

# FY 2006

# Resource Conservation Plan



Montgomery County Public Schools

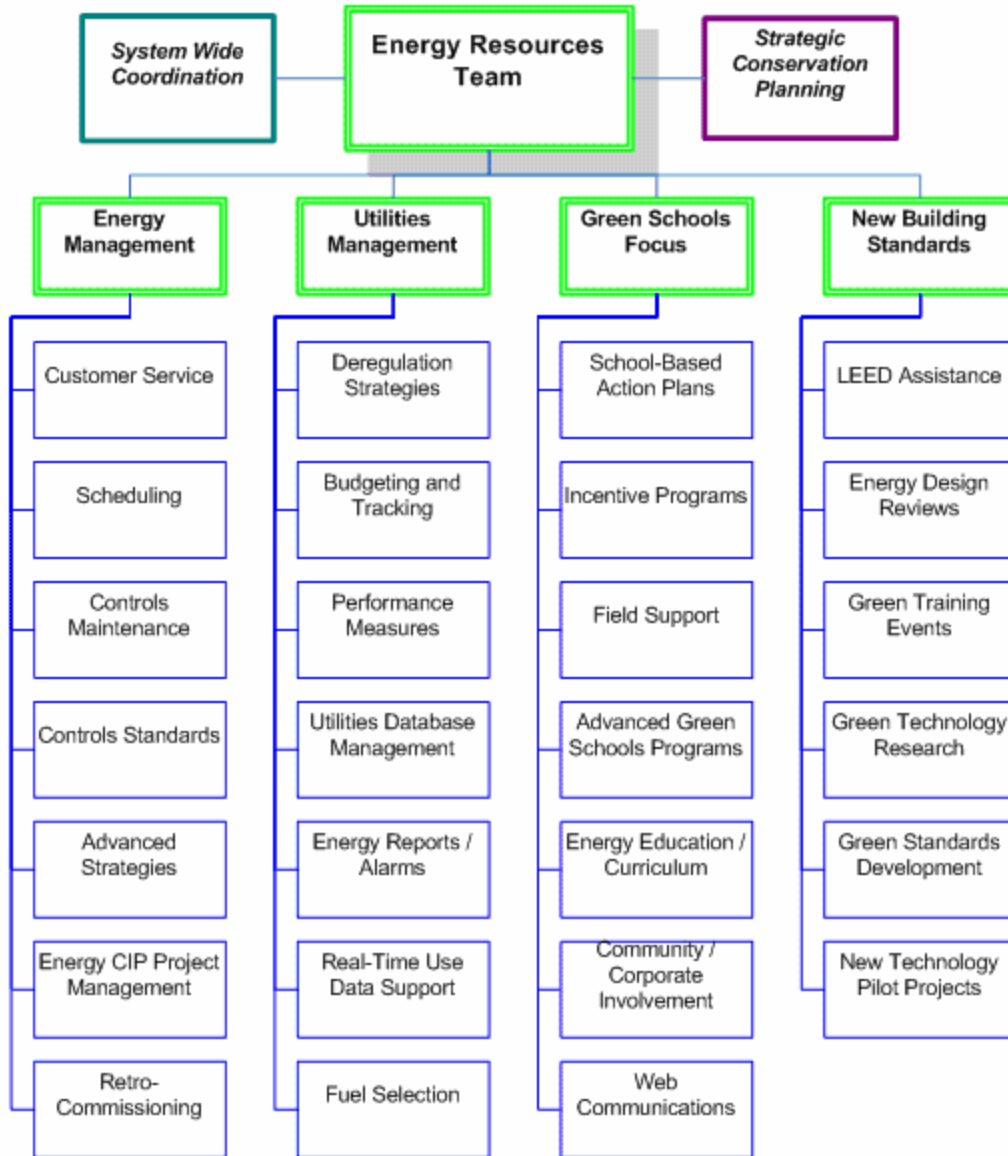
**Maryland**

Department of Facilities Management

November, 2004

# Summary

Montgomery County Public Schools maintains a comprehensive program of resource conservation and management for its facilities. The following chart summarizes the program elements in place:



For additional information on these program initiatives, please visit our website at: [www.greenschoolsfocus.org](http://www.greenschoolsfocus.org)

The MCPS **Resource Conservation Plan** follows a standardized reporting format suggested by the Montgomery County Department of Environmental Protection. Energy information is formatted in predefined tables for easy reference, and consistent tracking of data from year to year. The categories of information presented are: [Facility Summary](#), [New Measures](#), [Existing Measures](#), and [Planned Measures](#). An [Innovations](#) section lists significant “firsts” achieved over the past year, and an [Appendix](#) lists conservation policies and guidelines.

**Resource Conservation Plan  
FY 2006  
Summary**

The information on this page reflects the facilities owned or operated  
by this agency as of the end of **FY 04 (June 30, 2004)**

Agency	<b>Montgomery County Public Schools, Maryland</b>				
Number of Facilities	218	Change in number of facilities		+1	
Total square feet	21,209,335	Change in total ft <sup>2</sup>		691,076	
Average operating hrs/year	2940	Change in avg. operating hrs/year		+40	
Other changes effecting energy consumption	<p><b>Technology Modernization:</b> The Technology Modernization program adds a net 2,000 computers per year to the school system. Each one thousand new computers increases MCPS plug loads by 150 kW, equivalent to the energy of an average elementary school.</p> <p><b>Portable classrooms:</b> Surging enrollment drives the use of relocatable classrooms (portables). Portables grew by 140 units in FY 02, and by 57 in FY 03, reaching a total of 719 in FY 05. Portables are electrically heated and cost over twice as much per square foot to operate as permanent school facilities. The portables added in FY 02 and FY 03 alone equal the utility impact of three new middle schools.</p> <p><b>Expanding summer use of schools:</b> As schools have become air-conditioned, the summertime use of schools has also expanded. MCPS uses schools for a growing number of summer programs, as do 5,000 outside groups scheduled through the Community Use of Public Facilities. Annual operating hours and air-conditioning energy use are on the rise. In FY 02, the August electric bill for MCPS exceeded the September bill for the first time.</p>				
Utilities:	Units	Total consumption (actual FY 04)	Percent change from actual FY 03	Total cost (actual FY 04) \$	Percent change from actual FY 03
Electricity	kWh	194,288,169	0%	\$15,093,974	11%
Natural Gas (Firm)	therms	5,765,113	-10%	\$5,746,694	27%
Natural Gas (Irate)	therms	0 (burned FO#2)	0%	0 (burned FO#2)	0%
Fuel Oil #2	gallons	555,010	60%	\$612,815	78%
Propane	gallons	43,217	5%	\$51,697	5%
Water/Sewer	kgallons	405,965	-2%	\$1,963,148	13%
<b>Total</b>				<b>\$23,468,328</b>	<b>16%</b>

## New Measures

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The Table “**New Measures**” on the following page lists and describes energy retrofit activities occurring in the current fiscal year. New measures outside the Energy CIP are described below.

**New Construction:** In addition to the indicated retrofits, new building design guidelines generate substantial energy savings in each MCPS construction project. For example, the new Matsunaga Elementary School features a ground source heat pump HVAC system, and the planned Richard Montgomery High School replacement will have a similar system. Ground source heat pumps exchange heat with the earth through fields of closed-loop wells and reduce annual heating and cooling energy by 30% compared to conventional HVAC systems. New construction measures are not listed in this table due to the large number involved and because the cost and benefits of these measures are integrated into the total building design.

**Utility Procurement:** MCPS also controls utility costs through joint procurement efforts of deregulated energy supplies with other county and bi-county agencies. Joint procurement has produced significant utility savings for this group, including a six percent reduction in average electric rates through FY 04.

**Environmental Standards:** Beyond energy conservation measures, MCPS seeks to be environmentally responsible in all aspect of facility design and operation. New MCPS facilities are rated by the U.S. Green Building Council for certification under the Leadership in Energy and Environmental Design (**LEED**) program. This program recognizes sustainable design in facility sites, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality. Northwest Elementary School #7 is being designed as a **LEED** pilot project and was the first school in Maryland to register for **LEED** review. Three additional MCPS schools in design have now been registered as well.

*“Because good planets are hard to find.....”*

*Anja Caldwell, AIA, LEED-AP*

### New Measures

This table shows information on resource conservation measures implemented during FY 05  
(July 1, 2004 through June 30, 2005)

Measures - New: (Implemented during FY 05)	date implemented (mo/yr)	initial cost (\$)	annual net impact on maintenance cost (\$)	fuel type(s) affected and units	units saved per year	annual cost savings (\$)
<b>Capital Improvement Projects:</b>						
Daylight Dimming at Clopper Mill ES	12/04	\$ 70,000	(\$ 3,500)	Elect (kWh)	330,000	\$ 28,000
Internet Control of Portable Classrooms	8/04	\$350,000	0	Elect (kWh)	5,000,000	\$450,000
Waterless Urinals at MLK MS	10/04	\$ 10,000	(\$ 500)	Water (Gal)	560,000	\$ 4,000
Retro-Commissioning Wheaton / Edison HS	09/04	\$255,000	(\$ 8,000)	Elect (kWh)	420,000	\$ 43,000
<b>Total</b>		<b>\$685,000</b>	<b>(\$12,500)</b>			<b>\$525,000</b>
<b>Operations and Maintenance:</b>						
Shutdown of Network Computers	7/04	0	0	Elect (kWh)	3,060,000	\$275,000
<b>Total</b>		<b>0</b>	<b>0</b>			<b>\$275,000</b>
<b>Description of Activities:</b>						
<p><b>The "Internet Control of Portable Classrooms"</b> is a first of its kind application to portable classrooms of Carrier's "Broadcast Energy Savings" (BES) technology. MCPS and Carrier jointly developed the approach in which an internet interface allows MCPS to synchronize the HVAC schedules and thermostat set points at all portables. The savings for this project is high because portables originally contained only manual thermostats and ran essentially uncontrolled. The use of conventional 7-day programmable (but non-communicating) thermostats is impractical in this application because of the inability to verify programs at over 700 locations, and inability of 7-day thermostats programs to schedule holidays, breaks, and summer closings. The BES interface supports a 24-hour override to a setback temperature, or "snow day" command, allowing MCPS to shut down portables and save energy opportunistically. The newly developed system makes it feasible for the first time to efficiently control large numbers of small, relocatable buildings with a payback of under a year.</p> <p><b>Waterless Urinals:</b> Urinals are being tested that use no water for flushing, while improving sanitation and reducing restroom odors. One school and maintenance depot will be tested this year, with an anticipated payback of less than 3 years. If successful, this technology will be applied to 50 restrooms scheduled for work under the Restroom Renovations CIP.</p> <p><b>Shutdown of Network Computers:</b> In addition to using Energy Star computer equipment, MCPS has this year instituted the system-wide shutdown of all 40,000 computers at the end of the evening via network controls. The network also sets Energy Star settings on each computer to deactivate the monitor after 30 minutes of idle time. Research is continuing to optimize these settings.</p>						

## Existing Measures

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MCPS has made significant investments in energy conservation going back to 1980. The table “**Existing Measures**” on the following page highlights the past six years of projects using Energy CIP funding.

**Behavioral Measures:** In addition to capital improvements, MCPS has long maintained a program of behavioral education to reduce energy use by facility users. The original **School Eco-Response Teams (SERT)** program (1991), and the more comprehensive **Green Schools Focus** (2002), continually promote and reward a culture of conservation in the school system. These programs communicate with the schools through professional development events, newsletters, curriculum modules, informational flyers, email, websites, and a telephone hot line and site visits. As rewards for participation, the programs offer project grants, quarterly cash awards, contest prizes, publicity, and application for national Earth Apple Awards. These programs produce hundreds of thousands of dollars a year in utility savings for the school system and help to instill environmental responsibility in future generations.

*“The problem of energy conservation has been solved, technically. All that remains is 20 years of implementation.”*

*Amory Lovins, Ph.D., Rocky Mountain Institute*

### Existing Measures

This table shows information on resource conservation measures implemented prior to FY 05

Measures - Existing: (implemented from FY 98 to FY 05)	Date implemented (mo/yr)	Initial cost (\$)	Annual net impact on maintenance cost (\$)	Fuel type(s) affected and units	Units saved per year	Annual cost savings (\$)
<b>Capital Improvement Projects:</b>						
Lighting Retrofits	01/98	\$ 644,633	(\$25,325)	Elect kWh	2,992,939	\$209,506
Lighting Retrofits	01/99	\$ 467,748	(\$18,376)	Elect kWh	2,171,687	\$152,018
Lighting Retrofits	01/00	\$ 241,693	(\$ 9,495)	Elect kWh	1,122,147	\$ 78,550
Lighting Retrofits	01/01	\$ 193,471	(\$ 7,601)	Elect kWh	898,259	\$ 62,878
Lighting Retrofits	01/02	\$1,544,630	(\$60,682)	Elect kWh	7,171,498	\$502,005
Lighting Retrofits	01/03	\$ 237,000	(\$ 9,377)	Elect kWh	635,496	\$ 54,485
EMS Upgrades	01/03	\$ 161,000	0	Elect kWh	442,000	\$ 31,800
				NGTherms	18,500	\$ 15,200
Cooling Tower Water Monitors	01/03	\$ 65,000	(\$15,000)	Water Gallons	2,800,000	\$ 12,000
<b>Total</b>		<b>\$3,555,175</b>				<b>\$1,118,442</b>
<b>Operations and Maintenance:</b>						
Information Unavailable						
<b>Total</b>						
<b>Description of Activities:</b>						
<p><b>MCPS comprehensive lighting retrofits</b> improve every lighting fixture in the building. Fluorescent fixtures receive T8 lamps and electronic ballasts, 400-Watt Mercury Vapor fixtures are replaced with 250-Watt Metal Halide fixtures (with improved light output), incandescent fixtures are changed to compact fluorescent, and incandescent EXIT signs are changed to LED type. LED EXIT's consume only 5 Watts and never burn out, thus also improving the safety of the facilities.</p> <p><b>Cooling Tower Water Monitors</b> detect excess water flow through cooling towers, caused by malfunctioning controls, and alert maintenance staff. The monitors send a pager signal to the responsible person, including the type of alarm and the facility number. Monitors were installed on 92 cooling towers owned by MCPS, averting water losses of hundreds of thousands of gallons per year.</p> <p><b>Operations and Maintenance:</b> As a policy, the Division of Maintenance uses high-efficiency replacement equipment when replacing failed equipment in facilities. The incremental cost for efficiency is small at the point of equipment replacement and not tracked.</p>						

## Planned Measures

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**Energy Capital Improvement Program:** A significant backlog of profitable energy projects exists in MCPS for energy management, lighting, and water conservation. The table “**Planned Measures**” on the following page reflects the target areas for the coming fiscal year. Planned Measures outside of the Energy CIP are described below.

**Improved New School Design:** MCPS seeks to attain a **LEED** Silver Level rating on all new building designs started in FY 2007 and beyond. Costs of LEED certification will be submitted in the FY 2007 budget requests for these schools.

**New Green Schools:** MCPS plans to continue Green Schools training and support to schools at rate of 10 per year, with a goal of eventually having all middle and high schools become green.

**Expanded Incentive Program:** In the area of occupant behavior, MCPS plans to expand its Green Schools Focus in FY 06 to achieve full participation of schools in SERT programs. MCPS is requesting a new staff of energy field representatives along with supporting technical and controls personnel to perform regular site visits to assist each school with energy monitoring, planning, auditing, energy awareness, and quality control measures to save energy. Additional savings from this expanded effort are projected to be over 1.60 times the cost invested.

**Water Conservation Retrofits:** In the area of water conservation, MCPS plans to incorporate successful technologies from pilot studies into design for a 50-school Restroom Renovations Capital Improvement Project.

**High-efficiency Relocatables:** MCPS plans to pilot a high-efficiency design for relocatable classrooms to include a highly insulated thermal envelope with integrated daylighting for lighting savings and improved student performance.

*“We hope for a delightful, safe and healthy world, with clean water, renewable power, economically, equitably, ecologically and elegantly enjoyed.”*

*William McDonough and Michael Braungart*

### Planned Measures

This table shows information on resource conservation measures planned to be implemented in FY 06 (July 1, 2005 through June 30, 2006)

Measures - Planned: (for FY05)	Projected completion date (mo/yr)	Projected initial cost (\$)	Projected annual net impact on maintenance cost (\$)	Fuel type(s) affected and units	Estimated units saved per year	Projected annual cost savings (\$)
<b>Capital Improvement Projects:</b>						
EMS Upgrades	03/06	\$ 355,000	\$0	NG Therms	31,300	\$31,000
				Elect kWh	971,000	\$68,000
Lighting Retrofits	03/06	\$ 145,000	(\$5,000)	Elect kWh	543,000	\$38,000
<b>Total</b>		<b>\$500,000</b>	<b>-5,000</b>			<b>\$137,000</b>
<b>Operations and Maintenance:</b>						
Information unavailable						
<b>Total</b>						
<b>Description of Activities:</b>						
<p>The above project list is contingent on increased funding approved in the FY 05 to 10 Energy CIP.</p> <p><b>Energy Management Upgrades:</b> The infrastructure of energy management systems at MCPS has reached an age where many systems need to be replaced or upgraded. Advances in electronics and communications now enable deeper savings from energy management systems than previously possible. Also, new network interface standards can now distribute real-time EMS data instantly to widely distributed facility users and staff. Access to building automation data across the Wide Area Network multiplies the value of energy management systems well beyond the simple energy savings shown above. These and other strategic improvements will be made during the systematic EMS upgrade initiative.</p> <p><b>Operations and Maintenance:</b> As a policy, the Division of Maintenance uses high-efficiency replacement equipment when replacing failed equipment in facilities. The incremental cost for efficiency is small at the point of equipment replacement and not tracked.</p>						

## Significant Technology and Program Advances in Resource Conservation

- 1) First use of **Internet-communicating thermostats** in a U.S. school system to control HVAC in portables.
- 2) **First School System in Maryland** to register a new building design for LEED Certification (NWES #7). Four building designs are now registered in total.
- 3) First **MCPS Green Schools** supported by Green Schools Focus staff and modeled on the national Green Schools program of the Alliance to Energy:
  - a. Twenty secondary schools have received training, including sessions on an **investigation-based approach** for energy and environmental activities,
  - b. Use of professional instrument **Toolkits**, and
  - c. Energy-related **curriculum** materials and support.
- 4) First deployment of a **Web interface in MCPS** to view real-time building information.
  - a. Twenty schools are now "on-line" to anyone on the MCPS-wide area network to view building environmental conditions through a web browser.
- 5) First use of a **Web-based system to monitor daily electric profiles** in buildings and detect abnormal use patterns, control, and scheduling problems.
  - a. Forty-nine sites are installed under the PEPCO "CEO Online" subscription program.
  - b. A 10-building pilot project is testing a similar and less expensive approach completely owned by MCPS.
- 6) First MCPS use of the **automated scheduling database** operated by the ICB / Community Use of Public Facilities program to receive HVAC scheduling requests from three school clusters in place of paper calendars manually filled out by school staff:
  - a. This system will be extended to all elementary and middle schools in FY 05.

- 7) First systematic **Retro-Commissioning** of MCPS facilities to correct controls failures, improve comfort, and reduce energy expenses (six facilities to date).
- 8) First MCPS school opened with a **Geoexchange system** for heating and cooling:
  - a. Spark Matsunaga Elementary School and Longview Center, 125,000 square feet.
  - b. First MCPS school to have no comfort complaints in the first two years of operation.



## Appendix – Montgomery County Public Schools

# Resource Conservation Policy and Guidelines

- [!\[\]\(d25e96b37004bb0da300e6da96ee0cd4\_img.jpg\) BOE Policy On Energy Conservation](#)
- [!\[\]\(d3aa9c337ac999b14e00b7d8b3eddb7b\_img.jpg\) Electricity Guidelines](#)
- [!\[\]\(ab79838378ac037f4cb6d7f5a97bf3d7\_img.jpg\) Heating Guidelines](#)
- [!\[\]\(7c71e3de03a819b7752b2c78e9a5360a\_img.jpg\) Food Preparation Guidelines](#)
- [!\[\]\(01d650d17a45bc8a29eb2646a16957d3\_img.jpg\) Water Use Guidelines](#)
- [!\[\]\(7d584cf94017c826ed268aba218b4d3c\_img.jpg\) High Performance Green Building Plan for MCPS](#)

# POLICY

## BOARD OF EDUCATION OF MONTGOMERY COUNTY

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**Related Entries:** ECM, ECM-RA  
**Responsible Office:** Supportive Services

### Energy Conservation

#### A. PURPOSE

To ensure that Montgomery County Public Schools pursues energy conservation efforts and practices that continue to preserve our natural resources while providing a safe and comfortable learning environment for all staff and students

#### B. ISSUE

The nation is experiencing a depletion of its natural resources which include crude oil, natural gas, and other energy sources. The Montgomery County Public Schools is committed to reducing its consumption of natural resources and still improving the quality of its educational programs. The Montgomery County Board of Education desires to work with other agencies of government and plan school system activities so that the learning environment of essential education programs are not curtailed or compromised.

#### C. POSITION

1. The superintendent of schools shall continue to establish procedures to ensure the conservation of natural resources by personnel at all levels of the school system, which shall include the following practices:
  - a) Generation of a systemwide resource conservation plan that outlines goals and objectives
  - b) Development of acceptable energy conservation guidelines as outlined in the resource conservation plan
  - c) Continued development and implementation of conservation programs
  - d) Performance of energy studies on all new MCPS construction

**1 of 2**

- e) Monitoring the general operation and maintenance of all heating, ventilation and air-conditioning equipment
  - f) Procurement and consumption management of fossil fuels and electricity
  - g) Continuing reminders to staff and students of the need for conservation of all natural resources
2. MCPS will participate in a coordinated effort by government authorities to establish appropriate resource conservation plans and utility price monitoring systems to ensure that public schools have adequate supplies of essential fuels and can obtain these at the best possible prices.

#### **D. DESIRED OUTCOME**

Create a healthy and comfortable learning environment while controlling energy consumption more efficiently and diverting the otherwise rising utility costs towards educational programs. Continue development of energy conservation efforts that proportionally reduces energy consumption in new and existing facilities.

#### **E. IMPLEMENTATION STRATEGIES**

1. Should natural resources be insufficient to meet normal operating needs, the superintendent will develop further plans for the consideration of the Board of Education to conserve energy.
2. Copies of this policy and the annual resource conservation plan will be sent to appropriate school system and county government officials.

#### **F. REVIEW AND REPORTING**

This policy will be reviewed on an on-going basis in accordance with the Board of Education's policy review process.

*Policy History:* Adopted by Resolution No. 654-73, November 13, 1973; amended by Resolution No. 285-97, May 13, 1997.

## ***Electricity***

1. **Temperature Set Point:** The maximum cooling level is 76° F. Set thermostats accordingly. Some temperature variation will occur as equipment cycles on and off. Report cooling problems only if room temperature measured with a thermometer stays three degrees or more above set point.
2. **Controls:** Do not attempt to tamper with energy management or HVAC controls on equipment. Any problems with controls or equipment should be dealt with promptly through the work order system. Provide frequent inspection of pneumatic controls, including system filter/dryer, automatic bleed and compressor run time. Test and calibrate all pneumatic thermostats at the start of each cooling season.
3. **Computers:** Shutting down computers not in use is important. Computers in our schools consume more energy than the lighting. **Teachers and students should shut down the computer at the end of each use, unless a new user is waiting.** Sweeps should be made to shut down all computers immediately after school hours and before weekends, holidays, and breaks. Use of **flat panel monitors** is encouraged whenever procuring new displays. Flat panel monitors use 70% less energy than CRT models and help reduce excessive heat build-up in computer labs and closets.
4. **Lights:** Teachers should ensure lights are turned off when leaving the classrooms empty, even for a few minutes. Every effort should be made to avoid accidentally leaving lights on in storerooms, crawl spaces, attics, and other unoccupied spaces. Corridor lighting should be reduced in over-illuminated areas and turned off during unoccupied periods. Gym, auditorium, and stadium lights should be controlled on a tight schedule. Gym lights should be turned off during class periods the gym is not in use.
5. **Lighting Maintenance:** Maintain automatic lighting controls, occupancy sensors, or daylight sensors where installed. Light fixtures and lenses should be cleaned annually and the date documented.
3. **Daylighting:** Whenever possible, teachers should utilize natural light instead of artificial light. Window shades should be adjusted to make best use of daylighting. Because most classroom lights are controlled by two or more switches, maximum lighting and lights nearest the windows should be used only when daylight is not available.
4. **Exterior Lighting:** All outside lighting shall be **off** during daylight hours. Parking lot lights should be turned off at the close of the regular school day or evening activities (by 12:00 a.m. at the latest). Building service managers should seasonally check/reset the time clock for all outside lighting.

5. **Cleaning Crews:** All lights will be turned **off** when students and teachers leave school. Building service workers will turn on lights only in the areas in which they are currently working.
6. **Holidays and Breaks:** All electrical equipment will be shut down or unplugged per checklists before long weekends and school breaks.
7. **Off-Peak Use:** When possible, electricity use (for kilns, laminators, etc) should be scheduled prior to 12:00 noon when lower, off-peak rates are in effect.
8. **Personal electric space heaters** will not be permitted. Such units, in addition to having high energy costs, are a fire and safety hazard. Only heaters installed by the Division of Maintenance for emergency use will be permitted; others will be confiscated.
9. **Infiltration Control:** All windows and outside doors will be kept closed when cooling systems are in operation. Corridor doors and doors to classrooms will remain closed when HVAC is provided. Doors to unconditioned spaces, including gyms and pools, will be kept closed. Inspect automatic door closers weekly.
10. **Vending Machines:** Vending machines are major electric users that often cost more to operate than the school receives in revenues. A typical soft drink machine costs over \$400.00 per year to operate, and there are over a thousand in the school system. Measures should be taken to minimize the number of vending machines and the hours of use:
  - a. Review your school's vending machine use and have little-used units removed.
  - b. By BOE Action 12.8.2, vending machines serving food of "minimal nutritional value" must be unplugged or automatically turned off from midnight to the end of each school day.
  - c. Vending machines must be removed from the main entrance or lobby of all schools effective with the 2004-2005 school year.
  - d. Vending machines also may not be located anywhere in a corridor where it reduces the code egress path width.
  - e. Unplug vending machine units when "Sold Out" is displayed.
  - f. Unplug vending machine units for non-perishable items when vandal gates are closed.

## *Heating*

1. **Temperature Setpoint:** The maximum heating level is 70° F. Set thermostats accordingly and recheck monthly. Some temperature variation will occur as equipment cycles on and off. Report heating problems only if room temperature measured with a thermometer stays three degrees or more below set point.
2. **Controls:** Building staff or occupants should not attempt to manually control equipment by tampering with energy management or HVAC controls of equipment. Any problems with controls or equipment should be dealt with promptly through the work order system. Provide frequent inspection of pneumatic controls, including system filter/dryer, automatic bleed and compressor run time. Test and calibrate all pneumatic thermostats at the start of each heating season.
3. **Hours:** During non-school hours, heat is furnished only for MCPS activities and user groups with reservations through the ICB/CUPF. Consolidate necessary MCPS evening activities into the minimum number of zones possible. HVAC will not be provided for an individual to use a classroom or office outside of normal hours. HVAC systems will remain off during cleaning, except when ventilation is required for waxing or stripping activities.
4. **Filters:** Replace filters of all equipment at recommended intervals. Maintain documentation per your building maintenance plan.
5. **Boiler Maintenance:** Fuel oil burners should be cleaned and tuned for optimum combustion twice yearly.
6. **Pumps:** Only one main heating pump should be operated, except where additional pumps are provided for separate zones. Do not operate main pump and standby pump at the same time.
7. **Unit Ventilators:** Maintain unit ventilators free of obstruction, such as books, plants, and furnishings, both on the top grill and at the bottom intake, so that air can circulate efficiently throughout the room.
8. **Infiltration Control:** All windows and outside doors will be kept closed when heating systems are in operation. Corridor doors and doors to classrooms will remain closed when HVAC is provided. Doors to unconditioned spaces, including gyms and pools, will be kept closed. Inspect automatic door closers weekly.
9. **Storage Spaces:** Close unused storage rooms and set thermostat controls, where installed, to the lowest possible temperature setting that will prevent freezing.
10. **Personal electric space heaters** will not be permitted. Such units, in addition to having high energy costs, are a fire and safety hazard. Only heaters installed by the Division of Maintenance for emergency use will be permitted; others will be confiscated.

## ***Food Preparation***

### **Cooking Equipment**

1. Preheat only equipment to be used ... 15 minutes before using.
2. Reduce temperature or turn equipment off during slack periods.
3. Cook full loads on every cooking cycle when possible.
4. Use the correct size equipment for all operations.
5. Avoid slow loading and unloading of ovens and opening doors unnecessarily.
6. Keep equipment clean for efficient operation.

### **Hot Food Holding and Transporting**

1. Preheat equipment before loading.
2. Always use at full capacity ... when possible.
3. Clean thoroughly daily.

### **Refrigeration Equipment**

1. Keep doors tightly closed and avoid frequent or prolonged opening.
2. Place foods in refrigerator or freezer immediately upon arrival from supplier.
3. Keep evaporator coils free of excessive frost.
4. Keep condenser coils free of dust, lint or obstructions.
5. Unplug equipment that is not needed.

### **Ware Washing Equipment**

1. Always operate equipment at full capacity when possible.
2. Flush after heavy meal periods--clean thoroughly, daily.

### **Water Heating**

1. Repair leaking faucets as soon as possible.
2. Reduce storage temperature to 120° F where possible.
3. Insulate hot water pipes.

### **Ventilating System**

1. Use only the number of fans necessary at all times to provide adequate ventilation.
2. Turn fans off upon completion of cooking.
3. Operate two-speed fans on the lower speed ... when possible.
4. Keep filters and extractors clean.



# ***WATER USE***

## **GENERAL**

1. **Be alert for water leaks** and water main breaks. Look for continuous water flow through the water meter at any time, ponding of water around the building, and report leaks to maintenance immediately. A broken water main can release tens of thousands of dollars in water a week until it is repaired.
2. **Report and repair leaking faucets** and faulty flush valves promptly. Check and adjust valves for proper timing annually.
3. **Water is an MCPS resource and not to be given away** or used by outsiders. Do not provide free water to road maintenance tankers or any other non-MCPS agency.
4. Do not allow local residents to use school hose bibbs or to control irrigation.
5. **Car washes may not** use school water supplies.
6. The utility budget pays for bottled water only in elementary school portable classrooms.

## **IRRIGATION**

These general guidelines are supplied for the education of individuals operating turf irrigation equipment to help with the successful management of healthy turf.

1. **Avoid Excess Watering.** Excessive watering promotes fungal growth and prevents the development of long, deep root systems needed for healthy turf.
  - a. **Use a simple rain gauge.** Turf in our climate needs only 1” of water per week for optimum health. Use weather reports or your school’s rain gauge to determine whether irrigation is needed each week.
  - b. **With timer systems, check zones for proper saturation levels.** Make sure water saturates the root zone when irrigating but no further. No runoff should occur from the area being watered.
  - c. **Make sure irrigation systems are turned off when it rains.** The installation of rain switches on automated irrigation systems is highly recommended.
2. **Irrigate only in early morning or late evening hours.** This timing minimizes evaporation to the air.

3. **Irrigate only two or three times a week.** This interval promotes deeper root growth, which establishes healthier and sturdier turf.

## FY 05 High Performance Green Building Plan for MCPS

1. MCPS LEED™ Pilot Projects
2. Greening of the MCPS Standard Design Guidelines
3. Sustainable Design Review
4. Training of MCPS Staff in High Performance Green Building Technologies and Processes
5. Experience in High Performance School Design and LEED™ Requirement for MCPS Requests for Qualifications and Proposals
6. Green Building Technology Pilots
7. Operations and Maintenance of High Performance Green School Buildings
8. LEED™ Application Guide for Schools
9. MCPS LEED™ Application Template
10. Updates

## 1. MCPS LEED™ Pilot Projects

As a pilot project, the new Northwest Elementary School #7 in Germantown is currently being designed and evaluated for a certification under the LEED™ version 2.1 for new construction (Leadership in Energy and Environmental Design, see [www.usgbc.org/leed](http://www.usgbc.org/leed)) system. Three other schools, Clarksburg/Damascus ES #7, Northeast ES #16 and Downcounty Consortium ES #28 are also currently registered with the US Green Building Council. These schools are all part of the 2005-2010 CIP and scheduled for completion in September 2006.

The pilot of Northwest ES #7 was initiated at a MCPS system wide LEED Charrette in the summer of 2003 (see [www.greenschoolsfocus.org](http://www.greenschoolsfocus.org)). The project is scheduled to bid in January of 2005 with a completion date of September 2006. The project design incorporates several green building technologies as add alternates to ensure the base project is affordable within the allocated funds. Any additional initial investment costs for green building components will be identified and implemented as the project budget allows. The base project is currently at a basic LEED certification level and a recent assessment indicates that a LEED Silver certification can be achieved with the acceptance of all the identified additional alternates.

The construction budgets for these projects were allocated prior to the launch of the “High Performance Building Plan for MCPS 2003”(see [www.greenschoolsfocus.org](http://www.greenschoolsfocus.org)), which initiated the first MCPS green building initiative in FY 04. The schools have no additional budget allocations for high performance green building technologies that exceed current MCPS Facility Design Guidelines.

The Department of Facilities Management with the Division of Construction chose to apply the LEED rating system to the design process to streamline system integration and energy efficiency of these projects. This decision was based on the documented benefits of sustainable design practices and green building technologies. Research and data published by the US Green Building Council (USGBC, see [www.usgbc.org](http://www.usgbc.org)) show significant potentials for cost savings in maintenance and operations of LEED schools.

Key to avoiding extra costs was introducing the LEED rating system early in the design process. All four schools had recently undergone feasibility studies and were going into schematic design, so the timing was right. Therefore all four elementary schools got registered for a LEED certification with the USGBC.

As the pilot projects are currently underway, project costs and benefits will be evaluated as a basis for developing project budgets for future LEED™ projects. A system wide goal for a LEED certification status and level will be determined when the merit of the current LEED pilots can be evaluated.

## 2. Greening of the MCPS Standard Design Guidelines

Facility Design Guidelines: A thorough review of the Facility Design Guidelines CSI Division 1 through 16 has taken place by a sustainable design consultant, project managers at the Division of Construction and the Green Schools Program Manager. The results and an index have been presented to the Director of School Plant Operations and the Division of Maintenance, including the IAQ Team, end of October 2004. A last review will be compiled by the Green Schools Focus and submitted to the Division of Construction for distribution to the AE teams end of 2004.

Other Guidelines: It was determined at the Green Spec Meeting in October 2004 that the following additional documents need to be compiled by sub-committees by end of 2004:

- Indoor Air Quality Management Plan during Construction
- Construction Waste Management Plan
- Review of HVAC and Commissioning Guidelines according to LEED Standards
- Review of Lighting Standards according to LEED Standards

## 3. Sustainable Design Review

A Sustainable Design and LEED™ Review by the Green Schools Focus will be part of the design review processes at the Division of Construction, from the feasibility study to the construction documents of all new construction projects and major renovations.

The project managers at the Green Schools Focus are to be invited by the Division of Construction to the various milestone design meetings with the design team. The project managers will compile the comments and distribute them to the consultants.

The LEED related categories of site, water, energy, materials and resources and IAQ will be the focus of the review, with an emphasis on energy efficiency of envelope, operations, building systems and lighting.

## 4. Training of MCPS Staff in High Performance Green Building Technologies and Processes

A LEED Intermediate workshop has been conducted for MCPS Department of Facilities Management staff in 2003. It is a goal to have all project managers at the Division of Construction

certified as a LEED Accredited Professional by end of 2005.

The Green Schools Focus will continue to provide informal training sessions in the form of seminars, product presentations and luncheons at the Division of Construction. The Green Schools Focus will also continue to distribute information about conferences, seminars, workshops and tours focusing on high performance green schools and LEED on a national level and in the region.

5. Experience in High Performance School Design and LEED™ Requirement for Consultants Selection Process

In the consultants selection process firm experience in high performance green school design and LEED will be added to the criteria for Requests for Qualifications from consultants. MCPS advises consultants to have LEED Accredited Professionals on the design team working on capital MCPS projects.

The resumes of the design team members are part of the initial application and any changes or replacements in team members need to be approved by the Division of Construction at MCPS. Qualifications in regard to high performance green design and LEED™ will be submitted for review by the Green Schools Program Manager.

6. Green Building Technology Pilots

Several pilot projects for green building technologies have been started in 2004 for existing buildings and portables classrooms. The Green Schools Focus has developed a protocol to track these pilot projects and will distribute the proposed format among the divisions involved. The protocol will determine the evaluations of the technologies and continue to inform the design for new constructions and renovations. Current pilot projects are described in the latest MCPS Resource Conservation Plan.

7. Operations and Maintenance of High Performance Green School Buildings

Green Cleaning products and procedures according to the principles of the Green Seal guidelines have been introduced to the Division of School Plant Operations. The Division is evaluating the certification and will introduce a “Green Vendor Day”.

8. LEED™ Application Guide for Schools

MCPS is actively involved in the development of the LEED™ Application Guide for Schools (LEED™ AGS). The Green Schools Program Manager at MCPS is serving on the national USGBC LEED™ for Schools Committee as an elected member. The guide is scheduled for completion for summer 2005 and will be a supplement to LEED™ for New Construction Version 2.2.

MCPS' experience in implementing LEED™ will inform the USGBC committee and the committee work will inform MCPS about future adaptations that are expected to facilitate the application of the LEED™ rating system to our schools.

## 9. MCPS LEED™ Application Template

MCPS has developed a general MCPS LEED™ Application Template which is modeled after the LEED™ Scorecard that determines the goal for individual credits for all projects and pilots. The scorecard is at the end of this plan on page 6 and 7.

The scorecard shall be distributed to all consultants at the beginning of any capital project to guide the design process.

This approach was chosen in lieu of developing a separate comprehensive MCPS LEED™ Application Guide, as initially intended in the 2003 High Performance Building Plan for MCPS under 5.2.3, since MCPS has now an active role in the USGBC committee mentioned under section 8. of this plan.

## 10. Updates

This plan will be reviewed and updated biannually in October, to coincide with the CIP budget submission planning cycle for Construction, and the annual DFM Resource Conservation Plan. A list of certification goals for upcoming projects will be updated and attached.

MCPS LEED™ -NC 2.1 Application Template 2004

	<b>LEED 2.1 Prerequisites and Credits</b>		<b>All Projects</b>	<b>Pilot Projects</b>	<b>Site Specific</b>	<b>Not Likely</b>
<b>SUSTAINABLE SITES</b>	Site Prerequisite: Erosion & Sedimentation Control		X	X	X	
	Site Credit 1: Site Selection				X	
	Site Credit 2: Urban Redevelopment				X	
	Site Credit 3: Brownfield Redevelopment					X
	Site Credit 4: Alternative Transportation	4.1 Public Transportation Access			X	
		4.2 Bicycle Storage & Changing Rooms	X	X		
		4.3 Alternative Fuel Refueling Station				X
		4.4 Parking Capacity		X	X	
	Site Credit 5: Reduced Site Disturbance	5.1 Protect or Restore Open Space		X	X	
		5.2 Development Footprint		X	X	
	Site Credit 6: Stormwater Management	6.1 Rate and Quantity		X	X	
		6.2 Treatment		X	X	
	Site Credit 7: Heat Island Reduction	7.1 Non-roof		X	X	
		7.2 Roof	X	X		
Site Credit 8: Light Pollution Reduction		X	X	X		
<b>WATER EFFICIENCY</b>	Water Credit 1: Water Efficient Landscaping	1.1 Reduce by 50%	X	X	X	
		1.2 No potable Use or No Irrigation		X	X	
	Water Credit 2: Innovative Wastewater Technologies				X	
	Water Credit 3: Water Use Reduction	3.1 20% Reduction	X	X		
		3.2 30% Reduction		X		
<b>ENERGY AND ATMOSPHERE</b>	Energy Prerequisite 1: Fundamental Building Systems Commissioning		X	X		
	Energy Prerequisite 2: Minimum Energy Performance		X	X		
	Energy Prerequisite 3: CFC Reduction in HVAC&R Equipment		X	X		
	Energy Credit 1: Optimize Energy Performance	1.1 20% New/ 10% Existing	X	X		
		1.2 30% New/ 20% Existing	X	X		
		1.3 40% New/ 30% Existing	X	X		
		1.4 50% New/ 40% Existing			X	X
		1.5 60% New/ 50% Existing			X	X
	Energy Credit 2: Renewable Energy	2.1 5%		X	X	
		2.2 10%			X	X
		2.3 15%			X	X
	Energy Credit 3: Additional Commissioning		X	X		
	Energy Credit 4: Ozone Protection			X		
	Energy Credit 5: Measurement and Verification		X	X		
Energy Credit 6: Green Power			X			

	<b>LEED 2.1 Prerequisites and Credits</b>	<b>All Projects</b>	<b>Pilot Projects</b>	<b>Site Specific</b>	<b>Not Likely</b>	
<b>MATERIALS AND RESOURCES</b>	Materials Prerequisite: Storage and Collection of Recyclables	X	X			
	Materials Credit 1: Building Reuse	1.1 Maintain 75% of Existing Structure & Shell			X	
		1.2 Maintain 100% Existing Structure & Shell			X	
		1.3 Maintain 100% of Structure & Shell & 50% of Non-shell			X	
	Materials Credit 2: Construction Waste Management	2.1 Divert 50%	X	X		
		2.2 Divert 75%	X	X		
	Materials Credit 3: Resource Reuse	3.1 Specify 5%		X	X	
		3.2 Specify 10%				X
	Materials Credit 4: Recycled Content	4.1 Specify 5%	X	X		
		4.2 Specify 10%		X		
	Materials Credit 5: Local/Regional Materials	4.3 20% Manufactured Locally	X	X		
		4.4 Of 20% Above, 50% Harvested Locally		X		
	Materials Credit 6: Rapidly Renewable Materials			X		
Materials Credit 7: Certified Wood		X	X			
<b>INDOOR ENVIRONMENTAL QUALITY</b>	Prerequisite 1: Minimum IAQ Performance	X	X			
	Prerequisite 2: Environmental Tobacco Smoke (ETS) Control	X	X			
	IEQ Credit 1: Carbon Dioxide (CO <sub>2</sub> ) Monitoring	X	X			
	IEQ Credit 2: Increase Ventilation Effectiveness		X			
	IEQ Credit 3: Construction IAQ Management Plan	3.1 During Construction	X	X		
		3.2 Before Occupancy		X		
	IEQ Credit 4: Low-Emitting Materials	4.1 Adhesives & Sealants	X	X		
		4.2 Paints	X	X		
		4.3 Carpet	X	X		
		4.4 Composite Wood		X		
	IEQ Credit 5: Indoor Chemical and Pollutant Source Control		X			
	IEQ Credit 6: Controllability of Systems	6.1 Perimeter	X	X		
		6.2 Non-perimeter		X		
	IEQ Credit 7: Thermal Comfort	7.1 Comply with ASHRAE 55-1992	X	X		
		7.2 Permanent Monitoring System	X	X		
IEQ Credit 8: Daylight and Views	8.1 Daylight 75% of Spaces	X	X	X		
	8.2 Views 90% of Spaces	X	X	X		
<b>INNOVATION AND DESIGN PROCESS</b>	Credit 1: Innovation in Design (subject varies)	1.1 Additional Locally Manufactured Material	X	X		
		1.2 Green O&M Program	X	X		
		1.3 User Education Program	X	X		
		1.4 TBD		X	X	
	Credit 2: LEED™ Accredited Professional		X	X		

Created by Sustainable Design Consulting in Annapolis for MCPS facilities.