

The Impacts of Campus Activities on the Environment
2003 Update
July 15, 2004

Environmental Affairs Committee, University of Missouri-Columbia

INTRODUCTION

In April 2003, the Environmental Affairs Committee released its initial study, “The Impacts of Campus Activities on the Environment.” This initial report was the Committee’s first attempt to address resource use and environmental issues at the University of Missouri-Columbia (MU) in a comprehensive manner.

Questionnaires were distributed to various campus departments in the early months of 2004 to collect follow up information from the initial report. Attempts were made to collect information to compare with data collected in the initial report. In addition, follow up questions were also asked to better define resource usage and impacts. This report contains a summary of the collected information and makes comparisons with the initial report, when possible and appropriate.

FINDINGS—GENERAL CAMPUS STATISTICS

There are at least two ways of interpreting environmental information. One way is to look at gross resource usage statistics. Another way is to put the information in context based on statistics such as number of students, number of employees, number of buildings, budget and other factors. Though such information was not collected for the initial report, some general statistics were collected for the 2003 update. These statistics for FY2003 are as follows:

Number of student (full-time equivalents): 22,550
Number of faculty and staff (full-time equivalents): 1,628 + 8,861 = 10,489
Campus budget (excludes Hospital): \$682,220,668
Gross square feet of buildings (excludes Hospital): 12,976,507

FINDINGS—RESOURCES

Energy

Energy Management, a unit within Campus Facilities, is responsible for providing energy to campus. The service area is the Columbia campus and University Hospital and Clinics. Steam, but not electricity is provided to the VA Hospital. Ellis Fischel Cancer Center and Columbia Regional Hospital obtain energy from the City of Columbia.

In FY2003, the campus consumed 204 million kilowatt hours of electricity and 2.5 billion pounds of steam. These numbers represented drops of 1% and 6%, respectively, from FY2002. Compared with FY2000, these numbers represented an increase of 4% (electricity) and a decrease of 4% (steam), respectively. In FY2003, energy was provided from the following sources: coal – 76%, natural gas – 8%, tire derived fuel – 2%, and purchased electricity – 14%.

Energy Management has a continuing program of energy conservation projects. In FY2003, projects were completed in Clydesdale Hall, Fine Arts and Schlundt Annex, and included new and/or updated controls, replacement of inefficient lighting, installing occupancy sensors, and automatic setbacks for heating and cooling. Energy Management has replaced more than 98% of all exterior lighting and more than 85% of all interior lighting with energy efficient lighting.

Though no new energy conservation awards were received in 2003, Energy Management has received numerous such awards over the past 10 years. Energy Management has an active, varied and aggressive energy conservation program.

Water

Energy Management, a unit within Campus Facilities, is responsible for providing drinking water to campus and tracking wastewater discharged to the Columbia sanitary sewer system. The service area includes the Columbia campus and University Hospital. In FY2003, the campus consumed 734 million gallons of water and discharged 404 million gallons to the sanitary sewer system. These numbers each represent approximately a 2% increase over levels from FY2000.

In FY2003, Campus Facilities began evaluating waterless urinals in the General Services Building. The average urinal uses 40,000 gallons of water per year.

Solid Waste and Recycling

Total solid waste sent to the Columbia landfill was 5,797 tons in calendar year 2003. This was the lowest amount since 1998 and a drop of over 25% from the peak in calendar year 2001. No cause for this large decrease was identified, though it is possible that waste generation was impacted by large decreases in state funding to MU.

Fiber recycled in calendar year 2003 totaled 1199 metric tons, which is slightly more than in 2000. Relatively small amounts of glass and metals are also recycled, and totaled almost 11 tons. Information was not collected on the amount of other recycled items such as photographic silver, fluorescent lamps, batteries, and computer monitors. As a result of the smaller amount going to the landfill, the overall percent of solid waste recycled rose to 17% in calendar year 2003, which was the highest percentage since 1997.

In the summer of 2003, the campus had to cope with Columbia's repeal of the beverage container deposit ordinance. Though no formal collection system was established for recycling beverage containers, many departments made their own arrangements to collect containers and recycle them through Columbia's curbside recycling program.

In the fall of 2003, the campus had a solid waste audit prepared under a grant from the Missouri Department of Natural Resources. The report was released in November and contained a number of recommendations on how the campus might increase recycling.

Hazardous Materials

Environmental Health and Safety coordinates the campus hazardous waste management program. The service area for these programs includes the Columbia campus, University Hospital and Clinics, Ellis Fischel Cancer Center, Columbia Regional Hospital, University Physicians clinics, off-site research facilities (including farms), and the Missouri Rehabilitation Center in Mt. Vernon.

In FY2003, Environmental Health and Safety disposed of the following amounts of hazardous materials: 161,000 pounds of EPA regulated hazardous waste; 480,000 pounds of regulated wastes other than hazardous waste; 415,000 pounds of infectious medical/pathological waste; 40,400 pounds of low level radioactive waste (excludes the Research Reactor); and 800 pounds of mixed (chemical and radioactive) waste (excludes the Research Reactor). In most cases, these represented decreases from FY2002. Low level radioactive waste increased substantially, primarily due to a research project involving 19 cattle. The large number for regulated wastes other than hazardous waste is due to several remediation projects, which tend to generate relatively large amounts of waste.

Environmental Health and Safety did not report any new waste minimization initiatives. However, the very successful mercury reduction program has continued to be implemented.

FINDINGS—INFRASTRUCTURE

Purchasing

Purchasing is centralized under the University System offices; MU is serviced by a campus Procurement Service Center.

Procurement reported paper sales in FY2003 as follows: 14,000 cases of paper without recycled content; 150 cases of paper with 25% recycled content; and 300 cases of paper with 100% recycled content. Note that these numbers do not represent total campus usage because departments may purchase paper from other sources. Procurement recycled 8,500 toner cartridges in FY2003. The Committee did not present comparable statistics on resource usage or recycling in its previous report.

Printing Services

Printing Services reported a variety of resource usage statistics for FY2003.

For inks, the breakdown was as follows: vegetable/soy – 5%, metallic – 5%, low VOC petroleum based – 90%. Paper cost was reported at \$1.46 million; however, the amount of paper purchased is not available. Digital processing accounted for 12% of the business in FY2003.

In FY2003, the following amounts of materials were recycled: 395,000 pounds of scrap paper; 25,000 pounds of glue-contaminated scrap paper; 22,000 pounds of cardboard; 14,000 pounds of aluminum; and 270 troy ounces of silver from film processing.

Printing Services reported that their provider of 100% recycled bond paper has gone out of business. It is now using paper with 30% post-consumer recycled content.

Residential Life

No new information was received. The Residential Life Master Plan continues to be implemented with construction continuing on the new Virginia Avenue Residence and Dining Halls. Planning started for the new Southwest Campus Housing project to be located at the northeast corner of Stadium and Providence.

Landscape Services

Landscape Services, a unit within Campus Facilities, has responsibility for implementing the campus landscape master plan, maintaining grounds and landscape for most of campus, litter collection, snow removal, and the campus trash removal contract. For FY2003, the Committee collected more detailed information on resource usage compared with the initial report.

Landscape Services has 18 staff members who hold a Missouri Pesticide Applicator's license, which requires testing, periodic training and periodic recertification. In FY2003, Landscape Services used approximately 1,000 pounds of synthetic pesticides of which 72% were liquid pesticides and the remainder dry pesticides. Landscape Services also purchased 28,000 pounds of inorganic fertilizer.

In FY2003, Landscape Services used the following for ice control: 96 tons of sand, 1.25 tons of potassium chloride ice melt compound, and 316 tons of salt (NaCl). No cinders were used for ice control by campus in FY2003.

Landscape Services estimates that there are 6,000 landscape trees on campus and reports that the number is increasing. No records are kept on the amounts of landscape wastes managed. However, the following management practices are employed: all collected leaves are composted and used as soil amendments in planting beds; woody plant debris is taken to Capen Park and ground into mulch; and logs are provide to the Art Department for its ceramic kilns.

In 2003, Landscape Services was awarded the Missouri Arbor Award for Excellence by the Missouri Community Forestry Council and the Missouri Department of Conservation.

Trends identified by Landscape Services as affecting their future activities are: increased emphasis on erosion control; increased prevalence of pesticide tolerant plant pests; greater use of native plant species; and control of invasive species on University-owned lands.

Planning, Design and Construction (PD&C)

Planning, Design and Construction, a unit within Campus Facilities, is responsible for master planning, new building design and construction, additions, renovations, and for overseeing construction projects. In FY2003, campus construction totaled \$100 million. In FY2003, construction continued on three major projects: the Life Sciences Center, the new basketball arena, and the Virginia Avenue Housing and Dining Halls. Ground was broken for the renovation of Brewer Field House.

In FY2003, the size of the Columbia campus was 1350 acres, of which 500 acres (37%) is classified as green space.

Several environmental concerns were incorporated into building design specifications on a trial basis including specifications for sustainable furniture and interior finishes. PD&C continued following various energy saving features, including meeting ASHRAE 90.1 energy standards. A sustainability directive was developed for bidding on furniture for the Life Sciences Center.

Planning, Design and Construction staff have training on environmental building design through a variety of professional organizations. The Department is reviewing requirements for pursuing LEED (Leadership in Energy and Environmental Design) type recognition for new buildings; increased use of green building products as they become economically viable; and assessing the cost effectiveness of recycling materials from building demolition.

In FY2003 and continuing into FY2004, campus planners identified the need for significant utility infrastructure enhancements to serve both the construction projects mentioned above, and large new planned construction projects including the Performing Arts Center, Southwest Campus Housing, the Journalism Institute, several new buildings on the East Campus, and the Technology Incubator. Energy savings and water/wastewater efficiencies incorporated into early designs reduce both resource use and operating costs over the life of the buildings.

FINDINGS—EDUCATION

Environmental Education at MU happens on a number of different levels, ranging from recently established environmental majors, through environmentally-related majors, environmental coursework, and out-of-classroom experiences that give students opportunities to put formal knowledge to the test. There are also several graduate programs that prepare students for research or work in the environmental area.

There are two environmental majors at MU (Environmental Geology and Environmental Soil Science), both provided as emphasis areas within established programs. In 2004, the University approved Environmental Studies, an emphasis area in Interdisciplinary Studies in the College of Arts and Science. The Environmental Science major was approved as an emphasis area in Soils, Environmental and Atmospheric Sciences by the University and Coordinating Board of Higher Education in 2004.

Undergraduate students also have the opportunity to earn a Certificate in Environmental Studies. In FY2004, there were 14 students enrolled in the program, eight of whom will graduate with the certificate. Overall, students may earn environmentally-related majors or graduate degrees in the following

programs: Chemistry; Civil and Environmental Engineering; Forestry; Fisheries and Wildlife; Geology; Parks, Recreation and Tourism (no Ph.D.); and Soils, Environment and Atmospheric Sciences. At the graduate level, there are jointly coordinated programs offering graduate certificates in Conservation Biology and Resources and Development.

Faculty in a variety of instances have coordinated classroom experiences with local environmental initiatives and projects. In FY2004, these included:

- Communication 272 and 377: marketing plans for Earth Day Coalition
- Biology 6: planting wildflowers at Hearnese, assisting with Earth Day, and litter clean up
- Geology Club: recycling program for aluminum and paper, assist local scouts in earning Geology badge
- Sustain Mizzou: organized student petition calling for a campus recycling coordinator, various recycling activities, and adopted Peace Park
- School of Natural Resources Student Council: hosted Field Day at Prairie Fork Conservation Area, and adopted Rock Creek Park
- Textile and Apparel Management faculty and students: clothing collection for recycling

Current initiatives include a new joint major in Forestry and Fisheries & Wildlife; new internships with the Missouri Department of Conservation in each of the School of Natural Resources Programs; and a new Environmental Science emphasis area in Soil, Environmental and Atmospheric Sciences.

MU students had several notable achievements. Jared Cole won the 2004 MU-Peter Raven Environmental Leadership Award and was one of 80 students nationally to win a Udall Scholarship, which encourages students to pursue work on environmental issues. Dylan Sullivan was one of 80 students nationally to a Truman Scholarship, which covers some costs for his senior year and graduate studies. Sullivan won his scholarship for work on fair trade coffee. The MU Sun Tiger V Team placed 5th out of 19 in the annual Solar Challenge. An MU team placed 3rd in the Basic Utility Vehicle competition to design a vehicle for rural areas of developing countries that can be produced in local factories.

FINDINGS—RESEARCH

Research Farms

No new information was received.

Research Reactor

The Research Reactor activities described in the initial report continued in FY2003. Radioactive releases in FY2003 to the sewer system (82 Curies of tritium, 5.6 Curies of all other isotopes) dropped substantially from those in FY2000. Air releases in FY2003 for Ar-41 (half-life of 1.83 hours) increased 28% over FY2000 to 1250 Curies; however, this was only 77% of the Technical Specification limit and is within normal variation. All other air releases were less than 0.1% of the Technical Specification limits.

Low level radioactive waste shipped from the Research Reactor in FY2003 totaled 12,135 pounds. This was approximately half the FY2000 total, which was incorrectly reported in the report issued in 2003. Waste shipped has dropped each year since 2000. The amount generated can be greatly affected by special maintenance projects, several of which occurred in 2000 and 2001.

All persons with unescorted access to the Research Reactor receive basic radiation safety training. Persons working in laboratories or other restricted areas receive additional training, as appropriate.

The Research Reactor continues to maintain compliance with all applicable environmental regulations.

SUMMARY AND CONCLUSIONS

This report is intended as a supplement to the report issued in April 2003. The information contained herein is intended to provide information about the environmental impacts of MU activities and to stimulate discussion about these impacts and the projected trends.

The Environmental Affairs Committee notes that there are many success stories contained within this report. On the other hand, the report points toward opportunities in a number of instances. The Committee welcomes feedback about the data collected, the way the material is presented and any conclusions that are drawn.

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