

WMU Sustainable Buildings Upload

Energy Star Purchasing Policy: adopted 6/28/05

Environmental Tobacco Smoke Policy: adopted 3/1/08

Lifecycle Costing: adopted 4/26/11

Integrated Pest Management: adopted 5/1/12

Green Cleaning: adopted 6/15/12

CFC Phase Out Program: adopted 4/16/13

Storm Water Management Policy Division 31.1: adopted 8/15/13

Solid Waste Management Plan: (in prep by the Office for Sustainability)

WESTERN MICHIGAN UNIVERSITY



Maintenance Services
Physical Plant

28-Jun-05

WMU Energy Star Purchasing Policy

Western Michigan University has been an Energy Star Partner since October 10, 2000, actively pursuing energy reduction in our buildings and on our grounds.

As a part of Western Michigan University's on going pursuit of energy conservation, energy reduction, and cost containment, the following shall be the policy when purchasing energy consuming products that will be used at the university.

All products, appliances, and equipment purchased by Western Michigan University shall be Energy Star qualified wherever practical and/or possible.

Initial costs are the same or slightly higher than non qualified devices, but energy consumption will reduce life cycle costs sufficiently to make this a valuable policy.

Energy Star qualified devices use 25-50% less power than non-qualified devices. Energy Star devices can be identified at WWW.energystar.gov/purchasing

Handwritten signature of Carl Newton in black ink.

Carl Newton
Energy Reduction Mgr.
carl.newton@wmich.edu

Handwritten signature of Robert M. Beam in black ink.

Robert Beam
Vice President Business and Finance

Date. 6/30/05



Smoke Free Policy

Policy

In recognition of environmental tobacco smoke health risks, the University will provide as close to a smoke free environment as practicable for its faculty, staff, students and visitors. The right of a non-smoker to protect his or her health and comfort will take precedence over another's desire to smoke.

Regulations

- Smoking is prohibited in all University facilities including University vehicles except as indicated below.
- In order not to interfere with access or the rights of others, smoking is not permitted within 25 feet of all building entrances, air intakes, and operable windows. There may be some buildings where smoking will not be permitted at certain building entrances and/or the distance from buildings may be further than 25 feet; such information will be posted accordingly.
- Individuals who smoke on University premises will be responsible for the proper disposal of smoking products.
- The sale of tobacco products is prohibited on University premises.
- Smoking is prohibited in all housing facilities with the exception of resident apartments that have not been designated as non-smoking.
- Smoking will be permitted for controlled research, theatrical, educational or religious ceremonial purposes, with prior approval of the dean or director for the facility.
- Departments are encouraged to assist employees with smoking cessation. Assistance is available through the Sindecuse Health Center "Stop Using Tobacco Program." This program provides for reimbursement of costs if the employee and/or his/her dependents remain smoke free.

Procedures

The success of this policy depends upon the thoughtfulness, consideration, and cooperation of smokers and non-smokers. All faculty, staff, students and visitors share the responsibility for adhering to and enforcing the policy. Any concern should be brought to the attention of the individuals responsible for the operation of the University facility in question such as the building coordinator, facility manager or department supervisor responsible for the work area.

(Required by state law; approved by president January 1987; amended December 1991, January 2000 and March 2008.)

Office of University Relations, Western Michigan University, Kalamazoo MI 49008-5433 USA | (269) 387-8400

WMU Facility Life Cycle Design Guidelines

Revised- 4/26/11

Approved- President's Universitywide Sustainability Committee 8/18/11

Approved- VP Van Der Kley 8/24/11

A. Design Goals

1. Minimize building life cycle costs, direct and indirect, relating to energy use, maintenance, waste disposal and occupant health & productivity.
2. Minimize environmental impacts throughout the building life cycle, including product manufacturing, construction, use/occupancy, and demolition or renovation/reuse.
3. Optimize indoor environmental quality.

B. Design Process

1. The US Green Building Council LEED Rating System NC- 2009 is to be used as a performance standard and guideline on all new building and renovation projects. The highest number of credits should be achieved that are feasible, within project scope, program and budget. Official LEED Certification at a minimum of Silver level is to be obtained on all major projects.
2. Evaluate life cycle costs of design alternatives to reduce costs of major building systems. Use energy simulation/modeling software on major projects. Life cycle cost saving strategies used should have maximum payback period of 5-10 years.
3. The Project Design Team is to determine design strategies appropriate for project program, site and budget. The LEED Checklist is to be submitted with project reviews to document sustainable strategies implemented. Final checklist will be published on the WMU Office of Sustainability website.
4. Architectural/Engineering consultants are to include the above services in the Professional Services Agreement.

C. Design Guidelines

Site Work

1. **Erosion & Sedimentation Control:** Employ techniques such as silt fencing, sediment traps/filters, topsoil stockpiling and slope stabilization to minimize erosion of soil during construction. At a minimum, comply with Michigan NPDES Construction Storm Water Program: Rule 2190 of Part 31 of Act 451 and EPA Construction General Permit 2008.
2. **Site Selection:** As indicated in the WMU Master Plan, avoid development of buildings and parking in flood plain and wetland areas.
3. **Development Density & Community:** Encourage moderate density development to preserve open space and enhance pedestrian & bicycle use of campus. Locate new facilities in proximity to other related services.
4. **Alternative Transportation:** Provide site facilities to encourage pedestrian, bicycle and bus transport, where feasible. Promote carpooling and use of fuel efficient and alternative fuel vehicles.

5. **Minimize Site Disturbance:** Consider the impact of project on the surrounding ecosystem. Investigate methods to minimize impacts on natural habitats and watersheds.
6. **Habitat and Open Space:** Create or preserve vegetative open space within the project site, as feasible. Where feasible, use vegetation that is native to the bioregion to support ecological systems.
7. **Stormwater Management:** Limit off site storm water runoff and employ methods to increase on-site infiltration. Project design is to maintain no net increase in discharge to storm system for projects of an acre or larger. See WMU Campus Stormwater Policy 2008.
8. **Heat Island Effect:** Use light colored site surfaces, or provide shading on site where feasible, to minimize solar heat absorption.
9. **Light Pollution Reduction:** Minimize site lighting levels & off-site light spillover/ glare, while providing for adequate levels for security and wayfinding.

Water Conservation

1. **Water Use Reduction:** Use strategies to reduce water consumption, including low flow plumbing fixtures and mechanical equipment. Consider methods for water reuse & recycling.
2. **Water Efficient Landscaping:** Use drought resistant plant materials and low flow irrigation techniques, where feasible. Consider use of native plant species.

Energy Use

1. **Building Systems Commissioning:** Key mechanical & electrical systems are to go thru a Commissioning process, which includes the following:
 - Inspection & testing for functional performance in accordance with project objectives & University guidelines.
 - Testing to verify no cross connections between storm and sanitary sewers.
 - Documentation of criteria, inspections/testing & acceptance
 - Training of WMU operations & maintenance staffAll projects shall implement a Commissioning plan, with the scope to be determined by the project team.
2. **Integrate Buildings with the Site:** Consider local climate & site influences on building energy use. Use "free" energy sources where feasible, such as solar energy, daylight, exterior temperature variations and winds.
2. **Optimize Energy Performance:** Select building envelope, mechanical and electrical systems for improved energy efficiency. All projects are to comply with the International Energy Code as a minimum. Typical strategies & technologies:
 - Building Envelope
 - Control & utilization of solar heat gain
 - Daylighting of interior spaces

High performance windows/glazing
Optimized insulation values
Reduced air infiltration

•Mechanical Systems

High efficiency equipment
Direct Digital Control System (DDC) for HVAC
Occupancy sensors/CO2 monitoring
Heat recovery systems
Economizer cycle cooling
Zoning of HVAC system based on building orientations & loads
Variable speed drives on motors and fans
Time of day scheduling
Separate controls for individual spaces, where feasible

•Electrical Systems

High efficiency lighting fixtures (no incandescent)
Occupancy sensors
Daylight sensors
Separate ambient and task lighting
Lighting dimmers

3. **CFC/HCFC/Halon Reduction:** Avoid use of these products in HVAC refrigerants and fire suppression systems. No use of CFC's in new facilities. Develop a phase out & conversion plan for existing facilities.
4. **Renewable Energy:** Consider strategies to utilize renewable energy sources, including grant funding opportunities.
5. **Measurement & Verification:** Develop a plan for measurement & verification of energy saving design goal implementation, in conjunction with the Commissioning Plan.

Building Materials

1. **Recycling Facilities:** Plan for convenient areas in buildings for sorting & storage of recyclable items by the building occupants. See WMU Recycling Coordinator for type of items to be recycled & number of bins needed.
2. **Building Reuse:** Where appropriate, consider reuse of existing building elements such as structural system, building envelope, interior walls and finishes.
3. **Construction Waste Management:** Contractors are to develop a plan for sorting, storing & recycling of waste materials on projects. "Waste Spec" is to be used as a specification for this work. All projects shall implement a Construction Waste Management Plan, with the scope to be determined by the project team. A minimum of 50% of construction waste is to be salvaged, recycled or otherwise diverted from landfill or incineration. Submit final recycling data to WMU Office of Sustainability.
4. **Recycled Content Materials:** Use materials with post-consumer or post-industrial recycled content where feasible. Common products with recycled content include structural steel,

aluminum windows, gypsum board, acoustical ceiling tiles, rubber floor tiles, carpeting and toilet partitions.

5. **Durable & Flexible Materials:** Utilize components and systems which are durable and easy to maintain. Where feasible, use materials which provide flexibility for future changes and modifications to occur.
6. **Local Materials:** Use products produced regionally where possible. See WMU General Requirements for use of Michigan products.
7. **Renewable Materials:** Consider use of products that are comprised of raw materials that are in abundant supply or come from renewable sources. When feasible, obtain wood products from Forest Stewardship Council certified suppliers.
8. **Materials containing PCB's, lead and asbestos are prohibited.** Mercury containing products are prohibited, unless no alternatives are available. Use of Mercury containing products requires full disclosure in product submittals.

Indoor Environmental Quality

1. **Minimum Indoor Air Quality Performance:** Comply with ASHRAE 62.1-2007 and State Mechanical Code.
2. **Tobacco Smoke Control:** Prohibit smoking within 25 feet of buildings, including during construction.
3. **Ventilation Requirements:** Optimize the amount of fresh air provided to building spaces. Connect occupancy sensors & carbon dioxide monitors to HVAC systems, where feasible.
4. **Construction Air Quality Management:** Protect ductwork and equipment from contamination during construction. At a minimum:
 - During construction, comply with SMACNA IAQ Guideline for Occupied Buildings Under Construction, 2007, Chapter 3.
 - Protect stored on-site or installed absorptive materials from moisture damage
 - If air handlers are used during construction, filtration media with a MERV value of 8 are to be used at each return grille, per ASHRAE 52.2-1999.
 - Replace all filtration media immediately prior to occupancy.
 - Conduct a 2 week building flush-out with new filtration media with 100% outside air after construction ends & prior to occupancy. After flush out, replace filtration media.or
 - Conduct a baseline indoor air quality testing procedure to demonstrate that concentration of air contaminants are below specified levels. Meet the testing requirements listed in LEED IEQ Credit 3.
5. **Low Emitting Materials:** Utilize materials which have low levels of volatile organic compound off-gassing for interior construction:
 - Adhesives & sealants: VOC content less than limits of South Coast Air Quality Management District Rule No. 1168 and Green Seal Standard 36.
 - Paints & coatings: VOC emissions that do not exceed Green Seal's Standard

GS-11 & GC-03 and South Coast Air Quality Management District Rule No. 1113.

- Carpet: Comply with CRI Green Label Plus Testing program
- Carpet cushion: Comply with CRI Green Label Testing program
- Composite panels: No added urea formaldehyde resins.

6. **Indoor Chemical Source Control:** Consider methods to control & reduce dirt and moisture accumulation in flooring at entryways. Provide local exhaust ventilation at spaces in which hazardous chemicals will be present.
7. **Design for Human Health & Occupant Controls:** Consider environmental needs of people in terms of daylight, ventilation, exterior views and thermal/acoustic/visual comfort for interior spaces. Where feasible, provide controls for occupants to adjust these conditions. A direct line of sight to exterior vision glazing from 90% of all regularly occupied spaces is a long term goal.

D. References

General

US Green Building Council- LEED Green Building Rating System- NC 2009, www.usgbc.org.

Site Work

- EPA Construction General Permit 2008
- Michigan NPDES Construction Storm Water Program: Rule 2190 of Part 31 of Act 451
- ANSI/ASHRAE/IESNA Standard 90.1-2007, Section 9

Water Conservation

- The Energy Policy Act (EPAct) 1992, 2005
- Michigan Plumbing Code 2009

Energy Use

- ANSI/ASHRAE/IESNA Standard 90.1-2007 Energy Standard for Buildings except Low Rise Residential Buildings
- US DOE/EPA Energy Star Guidelines
- EPA Clean Air Act, Title VI, Section 608- Compliance with the Refrigerant Recycling Rule
- International Performance Measurement & Verification Protocol, Volume III EVO30000.1-2006

Building Materials

- EPA Comprehensive Guide for Procurement of Products Containing Recovered

Materials; Recovered Materials Advisory Notice III; Final rule (1/19/00) 40 CFR Part 247

- **Triangle J Council of Governments, "Waste Spec"- Model Specification for Construction Waste Reduction.**
- **Forest Stewardship Council Principles and Criteria**

Indoor Environmental Quality

- **ASHRAE 62.1- 2007: Ventilation for Acceptable Indoor Air Quality**
- **Sheet Metal & Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings Under Construction, Chapter 3, November 2007**
- **EPA Compendium of Methods for Determination of Air Pollutants in Indoor Air**
- **South Coast Air Quality Management District Rule No. 1168, Amended 1/7/05**
- **Green Seal Standard 36 (GS-36), 10/19/2000**
- **Green Seal Paints and Coatings Requirements- Paints (GS-11), GC-03.**
- **South Coast Air Quality Management District Rule No. 1113**
- **Carpet and Rug Institute Green Label Indoor Air Quality Test Program**
- **ASHRAE Standard 55- 2004**

END

WMU Landscape Services Best Management Practices



May 2012

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WMU Landscape Services complies with all environmental laws and regulations.

A. Irrigation

Management Responsibility

1. Assign management responsibilities (scheduling, evaluation, and repairs) for the irrigation system.
2. Ensure system managers have received necessary training on proper use, operation, and capacity of the system.
3. Ensure system managers have received necessary training to adjust or shutdown the system based on prevailing or impending weather conditions.
4. Ensure system managers stay current with the technological improvements and investigation those that optimize efficiency and the conservation of water.

Scheduling

1. Establish a base irrigation schedule to determine the initial frequency of operation.
2. Decide daily whether or not irrigation is necessary.
3. Determine application rate by:
 - ET calculation, on-site data
 - ET calculation, off-site data
 - Soil moisture probing (not available at this time)
 - Visual observation
 - Weather prediction
 - Accounts for daytime water use (syringing, watering in applications, etc.)
 - Consider pest related stress
4. Observe for the presence of puddles during and after irrigation cycles. (Water application rate does not exceed soil infiltration rate.)
5. Ensure the irrigation cycle maximizes output to compress "water window," and takes advantage of "off-peak" electricity costs.
6. Use programming software to help calculate irrigation rates.
7. Ensure all schedule changes and data entries are *double-checked*.

Monitoring

1. Check the central control computer after each irrigation event to ensure the system ran as expected.
2. Perform a field check after each irrigation event to evaluate the effectiveness of the schedule by assessing plant health and soil moisture. Adjust the irrigation schedule to avoid applying excessive irrigation water.
3. Check booster pump station daily. (Pump station located off site, owned by city.)
 - Water-use record is reviewed regularly to monitor for excessive water use, indication potential leaks. Rapid pressure loss from system, during non-watering periods may also indicate a leak.
 - Control panel is checked for electrical faults or errors.
 - Routinely inspect pumps, piping, and backflow preventers.
4. Routinely verify proper operation and performance of irrigation components several times per season.

Record Keeping

1. Record changes or repairs to the irrigation system. (See document on page 16.)
2. Keep a record of volume of water used every month the system is running. Note water use after each irrigation event.
3. Submit all mandated reports when required to do so.

System Maintenance

1. Perform a daily field check to look for system leaks and problems.
2. Perform minor repairs quickly. Keep spare heads and common repair parts on hand.
3. Trim turf around valve boxes.
4. Remove obstructions to sprinkler heads quickly.
5. Test all sprinkler heads from a central control several times a year.
6. Apply water only where needed. Avoid overthrow to hardscapes, natural areas, etc. Part-circle heads or smaller nozzles are installed and individual heads turned off as needed.
7. Ensure test equipment is available for trouble-shooting electrical and wiring problems.
8. Check grounding of pump station, field satellites, supply wells, and other components at least once per season, or after lightening strike or significant electrical surges.
9. Follow proper winterization procedures.
10. Follow proper spring start-up procedures.

Conservation Practices

1. Decide daily whether or not to irrigate, based on turf requirements and anticipated weather conditions.
2. Observed turf conditions after every irrigation event to evaluate water use efficiency. Modify irrigation schedule accordingly.
3. Take advantage of "cycle and soak" programming features where water requirements exceed infiltration rates.
4. Use cultural practices to improve infiltration rates and maximize water use efficiency.
 - Raise mowing height during drought
 - Top dress soil
 - Dethatch
 - Aerate
5. Use soil amendments to improve soil moisture balance.
6. Apply appropriate nutrients to maximize turf grass vigor and minimize excess shoot growth.
7. Use supplemental hand-watering to precisely apply water only where needed.
8. Ensure irrigation system is connected to rain sensors that automatically suspend irrigation cycle.
9. Use local or on-site weather station data to accurately determine ET.
10. Use drought tolerant plants where possible.
11. Ensure a water audit has been performed on the system.
 - In-house or contractor
 - Small sampling of system

- Large sampling of system
 - Problematic area
12. Investigate and research a system which includes alternative water delivery technologies (e.g. drip or weep systems) for difficult-to-irrigate areas.
 13. Investigate and research reclaimed water for irrigation.

B. Pesticides

Storage

1. Store all chemical pesticides in a separate building.
2. Provide secondary containment if floors of storage unit are pervious.
3. Ensure storage area is secured from the public and employees without proper training.
4. Post emergency phone numbers in an accessible spot with all appropriate numbers.
5. Ensure storage area is properly vented.
6. Dedicate a spill kit to the storage area. Ensure it is easily accessible.
7. Store pesticides and fertilizers separately from each other to prevent vapor or spill cross contamination.
8. Ensure an eyewash station is available.

Mixing and Loading and Operating Procedures

1. Ensure mixing and loading pad is designed to contain spills, leaks, releases, and other discharges.
2. Ensure mixing and loading pad is constructed with impervious materials and free of unsealed cracks.
3. Ensure mixing and loading pad can handle one minute of discharge.
4. Ensure material collected on the pad is either contained on the pad or transferred to another impervious, above ground holding tank until used or properly disposed.
5. Ensure a spill kit is available on the sprayers and in the mixing and loading area.
6. Attend the equipment the entire time it is being filled.
7. Locate primary shutoff valve within reach of the operator.
8. Locate emergency valve upstream of the primary shutoff valve positioned within 30 seconds of the operator.
9. Ensure there is a properly functioning anti-siphoning device on all water drawing equipment.
10. Close containers immediately after each use to prevent spills.
11. Triple or power rinse pesticide containers after being emptied.
12. Store pesticide containers in a secured area until they can be recycled or properly disposed of according to label directions.
13. Read entire pesticide label prior to actually opening and handling the formulated product.
14. Always wear all the necessary PPE when mixing and loading.
15. Wear additional PPE when the likelihood of pesticide exposure exists.
16. Keep container below eye level when pouring pesticides.

Handling and Application

1. All applicators must have the proper credentials (pesticide certification.)
2. Keep all MSDS sheets on file for all chemicals used by employees.

3. Keep drift management plan on file.
4. Postpone application if weather conditions favor off-target drift.
5. Identify sensitive areas adjacent to the application site. (See Appendix A)
6. Use precautionary measures to prevent discharge of pesticides.
7. Check Registry of Persons Requiring Notification before applying pesticides.
8. Correctly identify pest problem.
9. Ensure pest is in a vulnerable life stage before spraying.
10. Measure treatment area accurately.
11. Consider and account for soil conditions that might impact the efficacy or stability of the pesticide.
12. Account for special features of the site when planning pesticide application. Leave a buffer between your application area and special features.
13. Consider the following during the selection of a pesticide:
 - Formulation
 - Packaging
 - Signal word
 - Run-off and leaching potential
 - Efficacy
 - Treatment intervals
 - Persistence
 - Availability of PPE required by pesticide label on Reg. 637, Rule 9
14. Verify that the application site is listed on the pesticide label.
15. Read pesticide label completely.
16. Introduce staff members to new products, and provide an in-house educational Pesticide Program for staff members each spring before pesticides are used for the season.
17. Host yearly training event in collaboration with Environmental Safety & Emergency Management on Emergency Spill Response and Stormwater BMPs.
18. Maintain records of the following information for all general-use pesticide applications for at least three years from the date of application:
 - EPA Registration Number
 - Pesticide product name and concentration
 - Amount of pesticide applied
 - Target pest, purpose, or crop site
 - Date of application
 - Address or location of application
 - Method and rate of application
19. Do not spray pesticides if wind is over 7mph.
20. Maintain records of when and where a drift management plan was used. Maintain general-use records for at least one year and restricted-use pesticides (RUP) for at least three years.
21. Keep application equipment in good mechanical condition.
22. Routinely calibrate the application equipment. (See document on page 17.)
23. Ensure there are shut-off valves on the application equipment to prevent discharge.
24. Include a spill kit (shovel and absorbent material) on the application equipment.
25. Ensure application equipment meets the pesticide label requirements.

Criteria

Institution's grounds are developed and maintained in accordance with an integrated pest management plan that adheres to the following four-tiered approach:

1. *Set action thresholds*
2. *Monitor and identify pests*
3. *Prevention*
4. *Control*

The size of the campus grounds 1,233 acres

The size of campus grounds
that is maintained in accordance
with a four-tiered IPM plan 1,233 acres

A brief description of the Integrated Pest Management (IPM)
plan(s)

- Use of IPM Practices for all pest control activities:
 - o We apply the least toxic pesticide only after proper protocols are followed using all strategies of IPM practices first and foremost. All pesticides are scrutinized by our Environmental Health and Safety department and the director's approval is needed before we are allowed to use a product. Two major factors determine whether or not a product can be used; human toxicity and environmental effects. When a chemical is approved, everyone involved receives safety training.
 - o We have never applied pesticides on a regular schedule. It's always done on an "as needed" basis, and we always follow IPM tactics. All chemical applications are documented and copies are kept in our files as required by the Natural Resources and Environmental Protection Act 451, Part 83, Pesticide Control and Regulation 636.
 - o *Please see the attached pesticide application record form.*

Guiding Principles for the Use of Herbicides at WMU Grounds and Natural Areas:

1. Herbicide should be used when appropriate and only after careful consideration of alternate methods.
2. Herbicide use and application must occur at a time in which the herbicide is selective as possible for the target species.
3. The lowest dose of the least toxic and least persistent herbicide consistent with effective selective control must be used.
4. Follow all safety and ecological precautions per MSDS label instructions.
5. Use all-natural herbicides (containing vinegar, clove oil, etc.) when effective.

Guidelines for Herbicide Application by WMU Employees:

- WMU employees must have up-to-date pesticide certification.
- Herbicide may be applied using the cut and daub method.
- Herbicide may be applied by injective Glyphosate pellets into tree trunks.
- **Only** Glyphosate may be used unless scientific literature and/or field evidence supports the use of another herbicide for a specific invasive. Use of any other herbicide must be pre-approved by WMU's Natural Areas Manager and the Landscape Services Director.
- Broadcast spraying is only allowed under special circumstances:
 - o Only Glyphosate or all-natural herbicide may be used
 - o Appropriate signage must be posted
 - o A plan for planting native vegetation in the area sprayed must be in place
 - o This method must be pre-approved by WMU's Natural Areas Manager and Landscape Services Director

Herbicides Permanently Banned from use at WMU:

- Diquat dibromide
- Paraquat
- 2,4-D
- Rotenone

The website URL where
information about the IPM plan
is available

http://www.fm.wmich.edu/lss/governing_documents

PESTICIDE APPLICATION RECORD

DATE: _____

APPLICATOR: _____ CERTIFICATION# _____

SUPERVISOR OF APPLICATOR: _____ CERTIFICATION# _____

PESTICIDE INFORMATION:

Product _____ EPA Registration# _____

Brand Name _____ Case & Lot# _____

Formulation (% Active Ingredient) _____

Total Amount of Concentrate Applied _____

Form: Soluble _____ Flowable _____ Wettable Powder _____

EC _____ Granular _____ WDG _____ RTU _____

Signal Words on Label: Danger/Poison _____ Warning _____ Caution _____

APPLICATION INFORMATION:

Target Pest _____

Species Treated _____

Area#/Description
Start Time
End Time
Air Temperature
Wind Direction
Wind Speed
Relative Humidity

Type of Area Treated (Pavement, Beds, Lawn, etc)

Total Area Treated (Acre, Square Footage)

Total Amount of Mixture Applied _____

Application **Equipment** _____

Applicator Signature _____ Date _____

Supervisor Signature _____ Date _____ 7

Disposal

1. Dispose of pesticide containers as directed on the pesticide label.
2. Enforce a procedure for handling pesticide containing materials (PCMs).

C. Fertilizer

Storage

1. Store all chemical fertilizers in a separate building.
2. Provide secondary containment if floors of storage unit are pervious.
3. Ensure storage area is secured from the public and employees without proper training.
4. Post emergency phone numbers in an accessible spot with all appropriate numbers.
5. Ensure storage area is properly vented.
6. Dedicate a spill kit to the storage area. Ensure it is easily accessible.
7. Store pesticides and fertilizers separately from each other to prevent vapor or spill cross contamination.
8. Ensure an eyewash station is available.

Handling and Application

1. Use only non-phosphorous fertilizer in all lawn areas. Special exceptions may be made in cases where lawn/turf is phosphorous deficient or is in its first growing season (see Public Act 299).
2. Apply a maximum of 2 pounds of Nitrogen per season per LEED certified areas.
3. All fertilizers must meet the approval of Landscape Services Director before being purchased and applied. (Includes all contracted lawn fertilization program products.)
4. Areas where fertilizer is sprayed onto impervious surfaces must be blown/swept into lawn area in a timely fashion.
5. Applicators must read and understand all label instructions for application and calibration rates.
6. Clean equipment after every use.

D. Mowers

Operation & Guidelines

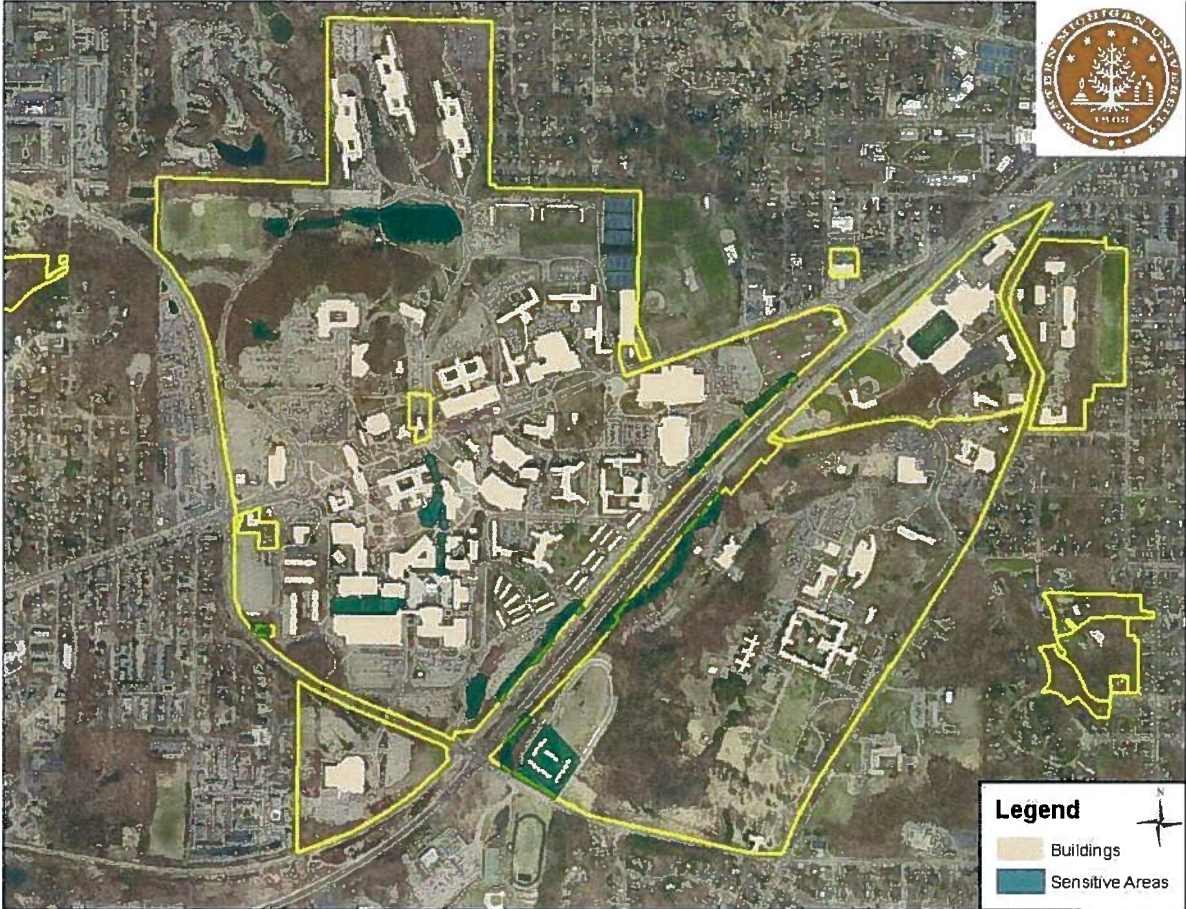
1. Use mulching mowers for routine mowing and mulching of leaves during the fall season.
2. Do not mow within 12 to 25 feet around water bodies where possible. **If** mowing within 12 feet or less is unavoidable, ensure no debris enters water body. Always mow with chute side in, and complete two passes around the perimeter and then proceed with mowing pattern.

Curblines, Roadways, Parking Lots, and Sidewalks

1. Mow with chute side in.
2. Complete two passes around the perimeter and then proceed with mowing pattern.
3. !flittering of impervious surfaces with grass clippings is unavoidable, clippings must be blown/swept back into the lawn area in a timely fashion.
4. Sweep mower clean-up area daily and place grass clippings in yard waste dumpsters.
5. Replace all yard waste/composting.

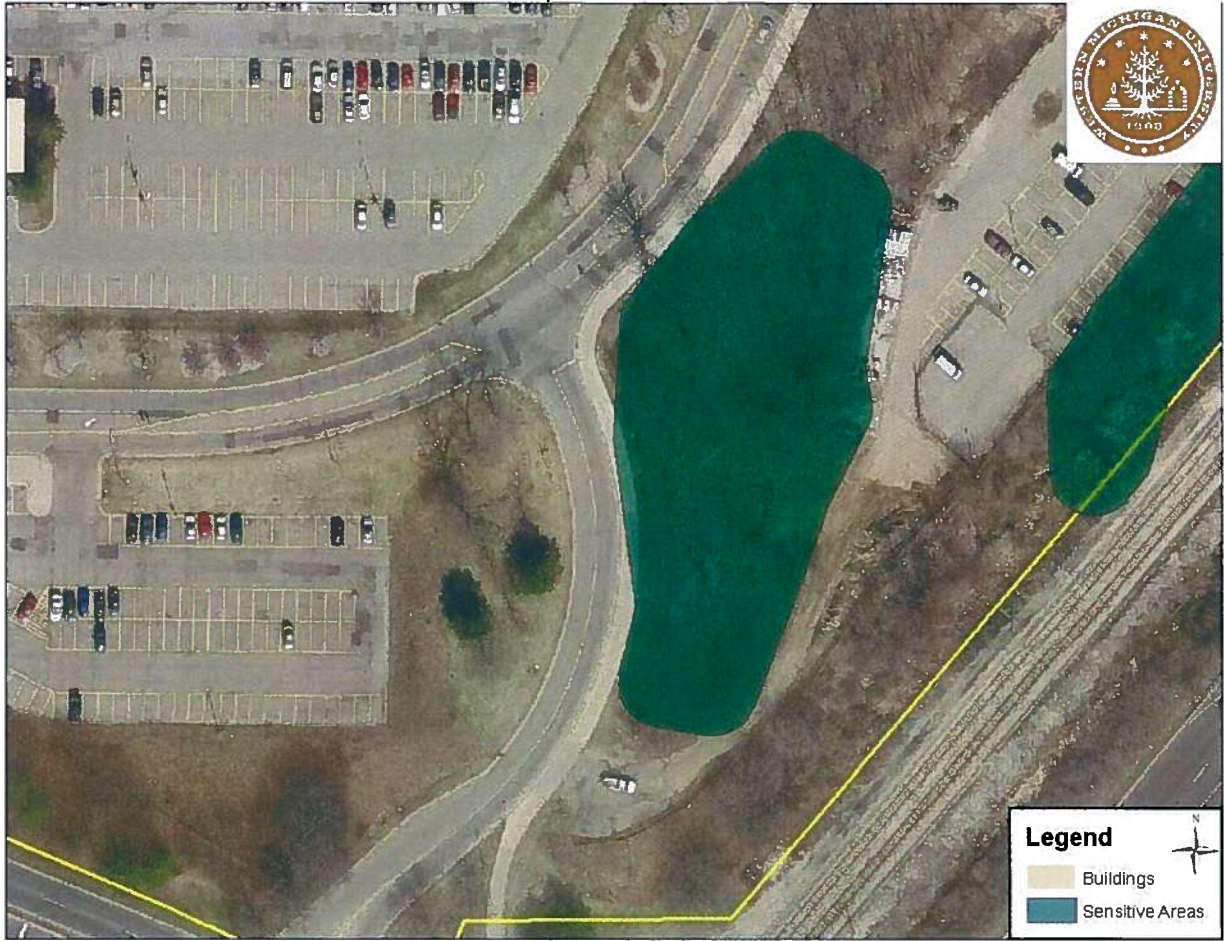
E. Appendix A: Maps

Sensitive Landscape Areas- 25 Foot Buffer



Lot 23

Sensitive Landscape Areas- 25 Foot Buffer



Arcadia Creek

Sensitive Landscape Areas- 25 Foot Buffer

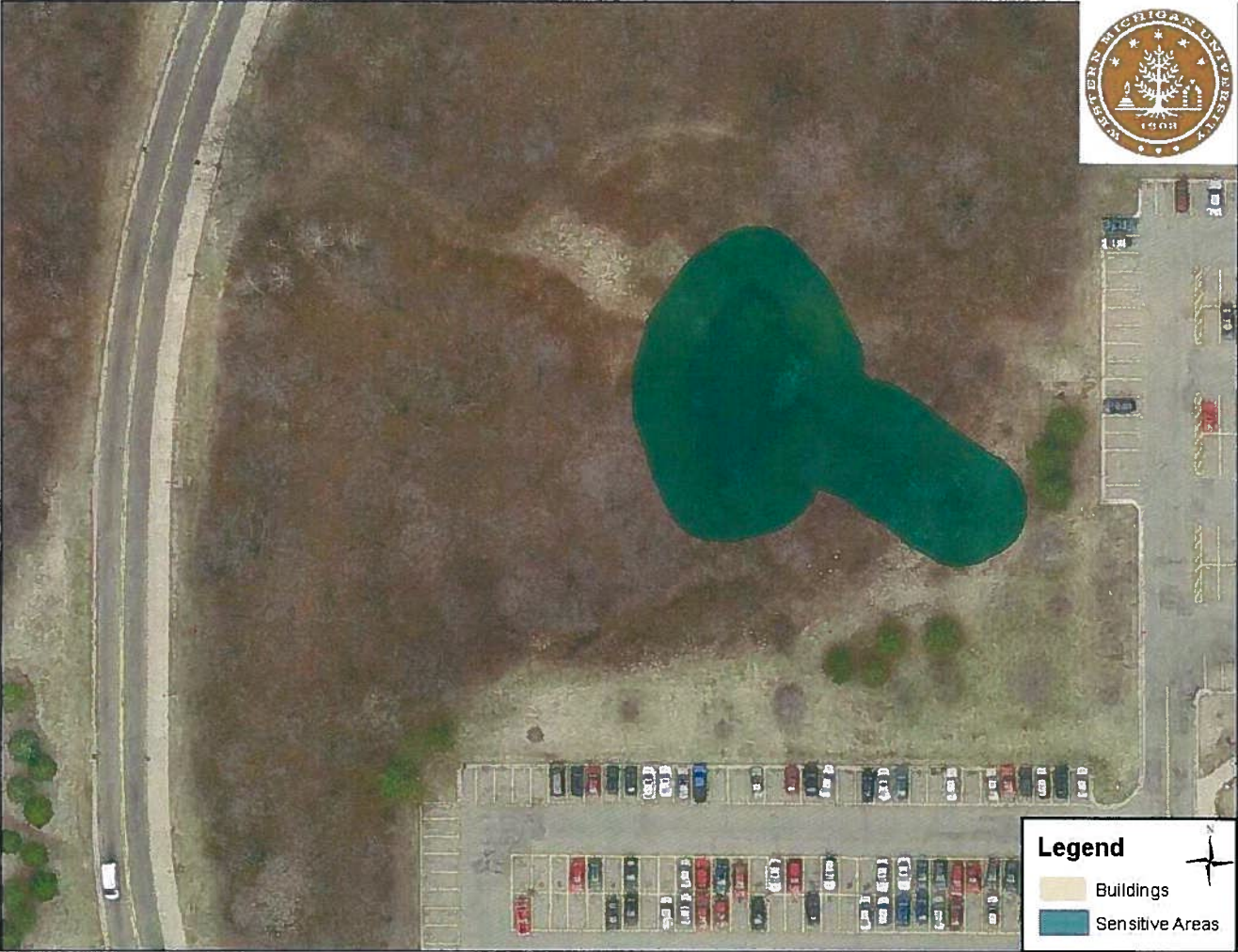


Arcadia Creek/Stadium Drive

Sensitive Landscape Areas- 25 Foot Buffer



Business College Retention Sensitive Landscape Areas- 25 foot buffer



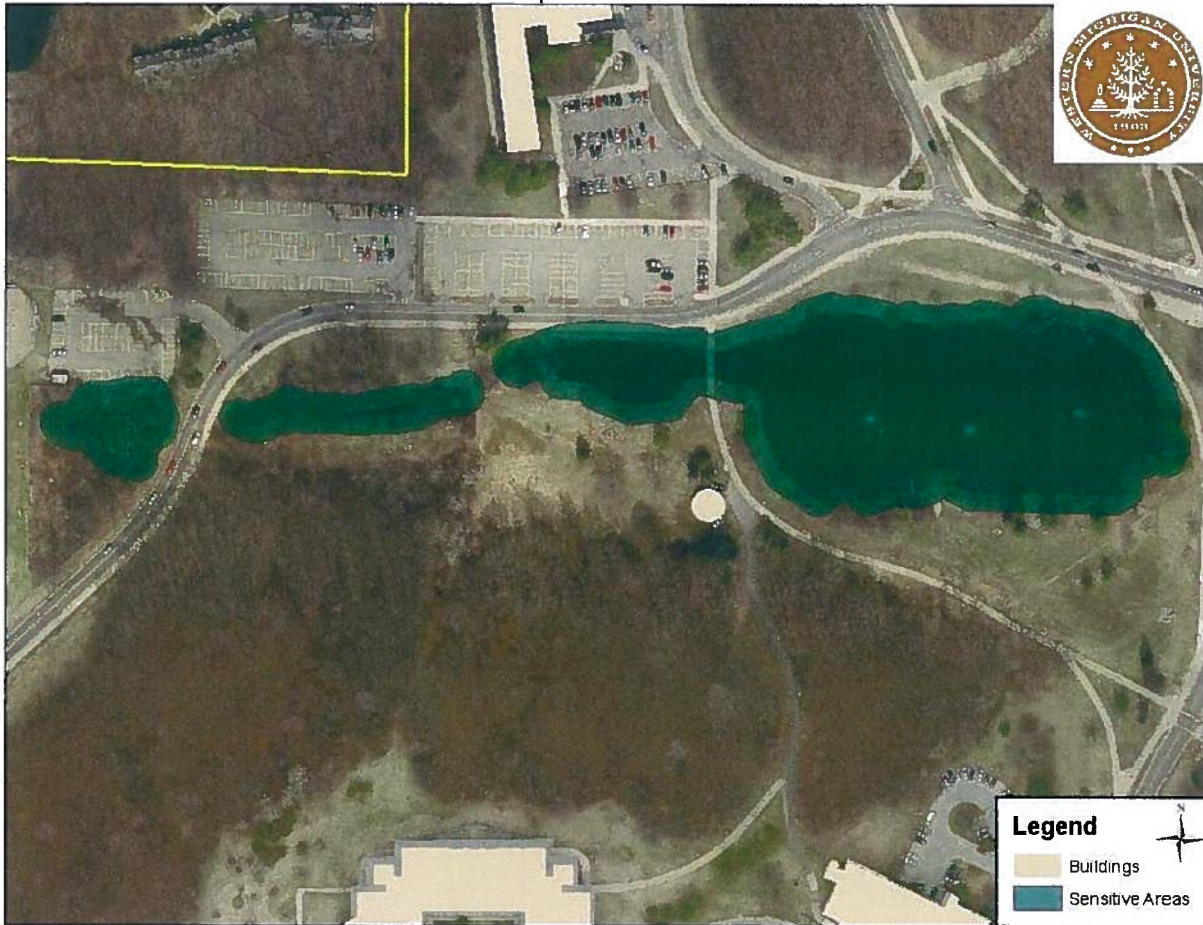
Chemistry Detention

Sensitive Landscape Areas- 25 Foot Buffer



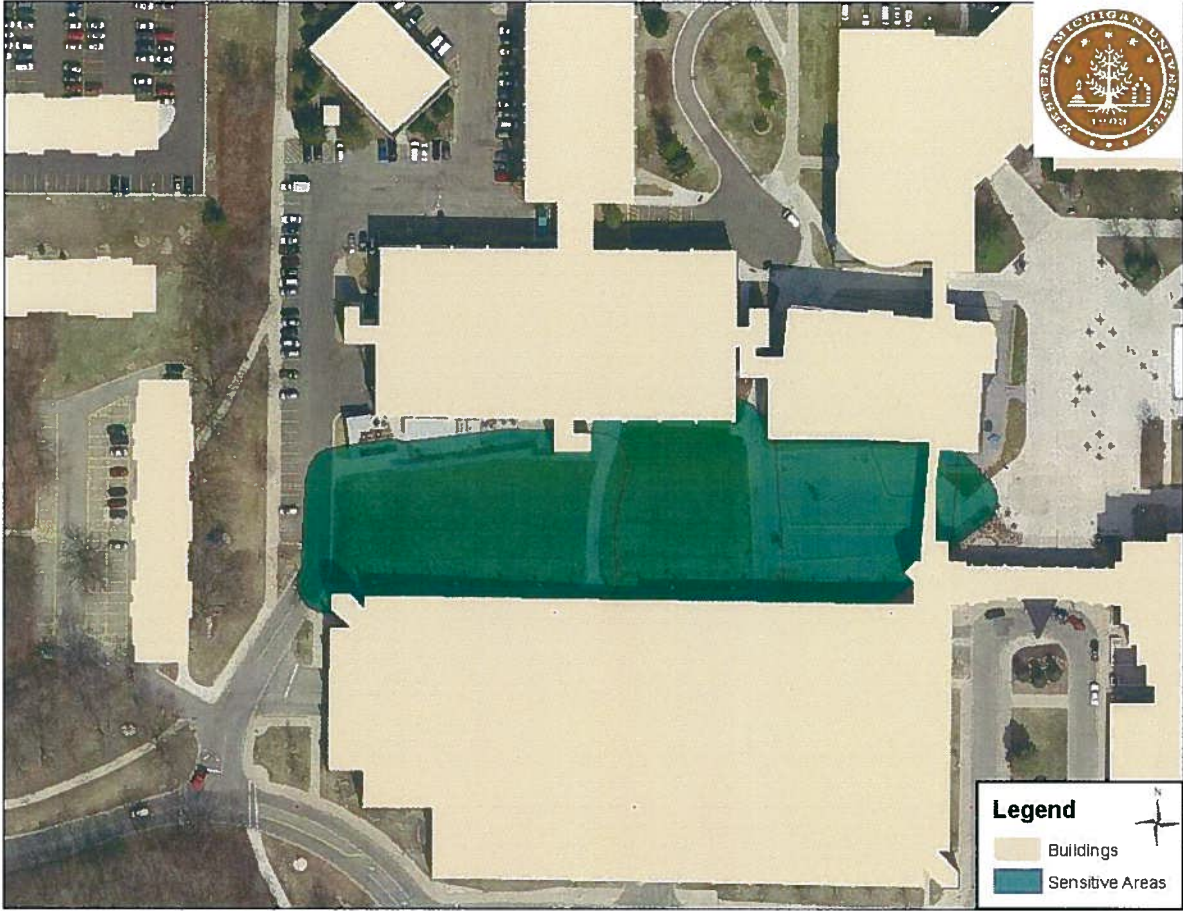
Goldsworth Valley Pond

Sensitive Landscape Areas- 25 Foot Buffer



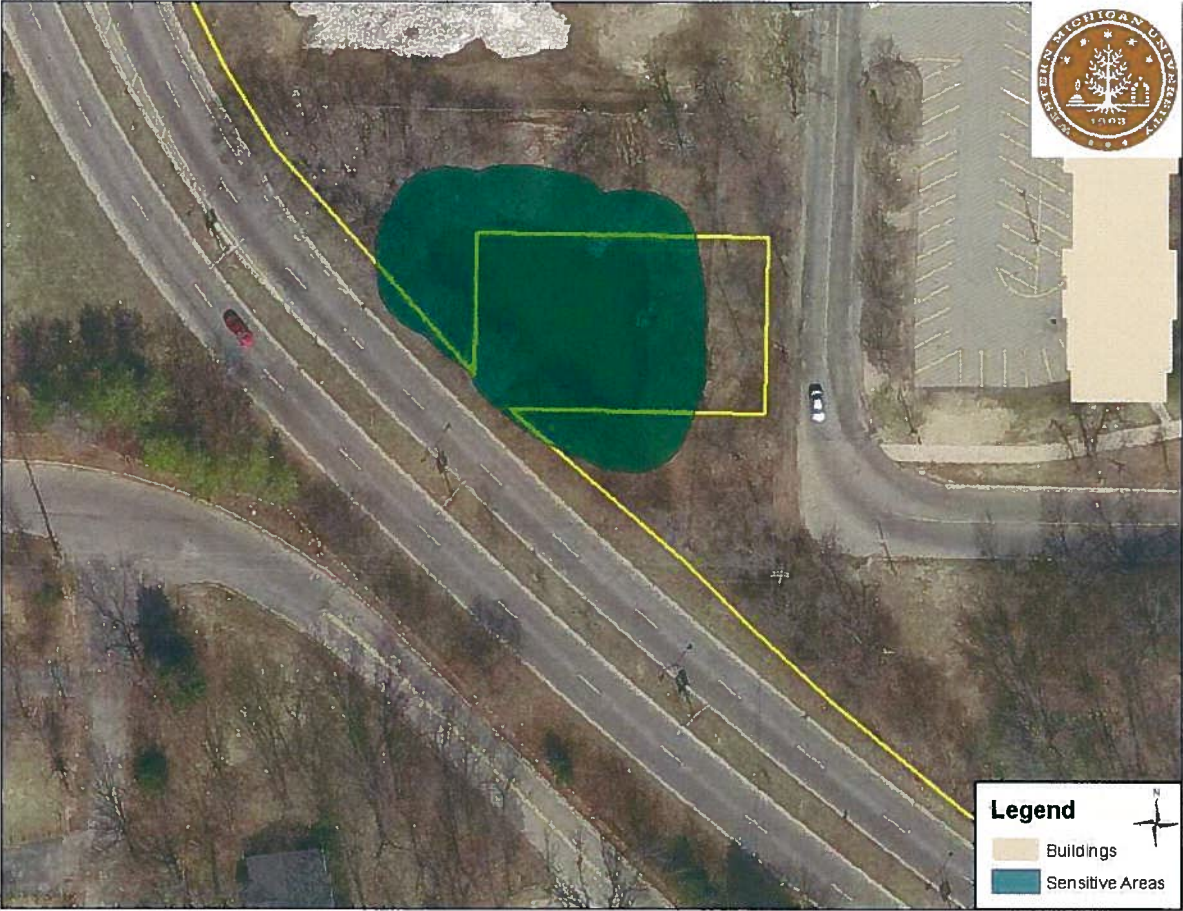
RCVA

Sensitive Landscape Areas- 25 Foot Buffer



WVA Retention

Sensitive Landscape Areas- 25 Foot Buffer



All maps can be found at L:\Shared\LSshared\LS Policies and Procedures\Sensitive Areas Maps

F. Appendix B: Records



Irrigation System Repairs & Alterations

WMU Landscape Services

Date	Time	System	Repairs/Alterations

Pesticide Equipment Calibration Record

WMU Landscape Services

Date	Equipment Calibrated	Calculations Used	Description of Calibration Methods Used

All records can be found at L:\Shared\Lshared\LS Policies and Procedures\Records

Custodial

Green Cleaning



Green Cleaning Policy

1. To reduce the exposure of building occupants and maintenance personnel to potentially hazardous chemical, biological and particulate contaminants, which adversely affect air quality, human health, building finishes, building systems and the environment.
2. Scope
 - 2.1. WMU BC&SS will encourage purchasing of certified green cleaning equipment.
 - 2.1.1. Cleaning, hard floor, and carpet care products meeting the Green Seal GS-37, for general purpose, bathroom, glass and carpet cleaners used for industrial and institutional purposes. Disinfectants, metal polish, floor finishes, strippers or other products not addressed by Green Seal GS-37 must follow Green Seal GS-40, for industrial and institutional floor care products.
 - 2.1.2. Vacuum cleaners are certified by the Carpet and Rug Institute “Green Label” Testing Program for vacuum cleaners and operate with a sound level of less than 70dBA.
 - 2.1.3. Carpet extraction equipment used for restorative deep cleaning is certified by the Carpet and Rug Institute’s “Seal of Approval” Testing Program for deep-cleaning extractors.
 - 2.1.4. Powered floor maintenance equipment, including electric and battery-powered floor buffers and burnishers, is equipped with vacuums, guards and/or other devices for capturing fine particulates and operates with a sound level of less than 70dBA.
 - 2.1.5. Propane-powered floor equipment has high-efficiency, low-emissions engines with catalytic converters and mufflers that meet the California Air Resources Board (CARB) or Environment Protection Agency (EPA) standards for the specific engine size and operate with a sound level of less than 90dBA.
 - 2.1.6. Automated scrubbing machines are equipped with variable-speed feed pumps and on-board chemical metering to optimize the use of cleaning fluids and minimize the use of water. Alternatively, the scrubbing machines can maximize the use of only tap water with no added cleaning products.
 - 2.1.7. Battery-powered equipment will be equipped with environmentally friendly gel batteries, preferred.
 - 2.1.8. Power equipment is ergonomically designed to minimize vibration, noise, and user fatigue to insure health and safety of users.
 - 2.1.9. Equipment is designed with safeguards to reduce potential damage to building surfaces e.g. rollers, bumpers.

- 2.2. BC&SS has established standard operating procedures to address how an effective cleaning, hard floor, and carpet maintenance system will be consistently utilized, managed, and audited. This will specifically address cleaning to protect vulnerable building occupants, such as those with asthma, other respiratory conditions, or sensitive or damaged skin.
 - 2.2.1. A written floor maintenance plan and log will be kept that details the number of coats of floor finish applied, including base and top coats, along with relevant maintenance and restoration practices and the dates of these activities.
 - 2.2.2. The duration between stripping and refinishing cycles will be documented.
- 2.3. BC&SS will develop strategies for promoting and improving hand hygiene, including the following:
 - 2.3.1. Hand washing
 - 2.3.1.1. Offering of an educational program.
 - 2.3.1.2. Posters will be provided in lavatories.
 - 2.3.2. Use of alcohol-based waterless hand sanitizers.
 - 2.3.2.1. Alcohol-based hand sanitizer must be readily provided in public areas
 - 2.3.3. Hand soaps must not contain antimicrobial agents (other than as a preservative system), except where required by health codes and other regulations.
 - 2.3.4. Hands-free dispensers must be used for custodial paper products to eliminate levers and cranks that users share.
- 2.4. BC&SS has developed guidelines addressing the safe handling and storage of cleaning chemicals used in the building, including a plan for handling hazardous spills or mishandling incidents.
 - 2.4.1. A log should be kept that details all housekeeping chemicals used or stored on the premises.
 - 2.4.2. Cleaning products procured for use in the building should meet the requirements stated in section 2.1.
 - 2.4.3. Proper containment, storage and dispensing techniques should be implemented
 - 2.4.4. Proper hot and cold water supplies and drain systems in custodial closets for the use of chemical dispensing and dilution should be installed
 - 2.4.5. Portion controlled dilution equipment or pre-measured pouches of chemical concentrates should be used.
- 2.5. BC&SS will develop requirements for staffing and training custodial personnel appropriate to the needs of the building. These requirements will specifically address the training of custodial personnel in the hazards of use, disposal, and recycling of cleaning chemicals, dispensing equipment, and packaging. Staffing is based on meeting the needs of APPA level 2 standards with defined cleaning frequencies. ISSA cleaning times have been used as a standard by which to measure the productivity (sq ft per hr) produced by each custodian. It is to be noted that a "relief crew" is being utilized to cover any planned or unplanned absences within the department. Should the relief crew number exceed the number of absences for the day, they are automatically assigned detail work to increase the cleaning

service level for their assigned area.

2.5.1. Training records certifying each person's specific training dates should be documented.

2.5.2 Employee training is to contain comprehensive training upon hire, and implement a quarterly review. Topics will rotate within the quarterly review. Training will include classroom review, computer based training and assessment and hands-on work. Topics will include: "green cleaning" basics and "Why go green" education; cleaning for appearance and health- "what's the difference?"; green chemicals; equipment (proper use to avoid repetitive motion injuries); practical procedures. Practical procedures include some of the science behind cleaning chemicals – where to use what and when and why; cleaning approaches to various areas (restrooms, classrooms, hallways, offices, stairwells, entrances, floor care maintenance, carpet care ...)

2.6. BC&SS has developed provisions for collecting occupant feedback and continuous improvement to evaluate new technologies, procedures, and processes:

2.6.1. Implement an occupant survey and compliant response system

2.6.2. Document survey results and remedial actions taken.

2.7 Paper supplies (paper towel, toilet paper) are 100% green seal certified post consumer recycled paper.

3. Performance Metric

3.1. Green cleaning equipment purchases should meet the guidelines in Section 2.1

3.2. Documentation of the type of chemical, volume, and concentration used in all cleaning processes must be maintained.

3.3. Documentation of the frequency of each cleaning process must be maintained.

3.4. Records and documentation for all guidelines, training, occupant feedback, and other strategies must be maintained.

3.5 Quality Assurance / Quality Control- APPA standards have been used to set the expectation for the cleaning service provided. A level 2 has been set as a goal. With individual task frequencies set accordingly. Inspection guidelines have been developed to promote consistency of expectation i.e. individual items per area – baseboards, window sills, corners- floors, corners-walls, corners- ceiling. Parties responsible for quality control are as follows: custodians- self monitor work completed; supervisors- follow up custodians once work is completed, supervisors will have one official inspection area of a building per day (e.g. classrooms); managers- follow up with the custodians and supervisors once work is completed and to insure consistency among supervisors and custodians, managers will have one official inspection area of a building per day (e.g. "Sample" Hall restrooms on 2nd floor); inspectors- inspectors will follow up with the custodians, supervisors and managers once work is complete to insure consistency among the different groups and to inspect larger areas on an on-going basis (i.e. one building, all areas per day). Inspection items are either acceptable or unacceptable and will generate a passing (above 80%) or failing percentage grade (below 80%) for the area inspected (i.e. "Sample" Hall 2nd floor restroom 205- 87%). Items that failed will be noted i.e. mirror is spotted; partition walls had graffiti. This information is then passed along to the supervisor to assign the task for completion. Inspections will be gathered for the week to generate an overall grade for the building, as well as a building area grade i.e. "Sample" hall restrooms 87%. Monthly building grades and building area

grades will be tracked on a weekly and monthly basis to develop a tracking system to monitor progress.

4. Performance Goals

4.1. BC&SS will strive to identify and use low-environmental-impact chemicals in its cleaning policies while reducing exposure of occupants to chemical hazards. BC&SS will also dispose of and/or recycle cleaning materials and chemicals in a sustainable manner.

5. Procedures and Strategies

5.1. BC&SS are responsible for:

5.1.1. Adopting a purchasing policy to sustainable cleaning products and equipment.

5.1.2. Establishing and enforcing standard operating procedures for consistent use of floor cleaning system. .

5.1.2.1. Providing ongoing documentation of enforcement.

5.1.3. Implementing strategies to improve hand hygiene.

5.1.4. Developing and enforcing guidelines for handling safe storage and cleaning chemicals.

5.1.4.1. This must include plan for managing hazardous spills.

5.1.5. Implementing training for staff and maintenance personnel.

5.1.6. The collection of occupant feedback.

6. Responsible Parties

6.1. Custodians- Custodians are knowledgeable of and responsible for the hands-on implementation of the department's green cleaning policy. They will implement and follow the cleaning frequencies set forth in the department's SOP (standard operating practices) utilizing the prescribed equipment, materials and chemicals. Custodians will utilize a daily check list to insure proper completion of cleaning frequencies and assigned duties

6.2. Supervisors- Supervisors are knowledgeable of and responsible for overseeing the department's green cleaning policy. Supervisors will train and correct custodians as needed- chemical usage, proper equipment use and maintenance. Supervisors will follow up with assigned duties to insure proper cleaning has taken place, following the department's SOPs and to monitor quality of completed tasks. Supervisors will monitor and track supply/chemical/equipment usage.

6.3. Managers- Managers are knowledgeable of and responsible for overseeing the proper adherence to the department's green cleaning policy. Managers will coordinate and direct supervisors and employees to meet the needs of the customer and match them with the resources of the department.

7. Time Period.

7.1. This policy will remain in effect going forward from its inception date, (06/15/2012).

How has WMU gone green?

WMU has a formal sustainability committee

Any new construction must be LEED certified

30% Waste diversion

80% of cleaning chemicals are green certified

WMU has an Environmental Studies program

100% of the WMU grounds are maintained organically

[Click here for more information on how WMU has gone green.](#)

How has BCSS gone green?

BCSS uses the Kaizen No-Touch Cleaning system, which is a multipurpose system that helps eliminate unnecessary equipment and automatically proportions chemicals to reduce waste.

BCSS vacuums are certified by the Carpet and Rug Institute's Green label.

BCSS uses window washing machines that employ the reverse osmosis de-ionizing technology. The machines produce mineral free water, which cleans windows spot free without the use of cleaning agents.

BCSS uses environmentally friendly machines.

BCSS uses green chemicals with less packaging and measured delivery systems.

BCSS uses the 3M Twist N' Fill chemicals and system. The chemicals can be disposed safely to water treatment facilities.

BCSS switched to EcoSoft™ towels which are made from 100% recycled fibers and meet EPA guidelines for post-consumer waste content.

BCSS's STOKO REFRESH foam soap is dye and fragrance free and is Green Seal certified.

BCSS's foam hand sanitizer is environmentally friendly, using no fluorinated chemicals.

What is Green Cleaning?

Green Cleaning is defined as cleaning to protect health without harming the environment. Green Cleaning is a new cleaning movement that takes into account: (1) the health, safety, and environmental risks of products and processes associated with cleaning; (2) the mission and use

of the facility to be cleaned and the behavior of the facility occupants; and (3) the cleaning, maintenance, and sanitation needs of the facility and its occupants.

In other words, it is an approach to cleaning that involves the use of alternative products, procedures, and equipment to reduce environmental and health risks while maintaining a satisfactory level of cleanliness.

Why do we Green Clean?

Studies have shown that facilities that go green have healthier occupants and employees, higher worker productivity, lower operating costs, and a positive environmental impact.

Green cleaning helps improve indoor air quality and reduce health problems that traditional products and processes can cause. With green cleaning building occupants experience fewer incidences of irritations or sensitivities to the indoor environment.

Healthier employees mean happier employees. Statistics show worker satisfaction, improved morale, reduced absenteeism and increased productivity and efficiency can occur when a facility is maintained using green cleaning processes and chemicals. Employees and customers appreciate knowing that green practices are used in the building they occupy. A green cleaning program also helps WMU be the environmentally conscious university it is.

Green cleaning has the same effectiveness as traditional cleaning, and has little or no cost increase; the return on investment for switching to green cleaning is immense.

The bigger picture associated with green cleaning is that it is better for the environment. In the United States, commercial buildings consume 17% of the water, 33% of the energy, 40% of the raw materials, and 71% of the electricity. They produce, directly or indirectly, 40% of the landfill waste, 33% of the carbon dioxide, 49% of the sulfur dioxide and 10% of the particulate emissions.

When we take on the responsibility of switching to green cleaning and other green building practices, together we, as a university and a world, can make an enormous improvement to our overall environment...and that is why we green clean.

How do we Green Clean?

Building Custodial & Support Services achieves green cleaning through the use of green equipment, processes, and products.

Employing the use of green equipment and processes saves energy and increases productivity. BC&SS uses several different types of equipment that allows for buildings to be cleaned effectively, while also promoting sustainability. These items and processes include:

- KaiVac Cleaning Systems
- CRI Vacuums
- Clarke CR28 BOOST Rider
- Strive Rider with Ready Space Automatic Extractors
- RODI (Reverse Osmosis De-Ionizing) window cleaning system

WMU has switched to the use of green paper products within BC&SS. Toilet paper is 20% post-consumer waste and paper towels are 100% post-consumer waste as well as 100% recycled fiber. BC&SS also has an ongoing donation program of partial paper product rolls to community service organizations.



New Sangren Hall CFC Phase out Plan

In response to LEED New Construction Energy and Atmosphere prerequisite 3, Western Michigan University (WMU) is providing this chlorofluorocarbon (CFC) phase out plan for the Schneider Hall chiller plant. The Schneider Hall chiller plant operates four chillers (Table 1, Attachment 1), and is the central chilled water plant for four buildings including new Sangren Hall.

Table 1

Schneider Hall Chiller Plant							
Chiller Tag #	Type	Make	Model	Year	Capacity (Tons)	Refrigerant (Type)	Refrigerant (Lbs)
083CWCH1	Centrifugal	Trane	CVHE032	1990	336	R-11	580
083CWCH2	Centrifugal	Trane	CVHE032	1990	336	R-11	580
083CWCH3	Absorption	Thermax	Model SS	2012	323	N/A	N/A
083CWCH4	Absorption	Thermax	Model SS	2012	323	N/A	N/A

The Schneider Chiller Plant is located approximately 1,200 feet northwest of new Sangren Hall and was expanded and upgraded in 2012 as part of the new Sangren Hall Project. Energy and Atmosphere prerequisite 3 requires that the project have zero use of CFC-based refrigerants in new base building heating, ventilating, and air conditioning and refrigeration (HVAC&R) systems, or have a plan in place to phase out CFC's within five years. This document serves as our formal commitment to phase out these chillers within five years of the project completion date, which was August 13th, 2012.

Implementation

Since the base HVAC&R systems are part of a central plant, USGBC requires that a comprehensive CFC phase out conversion prior to project completion, or demonstrate a commitment to phasing out CFC-based refrigerates to later than 5 years after the project is completed.

Minimize Refrigerant Leakage

In order to be eligible for a phase out plan, WMU is required to reduce annual leakage rates to less than 5%. Both chillers currently have an annual leakage rate of less than 5%, and therefore can be phased out within 5 years (Table 2, Attachment 2).

Table 2

Schneider Hall Refrigerant Leakage Rate				
Chiller Tag #	Refrigerant Added (Lbs)	Total Charge	Years	Annual Leakage Rate
083CWCH1	116	580	23	0.9%
083CWCH2	0	580	23	0.0%

Phase Out Plan

The two R-11 chillers being addressed by this phase out plan are currently 23 years old, and therefore phase out is considered to be economically feasible since WMU expects these particular chillers to have an expected service life of 25-30 years. WMU currently has 10 electric chillers that are 20 years or older and contain CFC's (Table 3, Attachment 3).

Table 3

R-11 Chillers 20 Years or Older			
Chiller Plant	Chiller Tag #	Refrigerant Type	Age
Miller/Shaw	041CWCH1	R-11	1990
	041CWCH2	R-11	1990
Schneider	083CWCH1	R-11	1990
	083CWCH2	R-11	1990
Waldo	061CWCH1	R-11	1990
	061CWCH2	R-11	1990
Bernhard	059CWCH1	R-11	1987
	059CWCH2	R-11	1987
Kohrman	044CWCH1	R-11	1991
	044CWCH2	R-11	1991

Due to the age and condition of these machines, they will all need to be replaced within the next 10 years. Miller/Shaw has the two machines that are in the worst condition, and Schneider has two machines that are the next in most need of replacement. All replacement machines will use an environmentally preferable refrigerant.

Phase out Date

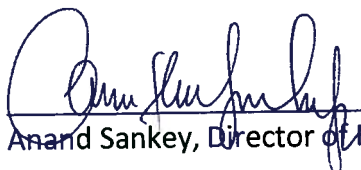
WMU is required to replace the two machines in Schneider no later than August 2017. Replacement of these machines will have to take place outside of the cooling season, and be up and running in spring 2017 for the cooling season.

Phase Out Cost

The approximate cost of replacing the two R-11 chillers in the Schneider chiller plant is \$500,000. The rest of the chiller plant including, pumps, towers, and piping were upgraded in 2012 when the absorbers were added to pick up the load of New Sangren Hall.

Attachments

1. Western Michigan University CFC Program: Identified Equipment with 50 LBS or Greater Refrigerant
2. The Maintenance Authority (TMA) Report: CFC Records for 083CWCH1 and 083CWCH2
3. Western Michigan University Chiller Replacement Study


Anand Sankey, Director of Engineering

4/16/13
Date

Western Michigan University CFC Program
Identified Equipment with 50lbs or Greater of Refrigerant

BLDG. # AND NAME	SYSTEM	LOCATION	REF	AMOUNT (lb)	MAKE	MODEL	SERIAL NUMBER	YEAR	Tag Number
009 OAKLAND RECITAL	AC	208	HCFC 22	50+	Trane	RAUC060GPJ130	J94081096	1994	009REAHU1
015B WALDO STADIUM	AC	2102	HCFC 22	489	York	YCAS-160-46XD	RPGM3999AA	1998	015BRECH1
022 CAMPUS SERVICES	AC	1650	HCFC 22	50+	McQuay	WHRO20CE	5SC0716100		022RECH1
024 LEE HONNORS	AC	0120	HCFC 22	125	Trane	CCAB030	U90A01635	1990	024CWCH1
027 MCCRACKEN	AC	1560	HCFC 22	60	Copeland	4DA3-2000TSK-100	ET57F039835		027RECU1
029 COMPUTER CENTER	AC	1018	HFCC 22	50+	Liebert	FH245AUA10	147331B		029RE1C1
029 COMPUTER CENTER	AC	1018	HFCC 22	50+	Liebert	FH245AUA10	147331C		029RE1C2
029 COMPUTER CENTER	AC	1018	HFCC 22	50+	Liebert	FH245AUA10	147331D		029RE1C3
029 COMPUTER CENTER	AC	1018	HFCC 22	50+	Liebert	FH245AUA10	147331E		029RE1C4
029 COMPUTER CENTER	AC	1018	HFCC 22	50+	Liebert	FH245AUA10	147331F		029RE1C5
029 COMPUTER CENTER	AC	1018	HFCC 22	50+	Liebert	FH245AUA10	147331G		029RE1C6
032 SEIBERT ADMIN.	AC	Roof	HCFC 22	65	Trane	SSHA4006LD	B4G00595		032RECU1
032 SEIBERT ADMIN.	AC	0108	HCFC 22	60	Liebert	FH199AUC10	136727A		032RE1C1
032 SEIBERT ADMIN.	AC	0108	HCFC 22	60	Liebert	FH199AUC01			032RE1C2
032 SEIBERT ADMIN.	AC	0108	HCFC 22	50+	Liebert	CD218A-C	136727B		032RE1C3

Western Michigan University CFC Program
Identified Equipment with 50lbs or Greater of Refrigerant

BLDG. # AND NAME	SYSTEM	LOCATION	REF	AMOUNT (lb)	MAKE	MODEL	SERIAL NUMBER	YEAR	Tag Number
041 MILLER/GILMORE	AC	1001	CFC 11	770	Trane	CVHE040	L89M04026	1990	041CWCH1
041 MILLER/GILMORE	AC	1001	CFC 11	770	Trane	CVHE040	L89M04038	1990	041CWCH2
044 KOHRMAN	AC	1051	CFC 11	575	Trane	CVHE028	L9201977	1991	044CWCH2
044 KOHRMAN	AC	1051	CFC 11	575	Trane	CVHE028	L92A02709	1991	044CWCH1
049 SRC	AC	1091	HCFC 22	605	Trane	3765RT300	U93A03764	1993	049CWCH2
049 SRC	AC	1091	HCFC 22	605	Trane	3765RT300	U93A03765	1993	049CWCH1
049 SRC	AC	1091	HFCC 22	200+	Pool Pac	SWHP140E	930101	1993	049REAHU1
051 511 MONROE	AC	0231	HFCC 22	50+	Trane	RAUC060GPJ130	J94081096		051RECH1
053 LAWSON AREAN	ICE MAKER	0140	HCFC 22	1750	Vilter	M17K358ESD	#1=31124		053BRCH1
053 LAWSON AREAN	AC	Roof	HCFC 22	125	Bohn	JLD500H2D	A98K00154	1999	053RECU1
053 LAWSON AREAN	AC	Roof	HFCC 22	125	Bohn	JLD500H2D	A98K00153	1999	053RECU2
056 ROOD	AC	045	HCFC 22	440	Trane	RTHA300	U92A07037	1991	056CWCH2
056 ROOD	AC	045	HCFC 22	440	Trane	RTHA300	U92A07038	1991	056CWCH1
056 ROOD	AC	Accel. Lab	HCFC 22	50+	Trane	CGWD			056REDX1
059 BERNHARD CENTER	AC	ME-G02	CFC11	770	TRANE	CVHE036	L87C0111	1987	059CWCH1

Western Michigan University CFC Program
 Identified Equipment with 50lbs or Greater of Refrigerant

BLDG. # AND NAME	SYSTEM	LOCATION	REF	AMOUNT (lb)	MAKE	MODEL	SERIAL NUMBER	YEAR	Tag Number
059 BERNHARD CENTER	AC	ME-G02	CFC 11	770	TRANE	CVHE036	L87C0112	1987	059CWCH2
059 BERNHARD CENTER	Freezer	ME-G02	HCFC 22	70+	Copeland	3DB3-1000-TFC	CT 91L 022235		059RECU18
061 WALDO LIB.	AC	ME-1	CFC 11	1000	Trane	CVHE040	L89J03081	1991	061CWCH2
061 WALDO LIB.	AC	ME-1	CFC 11	1000	Trane	CVHE040	L89J03086	1991	061CWCH1
062 UNIVERSITY ARENA	AC	R-1	HCFC 22	102	Snyder General	RPS060CLY	3ZA0063801		062RERTU1
062 UNIVERSITY ARENA	AC	P-2(W)	HCFC 22	500	McQuay	ALP185C	5ZA8184601		062RECU1
062 UNIVERSITY ARENA	AC	P-1(E)	HCFC 22	500	McQuay	ALP185C	5ZA8184701		062RECU2
081 MILLER RAMP	AC	RF-1	HCFC 22	80	Trane	TTA180B300BA	H22198403	1984	081RECU1
083 SCHNEIDER	AC	SB05	CFC 11	580	Trane	CVHE032	L89H02893	1990	083CWCH1
083 SCHNEIDER	AC	SB05	CFC 11	580	Trane	CVHE032	L89H02840	1990	083CWCH2
107 HAENICKE HALL	AC	Roof Top	HCFC 22	50+	McQuay	ALBO 45C	57D8140401	1999	107RECU1

TMA Reports

CFC Cylinder and Equipment

by Equipment Tag

Found 2 that matched your query.

Transaction Date	Technician	Reclaimed/ Added	Cylinder Tag	Pounds	Notes	Service
Equipment Tag: 083CWCH1						
12/14/2001	Cornelius Medendorp	Added	RC-R11	- 116 lbs. R-11	Added to chiller after overhaul was performed. tal chiller capacity 575lbs	211

This report is dynamic. Info was pulled from the database on Mon Apr 15 13:10:11 2013

[Rerun this Report](#)

[Back to Reports](#)

Version 20080909.1510

TMA Reports

CFC Cylinder and Equipment

No records found.

Search all:

- Cylinder Tags
- Equipment Tags

After:

Before:

AND/OR

Submit

Cylinder Tag:

Equipment
Tag:

•

Search

•

083CWCH2

Search

Cancel

Version 20080909.1510

WMU Chiller Replacement Study

Chillers		Year	Age	Capacity	Condition			
Location	Mark	Type	Manufacturer	Model	Installed	Age	Tons	Condition
McCracken		C	Trane	Centravac, VSD	2006	6	800	VG
Friedmann	Chiller #1	A	York	Millenium	1997	15	400	F
	Chiller #2	A	York	Millenium	1997	15	400	F
Bernhard Center	Chiller 1	C	Trane	Centravac, 3-stage	1987	25	360	G
	Chiller 2	C	Trane	Centravac, 3-stage	1987	25	360	G
Schneider Hall	CH-1	C	Trane	Centravac	1990	22	336	F
	CH-2	C	Trane	Centravac	1990	22	336	F
	CH-3	A	Thermax	Model SS	2012	0	323	E
	CH-4	A	Thermax	Model SS	2012	0	323	E
Miller/Shaw	Chiller 1	C	Trane	Centravac, 3-stage	1990	22	380	F
	Chiller 2	C	Trane	Centravac, 3-stage	1990	22	380	F
Waldo Library		C	Trane	Centravac	1990	22	360	F
		C	Trane	Centravac	1990	22	360	F
Kohrman	CH-01	C	Trane	CVHE	1991	21	240	F
	CH-02	C	Trane	CVHE	1991	21	240	F
	CH-1	A	York	Isoflow	1997	15	750	P
	CH-2	A	York	Isoflow	1997	15	750	P
	CH-3	A	York	Isoflow	1997	15	750	P
Rood		S	Trane	Series R	1991	21	260	F
		S	Trane	Series R	1991	21	260	F
Student Recreation	CH 1	S	Trane	Series R	1993	19	300	VG
	CH 2	S	Trane	Series R	1993	19	300	VG
CHHS		A	York	Millenium	2005	7	140	G
		A	York	Millenium	2005	7	340	G

FACILITY DESIGN GUIDELINES

Open All / Close All

	Responsible Party
‣ General Guidelines	
‣ Division 00 – Procurement & Construction Requirements	P&C/Purch
‣ Division 01 – General Specification Requirements	P&C/Eng
‣ Division 02 – Existing Conditions	P&C
‣ Division 03 – Concrete	Eng
‣ Division 04 – Masonry	Eng
‣ Division 05 – Metals	Eng
‣ Division 06 – Wood, Plastics, and Composites	Eng
‣ Division 07 – Thermal and Moisture Protection	P&C
‣ Division 08 – Openings	P&C
‣ Division 09 – Finishes	P&C
‣ Division 10 – Specialties	P&C
‣ Division 11 – Equipment	P&C
‣ Division 12 – Furnishings	P&C
‣ Division 13 – Special Construction	P&C
‣ Division 14 – Conveying Equipment	P&C
‣ Division 21 – Fire Suppression	Eng
‣ Division 22 – Plumbing	Eng
‣ Division 23 – Heating, Ventilating and Air Conditioning	Eng
‣ Division 25 – Integrated Automation	Eng
‣ Division 26 – Electrical	Eng
‣ Division 27 – Communications	OIT
‣ Division 28 – Electronic Safety and Security	DPS/Eng
‣ Division 31 – Earthwork	Eng/Landscape
‣ Division 32 – Exterior Improvements	P&C
‣ Division 33 – Utilities	Eng
‣ Division 48 – Electrical Power Generation	Eng