaced by 2008 *E85* Tahoe
- 2002 Ford Windstar (two) replaced by 2008 *E85* Dodge Durango (two)
- 2000 Ford Explorer replaced by 2008 *E85* Tahoe
- 2005 Jeep Liberty replaced by 2008 *E85* Dodge Durango

Sixteen of the new vehicles acquired in 2008 are flex-fuel and will refuel on site with E85 whenever possible. The vehicle upgrades listed above have afforded the following emissions reductions:

Estimated emission reductions (in pounds)						
CO	**$C0_2$**	**NOx**	**PM10**	**PM2.5**	**VOC**	**$S0_2$**
16,176.027	39,576.713	1,549.078	8.247	7.295	1363.234	1.505

Metropolitan Mosquito Control District – To reduce air pollution under the requirements of the Executive Order 04-08, MMCD adopted the following guidelines regarding the purchase or lease of new district vehicles. *Whenever possible MMCD will purchase or lease the most fuel efficient and least polluting vehicles that meet the operational needs of the district under the requirements of the Executive Order 04-08.*

MMCD purchased 17 new flex-fuel vehicles (FFV) capable of using E85 ethanol to replace 17 older fleet vehicles. The new FFV vehicles MMCD purchased are flex-fuel Ford F150 half-ton pickups. The average price of each FFV truck was $15,530. MMCD also purchased two Ford F250 three-quarter-ton pickups that do not use E85 fuels, and these vehicles were assigned to regional facilities that do not have ready access to E85 fuel. Using the emissions reduction spreadsheet provided by IPPAT, the 17 older vehicles were entered as baseline vehicles and the 17 new FFV pickups as current vehicles. The miles driven by each vehicle is an average for each group. A reduction total was calculated comparing the older vehicle emissions to the new FFV emissions totals. By eliminating seventeen older vehicles from the fleet and replacing them with new flex-fuel vehicles, MMCD reduced tail pipe emissions in 2007/2008. The table below contains MMCD's results for reducing tailpipe emissions.

Total 2007-08 emissions reduction (in pounds)							
Activity	**CO**	**CO_2**	**NOX**	**PM10**	**PM2.5**	**SO_2**	**VOC**
Gasoline vehicles	4,785	5,219	308	.6	.3	.1	489

MMCD owns and operates a fleet of 202 half-ton pickups, 70 of those pickups are E85 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 possibly cause adverse health effects. MMCD is committed to reducing pollutants generated by its vehicle fleet and plans to continue a program of replacing older fleet vehicles with more efficient, cleaner running flex-fuel vehicles whenever possible.

Minnesota Army National Guard (MNARNG) – P2 opportunity assessments have been run on benefits of self-antifreeze distillation, paint gun wash solvent distillation, water blast paint removal, as well as many other automotive-related projects.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – Automotive maintenance and repairs are performed by local vendors who recycle oil, oil filters, batteries, and air conditioning refrigerants. ATC coordinates vehicle replacements through the state vehicle leasing program. As replacement criteria warrant, the vehicles in our fleet are replaced with more fuel efficient models.

Itasca Community College, Itasca – Automotive fleet maintenance is primarily conducted by off-campus vendors. All used oil, filters, and antifreeze are recycled by local vendors.

Minnesota State University, Moorhead – Automotive fleet maintenance is primarily conducted by off-campus vendors. Any on-campus maintenance is conducted in the Physical Plant's auto mechanic 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.

North Hennepin Community College – Major repairs to our vehicles are performed by automotive dealerships. Minor maintenance such as oil and filter changes are performed by qualified staff on campus. The recapture of used oils, filters, and antifreeze is performed by these individuals. Recycling of this used material is performed by a local vendor.

Northland Community and Technical College, East Grand Forks and Thief River Falls – Major repairs to automotive fleet vehicles are performed by automotive dealerships.

East Grand Forks Campus – Automotive fleet maintenance is primarily conducted by Maintenance Department employees. All used oil, filters, and antifreeze are recycled by local vendors.

Thief River Falls Campus – Automotive fleet maintenance and repairs are performed by local vendors who recycle oil, oil filters, batteries, and air conditioning refrigerants.

St. Cloud State University, St. Cloud – The SCSU vehicle repair shop has revamped procedures for brake pad/shoe replacement to ensure asbestos fiber release control. Replacement pads are non-asbestos.

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

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 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/disposal. This system eliminates 240 gallons of solvent waste per year.

Vehicle fleet operations use absorbent pads to clean up small routine spills, in place of and/or in combination with floor-dry. Pads are laundered and reused. Absorbent disposal has been cut by 5 to 10 drums per year.

8. Batteries

Department of Administration (Admin) – RRO 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.

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.

MMD's contract for automotive batteries has provisions for all state agencies to recycle batteries. FSSD recycles automotive batteries. MMD procures only reduced or no-mercury batteries in accordance with Minn. Stat. § 115A.965, subd. 2. The mercury content in flashlight batteries has been either eliminated or reduced to negligible levels.

PMD returns batteries from vehicles and janitorial equipment to vendors for recycling. PMD participates in all voluntary internal battery collection and disposal programs.

Hospital supplies: MMD developed 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 lunch room. An employee volunteers to collect the batteries and provide them to Hennepin County for recycling. An employee has also volunteered to collect and recycle compact fluorescent lamps.

Department of Corrections (DOC) – All facilities collect used batteries and return them to the vendor for recycling when new batteries are purchased. Overall, over a ton of used batteries were recycled in 2008.

Iron Range Resources and Rehabilitation Agency (IRRR) – Batteries that cannot be recharged are transported 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 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 from heavy equipment, electric carts, and standby emergency electric power diesel-fueled generators that do accumulate are stored for recycling. In 2007, 19,140 pounds of SLABs—a decrease of 34 percent from the previous year—were recycled from MCES facilities, mostly through A-Battery City in Minneapolis.

Minnesota Army National Guard (MNARNG) – The JFMN (Army) recycled approximately 1,500 lead acid vehicle batteries.

Minnesota Pollution Control Agency (MPCA) –The MPCA purchases alkaline rechargeable batteries 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 173 pounds of rechargeable nickel-cadmium, nickel metal hydride, lead acid, vehicle, and button batteries in calendar year 2007 at an authorized battery collection point.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – All spent nickel-cadmium, lead acid, nickel metal hydride, mercury button, and lithium batteries are recycled through approved recycling contractors.

Anoka Technical College, Anoka – All batteries are recycled. When a new lead-acid battery is purchased, the old one is taken in for exchange. Other batteries are recycled through a local supplier.

Dakota County Technical College, Rosemount – DCTC collects lead acid batteries and returns them to the supplier for recycling. We also collect nickel cadmium, nickel metal hydride, mercury button, and lithium batteries and send them to a recycler.

Itasca Community College, Itasca – All batteries are recycled. When a new lead-acid battery is purchased, the old one is taken in for exchange. Other batteries are recycled through a local supplier.

Minnesota State University, Moorhead – 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.

North Hennepin Community College – All batteries are recycled. Every effort is made to ensure that when a lead acid battery is being replaced that an old worn out one is brought in for exchange at the time of the new battery purchase. Other batteries are recycled through a local supplier.

Northland Community and Technical College, East Grand Forks and Thief River Falls – All batteries, including lead acid, nickel cadmium, lithium, mercury oxide, and silver oxide, are collected and recycled. Automotive batteries are exchanged and recycled through a local dealer. Use of alkaline rechargeable batteries is promoted to departments who utilize these products in large amounts.

St. Cloud State University, St. Cloud – 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.

Department of Transportation (Mn/DOT) – Mn/DOT uses nickel-cadmium, lead acid, nickel metal hydride, mercury button, and lithium batteries. These batteries are sent to recyclers after their useful lives.

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.

In fall 2000, Facilities Management and the Department of Environmental Health and Safety reviewed and updated the battery collection program, purchased new, colorful collection containers and distributed 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 (Rechargeable Battery Recycling Corporation) for recycling. This is a free service for public agencies and institutions (http://www.rbrc.org/community/index.html).

9. Cleaning Supplies

Department of Administration (Admin) – MMD employed the services of MPCA in awarding its Cleaning Supplies Contract. Adherence to the product selection criteria established in this award will ensure that the cleaning products chosen have a lower negative impact on public health and the environment. Each solicitation responder was required to have its formulations reviewed by an independent laboratory to verify all ingredients found in their products. Items have been GreenSeal certified and meet the following criteria:

- 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 being considered to ensure greater safety to state agencies and the environment: aquatic toxicity, combustibility, skin sensitization, photochemical smog, tropospheric ozone production, and indoor air quality.

MMD has 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 and CPV cities and local governments.

The RRO uses state contract cleaning supplies that have high environmental attribute scores and that are delivered in bulk form to minimize waste and packaging.

PMD uses janitorial products that, after use, are safe to discard in sewers, chemicals packaged as concentrates to reduce packaging waste by 85 percent, and automatic dispensing systems to ensure correct dilutions from concentrates and to minimize waste.

Department of Agriculture – 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 by sending out a directive to all purchasing agents within the agency. For more information see f under *Part 3: Quantifiable Measurements for Activities Satisfying Executive Order 04-08*.

Department of Corrections (DOC) – All facilities use environmentally friendly products. DOC policy helps to ensure the use of the safest possible product, with the lowest capability of 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. These products have a lower volatility and do not evaporate nearly as readily as traditional solvent-based cleaners. Staff places a high priority on utilizing techniques, methods and products that are non-hazardous or less hazardous to implement the concept of source reduction. Since FY 2006, the DOC has increased its use of environmentally friendly cleaning product through MINNCOR (Green Seal approved). The decision to switch to these products was evaluated with the help of the former Office of Environmental Assistance. The corresponding reduction in VOCs could not be calculated as exact amounts and compositions of the materials were not obtained.

MCF-Red Wing – Facility building care workers began utilizing new environmentally friendly citrus-based cleaning chemicals.

Department of Revenue (DOR) – Cleaning supplies are provided by the Department of Administration and various cleaning services. DOR requests all of its independent cleaning services use low-VOC products.

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.

Minnesota Army National Guard (MNARNG) – Internal audits of MNARNG facility cleaning supply storage include a review of shelf life. Whenever possible the shelf life is extended and products are used up. Many of the Maintenance facilities within the MNARNG utilize 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 (MPCA) – The MPCA Alliance for Recycling and Reduction of Waste (ARROW), a group of employees that serves as a point of contact for any recycling (reuse, reduce, or rethink) or composting questions, encourages environmentally preferable purchasing whenever possible. ARROW supports using greener cleaning products in the MPCA building. The MPCA central office has encouraged its contracted vendor to pilot-test greener cleaners that meet environmental criteria, such as products that are nontoxic, water-based, and have low or no odors. Products that meet criteria are placed on a list for the cleaning company to refer to when ordering cleaning supplies. For staff's general desktop cleaning, 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)

Alexandria Technical College, Alexandria – Environmentally friendly cleaning products are used in many applications throughout the campus. Environmental stewardship is of utmost concern when evaluating cleaning products for purchase for use on our campus. MSDS sheets for these products are maintained on-

site, and employees receive training compliant with the Right to Know Act. Products eliminated from our programs are managed through the University of Minnesota's Chemical Safety Day Program.

Our Facilities Maintenance Department has converted most of its 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.

Dakota County Technical College, Rosemount uses environmentally safe, biodegradable cleaners.

Itasca Community College, Itasca – Environmentally friendly cleaning supplies are used whenever possible. MSDS sheets are maintained in the maintenance office, accessible to all custodians. Application and safety procedures are adhered to when products are dispensed and used.

Minnesota State University, Moorhead – All buildings are equipped with general cleaning stations, which reduce waste by accurately dispensing the proper amount of a concentrate needed. The campus has moved away from not only low-VOC cleaners, but many of the products in use are 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 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. Phosphorus-containing cleaning supplies are being replaced with alternative products, thus reducing phosphorus discharges to the wastewater treatment plant, which helps the city cut back on the amount of chemical needed to reduce phosphorus to meet environmental standards and will help reduce its costs.

North Hennepin Community College – We try to keep all cleaning supplies environment friendly. MSDS sheets are maintained in each custodial closet, and safety procedures are adhered to when products are dispersed and used.

Northland Community and Technical College, East Grand Forks and Thief River Falls – The Maintenance Department has eliminated almost all aerosol products and continues to look for environmental products available. All facilities are equipped with general cleaning stations involving equipment that accurately dispense the proper amount of a concentrate needed to reduce waste. The Maintenance Department continues to work toward use of products that are Green Seal approved. These products help those individuals in the college community who suffer from Multiple Chemical Sensitivities in addition to being environmentally friendly. The maintenance of Material Safety Data Sheets is achieved utilizing a private vendor and are maintained electronically online.

St. Cloud State University, St. Cloud – A SCSU committee has been in place for several years that reviews cleaning products that can be substituted for those which pose a hazard to the employee using them or pose a pollution risk. 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). On June 31, 2007, our general maintenance workers on campus will receive a training program on green cleaning.

Department of Transportation (Mn/DOT) – Mn/DOT uses cleaner concentrates that allow for reuse of dispensing containers. The department also uses cleaning systems that automatically measure correct amounts of product to prevent costly over use.

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 its employees. The goal is 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), comprised 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 completes two important objectives:

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

After a successful reduction in 1999, from 456 products to 150, the MRB made another impressive stride in FY 2001 by reducing the 150 approved products to 101. The approved custodial list of 101 products represent 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 101 approved products went through a process of stringent evaluation and testing.

The following is the process when an individual or vendor wants a new product to be considered for inclusion into the approved list. First, the vendor approaches the supervisory staff and provides a cut sheet of the product, but they do not and are not allowed to drop off any product samples. The supervisor in turn gives the vendor an evaluation packet, the Safety, Health, and Environmental Attributes Form, 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 products 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 is disposed of into the waste stream, what effects would the products' constituent chemicals have on the environment based on 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 ozone. The delivery/packaging category analyzes to see if the product has dispensing features with easy dilution ratios to minimize handling exposure, material handling issues, and the availability of the products labeling to meet the specification of the Minnesota Employee Right to Know Act. Finally, the dyes/fragrances category looks to identify 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 portion 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, members to determine if the product is to be included onto the approved list. For a new product to get on the approved list an existing product must be removed.

In addition, the MRB has embarked on integrating the use of bio-based products into 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. MRB intends to accomplish this 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

	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08
Metropass	50	47	40	-	39	52	49	51
Carpool	-	-	-	-	9	15	6	60

(-) unavailable

Department of Corrections (DOC) – All facilities have video conferencing systems that are used to reduce the amount of travel required for meetings. Also, utilization of Archibus makes a paperless work request and preventive maintenance program possible.

MCF-Rush City – Set up a recycling program for all staff.

Metropolitan Airports Commission (MAC) – To more efficiently transport passengers and airport employees between MSP's terminal buildings, MAC teamed with the Metropolitan Council to construct a light rail line. Light rail service replaces conventional buses previously used for such transportation. The free-of-charge rail between terminal complexes runs on electricity, eliminating an estimated 350 metric tons of CO_2 emissions annually. MAC has also instituted a vanpool to be used by MAC employees for off-airport meetings and events. Employees are encouraged to rideshare to such events using the MAC vehicles in the pool.

Department of Employment and Economic Development (DEED) – Efforts were made to further promote alternatives to single-occupancy vehicle commuting within our agency. DEED 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 approximately 15 percent of our employees. This is substantial considering many DEED employees are not able to participate because they live outside the metro area.

Promotion of alternative-commuting by our agency included providing information to employees about additional methods of commuting, such as vanpooling, carpooling, biking, and walking. Websites for the Interactive Ride Matching E-tool, Cost of Driving Alone Calculator, and the Guaranteed Ride Home Program were also provided. Employees were also encouraged to participate in the Metro Transit Commuter Challenge by pledging to try alternatives to driving alone to work or school.

Metropolitan Council Environmental Services (MCES) – MCES operates three gasoline/electric hybrid vehicles. The Honda Civic hybrids have two motors—one that is powered by an 85 horsepower 4-cylinder gasoline engine and one that is powered by a 13 horsepower nickel metal hydride battery. It is estimated that the hybrids achieve an efficiency of 46 miles per gallon in the city and 51 miles per gallon on the highway.

Minnesota Army National Guard – Video conferencing stations have been placed in all MNARNG facilities. As widespread as the MNARNG is, videoconferencing reduces travel time and fuel consumption costs associated with personnel traveling to a meeting.

Minnesota Pollution Control Agency – The MPCA has a continuing pollution prevention approach to promoting alternative transportation including 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, and shower facilities. Since 1999, the MPCA has offered employees Metro Transit's Metropass, an all-you-can-ride bus pass that encourages transit use to help reduce air, water, and soil pollution, congestion, parking demand, and urban sprawl. In FY 2008, 104 employees enrolled in Metropass. The agency subsidizes the Metropass through pretax payroll deduction, and employees now pay less for this than for contract parking. The MPCA also encourages employees to use the Metropass for business trips within the Twin Cities area, thereby saving the state money in parking and vehicle expenses.

The Rochester office has added two more video conference setups (total of three), making trips to the metro office less necessary.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – Due to the rural nature of our campus, this component has not been evaluated.

Anoka Technical College, Anoka – Many of our departments have been using the WebEx tool communication for learning.

Dakota County Technical College, Rosemount – DCTC has a car pool and rideshare board available to staff and students. We have negotiated with MVTA and DART to deliver bus service to staff and students. We have purchased a Smart Car and Toyota Prius.

Minnesota State University, Moorhead – 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. Weather permitting Campus Security and Parking Enforcement use bicycles and electric cars instead of automotive vehicles to patrol campus. The university is increasing yearly 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 10 minutes and reduce the number of commuters, especially during inclement weather. Approximately 68,000 riders utilized 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 2,600 students enrolled in this program. Also, due to the diversity of programs at MSUM, students, faculty, or staff attending off-campus meetings and conferences are strongly encouraged to form a car pool in order to reach their destination.

Northland Community and Technical College, East Grand Forks and Thief River Falls – Employees are encouraged to utilize video conferencing and WebEx as a conscious effort to reduce travel between campuses whenever possible. NCTC encourages our employees to car pool as an alternative to single-occupancy vehicle commuting. NCTC has one bus stop shelter to promote city bus ridership on the East Grand Forks campus. Students are able to ride the city bus free of charge.

St. Cloud State University, St. Cloud – 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 107 percent for January 2004 compared to January 2003.

South Central College, Faribault and North Mankato – South Central College will commit to carpooling in FY 2009. Although many of our employees car pool between our campuses, approximately 46 miles, South Central is committed to recording the carpooling activities in FY 2009. South Central College is also committed to maximizing the use of video-IP for college-wide meetings instead of meeting on a particular campus. The college leases vehicles from Travel Management for our staff and faculty use along with our Farm and Small Business Management programs. We are currently leasing E85 vehicles. Any vehicles that South Central College will purchase in FY 2009 will be E85 fuel.

Department of Transportation (Mn/DOT) – Mn/DOT maintains traffic lanes at various locations that are dedicated for vehicles with multiple passengers. Also, park-and-ride lots have been constructed at various locations promoting car-pooling, busing, or light rail commuting. Mn/DOT continues to encourage telecommuting for employees in the Minneapolis/St. Paul metropolitan area, along with promotion of numerous alternative transportation options such as High Occupancy Vehicle (HOV) Lanes, commuter rail, bus, bicycling, walking, and light rail. Mn/DOT, City of Minneapolis, and Metro Transit jointly encourage and manage carpool parking. Also, Mn/DOT plans to partner with other state agencies, citizens, and local officials in developing pilot projects to encourage use of alternative transportation.

University of Minnesota – The University of Minnesota will take delivery of 16 new intra-campus buses in fall 2008. With modern, efficient diesel motors and pollution control systems, the use of ultra low sulfur diesel fuel blended with 2 percent biodiesel, and added doors to speed loading thus reducing idling time, these buses

will have a significant impact on the air pollution from the fleet [annual reduction of 19 tons CO_2, 10 tons NOx, 1.5 ton CO]. The university will also add a hybrid bus to the fleet.

The university is host to the Zipcar. The Zipcar is 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 is hoping 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.

Each year from 2004 to 2007, the University of Minnesota has been designated one of the Best Workplaces for Commuters[SM] by the U.S. Environmental Protection Agency (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 EPA and DOT. 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 reduce automobile traffic to the Twin Cities campus and 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. A bus carrying as few as seven passengers is more fuel-efficient than the average single-occupancy vehicle.

The campus bus routes and schedules are evaluated and re-arranged 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 over 10,000 gallons of fuel and significant reduction of environmental pollution.

Since 2000, the University of Minnesota, Twin Cities' U-Pass and Metro Pass program, 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, has provided an unlimited ride transit pass that is good on every bus and rail route in the Twin Cities. The program has been a tremendous success with more than 20,000 students using the U-Pass program in fall 2007. 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 routines and establishing positive transportation patterns that will continue into their adult lives. Transit ridership at the university has increased 146 percent since the program was introduced, reducing more than 50,000 vehicle miles and saving more than 2,000 gallons of gasoline daily. The reduced driving also eliminates more than 220 tons of carbon monoxide and 4,500 tons of carbon dioxide emissions annually.

The U of M-Duluth started its 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 UMD ID or U-Pass. The DTA has transported more than one million UMD students since the induction of the U-PASS in September of 2000. The over 2000 riders per day is outstanding usage of this program, which decreases traffic congestion, fuel consumption, air pollution, and the need for taking 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 has also had a dramatic impact on the environment by reducing more than 30,000 vehicle miles traveled per day, saving more than 1,200 gallons of gasoline daily, and by eliminating over 132 tons of carbon monoxide and 2,640 tons of carbon dioxide emissions from the air annually.

Delivery consolidation through University Stores operations utilizes 12 vehicles on the Twin Cities campus and surrounding metropolitan area, to service more than 850 stops each day, eliminating the presence of 18 to 20 commercial trucks in the process. Reducing the number of trucks on campus reduces congestion, pollution, and cost, while increasing safety and making better use of resources.

The University of Minnesota's Intelligent Transportation Systems (ITS) Institute (http://www.its.umn.edu) conducts 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 United States Department of Transportation (USDOT). 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 by being a catalyst for transportation innovation through research, education, and outreach (http://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: a) create an environment for faculty, students, and practitioners from multiple disciplines to collaborate in transportation research and education efforts; b) 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)

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 these meetings.
- Provides Department of Administration support and representation on the Pollution, Reduction, and Recycling Advisory Council of the Office of Environmental Assistance.
- 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."

MMD:

- During FY 2008, MMD, as a part of its Authority for Local Purchasing (ALP) Training, ALP Management Overview, and other training programs, conducted 12 training sessions and trained more than 250 state agency staff in pollution prevention and procurement of environmentally responsible goods and services. MMD worked with MPCA to provide additional environmentally responsible information through the purchasing training provided to state employees.
- MMD conducted informational sessions for 273 vendors to learn how to do business with the state. In each session, vendors were encouraged to offer environmentally responsible goods and services to the state when available and how they can request an addendum if products are excluded because of the requirements listed in the solicitations document.
- MMD conducted information sessions for 125 people from CPV members and other entities of government on how to purchase more environmentally friendly and how the state contracts are established to be environmentally friendly. By using the MMD environmentally friendly state contracts, they can assist in reducing pollution.
- MMD continues to provide, on the website, the entire ALP manual and all updates greatly reducing the need to print hard copy versions. MMD encourages all agencies to use the online manual and to not print the manual in hard copy.
- 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 at: www.mmd.admin.state.mn.us/envir.htm.
- MMD has combined the Environmentally Responsible Work Group into the Procurement Coordinators Group in order to increase attendance and awareness of environmental matters. This group works to promote environmental purchasing in state government and is a multi-agency group.
- MMD has created a new group of (CPV) members that meets quarterly or on an as-needed basis. One role of this group is to increase awareness and knowledge about environmental products and options in purchasing.
- MMD, MPCA, and OSC continue to educate entities on using recycled paper.
- MMD and RRO contributed to the development of the Environmental Preferable Purchasing Guide (EPPG). Subtitled "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. The guide is available through a link on the MMD website.

- MMD maintains an environmental purchasing section on its website, which features:
  - Environmentally preferable goods and services lists
  - Minnesota legislative requirements
  - Administration Biennial Report on MMD Purchasing
  - Product experience/case studies on environmentally preferable products
  - Links to other websites helpful in environmental purchasing
  - Link to the Environmental Preferable Purchasing Guide (EPPG)
- MMD implemented a change in the Minnesota Accounting and Procurement (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 responsible when making purchasing decisions. This code also allows better tracking of the environmentally preferable purchases.

Department of Commerce – The department operates the Energy Information Center. Staff responds to consumer inquiries by telephone, e-mail, and at outreach events around the state. In the last several years, there has been an emphasis on reducing the amount of printing by responding to inquiries electronically. Employee information is distributed via a paperless process on the department's internal Web site.

Energy Information Center

	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08
Contacts*	60,000	61,000	63,000	62,127	54,856	66,096	64,618	87,771
Printed	240,000	200,000	127,000	-	-	75,277	31,791	47,345
Web site+	-	-	94,000	81,204	54,130	160,148	549,130	300,480
CDs	31,000	40,000	-	-	-	64,685	14,744	8,433

(-) unavailable; * Phone, in-person, e-mail responses; + individual visits.

Department of Corrections

MCF-Shakopee held an Earth Day event. The staff was encouraged to walk, carpool, and bike to work. Additional activities were worked into the day to help staff think about pollution, recycling, etc. Multiple locations deliver staff training on pollution prevention, hazardous waste management, and recycling. Green Committees exist at many facilities with the goal of increasing employee awareness to reduce/reuse, as well as focus on energy and resource conservation. In FY 2008, more central coordination of these groups will be undertaken in order to increase the profile and make the efforts more effective.

MCF-Lino Lakes – Employee training on hazardous waste and waste minimization was completed during FY 2008.

MCF-St. Cloud – Continues to execute the strategies of its resource management contract. Beginning in January 2006, MCF-SCL has been working with its local trash contractor to identify ways to reduce and reuse. Savings incurred as a result of these activities are shared between the facility and contractor.

Metropolitan Airports Commission (MAC) – Minneapolis-St. Paul International Airport earned this year's Airports Council International Outreach, Education, and Community Involvement Award with its Stewards of Tomorrow's Airport Resources (STAR) Program. The STAR Outreach Program was developed to promote the newly created STAR program, which manages the airport's sustainable efforts, including an aggressive energy conservation program. A promotional brochure was developed in accordance with the airport's sustainability policy; the majority of the brochures were transmitted electronically as a computer PDF file. By using a combination of electronic mailing and highlighting the STAR program on the airport's website, the outreach program was able to reach a large and interested audience without sacrificing the environment.

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 Eco Experience, 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. In 2007, as a member of the Watershed Partners, MCES participated in the "Minnesota Waters—Let's Keep It Clean" metro-wide media campaign that educates the public on the impacts and best management practices of urban stormwater run-off.

The IWPPS works in an advisory, or technical, role as well as a regulatory role with its permitted industrial users. Two issues of the *Open Channel News* have been mailed to industrial users in 2007. A specific P2 web site has been prepared for industries, customers, and other external users on the council's Internet site and can be found at http://www.metrocouncil.org/environment/PollutionPrevention.

The IWPPS staff attends quarterly meetings as regulatory advisors for the Healthcare Environmental Awareness and Resource Reduction Team (HEARRT), which 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 standards and make improvements on the proper management of hazardous waste from healthcare facilities.

An effort has been made to inform the public of the environmental impacts of pharmaceutical and personal care products, or PPCPs. This broad and diverse collection of thousands of chemical substances can impact fish and other aquatic life when disposed of down the drain. Even after treatment at a wastewater plant, PPCPs can be present in effluent in minute amounts. Therefore, it is recommended that they be disposed of in the solid waste destined for an incinerator or a modern landfill in order to prevent pollution of our waterways.

Metropolitan Mosquito Control District – Annually the district conducts pesticide applicator training sessions for all district employees in conjunction with the Minnesota Department of Agriculture (MDA). A portion of the training session 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, and 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 MMCD. 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.

Minnesota Army National Guard – The JFMN (Army) has developed a variety of hazardous waste, solid waste, recycling, and spill prevention and cleanup training formats. MNARNG personnel are provided with literature, CD-ROMs, and on-line training. All of these methods of training are essential, due to the ongoing deployment of soldiers, and the need to have a continuous method of training available to MNARNG personnel.

Minnesota Pollution Control Agency – The MPCA has pollution prevention information available to all staff and external customers on its website (www.pca.state.mn.us). This information is easy to access and includes suggestions and training tools to help staff minimize waste at work and at home on a daily basis.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – ATC finds audio and video conferencing, on-line employee educational products, facsimile transmissions, and electronic transfer of reports and data conserves energy and reduces paper consumption. ATC recently reduced paper waste by allowing the students to receive and submit educational products electronically.

Dakota County Technical College, Rosemount – Identified college employees are sent for hazardous waste training annually. Administrative personnel attend and participate in local council and committee meetings

to address the community needs for environmental conservation. Director of Operations is studying and testing to become LEED certified. Architecture instructor is LEED certified.

Minnesota State University, Moorhead – The Department of Environmental Health & 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 provide a complete understanding of environmental processes. Students have taken the initiative to form groups of their own that help raise awareness within the community as well. These groups help educate the university community by becoming involved in yearly events such as Earth Week, campus cleanup day, and more.

New academic classes in environmental sustainability are being added to the curriculums. The goals of these classes are to develop students' understanding of the concept of sustainability and the challenges in responding to environmental problems. Students 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 the university evolve toward a more sustainable future. This document was taken to the 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 fall and spring semesters. This money goes into a fund that generates approximately $45,000 per year. 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, remains a priority of research and funding. Other projects include managing the residence halls' recycling 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 monthly during the academic year.

The students main outreach projects included competing in Recycle Mania, the National Wildlife Federation Campus Ecology Program's national recycling competition, funding/planting over 50 trees on campus, funding/installing 27 permanent bicycle racks allowing 500 more bike locations, funding a bicycle for parking enforcement, sponsoring on the MSUM campus an Earth Day Celebration, and many more projects. Another major accomplishment was signing of the Talloires Declaration by MSUM President Dr. Roland E. Barden. This declaration states the university is willing to incorporate sustainability in its teaching and business practices.

North Hennepin Community College – Bright colored signs and containers are prevalent in buildings and on our grounds throughout campus. Plant Services staff is aware of the importance of our recycling effort, with new hires trained on proper procedure before allowed to work independently.

Northland Community and Technical College, East Grand Forks and Thief River Falls – The transfer curriculum for liberal arts requires completion of six credits in Natural Science. The Environmental Science course focuses on the dynamic equilibrium of the environment as well as focusing on current specific environmental problems.

St. Cloud State University, St. Cloud – The Environmental and Technological Studies Department of SCSU reflects increased opportunities for pollution prevention emphasis in the region of laboratory procedures. A Master of Science program in Environmental and Technical Studies, begun seven 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.

Department of Transportation (Mn/DOT) – Mn/DOT continually conducts training that includes pollution prevention 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. It includes 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 the state resources without depleting them.

Pollution and public health, the loss of biodiversity, the food vs. fuel dilemma—all in the context of a changing climate—encompass just a few of the complexities facing today's world. Accordingly, the University of Minnesota's Institute on the Environment (http://environment.umn.edu) has mobilized scholars from the natural and social sciences, design, engineering, law, health, public policy, and other disciplines to collectively discover solutions and deliver results. With Minnesota's vast forests, plains, rivers, and lakes as the backdrop, these transdisciplinary teams can address the environmental impacts on America's heartland and beyond. Essentially, the institute serves as the gateway to and the link between "all things environmental" at the University of Minnesota, creating a national model for research, communication, and implementation.

The University of Minnesota established the Precision Agriculture Center in 1995 (http://precision.agri.umn.edu) 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 between 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 the 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 Minnesota Pollution Control Agency 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 in the college yet, it is a goal CALA is shooting toward.

The Minnesota Sustainable Design Guide, developed by the Center for Sustainable Building Research (http://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: 1) educate designers, building owners, operations staff, and occupants about the concepts, goals, and significance of sustainable design; 2) develop an orderly decision-making process with measurable outcomes along with a database of decisions and outcomes; 3) 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; 4) organize information in a hierarchy that permits users to easily understand the sustainable design process; 5) 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. The training covers the basics of pollution prevention. Approximately 2,500 employees are trained annually. The training is offered through classroom presentations and over the Internet. The web-based training program is available on the Environmental Health and Safety home page with University of Minnesota X500 account login.

The Minnesota Technical Assistance Program (MnTAP) is a grant program at the University of Minnesota, School of Public Health, funded by the Minnesota Pollution Control Agency. We help 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 (http://www.mntap.umn.edu). MnTAP provides technical assistance to Minnesota businesses through the following services: 1) telephone assistance, 2) site visits, 3) intern programs, 4) presentations and workshops, 5) technical publications, 6) library, and 7) materials exchange.

The University of Minnesota's Sustainable Forests Education Cooperative (http://sfec.cfans.umn.edu/index.html) 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, a resource network that will bring current research, new technologies, and state-of-the-art practices to resource professionals—educating professionals to face tomorrow's resource challenges, 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 *(*http://www.extension.umn.edu) is the major educational outreach arm of the University of Minnesota, providing services 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 waste water management, to indoor environmental issues such as air quality, radon, housing materials, and systems.

12. Electronics

Department of Administration (Admin) – MMD worked with other state agencies and the Office of Enterprise Technology to develop standards for desktops, laptops, and monitors. Environmental characteristics such as Energy Star compliance, RoHS compliance, and EPEAT compliance are part of the specifications. Energy Star and EPEAT bronze or silver compliance are mandatory for the equipment proposed to meet the new state IT standards.

MMD worked with other state agencies and the Office of Enterprise Technology to develop standards for servers, storage area network (SAN), and network attached storage (NAS) devices, taking into consideration the power consumption of this equipment.

MMD and the Office of Enterprise Technology have been working together to develop projector standards, some of which were released in May 2008. Standards included minimum specifications for bulb life and energy efficiency, helping to reduce pollution through longer lasting bulbs and reduced energy consumption.

MMD electronic equipment contracts provide Energy Star compliant computers, copiers, fax machines, monitors, and printers. MMD requires that energy-efficient equipment be identified in all new electronic equipment contracts.

MMD is working with other state agencies, CPV members, and the Office of Enterprise Technology (OET) to develop standards for copiers and multi-functional copier equipment (MFDs), taking into consideration Energy Star energy-saving standard compliance. Energy Star certification is required and must be set as the default energy-saving mode on the equipment. Contract vendors are required to take back the replaced equipment, regardless of manufacturer, to not ship overseas for disposal, and the equipment must be disposed of properly if it can't be refurbished. Contract vendors are required to make remanufactured toner cartridges available to the state, inform users about them, and promote their use. MMD is exploring starting a remanufactured toner cartridge program with the awarded vendors. The specifications also ask for how packaging is minimized for MFDs. MFDs must be installed with the most environmentally responsible settings: duplex printing, multipage printing, color/toner reduction, and the Energy Star setting. MFDs should not revert to other settings upon shutdown or a power outage.

When considering whether to participate in a Western State Contracting Alliance (WSCA) contract, MMD uses the same evaluation criteria as MMD uses for Minnesota-generated contracts for energy efficiency, power consumption, and equipment take-back and recycling programs to ensure the same environmental factors are included in the WSCA contracts.

MMD 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.

A Request for Proposal (RFP) for computer hardware was developed by MMD with the assistance of other members of the Western States Contracting Alliance (WSCA). The RFP considered several environmental issues. Points were awarded to those who proposed for:

- Take-back and recycling programs

- Packaging reduction and use of recyclable materials programs.
- Environmental certifications from the following third-party certification bodies: Blue Angel, EcoLogo, Green Guard, Nordic Swan, and TCO.
- Self-registration claims made based on standards from Energy Star, EPEAT (with Bronze, Silver, or Gold registration level identified), or RoHS

In conjunction with other agencies and CPV members, MMD maintained its statewide computer/electronics recycling disposal contract with Asset Recovery Corporation of St. Paul. (Ref: "Hazardous Materials: Electronic and Electronic Component Recycling and Management," contract release number H-90(5), contract number 435450.) 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 $1,000,000 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.

MMD language in its solicitations bans certain types of flame retardants used in computer plastics and cabling, and also has potential sanctions against non-compliant manufacturers of video display devices.

Department of Agriculture – Prior to the move into the Capital Complex Facility (Freeman Office Building and Lab) in December of 2005, the 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 had been purchased during fiscal year 2006 to be placed in the new facility.

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

Department of Corrections

MCF-Red Wing –Information technology equipment purchases reduced related energy consumption by utilizing more efficient flat screen monitors, and all personal computers were set to automatically go to sleep mode after nine minutes of inactivity.

Department of Employment and Economic Development – As referenced in Part 2 of this report, employees involved with the purchasing of office equipment are encouraged through policy language to select energy-efficient, Energy Star® rated items.

Department of Revenue (DOR) – Our older CRT computer monitors are being replaced with Energy Star LCD displays, which consume one-half the energy and provide less glare. With replacements for 2008, electrical consumption should be reduced by an additional 27,523 KWhrs from DOR's 2005 base.

Equipment type	Anticipated annual energy savings (KWhr)	Reduction (in pounds)							
		CO	CO_2	Hg	NOx	PM10	PM2.5	SO_2	VOC
LCD monitors-Energy Star	27,253	7.985	50,113.634	0.001	111.410	10.111	7.767	201.209	1.036
Total	27,253	7.985	50,113.634	0.001	111.410	10.111	7.767	201.209	1.036

Revenue has also 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.

Iron Range Resources and Rehabilitation Agency (IRRR) – Information Technology staff recommends that all employees change their computer power settings to initiate the power-saving mode that is built into the unit. Our agency leases Toshiba e-studio copying machines, and all copiers have the Energy Star label on them. We encourage electronic communication among staff to help reduce paper usage and travel between our three facilities.

Metropolitan Airports Commission (MAC) – At the MAC, energy conservation and the use of renewable energy yield multiple environmental benefits, including reducing greenhouse gas generation and improving air quality. The MAC has:

- Installed ground power and pre-conditioned air at terminal gates.
- Installed a hydrant fueling system.
- Implemented annual energy conservation projects.
- Installed energy-efficient lighting.
- Implemented day-lighting window design.
- Implemented automatic lighting controls.
- Utilized automatic HVAC settings and controls.
- Upgraded both hot and chilled water central plants.

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 as a universal hazardous waste due to their mercury content. In 2007, 4,435 lamps were recycled through Retrofit Recycling in Little Canada, a decrease of 20 percent from 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.

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. From 2003 to 2006, the MPCA reused or recycled a total of 65,000 pounds or 35 tons of electronics. Information about reuse or recycling in FY 2008 was not available at the time of publication. MPCA has implemented power management functions for desktop computers and monitors, saving 632,000 kWh per year, and nearly $50,000 in energy. Additional software controls are being investigated. The MPCA also replaced remaining CRT monitors with flat screen monitors for additional energy savings.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – ATC purchases equipment that is Energy Star compliant. Obsolete electronics no longer in use at our facilities are either offered for purchase, donated to a nonprofit organization, or recycled through an approved, licensed electronics recycling vendor according Minn. Stat. §16C.23, subd. 6 specifications.

Anoka Technical College, Anoka – During the last fiscal year, the college did not have an established purchasing policy that computer services was directed to follow that specified the use of energy reducing technology. This may be included for discussion in the next three-year technology plan, however; it might

happen more by default as manufacturers are offering energy-saving by default.

Dakota County Technical College, Rosemount – All used electronic equipment is recycled through the MnSCU system and then asset recovery programs.

Minnesota State University, Moorhead – The 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 organizations. This program reduces the number of new PCs required and extends the service life of older machines. Also, most of the electronics on the MSUM campus have been replaced over the years with Energy Star equipment that help reduce campus-wide consumption of resources. All unwanted electronics are recycled through the Department of Environmental Health & Safety, which in turn works with recycling vendors from the MPCA-approved state contract list.

North Hennepin Community College – All discarded (no longer needed or in use) electronics are properly disposed of by a licensed local contractor.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC is reducing energy use by purchasing energy-efficient office equipment, including continued replacement of CRT computer monitors with low energy-consuming LCD flat-screen monitors. When possible, used computers and equipment are reallocated to other departments to reduce the need for additional and/or new equipment as part of the college technology recycling plan and saves budget money for many departments. Used and outdated computers and equipment that no longer meet departmental needs are made available for purchase to the general public via college rummage sales to reduce the number of discarded computers. Unsold electronics are properly disposed of by a licensed local contractor.

St. Cloud State University, St. Cloud – 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 59,754 pounds and net cost of about $9,733) were recycled for somewhat offsetting commodity and precious metal credits. Styrofoam from computer, electronic, and other shipping cartons was also recycled.

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 has expanded the use of LEDs for the yellow and green indicators also.

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.

An extensive evaluation of the highways traffic management system has occurred in the 1970s and 1980s. Several things were implemented as a result of these studies; metered entrance ramps probably being most noticeable to the traveling public.

Mn/DOT conducts a traffic management and development program. This program includes evaluation of high occupancy vehicles (HOV) 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 and sends it to a licensed de-manufacturer. The de-manufacturer 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 600,000 pounds of electronic material annually. The university has worked extensively with the Minnesota Department of Administration and other agencies to develop a statewide computer/electronics recycling contract.

The University Computer Services (UCS) and Como Recycling Facility (CRF) both provide collection of unwanted computer systems. UCS contracts through a third party to collect and recycle used computer equipment from the university community (http://oit.umn.edu/computer-recycling).

The university offers electronics recycling service to educational institutions throughout the state via its Chemical Safety Day Program (http://www.dehs.umn.edu/hazwaste_csdp.htm). 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.

A typical personal computer and monitor contains six pounds of lead and various other environmentally hazardous constituents that can be reclaimed and reused. Proper management of the electronics protects the university from future environmental liability, provides resource conservation, and avoids heavy metal contamination of soil, surface water, and groundwater.

13. Energy – Lighting

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

MMD procures only reduced- or no-mercury fluorescent lamps. Mercury content in fluorescent lamps has been either eliminated or reduced to negligible levels. It also has a contract for solar-powered highway warning signs for Mn/DOT. In conjunction with other state agencies and CPV members, MMD has a statewide recycling contract for the following items:

- fluorescent lamps
- HID (high intensity discharge) lamps
- light ballasts that contain PCBs (poly-chlorinated bisphenols)
- products that contain mercury

FSSD minimizes lighting through the use of energy efficient lights.

Department of Corrections

MCF-Faribault – Did not heat 10 buildings that are planned for demolition in 2008/2009. These buildings were demolished and two new K-style buildings were constructed.

MCF-Red Wing – Design of the new vocational building, to be constructed in FY 2009, includes light level adjustment based on ambient light already available.

Department of Revenue (DOR) – Revenue's lighting reduction program of 2006 continues to produce a savings of 240,000 KWhrs. 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, and there has been some increase in the use of task lighting. (Approximately 3,000 lights were reduced by one 32-watt tube per fixture in 2006, which equates to 240,000 Kw/annum of electricity). Lighting in the building was designed with occupancy monitoring. When an office has been vacated for several minutes, the lights go off.

The Department of Revenue leases space from the Department of Administration and various private landlords. DOR does not own any space and has limited control of the office environmentals. The department tries to keep temperatures in all spaces compliant with the governor's executive order on office space temperatures.

Iron Range Resources and Rehabilitation Agency (IRRR) – 263 energy-saving ballasts were installed, and 534 28-watt T-8 fluorescents were installed replacing the old 50-watt fluorescents.

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 2006, 5,520 lamps were recycled through Retrofit Recycling in Little Canada, an increase of 49 percent from 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.

Minnesota Pollution Control Agency – Since 2004, all closed offices, restrooms, and conference rooms in the St. Paul building have been equipped with motion detecting light switches.

MPCA's leased space in Mankato Place has a combined solar panel power system and an advanced daylighting system, resulting in a 23 percent reduction in electrical power consumption. (The skylight system eliminates 80 percent of the electricity normally required for electric lighting, and the roof-top solar panels provide six percent of the annual electricity consumed by tenants.) In addition, the lighting is on dimmer switches such that if the skylights are bringing in a lot of light, then the lights automatically either shut off or dim themselves. This puts the office among the most efficient in the state.

The Brainerd office's expansion included negotiating a lighting project with the landlord in order to reduce electrical usage. The entire building was converted to a two-bank lighting system, allowing staff in different wings to adjust lighting down so that only 50 percent of the ceiling fluorescent fixtures are on during sunny days (when a lot of light is coming in), or on days when only a few employees are in the wing. All offices are also equipped with motion sensors to turn lights off automatically. Finally, there is now extensive day lighting—tubular skylights—that brings natural light into the work space to reduce the amount of artificial light that is needed.

The Detroit Lakes office has prepared for the lease renewal due June 30, 2009, by conducting a space analysis that was completed with the advice and assistance of the Employee Office Space Advisory Committee. The analysis forms the basis for incorporating employee and agency business issues and needs into the lease agreement for the next lease term. Part of the analysis states, "The current building does not promote green and healthful practices. Employees have a preference for improved energy efficiency, natural lighting, and other such amenities that include bike storage and shower facilities for those who ride bike, walk to work, or exercise over the lunch break. Natural lighting (windows) is highly valued. Natural lighting is a green feature that would be beneficial from an energy and employee satisfaction perspective."

During 2008, the landlord for the Rochester office partnered with Rochester Public Utilities to be part of a 12-million kilowatt hour electricity savings.

- The office added motion sensor lights in all general use areas, labs, copy machine rooms, bathrooms, and break areas.
- All fluorescent lights were changed from three-bulb units to two-bulb units, using energy-efficient bulbs.
- In our office remodel process, we used "green" carpet throughout, for a big pollution savings.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – Energy conservation strategies have been a major focus for ATC's Facilities and Maintenance Department. Our continuous energy conservation program includes winterizing all overhead and exterior doors each fall and replacing T-12 fluorescent lighting with a T-8 fixture. The T-8 fixture is 30 percent more energy efficient than the T-12 model. All spent fluorescent bulbs are recycled by a licensed contractor. As equipment is replaced, we strive to find more efficient equipment. More efficient flat screen computer monitors have replaced most of the CRTs at our facilities to reduce energy consumption. ATC has installed motion detection lighting systems in the restrooms of newly constructed facilities to reduce energy consumption. Security staff performs a lock down of the facilities each evening during which they turn off lights and computer monitors as they lock each classroom.

Anoka Technical College, Anoka – Our college campus uses clean burning natural gas for heating and # 2

fuel oil as a back-up fuel. On a regular basis, we do boiler tune-ups to ensure the boilers are operating at peak efficiency.

Dakota County Technical College, Rosemount – Energy retrofits with Johnson Controls. Usage is lower as demonstrated in the report by Edward H. Cook and Associates, at the Facilities Planning and Programming office at MnSCU.

Energy lighting: DCTC campus buildings have been retrofitted with energy conserving fixtures and timers. All fluorescent bulbs are recycled by Greenlights.

Minnesota State University, Moorhead – To help better understand ways the university community can save on energy consumption, the campus conducts energy audits both internally and by utilizing consultants. These audits examine lighting, heating, and water usage assessments. Abiding with Executive Order 05-16, *Providing for Energy Conservation Measures for State Owned Buildings*, MSUM continues to maintain 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. The campus building's control systems allow setup to use night set-back energy optimization and programmable scheduling features. When purchasing new electronic office equipment and appliances, MSUM continues to purchase Energy Star rated devices through state contracts or select vendors.

North Hennepin Community College – At present, we have renovation projects taking place in several areas. These renovated areas will have energy-efficient lamps, ballast, and motors. All of our used lamps are recycled by a licensed local contractor.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC is reducing energy use by purchasing energy-efficient office equipment and appliances, including continued replacement of CRT computer monitors with low energy-consuming LCD flat-screen monitors. NCTC continues 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.

St. Cloud State University, St. Cloud – 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.

Energy saving projects	Description
Business Building	Energy design program participation
Centennial Hall	Energy design program participation
Halenbeck Hall – Gym lighting	Replace metal halide with high bay fluorescent
National Hockey Center – Rink lighting	Replace metal halide with high bay fluorescent

Date	Est. elec. Kwh saved	Est. gas therms saved	Rebate
July 2008	397,515	16,260	$17,573
May 2008	476,640	1,190	$16,728
June 2008	139,036		$6,996
June 2008	99,509		$6,825
February 2008	60,136		$1,710
November 2008	27,823		$750
Total	1,200,659	17,450	$50,582

Department of Transportation (Mn/DOT) – Mn/DOT buildings have replaced old PCB ballasts and lights with non-PCB ballasts and energy-efficient lighting. Motion detectors installed throughout many of its facilities turn off lights when rooms are not in use. Most Mn/DOT computers have a sleep mode that turns the monitor off 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: 1) 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. 2) Avoid general high levels of illumination except in the most critical applications. 3) Provide specialized supplementary lighting sources at the task area in lieu of uniform high level illumination throughout. 4) Switching or other lighting control devices shall provide for flexible levels of lighting. 5) Minimize decorative lighting. 6) Consider principles of day lighting for new buildings.

The ongoing green lights program changes out older, less efficient lighting, as remodeling of buildings is undertaken at all campuses and facilities. 2009 will bring the start of a new re-lamping program primarily shifting from 32-watt to 24-watt fluorescent lamps in buildings. The Fay Thompson Center for Environmental Management will reduce lighting energy demand by 33 percent, cut greenhouse emissions by 28 tons per year, and save $3,000 annually. Other energy-saving lighting strategies are evaluated for use on a site-by-site basis.

14. Energy – Production

Department of Administration – RECS specifies and incorporates, where possible, the use of energy efficient triple-glazed windows to manage energy loss and heat gain in facilities. MMD created a contract for window-mounted self-contained room air conditioners to emphasize performance over design, establishing a minimum energy efficiency rating requirement for each unit size. PMD has designed upgrades and expansion of the on-site chiller plant to further improve efficiencies and meet the needs of the additional facilities.

Department of Commerce

Solar Electric Rebate Program – The department 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 03	FY 04	FY 05	FY 06	FY 07	FY 08
Annual	12.7	49.7	104	85.3	132.1	314.1
Cumulative	12.7	62.4	166.4	251.7	383.8	697.9

*Adjustments made to previous years for reporting consistency

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

Electric energy aavings and avoided emissions due to electric CIP***

	2003*	2004*	2005**	2006**	2007**
Electricity (kWh)	403,570,318	268,998,041	395,345,173	370,442,558	461,475,509
CO_2 avoided	313,759	209,134	307,364	288,003	358,778

Natural gas savings and avoided emissions due to natural gas CIP***

	2003*	2004*	2005*	2006**	2007**
Natural gas (Mcf)	1,781,059	1,294,389	1,324,656	1,241,217	1,912,054
CO_2 avoided	89,053	64,719	66,233	62,061	95,603

* 2001 through 2004 data is for investor-owned utilities. Actual reported energy savings.
**2005 and 2006 data includes reported energy savings by municipal and cooperative utilities in addition to savings by investor owned utilities.
***Avoided emissions estimates are in metric tons obtained from U.S. EPA Greenhouse Gas Equivalencies Calculator, see: http://epa.gov/cleanenergy/energy-resources/calculator.html

Department of Corrections

MCF-Rush City – The facility is under contract with East Central Electric to provide peak shaving on an on-call basis using the facility diesel generator to pick up the entire electrical load during utility curtailment.

MCF-Red Wing has two deep well pumps for domestic water supply. The Wellhead Protection Rule governs us. Design of our new vocation building, to be constructed in FY 2009, includes reclamation of water run-off.

Iron Range Resources and Rehabilitation Agency (IRRR)

FY 2008 energy consumption			
Facility	**Electricity (kwh)**	**Gas (therms)**	**Water (gallons)**
Giants Ridge, Biwabik	2,147,161	67,253	2,371,600
Eveleth, Administration building	365,280	N/A	14,200
Mining and Reclamation, Chisholm	235,120	687	206,117

Metropolitan Council Environmental Services (MCES) –

The largest treatment plant consumed the following amounts of energy in 2007—Metro WWTP: 151,654,150 kWh electricity (-3 percent under 2006); 852, 216 therms natural gas (+ 14 percent over 2005).

Beginning in 2006, the MCES established an energy reduction goal of 15 percent by 2010. In 2007, 3.9 million kWh had been reduced through aeration basin equipment and operating changes, increased steam turbine electric generation, and facility re-commissioning. Energy use is being tracked at nine facilities on a quarterly basis, utilizing the measure of kilowatt hours per million gallons of treated wastewater as the basic comparison for plant energy use efficiency. Day time and seasonal use of electricity is being scrutinized. The cost can vary from 4.2¢ per kWh in off-peak winter/summer to 11.2¢ per kWh for the summer on-peak usage. Therefore, a goal of plant operations is to use discretionary electricity at off-peak times as much as possible.

Metropolitan Airports Commission (MAC) –

MAC purchases Energy Star computer equipment with features such as sleep mode for computer monitors that reduce energy consumption. 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 increased use of energy-efficient appliances and electronic equipment.

Minnesota Pollution Control Agency –

The MPCA's central building energy management system uses timers for regulating the temperature during evenings and weekends. The system includes thermostats located throughout the building for individual staff to monitor energy savings. Seven VendingMisers have also been installed in the St. Paul office building to reduce energy consumption by the beverage and snack machines.

The St. Paul office purchased green power (wind) to match employee commitments for their own green power purchases, and has increased monthly purchases from 37,500 kWh monthly to 165,000 kWh monthly (about 16 percent of energy used since November 2006).

The Mankato MPCA office is in an energy-wise building that moved to an all solar energy building. What energy that the sun generates and they don't use, it is sold to the power company. The Brainerd office energy management system regulates temperatures at night and on weekends to conserve energy when the building is vacant. This office also purchases 100 percent green power.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – ATC does not produce electrical or solar energy on its campus.

Dakota County Technical College, Rosemount – We purchase both coal- and wind-produced energy from suppliers. We have solar panels in the greenhouse. We use discharge from compressors to heat hot water.

Minnesota State University, Moorhead – 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.

Total emissions reduction (in pounds)							
CO	**CO_2**	**Hg**	**NOx**	**PM10**	**PM2.5**	**SO_2**	**VOC**
97.666	612,940.882	0.014	1,362.661	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.

Normandale Community College, Bloomington – Our energy is purchased through Xcel. We do not supplement this with other sources.

North Hennepin Community College – North Hennepin Community College does not have standby generator capacity. No electrical energy is produced at this site. Monthly usage of electricity and fuels are closely monitored to help ensure efficient operation of facilities.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC does not produce electrical or solar energy. Monthly usage of electricity and fuels are monitored to help ensure efficient operation of facilities. NCTC does have standby generator capacity at the airport site for fire protection. The Thief River Falls main campus has a standby generator for maintenance of IT and emergency lighting.

St. Cloud State University, St. Cloud – As with the SCSU lighting improvements identified above in item 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 No. 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.

Energy savings project for SCSU	
Garvey – Penthouse air handler	Premium efficient motor and variable frequency drive
Brown Hall	Variable frequency drive

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

University of Minnesota – The Initiative for Renewable Energy and the Environment, part of the University of Minnesota's Institute on the Environment (http://environment.umn.edu/iree), is helping to lead the transition to a more sustainable energy future. Since 2003, IREE has supported nearly 400 researchers focused on bioenergy, biofuels, and bioproducts; solar and wind power; energy conservation; renewable hydrogen; and policy, economics, and ecosystems. This research has resulted in publication in international science journals, technology patents and disclosures, solid partnerships with external stakeholders, and the education of the next generation of renewable energy experts. In 2007, the Legislature established more permanent funding for IREE, which will facilitate an even broader range of renewable energy research and demonstration.

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, Minnesota, is looking at ways to use 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: 1) provide a model for rural communities and agricultural producers to integrate renewable energy systems into their economies, and 2) 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.

1. 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.

2. 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 addition 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 ensure 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.

3. 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.

4. 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 2006 Capital Request to the 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.

A 15 MW co-generation steam turbine is operating 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 28,000 MWhrs otherwise generated by more environmentally problematic coal and nuclear plants. A 2003 marketing agreement with Xcel Energy allows 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 under way 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 Minnesota Pollution Control Agency 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://www.manure.umn.edu/research/treatment.html#Anerobic).

15. Groundwater Wells

Department of Corrections (DOC)

MCF-Rush City – One well is being used by the groundskeepers for underground sprinkler system. The system is controlled by an electronic timer and has an override that shuts off sprinklers during rain. When needed, sprinkling is only conducted in the early morning hours to derive the maximum benefit and reduce evaporation.

MCF-Red Wing – The facility has two deep well pumps for domestic water supply, which are governed by the Wellhead Protection Rule.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead – 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 83 feet deep and uses groundwater from the Buffalo aquifer. This well is regularly monitored by the Minnesota Department of Health. The main campus of MSUM is supplied water by Moorhead Public Service, which obtains 85 percent of its water supply from the Red River, and only 15 percent from seven groundwater wells.

North Hennepin Community College – There is one deep well on site. This well is used for lawn irrigation purposes only.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC campuses are supplied water by East Grand Forks and Thief River Falls public utilities. The college does not have groundwater wells.

St. Cloud State University, St. Cloud – SCSU has a small number of groundwater monitoring wells used for research purposes.

16. Heavy Metals

Department of Administration (Admin) – All MMD standard solicitation documents now require vendors to indicate if their products contain mercury. This information will allow MMD to work with customer agencies and determine 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. **Hospital supplies:** MMD continues to work to reduce or require no mercury (whenever possible) from contracted medical products.

Department of Commerce – An employee has volunteered to collect and recycle compact fluorescent lamps.

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

Metropolitan Council Environmental Services (MCES) – The MCES IWPP section is responsible for administering the pretreatment program for almost 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 bio-solids quality, reduced air emissions from bio-solids incineration, and compliance with bio-solids land application metals criteria. Economic benefits include reduced use of treatment chemicals and reduced disposal costs for bio-solids that can be beneficially reused.

Metals loading to Metro WWTP from industrial users

Metal	1980 (pounds)	2007 (pounds)	Reduction (pounds)	Reduction (percent)
Cadmium	4,585	76	4,509	98.3%
Chromium	64,755	5,504	59,251	91.5%
Copper	66,714	4,618	62,096	93.1%
Lead	10,600	782	9,818	92.6%
Nickel	43,128	3.304	39,824	92.3%
Zinc	90,931	7,528	83,403	91.7%
Total	280,713	21,812	258,901	92.2%

Despite reductions of mercury discharged to the collection and treatment system since 1980, mercury is still of concern due to reduced NPDES permit limits. In January 2003, the Metropolitan Council and the Minnesota Dental Association (MDA) established a jointly managed Dental Clinic Amalgam Recovery Program. The goal of the program is to have all general practice dental clinics in the MCES service area install separators to remove amalgam from clinic wastewater prior to discharge to the sewer system. As of December 2007, more than 99 percent of the dental clinics have installed a separator. Mercury loading to the Metropolitan Wastewater Treatment Plant (WWTP) has decreased by over 50 percent from 2003 through 2007, largely due to the separator installations. The MDA is also promoting this program statewide with a good success rate.

Minnesota Army National Guard – The largest heavy metal waste stream the MNARNG had was eliminated with the switch to the water blast paint removal system. Heavy metal contaminated sand, from the blast system, was phased out in favor of water. Likewise, replacement of vendor-supplied paint gun wash units with a paint gun distillation unit has also greatly reduced heavy metal contaminated paint waste.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – Very minimal amounts of heavy metals are used on campus. ATC coordinates the disposal of heavy metals, more particularly mercury, with the University of Minnesota's Chemical Safety Day Program.

Dakota County Technical College, Rosemount – DCTC has eliminated all mercury thermometers and thermostats. The photo technology program practices silver recovery and recycling.

Minnesota State University, Moorhead – Within the photo development areas on campus, silver continues to be reclaimed. Also, all mercury-bearing thermometers continue to be replaced by nontoxic alternatives as they are still being found.

North Hennepin Community College – Hazardous waste disposal for instructional chemicals is handled through the University of Minnesota.

Northland Community and Technical College, East Grand Forks and Thief River Falls – Mercury instruments in instructional labs have been replaced with mercury-free instruments. Disposal of hazardous waste is achieved through the Minnesota state contract.

St. Cloud State University, St. Cloud – Campus-wide, efforts continue 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. Minor amounts of gold, silver, copper, and palladium were recovered from our electronic recycling program. Small amounts of heavy metal compounds were removed from SCSU using the University of Minnesota Chemical Safety Day Program.

Department of Transportation (Mn/DOT) –

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

University of Minnesota –

Proactive programs of minimizing mercury and other heavy metals on campus and capturing at its source waste containing heavy metal 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 exchanged out 2,300 mercury thermometers in fiscal year 2007.

The University of Minnesota is cooperating with MCES in a program to reduce mercury in dental clinic wastewater. The Boynton Health Center Dental Clinic has installed a micro-screen system in its chairside 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 chairside 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 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. 100,000 fluorescent lamps (8 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 (http://www.dehs.umn.edu/hazwaste_csdp.htm). 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) – RECS specifies and administers proper flame spread materials for interior finishes to reduce or eliminate the spread of fire and toxic fumes. It also specifies indoor air quality standards of the Minnesota State Mechanical Code in state-owned facilities and additional requirements in its design guidelines.

MMD has a contract for Filters: Heating and Air Conditioning. In this contract, the Pre Pleat 40 air filter elements are made of 100 percent recycled materials (100 percent non-woven recycled synthetic materials, expanded wire backing support for the filter is made from 100 percent recycled scrap steel, the die cut clay board frame is made from 100 percent recycled paper board). Using all these recycled materials in this very popular style filter helps to reduce the waste stream and its impact on pollution.

PMD coordinated with the Department of Employee Relations' industrial hygienists to develop janitorial procedures for indoor air quality procedures and standards for statewide recommendations.

Department of Corrections

MCF-LL has installed a new front end for the building automation control system. 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.

MCF – Red Wing – New digital HVAC systems and appliances were purchased in FY 2007 that utilize less energy and incorporate night/off peak set-backs.

Metropolitan Airports Commission (MAC) – The MAC is committed to developing green buildings and to operating its facilities in ways that conserve energy, water resources, and other natural resources. The MAC has:

- Designed Humphrey Terminal to optimize HVAC efficiency and to maximize day-lighting.
- Used low-flow and automatic fixtures in all restrooms.
- Re-lamped all parking structures.
- Used locally and regionally produced raw materials.
- Maximized site development on constrained footprint.
- Recycled and reused demolition construction materials.

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.

Minnesota Army National Guard – 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 provide facility personnel with a safe and healthy work environment.

Minnesota Pollution Control Agency – The space analysis completed for the Detroit Lakes office requests upgrade of the HVAC system, "The HVAC system is not adequate. The temperature during all seasons is very inconsistent throughout the building. The HVAC is manually controlled and should be an automated system." The HVAC currently consists of four, independently operated roof units regulated by manual thermostat. There is great potential to reduce cost and increase comfort by upgrading to programmable control. In the past, heating and cooling costs have not been paid directly by the agency, however, overall cost of the lease could be

impacted by reduced energy consumption, as well as reducing the agency's carbon footprint. The employees' green vision has not yet been achieved for this office. However, staff is working to make as much progress as possible in the next lease agreement.

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.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – As HVAC funds become available, Freon-based cooling units are replaced with roof-mounted, energy-efficient cooling systems, which reduce energy consumption. New roof-mounted energy-efficient HVAC systems were installed during the reporting period. A contractor calibrated and tuned up all of our boilers to increase their operating efficiency.

Anoka Ramsey Community College, Cambridge and Coon Rapids – HVAC air handling system has been updated to replace the 40-year-old equipment. New energy-efficient VAV air handling unit's are being purchased and installed. The balance of items listed would fall under the ongoing category.

Anoka Technical College, Anoka – 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. In our auditorium, we have CO_2 detectors for fresh make-up air.

Dakota County Technical College, Rosemount – Johnson Control retrofit energy management system. As older refrigerant units (chillers, coolers, and freezers) are replaced, we are purchasing environmentally safe and Energy Star refrigerant appliances.

Minnesota State University, Moorhead – The Department of Environmental Health and Safety, in collaboration with the Physical Plant, reviews any carpeting plans prior to installation, ensuring low-VOC adhesives are used and the carpet meets the Carpet and Rug Institute's indoor air quality emission guidelines. EH&S 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.

North Hennepin Community College – We plan on continuing our program of monitoring/testing indoor air quality. Last year, we tested our College Learning Place and retested our Fine Arts/Music Wing facilities.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC employs energy-conserving strategies in buildings through use of computer-controlled HVAC systems throughout the college. NCTC continues to monitor/test indoor air quality.

St. Cloud State University, St. Cloud – 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. The painting department not only uses water-based paints and varnishes but is also upgrading ventilation controls to improve and IAQ. Strict carpet emission controls are used extensively to limit volatile organic compounds (VOCs). 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 cleaner bags and HVAC filters help.

Department of Transportation (Mn/DOT) – Mn/DOT buildings use air-to-air heat exchangers in the laboratory and rest stop areas, resulting in energy savings to condition the building environment. Mn/DOT uses digital control through building automation systems to maximize energy savings and employee comfort.

University of Minnesota – The university hosts an IAQ web page (http://www.dehs.umn.edu/iaq.htm) 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 replaced aging building chiller units on the St. Paul campus with an energy-efficient centralized chiller plant; 32 individual building chillers used on the St. Paul campus were replaced. 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, the central plant will save the university $9 million over the next 25 years. Furthermore, the newer buildings on campus have stand-alone systems but were built so they could eventually be connected to a central plant. Over the next several years in three more phases, three more chillers will be installed and more buildings will be connected.

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. Re-commissioning buildings can be a great pollution preventer and money saver.

18. Ice Control, Sanding

Department of Administration (Admin) – MMD and Mn/DOT have developed a contract for alternative blend deicer used in a mixture with alternative deicer, regular salt, and sand. This blend reduces the salt use and can be used successfully at lower temperatures. The contract will be expanded to include more plant-based alternative products. Mn/DOT is continually reviewing new products and, as approved, MMD adds them to the state contract. Some of these alternative deicers are corn-based [Contract Release D-156(5)]. This contract is also available to Cooperative Purchase Venture city and local governments.

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, and 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 [Contract Release S-954(5)].

MMD is continuing to work with the Mn/DOT on the development of 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. PMD is currently testing various programs to reduce chemical usage during the winter season.

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.

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 (FAA) 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, the 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 use of chemicals for pavement deicing has been halved by using runway brooms. Evaluation of new snow removal equipment and methods is ongoing.

Minnesota Pollution Control Agency – The MPCA renegotiated the lease on its St. Paul office building to require the use of deicing products that do not contain high levels of chlorides or urea. This reduces toxic runoff for water quality. For the last several years (approximately 2005 to 2007), the building management company has used MAG ice melting pellets, which contain magnesium chloride hexahydrate (calcium 2 to 3

percent, potassium chloride 0.5 to 1 percent, and sodium chloride 0.5 to 1 percent). It's safer to use around vegetation, safer on concrete, and corrodes metal less than many other ice-melting products.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – Heating units have been installed in several sidewalks accessing campus facilities. This is a phased program that will continue over the next several years. Heated sidewalks greatly reduce the need for sanding and deicing chemicals in addition to reducing the ergonomic hazards associated with snow removal. A calcium chloride based product mixed with sand is applied after snow and ice removal to unheated walkways, as needed, for ice control. Gutters installed above entrances and walkways also reduce ice accumulations caused by snowmelt.

Anoka Technical College, Anoka – We minimize the use of salt by using a brush-mounted sweeper in the winter versus standard salt application.

Dakota County Technical College, Rosemount – DCTC uses no sand, salt only for parking lots and sidewalks to ensure the safety of students and staff.

Itasca Community College, Itasca – All sidewalks are cleared of snow and ice, and ice melt applied as needed throughout the winter. Our practice of snow plowing our sidewalks followed by power brooms has greatly reduced the amount of ice melt used on campus. A plowing contractor performs snow removal from our parking lots.

Minnesota State University, Moorhead – The university's Physical Plant aggressively removes ice and snow and uses primarily 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.

North Hennepin Community College – All sidewalks are cleared of snow and ice, and ice melt applied as needed throughout the winter. Our plowing contractor performs snow removal from our parking lots. This college determines when and where to sand parking lots in order to keep sand use to only what is needed.

Northland Community and Technical College, East Grand Forks and Thief River Falls – All sidewalks are cleared of snow and ice with ice melt applied as needed throughout the winter. Our practice of snow plowing followed by using power brooms on sidewalks has reduced the amount of ice melt used. The Maintenance Department has a vehicle-mounted sand spreader to remove snow in parking lots and is able to better determine when and where to sand parking lots in order to keep sand use to only what is needed.

St. Cloud State University, St. Cloud – 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. It was kept on a slab and covered with tarpaulins to control salt leeching.

Department of Transportation (Mn/DOT)

– Mn/DOT conducts extensive research annually on ice control equipment, materials, and application methods. This research has shown some dramatic results. The largest success to date comes from research into liquid chemicals for anti-icing and pre-wetting 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 2002/2003. 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 environment while maintaining or increasing roadway safety. Robert Edstrom heads the Hazard Evaluation Process that is applied to new product types to determine possible environmental effects that may result from use of the product. This information is used to determine whether the department should use the product or if restrictions on use should be implemented.

Mn/DOT Maintenance has developed a Snow Plow Operator Training (SPOT) program. The program provides consistent, statewide training for operators with established standards for performance. Trainees spend 10 days

participating in classroom and field training exercises. Circuit Training and Assistance Program (CTAP) provides training in the latest transportation-related technologies for 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 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.

It is anticipated that with equipment innovations such as the zero velocity spreader, greater use of road weather information, anti-icing and pre-wetting chemicals, and operator training, the 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 and less air pollution from snow removal machinery. Less labor, less sand, and less fuel burned are balanced against very little loss in utility or safety.

During the winter cold and snowy season, University of Minnesota Landcare employs an anti-icing program to facilitate snow removal by mechanical means rather than using de-icing chemicals to melt the frozen precipitation. A liquid anti-icing product is applied prior to a forecasted storm to prevent the bonding of compacted snow to hard surfaces. The end result is less sand and chemicals entering the storm sewers.

19. Laboratory

Department of Administration (Admin) – MMD'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. MMD's laboratory supplies contract provides alternatives to laboratory media containing formaldehyde and heavy metals where scientifically possible. In conjunction with the MPCA, MMD has four full-service and four limited-service contracts for environmental sampling and analysis. These contracts are available to all state agencies

In conjunction with the Mn/DOT, MMD 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 that reduces toxic waste and vapors.

PMD and RECS designed high-efficiency, energy-saving hoods for the laboratory floor of the Bureau of Criminal Apprehension building. They have also approved the use of total heat recapturing technologies for the Ag/Health Laboratory building. PMD and RECS also designed high-efficiency, energy-saving hood controls for the laboratory areas of the Ag/Health Laboratory building.

Department of Agriculture –The Agronomy work unit's inductively coupled plasma mass spectrometer (ICP/MS) has helped reduce the heavy metals mercury waste stream that was created by the use of the Kjeldahl apparatus. By continuing to reduce the use of the Kjeldahl apparatus during the past year, the amount of mercury waste generated has remained constant at 15 gallons. This has also equated to a continual savings in hazardous waste removal. Method development and additional equipment is being investigated to further reduce this waste stream. The laboratory's Environmental Analysis Waters Section acquired a Solid Phase Extraction system in fiscal year 2003, which has significantly reduced the amount of methylene chloride used in the lab. The benefit to this system is a reduction in both hazardous waste generated as well as a 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 MPCA'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 the State Fire Marshall.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – All campus laboratories collect and dispose of medical and biological waste in approved containers and according to OSHA Standards. Chemicals no longer in use by the laboratories are managed through the University of Minnesota's Chemical Safety Day Program. All employees receive bloodborne pathogen training, including a review of our written response plan, on an annual basis.

Itasca Community College, Itasca – All campus laboratories collect and dispose of medical and biological waste in approved containers and according to OSHA Standards. Chemicals no longer in use by the laboratories are managed through the University of Minnesota's Chemical Safety Day Program.

Minnesota State University, Moorhead – Extensive safety and procedural training/testing are required of all students participating in Chemistry, Physics, 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 duplication of chemicals and providing less waste.

North Hennepin Community College – Legend Technical Service is used by North Hennepin Community College to provide professional technical testing services for environmental issues that arise.

Northland Community and Technical College, East Grand Forks and Thief River Falls – As laboratories and classrooms are renovated, new and updated equipment is installed to prevent air pollution. All campus laboratories collect and dispose of medical and biological waste in approved containers and according to OSHA standards.

St. Cloud State University, St. Cloud – 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 bloodborne pathogen controls, and both written response plans and cleaning/disinfection schedules. The Chemistry Safety Committee (CSC) and 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 70 unknowns. After-hours work controls and the Chemical Hygiene Plan (CHP) reviews have received special emphasis in all College of Science and Engineering (COSE) departments having labs. Renovations have included the addition of more plumbed eyewashes.

Department of Transportation (Mn/DOT) – Mn/DOT materials laboratories have replaced 1,1,1-trichloroethane with n-propyl bromide as an asphalt extraction chemical. 1,1,1-trichloroethane is hazardous and very expensive to manage and dispose of. In addition to being nonhazardous, n-propyl bromide can be recycled in-house and reused. Mn/DOT materials laboratory has substituted vinegar for muratic acid. Muratic acid was used to clean air pots and other laboratory equipment. It was found that if the equipment was 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 (http://www.dehs.umn.edu/hazwaste_chemwaste_umn_cwmgbk.htm).

DEHS continues its second mercury thermometer exchange, which started in 2006, in an effort to remove most of the mercury thermometers from the university's labs. The Chemistry Department exchanged out 2,300 mercury thermometers in fiscal year 2008.

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 both less virgin solvents must be produced and less waste solvents to be disposed of. The projected cost savings to the university, if the distillation and marketing focused solely on acetonitrile, would be $800 disposal costs avoided and $30,000 solvent purchase avoided for the annual system capacity of 1,200 liters of recycled acetonitrile. Total projected annual costs are $10,800 that yields 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 Corrections (DOC)

MCF-Shakopee – A new 30,000-square-foot wing was added on to the Monahan Building. Its footprint covers 11,190 square feet, which will no longer need to be mowed in the future. Also, 25 trees were planted around the new addition.

MCF-Willow River/Moose Lake – Installed a new parking lot retention pond to control stormwater run off.

Minnesota Pollution Control Agency – MPCA'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).

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – Landscaping of newly developed areas employ xeriscaping designs to reduce use of gasoline-powered maintenance equipment, fertilizers, and to reduce fire hazards.

Anoka Technical College, Anoka – We are working with our Horticulture program on a daily basis on upgrading the grounds. We have implemented some rain gardens.

Dakota County Technical College, Rosemount – We are employing landscaping techniques that will reduce the need for gas-powered maintenance equipment. DCTC has upgraded the landscape equipment to the most fuel-efficient available. We avoid mowing on pollution alert days. Pheasants Forever has partnered with DCTC to plant 20 acres of prairie grass restoration project with native species grasses, which will further reduce mowing.

Itasca Community College, Itasca – Itasca Community College employs landscaping that reduces the need for gasoline-powered maintenance equipment. 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.

Minnesota State University, Moorhead – 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 gardens have replaced lawn grass areas in and around the newly remodeled MacLean Hall, Frick Hall, and Comstock Memorial Union areas.

Total emissions reduction from new gardens (in pounds)						
CO	**CO_2**	**NOx**	**PM10**	**PM2.5**	**SO_2**	**VOC**
318.775	575.636	1.575	0.98	0.901	0.118	8.56

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, 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 Buffalo River and Buffalo State Park.

Northland Community and Technical College, East Grand Forks and Thief River Falls – Current procedures for lawn, tree, and flower maintenance continue to be reviewed in order to reveal areas where improvement is needed.

East Grand Forks campus – NCTC permits the Heritage Organization to utilize 20 acres to plant and harvest wheat crop for Heritage Days celebration.

Thief River Falls campus – NCTC in partnership with the Thief River Falls Joint Powers Board maintains the athletic fields at the Multi-Events Center.

St. Cloud State University, St. Cloud – SCSU has joined with the city of St. Cloud on many of their stormwater control plan initiatives, including community outreach/education and public meetings. 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.

Department of Transportation (Mn/DOT) – Mn/DOT uses wood mulch in and around woody plantings. This helps to conserve water and to control weeds, reducing, if not eliminating, the need for a pesticide. Mn/DOT's specification for wood products promotes the use of locally generated non-treated wood waste. The department also 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 waters of the state. Mn/DOT uses an integrated vegetation management approach that combines the use of appropriate herbicides, bio-control organisms, precision mowing, and on-going training through internal workshops and annual conferences. This limits the use of herbicides, fuel, and labor.

Mn/DOT uses native plant materials in stormwater 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 USDA, in addition to continued living snow fence program result in reduced chemical and fuel consumption.

The department is developing new training materials for the MS4 program, and is partnering with district maintenance personnel on developing temporary plans for routine stormwater facility management. Mn/DOT is continuing development of environmental and construction standards for wetland restoration, stormwater treatment technologies including infiltration recharge basins, bio-swale ditches, below-ground storage and fore bay treatment. The integrated approach to stormwater 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. In addition, MnDOT supports sustainable management of best management practices foster reuse of devices over the life of contracts. Finally, the department 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 ground water and disturb natural ecosystem processes.

Sustainable management embraces four major principles: 1) conserving bio-diversity: The naturally diverse landscape discourages outbreaks of disease or insects. Such a landscape also attracts birds and butterflies. 2) restoring native vegetation: Consider using native vegetation in landscapes. Restore native vegetation to shorelines to reduce nutrient enrichment through stabilizing sediments and shorelines. 3) 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. 4) 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, use spot treat problems of soft pesticides such as soaps, oils, and bio-rational products such as Bt (commercial formulations of *Bacillus thuringiensis*). Adopt these bio-rational practices that 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 SULIS has developed a Sustainable Lawn Care Information Series (www.entomology.umn.edu/cues/) 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 Twin Cities campus. The building of rain gardens and other pollution preventing landscape stormwater management projects were championed by the committee and have become part of new construction and building renovation projects, which provide opportunities to change the landscaping of the campus (www.dehs.umn.edu/envircomp_swm.htm).

The University of Minnesota Extension maintains a website entitled Sustainable Urban Landscape Information Series (SULIS) (http://www.sustland.umn.edu). This outstanding site 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.
- P**lant 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.
- The final section, **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 (http://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; and teaches students a working knowledge of Minnesota's natural and cultural ecosystems.

21. Materials Exchange

Department of Administration (Admin) – Fleet and Surplus Services administers Minn. Statute § 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 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 is recycled in accordance with MPCA's product stewardship policy proposal. FSSD's material

exchange is accomplished through Surplus Services when property has useful life remaining. RECS includes recycling and reusing materials and handling requirements for hazardous materials in all building construction specifications.

Department of Corrections – Multiple facilities have contracts with local farmers to pick up food waste.

MCF-Oak Park Heights sent all foam mattress and pillows to a recycler for re-use, preventing them from going to the landfill.

MCF-St. Cloud recycled 52 tons of cardboard and five tons of mixed metal.

Metropolitan Airports Commission (MAC) –MAC promotes reuse internally through 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 are kept out of the waste stream and reused in this manner.

Minnesota Army National Guard – Whenever possible, materials that are not being used at the facility and are no longer needed, are reissued to other facilities.

Minnesota Pollution Control Agency – 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 that serves as a point of contact for any recycling (reuse, reduce, or rethink) or composting questions, organizes a "treasure table." Staff places usable items on tables for others to take and reuse. It remains very popular.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – Obsolete, but usable materials, are exchanged according to the procedures outline in Minn. Stat. §16C.23, subd. 6.

Anoka Technical College, Anoka – We recycle cooking oil from our cafeteria and bakery. We have implemented a recycling program to include plastic and cans.

Itasca Community College, Itasca – Glass, plastics, aluminum cans, steel, carpet, some building materials, Styrofoam, and cardboard are recycled at Itasca. All computers and their components are offered to other schools and recycled through a certified recycler.

Minnesota State University, Moorhead – Used PCs are reallocated to other departments on campus to reduce the need for additional and/or new machines. Used PCs have also been made available to student organization and nonprofit organizations. This program reduces the number of discarded computers on campus and saves budget money for many departments.

North Hennepin Community College – Used but serviceable computers and components have been given to other schools that expressed a need. Excess office equipment has been given to other schools and also turned in to state Materials Management division for use elsewhere.

Northland Community and Technical College, East Grand Forks and Thief River Falls – When possible, used computers and equipment are reallocated to other departments to reduce the need for additional and/or new equipment as part of the college technology recycling plan and saves budget money for many departments. Used computers and equipment are made available for purchase to the general public via college rummage sales to reduce the number of discarded computers. Unsold electronics are properly disposed of by a licensed local contractor. Glass, plastics, aluminum cans, steel, carpet, some building materials, Styrofoam, and cardboard are recycled, as well as lard and cooking oil.

St. Cloud State University, St. Cloud – 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 (http://www.dehs.umn.edu/hazwaste_chemwaste_freechem.htm), which finds users for unwanted but usable chemicals and laboratory glassware within the university community. The program distributes approximately 1,000 kg of chemicals per year that would otherwise be disposed of as hazardous waste.

Since its commencement in 1991, the Reuse Program (http://www1.umn.edu/reuse) at the university has been relieving buildings of unwanted materials, fixtures, and supplies. Reusable furniture, equipment, electronics, and office goods are redistributed to U of M departments throughout campus to decrease the university's solid waste and to save money otherwise spent on transportation to a landfill. Items not claimed by university departments are made available to public schools, nonprofit organizations, charities, and the public. More than 240 tons of materials find new homes through the program annually and approximately $100,000 revenue from external sales is generated. The Reuse Program is currently working to further minimize transportation expenses between campus and the ReUse Warehouse by implementing an internal exchange of supplies using an online record of what materials are available and where they can be found on campus as opposed to the warehouse.

22. Office Supplies

Department of Administration (Admin) – RRP obtains office supplies and paper from the reusable office supplies area at the State Recycling Center. OSC stocks recycled papers including eight white papers in various sizes and various post-consumer waste contents. OSC also offers white and color papers which:

- Contain 100 percent post-consumer content.
- Are processed chlorine-free.
- Are acid-free for a long bright life.
- Have outstanding opacity for two-sided copying.
- Exceed all state and federal requirements for recycled content.

The stocked colored papers at OSC contain either 30 percent post-consumer waste or now 100 percent post-consumer waste.

OSC and MMD conducted a test of 100 percent recycled paper during FY 2007. Paper was supplied by the current contract holder to allow several state offices to use 100 percent recycled paper in their day-to-day operations and compare the quality to the 30 percent recycled. One of the challenges was that 100 percent recycled paper had been more expensive than 30 percent recycled content paper. The paper contract was renewed in July 2007 with a price decrease on the 100 percent paper. The price of 100 percent recycled remains the most cost-effective option for state agencies when compared to virgin and 30 percent recycled paper. Because of this pricing advantage and through promotion of its use, nearly 182,000 reams of 100 percent recycled paper were purchased during FY 2008, compared to 19,000 reams during FY 2007. This pricing advantage continues in FY 2009 as part of Office Supply Connection's pricing strategy reflected in an addendum to its business plan.

OSC has an electronic catalog that reduces paper consumption by allowing customers to order online without the need to fax or mail in an actual order form. A convenient express order form allows faster order placement without the need to have a printed catalog. In past years, a minimum of 2,500 stocked product catalogs where distributed to OSC customers. A convenient express order form allows faster order placement. In FY 2005, approximately 51 percent of orders were placed electronically. At the conclusion of FY 2007, the percentage was 63 percent, and the goal is to increase it to 75 percent. Also, since all prices 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.

OSC and MMD renegotiated the non-stock office supply contract with the focus on standardizing items and best pricing on the most commonly ordered products. The most commonly ordered products have been

combined in the "First Choice" catalog. The First Choice catalog has 3300 items available, more than 800 of these items are recycled.

- OSC's invoices are printed on recycled paper.
- All OSC newsletters and price lists are available online.

Used and empty cartridges are returned to OSC, palletized, and sent back to S&T Office Products to be returned for remanufacturing. OSC continues to solicit recommendations from the OSC User Group to keep improving this program.

- MMD buys only 100 percent post-consumer recycled papers for all of its printers and copiers.
- The Risk Management Division continues to request soy-based ink for printing orders.
- The Risk Management Division recycles printer and typewriter toner cartridges.
- MMD recycles laser printer cartridges.

Department of Administration's paper use

Paper type	Reams	Energy (MBTUs)	Greenhouse gas emissions (CO2 equivalents in pounds)	Wood use (tons)
Virgin paper	270	26	3,841	4,000
30% post-consumer paper	3,024	252	38,237	36,000
100% post-consumer paper	3,090	167	27,672	0

Department of Agriculture

In FY 2008, MDA headquarters used 4,360 reams of paper—a 15 percent reduction in paper usage from FY07. Of these, 550 reams were 1070 recycled paper, 150 reams were 1071 recycled legal paper, 10 reams were 1073 recycled 3-hole punch paper ,and 3,650 reams were 1,080 100 percent PC free recycled paper. No virgin paper was used in FY 2008. In FY 2007, MDA headquarters used 5,060 reams of paper: 5,000 reams were 1,070 recycled paper, 60 reams were ,1071 recycled paper, and 0 reams were virgin paper.

Department of Agriculture's paper use

	Wood use	Total energy	Greenhouse gas	Waste water	Solid waste
2008	27 tons	367 million BTUs	55,635 $C0_2$ equiv	180,952 gallons	21,354 pounds
2007	29 tons	400 million BTUs	60,693 $C0_2$ equiv.	197.402 gallons	23,295 pounds

*Source: Environmental impact estimates were made using the Environmental Defense Paper Calculator. For more information visit http://www.papercalculator.org

Department of Commerce

Paper Consumption (reams unless noted)

Type	0%	30%	100%	Total	GHGe	Wood
FY 04	0	6,790	0	6,790	85,731 lbs	82,385 lbs
FY 05	0	7,681	0	7,681	96,981 lbs	93,196 lbs
FY 06	20	7,770	0	7,790		
FY 07*	10	6,910	0	6,920		
FY 08						

*Includes Weights and Measures Division

Department of Corrections (DOC) – Paper use for reported DOC facilities and the corresponding energy use and greenhouse gas emissions associated with that use. Previous year is listed in parenthesis.

MCF-FRB – 6,050 (7,350 in FY 2007) reams (tons) of 30 percent post-consumer content paper.

MCF-OPH – 2,250 (3,000) reams (tons) of 30 percent post consumer content paper.

MCF-SCL – 5,610 reams (tons) of 30 percent post consumer content paper.

MCF-WR/ML – 6,910 reams (tons) of 30 percent post consumer content paper.

MCF-LL – 3,000 reams (tons) of 30 percent post consumer content paper .

MCF-STW – 4,150 (5,374) reams (tons) off 30 percent post consumer content paper.

MCF-RC – 5,740 reams (10 tons) of 30 percent post-consumer content paper.

MCF-RW – 2,090 reams (5 tons) of 30 percent post-consumer content paper.

MCF-SHK – 4,080 reams (9 tons) of 30 percent post-consumer content paper.

MCF-Togo – 490 reams (tons) of 30 percent post-consumer content paper.

Field Offices & Central Office – 10,515 reams (27 tons) of 30 percent post-consumer content paper.

Total Corrections 30 percent post-consumer content paper use – 50,885 (51,749 in FY 2007) reams. Using 127 tons of 30 percent post-consumer content paper instead of virgin resulted in the following positive environmental impact:

Wood use	132 tons	916 trees
Total energy	637 million BTUs	7 homes/year
Purchased energy	20 pounds	4 18-wheelers/year
Sulfur dioxide (SO_2)	80,451 lbs CO_2 equiv.	8 cars/year
Greenhouse gases	150 pounds	<1 18-wheelers/year
Nitrogen oxides (NOx)	186 pounds	17 buses/year
Particulates	12 pounds	
Total reduced sulfur (TRS)	333,934 gallons	<1 swimming pools
Wastewater	9 pounds	<1 homes/year
Biochemical oxygen demand (BOD)	121 pounds	<1 homes/year
Total suspended solids (TSS)	2,636 pounds	4 homes/year
Chemical oxygen demand (COD)	42,882 pounds	1 garbage trucks
*Source: Environmental impact estimates were made using the Environmental Defense Paper Calculator. For more information visit http://www.papercalculator.org		

The Department of Corrections has implemented its all-electronic EIOR accounting system for all budgeting and purchasing. No more paper reporting or paper copies of purchase orders beginning September 15, 2008.

Department of Revenue (DOR) –The DOR purchased 129,650 pounds of paper (19,945 reams @ 6.5 pounds per ream); of this, 98 percent was recycled content. Purchases by category primarily: 1070 – 105,000 pounds; 1071 – 832 pounds; 1073 – 604 pounds; and 1080 – 20,832 pounds.

Wood use	Total energy	Greenhouse gas	Waste water	Solid waste
238 tons	3,269 million Btus	495,662 $C0_2$ equiv.	1,612,113 gallons	190,243 pounds

Iron Range Resources and Rehabilitation Agency (IRRR) – In FY 2008, 1,044 reams of paper were used by our agency (2.67 tons).

Paper type	Tons	Energy (BTUs)	Greenhouse gas emissions (CO_2 equivalents in pounds)	Wood use (tons)
Virgin paper	0.12 tons			
30% post-consumer paper	0.75 tons			
100% post-consumer paper	1.8 tons			
Total paper used in 2007		**69 million BTUs**	**10,924 pounds CO_2**	**< 3 tons**
source – paper calculator.org				

Minnesota Department of Employment and Economic Development (DEED) – DEED began a process of implementing the Department of Finance's Self Service Time Entry system, which will allow DEED employees to enter bi-weekly timesheet information via the Internet, rather than using paper timesheets. This should result in a reduction in the consumption of more than 41,000 sheets of paper per year.

Metropolitan Airports Commission (MAC) – Paper consumption has increased by 1,220 reams over 2006 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 (CO2 equivalents in pounds)	Wood use (tons)
Virgin paper	5,610			
30% post-consumer paper	1,230			
100% post-consumer paper	0			
Total paper used in 2007	**6,840**	**26,000,000**	**3,814**	**<3**

Metropolitan Council Environmental Services (MCES) – The following table describes the use of office (copy) paper at the MCES in 2007.

Impact category *	30% recycled 2007 = 32.6 tons	Non-recycled 2007 = 4 tons	Per ton difference (+ for non-recycled)
Wood use	113 tons	14 tons	+ 1 ton
Total energy	1,251 million BTUs	153 million BTUs	+ 5 million BTUs
CO_2 emissions	185,500 pounds	22,761 pounds	+ 632 pounds
Wastewater	621,851 gallons	76,301 gallons	+ 19,075 gallons
Solid waste	74,274 pounds	9,113 pounds	+ 2,278 pounds
*Environmental impact estimates were made using Environmental Defense Paper Calculator, www.papercalculator.org			

Metropolitan Mosquito Control District (MMCD) – Metropolitan Mosquito Control District and the Metropolitan Emergency Services Board (MESB) entered into a shared resources agreement for office equipment, network resources, and some office supplies such as paper. By combining the purchasing power of the two agencies, office paper is purchased in bulk at a lower cost per ream and then shared by each agency. An accurate accounting of paper usage for 2007/2008 was not available in time to be included in this report, however staff estimated that paper usage was 850 reams for this reporting period. The average post-consumer content for all the paper used was 10 percent. Using the paper calculator on the Environmental Defense Fund website, the following table shows the impact of MMCD paper use in FY 2008.

Metropolitan Mosquito Control District office paper usage fiscal year 2008				
Quantity used (reams)	**Recycled content (%)**	**Energy used (BTUs)**	**Greenhouse gases (lbs)**	**Wood used (lbs)**
850	10%	154 million	23,000	26,000
* Environmental impact estimates were made using the Environmental Defense Fund Paper Calculator. For more information, visit www.papercalculator.org.				

The district is currently reviewing the printing and copier processes used by MMCD and MESB in an effort to reduce the amount of paper and printer ink used. Staff is being encouraged to use voice mail and e-mail more for internal correspondence and to resist the urge to print e-mail messages.

Minnesota Army National Guard – MNARNG purchased approximately 16,000 pounds of 30 percent post-consumer recycled office paper in FY 2008. Using the Environmental Defense website calculator comparison between virgin paper and 30 percent recycled, the following savings or decreased generation were achieved: 19 tons of wood, 267 million BTUs of power, 40,462 pounds of greenhouse gases, 131,000 gallons of water, and 15,500 pounds of solid waste. Additionally the MNARNG recycled approximately 52,000 pounds of office paper in FY 2008.

Minnesota Pollution Control Agency – The MPCA uses 100 percent post-consumer copy paper processed without chlorine for all of its basic printing and copying needs. In FY 2008, MPCA purchased a total of 10,272 reams of 100 percent post-consumer paper and a total of 1,315 reams of various papers with a minimum 30 percent post-consumer content. The following data represent the impact of the MPCA's paper use in 2008:

Impact category *	**30% recycled 2007 = 3.2785**	**100% recycled 2007 = 25.68**
Wood use	3 tons	89 tons
Total energy	16 million BTUs	429 million BTUs
CO_2 emissions	2,079 pounds	54,136 pounds

The MPCA saved 445 million BTUs of energy by using recycled paper instead of virgin and avoided 56,215 pounds of carbon dioxide emissions to the air. In addition, the MPCA saved 92 tons of wood by using 30 and 100 percent post-consumer recycled content paper instead of purchasing virgin paper. Recycled paper is used exclusively in the office. Letterhead, business cards, and envelopes contain 100 percent post-consumer recycled-content paper.

MPCA uses Savin IKON and Canon copier machines, and purchases remanufactured toner cartridges for these machines as well as for the majority of the black-and-white printers. Over 75 percent of the office supplies purchased are reusable, less toxic, or contain recycled content, including post-it-notes, refillable pens and pencils, file folders, 3-ring binders, and note pads. MPCA staff 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 on two sides whenever possible to reduce paper consumption by half.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – ATC uses both new and recycled office supplies, including paper with a 50 percent recycled content and 30 percent post-consumer fiber content. Recycled toner cartridges are purchased. Ink and toner cartridges, as well as obsolete cell phones are recycled through local nonprofits as a fundraiser. ATC maintains paper recycling stations at all printers, copiers, and mailrooms.

Anoka Technical College, Anoka – We currently purchase recycled paper for printing, copying, etc.

Century College, White Bear Lake – Century College primarily uses 30 percent post-consumer content paper for copying and duplication. Actual volume of paper use by category was not available at this time

Dakota County Technical College, Rosemount – We purchase 30 percent to 50 percent post-consumer recycled products. Office supplies are purchased from state contracts and state surplus whenever possible. All paper, cardboard, and toners are recycled after use.

Hennepin Technical College, Brooklyn Park and Eden Prairie

FY 2008 paper consumption:
184 reams virgin paper
4,242 reams minimum 10% post-consumer content
781 reams minimum 30% post-consumer content
5,207 reams total

Itasca Community College, Itasca – The college purchases only Energy Star rated computers and LCD panels. Computer settings are optimized to take advantage of energy-reducing capabilities. College e-mail is provided and encouraged to reduce paper for memos, announcements, and correspondence.

Minnesota State University, Moorhead – 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 continues to reduce mass-produced items such as student bulletins, liberal studies worksheets, billing and financial account information, and registration materials. These items are instead available to all students online. Last past year, MSUM used approximately 36,144 reams of office paper. This amount included 35,441 reams of 30 percent post-consumer content paper, 460 reams of 100 percent post-consumer content paper, and 243 reams of virgin content paper. Compared to 2007, this is a reduction of 602 reams.

Normandale Community College -This year the largest change is that we changed from 10 percent post-consumer paper to 35 percent post consumer waste. It has gone well with no problems. We are considering trying 100 percent post-consumer paper on a small trial basis. We have not requested our staff to use paper as efficiently as possible, but are considering it in the near future.

North Hennepin Community College –Central Duplicating Services provides both new and, when available, recycled office supplies to all departments on campus.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC purchases and recycles toner cartridges from a vendor specializing in remanufactured toner cartridges. Online resources have greatly reduced the amounts of office supplies used by NCTC. E-mail is the official means of communication for both students and employees. All employees and students are provided e-mail access and encouraged to reduce paper for memos, announcements, and correspondence. Many instructors use online resources for classes, including assignment and note postings, exams, syllabi, and announcements. The administration continues to take steps to reduce mass-produced items such as student bulletins, billing and financial account information, and registration materials. A recycling program exists for paper, cardboard, magazines, plastic, and aluminum. In fiscal year 2008, recycling containers were purchased at a cost of $7,000. Two work-study students are employed 10 hours per week for collection of recyclables.

St. Cloud State University, St. Cloud – SCSU extensively uses paper with 50 percent recycled content and 30 percent post-consumer fiber content. (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. Desks, plants, pesticides, produce, chemicals, computers, and cooking oil for bio-diesel were also recycled.

Department of Transportation (Mn/DOT) – Mn/DOT recycles computers, cardboard, paper, and toner; copies on both sides of paper whenever possible; and purchases printer toner with biodegradable inks and the cartridges can be recycled.

University of Minnesota – University Stores sells copy paper to the university departments. The use of recycled content paper decreases energy and wood usage and reduces the greenhouse gas production related to paper production. A decrease in paper sold by University Stores is partially due to "paperless U" initiative to eliminate paper with electronic records where possible. The "paperless U" initiative as a resource conservation effort has avoided the use of many millions of sheets of paper by the university in recent years.

23. Oil, Oil Filters

Department of Administration (Admin) – MMD has established statewide contracts to purchase re-refined motor oil and oil change services that 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, as well as the required additives to provide optimal engine performance. MMD has a contract for bulk re-refined motor oil. In conjunction with the Mn/DOT, MMD has a contract to manage used oil sorbents and filters for energy-recovery processing. PMD participates in a used-oil recycling program. Its 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.

MMD, in conjunction with the MPCA and Cooperative Purchasing Venture members established contracts in most regions of the state for recycling and managing used oil, filters, sorbents, and antifreeze (Contract Release H-94(5) ,contract numbers 433735 and 433736).

Iron Range Resources and Rehabilitation Agency (IRRR) – Como Oil of Duluth picks up the oil, oil filters, and floor-dry 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 to a large storage tank thus eliminating the possibility for 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.

The MAC, as a service, 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. The used oil is stored in tanks provided by the MAC. It is collected periodically and re-refined by a permitted vendor. Commercial tenants are required to follow MPCA regulations regarding management of used oil.

Metropolitan Council Environmental Services (MCES) – Used motor oil is collected and stored at MCES facilities and is transported by licensed haulers such as OSI Environmental, Inc. or Rock Oil 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 or Rock Oil. In 2007, for all facilities, 2,405 gallons of used oil were transported, a decrease of 51 percent from the previous year. For the same time frame, 550 pounds of used oil filters were recycled, a decrease of 59 percent.

Department of Military Affairs – The JFMN (Army) recycled approximately 8,200 gallons of used oil and 5,500 pounds of crushed oil filters.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – Oil and oil filters generated on our campus are drained, collected in approved containers, and recycled through licensed recycling contractors.

Anoka Technical College, Anoka – Our Automotive program recycles its waste oil and used oil filters.

Dakota County Technical College, Rosemount – DCTC collects oil and oil filters and sends them to Edel Oil for recycling.

Itasca Community College, Itasca – All oil and oil filters are recycled through an approved vendor.

Minnesota State University, Moorhead – All oil and oil filters are recycled through an approved vendor.

Northland Community and Technical College, East Grand Forks and Thief River Falls – Used oil and oil filters currently are recycled through an approved vendor.

North Hennepin Community College – North Hennepin Community College collects used oil and filters in approved containers and recycles them through a local recycling vendor.

St. Cloud State University, St. Cloud – SCSU oil filters are drained for over 24 hours to qualify as special hazardous waste. Motor oil is collected and recycled.

South Central College, Faribault and North Mankato – All oil and antifreeze products are recycled by the appropriate vendors.

Department of Transportation (Mn/DOT) – See *14. Energy Production*" Used oil filters are recycled.

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) – MMD specifies no-lead paint for traffic marking and equipment paint. It also makes solvent-free paint available to state agencies and political subdivisions through its state contract. PMD tested the use of latex-based duct sealant compounds. PMD uses nut chips with shot-peening equipment to remove paint and gasket materials.

Department of Corrections (DOC) – *MCF-Faribault* – Recycled 1,400 pounds of paint and 320 pounds of paint-related materials at the Rice County Recycling Center Reuse Center.

Metropolitan Airports Commission (MAC) – The MAC Paint Department is responsible for painting/ striping acres of pavement, runways, and taxiways in addition to parking lots and roads. The 10,000+ gallons of pavement-marking paint used annually is purchased in reusable 250-gallon totes. Once emptied, 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 whenever possible. 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 burned for energy recovery. Use of high-volume low-pressure (HVLP) spray technology for solvent-based paints reduces overspray by 40 percent, uses less paint, and provides a more even coat of paint. Sandblasting was replaced with shotblasting whenever possible with a self-recycling system that filters and reuses the blasting media.

Minnesota Army National Guard – New painting technology, materials, and recycling units have cut waste paint generation amounts in half from what was generated five years ago. New paint gun technology, training

techniques, and the switch to aqueous chemical agent resistant compound (CARC) paints, all contributed to the lowering of the waste generation amounts.

Regarding paint removal, the Camp Ripley Combined Support and Maintenance Shop (CSMS) has completed the switch to an aqueous paint strip system. This switch has eliminated the lead-contaminated sandblast waste stream, which was the largest hazardous waste stream for the MNARNG.

Minnesota Pollution Control Agency – MPCA'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 MPCA's St. Paul office uses only low-VOC paints for internal and external painting.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – Low-VOC, lead-free, water-based, and latex-based paints and finishes are purchased and used whenever possible. Licensed contractors are employed to strip and hydro-blast painted surfaces on campus.

Dakota County Technical College, Rosemount – All paints, carpet glue, and caulking sealants are low VOC.

Itasca Community College, Itasca – Maintenance procedures continue to reduce the use of organic solvent-based wood sealers. Water-based paints and finishes are used whenever possible. Services staff has eliminated many aerosol products and continues to look for the most environmental products available.

Minnesota State University, Moorhead – 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 paint is a no-VOC line of paint and is virtually odorless. The Buckeye products currently used are biodegradable and one, Star Spray, is Green Seal approved.

North Hennepin Community College – Minimal painting is done on site by in-house staff. The small quantities of paint/coatings kept on site are used for touch-up purposes, and are discarded when all of product is used up. The services of a local contractor are used for area painting.

Northland Community and Technical College, East Grand Forks and Thief River Falls – The Maintenance Department has eliminated use of almost all aerosol products and continues to look for available environmental products. NCTC has converted use of paint coatings to almost all water-based products to limit VOCs.

St. Cloud State University, St. Cloud – SCSU has converted almost all possible paint coatings to water-based products to limit volatile organic compounds (VOCs).

Department of Transportation (Mn/DOT) – Mn/DOT districts are using 110-gallon returnable paint totes instead of 55-gallon single-use drums. This eliminated 55-gallon paint drums as waste. Mn/DOT uses lead-free latex or epoxy pavement marking/striping paint. Also, all vehicles purchased by Mn/DOT are specified to have heavy metal-free coatings/paints. See *16. Heavy metals.* Mn/DOT uses stainless steel dump boxes and sanders to prevent future re-furbishing and sandblasting. Prior to demolishing structures (buildings and bridges), all loose or peeling lead paint is encapsulated with a nontoxic, water-based encapsulant to prevent the release of lead paint during the demolition.

University of Minnesota – The university's Standards and Procedures for Construction state that it "recommends and supports" the use of reblended paint and has developed reblended paint specifications (http://www.cppm.umn.edu/standards.html).

25. Parts Cleaning

Department of Administration (Admin) – PMD does not use solvent-based parts cleaning solution. MMD has a statewide contract for the maintenance of the aqueous parts washers used by state agencies and CPV members. The aqueous part washers produce waste material that is less toxic than other parts washing systems.

Department of Corrections (DOC) – *MCF-Lino Lakes* – Solvent is recycled. We used 30 less gallons in FY 2008.

Iron Range Resources and Rehabilitation Agency (IRRR) – Como Oil of Duluth picks up the parts cleaning fluid for recycling.

Metropolitan Airports Commission (MAC) – The MAC continues to use parts washers with 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 a high of over 400 gallons per year to less than five gallons without a corresponding increase in costs.

Metropolitan Council Environmental Services (MCES) – There are over two dozen parts washers at MCES facilities and 291 gallons of solvent were recycled in 2007, an increase of 5 percent over 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.

Minnesota Army National Guard – The JFMN (Army) continues to utilize 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, and the life of the solvent is greatly extended. All repair facilities have aqueous parts washing systems too. Skimmers collect any POL that washes off the parts, and the POL is recycled via the Used Oil recycling program.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – The Diesel Mechanic, Marine and Small Engine and Truck Driving programs use a recycling parts washing system that uses a distillation filtration process to virtually eliminate hazardous waste generation. This system is managed by an outside contractor. This has reduced our generation status from a Small Quantity Generator to a Very Small Quantity Generator, effectively reducing our waste generation fees paid annually to the Minnesota Pollution Control Agency.

Dakota County Technical College, Rosemount – Comolube changes the parts cleaning solution every month.

Minnesota State University, Moorhead – The university uses a citrus-based environmentally friendly parts washing fluid in the automotive mechanic shop.

Northland Community and Technical College, East Grand Forks and Thief River Falls – Over the last few years, faculty have been encouraged to use environmentally friendly products and chemicals that do not have to be treated as hazardous waste for disposal purposes. The Maintenance Department has eliminated use of almost all aerosol products and continues to look for available environmental products. Parts cleaner solvents are recycled through an approved vendor.

St. Cloud State University, St. Cloud – 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.

Department of Transportation (Mn/DOT) – Mn/DOT has replaced non-recyclable vehicle parts washer chemicals with aqueous-based vehicle parts washers and high flashpoint petroleum vehicle parts washers. The

vehicle parts washers are retrofitted with filtration systems so the product can be reused multiple times. These recyclable parts washers can go three to five years without changing the cleaning solution, compared to every two weeks to a month with the old non-recyclable parts washer solutions.

University of Minnesota – The University of Minnesota Studio Arts department installed a parts washer system for paint brush cleaning that 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 installed a parts washer system using a 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 240 gallons of solvent waste per year.

U of M-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 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. 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 – 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.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC distributed hand sanitizer to employees during the "Fight the Flu" campaign. In addition, the hand sanitizer products were available for purchase in the bookstore. This effort may also have reduced water consumption.

27. Pesticides, Fertilizers

Department of Administration (Admin) – PMD follows pollution prevention practices during the planting and care of landscaping by its Grounds Services staff. PMD participates in a Public Land Task Force addressing integrated pest management practices, and in conjunction with the Department of Corrections, MMD has established a Biohazard Waste Cleanup contract. MMD, in conjunction with state agencies and Cooperative Purchasing Venture members has established a contract for the handling of hazardous materials, pesticide packaging, transportation and disposal. It also provides for the transportation and disposal of pesticides from household hazardous waste facilities throughout the state.

Pest control: MMD has moved to integrated pest management. The goal of this management approach is to achieve long-term, environmentally sound pest suppression and prevention through the use of a wide variety of technological and management practices. RRP has not required pest control services at the State Recycling Center by ensuring clean facilities that do not attract vermin.

Department of Agriculture –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 web site 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)

Alexandria Technical College, Alexandria – ATC uses pesticides only on an as-needed basis and in very limited amounts. A phosphorous-free, organic-based fertilizer is applied by a licensed applicator to ATC green spaces.

Anoka Technical College, Anoka – We use a licensed pest control service (Ecolab). We use very few pesticides, which are measured accurately and are diluted according to manufacturer's instructions. Minimum levels of pesticides and fertilizers are necessary to maintain attractive grounds with a local vendor (TruGreen-Chemlawn). We also use non-phosphorous fertilizers.

Dakota County Technical College, Rosemount – DCTC's Green Initiative dictates no use of pesticides and fertilizers.

Itasca Community College, Itasca – We try to use the minimum levels of pesticides and fertilizers necessary to maintain attractive grounds.

Minnesota State University, Moorhead – 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. These beetles while adults 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 Spill Response Program continues to be updated and 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 includes education to staff as well as a centralized location for all spill response supplies.

North Hennepin Community College – All pesticide and fertilizer applications for pest control and lawn fertilizing and weed control are applied by licensed private contractors.

Northland Community and Technical College, East Grand Forks and Thief River Falls – The Maintenance Department has eliminated use of almost all aerosol products and continues to look for available environmental products. The minimum levels of pesticides and fertilizers necessary are utilized to maintain attractive grounds. The grounds personnel are trained to properly and safely use these products.

St. Cloud State University, St. Cloud – At SCSU, we try to use the minimum levels of pesticides and fertilizers necessary to maintain attractive grounds. Phosphate use concerns were addressed in MS4 actions and public community concern/outreach meetings. We use professional trained contractors to apply lawn pesticides and fertilizers.

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 that include 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.

Robert Edstrom heads the Hazard Evaluation Process that is applied to new product types to determine possible environmental effects that may result from use of the product. This information is used to determine whether the department should use the product or if restrictions on use should be implemented.

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).

The Elwell Agroecology Farm (http://swroc.cfans.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: 1) There are two on-going, 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. 2) 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. 3) 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 (http://www.cfans.umn.edu), Extension Services (http://www.extension.umn.edu), and Biosystems and Agricultural Engineering (http://www.bbe.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 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 – 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, providing leadership in developing, advocating, and implementing equitable, cost-effective policies regarding departmental agendas. Commerce is committed to lead by example through the reduction of energy use, the use of toxic pollutants, and the generation of hazardous waste in its 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 is committed to keeping Minneapolis-St. Paul International (MSP) as the airport of choice for travelers, airlines, and the aviation industry. The MAC strives to make sure, on a daily basis, that MSP and its six Reliever Airports operate as safe, secure, customer-oriented, economically sound, and environmentally responsible airports.

The MAC's Vision Statement includes the ongoing commitment to sustainability and stewardship: "MAC sets the standard in environmental stewardship in the development and operation of its airport system." Being good

stewards means operating and developing the MAC's airports in ways that meet the needs of the present without compromising the ability of future generations to meet their needs. Sustainable solutions are those that address long-term environmental, operational, financial, and social needs.

The MAC has been a longtime leader in proactively responding to environmental concerns across a wide spectrum ranging from a standard-setting noise mitigation program to the preservation of Minnesota wetlands. In an era when air travel is forecast only to increase, the MAC views environmental sustainability as integral to its mission. The MAC is committed to minimizing impacts to air and water quality, to reducing noise impacts, to continuing and improving recycling, and to preserving natural resources.

The MAC's environmental goals are to:

- Minimize impacts to air quality.
- Minimize impacts to water resources.
- Reduce waste generation and hazardous materials use.
- Minimize impacts to and seek opportunities to enhance natural resources.
- Reduce energy consumption.
- Purchase electric energy from sustainable sources.

The MAC's sustainable activities are grouped in the following major categories:

- Energy conservation / renewable energy.
- Green buildings, facilities and infrastructure.
- Water quality and conservation.
- Air quality.
- Waste management and recycling.
- Noise abatement.
- Natural resources management.
- Financial.

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.

Minnesota Army National Guard –

The JFMN (ARMY) is committed to the ISO 14001 standard of Environmental Management System (EMS). In accordance with ISO 14001 standards the JFMN (Army) is committed to integrate 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)

MPCA sustainability plan –The MPCA's new strategic plan calls for the MPCA to lead the way to minimize its environmental footprint and assist other public entities to do the same. MPCA chose to serve as a catalyst for these actions by appointing the first sustainability manager in the state government system to reduce our own environmental footprint, in addition to a staff-led "green" team, called ARROW. The enhanced sustainability effort got under way in the summer 2008. To date, examples of progress include joining the Climate Registry and encouraging 12 other Minnesota companies, DNR, and Metro Council to join. MPCA will report 2008 baseline information and undergo third-party verification in 2009; lead the Interagency P2 Advisory Team in developing greenhouse gas emission recommendations for all state agencies as recommended by the Minnesota Climate Change Advisory Group; and develop an MPCA sustainability plan for operational improvements related to greenhouse gas emissions. Focal areas for 2009 include green building (energy efficiency/renewable energy), source reduction, vehicle miles traveled/fleet management, green IT (energy-

efficiency focus), and closed landfills. Baseline measures and reduction targets are being established where metrics do not currently exist. (*2008 Biennial Report to the Legislature on the Waste Management Act* p. 10). Some impressive results are noted under *Part 4, sections 6, 12-14,* and *36*.

Green IT (energy-efficiency focus). MPCA has implemented power management functions for desktop computers and monitors, saving 632,000 kWh per year, and nearly $50,000 in energy. Additional software controls are being investigated. The MPCA also replaced remaining CRT monitors with flat screen monitors for additional energy savings.

Closed landfills. Over 26 million pounds of methane were collected and destroyed at 21 sites in FY 2008 and energy production from methane gas is occurring or engineered at two sites. Solar panels are used to power a flare to destroy methane at one site. Native plantings are specified for selected areas of closed landfill construction sites, and at one site, MPCA is managing a native oak savanna. Compost was used as a cover component at three sites, and recycled-content educational signage and benches were used at the Pickett Landfill, which is on the Heartland Trail.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – Alexandria Technical College employs a continuous improvement process that promotes excellence in environmental management and stewardship toward energy efficiency by using the implementation of environmentally friendly and energy-efficient products and waste stream reduction programs both internally and with our vendor partners.

Dakota County Technical College, Rosemount – Dakota County Technical College is committed to excellence and leadership in protecting the environment. In keeping with the policy, our objective is to reduce our energy consumption and to promote clean air landscaping. By successfully preventing pollution and conserving energy at its source, we can achieve cost savings, increase operational efficiencies, and improve the environment. Dakota County Technical College's environmental guidelines include the following: Environmental protection is everyone's responsibility. It is valued and displays commitment to DCTC. We will continue to pursue energy conservation and efficiency improvements in our operations, and promote conservation practices and investments in energy-efficient technologies. DCTC will encourage clean air landscaping and strive to reduce the mowable square footage of turf and replace current mowers with the most fuel-efficient mowers available. DCTC seeks to demonstrate its corporative citizenship by adhering to environmental regulations. We promote cooperation and coordination between higher education, government, and industry, toward the shared goal of reducing waste at its source, and recycling in an environmentally sound manner.

Hennepin Community College – North Hennepin Community College will strive to do its part in protecting our environment through conscientious use of supplies, materials, and equipment, recycling and reusing whenever possible in order to make full use of valuable resources that went into making these products.

Minnesota State University, Moorhead – Minnesota State University Moorhead 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. Minnesota State University Moorhead 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.

Northland Community and Technical College, East Grand Forks and Thief River Falls – In fiscal year 2009, the following policy will be drafted and presented through appropriate channels for policy approval: Northland Community and Technical College will strive to do its part in protecting our environment through conscientious use of supplies, materials, and equipment, recycling, and reusing whenever possible in order to make full use of the valuable resources that went into making these products.

St. Cloud State University, St. Cloud – 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.

Department of Transportation (Mn/DOT) – See *Part 2 – Policy/Regulatory Activities.*

University of Minnesota – The university has a Board of Regents 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 supersedes *Board of Regents Policy: Pollution Prevention and Waste Abatemen*t. A Sustainability and Energy Conservation Policy Work Group (SEC Work Group), appointed by the president, is charged with developing a policy framework that will 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 the following *Board of Regents Policy: Sustainability and Energy Efficienc*y.

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.

29. Printing

Department of Administration (Admin) – MMD continues to require post-consumer recycled paper content on all paper used for printed material to be at least 30 percent. In addition, MMD 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). Responders 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 and contracts. Minnesota's Bookstore continues to print its law and rule extracts and other products sold to the general public on recycled paper containing at least 30 percent recycled content and also used agra-based inks on products. Whenever practicable, it also uses environmentally sound packaging and shipping products.

Department of Commerce – The department uses an electronic licensing process for hundreds of thousands of licenses that are issued each biennium. First used for insurance licensing in July 2006, new online systems now handle nearly all of the applications submitted by insurance, real estate, mortgage, and collections companies and professionals. This has greatly reduced paper and mailing costs for the department and transportation expenses for licensees, who no longer have to travel to St. Paul to conduct their license transactions. The online systems also allow licensees to print their own licenses, further reducing postage and fuel costs.

Minnesota Pollution Control Agency (MPCA) –The MPCA uses a number of strategies to reduce waste and pollution from printing. **More online, less in print:** Increasingly, the agency 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 division's green building web pages for detailed and up-to-date information. For publications that are printed, nearly all are put on 100 percent post-consumer content paper.

Direct-to-plate: Although limited by the state's purchasing rules, the agency tries to send offset print jobs to printers that use direct-to-plate technology (sometimes called computer-to-plate). This process allows printers 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.

The division specs vegetable-based ink on print jobs (though most printers now use it by default). Many of its short-run print jobs (less than 1,500 double-sided 8.5 x 11 or equivalent) are done in-house on a high-speed color laser printer. This saves money, and it reduces film, developing chemicals, ink and cleaners/solvents waste associated with sending jobs to a film-based offset printer. 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 revisions to be made between runs.

Recycled consumables: Most of the consumables (toner cartridges, imaging units, etc.) that the MPCA'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 MPCA does a lot of informational displays and signage for events. The designers avoid the use of vinyl banner and signboard substrate (the most commonly used substrate in the industry), and instead use recyclable materials, such as paper or Tyvek, and post-consumer products such as Ecofab fabric. Staff also 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 paper jams.

Individual business cards are printed using a high-speed color copier in the service center. 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 his/her position or job title. This in-house option reduces the use of paper and saves the MPCA a significant amount of money.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – Our Reprographics Department participates in the Xerox Green Alliance Program to recycle used toner cartridges. Where possible, recycled paper products are used for copying and printing documents. Near each printing and copying station is a recycling center for spent paper products. Cardboard boxes are recycled through our local recycling center.

Dakota County Technical College, Rosemount – DCTC has upgraded all machinery and components to the most environmentally responsible available. We encourage two-sided copying whenever possible.

Minnesota State University, Moorhead – Campus Printing Services continues using vegetable-based inks and 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 also uses a safer plating chemistry and recycles its aluminum plates, litho film, and reclaimed silver. The student newspaper, which is printed off-campus, uses soy inks and is printed on 20 percent post-consumer paper.

North Hennepin Community College – Some of our copying is performed on departmental photocopy machines with recycling bins located nearby for copy errors disposal. Our Duplicating section runs most of the tests, quizzes, handouts, etc. needed on campus using larger photocopying machines that are more cost efficient. Whenever possible, copying error sheets are recycled as note pads. Large printing jobs are sent off-site to commercial vendors.

Northland Community and Technical College, East Grand Forks and Thief River Falls – A vendor specializing in remanufactured toner cartridges is utilized for purchase and recycling of toner cartridges. In the fall of 2007, NCTC implemented a print management system in an effort to reduce paper waste from excessive or unnecessary printing. The print management system provides students with a free quota of print pages with an option to purchase additional print page capabilities through a print vending station. As part of the print management system, employees are charged printing costs to their respective departmental budget. In addition, double-sided printing and copying is available and encouraged. The use of Astrobrite paper was discontinued during fiscal year 2008.

A recycling program exists for paper, cardboard, magazines, plastic, and aluminum. In fiscal year 2008, recycling containers were purchased at a cost of $7,000. Two work-study students are employed 10 hours per week for collection of recyclables.

St. Cloud State University, St. Cloud – 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 Transportation (Mn/DOT) – The Mn/DOT sign shop is using lead-free ink. The Mn/DOT sign shop also uses recycled signs.

University of Minnesota –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 use this process. The following initiatives have made Printing Services more environmentally responsible: 1) Installed an X Rite silver recovery machine that recovers silver from photo fixer. The department recovers 28 pounds of silver annually. 2) Installed a Devek system that allows recycling and reuse of developer in its film processing. The developer can be used four times instead of once as in the past. 3) Migrated some presswork to Xerox machines. Use of the toner process eliminates ink and press-wash wastes. 4) Metal press plates are collected and sold for scrap. 5) Wood pallets are sent back to paper companies for reuse. 6) Paper and cardboard are collected and recycled throughout operations. 7) 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) – 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. MMD's 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.

MMD has been proactive in 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. MMD has numerous contracts to encourage sustainability in state government daily activities. These contracts include:

- Hazardous waste management
- Hazardous spill emergency response
- Fluorescent and HID lamp recycling
- Waste paper sales
- Hazardous materials, used oil, filter, sorbent, and antifreeze management
- Hazardous materials, electronic and electronic component recycling and management

MMD continues to require state purchasers to code each purchase order line with the environmental code. This is a required field. This allows MMD to more effectively track environmental purchases made by the state. MMD, in cooperation with Environmentally Responsible Work Groups, developed environmental definitions

to code all items on purchase orders and contracts. MMD contract solicitation documents require responding vendors to code the goods and services they offer with the state's environmental codes. The codes are required when purchasers complete an order in MAPS. MMD contract release documents now show the environmental code for each item.

All MMD standard solicitation documents now require vendors to indicate if their products contain mercury. This information will allow MMD to work with customer agencies and ascertain whether future specifications should require mercury-free products or award preferences based on the level of 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, MMD 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. MMD has developed environmentally preferable goods and services contracts estimated in excess of $293 million per year. The list of contracts can be viewed at http://www.mmd.admin.state.mn.us/pdf/environ.pdf. MMD continually works with state agencies and environmental groups to discover mutually satisfactory solutions to increase environmentally responsible purchasing. MMD's 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 on-line 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. It 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.

MMD in the past year has entered into contracts for heavy equipment and construction equipment that have increased environmentally friendly characteristics such as recycled content in the equipment, emission friendly engines, or increased energy efficiency engines (Contract Releases T-631, T-632, and W-196). MMD has developed and awarded contracts for scanning of documents designed to help the state government move towards a less paper-based records management environment. MMD has a contract for Erosion Control Materials where several of the products are 100 percent plant-based material available to state agencies and city and local governments. RRP provides technical assistance regarding environmental purchasing.

Carpet and vinyl flooring: MMD, in conjunction with RECS and 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.

Refurbished furniture: MMD has furniture cleaning and reconfiguration contracts that include the following specifications: all fabric surfaces shall be vacuumed using high-efficiency particulate air filter (HEPA) filtration. HEPA vacuum must have efficiency rating of 99.97 percent of airborne particles 0.3 microns and larger. Fabric cleaning shall be done using a continuous flow recovery (CFR) machine with a minimum return of 90 percent of liquid applied to fabric surface. Responders were required to include Material Safety Data Sheets (MSDS) or a list of ingredients for each cleaner or paint they intend to use in the process.

Furniture: MMD has contracts for remanufactured Herman Miller and Steel Case system furniture that allows state agencies and CPV 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 and allows trade-ins of Herman Miller and Steel Case system products. MMD, through the Furniture Users Group, acts as a clearinghouse for systems furniture, notifying members of the availability of used

systems furniture, or other agencies' need for used systems furniture. This facilitation leads to increased reuse of on-hand furniture, reducing waste and development of environmentally responsible specifications.

MMD has specified in the General and Ergonomic Furniture Seating contract that the products on contract be recyclable, that the vendor accept product stewardship, and that the products can be remanufactured. MMD has contracts for systems furniture that require the vendor to meet the California Indoor Air Quality VOC emissions standards. The specifications also set minimum standards for post-consumer recycled content. Extra consideration for award was given to vendors based on daylight-optimized and acoustic-optimized configurations, those that do not use CFCs (chlorofluorocarbon) or HCFCs (hydro-chlorofluorocarbons) in their manufacture of plastic parts, those that have an established solid waste auditing program, and if they offer a take-back program at the end of their product's useful life.

MMD has furniture cleaning and reconfiguration contracts that include the following specifications: all fabric surfaces shall be vacuumed using high-efficiency particulate air filter (HEPA) filtration. Fabric cleaning shall be done using a continuous flow recovery (CFR) machine with a minimum return of 90 percent of liquid applied to fabric surface. Responders were required to include Material Safety Data Sheets (MSDS) or a list of ingredients for each cleaner or paint they intend to use in the process.

Composting: PMD composts yard waste whenever practical.

Department of Agriculture – Twenty-liter "nowpack" containers for methylene chloride are used 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. 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 reduce the amount of waste material place in local landfills.

Department of Corrections (DOC) – Facilities follow Minnesota Statute §16B.121 and 16B.122 along with Minnesota Executive Order 99-4 requirements via their purchasing departments.

MCF-Faribault – The facility removed six vehicles from service and purchased five E85 compliant vehicles.

MCF-Oak Park Heights – The facility's procurement process is a 90 percent paperless system, using an electronic signature program

Department of Employment and Economic Development (DEED) – As referenced in Part 2 of this report, employees involved with the purchasing of office equipment are encouraged through policy language to select energy-efficient, Energy Star rated items.

Metropolitan Airports Commission (MAC) – The MAC is committed to purchasing environmentally preferable products and services that contain fewer toxic materials, minimize waste, contain recycled content, and conserve energy and natural resources. The objective of the MAC's Environmental Purchasing Policy is to provide a foundation for effective, consistent, and complete consideration of all aspects of environmental purchasing practices. Specifically, the goal is to provide resources that can assist in procuring environmentally friendly products and services.

Minnesota Army National Guard – The MNARNG continues to replace old mattresses in barracks located across Camp Ripley. Old mattresses are recycled through Goodwill Industries in Duluth. Obsolete uniforms, tents, and other textiles are collected, then the textiles are recycled through the Defense Reutilization Marketing Service. It was estimated that nearly 100,000 pounds of textiles were recycled last year.

Minnesota Pollution Control Agency – Through its Environmentally Preferable Purchasing (EPP) program, the MPCA follows the Environmentally Preferable Purchasing Guide online at www.greenguardian.com/government/EPPG. The EPPG provides public entities with information on

environmentally preferable purchasing including laws, guidelines, tools, and resources. See *Part 4, item 9, Cleaning Supplies*, for information on the agency's procurement of green cleaning supplies.

The MPCA also purchases remanufactured toner cartridges, while recycling 875 pounds of laser printer toner cartridges in calendar year 2007. (See table under *Part 4 item 36, Other*). See *Part 4, item 22, Office Supplies* for amount of 100 percent and 30 percent post-consumer recycled-content paper purchased in FY 2008.

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. The MPCA strives to purchase recycled-content products wherever possible.

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 requires a commercial energy audit of the building and the implementation of cost-effective recommendations derived from the audit.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – Alexandria Technical College employs a continuous improvement process that promotes excellence in environmental management and stewardship towards energy efficiency when purchasing products. ATC strives to locate suitable environmentally friendly and energy-efficient products both for use internally and also for use by our contractor partners.

Dakota County Technical College, Rosemount – DCTC purchases from state-approved environmentally committed contractors whenever possible. We have purchased a Smart Car, produced in Hambach, France. Environmental management is a high priority in Hambach. For example, only water-soluble paints are used for the Smart's three basic colors—black, white, and yellow. Painting the tridion safety cell is done by the powder-coating process, removing the need for solvents. The body panels with molded-in color are fully recyclable. Smart is dedicated to protecting the environment with future-focused recycling and an environmental policy that makes a strong statement. The Smart Car is also classified as an ultra-low emission vehicle (ULEV) on account of its extremely low exhaust emissions. The catalytic converter is positioned close to the engine for a quick response. An electric pump blows fresh air into the exhaust port when the engine is cold to almost completely oxidize the carbon monoxide (CO) and hydrocarbons (HC) and render them harmless.

We have also purchased a Toyota Prius: CO_2 emission of Prius is 104 g/km, which is about 55 percent less than other cars of the same class equipped with emissions control devices. Toyota has also adopted a three way catalyst and VVT-i, as well as improving performances of the air-fuel ratio compensator, electric spark advancer, fuel evaporative emission control system, and other devices and systems, thereby proactively suppressing generation of emissions and enhancing the capacity to cleanup emissions. Emission standards of NOx is 0.010 g/km and hydrocarbons of the Prius is 0.020 g/km, which is about less than half those of the other cars of the same class equipped with emissions control devices.

Minnesota State University, Moorhead – As a state agency, MSUM has a procurement department in conjunction with the state of Minnesota Materials Management Division. We also use Central Stores, which is an expansion of state surplus services. The Physical Plant has centralized all of its chemicals and supplies, saving storage space and enabling staff to use improved products that are constantly coming onto the market. University personnel are 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 a need-only basis to reduce stock and storage time.

North Hennepin Community College – Several items of concern are considered when making purchasing decisions on this campus—the life expectance of the product, shelf life for chemicals, number of uses it can be put to, toxicity of chemical used in expendable product, versatility of the product, and any special disposal requirement that may be required.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC purchases items while taking life expectancy of the product, shelf life for chemicals, versatility of the product, and special disposal considerations that may be required into consideration. Employees are able to purchase

departmental office supplies through the bookstore, which has created less volume in storage. The Maintenance Department has centralized all chemicals and supplies creating less volume in storage and enables employees to use improved products that are constantly coming onto the market. NCTC employs a continuous improvement process that promotes excellence in environmental management and stewardship towards energy efficiency when purchasing products.

St. Cloud State University, St. Cloud – 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 Transportation (Mn/DOT) – Mn/DOT is constantly eliminating and/or reducing waste streams with a goal of finding new products and technologies that reduce toxicity and protect the environment. The department uses purchasing preferences to encourage use of products with recycled material content.

University of Minnesota – The university is pursuing LEED certification on the new 50,000-seat TCF Bank Stadium. When open in 2009, the stadium will join a growing number of LEED-certified buildings throughout the University of Minnesota system. The university will also pursue LEED certification on proposed Science Teaching and Student Services Building and on the new Bell Museum of Natural History. The university follows the state of Minnesota's Sustainable Building Guidelines, which adapt the LEED building policy to specific regional issues, resulting in the equivalent of a LEED Silver rating. The university's Sustainability and Energy Efficiency Policy requires sustainable design guidelines to be applied to all major new construction and renovation projects.

The University of Minnesota Facilities Management has developed construction standards, which include Sustainable Design Requirements and other concepts from the Minnesota Sustainable Design Guide (http://www.msdg.umn.edu). The university's current Standards and Procedures for Construction address Energy Conservation Elements: 1) Design objectives 1.1) 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. 1.2) The A/E 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. 1.3) 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. 1.4) The responsibility for choosing and incorporating energy-efficient strategies into the design remains that of the design team and the university. 1.5) Include the means to measure the results of the energy-efficient design strategies in all projects. 2) 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. 3) Mechanical systems 3.1) 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. 4) 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 day lighting for new buildings. 5) Evidence of compliance: The A/E 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 (CSBR) 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 & 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 and 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 (see http://www.sustainabledesignguide.umn.edu).

31. Remanufactured Parts

Department of Administration (Admin) – MMD specifies remanufactured automotive products. It has contracts for remanufactured automotive products for state agencies, including diesel engines, transmissions, alternators, and starters. FSSD division uses remanufactured parts for vehicle repair whenever available.

Department of Corrections – *MCF-Rush City* – Copier toner cartridges are returned to the vendor for reuse.

Metropolitan Airports Commission (MAC) – The MAC fleet/vehicle maintenance uses remanufactured starters, alternators, water pumps, calipers, turbo chargers and injectors, and relined brake shoes. Rebuildable cores are exchanged for newly remanufactured parts. Other parts are sent out for rebuilding/overhaul when it is a suitable alternative to new parts.

Minnesota Pollution Control Agency – Remanufactured toner cartridges are purchased for all St. Paul non-support staff black-and-white printers. HP cartridges are purchased for all regional office and St. Paul support staff black-and-white printers, and all agency color printers. OEM cartridges for leased copiers (multi-functional devices) are furnished by the vendor as part of the lease agreement. (Note: The MPCA does not buy remanufactured parts for printers, copiers, or faxes, only genuine parts and kits. Fax machine toner cartridges are purchased directly from the vendor leasing the machine.) Spent toner cartridges are collected and recycled by a St. Paul vendor. The MPCA's Brainerd office also uses remanufactured toner cartridges for its printers.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – The purchase and use of refurbished office furniture is encouraged. ATC coordinates office furniture purchases through contractors that offer this type of office furniture. Remanufactured parts are routinely used for the maintenance and repair of non-leased vehicles and equipment. Using remanufactured parts cost effectively prolongs the life of these units.

St. Cloud State University, St. Cloud – SCSU uses remanufactured photocopier cartridges.

Minnesota State University, Moorhead – MSUM currently uses remanufactured printer cartridges and Xerox copier dry ink and toner cartridges.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC currently uses remanufactured printer cartridges and copier ink and toner cartridges. Remanufactured telephone parts and telephones are used. The purchase and use of refurbished office furniture is also encouraged.

North Hennepin Community College – All departments of this college are encouraged to return fax machine ink cartridges to the manufacturer for reuse. Ink cartridges from our larger machines are sent in for re-inking/reuse by our Duplicating section.

Department of Transportation (Mn/DOT) – Mn/DOT purchases several remanufactured parts for vehicle parts replacements.

32. Tanks

Department of Commerce –The Minnesota Petrofund Program, housed at the Department of Commerce, provides reimbursement to help businesses and citizens clean up petroleum tank leaks.

Petrofund applications and funding							
	FY 01	**FY 02**	**FY 03**	**FY 04**	**FY 05**	**FY 06**	**FY 07**
Applications approved	1,630	1,204	1,699	1,575	1,541	1,267	1,043
Funding approved (millions)	$13.1	$10.6	$16.6	$14.6	$13.1	$12.3	$8.7

Department of Corrections – All tanks are currently reported under MPCA requirements and have spill containment as required.

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. The tanks are equipped with computerized leak detection and spill containment devices.

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. Fuel islands have been installed at MSP for all MAC vehicles and heavy equipment.

Minnesota State Colleges and Universities (MnSCU)

Dakota County Technical College, Rosemount – We have one underground 30,000-gallon tank. We have two aboveground fuel tanks that are double walled, spill contained, and are inspected by MPCA.

Itasca Community College, Itasca – There is one fuel tank located on this campus. A 10,000-gallon underground storage tank is used for #2 fuel oil for our boiler plant.

Minnesota State University, Moorhead – 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. The Physical Plant also maintains a 1,000-gallon gasoline tank, and a 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. MSUM currently has updated procedures in place and training provided to respond to spills, overfill, puncture, and other such emergencies.

North Hennepin Community College – There are two fuel tanks located on this campus. One is a 10,000-gallon underground storage tank containing #2 fuel oil for our boiler plant, and the other is a 285-gallon aboveground diesel fuel tank for our lawn equipment. The monitoring and secondary containment equipment on these tanks are checked frequently to ensure leaks, spills, or contamination does not occur. An emergency response plan is maintained on site for any future contingency.

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC does not have any underground or aboveground tanks.

St. Cloud State University, St. Cloud – New storage tanks with underground monitors were installed for our campus boilers.

Department of Transportation (Mn/DOT) – Many Mn/DOT districts use salt brine tanks to produce and store salt brine. Currently, salt brine production systems are of double-walled fiberglass construction. Fiberglass is resistant to degradation from salt. These systems lessen the probability of a release to the environment. Mn/DOT fueling systems are comprised 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.

Mn/DOT developed a compliance program that includes information that should increase the likelihood that that tank system equipment is properly maintained. Equipment inspection and maintenance are necessary to ensure that pollution prevention equipment installed with these storage tank systems continue to function properly.

University of Minnesota – The university has reviewed and updated its Spill Prevention Control and Countermeasures (SPCC) plan (see http://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 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. 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. The first is to prevent oil spills. Operating procedures, such as inspections, recordkeeping, security, personnel training, and tank specifications, address this goal (40 CFR Section 112.7(e)). The second goal is to 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. The third goal of the SPCC plan is to prepare for responding to an oil spill. Facilities who 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) – RRP provides waste reduction and recycling technical support to government agencies, which includes referrals to Minnesota Technical Assistance Program.

Department of Corrections –ReTAP has conducted an assessment at MCF-Stillwater and provided many recommendations for the reduction of water and energy consumption. In addition, the department will contact MnTAP to determine the feasibility of participating in its summer internship program during 2008.

> *MCF – Red Wing* – Lead Electrician and Physical Plant Administrative Assistant attended Xcel Energy Annual Energy Conservation conference.

Metropolitan Airports Commission (MAC) – The Environment Department provides technical support to all MAC offices/divisions, as well as airport tenants and surrounding communities. The MAC provides this assistance through phone calls, acting as a regulatory liaison, informational meetings, and providing resources.

Metropolitan Council Environmental Services (MCES) – As a regulatory agency, MCES is active in P2 technical support through the Industrial Waste and Pollution Prevention Section (IWPPS). This section continues to promote P2 to its almost 800 permitted industrial users. During on-site inspections, IWPPS staff regularly discusses P2 issues and point out process areas where P2 would result in waste reduction. Although MCES collects fees based on volumes and characteristics of wastewater through its Strength Charge and Service Availability Charge, 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 P2 concerns. Work on mercury reduction continues with the Minnesota Dental Association in the amalgam recovery program (see detailed discussion in *Section 16, Heavy Metals*).

The IWPPS has participated in national, regional, and local P2 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 and Waste Environmental Conference and the MPCA Wastewater Operators' Seminar. The section participates in the Great Lakes Regional Pollution Prevention Roundtable through its web site.

An intranet site is in place for the Environmental Quality Assurance Department (EQAD) within MCES, which includes P2 Pages to promote P2 and encourage new ideas. The publicly accessible Internet site for viewing this pollution prevention information can be found at www.metrocouncil.org/environment/PollutionPrevention/. Additional information, including an on-line version of the Waste Discharge Rules and a table of user rates and fees can be found at www.metro.council.org/environment/IndustrialWaste/.

Minnesota Army National Guard – In the event of an environmental emergency at Camp Ripley or outstate, phone call procedures are established to address the emergency. All facilities have been provided a 1-800 number that will put them in contact with the appropriate entity within the MNARNG that can address the emergency. There is also an established environmental and P2 intranet and Internet web page for sharing information throughout the organization.

Minnesota Pollution Control Agency (MPCA) – The MPCA is intentionally not reporting anything under this heading because this topic is discussed in the agency's *P2 Evaluation Report*, available at www.pca.state.mn.us/oea/p2/p2evaluation.cfm.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – Technical support is provided through OSHA, RECRA, MPCA, University of Minnesota, and private consultants.

Itasca Community College, Itasca – Often our first contact for technical support is our contracted specialist, McNeil Environmental Services, employed by this college in a consultant capacity on environmental and other safety issues.

Minnesota State University, Moorhead – 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 process. The Sustainable Campus Initiative Committee completed a campus-wide environmental assessment through the National Wildlife Federation's Campus Ecology Program. Staff from the Minnesota Technical Assistance Program and the city of Moorhead's wastewater treatment plant assisted in a phosphorus audit of campus cleaning supplies in order to reduce use and suggest alternative products.

North Hennepin Community College – Often our first contact for technical support is our contracted specialist, McNeil Environmental Services, employed by this college in a consultant capacity on environmental and other safety issues.

Northland Community and Technical College, East Grand Forks and Thief River Falls – Necessary technical support is provided through OSHA, RECRA, MPCA, and private consultants.

St. Cloud State University, St. Cloud – St. Cloud State University has 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 substantially reduced 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 department's functions. Mn/DOT has developed a waste management procedure manual. This manual 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 web site 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 to minimize risk to the environment. The manual is available on the Mn/DOT web site at www.dot.state.us/environment.html by accessing *publication* and selecting *Asbestos and Regulated Waste Material Manual for Building Demolition or Relocations for Construction Projects.*

Mn/DOT is dedicated to the study, coordination, and evaluation of pollution prevention opportunities, as they relate to reduction of toxics within the department. 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, economic, and/or regulatory standpoint. Mn/DOT has formulized this Hazard Evaluation Process by issuing a technical memorandum (Mn/DOT contact: Robert Edstrom). Mn/DOT conducts workshops to assist staff in complying with federal and state environmental regulations. Mn/DOT provides on-going guidance for local communities interested in designing and/or improving bicycling, walking and telecommuting programs or initiatives. (Mn/DOT Contact: Jarvis Keys, Darryl Anderson).

University of Minnesota – The Regional Sustainable Development Partnerships unite citizens and their university working together to strengthen rural Minnesota (http://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 and as citizens committed 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. The sustainability principles are embodied in the Sustainability Policy adopted by the Board of Regents in June 2004. Several university units are involved in the Sustainable U effort, a common identity for partner organizations such as the Minnesota Institute for Sustainable Agriculture and the Institute for Social, Economic and Environmental Sustainability (ISEES). Five core goals shape the work of the Regional Partnerships, and form the basis on which we evaluate our effectiveness.

- Establish partnerships between the University of Minnesota and Minnesotans in a community- and citizen-driven process for identifying and addressing local, regional, and statewide agricultural, natural resources, tourism, environmental, societal, and economic issues.
- Employ a systems perspective on interactive environmental, societal, and economic issues when possible.
- Direct research, education, and outreach resources of the University of Minnesota to meet agreed-upon local, regional, and statewide needs.

- Increase community input and access to, involvement in, and the utilization of, the research, education, and outreach capacity of the University of Minnesota.
- Preserve and strengthen agricultural and natural resources systems for the benefit and worth of the citizenry while enhancing environmental quality and nurturing rural communities. -

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.

The University of Minnesota Center for Sustainable Building Research (CSBR), (http://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. 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 state of 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 (http://cfc.cfans.umn.edu/index.html), 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 forestlands 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: 1) monitoring the response of forest ecosystems to activities such as planting, thinning, harvesting, prescribed burning, genetic tree improvement, vegetation management, and natural disturbances; 2) establishing and evaluating long-term ecological studies to assess the dynamics of change and to understand natural processes; 3) developing and applying forest genetic resource management techniques, including gene conservation, selection, breeding, and

deployment; 4) characterizing the hydrometeorological characteristics of watersheds on and near the Cloquet forest; 5) evaluating residential construction products and techniques in cold climate conditions; 6) expanding wilderness research capabilities in collaboration with the Wilderness Research Center; 7) using the center's data bases for development of multiple resource management models; and 8) 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) – MMD has contracts for tire recovery and for retread tires utilizing old tire casings. PMD, Mn/DOT, and other state agencies may purchase from these contracts. The state and Cooperative Purchasing Venture members purchased in excess of $660,000 in retread tires in FY 2008. MMD'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.

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 they are picked up by a recycle vendor from there. Batteries that cannot be recharged are transported to the Virginia area regional landfill where they are recycled by Arrowhead Battery of Buhl.

Metropolitan Airports Commission (MAC) – High mileage tires provide the most economical service for 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 on the airport's paved surfaces are reused in off-road (agricultural) applications. All vehicle and heavy equipment tires are transported to and recycled by a permitted vendor when no longer useable.

Minnesota Army National Guard – The JFMN (Army) recycled 33,000 pounds of tires through the Defense Reutilization Marketing System.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College, Alexandria – All tires are recycled through a local vendor at a cost to ATC.

Anoka Technical College, Anoka – All tires are recycled by local vendors through our Physical Plant.

Dakota County Technical College, Rosemount – We recycle all used tires.

Itasca Community College, Itasca – All used tires are replaced and recycled at an off-campus vendor.

Minnesota State University, Moorhead – All used tires are replaced and recycled at an off-campus vendor.

North Hennepin Community College – Old tires are turned in for recycling at time of new tire purchase. All other tires are recycled through local vendors.

Northland Community and Technical College, East Grand Forks and Thief River Falls – Used tires are replaced and recycled by a private vendor.

St. Cloud State University, St. Cloud – About 357 tires are recycled each year at SCSU at a cost of about $1.25 each. Tires are ground up and become components in other products.

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 does re-cap a small percentage of waste tires for reuse. However, due to the conditions under which Mn/DOT vehicles are operated (i.e., plowing snow) only a limited number of re-capped tires can be safely used.

35. Water Treatment and Conservation

Department of Administration (Admin) – PMD rebuilds parking lots and structures to meet water division guidelines. MMD 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

MCF-Shakopee – In FY 2008, two old, inefficient water heaters were replaced with a one MBTU water heater that was 96 percent efficient. The savings are estimated to be approximately $500 per month and new Energy-Star rated appliances were purchased for the living units, including two refrigerators, five ice machines, and 12 washers. In addition, 12 dryers were also added. (Dryers are not Energy-Star rated.) A can compactor was purchased for Food Services. During the construction period of the Monahan Building, two acres of land were not watered during the summer since the in-ground sprinkler heads were removed to allow for site preparation, etc. The irrigation did not run all summer after three zones were cut and capped. Also, 25 trees were planted around the new addition.

MCF-Rush City – The facility is equipped with a computerized water control system for all showers, sinks, and toilets. Ultra-low flush toilets are used with flood control devices that prevent flooding of toilets. A salt reclaimer has been installed to increase efficiency of the water softening system and is saving the facility 30 percent on salt used or 79,000 pounds per year.

MCF-LL has installed a new chemical feed system to minimize chemical use and ensure better control of water treatment.

MCF-Willow River/Moose Lake – Installed Energy Star clothes washers at the new CIP building.

Metropolitan Airports Commission (MAC) – The Clean Water Act uses the National Pollutant Discharge Elimination System (NPDES) permit program to control water quality by regulating point source discharges to navigable waters of the state of Minnesota. Water conservation efforts reduce demand on freshwater supply wells and distribution systems. Water conservation also contributes to habitat protection, relieves pressure on local wastewater treatment facilities, reduces energy consumption for water heating and cooling, and protects the natural state of watersheds. The MAC has:

- Implemented construction best management practices.
- Established an MSP Airfield and Aircraft Deicing Program.
- Developed Stormwater Pollution Prevention Plans.
- Obtained and maintains construction stormwater discharge permits.
- Constructed stormwater retention ponds.
- Installed oil/water separators at fueling load racks.
- Developed a comprehensive well monitoring network.
- Implemented an airport-wide integrated spill plan.
- Constructed greenways and grass areas between runways and taxiways.
- Installed low-flow and automatic restroom facilities throughout MSP.
- Installed hydropower self-generating faucets (use no electricity).
- Implemented gray water recycling in the truck/equipment wash bay.
- Removed cooling water wells.

Metropolitan Council Environmental Services (MCES) – MCES is the division of the Metropolitan Council that treats wastewater. The system collects and has the capacity to treat 358 million gallons of wastewater per day from 104 communities and 2.4 million people. 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 $117 million with an additional capital improvement program of $188

million. Clean effluent is discharged to four area rivers—the Mississippi, Minnesota, St. Croix, or Vermillion. From the metro plant alone, over 66.3 *billion* gallons of treated wastewater were discharged to the Mississippi last year. P2 affecting the quality of effluent was described in the section on heavy metals.

One area that clearly falls under P2 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 either multiple-hearth furnaces or fluidized bed reactors 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 (CSBUD) program. All ashes are presently being landfilled.

Biosolids from the Empire WWTP in Farmington—without any blended components—are typically landspread on farm fields. In 2007, 1,484 dry tons and 10,631 wet tons were landspread. A total of 11,468 tons of heat-dried biosolid pellets from Blue Lake WWTP in Shakopee was produced for land application in 2007.

In August 2007, MCES released a significant report:"*Recycling Treated Municipal Wastewater for Industrial Use*" addresses the conservation of the state's water supply and identifies recycled wastewater as an emerging non-potable water supply that is viable for some industries. The report shows the location of major industries in the proximity of wastewater treatment plants that could supply treated effluent. Areas of inquiry include economic feasibility, regulatory requirements, liability, reliability, and risks. The report can be accessed by searching the council's web site, www.metrocouncil.org .

Minnesota Army National Guard (MNARG) –There is a wastewater treatment plant operated by MNARNG personnel that services all of the Camp Ripley sanitary sewer waste.

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)

Alexandria Technical College, Alexandria – Alexandria Technical College has installed automatic flushing units on low-consumption toilets and urinals, and low-flow faucets. Our campus provides a reverse osmosis water source for its employees in the staff lounge. Wastewater is treated through our municipal water treatment plant.

Anoka Technical College, Anoka – We do not at this time have a water treatment system in place. We do irrigation based on the city and county regulations.

Dakota County Technical College, Rosemount – A 2008-2009 construction upgrade, Phase 1 calls for replacing cooling system, pumps and feed water system to eliminate environmentally unfriendly chemicals.

East Grand Forks Campus – A reverse osmosis water source is utilized for science labs.

Itasca Community College, Itasca – Plumbing fixtures and supplies with lower gallon per minute ratings are used at this facility whenever possible, depending upon the application requirements.

Minnesota State University, Moorhead – A computer-managed watering system is used on the athletic fields, 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 retention pond and underground drainage system 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 and ultimately into the Red River of the North.

North Hennepin Community College – Plumbing fixtures and supplies with lower gallon per minute ratings are used at this facility whenever possible, depending upon the application requirements. Chemically

treated water systems like our boiler water, and cooling tower chemical treatment systems, as well as closed loop heating and cooling systems for this college are properly isolated from potable water supply by approved anti-siphon devices (RPZ).

Northland Community and Technical College, East Grand Forks and Thief River Falls – NCTC has installed automatic flushing units on low-consumption toilets and urinals and low-flow faucets.

St. Cloud State University, St. Cloud – Progress continued on replacing systems to reduce water use.

Department of Transportation (Mn/DOT) – Mn/DOT uses low-water consumption toilets, urinals, and sinks that use one third of the water compared to traditional fixtures, 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 expenditures.

University of Minnesota – The Water Resources Center (WRC) (http://wrc.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 MMD in conjunction with the MPCA 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 MMD has developed contracts for using the waste food from the correctional facilities, State Capitol Complex cafeterias, and the St. Paul Public Schools for feed for farm animals, thereby reducing the amount of solid waste going into landfills.

The MMD helped the MPCA implement the *Get the Mercury Out Now!* Program. This effort aims to remove elemental (liquid) mercury and mercury-containing equipment from Minnesota's public and private middle schools, and junior and senior high schools. MMD solicited quotes from the current state of Minnesota contractors for hazardous waste management service and contracted with two of the current hazardous waste management contractors to execute the program. *Get the Mercury Out Now!* gives each of the schools the opportunity to get rid of its elemental mercury and mercury-containing equipment and to have the equipment replaced with a limited amount of mercury-free equipment at no cost to the school.

MMD established contracts for plastic bags that had the following requirements: bags do not contain lead, will be nontoxic when incinerated, when disposed of in a landfill or disposed of in composting and whenever possible, to be made with post-consumer recycled content. Consideration during the award was also given to the percentage of post consumer recycled paper in the package that contains the bags.

Refrigerants: PMD recovers and recycles all refrigerants. MMD's refrigerants contract offers environmentally friendly alternatives to Freon.

Compost: PMD composts yard waste whenever practical.

Department of Corrections (DOC) – 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. Multiple established a Green Committee in FY 2008 to improve recycling efforts and increase staff awareness.

MCF-Rush City –Four living unit buildings, Food Service Area and Education have removed paper towels and replaced with hand dryers. Additionally, multiple recordkeeping and audit forms that had been completed using paper have now been switched to electronic formats. In addition, a grease recycling process has been implemented that reduces the amount of treatment required for the waste stream.

Iron Range Resources and Rehabilitation Agency (IRRR) – Aluminum cans at all agency facilities are collected and brought to various recycle locations. In addition, the following items were recycled:

- 1,200 pounds of cardboard
- 3,360 pounds of paper
- 1,600 pounds. of shredded paper

Internet technology equipment recycled FY 2008 through Asset Recovery:

- 300 pounds. of PCs
- 873 pounds. of miscellaneous electronics (printers, phones, faxes, etc.)
- 1,596 pounds. of monitors

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 airborne 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 bio-filter. The bio-filter 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 bio-filter reduces the need for 100 gallons of caustic and 100 gallons of bleach every day. Operating costs of the bio-filter 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 bio-filter operation.

Minnesota Army National Guard (MNARG) – The JFMN (Army) has established a “recycling” account that is used to fund P2 and other environmental projects. Money is generated from the sale of recyclable materials and from an account established with the Defense Financial Accounting Service (DFAS-IN). The DFAS-IN markets excess hazardous materials received from JFMN (Army) facilities, and if the materials are purchased, DFAS-IN returns a portion of the money to the recycle account. The Environmental Quality Control Committee , which is made up of senior MNARNG staff, has control of these funds. Funds were used to purchase a new recycle truck for Camp Ripley.

Minnesota Pollution Control Agency – The Alliance for Recycling and Reduction of Waste (ARROW) committee at MPCA promotes waste reduction, recycling, and sustainability within the agency. ARROW has coordinated composting efforts at the agency since 1999 and has implemented recycling programs for hard-to-recycle materials such as batteries, computer disks, transparencies, and video tapes. ARROW also coordinates an e-bulletin board for reuse and two annual “treasure table” events that promote the reuse and free exchange of unwanted items.

Source reduction was identified by the Climate Change Advisory Group as one of the more cost-effective greenhouse gas emission reduction strategies. MPCA staff already use half the typical amount of paper used per person in a commercial office building, but we are attempting to reduce at least another 10 percent, through

printing reduction software, capture and reuse of "second chance" paper, and increasing availability and distribution of documents and invoicing through e-commerce, rather than paper copies. Our FY 2008 baseline is 14,141 reams of paper. MPCA audio, video, and digital tapes, and computer discs are reused. The MPCA/DNR cafeteria supplies compostable dishware and flatware. Staff on several floors in the MPCA building use washable linens in the kitchen and restrooms and environmentally preferable cleaning products (Restore brand) in the kitchen and in refillable spray bottles throughout the office. MPCA's St. Paul office uses reusable visitor badges which waste less paper, provide improved security, are easily distinguishable, and do not damage clothing. MPCA strives to provide information for internal and external customers electronically to reduce paper use, including putting some annual reports on its website. Efforts continue to reuse existing supplies through its central MPCA supply center.

The Alliance for Recycling and Reduction of Waste committee at MPCA also encourages staff to make one-sided paper pads with experienced paper. All offices are set up to reuse mailing envelopes and boxes, and to collect one-sided used paper to use for copies that stay in the office. ARROW implemented an environmentally preferable purchasing plan that 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 a reference list for all individuals who order office and cleaning supplies.

Composting and recycling: For calendar year 2007, ARROW helped the agency recycle or compost over 69 percent of what was discarded at the MPCA. Several ARROW-led internal education campaigns promoted increased recycling and paper reduction over the past two years. ARROW also advocates for energy-efficiency initiatives, and promotes transportation alternatives and hiring agency staff dedicated to promoting sustainability..

MPCA recycling and composting results (in pounds for calendar year)

Items recycled or composted	2002	2003	2004	2005	2006	2007
White and pastel office paper*	81,003	96,374	99,350	73,713	95,466	82,021
Mixed paper	N/A*	N/A	N/A	N/A	N/A	N/A
Corrugated cardboard	8,696	11,891	10,722	7,799	10,114	12,314
Cans, glass, plastic	5,427	5,163	4,333	2,974	3,804	4,178
Compostable organics	16,640	18,400	24,000	24,000	20,840	25,020**
Laser printer toner cartridges	1,013	1,090	1,050	965	1,040	875
Typing ribbons/cartridges	N/A	N/A	N/A	N/A	N/A	N/A
Metal (mostly from recycled	14,534	34,105	15,109	18,816	16,363	600
Batteries (auto and appliance)	29	600	45	51	84	681
Fluorescent lights	375	570	387	0	450	560.5
Reusables (including office supplies, calendars/pictures and paper bags)	1,459	0	0	0	0	600
Other plastics(Tyvek, transparencies)	143	137	73	88	90	74.5
Techno trash	N/A	N/A	N/A	N/A	N/A	1,142
Other recyclables/ reusable (not included in total)	0	0	0	0	0	600
Total recyclables/reusables	129,319	168,330	155,069	128,406	148,251	126,924
Trash	35,725	40,370	64,350	50,000	62,500	55,960
Trash + reusables recyclables	165,044	208,700	219,419	178,406	210,751	182,884
MPCA recycling rate	78.35%	80.66%	70.67%	71.97%	70.34%	69.40%

*From 2002 forward, the Mixed and Office Paper are reported together.
**Veolia reported 55,960 pounds of compost in 2007 and 25,020 pounds of trash. These numbers are not consistent with historic numbers and as such, it is believed the hauler juxtaposed them during reporting.

Closed landfills: Over 26 million pounds of methane were collected and destroyed at 21 sites in FY 2008 and energy production from methane gas is occurring or engineered at two sites. Solar panels are used to power a flare to destroy methane at one site. Native plantings are specified for selected areas of closed landfill

construction sites, and at one site, MPCA is managing a native oak savanna. Compost was used as a cover component at three sites, and recycled-content educational signage and benches were used at the Pickett Landfill, which is on the Heartland Trail.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead – **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 of the North. 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.

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, continues to be further developed and updated by students. Physical Plant staff attends stormwater pollution prevention training sessions. In cooperation with the Sustainable Campus Intiative 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 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, warning the general community 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 to remove 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 of alternative products, primarily pesticides and herbicides, continues to be investigated to minimize contaminated stormwater. MSUM primarily uses 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 reused. Hazardous material storage areas are inspected on a regular basis. Hazardous material storage areas are enclosed, use 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 is in place that reminds drivers of both fleet and service vehicles to regularly inspect their vehicles and report any maintenance concerns to the Physical Plant.

Northland Community and Technical College, East Grand Forks and Thief River Falls – Hazardous material storage areas are inspected on a regular basis. Hazardous material storage areas are enclosed, use spill prevention, and are provided with secondary containment systems and spill response.

East Grand Forks campus: A stormwater pollution prevention program (SWPPP) has been developed in order to minimize the harmful effects of stormwater runoff and its potential to affect the water quality of the Red River of the North. The SWPPP includes public outreach, education, and involvement; controlling illicit discharges; maintaining clean construction sites; and pollution prevention and good housekeeping measures. LHB Incorporated was contracted to assist in the development of the stormwater plan. Students helped post stormwater informational pamphlets, brochures, and other educational materials at several

public locations throughout the campus. Brochures were created specific to the college's stormwater program so community members can report concerns of potential stormwater pollution.

St. Cloud State University, St. Cloud – SCSU continues 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 (Mn/DOT contact: Robert Edstrom). 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 that can be associated with some treated wood products (Mn/DOT contact: Mark Vogel).

Mn/DOT is constructing salt sheds made of recyclable materials, eliminating the disposal and chemical leaching concerns that can be associated with some treated wood products (Mn/DOT contacts: Glenn Heapy, Ron Lagerquist). Mn/DOT recycles approximately 1.5 million tons of asphalt and 2 million tons of concrete annually (Mn/DOT contact: Linda Taylor).

Mn/DOT developed a procedure to address all abandoned containers found in Mn/DOT right-of-way. The procedure is safe, practical, and cost effective. Much of the material recovered in the right-of-way is recycled by Mn/DOT (Mn/DOT contact: Mark Vogel). Mn/DOT is a strong advocate of electronic communication using e-mail and teleconferencing, which results in energy and product savings (Mn/DOT contact: Mark Vogel).

Mn/DOT's Office of Transit is launching a statewide public information service called Arrive MN during the third week of September 2007. The launch unveils a web site and uses three awareness-building events to showcase Arrive MN that will provide a single point of reference for travel throughout the state. This information service will feature a number of transportation options that include public transit, bicycling, and car and van pooling that can have a positive impact on pollution reduction (Mn/DOT contacts: Jarvis Keys and Sarah Lenz.)

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 worked 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 a municipal separate storm sewer system permit application for the Twin Cities campus (www.dehs.umn.edu/envircomp_swm.htm) 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.

Commission on Environmental Science and Policy: The University of Minnesota's Commission on Environmental Science and Policy has completed its work and submitted a report to Executive Vice President and Provost Robert Bruininks. The report is intended as a starting point for ongoing discussions about the university's efforts in environmental teaching, research, and outreach. You're invited to read the report and recommendations, as well as the commission's cover letter that identifies reasons why the report is important and some immediate steps the university should take. After reviewing these materials, your feedback is encouraged.

The Commission on Environmental Science and Policy was created by then 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. 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. The ideal is if we can find ways to manage farm operations in a

way that doesn't affect yield but does that improve water quality. Nitrogen is also the major contributing factor to the spread of hypoxia, oxygen depletion, in nation's waters. Hypoxia occurs in the Gulf of Mexico, at the mouth of the Mississippi River, where aquatic life is severely compromised because of chemical runoff.

Organic waste collection: After attempts to recover organic materials from the trash, such as small animal bedding in 1990 and food wastes for feeding pigs in 1995, the Recycling Program successfully began the collection of food waste for composting from residential hall kitchens and on-campus dining locations as well as animal bedding from Research Animal Resources in August of 2007. In September 2007, UDS implemented a pilot program, in partnership with U of M Waste Management and Hennepin County, to recycle compostable kitchen and dining room waste on campus. Eco-friendly waste, such as food scraps, napkins, paper, cardboard materials, and biodegradable packaging, is collected in compostable trash bags and taken to the university's composting site on the St. Paul campus. Composting reduces the amount of waste sent to incinerators and creates a beneficial product used to restore soil structure and reduce air and water pollution. In fall 2007, UDS collected over 78 tons of compost from participating kitchen and dining facilities. The four phases of the organics recycling program:

- Phase 1: Implement organics recycling in all residence halls as well as the student unions. This effort has led to the collection 4,000 pounds per day of food waste. In addition, the collection of small animal bedding and organic waste is sent to the St. Paul campus where anaerobic and tissue digesters convert the waste into useful byproducts such as methane gas as a fuel source.
- Phase 2: Implement organics recycling, to include retail food service waste, such as disposable dinning ware, compostable single use plates, cups and utensils, in all food service areas on campus and eventually in the concessions area within the new TCF football stadium.
- Phase 3: Extend organics recycling to all buildings on campus. This involves placing containers in all restrooms to catch all organic waste in the buildings—including paper toweling, any food waste, and compostable food containers. Summer of 2008, four pilot programs are in full swing. Pattee Hall, Morrill Hall, Hanson Hall, and Rapson Hall have their organic waste from the entire building, or a specific area, picked up on a daily basis by Team Recycle. Buckets have been labeled and placed in kitchen and break areas to collect napkins, food waste, and paper toweling. We hope to be able to turn the program over to custodians in the near future.
- Phase 4: Extend the organics recycling Program to area businesses and restaurants. This would prevent the on campus recycling from becoming contaminated, as well as increasing the waste recovery rate.

Part 5

Matrix of Agencies and Categories

Activity type	Department of Administration	Department of Agriculture	Department of Commerce	Department of Corrections	Iron Range Resources & Rehabilitation	Metropolitan Airports Commission	Met Council– Environmental Services	Metropolitan Mosquito Control	Minnesota Army National Guard	Minnesota Pollution Control Agency	Department of Transportation	University of Minnesota	Department of Employ & Econ Dev. No Matrix	Department of Revenue	MN State Colleges and Universities
Absorbents	FY/08			FY/08 O/P	O	O	O/Q		O		O	O			O
Adhesives	FY/08								O						O
Air quality, CFCs	FY/08	O		FY/08 O/P		O	O		O		O	O			O
Antifreeze	FY/08			FY/08 O/P	O	O	O		O/Q		O	O			O
Audits	FY/08			FY/08 O/P		O	O		O/Q		O	O			O
Auto fuels	FY/08	O	FY/ 08 O/P/Q	FY/08O/ P/Q	O	FY/08 O/P/Q	O	FY/08 O	O/Q	FY/08 O	O	FY/08 O	P		O/Q
Auto maintenance	FY/08		FY/ 08 O/P	FY/08 O/P	O	FY/08 O/P/Q	O	O	O		O	O			O/Q
Batteries	FY/08		FY/ 08 O	FY/08 0/P	O	O	O/Q		O/Q	O/Q	O	O			O/Q
Cleaning supplies	FY/08	O		FY/08 O/P/Q	O		O		O	O	O	O/P			O/Q
Commuting & transportation	FY/08		FY/ 08 O/Q	FY/08 O/P	O		O/Q		O	O/Q	O	FY/08 O/P	FY/08	FY/08 O/P	O/Q
Education, comm. & training	FY/08	O		FY/08 O/P		O	O	O	O	O/P	O	FY/08 O/P			O
Electronics	FY/08		FY/ 08 O	FY/08 O/P	FY/08 Q	O	O		O	O/Q	O	O	P	FY/08 O/P	O/Q
Energy– lighting	FY/08			FY/08 O/P	FY/08 Q	O	O/Q		O	O/Q	O	O		FY/08 O/P/Q	O/Q
Energy – production	FY/08			FY/08 O/P			O/Q			O/Q	O	FY/08 O/P/Q			O/Q
Groundwater wells	FY/08			FY/08 O/P			O		O						O
Heavy metals	FY/08	O		FY/08 O/P			O/Q		O	O	O	O			O/Q
HVAC, indoor air quality	FY/08			FY/08 O/P	O	O/P			O	O	O	FY/08 O/P			O/P
Ice control, sanding	FY/08			FY/08 O/P	O	O			O	O	O	O			O/Q
Laboratory	FY/08	O	FY/ 08 O	FY/08 O/P			O			O	O	O			O/Q
Landscaping	FY/08			FY/08 O/P	O					O		FY/08 O/P			O/P
Materials exchange	FY/08			FY/08 O/P		O	O			O	O	O			O
Office supplies	FY/08 Q	O/Q	FY/ 08 O	FY/08 O/P/Q	FY/08 Q	FY/08 O/P/Q	O/Q	O/Q	O/Q	O/Q	O/Q	O/Q	Q	Q	O

Activity type	Department of Administration	Department of Agriculture	Department of Commerce	Department of Corrections	Iron Range Resources & Rehabilitation	Metropolitan Airports Commission	Met Council–Environmental Services	Metropolitan Mosquito Control	Minnesota Army National Guard	Minnesota Pollution Control Agency	Department of Transportation	University of Minnesota	Department of Employ & Econ Dev. No Matrix	Department of Revenue	MN State Colleges and Universities
Oil, oil filters	FY/08				O	O	O/Q		O/Q		O	O			O
Paints, coating, stripping	FY/08			FY/08 O/P		O	O		O/Q	O	O	O			O
Parts cleaning	FY/08				O	O	O/Q		O			O			O
Personal care	FY/08										O				O
Pesticides, fertilizers	FY/08	O		FY/08 O/P					O		O	O			O
Policy statement	FY/08	O	FY/ 08 O	FY/08 O/P	O	O	O		O	O	O	O	FY/08		FY/08 O
Printing	FY/08		FY/ 08 O/P/Q					FY/08	O	O	O	O	FY/08		FY/08 O
Procurement	FY/08	O		FY/08 O/P	O	O	O		O	O	O	O		FY/08 O/P	FY/08 O
Remanufactured parts	FY/08				O	O				O	O				FY/08 O
Tanks	FY/08		FY/ 08 O	FY/08 O/P	O	O	O		O		O	O			O
Technical support	FY/08			FY/08 O/P	O	O	O		O	O	O				FY/08 O
Tires	FY/08			FY/08 O/P	O	O	O		O/Q		O	O			O
Water treatment	FY/08			FY/08 O/P		O	O/Q		O	O	O	O			FY/08 O
Other	FY/08			FY/08 O/P			O			O/Q	O	O			

FY08 = fiscal year 2008 O = ongoing P = planned Q = quantifiable data available