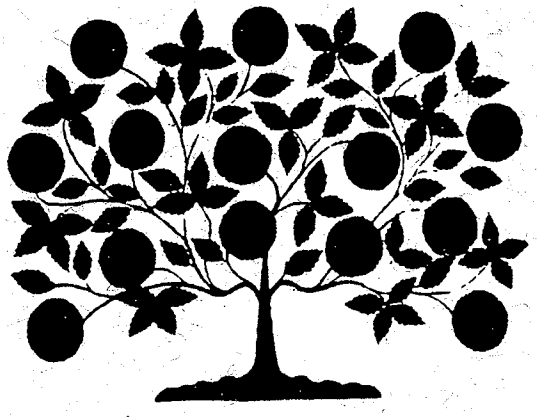
PATHWAYS TO A GREEN CAMPUS

ENVIRONMENTAL COUNCIL

REPORTS AND RECOMMENDATIONS

Middlebury College

May 12, 1995



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Introduction

Middlebury College has a long history of environmental awareness and responsibility beginning with the formation of an Energy Council in the 1970s. After a period of inactivity in the mid 1980s, the Energy Council was reactivated in September, 1990, by David Ginevan, Vice President for Administration and Treasurer. As the Council's agenda of environmental concerns and initiatives expanded, it was renamed the Environmental Council. The membership of the Council has included faculty, staff, and students. In recent years the Environmental Council has been engaged in a number of long-range planning studies concerned with the greening of Middlebury College. The Council has encouraged research by faculty and students as well as staff, and it has received many valuable reports, suggestions and recommendations. In the Fall of 1994 the Council decided to prepare a special report for the President of the College that would attempt a comprehensive overview of the current state of the College from an environmental perspective with recommendations for advancing the process of greening the institution.

Given the broad scope and complexity of this undertaking, the Environmental Council formed ten subcommittees, each of which was charged with studying a particular area, noting relevant federal and state laws and College policies and programs, identifying problems, and making recommendations. The various subcommittees were chaired by Council members and in some cases included College students and staff who were not Council members. The recommendations and suggestions of these subcommittees have been incorporated into this Report as Chapters II through XII. Since different persons authored these various chapters, the reader will detect some variation in writing style and organization of material. The first chapter, which contains a proposal for a Middlebury College Environmental Mission Statement and a list of the major recommendations of the Report, can be read as an executive summary of the Report.

The Environmental Council wishes to thank David Ginevan for the environmental leadership he has provided at Middlebury College by appointing an Environmental Council in recent years and for the support that he has given the Council. The Council also wishes to thank and commend President John McCardell for the challenging vision that he has been developing for the College with regard to environmental studies and environmental responsibility. The Council also wishes to express its deep appreciation to all those members of the College community who contributed helpful research and who worked so effectively with the Council's subcommittees. Special thanks are extended to Claire Wilson and Janet Winkler for their assistance with computerizing and printing the Report.

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TABLE OF CONTENTS

		Page
Introduction		
I.	A Vision and Mission for Middlebury	1
	A. Proposed Middlebury College Environmental Mission Statement	1
	B. Major Recommendations	2
II.	Administration and Business Management	5
III.	Environmental Council	9
IV.	Environmental Coordinator	11
V.	College Publications	13
VI.	Community Awareness and Education	17
VII.	Energy and Water Conservation	22
VIII.	Dining Services and Food	25
IX.	Land Stewardship	28
X.	Toxics and Pollution	32
XI.	Waste Minimization	48
XII.	Pedestrian Campus Proposal	61

Appendices

A	Environmental Council Subcommittees	64
B	Winkler/Andres Memorandum on A College Campus Analysis and Proposal for Future Development; Environmental Council Memorandum of Support	66
C	Talloires Declaration, 1990, University Presidents for a Sustainable Future	69
D	Recommendations from Blueprint for a Green Campus: The Campus Earth Summit Initiatives for Higher Education, 1995	71
E	Selected Bibliography	74
F	Appendices to the Report of the Subcommittee on Toxics and Pollution	76

I. A Vision and Mission for Middlebury

The recommendations of this Report are pathways to a green campus--options and opportunities that Middlebury College is in a position to choose. However, the most fundamental need of the College at this point in its evolution as an environmentally responsible institution is a clarification of its vision for the future and of the purposes and values to which it is committed. With this in mind the Environmental Council has designed an Environmental Mission Statement, and adoption of this Mission Statement by the College is the Council's first recommendation.

The Environmental Mission Statement is primarily concerned with the policies and activities of the College as an institution and community rather than with the Environmental Studies Program and the academic curriculum. The Council's recommendations for how the College might use this Mission Statement are presented and further discussed in Chapter II, Administration and Business Management.

Following the Mission Statement there is a listing of all the major recommendations of the Report. After each recommendation there is a reference to the Report chapter where the recommendation is fully discussed. In many cases specific steps and procedures are proposed for implementing a recommendation.

A. Proposed Middlebury College Environmental Mission Statement

Middlebury College as a liberal arts institution is committed to environmental mindfulness and stewardship in all its activities. This commitment arises from a sense of concerned citizenship and moral duty and from a desire to teach and lead by example. The College gives a high priority to integrating environmental awareness and responsibility into the daily life of the institution. Respect and care for the environment, sustainable living, and intergenerational responsibility are among the fundamental values that guide planning, decision making, and procedures. All individuals in this academic community have personal responsibility for the way their actions affect the local and global environment.

In its efforts to fulfill its environmental mission, the College is committed to the following objectives:

1. In its stewardship of land, the College endeavors to:
   - maintain biodiversity and health of ecosystems
   - restore ecological processes that become damaged
   - conserve natural resources
   - safeguard the beauty of the landscape.

2. In its operations and management of facilities, the College seeks to reduce environmental impacts, and it endeavors to:
   - prevent pollution
   - reduce energy consumption and increase energy efficiency
   - conserve water

- reduce waste, reuse, recycle, and purchase recycled content products
- increase reliance on renewable resources

The College supports many of these measures as important cost-saving initiatives as well as matters of environmental responsibility.

3. When siting, designing and constructing new buildings or renovating old ones, the College seeks to minimize environmental impacts.

4. The College pledges itself to create a safe and healthy environment both indoors and outdoors for all who live and work on the College campus and its properties. It considers full compliance with state and federal law to be the minimally acceptable standard. It strives to prevent and eliminate harm to public health.

5. When making financial investments, the College takes into consideration long-term as well as short-term environmental consequences.

6. The College is committed to maintain an ongoing program of environmental awareness education on campus and to serve as a local and regional resource in support of efforts to increase environmental awareness outside the institution.

Environmental studies are recognized and supported as a major component of the College's academic curriculum. Through its many environmental awareness initiatives and its diverse course offerings in environmental studies, the College seeks to ensure that its graduates will have the knowledge, skills, and values to become leaders in the worldwide endeavor to restore and protect the environment.

B. Major Recommendations

1. Environmental Mission Statement - Middlebury College should adopt and the President should sign an Environmental Mission Statement. This statement should be distributed throughout the College as a statement of the fundamental principles and objectives governing College policy pertaining to the environment. (Chapter II)

2. Policy Formation - The President and senior Administration of the College should lead the institution in an effort to formulate in writing the environmental policies and procedures that should govern the various departments, programs, and activities of the College, using the Environmental Mission Statement as a general guide. (Chapter II)

3. Environmental Audit - The College should conduct an audit of its environmental impacts on a regular basis (every two, three, or four years). The Environmental Council or another appropriate group in the College should undertake a report on the environmental state of the College, using this Report as a point of reference, during the year 1998-1999 so that the College can prepare to enter the twenty-first century with its environmental policies and programs in first-rate order. (Chapter II)

4. Investment Policy - When making financial investments, the College should consider long-term as well as short-term environmental impacts, seeking to avoid investments in businesses and products that are inherently unhealthy for human beings or that threaten serious environmental harm. (Chapter II)

5. Recycled Paper and Printing Policy - (1) The College should adopt and circulate a formal policy of using recycled paper with a high percentage of post-consumer waste for all College offices, publications, and posters; and (2) the College should use soy-based ink, or an ink that is equally benign from an environmental point of view, in all its printing processes and publications. (Chapter II)

6. Environmental Council - The Environmental Council should become a standing College council whose chair is appointed by the President of the College. (Chapter III)

7. Environmental Coordinator - The position of Recycling Coordinator should be renamed Environmental Coordinator and be established as a permanent position, and an Environmental Coordinator should be hired for the 1995-1996 year. (Chapter IV)

8. College Catalog - The *Middlebury College Catalog* should put greater emphasis in its first section on Middlebury's Environmental Studies Program and commitment to environmental awareness and responsibility. (Chapter V)

9. College Handbook - A new set of regulations on "Respect for the Environment" should be added to the *Middlebury College Handbook* in the section on "General Regulations" after the subsection on "Respect for College Property." (Chapter V)

10. Environmental Studies Program - The College should continue to support a strong Environmental Studies major. The College should support initiatives to increase environmental education across the curriculum, including staffing to allow for an Environmental Studies minor and courses for non-majors. The Faculty should also add the environment to its distribution requirements. (Chapter VI)

11. New Student Orientation - The Dean of Students should include in the new student orientation program in September and February a 30-minute environmental awareness session to be conducted in the relevant residence halls by the Environmental Coordinator. Attendance at this environmental awareness session should be mandatory for all entering students. (Chapter VI)

12. Environmental Monitors - The Residential Life Program, under the supervision of the Dean of Students, should take on full responsibility for appointing Environmental Monitors for all student residence halls and should ensure that monitors carry out their responsibilities. The job description of the Director of Residential Life, the RAs, and the JCs should include responsibility for promoting environmental awareness, conservation, and recycling. (Chapter VI)

13. Energy Conservation - An energy management policy for the 90s should be formulated, written down, formally adopted, and circulated. (Chapter VII)

14. Energy Impact Study - An energy impact study and environmental impact assessment should be included as part of every College renovation and new construction project. Life cycle costing should be a primary element in design and equipment selection. The project budget should make provisions for all energy conservation measures that have a simple payback of five years or less. (Chapter VII)

15. Environmentally Advanced Dormitory - The College should construct a dormitory that is state-of-the-art in energy/environmental technology as a learning center for students, faculty, and staff. (Chapter VII)

16. Dining Services and Food - Dining Services should continue to (1) reduce and responsibly manage waste in all of its operations, (2) search for alternatives to disposable products, (3) support local and sustainable agriculture, and (4) increase awareness concerning organic and locally grown foods. (Chapter VIII)

17. College Lands - (1) The College lands should be entered into a Geographic Information System (GIS) data base through a cooperative effort among College land administrators, the Geography Department, and other interested academic departments; and (2) the College should encourage organic and sustainable agriculture on its farmlands. (Chapter IX)

18. Written Policies and Procedures for Toxics - With guidance from the College Safety Officer, current policies and procedures relating to toxics and pollutants should be clarified and written down. Uniform policies should be established for the campus, and appropriate procedures should be established where lacking. Middlebury College should be in conformity with state and federal regulations. (Chapter X)

19. Toxics Inventory - Middlebury College should take an inventory of toxic materials to help in identifying areas where policies and procedures are needed, to document the need for a hazardous storage facility, and to comply with federal regulations concerning the quantity of hazardous waste produced and stored by hazardous waste generators. (Chapter X)

20. Toxics and Pollution Policy - Middlebury College should (1) prevent and reduce hazardous waste and pollution at its source whenever possible, (2) handle and recycle in an environmentally safe manner hazardous waste and other pollutants that cannot be prevented, and (3) dispose of in an environmentally safe manner hazardous waste and other pollutants that cannot be recycled. (Chapter X)

21. Waste Minimization - The College should increase efforts aimed at waste minimization by (1) putting a new emphasis on source reduction, (2) using purchasing as a waste reduction strategy, (3) establishing a formal recycling policy, (4) further developing the recycling and composting program, and (5) continuing community education. (Chapter XI)

22. Pedestrian Campus - The College should adopt and implement a plan that will minimize driving on campus by members of the community and create a pedestrian campus. This can be accomplished by (1) assigning all student, faculty, and staff cars to specific parking lots, (2) blocking specific roads on campus to create cul-de-sacs and reduce traffic, (3) working with the town to restrict parking and improve safety along College Street, and (4) increasing parking enforcement. (Chapter XII)

II. Administration and Business Management

Over the past thirty years Middlebury College has taken many steps to promote environmental awareness and responsibility on campus. In addition to a concern to reduce environmental impacts and to contribute to a safe and healthy environment, the College has also recognized that many programs that promote environmental responsibility, such as efforts to reduce energy consumption, also reduce costs and are consistent with sound financial management. A former president of Middlebury was an early signer of the Talloires Declaration on the environment issued by University Presidents for a Sustainable Future. (See Appendix C.) This past fall President McCardell reaffirmed the College's commitment to both Environmental Studies as a particularly important component of the curriculum and to the goal of making Middlebury as an institution an example of environmental responsibility in its day to day operations.

What can be done in the area of administration and business management to build on the College's past accomplishments and to meet President McCardell's new challenge to the College community? This chapter identifies a number of new steps that can be taken, but a more thorough analysis of Middlebury's administrative practices is needed than the authors of this report have been able to undertake.

A. POLICY DEVELOPMENT

Middlebury's Administration and Facilities Management has been operating for many years with various environmental policies and guidelines, but few have ever been written down and clearly formulated. Responsibility and accountability in the environmental area have not been as clearly defined as they could and should be. If Middlebury is to move forward on the environmental front, it must enter upon a new stage in its administrative policy making, practices, and procedures. Leadership and support for this undertaking must come from the President. Towards this end, it is recommended:

1. **That Middlebury College adopt and the President sign an Environmental Mission Statement. This statement should be distributed throughout the College as a statement of the fundamental principles and objectives governing College policy pertaining to the environment.**

2. **That the President and senior administration of the College lead the institution in an effort to formulate in writing the environmental policies and procedures that should govern the various departments, programs, and activities of the College, using the Environmental Mission Statement as a general guide.** Many of the other recommendations in this report can be used to advance this process.

It is imperative that the institution as a whole at all levels and in all departments assume full responsibility for achieving the College's environmental goals. This task should not be perceived as the special responsibility of one office or of the Environmental Council, but of the whole institution working cooperatively under the leadership of the President. Charging supervisors and each department and program with clarifying and getting into written form the policies and procedures that govern their operations is the first essential step. This, of course, requires a knowledge of federal and state law and up-to-date information on new and changing regulations.

B. ENVIRONMENTAL AUDIT

An environmental audit can help Middlebury College develop effective environmental policies and procedures by identifying the most significant environmental impacts and their causes. It can also identify areas of waste and inefficiency and leads to financial savings. **It is, therefore, recommended that on a regular basis (every two, three, or four years) the College conduct an audit of its environmental impacts, including but not limited to: solid waste, hazardous substances, radioactive waste, medical waste, wastewater and storm runoff, pest control, air quality, the work place environment, water, energy, food, purchasing policies, transportation, campus growth, and investment policies. An audit report should be prepared and forwarded to the President and all relevant departments and offices.**

A successful audit requires leadership and support from senior administrators, including financial resources and allocation of staff time. It also requires the cooperation of the entire institution. The Vice President for Administration should initiate and ensure satisfactory completion of the environmental audit. The Environmental Council could assist with coordination. Students and faculty as well as staff can help with the process.

For further information on conducting a campus environmental audit, see Blueprint for A Green Campus: The Campus Earth Summit Initiatives for Higher Education, chapter IV.

C. RECYCLED PAPER, PRINTING, AND PUBLICATIONS

1. Reprographics and other departments in the College have as a matter of policy moved to the use of recycled paper for many purposes. Ninety percent of the paper used in Reprographics is recycled with from 10% to 50% post-consumer waste. It is recommended **that the College adopt and circulate a formal policy of using recycled paper with a high percentage of post-consumer waste for all College offices, publications, and posters.**

2. Soy-based inks are far more benign from an environmental perspective than petroleum-based inks. Soy ink is a renewable resource and is easily recycled. It is low in volatile organic compounds (VOCs). It is produced in America and provides vivid color reproduction. Corporations like the Ford Motor Company and the Los Angeles Times have switched completely to the use of soy ink. Middlebury is not currently using soy-based inks in Reprographics. It is recommended **that the College use soy-based ink, or an ink that is equally benign from an environmental point of view, in all its printing processes and publications.**

3. The College should also make every effort to use printing technologies that reduce the percentage of VOCs emitted from press washes (which clean inks off the press) and fountain solutions (which are used to keep ink on the image areas of printing plates). Waterless printing is a new technology that eliminates fountain solutions from the printing process, and it also reduces waste. The College is encouraged to explore new technologies like waterless printing.

D. PURCHASING POLICY

1. The College has become a member of the Buy Recycled Business Alliance, a step which the Environmental Council strongly supports, and as a member the College is pledged to increase each year its purchases of recycled content products. The Buy Recycled Business Alliance

may be used as a useful resource regarding recycled products and related purchasing policies. For further information on Buy Recycled, see Chapter XI on Waste Minimization. It is recommended **that the Director of Operations coordinate the effort to fulfill the College's pledge as a member of the Buy Recycled Business Alliance to increase each year its purchases of recycled content products.** (See Chapter XI, Waste Minimization)

E. INFORMATION, CONSULTANTS AND CONSORTIUMS

The new technology that reduces environmental impact and that often reduces costs is constantly changing and developing. The College can benefit from expert advice in this area, and should secure for itself the best advice available for environmental, educational, and economic reasons. In some situations that can best be accomplished by seeking the services of an expert outside consultant and in other instances it may mean sending staff to a workshop. In some cases faculty may be able to serve as a resource.

Some environmental problems like indoor air pollution can only be detected and analyzed with the aid of an expert. In this area of safety and health, which is regulated by federal and state law, the College also needs expert assistance. The hiring of a new Safety Officer is a major step in addressing this need.

It is recommended **that the College establish and fund a program designed to ensure that administrators and managers keep abreast of new developments in construction, energy, and transportation technologies that can reduce environmental impacts at Middlebury College. In addition, the College should provide budgetary support that enables the staff to secure expert assistance in analyzing and addressing environmental problems on campus when the staff do not have the professional training required. Under the supervision of the Director of Operations and Safety Officer a system should be set up in the College for ensuring the dissemination and sharing of information on new technologies and related matters.**

It is also advisable for the College to join and participate in consortia of environmentally concerned institutions like Buy-Recycled and the EPA Green Lights program.

F. INVESTMENT POLICY

The Environmental Mission Statement calls on the College investment managers to take into consideration the short and long-term environmental consequences of the activities and products of corporations in which the College is invested or might invest. As a general policy guideline, it is recommended that:

When making financial investments the College should consider long-term as well as short-term environmental impacts, seeking to avoid investments in businesses and products that are inherently unhealthy for human beings or that threaten serious environmental harm.

More specifically the College should adopt the following investment policy guidelines:

1. Avoid investment in any product when there is strong reason to believe that it is inherently unhealthy for human beings or seriously damaging to the environment.
2. Avoid investment in businesses which involve manufacturing processes or other operations that are particularly dangerous to or unhealthy for human beings or that threaten serious harm to the environment.
3. Avoid investment in businesses whose choice of location outside the U.S. is based primarily on local tolerance of degradation of the environment and/or unsafe or unhealthy working conditions.

As Middlebury College's environmental concerns develop, it may want to screen the environmental practices of each company under consideration by its investment managers using certain available databases and try to invest in those financially promising options that are leaders in environmental responsibility. The College could also focus its attention on certain environmental issues of special significance in Vermont or at Middlebury like acid rain or recycling. It could then contact companies held in its portfolio and ask them to explain how their manufacturing processes, business practices, and products affect these issues and how these businesses have or could change in ways consistent with environmental responsibility. If students became involved in such a dialogue, it could be instructive and constructive.

G. LONG-RANGE PLANNING

Environmental responsibility calls for long-range planning of the kind called for by Professor Glenn Andres and Frank Winkler in their memorandum of March 9, 1995 to President McCardell, which was supported by the Environmental Council in a memorandum of March 22, 1995 to President McCardell. See Appendix E.

It is recommended **that the Environmental Council or another appropriate group in the College undertake a report on the environmental state of the College, using this Report as a point of reference, during the year 1998-1999 so that the College can prepare to enter the twenty-first century with its environmental policies and programs in first-rate order.** Such a report could be tied to a Collegewide environmental audit. (See Section B. Environmental Audit)

For additional recommendations and discussion of issues related to administration and business management, see Chapter VII, Energy and Water Conservation; Chapter VIII, Dining Services and Food; Chapter IX, Land Stewardship; Chapter X, Toxics and Pollution; Chapter XI, Waste Minimization. In addition, the Report of the Committee on the Environment, which was recently completed and submitted to President McCardell, contains an instructive discussion and set of recommendations in Part 2 under the heading "New Buildings on Campus."

Administration and Business Management Subcommittee
Steven C. Rockefeller
George W. Whitney, Jr.

III. Environmental Council

In 1977 the President of Middlebury College, Olin C. Robison, formed an Energy Council to address problems of rising energy costs and the threat of shortages in the international oil supply. Over the years the programs designed by the Energy Council have enabled the College to achieve significant reductions in energy consumption and advances in energy efficiency. The College disbanded the Energy Council in 1985, but five years later, David Ginevan, the Vice President for Administration and Treasurer, reestablished the Council. Three years ago in the light of an expanding agenda of environmental concerns, the Energy Council was renamed the Environmental Council.

In recent years the Environmental Council--formerly the Energy Council--has been organized and given its charge by David Ginevan. Its membership has included faculty, staff, and students, and it has been chaired by a faculty member. With David Ginevan's strong support, the Council has made many recommendations and coordinated efforts that have initiated and strengthened environmental programs on campus and heightened environmental awareness among faculty, staff, and students.

The following recommendations are designed to give the Council an even greater role and influence as the College seeks to renew and deepen its commitment to the purposes that the Council serves. Considering its long history and its many and expanding responsibilities, the time has come to establish the Council as an official standing College Council, involving faculty, staff, and students working together to address important problems and opportunities that are of critical significance to both the future of the College and our society. It is, therefore, recommended:

A. that the Environmental Council become a standing College council whose chair is appointed by the President of the College.

B. that the Environmental Council be composed of up to fifteen members and no fewer than eleven members, including two faculty members (appointed by the Committee on Committees), seven students (appointed by the SGA, EQ, and Weybridge House), and six staff members (appointed by the Vice President for Administration and Treasurer, who is an ex officio member of the Council).

C. that the Mission of the Council shall be:

1. to promote environmental awareness on campus among faculty, staff, and students.

2. to make recommendations to the President of the College designed:

   a. to ensure a safe and healthy environment for all who live and work on the College campus.

   b. to maintain biodiversity and wildlife habitat, restore damaged ecosystems, prevent pollution, safely manage hazardous waste, and safeguard the beauty of the landscape in the outdoor environment directly under the care of the College.

   c. to promote throughout the College community conservation of resources, energy efficiency, waste reduction and recycling, pollution prevention,

increased reliance on renewable resources, and other measures consistent with sustainable living.

d. to further long-range environmental planning by the College.

e. to assist the College in carrying out its civic responsibilities in the area of the environment.

3. to ensure that the College undertakes a Collegewide environmental audit on a regular periodic basis (every two, three, or four years) and that the audit is shared with appropriate College administrators.

4. to encourage faculty to provide students opportunities within the framework of academic courses to conduct research on campus and local environmental issues; and to ensure that such research is shared with the Environmental Council and appropriate officials within and outside the College so that it can be used to formulate improved policies and programs.

5. to design and coordinate environmental programs on campus as directed by the President.

D. that the Environmental Coordinator (presently Recycling Coordinator) be an ex officio (staff) member of the Council who serves as Vice-Chair of and Project Coordinator for the Council.

E. Budget for 1995-1996: $6,000?

IV. Environmental Coordinator

For the last two years Middlebury College has had the services of a Recycling Coordinator who has been supervised by Norman Cushman, the Assistant Director for Maintenance and Operations, Facilities Management. The current Recycling Coordinator, Holly Cookis, has been instrumental in helping to improve and promote the College's recycling and composting operations. She has also worked closely with the Environmental Council and been active in coordinating many of its environmental awareness programs and other projects. It has been very helpful to have on the staff of Middlebury College a person whose first responsibility is recycling and environmental awareness, and the Council strongly recommends that when Holly Cookis leaves this position at the end of this academic year, the position be continued and another person be hired to take her place. Given the way this job has evolved and the future needs of the College and the Environmental Council, it seems appropriate to give this position a new title and to redefine the job. With these considerations in mind, the following recommendations are made:

A. that the position of Recycling Coordinator be renamed Environmental Coordinator, be established as a permanent position, and that an Environmental Coordinator be hired for the 1995-1996 year.

B. that the job description for the Environmental Coordinator include the following basic responsibilities:

1. To serve as recycling coordinator with the responsibility:

a. to hire, train and supervise student recycling workers.

b. to design the recycling and pick up schedule for campus buildings and communicate the schedule to workers and the College community.

c. to work in collaboration with the Addison County Solid Waste Management District.

d. to research new recycling equipment and possibilities.

e. to assist with the tracking of information on College waste and publicize findings when appropriate.

f. to assist the Bread Loaf mountain campus and the Snow Bowl with their recycling programs.

2. To serve as an environmental awareness educator for the College community regarding recycling, waste reduction, and conservation with the responsibility:

a. to conduct an environmental awareness and recycling orientation session for all new students during their College orientation in September and February and for new faculty and staff.

b. to organize and lead the training of the Residential Life staff and residence hall Environmental Monitors regarding recycling and energy and water conservation, and to assist the Director of Residential Life in promoting environmental awareness among the students.

c. to offer environmental awareness and recycling presentations to faculty, staff, and students as needed and to promote environmental awareness and responsibility through the campus media.

d. to represent Middlebury College at other institutions and at off-campus events concerned with recycling and environmental awareness; and to advise other colleges on recycling.

3. to serve as an ex officio member of the Environmental Council and as the Vice-Chair and Project Coordinator for the Council, coordinating such projects for the Council as the responsibilities described in 1 and 2 above permit.

4. to make recommendations to the College community and the Environmental Council on ways to reduce waste and increase environmental awareness; to assist students with research projects on recycling and other related environmental issues; to perform other tasks for Facilities Management as needed.

The needs and priorities of Middlebury College pertaining to recycling and environmental awareness will continue to evolve as they have over the past few years, and whoever is hired as the new Environmental Coordinator should be prepared to have the job description evolve with the situation. At present it seems advisable for the Environmental Coordinator to continue to report to the Assistant Director for Maintenance and Operations, Facilities Management. There are special advantages with regard to the recycling responsibilities of the Environmental Coordinator to having the Coordinator's office in the Service Building where it currently is located. This location of the Environmental Coordinator's office also fosters some productive communication between faculty and students on the one hand and the Facilities Management staff in the Service Building on the other hand that might otherwise not occur.

However, it is also important that the Environmental Coordinator work closely with the Residential Life staff in the Dean of Students office and that environmental awareness and responsibility be included as an important item on the Dean of Students' agenda for new student orientation and the Residential Life program. (See Chapter VI.)

It must also be pointed out that the Environmental Coordinator with his/her many responsibilities cannot provide the Environmental Council with all of the staff assistance that it needs in order to fulfill its mission. This need remains an unresolved problem that must be addressed in the future.

Environmental Coordinator Subcommittee
Holly Cookis
Norman Cushman
Steven C. Rockefeller, Chair

V. College Publications

The Publications Subcommittee has reviewed the *Middlebury College Catalog* and *Middlebury College Handbook* to determine whether these publications adequately represent the College's commitment to Environmental Studies and environmental awareness and responsibility. The Committee recommends the following changes and additions:

A. *Middlebury College Catalog*, 1994-1995.

1. The opening statement, "To Choose and Be Chosen," which is found on pages 7-8, could mention environmental studies in the third paragraph by rewriting the last sentence. In the proposed revision below, the new wording is in **boldface** type.

> For some this transcendence may come through the study of other peoples and other tongues **or through environmental studies;** for others it will come through **inquiry in the fields of** the ~~hard study that brings an understanding of~~ physics or philosophy, mathematics or music.

This revision balances the reference to the study of people and of language with a reference to the study of nature and the relations of people and nature.

2. On pages 12-13, there is a section entitled "The Curriculum of Middlebury College," which does not describe the curriculum and which is unnecessarily repetitive. We suggest giving the section a new title that reflects its actual content and rewriting the first paragraph, making it shorter and more focused and eliminating repetitious statements as well as ideas repeated in the second paragraph. The second paragraph is the heart of the section, and it should include references to environmental studies and related issues. In the proposed revisions below, the new wording is in **boldface** type.

The Goals of A Middlebury Education

> **The Middlebury College faculty is composed of outstanding dedicated teachers who are also accomplished scholars. Students are provided opportunities for close working relations with their teachers, and intellectual exchange with the faculty goes on outside as well as inside the classroom. The liberal arts education offered by the College is designed to enable students to lead rewarding lives of ongoing intellectual and spiritual growth and to prepare them to meet the challenges of responsible citizenship in a complex changing world.**
>
> ~~Helvétius wrote:~~ "L'éducation nous faisait ce que nous sommes" ("Education made us what we are"), **wrote Helvétius**. We have an ideal of the kind of person a Middlebury education should help to make. It is a person who can think logically; who can write not only with accuracy and clarity, but also with style and an individual voice; who can appreciate the visual and performing arts and participate in their creation; who can reason with numbers and symbols and apply rigorous ~~analytic~~ techniques **of analysis** in seeking answers; who knows how to read--~~analytically~~ **critically** and imaginatively--literature and philosophy from around the world; **who is capable of wide sympathy and of making intelligent value judgments;** who has an

informed sense of the varied, eventful path humanity has taken to reach the present; who is aware that the frontiers of understanding and knowledge are always shifting and expanding; who understands the principles and methods of the natural sciences and knows what it is to experience the excitement of scientific discovery; who has a sense of the interaction between people and society in the United States and in other countries; **who has an understanding of the relations between humans and the environment; who is mindful of the responsibilities present generations have to future generations and of the need for long-term thinking;** who can understand, read and speak a foreign language and thereby has the access to foreign cultures that only such proficiency can bring; who knows how to discipline the body as well as the mind.

~~Even~~ Expecting students to seek such an ideal is asking much, but we believe each Middlebury student is capable of approaching it. The faculty and staff at Middlebury College have dedicated their talents and their efforts to making such achievements possible.

Note: Some of the ideas in the first two sentences of the revised first paragraph are reiterated in the *Middlebury College Catalog* eight pages later in the second paragraph of the section on "The Middlebury Community." One could address this problem by eliminating the second sentence of this second paragraph on page 20, which reads: "Middlebury's faculty is composed of an exceptional group of dedicated teacher-scholars." However, the repetition of this statement may be desirable.

3. On pages 20-24 one finds a section on "The Middlebury Community," which includes subsections on "Student Life," "Athletics," and "The Middlebury Student." We recommend adding a new subsection on "Environmental Awareness" at the end of this section on page 24.

Environmental Awareness

Respect and care for the environment are a central concern of Middlebury College. A high priority is given to integrating environmental awareness into the day to day operations and life of the institution. In this way, the College encourages all students, faculty, and staff to be mindful regarding the effect of their actions on the local and global environment, and it challenges them to help the institution pursue its goal of environmental responsibility.

In its stewardship of land, the College endeavors to preserve biodiversity, conserve natural resources, and maintain the beauty of the landscape. In all its operations, including the management of student residence halls, the College works to increase energy efficiency, conserve water, minimize waste, and recycle. When making financial investments, purchasing supplies, and designing new buildings or renovating old ones, the College considers environmental impact. The President of Middlebury was an early signer of the Talloires Declaration on the environment issued by University Presidents for a Sustainable Future.

Through Environmental Quality (EQ), the Mountain Club, Middlebury Outdoor Orientation, the Otter Creek Journal, Students Organizing for Animal Rights (SOAR), Weybridge House (an environmental interest residence hall), and the Environmental Council, students exercise significant environmental leadership in the College community. There is a lively debate on campus about our knowledge of the environment and its implications and about how to improve the College's environmental policies. It is also widely recognized that many measures that are good for the environment are also good for the College budget, generating significant savings.

With its many environmental initiatives as well as a wide range of academic courses in the field of environmental studies, Middlebury seeks to ensure that its graduates will have the knowledge, skills, and values to be leaders in the world wide endeavor to restore and protect the environment.

B. *Middlebury College Handbook*

1. General Regulations. On pages 32 and 33 there is a section on General Regulations which includes subsections on A. Respect for Persons and Property, B. Respect for the Educational Function of the College, C. Respect for College Officials, and D. Respect for College Property. The last section deals explicitly with residence halls, institutional facilities, and other buildings. No mention is made of the out-of-door campus. We recommend that a new section E. be added entitled, Respect for the Environment, which would contain the three points stated below. The new wording is in **boldface** type.

E. Respect for the Environment

Respect and care for the environment are a central concern of Middlebury College. A high priority is given to integrating environmental awareness and responsibility into the day to day operations and life of the institution.

1. The Outdoor Campus. Destroying or doing physical damage to trees, shrubs, gardens, lawns, wildlife habitat, ponds, rivers, and streams on College property is a serious offense. The minimum penalty is payment of the full cost of repair and replacement and a $100 fine.

2. Wildlife. All students are expected to respect state and federal laws pertaining to animal welfare and endangered species. In addition, the unauthorized trapping or killing of wildlife or the harassment of wildlife on College property is not permitted and will result in disciplinary action.

3. Conservation and Recycling. All students are expected to cooperate with College programs designed to promote energy and water conservation and recycling. Disruption of conservation and recycling programs, including damage to equipment, is subject to disciplinary action, and those responsible for damage will be charged for repairs and the replacement of equipment.

2. Listing of Environmental Council. The Environmental Council has recommended that the Council become a standing College Council, and if this change is made, the Environmental Council should be listed in the *Middlebury College Handbook* as one of the College Councils (See 1994 *Middlebury College Handbook*, p. 66).

C. Environmentally Responsible Publications Printing Policy

It is recommended in the report on Administration and Business Management that the College integrate environmental considerations into all office management practices by reducing waste, energy consumption, and the use of volatile organic compounds. The College has already taken many steps toward implementing such a policy, including the extensive use of recycled paper products. It would be helpful to formalize this policy. Therefore, in connection with the printing of College publications, it is also recommended:

1. that in purchasing paper for College publications the Vice President for Administration establish a policy of using paper that is recycled with a high percentage of post consumer waste.

2. that the College use soy-based inks in the printing of publications whenever such inks are a satisfactory alternative and that every effort be made to use printing technologies that reduce the percentage of volatile organic compounds emitted from press washes (which clean inks off the press) and fountain solutions (which are used to keep the ink on the image areas of printing plates).

Waterless printing is a new technology that eliminates fountain solutions from the printing process, and it also reduces waste. The College is encouraged to explore waterless printing as well as other new environmentally sound technologies.

College offices can reduce the volume of publications and also reduce costs and waste by more carefully determining actual need. For example, Admissions and Publications often send cases of unused College catalogs and other publications to be recycled.

The College has become a member of the Buy Recycled Business Alliance, a step which the Environmental Council supports, and as a member the College is pledged to increase each year its purchases of products made from recycled materials. The Buy Recycled Business Alliance should be used as a useful resource regarding recycled products and related purchasing policies.

Publications Subcommittee
Alexander P. Lee, '97
Christopher McGrory Klyza
Steven C. Rockefeller, Chair

VI. Community Awareness and Education

On September 19, 1994, President John McCardell delivered his beginning of the year "State of the College" address. In this, he identified as one of his goals making Middlebury "The environmentally aware campus" and identifying as a "10-year goal the establishment of *the* preeminent Environmental Studies Program." In the following section, we will examine where the College now stands in regard to overall environmental awareness and make recommendations to improve the College's standing in this area. It should also be noted that the President has convened an ad hoc Committee on the Environment to broadly address these issues. This Committee submitted its Report to the President in April 1995.

A. Environmental Education

There are two general arenas of environmental education at the College. The first is the Environmental Studies (ES) major, in which students achieve depth and breadth in study of the environment. The second deals with environmental education in a broader sense. It concerns the environmental education of students who don't major in environmental studies as well as introducing the environment as a topic in courses not specifically part of the Environmental Studies Program.

The Environmental Studies Program

The Environmental Studies Program at Middlebury College, established in 1965, is the oldest in the country. The Program was a relatively small one through the late 1980s, typically graduating five to twelve majors per year. This has changed dramatically, however. Since graduating no majors in 1988, the Program has grown at an astronomical rate: nineteen in 1991, forty-one in 1994, and a projected sixty graduates in 1995. Currently, Environmental Studies is the fourth largest major at Middlebury. Nineteen faculty members from twelve different departments are now affiliated with the ES Program. The major has four parts: a set of three core courses, an in-depth focus, cognate courses that supplement the breadth gained in the core courses, and senior-level work.

We recommend that the College continue to support a strong Environmental Studies major.

Environmental Education Beyond the Environmental Studies Major

Under the "old" distribution requirements (in place through the Class of 1997), a concentration in Environmental Studies exists. This has been a popular concentration with students. Under the "new" distribution requirements, the required concentrations have been replaced with voluntary minors. Due to enrollment pressures, especially in the introductory ES courses, there is no minor in Environmental Studies.

Currently, three problems regarding environmental education outside of the ES major exist at Middlebury. (1) There is no minor available for students who would like this opportunity. (2) It is very difficult for non-ES majors to get into ES classes after sophomore year. (3) There is no requirement that all students take at least one environmentally-related course before they graduate. The first two problems are related to staffing issues and student demand. If more sections of the ES courses could be offered, or if a new ES course for non-majors could be developed, these problems could be dealt with. The third problem requires action by the faculty. One option would be to make the

environment a fourth category of the Cultures and Civilization category of the new distribution requirements. This would mean all students must take at least one course relating to the environment in order to graduate, and this course could satisfy other requirements as well (e.g., subject matter distribution or major).

A further concern is the idea of incorporating environmental subject matter into more courses across the curriculum. This, too, would require the support of the faculty (e.g., their interest) and the Administration (e.g., course development grants).

We recommend that the College support initiatives to increase environmental education across the curriculum, including staffing to allow for an Environmental Studies minor and courses for non-majors, and that the faculty add the environment to its distribution requirements.

B. Environmental Awareness

In the following section we examine current policies and groups involved in furthering environmental awareness for the entire Middlebury College community--faculty, staff, and students.

Environmental Council

The Environmental Council is an ad hoc committee appointed by the Vice President for Administration and Treasurer of the College. It consists of faculty, staff, and students who are concerned with environmental issues and whose jobs deal with aspects of the college that affect the environment. The Council came into existence in 1992, though its roots can be traced to the Energy Council that began in the mid-1970s. Among the issues that the Environmental Council deals with are: developing a campus environmental plan; promoting composting, energy conservation, waste minimization and recycling, and water conservation; and raising environmental awareness on campus through environmental contests, fairs, and speakers. It should be stressed that the Council has no authority or power to make decisions regarding College policy; it is purely an advisory and educatory body. In 1994-95, the Council has had a $5,000 budget to support its activities.

We recommend that the Environmental Council become a permanent committee (see Environmental Council section).

Student Organizations and Activities

1. Middlebury Mountain Club. This student group, founded in 1930, focuses on helping students to engage in outdoor activities, such as backpacking, biking, camping, canoeing, caving, climbing, hiking, kayaking, and skiing, throughout northern New England and the Adirondacks. The group organizes trips, lends out equipment, and brings speakers to campus. Although not an environmental group per se, by helping get students outdoors, the Mountain Club plays a crucial role in furthering environmental awareness on campus and in developing a sense of place in the surrounding region. A special program that the Mountain Club runs is the Middlebury Outdoor Orientation (MOO). This program for incoming students serves as an orientation to the College and to the surrounding natural regions. It has been a tremendous success since it began. In 1994, 215 first year students participated in the fall MOO, and the Mountain Club hopes for 300 students in 1995. In addition, this February FOO (February Outdoor Orientation) was initiated for students beginning the year in February.

2. Environmental Quality (EQ): EQ is a student group dedicated to educating and mobilizing students on environmental issues. Among the organization's major activities are inviting and sponsoring

speakers on environmental issues, undertaking letter-writing campaigns, and organizing Earth Day activities. One of EQ's greatest successes is the C.U.P.P.S. program, which supplies every student, faculty, and staff member with a portable plastic cup to use for take-out beverages. This program has led to the elimination of paper cups at the dining halls. EQ, founded in 1980, has been a very popular and successful organization. Current membership is approximately 25 students. EQ has no relationship to the ES Program.

3. Weybridge House: Weybridge House--or the Environmental House--is a student residence based on mindful living. Established in 1991, between 12 and 20 students live in the house. Among the activities members have undertaken over the last few years are hosting faculty dinners on environmental issues, communal cooking and eating (the House is off the meal plan), gardening and composting, and forming a nature writers' circle. Future goals include retrofitting Weybridge House with a composting toilet and taking the House off the electric grid through solar and wind energy. Weybridge House raises awareness both through example and through their activities. Weybridge House has no relationship to the ES Program.

4. *Otter Creek Journal* (OCJ): The OCJ, founded in 1992, is a student environmental journal. Published each semester, the OCJ includes student, staff, and faculty writing and artwork on issues related to the environment. Much of the work in the journal is "nature writing," though the OCJ is open to any work exploring the relationship of humans to their environment. The OCJ publishes on tree free paper.

We recommend that the College continue to support and fund these student organizations.

Administration, Faculty, and Staff Activities

One central element to the growth of environmental awareness throughout the Middlebury College community is the strong support of the administration. By sending a clear message to *all* segments of the community that environmental awareness is an important part of the College's mission, there is a growing likelihood that environmental awareness will expand and deepen. Recent positive examples of this have been the College's donation of lands in Cornwall Swamp to the Nature Conservancy, the decision to support the Otter Creek Greenbelt, and President McCardell's September speech identifying the environment as a peak of excellence at the College.

We recommend that the Administration support significant environmental initiatives in all aspects of College life and make it clear to the College community that environmental awareness is important. This could be done through presidential statements and through including language on environmental awareness in the *Middlebury College Catalog* and the *Middlebury College Handbook* (see College Publications section).

Residential life is an arena where environmental awareness can be raised significantly. It is in the dorms that students make most of their decisions about energy use, recycling, and water use. Including environmental awareness as a responsibility of Resident Assistants (RAs) and Junior Counselors (JCs), the students will see the importance of this and be reminded of it in their living space. It is of the utmost importance that the Dean of Students cooperate in helping to build environmental awareness on campus.

At present, student cooperation in the dormitories with conservation and recycling efforts is poor. In an effort to improve this situation,

We recommend that the Dean of Students include in the new student orientation program in September and February a 30-minute environmental awareness session to be conducted in the relevant residence halls by the Environmental Coordinator. Attendance at this environmental awareness session shall be mandatory for all entering students.

In recent years it has been the responsibility of the Environmental Council to appoint Environmental Monitors to promote energy and water conservation and recycling in the various buildings on campus. It has been particularly difficult for the Environmental Council, working through various student organizations and through the office of the Recycling Coordinator, to find student volunteers to serve as Environmental Monitors in the dormitories. The current system for making these appointments is very time-consuming and very inefficient. However, the assistance of Environmental Monitors in the dormitories is essential if the student body is to be made environmentally aware, leading to full cooperation with College efforts aimed at conservation and recycling.

We recommend that the Residential Life Program, under the supervision of the Dean of Students, take on full responsibility for appointing Environmental Monitors for all student residence halls and ensuring that monitors carry out their responsibilities. The job description of the Director of Residential Life, the RAs, and the JCs should include responsibility for promoting environmental awareness, conservation, and recycling. The RAs and JCs should participate in an environmental monitor training session with the College Environmental Coordinator and serve as Environmental Monitors themselves. They should also assist the Director of Residential Life in appointing and supervising a core of additional Environmental Monitors as needed. The position of residence hall Fire Safety Monitor and Environmental Monitor could be combined, and it would be appropriate to offer the students who assume this joint responsibility some form of compensation. The Environmental Coordinator will conduct orientation and training sessions for the residence hall Environmental Monitors at the beginning of each academic year as soon as the Environmental Monitors have been appointed.

Faculty are often engaged in environmentally-oriented research and in local projects related to environmental issues. The College should seek to have the faculty share this work with the public, as it has done in such past events as The Sense of Place Symposium. In addition, the College should continue to support efforts to bring in environmental speakers, such as Gary Snyder, Terry Tempest Williams, and William Cronon, and to undertake conferences, such as The Future of the Northern Forest and Spirit and Nature.

We recommend continued support of speakers and conferences on environmental issues. To further this support, we recommend establishing an endowed lecture fund for environmental affairs.

Conclusion

If Middlebury College is to become a leader in environmental education and environmental awareness among colleges and universities, it must be aware of what other institutions are doing and respond accordingly. For instance, a number of campuses are designed to be car-free or pedestrian campuses (e.g., UC-Davis, St. Lawrence). George Washington University just signed an agreement with the EPA to make the institution a "green" university. The EPA hopes to sign similar agreements with other schools. Why not Middlebury? Tufts University has an Environmental Literacy Institute. The EPA's Green Lights program has over 76 college and university members. Why not Middlebury?

Middlebury College has shown leadership in signing the 1990 Talloires Declaration, a commitment by university presidents to a sustainable future. If the College is to be a leader, however, it must at the very least be doing what other institutions are doing. Indeed, Middlebury should be doing it before them. The College should be an innovator in areas like energy conservation, reduced use of toxic substances, and sustainable land management.

Community Awareness and Education Subcommittee

Christopher McGrory Klyza, Chair
Alexander P. Lee, '97
George A. Romer, '95
Steven C. Rockefeller

Appendix
Suggestions Regarding Weybridge House

As part of the establishment of Environmental Studies as an academic peak, the College should review its policy on academic interest houses. The environmental house, in a brainstorming meeting earlier this semester, decided that it would like some major changes. Some of the items listed would only benefit house members, but many could be implemented on a campuswide basis.

1. Allow the house to switch to organic food. This can be cost effective if students are allowed to create their own food budget.
2. Turn front room into a house library. Add money to the house budget for books and periodicals.
3. Build a greenhouse to allow students to grow vegetables during the colder months of the year.
4. Increase counter space to facilitate meal preparation.
5. Turn Homestead into another environmental house, so that the two houses would form an "environmental complex."

OR

6. Build a new environmental house, with an eye towards solar energy and similar cutting edge environmental technologies.
7. Switch to double- or triple-glazed windows that reduce winter heat loss.
8. Address the problem of the house settling. Upper floors are uneven.
9. Create laundry facilities. Big basin sinks and room to air dry clothes would be sufficient.
10. Create a safe, secure, indoor bicycle storage space.
11. Invest in composting toilets as a means to reduce water consumption.

Alexander P. Lee, '97
George A. Romer, '95

VII. Energy and Water Conservation

In the early 1970's Middlebury College made a major commitment to Energy Management in order to reduce its operating costs, its dependence on public utilities, and its impact on the environment. After two decades, the College continues to expand its Energy Management Program through the purchase of energy efficient equipment, new technologies, retrofits, research, and community awareness and education. Its efforts have reduced the consumption of fossil fuels, electricity, and water and have heightened the consciousness of the community.

Below is a list of the primary energy conservation policies and practices of the College's Energy Management Program.

1. Operational & Maintenance Standards

Facilities Management maintains high operational and maintenance standards and practices in managing equipment and facilities. It is important that facilities be operated efficiently and effectively to minimize interruption of services and reduce operational costs.

2. Renovations & New Construction

All renovations of existing facilities and construction of new facilities must involve building materials, equipment, and technologies that are highly energy efficient, reducing consumption of fuel and electricity. The use of high R-value insulation and air tight high E windows are important in reducing heat loss. The installation of energy efficient motors, lighting systems, and appliances is necessary to reduce use of electricity. New technologies and devices like electronic ballasts, low energy lamps, computerized building management systems, passive solar and heat pumps are also important to energy efficiency. Water saving technologies are also very important.

3. Efficient Central Heating Plant

Facilities Management is committed to the operation and maintenance of a highly efficient Central Heating Plant, including the utility distribution systems for steam, electricity and water. The continuous upgrading of boiler controls and plant auxiliaries are essential to good plant management.

4. Research

Facilities Management is committed to the research of new building materials, devices, equipment, technology and operational practices that will reduce energy consumption in campus facilities.

5. Retrofit

Facilities Management is authorized and expected to retrofit systems and devices whenever feasible to reduce energy consumption. The College will continue to work closely with Central Vermont Public Service to take advantage of Demand Side Management programs whenever possible. Retrofits with simple payback of three years or less are considered high priority projects.

6. Fuel Purchase Policy

The Purchasing Department is responsible for initiating the fuel purchase policy. Annually bids are invited from eligible fuel suppliers to obtain the lowest price possible for No. 6 and No. 2 fuel oils. A contract is signed for a unit price of x-number of gallons of a tightly specified fuel oil. Periodic quality control monitoring is required to maintain stack emissions standards. (See Chapter X, Toxics and Pollution, for further comment on the College Service Building smokestack.)

7. Staff Education and Training

Facilities Management is committed to the ongoing education and training of staff to keep pace with changing technologies and operational and maintenance practices.

8. Co-Generation

Facilities Management is committed to generating as much electricity as possible via steam driven turbine/generators from a back pressure steam process to reduce the College's dependence on the local electric company and to reduce operating costs. As steam loads increase through facilities growth so too should co-generation.

9. Computerized Energy Management System

Facilities Management is committed to the operation and expansion of the Powers 600 EMS to reduce steam, electricity, and water consumption. Presently, micro computers with DDC and antilog output controls, monitor trends, and maintain records on building equipment in about half of our major buildings. Automatic control strategies in the equipment allow us to limit electricity usage, duty cycle electric motors, stop/start equipment and lighting systems, control and monitor space temperature, etc. Expansion of this equipment coincides closely with the College's building renovations/new construction schedule.

10. Water Conservation Management

Middlebury College's source of water for domestic use, fire protection, and process is from the municipal water system. Our consumption of water is metered and we pay a water use tax and a sewer discharge tax based on the metered amount. Facilities Management has established some standards to reduce consumption. It controls shower head flow to 2 GPM or less. It installs system pressure regulators to reduce water pressure, uses air cooled refrigeration equipment whenever possible in lieu of water cooled, and installs water flow reducer devices whenever possible.

11. Community Energy Conservation Awareness

As long as Middlebury College has had an energy management program, it has promoted community awareness as a key element of its program. The primary vehicle for promoting awareness is the Energy Council whose membership is comprised of students, faculty, and staff. The Council's role is to propose policy, make recommendations as to energy related projects, and inform and educate the community on energy related matters. The Council uses energy fairs, posters, table tents, Campus articles, competitions, seminars and exhibits, energy monitors in every building, and special meetings to promote awareness.

Recommendations:

1. An energy management policy for the 90s should be formulated, written down, formally adopted, and circulated.

2. The College should construct a dormitory that is state-of-the-art in energy/environmental technology as a learning center for students, faculty, and staff.

3. An energy impact study and environmental impact assessment should be included as part of every College renovation and new construction project. Life cycle costing should be a primary element in design and equipment selection. The project budget should make provisions for all energy conservation measures that have a simple payback of five years or less.

Relevant Federal, State and Local Laws

ASHRAE Standards - for quality standards relating to mechanical and electrical systems.

BOCA Building Code - Chapter 25

BOCA Mechanical Code

National Electric Code

Town of Middlebury Waste Water Ordinance dated August 1989 - for the discharge of waste water.

Clean Air Act

Energy and Water Conservation Subcommittee
Jon C. Woodbury, Chair

VIII. Dining Services and Food

A. Dining Service's Current Practices Relating to the Environment

Dining Services at Middlebury College prepare and serve food at Upper, Lower, and Redfield Proctor, and at the Student Dining Units, Chateau, Crest Room, Rehearsals Cafe, Snow Bowl lodge, Golf Course snack bar, Bread Loaf Campus, and most catered events at the College.

Dining Services has already made noticeable progress in reducing its environmental impact. While there are no existing Dining Services policies regarding environmental stewardship, there have been a number of incremental changes designed to reduce the impact of Middlebury's food services on the environment.

Below is a list of practices followed by Dining Services. None of these practices are written into dining policy, and they are subject to change with new price or feasibility considerations. These practices are listed for informational purposes only. They identify where the College has taken constructive steps and where there are gaps between our proposed policies and existing practices.

Treatment of Waste

- composts most pre-consumer and post-consumer food waste
- purchases food in bulk, when possible, to reduce packaging waste
- provides no paper or disposable cups or plates at dining halls (students should use their EQ mugs for drinks to take home). Paper cups and plates are still used at most all college catered events and for to-go purchases from the Crest Room. Paper products are the only option at the Snow Bowl, golf course, and Rehearsals Café.
- provides bins to compost napkins and other materials in dining halls and at catered events
- donates extra pre-consumer food from kitchen to local community groups

Food Purchasing

orders food through the primary vending system (currently with Jordan's Foods) to increase efficiency and decrease transportation involved in supplying food

supports local producers by purchasing their milk, yogurt, ice-cream, and seasonally available fruits

Other

- lights dining halls with candles on Wednesday nights in January to increase energy awareness and reduce electrical consumption
- provides vegetarian hot meals at lunch and dinner for students whose diets do not include meat
- provides soy-based milk for students whose diet does not include dairy products
- is a member of the National Association of College and University Food Services which collectively pressures vendors and manufacturers about issues concerning member schools

B. Relevant State and Local Laws

There are few laws that control how Dining Services can operate with regard to the environment. Below are the relevant laws that were identified.

- cannot serve post-consumer food leftovers (state health law)
- must recycle all recyclable waste (county and town waste management ordinances)
- cannot re-use plastic bread bags as lunch bags or for other purposes (state health law)

C. Proposed Environmental Guidelines For Middlebury Dining Services

The following are the recommendations of the Environmental Council. Many of the recommendations were developed from current practices at Middlebury and policies made at other colleges, including Hendrix College in Arkansas and Carleton College in Minnesota.

Middlebury Dining Services consciously works to promote a sustainable environment through its operations. Dining Services will continue to build on its past and work to:

1. **Proactively *reduce* the waste generated by its operations.** When purchasing food, a preference will be given to items that meet price and quality standards while containing a minimal amount of packaging. Reusable packaging materials will be returned to vendors. Food servers will avoid serving students more food than they require. Students should be encouraged to return for seconds and will be educated to take only the food they can eat.

2. **Responsibly *manage* the waste it produces.** Kitchen food scraps, food waste from trays, and paper products like napkins will be collected and composted when feasible. Recyclable materials handled by the College recycling program, including cardboard, metals, glass, and plastics, will be separated and recycled.

3. **Find alternatives to disposable products at catered events and in small cash dining operations.** Linen napkins, reusable or compostable flatware, and china dishware will be used when practical and affordable.

4. **Use one food vendor for the bulk of its food purchases** when financially feasibly. This cost effective plan increases the efficiency of food delivery and requires less transportation to bring products to the College. As a large customer of a food vendor, Dining Services can exert pressures on suppliers and manufacturers to increase product quality and environmental standards.

5. **Support local and sustainable agriculture** with the purchase of available and affordable products like local milk, yogurt, ice cream, and seasonally available fruits and crops. Dining Services will integrate environmental considerations with existing price and quality criteria for food so the College can provide more high quality foods grown with organic and sustainable farming practices. When possible, these local and organic food purchases will be made through the primary vendor.
   The largest barrier to organic food purchases today is the high cost of organic foods. Purchasing organic foods requires new funds and/or cuts in other foods and services currently provided by Dining Services. Hendrix College and Carleton College both provide very good examples of colleges that have committed themselves to purchasing local

and organic food products while maintaining high levels of food quality and selection at an affordable cost.

6. **Pressure food vendors and suppliers to provide affordable products that meet Middlebury College's environmental goals.** Through the National Association of College and University Food Services and other available mechanisms, the College will work with suppliers to promote our environmental food service goals.

7. **Increase awareness concerning organic foods and Vermont products.** Promotions, advertising, and labels on food will challenge students to consider the importance of local and organically grown foods provided by the College.

8. **Plan facilities upgrades to promote the environmental goals of Dining Services.** This is particularly important in light of the proposed remodeling of our central dining facilities.

   • A new dining facility should include a larger, more efficient hot-meal service area so students can return for seconds without having to wait in line. The current configuration often has long lines that encourage students to take too much food as a way to avoid waiting in a lengthy line for more helpings.
   • A refrigerated loading dock would allow incoming food orders to stay cool. This would reduce food waste from spoilage.
   • Added space for storage would reduce the required delivery trips currently made by our food vendors.
   • Space for storing reusable shipping containers from vendors to promote packaging reuse.
   • Room for a short-term recycling bin near kitchen area and long-term storage bin conveniently located for kitchen staff and recycling truck.

The recommendations in this report have evolved from suggestions and ideas made by the Environmental Council working with information supplied by the Dining Services and Food Subcommittee.

Dining Services and Food Subcommittee
Hillery N. Hinds, '96
Russell P. Hulst, Buyer/Assistant Unit Manager, Dining Services
Ted A. Mayer, Director, Dining Services
Eric A. Odell, '95
Peter Polson, '95, Chair
Sarah S. Rebick, '97

IX. Land Stewardship

College lands provide an environment of great beauty and tranquillity which enhances the educational experience. Through sound management and stewardship of its valuable land resource, the College demonstrates practicable conservation and recognizes and seeks to preserve the values of diverse ecosystems.

1. CAMPUS, including athletic fields and golf course

The College maintains a biologically diverse campus landscape including over 300 acres of campus, athletic fields, and golf course. Choice of type and species of vegetation is influenced by the degree of human impact and by the needs and desires of the College community. Maintenance variations and informal buffers of natural plant communities are utilized to delineate the campus proper from the surrounding lands characterized by lower use levels. These provisions and policies tend to concentrate human impact to a core of campus, athletic fields, and golf course.

The College subscribes to the Integrated Pest Management (IPM) approach to plant pest control. This entails the limiting of vectors for infestation and growth and includes planting resistant species, limiting monocultures, limiting the introduction of pests, and generally providing for a healthy horticultural environment. When pesticides must be applied to protect the beauty of the campus and the safety of our students, we employ the least toxic chemicals sufficient to meet the need. Pesticide applications are performed or supervised by our own State Certified Applicators and are governed by State regulations. Material safety data sheets (MSDS) are available for inspection at Campus Security.

2. FARMLANDS

The College owns over 1600 acres of farmland of which more than 1150 are contiguous to the campus. It maintains a "working farm" landscape with its associated environmental, social, and economic values. Farmland is under long-term lease to farmers, with the intent of improving the land and increasing its yielding capacity by means of a good cropping program and good cultural practices. Lessees are not permitted to employ pesticides with long-term residual effects in the soil. Participation in federal cost-sharing and farm subsidy programs requires adherence to the conservation plan prepared by the Natural Resources Conservation District (NRCD) for each applicant. Some smaller parcels are maintained by farmers under informal verbal agreements. Other open lands not under lease, such as the 85 acres of Bread Loaf meadowland, are annually "bushhogged" in order to retain the biodiversity and aesthetic values they provide.

3. FOREST LANDS

The College's 4000 acres of forest include 200 acres contiguous to the main campus and 1000 acres surrounding the Bread Loaf campus. The College places prime importance on the forest's intrinsic values including aesthetics, biological diversity, and wildlife habitat, which provide for a rich inspirational, recreational, and educational experience. These values are protected and enhanced through the practice of sustainable forestry which utilizes and maintains the productive capacity of the land. Periodic timber harvests improve stand quality and spacing, reduce losses to natural mortality, stimulate growth, and provide conditions favorable for natural regeneration. Harvesting is conducted in a judicious manner to protect the residual stand and existing regeneration. Forestry operations adhere to all applicable state and federal regulations. Buffer strips of a width sufficient to protect stream habitat are retained in riparian

areas, such as the lands adjacent to the South Branch of the Middlebury River in Ripton. Wildlife is favored by the retention of snags, nest, and den trees, as well as certain mast trees including bear-clawed beech, hop hornbeam, black cherry, and oak.

Several unique areas are held as forest reserves. These include about 200 acres of riparian lands along the Middlebury River and Otter Creek. In addition, the 100 acre Abbey Lot in Middlebury, an example of hemlock-northern hardwoods "climax" forest, is retained as a natural preserve and study area. In addition, uncommon vegetation types are identified and maintained when recognized.

Some lands of significant ecological value have been transferred to the Nature Conservancy, including, most recently, a gift of 37 acres of woodland in the Cornwall Swamp.

4. STATE and FEDERAL REGULATIONS

A.- Pesticide use - as per Title 6 VSA, Chapter 87, Section 1102-1104.

B.- the State's Acceptable Management Practices (AMP's) are Vermont's approach to complying both with Section 208 of the Federal Water Pollution Act and with Vermont's Water Quality Statutes (Title 10 VSA, Section 1259). AMP's are particularly concerned with erosion control and are intended to have the force of law.

C.- The Slash Removal law (Title 10, Section 2648) governs the treatment of logging slash near boundary lines and public rights-of-way.

D.- Vermont Wetlands Rules (Title 10, Chapter 37, Section 905) identify and protect significant wetlands and their values. Forest Management is an allowed use in Class I or II wetlands if it complies with AMP's and with silvicultural standards for deer wintering yards.

E. - Stream alteration or modification (Title 10, Sections 1021 and 1025)

F. - Protection of endangered species (Title 10, Chapter 123, Section 5401)

G.- Timber trespass (Title 10, Chapter 77, Section 3606)

H. - Logging above 2500 feet elevation (Title 10, Sections 6001 (3) and 6081)

5. RECOMMENDATIONS

A. - That College lands and their associated resources be entered in a Geographic Information System (GIS) data base through a cooperative effort among College land administrators, the Geography Department, and other interested academic departments. A GIS data base will aid land management and planning and will facilitate the academic use of College lands.

B. - That there be wider communication between faculty and land administrators with a view towards fostering greater utilization of the land resource for academic purposes, including student involvement in a complete natural resource inventory.

C. - That we continue to keep abreast of research on environmentally benign pesticides and on the latest technology for minimizing use of pesticides.

D. - That we consider purchasing locally produced soil amendments for use on College lands until such time as we are able to solve the logistical and financial problems associated with our own composting operation.

E. - That we encourage organic and sustainable agriculture on College farmlands.

F. - That where adjoining ownership occurs, the College cooperate with the U.S. Forest Service in joint projects to restore aquatic habitat and implement streambank revegetation and stream monitoring activities.

Land Stewardship Subcommittee
Samantha D. Abeyratne '98
Timothy V. Bouton, Supervisor, Landscape and General Service Personnel, Facilities Management
Alexander P. Lee'97
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Stephen W. Weber, Chair

Appendix

MIDDLEBURY COLLEGE LANDS
ACREAGE SUMMARY *

Revised 4/14/95

Location	Total Acres	Wood Lands	Farm Lands	Campus	House Acres	Athletic Fields	Other
Albany	160.00	160.00	-	-	-	-	-
Bristol	56.68	56.68	-	-	-	-	-
Cornwall	463.86	49.97	386.88	-	5.01	-	22.00
Hancock	763.00	672.00	-	-	-	-	91.00
Leicester	119.00	105.00	-	-	4.00	-	10.00
Lincoln	158.00	133.00	20.00	-	5.00	-	-
Middlebury	2,150.19	593.17	960.15	133.20	48.64	62.50	352.53
New Haven	465.20	292.90	152.30	-	-	-	20.00
Ripton	2,140.45	2,020.42	84.00	22.00	10.03	-	4.00
Waitsfield	31.39	31.39	-	-	-	-	-
Weybridge	233.59	3.17	151.12	-	2.00	-	7.30
New Jersey	39.49	6.96	24.50	-	1.50	-	6.53
Totals	6,780.85	4,194.66	1,778.95	155.20	76.18	62.50	513.36

*Summary does not include out-of-state properties for sale.

2. PESTICIDES IN USE

MSDS 's available at Campus Security.

X. Toxics and Pollution

Introduction

Our charge was to assemble all existing College policies and identify relevant federal and state laws in the area of toxics and pollutants as they relate specifically to Art Department materials, Science Center materials, waste, and indoor air quality. We were to identify existing and potential problems on campus or College lands, and to identify gaps in critical information. Finally, we were asked to recommend revisions to existing policies and new policies, as well as identify problem areas where new policies are needed.

The committee found the task before it enormous. We would like to present a report that is all encompassing and that completely acknowledges all relevant state and federal regulations. However, our lay knowledge and the time limitation for this report cause it to be more a compilation of concerns and a basis for further study.

We considered toxic materials as they are brought onto campus, as they are used by various departments, and as they are disposed of and leave campus. Of course, the answer to the "toxics problem" is to reduce the amount of toxics, and many steps have been taken to reduce the use and storage of toxic materials. The requirement for Material Data Safety Sheets especially motivated individuals and the purchasing department to "buy green" whenever possible. Whenever a more environmentally friendly item can be procured to do a given job, the College attempts to buy responsibly. Organic Chemistry laboratories have reduced their use of hazardous materials. [1] Operations continually looks for alternative materials. Some items are re-used (paint thinner, antifreeze) and some recycled (used motor oil, fluorescent light bulbs and ballasts). We believe that faculty and staff want to be responsible in proper use and disposal of toxics, but several have indicated frustration in not knowing what they should be doing. Policies and procedures need to be established so that individuals and departments will know how to deal responsibly with toxics. This will be an area for the expertise of the new Safety Officer.

It is difficult to follow toxics as they come to campus, are disbursed to many locations and are used by academics or by Operations. No one person knows what quantities of hazardous materials are on campus, and no one person knows the quantities of materials that are no longer used and would be categorized as waste materials. Taking an inventory of all toxic materials will be one of the first tasks of the new Safety Officer. It will bring us into compliance with Right-to-Know regulations as well as other legislation. Should the College fall into the category of a "Class B generator" who generates more than 220 pounds but less than 2200 pounds of hazardous waste in one calendar month, or accumulates more than 2200 pounds, a great deal of paperwork and reporting to state or federal agencies would be required in compliance with 1986 EPA rules. [2] Also required would be written policies for toxic use

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[1] The College organic chemistry teaching labs switched to microscale experiments several years ago, reducing the volume of solvent wastes generated by a factor of nearly 50. The inorganic labs have replaced a quantitative determination that used to generate several gallons of mercury waste with one that instead uses electronic instrumentation.

[2] E.P.A., Office of Solid Waste and Emergency Response, *Understanding the Small Quantity Generator Hazardous Waste Rules: A Handbook for Small Businesses*, September 1986.

reduction. [3] Because of this, it is mandatory that the College know how much hazardous material it generates and stores.

After use, or as a byproduct of academic programs or of Operations, hazardous materials are generally taken to the Science Center or to Facilities Management. There they are recycled or disposed of according to regulations and the best known procedures. The Safety Officer will provide knowledge of law to ensure that the College handles these materials properly. One cannot go by the old adage "If it looks like a duck....". Lead-acid batteries are considered hazardous waste (EPA Hazardous Waste number D008) unless they are going to be recycled. "Used lead-acid batteries that are recycled do not need to be counted in determining the quantity of waste that you generate per month, nor do they require a hazardous waste manifest when shipped off your premises - see 40 CFR Part 266)." [4] The law is complex and evolving, and there are very few people, including those at government agencies, who understand all of it.

We of this committee believe that much needs to be done in this area of toxic and pollutant policy and procedures. Endorsing the Federal Pollution Prevention Act of 1990, we recommend **Middlebury College should (1) prevent and reduce hazardous waste and pollution at its source whenever feasible; (2) handle and recycle in an environmentally safe manner hazardous waste and pollution that cannot be prevented; and (3) dispose of in an environmentally safe manner hazardous waste and other pollutants that cannot be recycled.** We are hopeful that with the expert guidance of the new Safety Officer, and with the continued efforts of many committed individuals, we will meet this challenge and make our environment and the program here one of the peaks of President McCardell's Vision Statement. We hope that this report will define some of the issues to help in this effort.

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[3]Vermont Toxic Use Reduction Law S. 156, 1991.

[4]E.P.A., Office of Solid Waste and Emergency Response, *Understanding the Small Quantity Generator Hazardous Waste Rules: A Handbook for Small Businesses*, September 1986.

Toxics and Pollution: Table of Contents

General Recommendations

A. Air Quality Issues

1. Carpet Fumes
2. Interior Paint Fumes
3. Welding Fumes and Shop Dust
4. Fume Hoods and Biology Safety Cabinets
5. Smoking Policy
6. Smokestack of the Central Heating Plant

B. Hazardous Waste

1. Asbestos
2. Emergency Light Batteries
3. Small Household Batteries
4. Car Batteries
5. Fluorescent Bulbs
6. Light Ballasts
7. Miscellaneous Chemicals (non-Science Center)
8. Storage and Access to Chemicals (Science Center)
9. Mercury
10. Oil and Antifreeze
11. Paint Thinner, Turpentine, and Other Solvents
12. Old Paint and Stain
13. Refrigerant
14. Silver and Photo Waste
15. Science Center RCRA Wastes
16. Science Center Non-RCRA Wastes

C. Medical Waste

D. Radioactive Materials

1. Use of Radioactive Materials
2. NRC Regulations Regarding Radioactive Waste
3. Wastes Disposed of by Decay-in-Storage
4. Wastes Destined for Incineration
5. Radon

E. Other Regulatory and Safety Issues

1. Posting and Signage
2. Spill Cleanup
3. Visitors
4. Temporary Hazardous Waste Storage Facility
5. Evacuation Plans
6. Art Department - Flammable Products Storage

7. Art Department - Proper Labeling of Materials
8. Science Center - Personal Protective Equipment
9. Science Center - Use of Infectious Agents
10. Material Safety Data Sheets - for Facilities Management
11. Material Safety Data Sheets - for Other Parts of the Campus
12. Right-To-Know: the OSHA Laboratory Standard
13. Shipping and Transport of Hazardous Materials

Appendix F

Smoking Policy
Darkroom Safety Policy
Bloodborne Pathogens Exposure Control Plan for Middlebury College
Standard Operating Procedures for Radioactive Waste Disposal
Middlebury College Radioactive Waste Disposal Handbook for Faculty

GENERAL RECOMMENDATION:

In conjunction with the new College Safety Officer, current policies and procedures relating to toxics and pollutants should be written down. Uniform policies should be established for the campus, and appropriate procedures should be implemented where lacking. Middlebury College should be in conformity with state and federal regulations.

Middlebury College should take an inventory of hazardous materials to help in identifying areas where policies and procedures are needed, to document the need for a hazardous waste storage facility, and to ensure compliance with federal regulations concerning the generation and storage of hazardous wastes and the storage and use of hazardous materials.

Middlebury College should (1) prevent and reduce hazardous waste and pollution at its source whenever feasible; (2) handle and recycle in an environmentally safe manner hazardous waste and pollution that cannot be prevented; and (3) dispose of waste and pollutants that cannot be recycled in an environmentally safe manner.

A. AIR QUALITY ISSUES

1. Carpet Fumes

Present Policies/ Procedures: No written policy. The College works with the vendor and carpet manufacturer concerning air quality issues of specific carpets. It is an unwritten policy that the vendor must off-gas the carpet at the warehouse for a minimum of 24 hours before the carpet can be installed. A non-solvent adhesive is used (one level better than that used at IBM) and a Material Safety Data Sheet (MSDS) on the adhesive are obtained from the installer. Middlebury College thoroughly vacuums the carpet after installation.

State/Federal Regulations: This is an area of relatively new concern and there is little published information available at this time. A search of the internet found no regulations. Vermont Building Officials & Code Administrators Mechanical Code concerning air exchange

within buildings must be followed. All Middlebury College buildings conform to this code for the stated use of that building or area.

Deficiencies/Recommendations: The policy should be written.

2. Interior Paint Fumes

Present Policies/ Procedures: Facilities Management is currently changing to non-oil based paints where practicable. Spray painting is not allowed in the Johnson building.

Deficiencies/Recommendations: A policy is needed for each category of paint. A Service Building Paint Shop spray booth is on the Facilities Management project list. Adequate ventilation is needed in the Johnson building. The Johnson building spray paint policy needs to be written.

3. Welding Fumes and Shop Dust

Present Policies/ Procedures: None.

Deficiencies/Recommendations: It is College policy that staff members are trained in Right-to-Know procedures, and are required to follow suggested procedures listed on MSDS received from vendors. Welding shop ventilation in the Service Building is on the Facilities Management project list. Other shops on campus should be studied further (Snow Bowl, Bread Loaf, Golf Course, Center for the Arts, Freeman International Center, Johnson, and Science Center).

4. Fume Hoods and Biological Safety Cabinets

Present Policies/ Procedures: No written policies exist. However, fume hoods are inspected annually, and biological cabinets are inspected semi-annually. The policy for use of this equipment is established by individual faculty members. All hoods have panel-mounted devices indicating safe operation of the hood. The 1991 reconstruction of the fume hood system in the Science Center improved controls, average velocity, and containment for individual hoods, reduced the likelihood of reentrainment of discharged contaminants into the fresh air supply for the building, and improved overall building ventilation.

Deficiencies/Recommendations: Are faculty members consistent in requiring proper use of hoods and cabinets? Is our present training adequate for helping faculty obtain optimal use and personal protection from the hood system?

5. Smoking Policy

Present Policies/ Procedures: The attached written smoking policy (see Appendix F) is in compliance with Vermont statute, effective July 1, 1993 and new state regulations. The College is smoke free, effective September 1, 1994 with specific exceptions as listed in the policy.

State/Federal Regulations: Vermont statute and regulations.

Deficiencies/Recommendations: There is a problem of enforcement in residential buildings, specifically in student lounge space and hallways as evidenced by cigarette holes in the carpeting.

6. Smokestack of the Central Heating Plant

Present Policies/Procedures: Facilities Management currently monitors the smokestack emissions for compliance with state and federal air quality regulations. Operating procedures are based on these state and federal regulations. Fuel samples are tested regularly for compliance with specifications.

Deficiencies/Recommendations: The smokestack continues to emit ash periodically, and the ash corrodes the paint on cars in the Service Building parking lot. Efforts have been made to solve this problem, and numerous experts have been consulted. However, there is no economically feasible solution known at this time. A more expensive fuel oil--two and one-half times the cost of the oil currently being used--would reduce the problem. This is an ongoing concern, and a solution continues to be sought through improved technology or by shifting to natural gas as a fuel. At present there is no natural gas supply line from Burlington to Middlebury.

B. HAZARDOUS WASTE

1. Asbestos

Present Policies/ Procedures: No written policy or procedure exists. Friable asbestos, found predominantly in and around campus mechanical systems, i.e., pipe insulation, water storage tanks, and oven fire/heat protection, is removed on an as needed basis. Removal activities are undertaken by qualified contractors, utilizing state of the art, approved processes. Air quality monitoring, before, during and after removal work is completed, is typically conducted by a third party. All removal activities are coordinated and managed by the Facilities Management Department. Removed asbestos is disposed of at federally approved landfills.

Deficiencies/Recommendations: Current approach works well. Expansion of removal activities is not economically feasible nor practical. Properly encapsulated asbestos is non-threatening and non-harmful. A complete inventory of college asbestos, while serving as a strong resource base would only assist in chronicling removal activities.

2. Emergency Light Batteries

Present Policy/Procedure: No written policy or procedure exists. Facilities Management staff store spent batteries in approved 55 gallon drums in the White Metal Building. Lead-acid and "gel-lead" batteries are purchased by local scrap metal dealers or are given to a local new battery vendor. Nickel cadmium batteries are presently stored for future shipment to a hazardous waste recovery facility.

Deficiencies/Recommendations: Current approach works. Lack of storage space is the only serious bottleneck.

3. Small Household Batteries

Present Policy/Procedure: No comprehensive written policy or procedure exists. Batteries are collected and stored in an approved 55 gallon drum in the White Metal Building by Recycling and Electrical Facilities Management staff. Some reuse of smoke detector batteries is sought through College and public sources. After a marketable volume of these batteries is accumulated, they will be shipped to a hazardous waste recovery facility. None have been shipped to date.

Local/State/Federal Regulations: Procedures required by Addison County Solid Waste Management District.

Deficiencies/Recommendations: Current approach works. Many years will be necessary before an adequate volume accumulated. Good quality storage space is not available. We do not know what percent of student batteries are currently being recycled. Students need to be educated that it is against the law to put batteries in the waste stream. Faculty and staff are quite conscientious with batteries.

4. Car Batteries

Present Policy/Procedure: No written policy or procedure exists. Spent batteries are collected by Facilities Management staff and are stored outdoors in a wooden box at the Harris Farm. These batteries are purchased by a local scrap metal dealer when an adequate quantity, 10 or more, is stored.

Deficiencies/Recommendations: Current approach works well. Transportation of batteries to the scrap metal dealer is highly regulated. Pick-up at our site by an approved hauler is best. Good quality storage space is not available.

5. Fluorescent Bulbs

Present Policy/Procedures: No written policy or procedure exists. Spent bulbs are stored by Facilities Management staff in a college owned barn. After a marketable volume of bulbs is accumulated, they will be shipped to a hazardous waste recovery facility. None have been shipped to date.

Deficiencies/Recommendations: Current approach is less than six months old. Good quality storage space is not available.

6. Light Ballasts

Present Policy/Procedures: No written policy or procedure exists. Facilities Management staff store spent ballasts in approved 55 gallon drums in the White Metal Building. After a marketable volume of ballasts is accumulated, they are shipped to a hazardous waste recovery facility.

Deficiencies/Recommendations: Current approach works well. Good quality storage space is not available.

7. Miscellaneous Chemicals (non-Science Center)

Present Policy/Procedures: Facilities Management has an unwritten policy that when chemicals are purchased in bulk quantities and decanted, the smaller containers must be labeled. In the Art Department, there is no policy for use, labeling, and disposal of etching materials.

State/Federal Regulations: Right-to-Know regulations require proper labeling of hazardous materials.

Deficiencies/Recommendations: Policies are needed for proper labeling of hazardous materials, as well as for their use and disposal.

8. Storage and Access to Chemicals (Science Center)

Present Policy/Procedures: Bulk storage of solvents, acids, and other chemicals is in the 114-116 stockroom. Currently, inventory control is minimal; any faculty or student with a departmental key can access material at any time. As a result, there is not good data on the amounts and identities of all chemicals in stock. There are also various hazardous materials in individual laboratories. There is no central inventory of these materials. Chemicals are stored by hazard class for safety.

Deficiencies/Recommendations: The OSHA Laboratory Standard and other standards of good practice call for better knowledge and control of chemical inventories. Are we approaching/exceeding the reportable quantity of any material per Superfund Amendments Reauthorization Act (SARA) Title III? Probably not, but we should know for sure. Should we have a system to retire and dispose of hazardous materials that have not been utilized in too long a time?

9. Mercury

Present Policy/Procedures: Broken thermometers and other mercury-containing waste from the Parton Health Center and the Science Center are sent out with other hazardous waste shipments from the Science Center. As much as possible of the mercury in this waste is recovered for recycling; the balance of the waste is then properly treated and disposed. There is no written policy.

Deficiencies/Recommendations: Policy should be written.

10. Oil and Antifreeze

Present Policy/Procedures: Old motor oil, hydraulic oil, other like oils, and waste petroleum products are generated at numerous College locations. Most of these products are temporarily stored at the generator locations and are subsequently delivered to Facilities Management - Harris Farm bulk waste oil storage. When approximately 200 gallons are stored, a petroleum - recycling vendor removes the oil for refinement and reuse. No written policy exists. Antifreeze is also used at numerous College locations. When removed for maintenance purposes, antifreeze is collected for reuse. Recycling - reconditioning of antifreeze for reuse is occasionally completed by a local automobile repair vendor. No written policy exists.

State/Federal Regulations: Oil to be recycled is not counted in any hazardous waste inventory.

Deficiencies/Recommendations: Written policy is needed. The College should verify if these materials are regulated by the Department of Transportation.

11. Paint Thinner, Turpentine, and Other Solvents

Present Policy/Procedures: In Facilities Management, paint thinner is allowed to settle and then reused. When it can no longer be used, it is treated as hazardous waste. It is not known how paint thinner, turpentine, and other solvents are handled on other parts of campus. In Johnson, disposal of solvents is left to the discretion of individual faculty members.

State/Federal Regulations: EPA regulated under the 1984 Hazardous and Solid Waste Amendments to the Resource Conservation and Recovery Act (RCRA).

Deficiencies/Recommendations: It is important to know where these materials are being used on campus. A written policy and working procedures are needed to establish consistent handling of solvents.

12. Old Paint and Stain

Present Policy/Procedures: In Facilities Management, old paint and stain is used when possible, or donated for use by someone else. That which remains is combined and removed as hazardous waste by a vendor. Periodically, paint is received from the Theatre Department for disposal.

State/Federal Regulations: EPA regulated under the 1984 Hazardous and Solid Waste Amendments to the Resource Conservation and Recovery Act.

Deficiencies/Recommendations: A written policy and working procedures are needed to establish consistent handling of old paint and stain.

13. Refrigerant

Present Policy/Procedures: Refrigerant is stored for reclamation and sold. Several of our Plumbing Department staff members are certified to handle refrigerants.

State/Federal Regulations: EPA regulated.

Deficiencies/Recommendations: None.

14. Silver and Photo Waste

Present Policy/Procedures: See attached Forest Darkroom Safety Policy (See Appendix F). Old silver is recovered in the photo labs and the Student Activities Office contracts for a hauler to remove it. Reprographics and the Proctor Dark Room dispose of their fixer and negatives in the Student Activities Dark Room which has a program to responsibly manage them. Some ink used in Reprographics is soy-based. The oil based ink that is used is a very small quantity, and clean-up involves only a bit of solvent on a specially designed paper. VOSHA has inspected and approved of Reprographics' handling of these oil based inks and solvent.

Deficiencies/Recommendations: A campus written policy is needed to ensure that all silver and photo waste is handled properly.

15. Science Center RCRA listed and characteristic wastes

Present Policy/Procedures: Small volumes (in the mL range) of relatively-harmless water-miscible solvents(e.g., ethanol, acetone rinses) and 1 L or less of dilute low-toxicity solutions are now flushed to the sewer. Larger volumes of the above materials, concentrated solutions of other, dry powders, and any solvents not miscible with water are accumulated for disposal via a waste hauler (presently Clean Harbors, Inc.). Most wastes are lab-packed (an expensive option); where possible, waste streams are sent out in bulk to save costs. Presently only two waste streams can be effectively bulked.

Other campus departments (Art, Reprographics) currently piggyback their hazardous waste disposal to the Science Center lab-packs.

Deficiencies/Recommendations: No written manual of procedures. Sewer disposal of waste subject to requirements of Middlebury's Publicly Owned Treatment Works (POTW). (Clean Water Act applies only to discharge from POTW). Will town requirements become more stringent, eliminating this option or requiring on-site pre-treatment? Other concerns? Science Center and Facilities Management currently use the same EPA ID number. We do not know if this is a good idea. We do not know the intricacies of regulations concerning movements of waste from other campus buildings. (DOT HM-181 regulations)

16. Science Center Non-RCRA wastes

Present Policies/ Procedures: Waste and surplus dry and concentrated liquid chemicals that are not RCRA waste are currently disposed in non-hazardous lab-packs along with our hazardous waste disposal. The rationale is that these materials may be irritating, that disposing of all chemicals in the same manner reduces the chance of a regulated material being improperly disposed, and that there are potential PR problems if "chemicals" are found in ordinary trash. Of course, such disposal is much more expensive than simply throwing the materials in the dumpster. Preserved animals are bagged and disposed in the dumpster. Ordinary animal carcasses are frozen, and are periodically taken to a local veterinarian for cremation.

Deficiencies/Recommendations: Is lab-packing of non-hazardous chemical waste reasonable or excessive in terms of dollar cost and demand placed on waste-handling resources? With newer formaldehyde regulations, are preserved animals now a RCRA waste? If so, we must redesign our procedures. If not, should we still be disposing them with ordinary trash, or should they be treated as other animal carcasses?

C. MEDICAL WASTE

Present Policies/Procedures: Middlebury College has a Bloodborne Pathogens Exposure Control Plan (see Appendix F) that outlines safety procedures and equipment to be used in the handling of blood and other medical waste. It explains the Hepatitis B immunization program for employees and the procedure to follow in the event an employee is exposed to bloodborne pathogens. It outlines employee training programs related to this issue and the procedure for

disposing of medical waste. The policy is written to comply with Vermont standards set by the Vermont Occupational Safety and Health Association (VOSHA).

Deficiencies/Recommendations: None.

D. RADIOACTIVE MATERIALS

1. Use of radioactive materials

Present Policies/Procedures: The amount of radioactive materials used on the Middlebury College campus is minuscule in comparison to that used in hospitals or medical schools. Nonetheless, use of radioactive materials is to be in accordance with all NRC regulations and the requirements of our license. In addition, federal clean air standards may apply.

Deficiencies/Recommendations: Given the very small quantities of radioactive materials used on site, it is highly unlikely that we could be exceeding Clean Air Act standards for airborne releases of radioactivity. We do need to verify this for the record, however.

2. NRC Regulations regarding radioactive waste

Present Policies/Procedures: Radioactive waste handling is strictly defined by Nuclear Regulatory Commission (NRC) regulations and by the terms of our license application and license document. We have developed a manual entitled *Standard Operating Procedures for Radioactive Waste Disposal* (see Appendix F) which has been incorporated in our most recent license renewal. Also attached is the *Middlebury College Radioactive Waste Disposal Handbook for Faculty*.

Deficiencies/Recommendations: The NRC has requested that we build an enclosure to further restrict access to our radioactive waste storage area. We now are in the process of implementing this requirement.

3. Wastes disposed of by decay-in-storage

Present Policies/Procedures: Wastes with a half-life of less than 90 days are held for 10 half-lives, reducing the level of activity to less than 1/1000th of its original level. The waste is then surveyed to be certain that the activity is indistinguishable from natural background radiation and is finally disposed as ordinary trash.

Deficiencies/Recommendations: An unexpectedly large increase in use of these materials in the future might possibly cause difficulty in finding sufficient storage space; otherwise, no problems identified.

4. Wastes destined for incineration

Present Policies/Procedures: Organic-solvent based scintillation fluids of suitably-low levels of radioactivity are permitted to be incinerated as if they were non-radioactive hazardous wastes. Little if any such waste is currently being generated at Middlebury.

Deficiencies/Recommendations: None.

5. Radon

Present Policies/Procedures: Radon levels in college buildings are periodically monitored for safety.

Deficiencies/Recommendations: None.

E. OTHER REGULATORY AND SAFETY ISSUES

1. Posting and signage

Present Policies/Procedures: Science Center lab doors, where radioactive materials are used, are posted per NRC requirements. Refrigerators are posted as to whether they are safe for storage of flammable solvents, and whether they are for food or for chemicals, etc. Other posting (Science Center) is currently at the discretion of the room's user.

There is no other posting in other buildings such as Facilities Management, Johnson, Health Center, etc. that we are currently aware of. These policies are specifically being recommended based on our knowledge of Science Center but should not be limited to it.

Deficiencies/Recommendations: In case of emergency, few people know what is in a room or who is responsible for it. Security calls Tim Wickland who then tracks down a professor. It would be more efficient to go straight to the source. If someone other than Security were calling, would they even know of Tim Wickland? What about problems in other buildings aside from Science Center?

It would be desirable for rooms containing hazardous materials to be posted with an emergency phone number and a list of major hazards.

Compliance with the Superfund Amendments Reauthorization Act (SARA) Title III could require additional posting of hazards, National Fire Protection Association (NFPA) diamond label, etc.; thus far, the Middlebury Fire Department has not required Middlebury College to supply this information. We recommend formation of a Science Safety Committee that will convene regularly to discuss issues.

2. Spill cleanup

Present Policies/Procedures: Small spills of hazardous materials are cleaned up by or under the supervision of the faculty member responsible for the lab in which the spill occurred in the Science Center.

In the event of a large spill of a hazardous material, we would plan to call in an outside firm (Clean Harbors, or Pollution Solutions) to deal with the spill cleanup.

Custodians are specifically instructed not to clean any chemical spills other than their own cleaning chemicals. Employees should only handle materials for which they have read the Material Safety Data Sheets (MSDS).

Deficiencies/Recommendations: Is the College's present system adequate? Does it meet any applicable federal or state hazardous material requirements? Should the College provide/install spill cleanup stations? A campuswide system of clean-up should be considered. There are certainly laws which govern clean-up and disposal of these spills, specific to the material. Guidelines could be created. Further research is needed.

3. Visitors

Present Policies/Procedures: At the discretion of the room user.

Deficiencies/Recommendations: The College wishes to encourage visits to labs by prospective students and their parents; there are significant liability issues involved because of the risk of injury from chemical and physical hazards. Should warnings be posted, access be limited, visitors be permitted only if personally escorted, etc.? What about children of faculty/staff? The same question should also be considered for art classes and other areas of campus that might put visitors at risk.

4. Temporary Hazardous Waste Storage Facility

Present Policies/Procedures: Currently the College stores hazardous waste in several areas on campus, ranging from the Science Center to the land behind the Harris Farm.

Deficiencies/Recommendations: Occasionally the College finds non-College hazardous waste left at the Harris Farm that the College is then forced to pay to dispose of. The College may need to build a certified storage facility that is in compliance with federal law. This facility would include explosion proof lights, proper ventilation and provide security for our waste.

We also recommend negotiations with the Addison County Solid Waste Management District which would lead it to become a collection point for certain hazardous waste. We do not have enough of many types of waste to contract for disposal. If similar waste from the entire county were brought together at the Transfer Station, disposal would be possible and more cost effective. Temporary storage would then be in the hands of professionals, and reduce our need for storage space. Necessary certification of vehicles and personnel would be necessary for transfer of those materials on public highways.

5. Evacuation plans - McCullough Student Center, Memorial Field House, Science Center, Johnson

Present Policies/Procedures: Security has specific procedures that they follow for evacuation of any building on Campus per Peter Chenevert, Director of Campus Security.

Deficiencies/Recommendations: These procedures need to be examined to confirm that they are adequate. Facilities Management and building occupants should be trained in these evacuation procedures and we should adhere to OSHA standards.

6. Art Department - Flammable products storage

Present Policies/Procedures: No policies nor procedures are in place in some studios.

State/Federal Regulations: Flammable materials need to be stored in a properly vented metal safety cabinet. Used flammable materials need to be put in fire safety cans and disposed of as hazardous waste.

Deficiencies and Recommendations: Faculty need to enforce the proper storage of flammable products in the metal storage cabinets provided. Also the used flammable products need to be put in the safety cans provided and removed as hazardous waste by Facilities Management. More metal storage cabinets and fire safety cans need to be provided so each art studio will have the proper safety equipment.

7. Art Department - Proper labeling of materials

Present Policies/Procedures: None

State and Federal Regulations: According to the Right-To-Know program for the State of Vermont, the Supervisor is responsible for re-labeling chemicals when they have been transferred to an unlabeled container and the product to be labeled is not being used by the same employee on the same work day.

Deficiencies and Recommendations: A regulation should be established that each member of the faculty of the Art Department is responsible for the labeling of hazardous chemicals that are transferred to an unlabeled container.

8. Science Center - Personal protective equipment (PPE)

Present Policies/Procedures: Use of safety glasses (not necessarily safety goggles) is mandated in all student labs. Faculty are expected but not required to comply with this mandate. All other PPE, including face shields, respirators, lab coats, aprons, etc., is used at the discretion of the faculty member in charge of a given lab, as is any requirement for specific types of conventional clothing (i.e., open-toes shoes vs. closed shoes, shorts or skirts vs. long pants, etc.)

Deficiencies and Recommendations: Is the present protective equipment adequate? Should there be any required dress code, requirement for lab coats and/or aprons in certain instances?

9. Science Center - Use of infectious agents

Present Policies/Procedures: Use of infectious materials is specified to an extent by NIH guidelines and established standards of good practice, including contamination of equipment and waste, is at the discretion of individual faculty.

Deficiencies and Recommendations: At the present time, there is no program in place to regularly certify the autoclave. Implementing such procedures would seem to be a good idea. Responsibility for this must be determined; however, some combination (say, annual or semiannual re-certification by the building with intermediate checks by faculty on the efficacy of sterilization) would seem to be sensible.

10. Material Safety Data Sheets (MSDS) for Facilities Management

Present Policies/Procedures: The College currently has a written Right-To-Know program and follows certain procedures. For example, in Custodial Services, new employees are trained when they arrive, and are tested on the program. When new chemicals are introduced, it is the responsibility of the immediate Supervisor to train the employee on the new chemical and its use. Currently, a complete updated Right-To-Know program and MSDS book is on file in the Custodial Breakroom, in the Assistant Director for Custodial Services of Facilities Management Office, and at Security. In other departments of Facilities Management, MSDS files are maintained by each department and available there. The central repository for MSDS is Security, except for the Science Center which stores its own.

Deficiencies and Recommendations: None

11. Material Safety Data Sheets for other parts of campus

Present Policies/Procedures: Each Art faculty member is currently compiling MSDSs.

Deficiencies and Recommendations: The new Safety Officer should follow up on the Right-To-Know compliance in each department as well as provide instruction for the handling of the MSD sheets. The College should include the students even though it is not required to do so by the existing regulations. There probably are other departments on campus that need to collect MSD sheets.

12. Right-To-Know: the OSHA Laboratory Standard

Present Policies/Procedures: Currently, the Science Center maintains MSD sheets of hazardous materials on file as they are received. Although Middlebury College has a written Right-to-Know program, it does not have a written Chemical Hygiene Plan, nor does it have the Standard Operating Procedures for hazardous operations required under OSHA regulations.

Deficiencies/Recommendations: The required plans and procedures need to be developed and implemented. Because faculty are subject to these requirements, the primary mandate for implementation must come from the President and/or the Vice President for Academic Affairs, and the process of development and implementation should include faculty participation. Students also should be included. Though not required by law, students deserve the same protection as our staff, not to mention that propriety and liability for injury would seem to mandate this. Again, we recommend a Science Safety Committee be formed to examine this issue and to develop policies.

13. Shipping and Transport of Hazardous Materials

Present Policy/Procedures: None.

State/Federal Regulations: U.S. Department of Transportation (DOT) regulations require proper documentation, specific and precise labeling of packages as to their contents, and appropriate placarding of vehicles for shipment or transport of hazardous materials over a public street or road. In addition, biennial training is mandated for all personnel involved in

transporting hazardous materials, preparing hazardous materials for shipment, or preparing the paperwork for such shipments.

Deficiencies/Recommendations: Policies and procedures are needed (1) to ensure that all staff involved in preparing hazardous material shipments or related paperwork, or in physically transporting hazardous materials for the College, are properly trained; (2) to confirm that outgoing shipments made via common carrier are routinely packaged, labeled, and documented as required; and (3) to verify that all transport of hazardous materials by College staff on College business, whether in College-owned or in private vehicles, is performed in accordance with applicable DOT regulations.

Toxics and Pollution Subcommittee
Suzanne Bocanegra, Visiting Assistant Professor, Art Department
Peter L.W. Burton, Golf Course Superintendent/Snow Bowl Ski Shop Manager
Holly Cookis
Amy Emerson, Chair
Norman Cushman, Assistant Director for Maintenance and Operations
Kathleen A. Ready, Administrative Director, Parton Health Center
Linda L. Ross, Assistant Director for Custodial Services
Timothy H. Wickland, Administrative Director, Science Division

March 15, 1995

NOTE: Appendices to the Subcommittee's Report may be found in Appendix F.

XI. Waste Minimization

I. Introduction

Since 1989 when the students in Environmental Studies 401 wrote their report *No Time to Waste*, Middlebury College's Recycling Program has been expanded and transformed in many ways. Five years later, recycling has become an integral part of our lives here at Middlebury.

Informally, many codes of behavior and professionalism exist at Middlebury College. Most faculty and staff recycle, purchasers stock recycled products, and individuals minimize their waste as best they can. Middlebury College does not have any campuswide policies that require recycling or waste minimization, nor do we mandate that anyone buy recycled products (the only way to make sure there are markets for the materials we collect.) Again, informally, most buy recycled since it is what is currently available on campus. Much of what has happened in the past three or four years has been based on individual beliefs and personal commitments, not any long-standing edict from the College. Even the structure of the Recycling Coordinator's job was designed to be temporary.

In light of the fact that the College must operate under town and county ordinances and various state laws, it would seem appropriate that Middlebury College institutionalize its efforts to reduce waste and require the entire community to comply. Though this venture started out as a feel-good, be more responsible experiment, laws are now in place and put heavy demands on our behavior. Meeting these demands is difficult. It is time that the Administration make recycling a collegewide commitment. At times, it is still a peripheral and only when convenient issue. Vermont as a whole has progressed past this rendition of recycling and in order to be most effective in our endeavors, we must as well. Middlebury College must make a statement that can only come from the Administration.

Though the Recycling Coordinator makes waste reduction suggestions continually, the Environmental Council has included more suggestions at the end of this Report. The list contains ideas that have not been put into action simply for lack of time in the day. The Committee passes them on as a work list for the future. Others have not been attained although they have been attempted.

One initiative that has come about since the start of this Report is that Middlebury College signed the Buy Recycled Business Alliance, pledging to continue to increase its procurement of recycled products. This will be a task for a college that has made great strides already. In effect, this alliance could be used as the administrative mandate to ensure participation from the entire community.

It is important to understand that waste minimization exists on a continuum. There are a variety of efforts that must be combined in order to massively reduce waste. Some must take priority over others as they are proactive and cost-saving instead of reactive and potentially expensive. This hierarchy was taken from the State waste management plan, adapted from the Resource Conservation and Recovery Act (RCRA).

1. Reduce waste and the toxicity of waste
2. Reuse waste

3. Process waste responsibly - recycle or compost
4. Dispose - incinerate or bury

Over the past year, significant energy has been focused on making the concept of recycling palatable and convenient, as well as economically viable. A variety of departments has been engaged in this task, including the College Store, Reprographics, Purchasing, General Services, Dining Services, and many more. Now that recycling is widespread and well-known on campus, it is time to focus energies on techniques that are more effective than taking care of the waste the College has. The most efficient way to deal with waste is to avoid the generation of waste to begin with! As Middlebury College looks toward a future of becoming the Environmental College with Environmental Studies as one of our peaks, it needs to make source reduction a top waste priority. Middlebury needs to constantly ask: "How can the College avoid generating waste?" instead of asking what to do with it.

II. Relevant Laws

Local Law

Town of Middlebury - Ordinance Regulating the Collection and Disposal of Solid Waste

Purpose:
"To protect the health and welfare of the citizens of Middlebury and to promote the conservation of natural resources and the wise use of the environment, the Board of Selectmen of the Town of Middlebury hereby adopt this ordinance to regulate the separation, recovery, collection, removal, storage and disposition of solid waste, including recyclables, in the Town of Middlebury, Vermont."

In Article VIII, section 3, the ordinance specifically says:
"In accordance with regulations adopted pursuant to this ordinance, any person within the Town of Middlebury may properly dispose of recyclables at private collection facilities or at collection areas maintained by the Town of Middlebury or its designated agent for that purpose."

County Law

Addison County Solid Waste Management District Waste Management Ordinance

Purpose:
In addition to the above, "to regulate the separation, collection, transportation, recycling and disposal of solid waste within the District . . . to provide for the efficient, economical, and environmentally sound management of solid waste."

"All Generators within the District shall separate their solid waste according to the provisions of this Ordinance and any procedures or practices adopted by he Board of Supervisors to implement this Ordinance."

"Recyclables shall mean clear, green, and brown glass bottles and jars; aluminum, steel and tin cans; translucent high density polyethylene (HDPE) bottles an jugs (including, but not limited to, plastic milk, cider, juice, and water bottles); colored HDPE plastic bottles (including, but not limited to detergent bottles); polyethylene terephthalate (PET(E)) bottles; boxboard (including, but not limited to cereal boxes); corrugated cardboard; newspaper; glossy

magazines, catalogs and other publications; and, from businesses, institutions, and government offices only, white typing, computer, copier, and notebook paper."

State Law

State of Vermont - Title 10, Chapter 159 & Act 78

Purpose:
"The developed world continues to pollute the environment and add to the depletion of the world's resources by burning and burying resources as waste. Furthermore, inefficient and improper methods of managing solid and hazardous waste result in scenic blights, hazards to the public health, cause pollution of air and waste resources, increase the numbers of rodents and vectors of disease, have an adverse effect on land values, create public nuisances, and otherwise interfere with proper community life and development."

These documents pertain mostly to the solid waste districts they create as well as the State of Vermont but not specifically to the generators of waste.

These documents are available in the Appendix of this Report.

III. Recommendations

1. Maintain someone to coordinate the program. See Chapter IV, Environmental Coordinator.

2. Move from step 1, recycling implementation and expansion to step 2, considerable source reduction. See "Waste Reduction - The Ultimate Goal," (p. 51)

3. Continue to increase procurement of recycled products as technology improves, markets regulate prices and capitalistic innovation invents them. See "Buy Recycled Business Alliance," (p. 56)

4. Add waste minimization concerns into purchasing contracts and bidding specs. Force companies to meet Middlebury College standards in order to retain College business. Recognize the strength of Middlebury College's purchasing power. See "Purchasing as a Waste Reduction Strategy," (p. 55)

5. Educate the community about the technology on campus (gopher, VAX, MS Mail, Internet, First Class, World Wide Web, new copiers, etc.) that can help them to minimize waste.

6. Establish a formal recycling policy that reflects the institutional commitment to the program and environmental protection.

Suggested Policy

Middlebury College is committed to reducing its impact on the environment. One way to accomplish this end is through waste minimization. Waste minimization exists on a continuum encompassing the entire waste hierarchy of reduction, reuse, and processing (recycling and composting), in that order of priority.

In order to achieve the greatest possible waste diversion, Middlebury College is committed to educating the community about the benefits of waste minimization. These benefits include:

1. Conservation of natural and sometimes, non-renewable resources
2. Reduction of waste requiring disposal
3. Reduction of pollution associated with the manufacturing process
4. Potential to generate revenue from recycling markets
5. Contribution to the statewide waste diversion goal of 40% by the year 2000
6. Responsible environmental leadership

By the same token, the College recognizes that recycling only truly happens when consumers close the loop through purchasing recycled products. Middlebury College is committed to using recycled products when quality and price are comparable, knowing that it will enhance the College's ability to find markets for recyclables.

Procedures:

- Follow the waste hierarchy outlined in Act 78:
  Reduce
  Reuse
  Recycle or Compost
  Landfill or Incinerate as the last option

- Although Middlebury College established its recycling program prior to the 1993 passage of the Addison County Solid Waste Management District's (ACSWMD) ordinance, it will continue to comply with and exceed its standards. The College will manage a comprehensive program that combines many of the waste management strategies outlined above.

- The College will maintain a member of the staff who will be responsible for overseeing waste reduction and recycling programs and providing education around these issues.

- Middlebury College is a member of the Buy Recycled Business Alliance which promotes the increased procurement of recycled products.

IV. Waste Reduction - The Ultimate Goal

"Today, our waste management issues are much more complex than those of the past. Old answers no longer work, and we're struggling to find new ones. So far, the new answers are expensive, but not as expensive as ignoring the problem. Sometimes a simple answer is the best way to begin solving a complex problem. If we simply produce less waste, our economy and the environment both benefit."[5]

A. Background

Waste reduction is accomplished through a variety of means: composting, recycling, reusing, incineration, and source reduction. All of these methods decrease the amount of waste to be disposed of, though some are more important than others. State and federal legislation

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[5]Brown, Kenneth, "Waste Prevention: Source Reduction NOW," Minnesota Office of Waste Management, 1993, p. 4.

prioritize methods of waste disposal. Vermont's 1987 Solid Waste Law, Act 78, lists reduction first, reuse second, and recycling third. Overall, Vermont's goal is to reduce discarded waste by 40% before the year 2000.

In 1990, the Environmental Protection Agency (EPA) drafted a similar law regarding pollution prevention.

Pollution Prevention Act of 1990 (Section 6602.3b)
The Congress hereby declares it is to be the national policy of the United States that:

1. pollution should be prevented or reduced at the source whenever feasible;
2. pollution that cannot be prevented should be recycled in an environmentally safe manner when feasible;
3. pollution that cannot be prevented or recycled should be treated in an environmentally safe manner; and
4. disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.[6]

From this hierarchy, it is clear that waste prevention is the most favorable option. The EPA defines waste prevention as "the design, manufacture, purchase or use of materials or products to reduce the amount or toxicity of what is thrown out."[7] Waste prevention, or source reduction as it is also known, is not only beneficial because it diminishes the volume of waste that we must dispose of, but it also helps to reduce the amount of energy required during the manufacturing process, thereby reducing the pollution created, and helps to conserve natural resources. Generally, source reduction lowers costs, not only of disposal, but of production as well. Waste prevention, not recycling, must become the focus of waste management efforts during the coming years. The EPA suggests eight basic strategies to prevent waste, many of which Middlebury College is already engaged in. They are listed below.

1. Use minimal or reusable packaging.
2. Use and maintain durable equipment and supplies.
3. Reuse products and supplies.
4. Reduce the use of hazardous components.
5. Use supplies and materials more efficiently.
6. Compost yard trimmings on site.
7. Exchange, sell or give away unneeded goods or materials.
8. Eliminate unnecessary items.[8]

As Porter Ball, the Recycling Coordinator for Addison County, would say, waste reduction efforts can be categorized in two ways, those that are symbolic and those that are significant. Symbolic ideas call attention to solid waste problems and keep people thinking about the environment. Significant ideas reduce waste in measurable amounts and conserve substantial resources. An example of symbolic might be to write messages on scraps of paper from the recycling bin. While this is a smart idea and can save paper, there is no real way to measure the results of this activity and show its success. A significant idea might be to copy

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[6]Creighton, Sarah Hammond, "Solid Waste Reduction in Colleges and Universities: A Status Report," Center for Environmental Management, Tufts University, 1993, p. 2.
[7]Environmental Protection Agency, "Waste Prevention Pays Off," 1993, p. 1.
[8]*Ibid.*, p. 2.

course packets on both sides of the paper. If the class contains 100 students and has a course packet of 100 pages, then double-sided copying can save an entire ream of paper!

B. Some Tips to Reduce Waste on Campus[9]

Staff/Faculty Ideas:

- make double-sided copies
- use intercampus mail envelopes
- reuse envelopes sent to you, like the big manila ones
- omit the cover sheet when using the fax; write information on the first page or use one of those small fax post-its
- keep mailing lists current
- make scratch pads from used paper or get them at Reprographics
- circulate memos, documents, periodicals, and reports instead of making individual copies for everyone
- use electronic mail memos or a quick phone call in lieu of written memos
- avoid printing e-mail messages; instead store them on your computer until you no longer need them; (use the multiple print per page function on some computers)
- post messages on electronic mail
- use the already established bulletin mailing system to reach the entire faculty and staff using fewer printed copies (great when you need graphics or want to reach employees without computers)
- save documents on hard drives instead of making paper copies (keep backups!)
- use spell check and print preview functions
- proof documents on the computer screen before printing
- use the back side of old paper to print necessary drafts
- use outdated letterhead for memos within the department
- return unneeded information, brochures, catalogs, etc. This will let the department, person, or company reuse the material. (This action is simplified on campus where postage is free and the envelope can be reused!)
- eliminate unnecessary reports
- use rechargeables wherever practical
- avoid ordering excess supplies that may never be used
- use a dry-erase board or chalk board

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[9]Environmental Protection Agency, "Business Guide for Reducing Solid Waste," 1993, p. 23

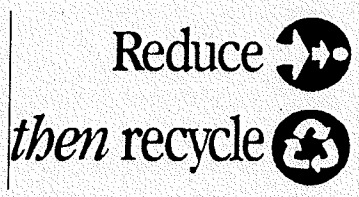
• make only as many copies as you will need to avoid recycling unused memos, posters, and brochures
• use First Class to have students submit papers electronically

Departmental Ideas:

• rent equipment that is only used occasionally
• install reusable filters
• purchase remanufactured office equipment
• use the materials exchange on the gopher
• order merchandise in bulk
• purchase concentrates and products with minimal packaging
• return cardboard boxes to manufacturers (Dining Services does this with Frito-Lay)
• request minimal and/or recyclable packaging
• reclaim reusable parts from old equipment
• choose a landscape design that needs low maintenance
• reuse worn out tires for landscaping, swings, etc.
• find creative uses for waste, like experiments and class projects

Institutional Ideas:

• adopt a company wide double-sided copying policy
• make it more economical for departments to make double-sided copies than single-sided
• negotiate take-back policies with suppliers whenever possible
• reuse packaging materials
• operate a Free Store where materials can be exchanged year round instead of running one office supply exchange per year
• use send and return envelopes for phone/tuition bills, loan payments, Annual Fund solicitations, etc.



C. Purchasing as a Waste Reduction Strategy

Middlebury should try to prevent waste before it is even a problem for us. Purchasers could continue to request that manufacturers minimize packaging or eliminate it altogether. The College could set up take-back policies in which companies would reuse their own boxes or containers for future shipments. This already happens on a small scale between Dining Services and Frito-Lay who retrieves their cardboard boxes delivered to campus. What Middlebury College needs to do is to "Make it clear in writing to [our] suppliers that [our] purchasing decisions include waste as a factor."[10] This also includes purchasing products that can be repaired or refilled to extend their useful life. Here is a checklist of activities provided by the Minnesota Office of Waste Management:

1. Require manufacturers to state what they're willing to do to reduce the amount of material of toxicity of their shipping containers while maintaining protection of the product.

-too large or too thick?
-are the dividers necessary?
-are products individually wrapped?
-could they be sold in bulk?
-can packaging ink or plastic be reduced?
-does it have to have polystyrene inserts?
-does the polystyrene have to be glued to the packaging?

2. Require the manufacturer to state the possibilities for using reusable shipping containers and packaging.

-is backhauling possible?
-are the containers reusable by others?
-are they repairable?

3. Write into the bidding request: "Preference will be given to products that create the least solid or hazardous waste while fulfilling the desired function."

-can the product be reused, repaired, refilled or upgraded?
-how accessible are the parts?
-how cost effective are the parts?
-how many years are parts guaranteed to be available?
-what is the product's warranty?
-are quality remanufactured products available?

4. Any time two products are compared, user safety should be addressed. One product may be more hazardous and consequently less safe to use than the other.

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[10]Brown, p. 40.

D. Buy Recycled Alliance

Who: "Founded by the National Recycling Coalition, a non-profit organization representing diverse recycling interests, the Alliance has launched the Buy Recycled Campaign: a nationwide effort to encourage businesses of all sizes to increase the use of recycled content products in their day-to-day operations.

What: "All that is required is a commitment to increase your purchases of recycled content products-a move that will benefit both your company and the environment."

Why: "Collecting and processing materials are two parts of recycling. Buying recycled products and materials is the other part. Buying recycled closes the recycling loop."

"The Alliance provides information and guidance that helps your company save time and money setting up its own in-house Buy Recycled program."

Pledge: "We commit to buying recycled. As a participant in the National Recycling Coalition's (NRC) Buy Recycled Campaign, we are committed to increasing the procurement of products with recycled content.

Middlebury College Objectives:
- to facilitate the increased procurement of products with recycled content; and

- to increase the understanding of the value, reliability and performance of products with recycled content.

The College will:
- survey current usage of recycled content products and report to NRC; and
- report progress annually to NRC.

Middlebury College is participating with a diverse group of businesses to demonstrate that "buying Recycled," as part of an integrated effort, is a practical, market-based solution to one of today's environmental problems.

V. Examples of Waste Reduction Efforts Attempted

Already the College has begun to think about reducing and reusing waste. Programs such as those listed below should be continued and maybe even expanded while new ones are developed. Many did not even happen through the efforts of the Recycling Office, they were taken on by other departments. In no way is this a comprehensive list, merely a chance to view the range of tasks undertaken.

C.U.P.P.S. Program - Dining Services provides every student with a reusable mug at the beginning of each year. Faculty and staff who needed a replacement mug are also issued them. These mugs are free of charge and encourage reuse on campus.

Styrofoam Peanuts/Shredded Paper Giveaway - These materials are donated to local businesses ranging from Holy Cow to the Shipping Store to Illuminae DuMonde.

Jiffy Mailers - Mailers are collected through the recycling program and reused. Students, faculty or staff can obtain them in the mailroom for free. Interlibrary loan reuses jiffy mailers from WRMC and donates excess to the student mailroom.

Office Exchange - A Suggest-it program winner designed to provide college employees with surplus and/or unwanted office supplies. In 1994, two days were designated for this exchange where anyone could drop items off or take them at no cost. This event was very successful, allowing over 50 people to give new life to unwanted materials.

Tag Sale - The Purchasing Department sponsored a tag sale in 1993 to clear out old desks, dishes, mirrors, etc. that were no longer being used. The price was right and shoppers were more than happy!

Waste Exchange - The Recycling Office posts a monthly waste exchange that lists materials people wish to give away or are searching for. All materials are free. This listing is located on the gopher. Currently, I call this an underutilized service.

Copy Machines - Purchasing acquired new copy machines for the entire campus. Most copiers have the capability of doing double-sided copying easily without having to go to the central duplicating center. The Recycling Office did a publicity campaign by posting double-sided copying information specific to the copier above each new Minolta.

Spring Clean-up Day - Last spring the Recycling Office sponsored a pre-move-out clean up day to try to capture a greater percentage of recyclables and to ensure that clothing and other unwanted goods made it to local charities instead of in the trash. Residential Life was very supportive of this project.

Evaluation of Periodicals - The library inventoried its periodical purchases and eliminated 150 that were not being read.

Paperless Office - Ron Liebowitz (we are told) has pledged to run a paperless office where all work is done electronically.

VI. Waste Reduction--Specific Idea List

A. Discussion has begun. . .

- Mandate attendance of all residential life staff to a 15-30 minute recycling talk with the Coordinator.

- Speak with students directly at new student orientation and dorm meetings instead of trying to communicate only through brochures and posters. Recently, I have begun offering to speak through student organizations and social houses and have achieved greater success than through the Residential Life staff.

- Purchase more durable (and perhaps fire-safe) recycling bins, especially for residential buildings. This has already been done in Battell and particular halls on campus. Plastic or metal bins are costly and finding the optimal bin will require research as well as a financial commitment from the College. More durable bins will 1) minimize waste from dorm damage and wear and tear on the cardboard bins; 2) be potentially safer; and 3) be more attractive.

• Use two-way envelopes. These have a flap on the inside that allows respondents to mail correspondence in the same envelope in which they receive information.

• Publish a guide to recycling on the World Wide Web. A student has volunteered to begin this project.

B. Still to be initiated

• Faculty need to be educated about recycling. New faculty should be exposed to a brief (10-15 minute presentation) about recycling. [New staff currently receive this introduction through the Human Resources new staff orientation sessions.]

• Coordinate end of year activities more closely with local charitable organizations so that materials more easily find their way into the hands of the needy instead of the dumpster.

• Make a reuse guide of repair and consignment shops as well as charities and organizations that accept donations. Compile names and phone numbers.

• Operate a free store where materials can be constantly dropped off and collected (nothing glamorous, a barn that people can have access to and take or leave materials for no charge. Perhaps have volunteers stock shelves, clean up or take inventory.)

• Convert all campus departments to nickel-cadmium rechargeable batteries. Have a battery charger accessible for student use. Educate community about the benefits of rechargeables over single-use. The Renewals (rechargeable alkalines) have worked poorly in Facilities Management where we are experimenting with them.

• Encourage vendors to use reusable packaging or to reuse the boxes they currently ship to us. In general, minimize the flow of packaging materials that enter campus.

• Seek out the reusable pizza boxes. A company (in Wisconsin I think) makes pizza boxes from plastic. Customers put a deposit on them. The College could pay the deposit and work out an arrangement with the local pizza places. Pizza boxes are often difficult to recycle because of the food stuck to the inside. Now that we no longer compost bulky papers, many pizza boxes are likely to end up in the trash.

• Look at lifecycle costs of a product when making purchasing decisions. Currently, departments operating on separate accounts from Facilities Management have no need to consider how much it might cost to dispose of something. Instead, they are concerned only with how much it might cost to acquire. Perhaps find a way to pass the cost of recycling or disposal on to the generator.

• Encourage all departments to buy concentrates (when available). These products can be mixed on site to reduce shipping and packaging costs and minimize waste. Often containers are reused. Custodial services has implemented this practice with successful results. They would have a useful model for interested departments.

• Develop a poster policy establishing the maximum number of posters allowed and appropriate areas where they might be hung. This will not only reduce paper

consumption but will help to prevent fire hazards and damage to walls where there are no corkboards. When compliance is achieved, it may also save the custodial staff time.

• Keep College and departmental mailing lists up to date so as to alleviate unsuccessful mailings. Remedy problems in cases where people receive double mailings. If staff do not have time, employ students on work study to make phone calls and verify addresses or track down correct ones. When mailings are sent, employ all waste reduction strategies such as send and return envelopes and double-sided copying.

• Reduce unnecessary mailings to students, parents, alumni, faculty and staff.

• Create a double-sided copying policy in which departments receive an economic advantage for making double-sided over single-sided without having to go to Reprographics to do it.

• Install fax modems so that documents can be sent from computer to computer or computer to fax machine, eliminating the need for extra printing.

• Encourage/require that professors have students submit papers through First Class to eliminate the need to print papers. First Class could also be utilized by more committees and organizations, especially those sharing information and writing reports. If papers are not printed on First Class, allow/require papers to be printed on both sides of the paper.

• Use paper goods only for to-go purchases in dining facilities. This would require some renovation to the system currently employed in Rehearsals and the Pro Shop which are not equipped to handle dishwashing.

• Take over the recycling for College rental units where the College is responsible for waste. This will allow recyclables to count toward our diversion percentages and capture a greater number of materials. White paper from these residences is a concern when we collect it with our commercial waste. The Town is the current hindrance in this venture.

• Make register receipts for people charging to their IDs only upon request.

• Require departments handling visitors/contractors/guests to comply with recycling program and include information for their invitees. Visiting populations often do not follow the game plan, such as those attending Alumni Weekend.

• Replace plastic bags with smaller ones that are more closely suited to the size of recycling bins and waste receptacles we have on campus. This would mean that we might have to carry two or three different size trash bags to accommodate grey rounds, blue toters, recycling and waste bins and smaller, personal size receptacles.

• Use old phonebooks in less frequently used locations such as pay phones. Have one phonebook with each telephone instead of each employee.

• Reprographics makes pads from scratch paper. These could be sold through the College Store to departments on campus. This task could be saved for down times.

• Expand the CUPPS discount from simply the Crest Room to include Rehearsals and the Pro Shop snack bar as well.

• Departmental contest to reduce waste or a call for suggestions.

VII. Conclusion

Middlebury College has come a long way since the report issued in 1989 and even the second one issued in 1992. There are many things to be proud of, as demonstrated by the diversion percentages (57% in 1994). The work is never-ending though: the student body changes, new faculty and staff are hired, language students come and go, leadership roles are handed down, and people can lose energy and contribute less effort. Waste minimization requires constant attention, especially at the start and end of each semester.

Recycling alone cannot be the answer to the solid waste and environmental issues in America. The process still consumes energy and resources. Now that Middlebury College actively recycles, members of the College community must move beyond the first stage and engage in waste prevention activities. Convincing people to reduce waste is a difficult task--it is not as tangible as recycling. When you reduce waste, you do not have a heaping bin full of materials to weigh. Waste that has been reduced is waste that you never saw or missed.

Middlebury College operates with some wonderful practices, but none of them are policies. Most people recycle, but there are no consequences for those that do not. Purchasers inquire about recycled content and try for the greatest possible percentages. This is an informal policy strongly suggested by George Whitney, the Director of Operations, but what happens when people change jobs and the individuals driving these initiatives are gone? It is time to solidify recycling and waste reduction through policy formation and to let our manufacturers and distributors know what we want and that we will accept no substitutes.

NOTE: Those interested in the development of Recycling at Middlebury should consult the following reports: No Time to Waste, by Environmental Studies 401 (class report, February, 1989); Recycling and Composting at Middlebury College, by Heidi Van Winkle (Summer 1992); and A Look at Recycling at Middlebury, by Holly Cookis (February 1995). These reports may be found in the Office of the Recycling or Environmental Coordinator, Service Building.

Waste Minimization Subcommittee
Holly Cookis
Sarah S. Rebick, '97

XII. Pedestrian Campus Proposal

BACKGROUND

In the fall of 1994, the Environmental Council distributed a memo to the College community about parking and driving on campus. The Council was concerned about excessive and unsafe traffic on campus and offered preliminary recommendations to address the problem. A member from the Council then met with the Faculty Council, Staff Council, Community Council, and Student Government to hear feedback on the initial recommendations. This final report reflects much of the constructive input from these meetings.

The Council's recommendations are driven by three primary concerns with car traffic on campus:

1) vehicular safety and emergency access
2) quality of life on campus
3) environmental impact and energy waste

Overall, there is support for making Middlebury's campus a more pedestrian campus. While many people support a pedestrian campus in principle, there is also an understandable reluctance among students, faculty, and staff to give up parking and driving privileges. At Middlebury, these privileges are abundant and unrestricted: the college provides free parking for all students, lots are conveniently located on campus, and there are numerous roads bisecting the campus. Other competitive colleges like Williams, Amherst, Princeton, and Dartmouth have much more restrictive policies to promote a pedestrian campus. Princeton, for example, is a completely pedestrian campus where no cars are allowed on the main campus and parking is only provided in satellite parking lots.

This year there are 1,300 registered student cars and 760 faculty/staff cars. Traffic has increased through campus as the college expands and more students bring cars to Middlebury. Some of the traffic through campus is caused by students and faculty who drive short distances to class, lunch, the fitness center, and other areas of campus.

A large motivation for this proposal is the safety concerns with traffic through campus. In recent years there have been tragic accidents involving students and vehicles at Middlebury. Matthew Slautterback was killed on his skateboard in 1991 after colliding with a car on Hillcrest Road, and David Busé was maimed while biking in 1993 when he hit a College snowblower alongside Old Chapel Road. Poor visibility between parked cars along Old Chapel Road contributed to Busé's accident. The problem of poor visibility combined with the substantial car and pedestrian traffic along College Street, Old Chapel Road, and Hillcrest could lead to future tragic car related accidents.

In response to these concerns, the Council's recommendations are designed to promote a safe pedestrian campus where students, faculty, and staff walk, rather than drive, throughout the campus. These recommendations are aimed at travel within the campus, and they are not designed to restrict the ability of students, faculty, and staff to drive onto or off of campus.

RECOMMENDATIONS

I. Assign all student, faculty, and staff cars to specific parking lots.

- Give faculty and staff first choice in parking lot assignments to ensure that they have access to a parking lot that is convenient to their work location. Students will choose from the remaining parking lots during spring room draw or in the fall with Security.
- Issue car registration stickers that are color coded for specific parking lots. The stickers will also be marked to differentiate two types of drivers: 1) students living on campus who must always park in their assigned lots, and 2) faculty, staff, and students living off campus who are assigned to specific lots during the day and can park in any lot after 3 p.m. or on weekends. (Car registration stickers may be yearly removable stickers that go on an interior window. Removable stickers would make it easier for students to get different lot assignments each year without having multiple stickers on their windows.)
- Create 15 minute parking stalls in all parking lots. These stalls will allow any driver to pick up deliveries, move equipment, or make necessary errands on campus. The 15 minute limit will be strictly enforced.
- Enforce student parking lot assignments at all College events, including athletic events and social house parties.
- Allow College service vehicles and third-party delivery trucks to park in any lot at any time.
- Allow College event organizers (parties, dances, special dinners, etc.) and elderly, handicapped, or injured people to get parking permits that would allow them to park when necessary at lots other than their assigned lot.

II. Block specific roads on campus to create cul-de-sacs and reduce traffic.

- Block Old Chapel Road between McCullough and Starr Library to prevent through traffic. During the first year, parking in stalls on this road will be available for assigned cars. To improve visibility and safety, parking will not be allowed along the east curb.
- Consider eliminating all parking on this road *in two years*. The road would be blocked at both ends, creating a limited-access road similar to the road past Mead Chapel.
- Consider blocking Hillcrest Road between the tennis courts and the cemetery to reduce through traffic and improve pedestrian safety around Proctor, Chellis House, Farrell House, Geonomics Institute, and other campus facilities on the road.
- Consider a new technology for blocking campus roads. The existing chain and lock system is time consuming and inconvenient. Explore removable metal pilings or small, aesthetic gates that could be operated with a garage door opener or card key.

III. Work with the town to restrict parking and improve safety along College Street

- Eliminate parking on the south side of College Street. Allow only 15 minute parking on the north side of College Street between Carr Hall and Adirondack View.
- Reduce the legal speed limit along College Street from 25 mph to 20 mph. Enforce the speed limit.

IV. Increase parking enforcement.

- Charge students to register cars at the beginning of each year. This practice is standard at almost all colleges.
- Create escalating ticket fees to discourage repeat offenders and higher fines for unregistered cars.
- Improve the currently ineffective impound system for repeat parking offenders by creating a secured impound lot or using the Boot™ to immobilize cars. (The Boot™ attaches to a car's wheel and immobilizes the car until Security unlocks the device.)

- Continue to allow visitors to register their cars with Security. Visitors should be assigned a parking lot for their stay at the College.
- Ticket unregistered cars parked overnight in any lot. This would discourage students from not registering their cars.
- Continue to allow open parking and access to restricted roads by dorms at the beginning and end of the semester so students can move into and out of their dorms.

Pedestrian Campus Subcommittee
Christopher McGrory Klyza
Peter M. Polson, '95, Chair
Sarah S. Rebick, '97
Carly H. Vynne, '97
Jon C. Woodbury

Appendix

During the course of its research, the Pedestrian Campus Subcommittee discovered that many of the schools with whom Middlebury College compares itself have more stringent parking and driving policies than Middlebury. Here are some of the highlights of these policies.

PRINCETON - Princeton has a completely pedestrian campus. Students are assigned to one of two remote parking lots and pay $115 per year to park. Faculty and staff have their own lots and are assigned by building. They are assigned first come first served to lots that are within seven minutes walking distance from their office. When close lots fill, faculty and staff are assigned to a remote lot that has a shuttle bus. The student lots are near this remote lot so students may also use the shuttle. Visitors must check in with a booth officer upon entering the campus. They are then assigned specific parking near the building they are visiting. Tickets escalate in value, and repeat offenders are booted or towed.

ST. LAWRENCE - St. Lawrence has a pedestrian campus. No cars are allowed on the main campus. Students pay $25/year to register a car and park in lots on the periphery of campus. Faculty and staff have their own spots. Tickets for violations vary depending on the offense with escalating fines for repeat offenders. Cars without permits have higher fines.

DARTMOUTH - All cars must be registered. Faculty and staff parking is assigned based on seniority. There are only two student lots, so driving around campus is not a problem. Students pay $44/year, faculty $120, and staff $72. There is a free remote lot for faculty and staff with a shuttle that runs to buildings on campus. Faculty and staff can opt to park there rather than paying to park closer to their offices. Tickets vary from $25 for the first offense to $100 for a third offense.

WILLIAMS - Students are assigned to specific parking lots each year based on their housing. Lots are assigned at room draw and when the most desirable lots fill, the overflow is assigned to a remote lot. Students pay $60 to register a vehicle. In addition, students are not permitted to park on the inner campus during business hours to discourage driving from place to place on campus and to allow parking for faculty and staff.

Sarah S. Rebick, '97

Appendix A
Environmental Council Subcommittees

Administration and Business Management
Steven C. Rockefeller
Professor, Religion; Chair, Environmental Council
George W. Whitney, Jr.
Director, Operations

College Publications
Christopher McGrory Klyza
Director of the Environmental Studies Program
Assistant Professor, Political Science
Alexander P. Lee, '97
Steven C. Rockefeller, Chair

Community Awareness and Education
Christopher McGrory Klyza, Chair
Alexander P. Lee, '97
Steven C. Rockefeller
George A. Romer, '95

Dining Services and Food
Hillery N. Hinds, '96
Russell P. Hulst
Buyer/Assistant Unit Manager, Dining Services
Ted A. Mayer
Director, Dining Services
Eric A. Odell, '95
Peter M. Polson, '95, Chair
Sarah S. Rebick, '97

Energy and Water Conservation
Jon C. Woodbury, Chair
Director, Facilities Management

Environmental Coordinator
Holly Cookis
Recycling Coordinator
Norman Cushman
Assistant Director for Maintenance and Operations, Facilities Management
Steven C. Rockefeller, Chair

Land Stewardship
Samantha D. Abeyratne '98
Timothy V. Bouton
Supervisor, Landscape and General Service Personnel
Facilities Management
Alexander P. Lee '97
Bryan T. Merrill
Crew Chief, Athletic Fields, Facilities Management
Stephen W. Weber, Chair
College Forester, Operations

Pedestrian Campus
Christopher McGrory Klyza
Peter M. Polson '95, Chair
Sarah S. Rebick '97
Carly H. Vynne '97
Jon C. Woodbury

Toxics and Pollution
Suzanne Bocanegra
Visiting Assistant Professor, Art
Peter L.W. Burton
Golf Course Superintendent/, Snow Bowl Ski Shop Manager
Holly Cookis
Norman Cushman
Amy Emerson, Chair
Administrative Consultant, Office of the Treasurer
Kathleen A. Ready
Administrative Director, Parton Health Center
Linda L. Ross
Assistant Director for Custodial Services, Facilities Management
Timothy H. Wickland
Administrative Director, Science Division

Waste Minimization
Holly Cookis
Sarah S. Rebick, '97

Appendix B
Winkler/Andres Memorandum on
A College Campus Analysis and Proposal for Future Development; Environmental Council Memorandum of Support

TO: John McCardell

DATE: March 9, 1995

COPY: Natural Sciences Planning Committee

FROM: Frank Winkler
Glenn Andres

SUBJECT: Need for Campus-Wide Analysis

According to the tentative schedule that has recently been announced, Middlebury stands on the threshold of what could be the most prolific decade for building in the College's history. Within the next year alone, we may be siting and breaking ground for a new Swimming Pool, Hockey Rink, and Social Houses, along with renovations of Old Chapel, the Johnson Art Studios, and Adirondack House. Numerous additional projects, including the long-awaited addition to the Science Center, are scheduled to begin not long afterward. And, should we decide to enlarge the student body significantly, even more extensive projects will occur within the coming decade. At the end of it, the Middlebury campus will be profoundly changed.

As we discussed with you Tuesday, we urge that before the College begins these major projects that we assess carefully the present state of the campus, and plan additions which will enhance it, rather than detract from it. Middlebury's campus is arguably its greatest long-term asset. In many areas we may have some distance to go to become the "College of Choice," but in the beauty of the campus, there are very, very few institutions that can compete with Middlebury. In our drive to pull ourselves upward in other areas, it's imperative that we not take excellence we already have too much for granted, lest we lose it.

We urge you to engage the services of a firm or individual who can help us understand what we now have, and articulate principles to follow as we plan for future growth. What are vistas that should be preserved? How do buildings relate to one another and to the campus as a whole? What are pedestrian and vehicular traffic patterns now, and how might changes affect them? What are architectural themes that can be repeated? What we need is an *analysis*, not a "grand design" or "master plan". An analysis will serve as a guide for any future development. It is perhaps best carried out by a firm or individual who is *not* designing any buildings now being planned, because they will be less likely to slant the analysis to justify any one particular concept for growth.

Middlebury is fortunate to have great faculty expertise in Geographic Information Systems (GIS) and state-of-the-art equipment for geographic analyses and can easily add Computer Assisted Design capability. It is reasonable that our faculty and students could play a role in gathering and entering data that could become a part of the analysis, and the resulting product could include maps and data on our own computers which could be used to aid in testing the

impact of possible changes or additions to the campus, and for visualizing how they might look from any vantage point.

There are several firms with which we already have some connection who could work with us on a campus analysis:

- Dober Lidsky, Craig and Associates – Belmont MA. Art Lidsky is very much a known quantity, having worked effectively with us in developing plans for Science Facilities. He and his firm are one of the nation's premier campus planners. They have done analyses and long-term planning for Carleton, Bowdoin, and numerous other institutions.

- Juster, Pope, Frazier – Shelburne Falls, MA. This firm has recently completed a campus planning study for Amherst College. A brief summary of the study, included in materials they have submitted with their qualifications as candidate architects for the Science Facilities project, suggests real sensitivity to that campus and its surroundings. An initial read of the dossiers we have suggests that this firm is unlikely to be among the finalists for the Science project, but they might be an excellent candidate for the analysis we are suggesting here. One of the partners, Earl Pope, turns out to be the father of Dan Pope, '97.

- Parker Croft, David Bartlett, and Associates – Middlebury and San Francisco. They have done extensive work for the University of California system and are currently campus architects to Stanford and Notre Dame. Bartlett began his career as a preservation expert. Croft has shown great sensitivity and ingenuity in working with historical fabrics and settings.

- Wallace, Floyd and Associates – Boston. This is the firm that planned the development of Charles Center, which triggered the rebirth of downtown Baltimore. They are now doing the Central Artery project in Boston and have done master plans for the northern extension of the MIT campus. David Wallace is an alumnus ('50) with great sensitivity to both Middlebury's campus and town. He was responsible for the recent design studies for Middlebury's second in-town bridge that broke an impasse between state preservation and traffic planners.

Again, what we seek is to understand and plan for intelligent growth that will preserve the integrity of the Middlebury campus and enhance what is already one of the premier college campuses in America.

MIDDLEBURY COLLEGE
MIDDLEBURY, VERMONT 05753
(802) 388-3711

March 22, 1995

TO: John McCardell
cc: David Ginevan
Frank Winkler
Glenn Andres

FROM: Steven C. Rockefeller

SUBJECT: Winkler/Andres memo on "Need for Campus Wide Analysis"

At its most recent meeting the Environmental Council discussed the proposal made to you by Professors Winkler and Andres recommending that the College engage the professional services of a firm that is able to do a careful analysis of the unique values of the Middlebury College campus before the College embarks on any of the major new building projects which are under consideration. The Council members present unanimously voted to endorse this recommendation, and I am writing to communicate our strong support for what Professors Winkler and Andres have proposed.

In addition to the architecture, landscape design and pedestrian/traffic patterns about which Winkler and Andres have expressed concern, the Environmental Council recommends that the proposed campus-wide analysis also take into consideration important environmental concerns such preservation of the diversity of native species and protection of wooded and other wild areas, including wetlands, that adjoin the campus and that may include critical wildlife habitat or otherwise contribute in significant ways to the health of local ecosystems.

Regarding a specific issue, there is concern among a number of students and faculty about the plan to locate four social houses in the wooded area west of the cemetery for various environmental, aesthetic, and recreational reasons. The Environmental Council recommends that this plan be reviewed in the light of a careful analysis of the woods and agricultural field that would be affected, that that this study include consideration of the current and potential use and enjoyment of this area by students, faculty, and staff.

If I or the Council can be of any assistance to the College in connection with the proposed campus study, please let me know.

Appendix C
Talloires Declaration, 1990,
University Presidents for a Sustainable Future

We, the presidents, rectors, and vice chancellors of universities from all regions of the world are deeply concerned about the unprecedented scale and speed of environmental pollution and degradation, and the depletion of natural resources. Local, regional, and global air and water pollution; accumulation and distribution of toxic wastes; destruction and depletion of forests, soil, and water; depletion of the ozone layer and emission of "greenhouse" gases threaten the survival of humans and thousands of other living species, the integrity of the earth and its biodiversity, the security of nations, and the heritage of future generations. These environmental changes are caused by inequitable and unsustainable production and consumption patterns that aggravate poverty in many regions of the world.

We believe that urgent actions are needed to address these fundamental problems and reverse the trends. Stabilization of human population, adoption of environmentally sound industrial and agricultural technologies, reforestation, and ecological restoration are crucial elements in creating an equitable and sustainable future for all humankind in harmony with nature. Universities have a major role in the education, research, policy formation, and information exchange necessary to make these goals possible.

University heads must provide the leadership and support to mobilize internal and external resources so that their institutions respond to this urgent challenge. We, therefore, agree to take the following actions:

1. Use every opportunity to raise public, government, industry, foundation, and university awareness by publicly addressing the urgent need to move toward an environmentally sustainable future.

2. Encourage all universities to engage in education, research, policy formation, and information exchange on population, environment, and development to move toward a sustainable future.

3. Establish programs to produce expertise in environmental management, sustainable economic development, population, and related fields to ensure that all university graduates are environmentally literate and responsible citizens.

4. Create programs to develop the capability of university faculty to teach environmental literacy to all undergraduate, graduate, and professional school students.

5. Set an example of environmental responsibility by establishing programs of resource conservation, recycling, and waste reduction at the universities.

6. Encourage the involvement of government (at all levels), foundations, and industry in supporting university research, education, policy formation, and information exchange in environmentally sustainable development. Expand work with non-governmental organizations to assist in finding solutions to environmental problems.

7. Convene school deans and environmental practitioners to develop research, policy, information exchange programs, and curricula for an environmentally sustainable future.

8. Establish partnerships with primary and secondary schools to help develop the capability of their faculty to teach about population, environment, and sustainable development issues.

9. Work with the U.N. Conference on Environment and Development, the U.N. Environment Programme, and other national and international organizations to promote a worldwide university effort toward a sustainable future.

10. Establish a steering committee and a secretariat to continue this momentum and inform and support each other's efforts in carrying out this declaration.

From Report and Declaration of The Presidents' Conference, "The Role of Universities and University Presidents in Environmental Management and Sustainable Development," Tufts University European Center, Talloires, France, October 4-7, 1990. (Call Tom Kelly at 617/627-3486 for a copy of the Declaration.)

Appendix D
Recommendations from Blueprint for a Green Campus: The Campus Earth Summit Initiatives for Higher Education, 1995

I. Integrate Environmental Knowledge into all Relevant Disciplines.

1) Integrate environmental knowledge into courses in all relevant disciplines.
2) Include a section in the academic mission statement, such as "all students, upon graduating, will possess the knowledge, skills, and values to work toward an environmentally sustainable future."
3) Provide resources for appropriate faculty to integrate environmental issues and perspectives into their existing courses, by developing and launching faculty training programs, holding seminars, and providing funding.
4) Become a signatory to the Talloires Declaration, an international declaration of principles signed by over 150 institutions worldwide dedicated to fostering environmental literacy.

II. Improve Undergraduate Environmental Studies Course Offerings.

1) Assemble a review team of students, faculty, alumni, and outside experts to produce a report on the quality of any existing or proposed environmental studies course offerings.
2) Publicize, distribute the report, and adopt the recommendations for the environmental studies course offerings.
3) Make a university commitment to provide funding for the costs of environmental studies courses and administration, and provide resources to hire and appoint faculty members and staff to lead such courses.

III. Provide Opportunities for Students to Study Campus and Local Environmental Issues.

1) Develop classes in which students can obtain academic credit for research on campus and local environmental issues.
2) Make a commitment to use these studies to help formulate more effective, innovative approaches to campus and local environmental issues.

IV. Conduct a Campus Environmental Audit.

1) Conduct an annual or biannual review of campus environmental impacts, including, but not limited to: solid waste, hazardous substances, radioactive waste, medical waste, wastewater and storm runoff, pest control, air quality, the workplace environment, water, energy, food, purchasing policies, transportation, campus design and growth, research activities, investment policies, business ties, environmental education and literacy, job placement and environmental careers.
2) Issue a report providing recommendations for improved performance in each area, ranking priorities for action, and setting goals to be completed by the next audit.

3) Distribute to all members of the campus community, including trustees, high-level campus officials, staff, faculty, students, alumni, foundation donors, corporate donors, government officials, environmental leaders, community leaders and the public at large.

V. Institute Environmentally Responsible Purchasing Policies.

1) Include environmentally sensitive specifications in all university goods and services contracts.
2) As an individual institution and through cooperative purchasing agreements with other universities and large institutions, purchase products with high recycled content, produced in an environmentally sustainable manner, which demonstrate maximum durability or biodegradability, reparability, energy-efficiency, non-toxicity, and recyclability.
3) Require every university department and program to meet university-wide purchasing standards.

VI. Reduce Campus Waste.

1) Establish a program to reduce, reuse, recycle, and compost a high percentage of campus waste.
2) Increase the percentage reduced, reused, recycled, and composted annually.
3) Expand the scope of waste reduction programs to include the following: glass, steel/aluminum cans, plastic, food waste, cardboard, bond and computer, paper, mixed, paper, magazines, newspapers, construction debris (steel, wood, concrete, asphalt), yard waste, oil, leaves, tires, scrap metal, hazardous chemicals, telephone books, contaminated soil, and mattresses at all areas and facilities of the campus.

VII. Maximize Energy Efficiency.

1) Invest in energy efficient technologies for heating, cooling, lighting and water systems in all existing and future campus buildings and earmark the savings for further improvements in environmental performance.
2) Install meters to measure the use of heat, electricity, and water by building or department and take ongoing meter measurements to set baseline data and determine progress.
3) Raise campus awareness about the need for energy conservation and provide incentives for action, such as by establishing campus-wide "Eco-lympics" competitions.

VIII. Make Environmental Sustainability a Top Priority in Campus Land-Use, Transportation, and Building Planning.

1) Incorporate sustainable design principles into existing and future land-use, transportation, and building plans.
2) In land-use plans, include guidelines to promote compact development for all new campus growth and to insure that any proposed development will not have a negative impact on parks, forests, wetlands, wildlife habitats, agricultural land, watersheds, historic buildings, traffic congestion, or noise and air pollution.
3) In transportation plans, provide incentives for walking, bicycles, buses or rail, and ridesharing; discourage the use of single-occupancy cars by passing on the full cost of parking to drivers, and link transportation planning to land-use planning.

4) In plans for building construction or renovation, incorporate guidelines for energy-efficiency, proper ventilation, and non-toxic, environmentally-sound construction materials.

IX. Establish a Student Environmental Center.

1) Provide space, funding, and high-level support for a student environmental center as a durable institution from which to educate the campus and local community about environmental problems and their solutions.
2) Develop a Center membership program, and use Center-sponsored events and conferences to strengthen the network of students, faculty, staff, and alumni concerned about environmental problems.
3) If possible, support a full or part-time paid administrator/staffer for the center who can help students channel their interests into substantive reforms on the campus, local, state, national and global levels.

X. Support Students who Seek Environmentally Responsible Careers.

1) Provide funding and resources to the career placement office for staff to assist student efforts to find careers in organizations working for an environmentally sustainable future, including comprehensive and accessible job and internship listings, alumni contacts, recruitment opportunities, and environmental career guidance.
2) Provide staff and funding support for students, faculty, and staff to organize an annual "Careers in the Environmental Field" panel that brings environmental leaders and alumni from different sectors (government, business, academia, the media, non-profits), to campus to speak to students about their work.

NOTE: A copy of the full report is available in the Office of the Environmental Coordinator or through the Environmental Council.

Appendix E
Selected Bibliography

BOOKS

Argentine, Cindy Corlett. *Vermont Act 250 Handbook: A Guide to State and Regional Landuse Regulation.* Brattleboro, VT: Putney Press, 1993.

Campus Green Buying Guide. Washington, DC: Green Seal and the University of Maryland Center for Global Change, 1994.

Choosing a Sustainable Future: The Report of the National Commission on the Environment.. Covelo, CA: Island Press, 1993.

Eagan, David and David Orr, eds. *The Campus and Environmental Responsibility.* San Francisco, CA: Jossey-Bass, 1992.

Education for the Earth: A Guide to Top Environmental Studies Programs. Princeton, NJ: Peterson's Guides, Second Edition, 1994.

50 Simple Things Your Business Can Do to Save the Earth. Berkeley, CA: Earthworks Group., 1989.

Little, Charles E. *Greenways for America.* Baltimore: The Johns Hopkins University Press, 1990.

Moody, Joan and Richard Wizansky, eds. *Earth Work: Resource Guide to Nationwide Green Jobs.* San Francisco: HarperCollins*West*, 1994.

Orr, David. *Earth in Mind: Essays on Education, Environment, and the Human Prospect..* Washington, DC: Island Press, 1993.

Orr, David. *Ecological Literacy and the Transition to a Postmodern World.* Albany, NY: SUNY, 1992.

Smith, April, and the Student Environmental Action Coalition. *Campus Ecology: A Guide to Assessing Environmental Quality and Creating Strategies for Change.* Washington, DC: Living Planet Press, 1993.

Toxics Watch 1995. New York: INFORM, Inc., 1995. Copies may be ordered from INFORM, 120 Wall Street, New York, NY 10005.

REPORTS, GUIDES, AND ARTICLES

Blueprint for a Green Campus: The Campus Earth Summit Initiatives for Higher Education. A Project of The Heinz Family Foundation, January, 1995. Copies are available through Campus Green Vote, 1400 16th Street, NW, Box 24, Washington, DC 20036, phone: 202/939-3338; fax: 202/979-6646; Email: shadow@igc.apc.org.

Brown, Kenneth. *Waste Prevention: Source Reduction NOW*. Minnesota Office of Waste Management, 1993.

Business Guide for Reducing Solid Waste. US Environmental Protection Agency, November 1993, Publication DOC/530-K-92-004.

Campus Green Pages. A Directory of students, faculty, staff, and administrators working for a sustainable future. Last revised October, 1994. Copies are available through Campus Green Vote, 1400 16th Street, NW, Box 24, Washington, DC 20036, phone: 202/939-3338; fax: 202/979-6646; Email: shadow@igc.apc.org.

Catalog of Hazardous & Solid Waste Publications. US Environmental Protection Agency, May 1994, Publication DOC/530-B-93-002.

Creighton, Sarah Hammond. "Solid Waste Reduction in Colleges and Universities: A Status Report." Medford, MA: Tufts Center for Environmental Management, 1993.

Fishbein, Bette K. and Caroline Gelb. *Making Less Garbage: A Planning Guide for Communities*. INFORM, Inc., 1992. Copies are available through INFORM, Inc., 120 Wall Street, 16th Floor, New York, New York 10005, 212-361-2400.

Keniry, Julian. "Environmental Movement Booming on Campuses," Change. September/October, 1993.

"Partnership Leader Workshop Manual," Second Nature. 28 Msgr. O'Brien Highway, East Cambridge, MA, 1994. Call 617/227-8888.

Report of the Governor's Commission on Vermont's Future: Guidelines for Growth, January, 1988. Copies are available from the Office of Policy Research and Coordination, 109 State Street, Montpelier, VT 05602.

Roodman, David Malin and Nicholas Lenssen. "A Building Revolution: How Ecology and Health Concerns Are Transforming Construction," *WorldWatch Paper #124*. March 1995.

Soy Ink. For information on soy ink and the SoySeal, write the Naitonal Soy Ink Information Center, c/o Iowa Soybean Association, 1025 Ashworth Road, No. 310, West Des Moines, IA 50265-3542; phone: 515/223-1423; fax: 515/223-4331.

Student Environmental Action Guide, Student Environmental Action Coalition. Berkeley, CA: EarthWorks Press, 1991.

"The Inside Story: A Guide to Indoor Air Quality." US General Services Administration: Consumer Information Center, 1988.

The New Complete Guide to Environmental Careers. Environmental Careers Organization. Covelo, CA: Island Press, 1993.

Understanding the Small Quantity Generator Hazardous Waste Rules: A Handbook for Small Businesses. E.P.A. Office of Solid Waste and Emergency Response, September 1986.

MEMORANDUM

June 3, 1994

To: Professor Brett Millier, Chair Faculty Council
Professor Don Wyatt, Co-chair, 94-95 Community Council
Dudley Winthrop, Co-chair of 93-94 Community Council
Dumith Fernando, Co-chair of 94-95 Community Council
Chip Earle, President, 94-95 SGA

Copy: Senior Staff (E-mail)
Community Council File

From: John Emerson
Vice President for Student Affairs

Subject: Smoking Policy

The College recently received feedback related to the revised smoking policy that was voted by the Community Council on April 11, 1994. The Vermont State Division of Environmental Health requested further adjustments in the language of the policy, to assure greater protection for non-smokers who might be adversely affected by smoke from a designated smoking area.

I have revised the wording of the policy to reflect these requirements, and I have carefully reviewed these changes with Tom Corbin, Acting Director of Human Resources. I believe that the additions to the language (mostly in 2b, last clause; 2e; 2f; and 2g) are fully consistent with the intentions and wishes of those groups and individuals assisting in the development of the new policy over the past year. A copy of the policy as it will appear in College Handbooks is enclosed. As we all know, there are always opportunities to propose amendments to such a policy as we learn from our experience with it.

JDE:blh

Enclosure

H. Middlebury College Smoking Policy
(June 1994)

Middlebury College seeks to maintain a healthy, comfortable and productive work environment for employees and students. In addition, the College must remain in absolute compliance with fire and safety regulations. The College seeks also to comply with the laws of the State of Vermont governing smoking in public areas. Vermont statute, effective July 1, 1993, prohibits smoking in most public places. In compliance with the new state regulations, all areas in the College will be smoke free, effective September 1, 1994, with the exceptions listed below:

1. Residential Space:

Students may smoke in their rooms provided it is mutually agreeable to their roommate/s and to those who may be affected in adjacent areas. Smoking is not permitted in lounges, hallways, stairwells, bathrooms, or other public areas in student residences.

2. College Workplace, College Offices, and Student Offices.

The Middlebury College workspace is a smoke-free environment. Smoking is not normally permitted in the College workplace, in offices of College employees, and in student offices. Exceptions in the form of designated smoking areas may be made under very limited conditions. A group of employees or students may identify an office or other enclosed area as a designated smoking area only when the following conditions are met:

a. The space is enclosed and is fitted with a door that is closed at all times.

b. The space is adequately vented by mechanical systems directly to the outside of the building, so that smoke does not seep into indoor common areas and other indoor work areas.

c. Smoking in the office or workplace is mutually agreeable to all occupants of that space, and to those who may be affected in adjacent areas.

d. Use of the space as a smoking area will not cause physical irritation to any non-smoking member of the College community.

e. The space is not an indoor area where non-smoking employees are required to visit or perform work duties during the course of their workday.

f. The space is not an area that is normally accessible to the public or to non-smoking members of the College community for reasons of business transaction, information gathering, etc.

g. The space is clearly designated as a smoking area.

h. The designation of a smoking area has the prior approval by the Office of Human Resources.

Rational:
The Surgeon General of the United States now estimates that passive smoke from tobacco products causes over 3,000 deaths in the U.S. yearly. We believe the policy as proposed would put Middlebury College in full compliance with the Vermont Statute that took effect July 1, 1993. The policy aims to permit individuals and groups of people to develop certain exceptions to a smoke-free environment only in very limited circumstances. It should not be seen as the College's obligation to create or provide for smoking areas. All members of the Middlebury community are expected to observe these policies. Where necessary after reasonable requests have been made, an individual may file a complaint through the appropriate channels.

DARKROOM SAFETY

The Forest Darkroom is for your use as a staff person of THE CAMPUS, KALEIDOSCOPE, or for your own personal photographic needs. At all times, safety must be your first priority. Please read this information packet carefully; ask questions; and follow all of the guidelines.

Material Safety Data Sheets (M.S.D.S.'s) provided by manufacturers are kept on file in the darkroom and at Student Activities. They are required to list known product hazards, safe exposure levels, reactivity, first aid and other safety and environmentally related data. Security will give you an orientation about these sheets and how to read them. Whenever you have a question, do not hesitate to ask. Please review these sheets before working with chemicals.

Products that are considered to have "Trade Secrets" are exempt from listing toxic ingredients. You should be aware that many chemicals have not been studied for long term effects. Also notice that toxicity levels are derived from studies on laboratory animals, thus giving information to predict effects on humans. The following information will attempt to clarify and supplement the information on the M.S.D.S's. (There will be references to the text, Overexposure: Health Hazards in Photography, Second Edition by Susan D. Shaw and Monona Rossol, Allworth Press, New York, 1991. This book is located near the binder full of M.S.D.S sheets on the shelf near the exit).

BEFORE YOU EVEN USE THE DARKROOM

1. No student will be given access to the darkroom without having first completed the Darkroom Orientation and Right to Know Training.

2. Unauthorized people should never be allowed into the darkroom with you.

3. Do not store or use any unauthorized chemicals in the darkroom (this includes all cleaners too.) All chemicals MUST be approved by Student Activities. Complete Material Safety Data Sheets must be kept in both the darkroom and at Student Activities for your information. Federal law requires this under the Hazardous Communications Act.

4. Agree to follow all directions and signs regarding safe mixing, dilution and disposal of chemicals.

CHEMICALS - LISTED BY USAGE

(This is not an exhaustive list but will provide an idea about information available from the M.S.D.S sheets.)

DEVELOPERS

Developers are considered to be the source of most health problems associated with photography. They have been found to cause skin and respiratory disorders, as well as allergies in some people. Most developers contain ingredients that are listed as hazardous. Only two of these ingredients are outlined below. Refer to the Material Safety Data Sheets for further information.

HYDROQUINONE
- hazardous ingredient found in many developers
- highly toxic by ingestion (causing major damage or fatality if swallowed)
- moderately toxic by skin contact and inhalation
- linked to causing cancer in laboratory mice and rats
- almost all developers in use at the Forest Darkroom contain hydroquinone at less than 10% by weight in the chemical concentrate and at 1% or less by weight in the working solution of the developer

(Read Overexposure, page 103, section 4.005.)

DIETHYLENE GLYCOL
- listed as hazardous.
- has not been fully tested
- suspected to cause cancer, tumors and birth defects
- Sprint Standard (film developer) and the Sprint Quick Silver (print developer) contain diethylene glycol at 5% by weight in developer concentrate and at 1/2 % by weight in the working developer solution.
- darkroom manager has pre-mixed the developer solution from the liquid concentrate
- in Kodak HC110 Developer at 5-10% in concentrate and present in the working solution at less than 1%.

(Read Overexposure page 158, section 4.264 and page 161, section 4.270.)

RISK LEVEL

According to the M.S.D.S. sheets, these developer working solutions cause eye and skin irritation and may cause skin allergies. Gastrointestinal irritation may occur if these chemicals are ingested. These developers have a low inhalation hazard for recommended handling. "Good Ventilation" is required, constituting 10 complete changes of air per hour in the work space.

FIXER

The Federal Clean Water Act allows liquids with up to 5 parts per million concentration of silver to be discharged into sewers. Used fixer can contain thousands of parts per million of silver. Therefore, used fixer is considered hazardous waste.

USED FIXER CANNOT BE DISPOSED OF IN SEWERS! USE THE DISPOSAL CONTAINER IN THE EAST ROOM.

- Student Activities has a waste disposal contractor who provides proper storage, removal and recovery of silver from used fixer.
- silver recovery removes most of the silver from fixer solutions
- silver will be refined and reused instead of polluting water
- working with fixer is considered to have a low hazard risk when used properly
- fixer is possibly hazardous when inhaled
- inhalation is most likely to occur when it is old or when heated
- inhalation may also occur when fixer solution is contaminated by an acid stop bath; this may cause toxic sulfur dioxide gas to be released
- Part B (hardening solution) of Kodak Rapid Fixer contains 11% sulfuric acid (a highly corrosive ingredient).
- Part B component equals less than .028 % (or 3.5 oz. per gallon) of the working solution of Kodak Rapid Fixer (mixed for you by D. Manager)

EDWAL HYPO-CHEK

- contains formaldehyde (OSHA considers to be a carcinogen)
- formaldehyde is highly toxic by inhalation and ingestion, and moderately toxic to skin
- long exposures to formaldehyde can cause severe symptoms and even death!
- Edwal Hypo-Chek contains less than 1% of formaldehyde.
- OSHA requires having an eyewash when solutions contain more than .1% Formaldehyde
- solutions containing more than 1% require a quick drench shower on site
- having larger work place percentages of formaldehyde often require air monitoring, protective clothing, masks and respirators.
- we have been unable to find a safer substitute for Hypo-Chek.

IF YOU DECIDE TO USE HYPO-CHEK, YOU MUST WEAR SAFETY GOGGLES AND GLOVES.

(Please read Overexposure page 135, section 4.144 and page 107, section 4.023)

STOP BATH - WATER

Use water for 30 seconds between developing and fixing both films and papers. (For best results keep water close to the same temperature as the developer and the fixer.)

- we use water instead of a dilution of Acetic Acid
- acetic acid is highly corrosive to skin, eyes, respiratory system and stomach
- diluted acetic acid stop bath can cause chronic bronchitis
- to safely mix and use acetic acid stop bath, the darkroom would need a deluge shower and additional ventilation (exhaust hoods). For this reason, acetic acid has been removed.

WHAT IS MISSING FROM THE DARKROOM?

A. Powdered chemical mixes
   - highly concentrated
   - toxic dust particles may be inhaled when mixing powders
   - mixing liquid concentrates is safer

B. Acetic Acid Stop Bath (See: Stop Bath)

C. The film cleaner PEC-12
   - solvent requires greater ventilation than we are equipped with
   - ingredients are considered "a trade secret". (There is no information available on any potential health risks.)

D. Kodak Rapid Selenium Toner
   - requires need increased ventilation because of the toxic gases it may produce as it ages.
   - Using most photographic toners can be <u>very</u> dangerous

REFERENCES

_____, Safe Handling of Photography Chemicals-Kodak Publication #J-4, New York: Eastman Kodak Company, 1990.

Rossol, Monona. The Artist's Complete Health and Safety Guide, New York: Allworth Press, 1990.

Shaw, Susan D. and Monona Rossol. Overexposure, Health Hazards in Photography, 2d ed. New York: Allworth Press, 1991.

Tell, Judy, ed. Making Darkrooms Saferooms, Durham, North Carolina: National Press Photographers Association, 1989.

SAFE WORKING REQUIREMENTS

1. **Pregnant women and children under 12 years of age should not be exposed to photographic chemicals.** Also, individuals with immune and allergic conditions, chronic diseases, the elderly and asthmatics are at a greater risk of being adversely affected by chemical exposure.

2. **Always work with the ventilation system turned on.** Home darkroom users note that good general ventilation should completely change the air in a darkroom at least 10 times every hour with fresh air from outside of the building. The exhausted air needs to leave the building without entering anyone's work or living space.

3. **Avoid chemical exposure to skin and eyes.** Never put hands into chemicals. Use tongs to move prints between chemical trays. For many chemicals M.S.D.S. has recommended the use of goggles and gloves. Gloves are to protect your hands from splashes and are not made for dunking into chemical baths!

4. **Smoking, consuming food or beverages and applying makeup are prohibited.** These activities put you at greater risk of chemical exposure through inhalation and ingestion.

5. **Contact lenses** may trap chemical gases, vapors and dust which may cause eye damage.

6. **Never mix different chemicals together.** Reactions can occur including toxic vapors.

7. **Keep the Darkroom clean!** Contaminants can adversely affect your health and the permanence of your photographs.

8. **When cleaning up spills,** consult the appropriate M.S.D.S. or call Student Activities.

9. **Properly wash** rejected film, prints and test strips before disposing of them. With the low price of silver, we have not been able to find a vendor that can reclaim the silver form processed prints and films

10. **Tired or fatigued people should not work in the darkroom.** Accidents are more likely to occur.

11. **Individuals who work for long periods of time in the darkroom without breaks are increasing the risk of being adversely effected by chemical exposures.** Note: Most exposure levels are set for workers exposed for 8 hours a day for a 40 hour work week.

12. **It is recommended to work with another person present in case of an emergency.**

13. **Fixer should never be poured down the drain.** It must go through a silver recovery process.

14. **When disposing of the non-fixer photo chemicals down the drain, use plenty of running water to dilute the chemical.** Note: Home darkroom users need to contact your local government for disposal regulations. Many places will not allow any photo chemicals to be dumped down the drain. Photo chemicals are commonly collected by community hazardous waste collection programs. Never dump chemicals into storm sewers or natural bodies of water!!!

15. **Wash hands with soap and water before leaving the darkroom.**

EMERGENCY NUMBERS

Vermont Poison Center	1-658-3456
College Emergency Number	*77
Campus Security	5911
Health Center	5135
Ambulance	388-3333
Kodak 24 Hour Hotline Ext. 3	1-800-242-2424
or	1-716-722-5151
Sprint Systems of Photography	1-800-356-5073 (day time hours)
Arts, Crafts and Theater Safety (ACTS) Hotline	1-212-777-0062

BLOODBORNE PATHOGENS

EXPOSURE CONTROL PLAN

FOR MIDDLEBURY COLLEGE

Revised
September 01, 1994

TABLE OF CONTENTS

Introduction	Page 3
Glossary	Page 4
Exposure Determination	Page 5
Job Classifications with Occupational Exposure	Page 7
Methods of Compliance	Page 8
A. Engineering Controls	Page 8
B. Bio-Safety Cabinets	Page 8
C. Work Practice Controls	Page 8
D. Personal Protective Equipment	Page 9
E. Emergency Medical Calls	Page 10
F. Bio Hazard Communication	Page 10
G. Housekeeping Measures	Page 11
H. Regulated Waste	Page 12
Hepatitis B Vaccination	Page 14
Exposure Incident	Page 15
Post Exposure Vaccination and Follow Up	Page 15
Medical Records	Page 16
Employee Training	Page 16

INTRODUCTION

Under recent federal regulations, OSHA requires that all employers with employees exposed to bloodborne pathogens implement an exposure control plan. The purpose of this plan is to identify employees at risk of occupational exposure to bloodborne pathogens and implement control measures designed to decrease these risks.

The OSHA standard also requires the plan to contain the following information:

1. An exposure determination list. This list includes all job classifications where employees have occupational exposure to bloodborne pathogens.

2. The schedule and method used to implement all provisions of the standard.

3. The procedure for evaluating exposure incidents and the procedure used to evaluate post exposure incidents.

The plan must be available to all employees and be reviewed on an annual basis. This information will be maintained in the Health Center, the Human Resources Office, and areas where there are employees with occupational exposure to bloodborne pathogens.

This Exposure Control Plan was produced by the Hepatitis B Committee. We gratefully acknowledge Colby College for the information provided in the development of the plan.

GLOSSARY

These standard definitions, as defined by OSHA, apply at MIDDLEBURY COLLEGE.

Blood: Human blood and blood component.

Bloodborne Pathogens: Microorganisms present in human blood which may cause disease in humans.

Clinical Laboratory: A work place where diagnostic and screening procedures are performed on blood or other potentially infectious material.

Contaminated: The presence or the reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.

Contaminated Laundry: Laundry which has been soiled by blood or other potentially infectious materials or that may contain sharps.

Contaminated Sharps: Any contaminated object that can penetrate the skin including, but not limited to needles, broken glass, and capillary tubes.

Decontamination: Physical or chemical means of removing or inactivating bloodborne pathogens to the point where they are considered safe for handling, use or disposal.

Engineering Controls: e.g., sharp containers, self-sheathing needles that isolate or remove bloodborne pathogen hazards from the work place.

Exposure Incident: Specific eye, mouth, other mucus membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties.

HBV = Hepatitis B Virus

HIV = Human Immunodeficiency Virus

Occupational Exposure: Reasonably anticipated skin, eye and mucus membrane or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

Parenteral Exposure: Piercing mucus membranes or the skin barrier through such events as needle sticks, human bites, cuts, or abrasions.

Personal Protective Equipment: Specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes are not considered protective equipment.

Regulated Waste: Liquid or semi-liquid blood or other potentially infectious materials; contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed. Items that are caked with dry blood or other potentially infectious materials and are capable of releasing these materials during handling. Contaminated sharps; pathological and microbiological wastes containing blood or other potentially infectious materials.

Source Individual: Any individual, living or dead, whose blood or other potentially infectious material may be a source of occupational exposure to the employee.

Sterilize: The use of a physical or chemical procedure to destroy all microbial life including highly resistant endospores.

Work Practice Controls: Controls that reduce the likelihood of exposure by altering the manner in which a task is performed.

Exposure Control Plan: A written established plan designed to eliminate or minimize exposure. This plan shall include: the determination of exposure, the method of post vaccination follow up, communication of hazards with employees and record keeping. This information is available to any employee upon request, and will be reviewed/revised annually.

Exposure Determination: List of all job classifications which have occupational exposure.

EXPOSURE DETERMINATION

All job descriptions at Middlebury College with exposure risk have been classified according to risk of occupational exposure to bloodborne pathogens. These classifications are defined as follows:

CATEGORY A: This category includes all employees who have routine exposure to bloodborne pathogens, primarily Health Center staff, training room staff, laundry operators, ski patrol and security personnel.

CATEGORY B: This category includes all employees who do not routinely have exposure to bloodborne pathogens, but may, on occasion, perform tasks which involve potential exposure, primarily crew custodians, custodians, coaches, and assistant coaches.

CATEGORY C: This category includes all employees who do not have any occupational exposure to bloodborne pathogens, primarily faculty, administrators and support staff not identified in Category A or B.

Middlebury College has defined these classifications to include the various tasks within these categories where occupational exposure might occur. These tasks have been grouped as follows:

0. No occupational exposure.
1. Handling of contaminated linen/clothing.
2. Handling of contaminated sharps and venous access.
3. Handling of contaminated surgical instruments.
4. Cleaning of surfaces/equipment contaminated with body fluids.
5. Insertion of tubes or other equipment into body surfaces.
6. Handling/exposure of body fluids.
7. Wound care/dressing changes.
8. Responding to emergency situations.
9. Handling of contaminated trash.

Middlebury College has determined that any Category A or Category B position will be treated as a Category A position for the purposes of employee training and identification of employees eligible for the administration of Hepatitis B vaccine. The only exception would be limited to persons who render first aid only as a collateral duty, responding solely to injuries resulting from workplace incidents, generally at the location where the incident occurred (i.e. Coaches, Assistant Coaches and Night Watch). Based on the low risk of exposure for these first aid providers, OSHA believes that post-exposure prophylaxis, including Hepatitis B vaccination within 24 hours of possible exposure, minimizes the risk to employees. All other requirements of the standard, including reports and training, must be met.

JOB CLASSIFICATIONS WITH OCCUPATIONAL EXPOSURE

The following chart lists potential exposures and job classifications by department:

Department	Position	Tasks	Class
Health Services	Admin Dir'r Health Center	1-9	A
	Medical Director	1-9	A
	Staff Nurse	1-9	A
	Nurse Practitioner	1-9	A
	Asst Head Nurse	1-9	A
Biology & Chemistry	Faculty	2,3,4,5,6	B
	Teaching Assistant	2,3,4,5,6	B
Facilities Management	Night Watch	7,8	B
	Crew Custodian (Floater)	1,4,9	B
	Custodian for Health Center	1,4,9	A
	Issue Counter Attendant	1	B
	Laundry Operator	1	A
	Custodian	1,4,9	B
	Supervisor Custodian	1,4,9	B
	Maintenance Plumber	4	B
Athletics & Physical Education	Coach/Faculty	7,8	B
	Assistant Coach	7,8	B
	Equipment Manager	1	A
	Asst Equip Manager I	1	A
	Asst Equip Manager II	1	A
	Coord of Sports Medicine & Physical Therapist	1-9	A
	Head Athletic Trainer	1-9	A
	Athletic Trainer	1-9	A
	Registered Nurse	1-9	A
	Student Trainers	1-9	A
Security	Director of Public Safety	7,8	A
	Security Officer	7,8	A
	Lieutenant	7,8	A
	Sergeant	7,8	A
Snow Bowl	Ski Patrol Director	4,6,7,8	A
	Professional Ski Patrol	4,6,7,8	A
	Lodge Caretaker/Janitor	1,4,9	B
	Student Ski Patrol	4,6,7,8	A
Operations	Housekeeper	1,4,9	B
Residential Life	Residence Hall Advisor	7,8	B

METHODS OF COMPLIANCE

A. ENGINEERING CONTROLS: To decrease occupational risk to blood-borne pathogens the College has developed the following system to isolate contaminated needles in a safe fashion:

All needle disposal units at Middlebury College are made of rigid plastic which prevent needles from piercing through the container. These units are also leak proof. Disposal units are strategically placed to allow for disposal as quickly as possible.

These units are inspected daily and replaced when 3/4 full. This further reduces the potential for accidental exposure due to overfill.

B. BIO-SAFETY CABINETS These are in use where occupational exposure to pathogens might occur. All microbiological and parasitic specimens are processed using these cabinets. Bio-safety cabinets are also used when specimens are separated and processed. These cabinets are certified every six (6) months. Documentation is maintained in the office of the Administrative Director of the Natural Sciences Division.

C. WORK PRACTICE CONTROLS: The following procedures must be followed by all employees with exposure to bloodborne pathogens.

HAND WASHING:

Hand washing is the single MOST IMPORTANT means of preventing the spread of infection. It is also an important measure to decrease occupational exposure to bloodborne pathogens.

1. Use warm running water.
2. Use mild liquid soap.
3. Friction is the most important part of the hand washing procedure. Careful washing between fingers is essential.
4. Hands are thoroughly rinsed while they are held downward.
5. Dry thoroughly with paper towel.
6. Turn water faucet off with paper towel. (This prevents recontamination of the hands.)

HANDS SHOULD BE WASHED

1. After touching any patient.
2. After touching any patient secretions, or any potentially infectious material.
3. Before leaving any isolation room.
4. Before performing invasive procedures.
5. After performing personal bodily functions.
6. After performing any job where a person comes in contact with any potentially contaminated material.

In the event that a sink is not available, hands may be washed with an antiseptic solution. If this method is used, hands must be washed with soap and water as soon as feasible.

Remember: gloves are not a substitute for hand washing.

OTHER IMPORTANT INFECTION CONTROL MEASURES

1. Eating, drinking, smoking, applying cosmetics, lip balm and handling contact lenses are prohibited in work areas where there is reasonable likelihood of occupational exposure to infectious agents.
2. Food and drink shall not be kept in refrigerators, freezers, shelves, cabinets or on counter tops or bench tops where bloodborne or other potentially infectious materials are present.
3. All procedures involving blood or other potentially infectious materials shall be performed in such a manner as to minimize splashing. Employees shall be trained in these techniques during the orientation period.

D. PERSONAL PROTECTIVE EQUIPMENT (PPE): The use of PPE may decrease occupational risk to bloodborne pathogens. PPE is provided to employees at no cost and must be accessible in all areas where occupational exposure is possible.

GLOVES must be used when:

1. There is a likelihood of contact with blood or other body fluids.
2. During venous access procedures and when giving injections.
3. When there is contact with mucus membranes and non-intact skin.
4. When contaminated items/surfaces are handled.

DISPOSABLE GLOVES must be discarded when contaminated and may not be rewashed.

UTILITY GLOVES must be used to perform housekeeping activities when the possibility of occupational exposure exists. These gloves may be decontaminated, but must be disposed of when cracked or no longer intact. To decontaminate, the gloves will be washed with bleach.

MASKS, EYEWEAR AND FACE SHIELDS: Face and eye protection must be used when there is potential for splashing, spraying, spattering of blood or other potentially infectious materials into the eyes or mouth. Glasses must have rigid side shields in order to be considered PPE. When eyewear is worn as PPE, a mask must be used to protect the nose and mouth. If face shields are selected, the shield must be worn with a mask.

GOWNS, APRONS OR LAB COATS:

All gowns or aprons selected as PPE must do the following:
1. Adequately cover clothes.
2. Prevent blood or other fluid from reaching clothes or skin.

If lab coats are used as PPE, these must be:
1. Laundered by the College laundry.
2. Be adequate to the task to prevent contamination of clothes or skin.

If clothing becomes contaminated while on duty, the College shall launder this clothing free of charge to the employee.

All employees shall be trained in the use of PPE at the time of employment.

E. EMERGENCY MEDICAL CALLS: CARDIOPULMINARY RESUSCITATION (CPR)

In the event that CPR must be performed on the patient, the employee shall use a mechanical device designed to protect the employee from bodily fluid exposure.

All personnel who respond to disturbances shall be trained in appropriate measures designed to decrease injuries and minimize exposure to bloodborne pathogens. If the employee sustains a human bite during this time, this shall be considered a percutaneous exposure and all follow-up measures for exposure shall be instituted.

F. BIOHAZARD COMMUNICATION:

Biohazard labels and signs are used by Middlebury College to communicate hazards to employees. The biohazard label includes the universal biohazard symbol and is fluorescent orange or orange-red with lettering or symbols in a contrasting color. They are either an integral part of the container or located as close to the hazard as possible.

LABELS shall be affixed to:

1. Containers of regulated waste.

2. Refrigerators and freezers containing blood or other potentially infectious material; and other containers used to store, transport or ship blood or other potentially infectious material except for:

   * Red bags or red containers
   * Containers of blood, blood components, or blood products that are labeled as to their contents and have been released for transfusion.
   * Individual containers of blood or other potentially infectious materials that are placed in a labeled container during storage, transport, shipment or disposal.
   * Regulated waste that has been decontaminated.
   * Laundry bags.

3. Labels required for contaminated equipment shall state which portions of the equipment remain contaminated.

SIGNS shall be posted at the entrance of work areas where there is potential exposure to infectious agents. Signs shall be fluorescent orange-red with letters and symbols in contrasting colors. The signs shall contain the following information:

* Name of the infectious agent
* Special requirements for entering the area
* Name, phone number of the responsible person

HAZARD COMMUNICATION TRAINING for employees shall take place at the time of hiring and annually thereafter.

G. HOUSEKEEPING MEASURES:

Middlebury College strives to provide a work environment which is maintained clean and as free from potential exposure as possible. All agents used to decontaminate work areas are EPA approved and meet standards for deactivating the Hepatitis B and HIV virus.

A detailed schedule for cleaning and decontamination is based upon the location within the facility, the degree of contamination present and the nature of the tasks being performed in each area. This schedule is maintained by the Assistant Director, Facilities Management for Custodial Services and is reviewed annually.

The following tasks may be performed by some employees at Middlebury College. All employees shall be trained to perform the tasks in such a way to decrease occupational exposure to bloodborne pathogens.

DECONTAMINATION OF:

WORK SURFACES

To prevent exposure of the employee to blood or other potentially infectious material remaining on a work surface from a previous procedure, all work surfaces must be decontaminated after completion of each procedure, when they are overtly contaminated during a procedure, and at the end of the work shift. When procedures are performed continually through out a shift, the work area should be decontaminated after each set of tasks is completed. The work area should be decontaminated if an employee leaves the area so that it does not present a source of contamination to other workers. Work surfaces in patient care areas do not need to be cleaned after each procedure unless that procedure results in contamination of the area.

EQUIPMENT:

All equipment shall be decontaminated immediately if contamination has occurred. Employees who perform this function shall be trained in the methods appropriate to the procedure.

H. REGULATED WASTE:

Regulated waste must be properly contained and disposed of so as not to become a means of transmission of disease to workers.

WHAT IS REGULATED WASTE? Regulated waste is defined as any waste capable of transmitting bloodborne pathogens.

The following wastes are determined to be regulated waste:

1. Liquid or semi-liquid blood or other potentially infectious material.
2. Items contaminated with blood or other potentially infectious materials and which would release these substances in a liquid or semi-liquid state if compressed.
3. Items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling.
4. Contaminated sharps.
5. Pathological and microbiological wastes containing blood or other infectious material.

All regulated waste shall be bagged in sealed red bags and transported to Porter Medical Center (PMC) for proper disposal.

Regulated waste shall be handled using protective equipment. Any container used to transport this waste shall be marked with the bio-hazard symbol. These containers shall be closable and leak proof on the sides and bottom as well as puncture resistant.

A secondary container must be used in situations where the outside of the first container becomes contaminated.

BIO-MEDICAL WASTE: Middlebury College recognizes that biomedical waste may also contain blood and other potentially infectious materials and follows the same procedure for handling, storing, and transporting this waste as for regulated waste.

Included in this category are:

Sharps
Outpatient waste
Emergency Accident waste

Responsibility for managing the regulated waste program rests primarily with the department that generated the waste. Regulated waste from the Health Center is collected and transported to PMC for proper disposal.

BLOOD SPILLS:

Blood spills are of extreme concern for transmission of bloodborne pathogens. The following procedure must be followed by all employees who remove or disinfect a blood or bodily fluid spill:

1. Gloves must be worn for the cleaning of any body fluid spills. Vinyl aprons must be worn for a large spill.

2. For small body fluid spills in rooms, corridors, etc., visible material should be removed and the area disinfected with a College approved disinfectant or a solution of bleach (1:10) dilution.

3. For large body fluid spills in the non-patient care areas: the contaminated area should be completely covered with paper towels and flooded with one of the above cleaning agents. Allow contact time (minimum of ten minutes). Remove soiled paper towels and dispose of in a red bag for incineration. Wet mop area with a clean solution.

4. Large body fluid spills in patient care areas: spills should be wiped up as soon as possible with paper towels, and the towels discarded in a red bag for incineration. Final clean up of the area should include disinfection of the contaminated surfaces using a solution of bleach (1:10), or hospital approved disinfectant providing for a contact time of at least 10 minutes to complete the disinfection process.

5. For body fluids containing glass: glass is removed by sweeping with a counter brush and dust pan. Body fluid is then removed following proper procedure as stated in this policy (Procedures 1-4). Equipment used to clean a body fluid is then disinfected using a solution of bleach (1:10), or an approved disinfectant. All glass needs to be disposed of in a manner to prevent exposure to another employee.

6. Dispose of protective equipment. Wash hands.

LAUNDRY: Contaminated laundry is defined as any laundry that may contain blood or other potentially infectious material. The following guidelines have been designed to decrease occupational exposure by means of contaminated linen:

1. Linen shall not be sorted or rinsed in patient care areas.

2. All personnel shall use protective equipment when handling all contaminated linen.

3. Only laundry bags that prevent soak through or leakage of fluid shall be used to contain soiled or contaminated laundry.

4. All laundry workers shall be trained in the following areas:

   * Proper method of handling contaminated linen.
   * Method of selecting protective equipment.
   * Handling of contaminated sharps.

Standard sharps containers shall be located in the laundry for disposal of all sharps found in contaminated linen.

HEPATITIS B VACCINATION:

Middlebury College provides the Hepatitis B Vaccine free of charge to all employees who have the potential for occupational exposure during the course of performing their duties. All new employees who are eligible for the vaccine are trained on the provisions of this standard and will be offered the vaccine within ten (10) days of employment.

Middlebury College does not offer the vaccine to new employees who have previously received the vaccine series if antibody testing reveals the employee is immune or for those employees for whom the vaccine is contraindicated. When the vaccine is not given for these reasons, there will be documentation provided in the employee's medical record.

Occupational exposure is defined as reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

All current employees with occupational exposure have been identified and will be offered the vaccine prior to December 15, 1992.

All employees who choose to receive the Hepatitis B vaccine must sign an informed consent explaining the benefits derived from the vaccine. Any employee who declines the Hepatitis B vaccine must sign the declination statement at the bottom of the form. At this time the employee will be counseled as to the risks of refusal. If at any future time the employee decides to be vaccinated, the vaccine will be administered at no cost. All employees who refuse vaccination will be recontacted annually and offered vaccination.

ADMINISTRATION OF THE VACCINE:

The Hepatitis B Vaccine will be administered according to the United States Public Health Standards. If in the future these standards require routine booster doses, these shall be offered to all employees with occupational exposure as required by the guidelines. Under current public health guidelines, routine post vaccination testing is not required although it is recommended. Employees receiving the Hepatitis B Vaccine may have post vaccination testing at the College's expense.

RECORD KEEPING

Employees and the College shall receive a written opinion from the evaluating health care provider on their vaccination status. A copy of the vaccination consent/declination form and dates of training and vaccination will be kept in the employee's personnel file.

EXPOSURE INCIDENT

An exposure incident is defined as "specific eye, mouth, other mucus membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties".

THE FOLLOWING STEPS ARE TO BE TAKEN AFTER EACH EXPOSURE INCIDENT:

1. Employee will be administered first aid.

2. Each incident is to be reported to the supervisor immediately.

3. The supervisor and the employee will complete an Incident Report as soon as possible after the exposure incident.

4. Each incident is to be evaluated by a licensed health care professional. Once it has been determined that an exposure has occurred, the employee's personal physician will determine the necessary follow up.

5. When the source individual is known, the source individual's blood will be tested for the Hepatitis B virus. The individual will also be tested for the HIV virus once informed consent has been obtained. If consent cannot be obtained from the source individual and the employee requests that HIV testing be performed, Middlebury College will assist the employee to whatever degree necessary to obtain this consent. In this event State regulatory procedures shall be followed. The result of any evaluation is part of the employee's medical record. The employee shall be given information pertinent to to the source individual as needed to make an informed decision concerning appropriate follow up measures.

6. When appropriate, the exposed employee's blood will be tested for the Hepatitis B virus and for the HIV virus. The employee's personal physician will provide the test results to the exposed employee and provide counseling as medically indicated, including referral to an infectious disease specialist.

POST EXPOSURE VACCINATION AND FOLLOW UP

A confidential post exposure medical follow up is performed after each exposure incident. This follow up is provided under the direction of a licensed health care professional.

All employees who have an exposure as previously defined must complete an incident report. This report must be evaluated and signed by the employee's supervisor. If indicated, the employee will receive further training to correct any problems detected through the incident. The incident report shall be forwarded to the Human Resources Office.

In order to perform appropriate follow up, the health care professional responsible for the follow up shall be provided with the following information:

* A copy of the standard.
* A description of the employee's duties as they relate to the incident.
* Documentation of the route of exposure and circumstance under which the exposure occurred.
* Results of source individuals blood testing, if available.
* Medical records relevant to the treatment of the employee, including vaccination status.

The employer and employee are provided with a written post-exposure evaluation opinion within fifteen (15) days after the completion of the evaluation. This documentation will include the results of the medical evaluation and any medical conditions which may arise from the exposure that may require further treatment. A copy of this report will be kept in the employee's medical record.

All needle stick and other exposure incidents that result in medical treatment and follow up shall be documented on the OSHA 200 Log. All identifying information pertaining to bloodborne pathogens are removed prior to granting access to the records.

MEDICAL RECORDS

The Human Resources Office will maintain confidential medical records on all employees with occupational exposure for the duration of their employment and an additional thirty years. All employee medical records are maintained as confidential records and as such will not be disclosed without written consent unless required by law. This record will include:

1. The name and social security number of the employee.
2. All information pertinent to Hepatitis B status and vaccination.
3. A copy of all results of examinations, medical testing, and follow up.
4. The employer's copy of the health care professional's written opinion.
5. A copy of the information provided to the professional.

EMPLOYEE TRAINING

Specific information and training about occupational hazards and required protective measures will be provided to all employees with occupational exposure. All current employees with occupational exposure will be provided with this training by November 20, 1992. New employees with occupational exposure will receive training at the time of initial employment. These employees shall be trained prior to being placed in positions where occupational exposure may occur. Retraining on an annual basis will be required. Provision will be made to provide training by a qualified trainer whenever a change in an employee's responsibilities, procedures, or work situation is such that an occupational exposure risk is affected.

Training will be provided by an individual(s) who is knowledgeable in the subject matter (i.e., infection control) at no cost to the employee, during work hours, and at a location reasonably accessible to the employee. The training will be appropriate in content, language, and vocabulary to the education, literacy, and language background of the employee. The training will include:

* An accessible copy of the regulatory text of the standard.
* A general explanation of the epidemiology and symptoms of the bloodborne pathogens.
* An explanation of the modes of transmission of bloodborne pathogens.
* An explanation of the appropriate methods of recognizing risks and other activities that may involve exposure to blood and other potentially infectious materials.
* An explanation of the use and limitation of methods that will prevent or reduce exposure including appropriate engineering control, work practices, and personal protective equipment.
* Information of the types, proper use, location, removal, handling, decontamination and disposal of personal protective equipment.
* An explanation of the basis for selection of personal protective equipment.
* Information on the Hepatitis B vaccine, including information on its efficacy, safety, method of administration, the benefits of being vaccinated, and that the vaccine and vaccination will be offered free of charge.
* Information on the appropriate action to take and the person to contact in an emergency involving blood or other potentially infectious materials.
* An explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow up that will be made available.
* Information on the post exposure evaluation and follow up that the employer is required to provide for the employee following an exposure incident.
* An explanation of the signs and labels and/or color coding used to identify hazards.
* An opportunity for interactive questions and answers with the person conducting the training.

Written training records will be kept in the Human Resources Office for three (3) years. These records will include:

* The dates of the training sessions.
* The contents or summary of the training.
* The names and qualifications of the person conducting the training sessions.

Middlebury College
Standard Operating Procedures for
Radioactive Waste Disposal

1. **General information:** Accumulation and disposal of all radioactive wastes must follow the exact procedures below. Each faculty member who is listed as a user on Middlebury College's Radioactive Material License is responsible for ensuring that all wastes from his or her laboratory are properly accumulated and packaged for disposal. The user must maintain a log for *each* waste container that lists the names and activities of all nuclides that are placed in the container. The Science Center Administrative Director will supervise transfer of all radioactive wastes to the waste bunker and, together with the Radiation Safety Officer (RSO), will verify that wastes are properly disposed according to Federal regulations and the requirements of our waste handler.

2. **Disposal of radioactive wastes:** Radioactive wastes may be accumulated or disposed only in designated Limited Access Areas and not in any Occasional Use Areas. As of August, 1994, these designated Limited Access Areas are Science Center 307, 309, 327, 337, and 520. Paragraphs 3. through 10. list in detail the available methods and specific requirements for accumulation and disposal of radioactive wastes that are applicable to individual users.

   The NRC permits direct disposal of certain low-level radioactive wastes, including some that can be discharged to the sanitary sewer, *within strictly defined limits*. Before accumulating a specific waste for disposal, you should check whether one of the immediate disposal methods listed in Paragraphs 3. or 4. is applicable to that waste. In all cases where more than one disposal method can apply, the first listed method is preferable, both in terms of environmental impact and the cost for disposal.

   ***All* radioactive waste disposal, including disposal into the sanitary sewer must be recorded in the Radioisotope Use Log, regardless of the method used.**

3. **Animal carcasses** containing *only* ^{3}H or ^{14}C at a total concentration of 0.5 μCi or less per gram averaged over the body weight of the entire animal are to be disposed as for nonradioactive carcasses, without regard to the limits listed at Paragraph 5.

4. **Immediate disposal of aqueous effluents into the sanitary sewer system:** Aqueous radioactive wastes may be discharged to the sewer via *designated* laboratory sinks in Limited Access Areas only, **subject to the exact conditions listed below.**

   A. Aqueous-based liquid scintillation cocktail containing ***only*** ^{3}H or ^{14}C at a total concentration of 0.5 μCi or less per gram of medium may be disposed without regard to the limits listed at Paragraph 5. Empty the vials into running water in a *designated* sink. Rinse the scintillation vials three (3) times and then treat them as ordinary trash.

   B. Other aqueous radioactive wastes, defined as

      - the water-soluble waste supernatants or fluids from any experiment involving radioactive materials, or
      - the water-dispersed biological wastes contained in such supernatants or fluids, or
      - the first decontamination wash (using *Count-OFF®*, etc.) of all glassware and apparatus used for such experiments, or

- aqueous-based scintillation cocktails containing radionuclides other than ^{3}H or ^{14}C, and which may also contain ^{3}H or ^{14}C at a total concentration of 0.5 μCi or less per gram of medium,

may be discharged to the sewer **only if *all* of the following conditions are met:**

1) The quantity of waste discharged must not exceed any of the activity limits listed in the table at Paragraph 5. below, and

2) The waste must be completely dissolved in water before disposal, or must be miscible with water in all proportions. Also permissible: Biological wastes only may be dispersed in the aqueous waste rather than dissolved, and

3) The waste must not be flammable, toxic, contain heavy metals, or otherwise be subject to EPA, Vermont DEC, or other regulations as a hazardous waste, and

4) All pathogenic or infectious agents in the waste must be rendered non-viable.

Note that the dilution factor for each Limited Access Area is based on total building wastewater generation, which has been conservatively identified at 2×10^{4} L/day.

Inadvertent disposal of radioactive waste into the sewer in excess of the designated limits *must* be logged and reported immediately to the RSO.

5. Permitted discharges of radioactive effluents from designated Limited Access Areas:

Nuclide	Half-life	Maximum amount allowed on site	NRC-permitted effluent concentrations		Permitted release from EACH Limited Access Area†	
			Air, μCi/mL	Release to sewer, μCi/mL	Release to sewer, μCi/day	Maximum release to sewer, μCi/year
^{3}H	12.3 y	250 mCi total 100 mCi per sample	1×10^{-7}	1×10^{-2}	20,000	5×10^{5}
^{14}C	5,730 y	50 mCi	3×10^{-9}	3×10^{-4}	600	1×10^{5}
^{24}Na	15 h	1 mCi	7×10^{-9}	5×10^{-4}	1,000	1×10^{5} combined total for all nuclides other than ^{3}H & ^{14}C
^{32}P	14.3 d	10 mCi	1×10^{-9}	9×10^{-5}	180	
^{35}S	87.2 d	50 mCi	2×10^{-8}	1×10^{-3}	2,000	
^{42}K	12.4 h	1 mCi	7×10^{-9}	6×10^{-4}	1,200	
^{45}Ca	165 d	1 mCi	1×10^{-9}	2×10^{-4}	400	
^{86}Rb	18.6 d	1 mCi	1×10^{-9}	7×10^{-5}	140	
^{125}I	59.9 d	5 mCi	3×10^{-10}	2×10^{-5}	40	

† **Note:** The table above applies **TO EACH** of the following five (5) designated Limited Access Areas in the Science Center: SC307, 309, 327, 337, and 520. It would also apply if up to five (5) additional Limited Access Areas in the Science Center were to be so designated on our license at some time in the future. This table would no longer apply if more than a total of ten (10) Limited Access Areas were to be designated, nor would it apply to any Limited Access Areas at locations other than in the Science Center building, should any be so designated. The dilution factor for each Limited Access Area is based on a total Science Center building wastewater generation of 2×10^{4} L/day or 6×10^{5} L/month.

6. **Accumulation and on-site temporary storage of radioactive waste in laboratories:** Radioactive wastes that cannot be disposed by one of the immediate methods listed above must be accumulated for eventual disposal. In order to facilitate proper disposal, wastes *must* be segregated into separate containers according to the categories listed in Paragraph 7. below. These categories distinguish wastes by half-life, nuclide, physical form, and contamination with other hazardous substances. All waste accumulation containers must be properly marked and labeled, as described in Paragraph 8., and the contents of each container are to be logged as described in Paragraph 9.

In general, the greater the variety of materials and number of different nuclides you use, the greater the number of separate waste containers you will need to maintain. Be sure you understand the waste categories applicable to your laboratory procedures *before* you begin to accumulate any radioactive wastes.

- Solid radioactive wastes must be accumulated in closable containers lined with the labeled heavy yellow polyethylene radioactive waste bags available from the stockroom. *Do not use ordinary trash bags.*
- Bulk liquid wastes are to be accumulated in suitable closed containers. Liquid accumulation containers must also stand in leakproof trays.
- Scintillation fluids must remain in their plastic counting vials — do not empty. As a convenience in handling, vials should be replaced in their original packing trays, if available.
- In addition to the requirements listed above, all ^{32}P wastes are to be accumulated in plastic containers, and shielded behind of materials of low atomic number such as 3/8" thick acrylic or polyethylene, so as to minimize Bremsstrahlung radiation.

Radioactive waste generated in Occasional Use Areas shall not be accumulated in those areas, but shall be transferred to a designated Limited Access Area at the end of each experiment.

7. **Categories of radioactive waste:** *For each Limited Access Area*, all radioactive wastes being accumulated for disposal must be segregated into separate waste containers according to both the half-life of the radionuclide (Half-life Category) and the type of waste (Waste Category).

A. The following categories are to be used to segregate wastes by half-life. To determine the half-life category for a given waste, use the *longest-lived* nuclide included in the waste. Unless samples need to be labeled with multiple radionuclides, however, please do not combine radioactive wastes with different half-life categories in the same waste container, as this will make disposal more expensive. If the waste storage bunker becomes overcrowded, wastes of mixed half-life may need to be returned to the original generator to be held for decay.

Half-life Category	Actual half-life	Applicable nuclides for which we are licensed
LONG	$t_{1/2} > 90$ days	^{3}H, ^{14}C, ^{45}Ca
90	90 days $\geq t_{1/2} >$ 60 days	^{35}S
60	60 days $\geq t_{1/2} >$ 30 days	^{125}I
30	30 days $\geq t_{1/2} >$ 15 days	^{86}Rb
15	15 days $\geq t_{1/2} >$ 5 days	^{32}P
5	5 days $\geq t_{1/2}$	^{24}Na, ^{42}K

B. **For radioactive wastes in which *ALL* components have a half-life of 90 days or less**, the following categories must be used to further segregate the wastes into separate waste containers when accumulating wastes for disposal. All wastes in this section will be held for 10 half-lives to permit decay and then disposed of as either EPA hazardous waste or ordinary waste, as appropriate. *In order to permit this waste to be readily and properly disposed at the lowest possible cost, it is essential that the listed segregation categories be strictly adhered to.*

Waste Categories for waste consisting only of materials with a half-life of 90 days or less.

Category DW-Hold Dry and Wet Wastes, Non-Hazardous	Solid dry waste with small amounts of absorbed or pourable aqueous liquids, wet items (vials, test tubes, etc.), and/or aqueous liquid waste in vials containing 50mL or less of liquid. There must be no organic solvent contamination, no heavy metals or other EPA hazardous waste, and no radioactive waste of any other kind. Any pathogenic or infectious material must be rendered non-viable.

Very Important!
All radioactive labels, warning legends, and symbols on any item must either be removed or completely defaced before that item is placed inside the waste collection bag or container!

Category O-Hold Organic Liquids	Organic solvent waste with **no heavy metal content**, with radionuclides having a half-life of 90 days or less, and with no radioactive waste of any other kind.
Category SO-Hold Liquid Scintillation Vials	Scintillation vials containing organic solvent-based scintillation cocktails with radionuclides having a half-life of 90 days or less and with no radioactive waste of any other kind.
Category LH-Hold Hazardous Aqueous Liquids	Aqueous liquid waste which contains any EPA- or Vermont DEC-regulated hazardous material, including heavy metals, azides, cyanides, etc. This waste must have no organic solvent contamination and no radioactive waste of any other kind. Any pathogenic or infectious material must be rendered non-viable. **Depending upon the exact composition of the waste, further segregation may also be required. Therefore, before beginning accumulation of any hazardous aqueous liquid wastes, please confirm the proper waste categories for your specific wastes with the Science Center Administrative Director.**
Category L-Hold Aqueous Liquids	Aqueous liquid wastes having an activity level in excess of that which may be discharged to the sanitary sewer, with no organic solvent contamination, no heavy metals, azides, cyanides, or other EPA hazardous waste, and no radioactive waste of any other kind. Any pathogenic or infectious material must be rendered non-viable.

C. **For radioactive wastes which contain *any* material with a half-life greater than 90 days,** the following categories must be used to further segregate the waste. All wastes in this section will be shipped to an appropriate radioactive or hazardous waste site for disposal. Organic solvent-based liquid scintillation cocktails containing *only* ^{3}H or ^{14}C at a total concentration of 0.5 μCi or less per gram of medium will be incinerated. All *Hold* Category wastes will be held for decay of the short-lived component(s) prior to final disposal. *In order to permit these wastes to be readily and properly disposed at the lowest possible cost, it is essential that the listed segregation categories be strictly adhered to.*

Waste Categories for radioactive waste containing any material with a half-life greater than 90 days.

Category D Dry Waste Only	Solid dry waste with **no absorbed or pourable liquid of any kind,** no wet items (vials, test tubes, etc.), no animal carcasses, and no organic solvent contamination. If the waste contains chelating agents (EDTA, DPTA, citrates, etc.) at concentrations greater than 0.1% by weight, the total weight of these agents must be accurately estimated and declared.
Category L Solidified Liquids	Aqueous liquid waste with a pH between 6 and 9, solidified using a solidification agent approved by our waste handler. There must be **no organic solvent contamination** and no other radioactive waste of any kind. Any pathogenic or infectious liquids must be rendered non-viable. If the waste contains chelating agents (EDTA, DPTA, citrates, etc.) at concentrations greater than 0.1% by weight, the total weight of these agents must be accurately estimated and declared.
Category SX Liquid Scintillation Vials	Scintillation vials containing organic solvent-based scintillation cocktails with a specific activity for ^{3}H or ^{14}C of 0.05μCi or less per gram of medium, and with no other radioactive materials present.
Category SX-Hold Liquid Scintillation Vials	Scintillation vials containing organic solvent-based scintillation cocktails with a specific activity for ^{3}H or ^{14}C of 0.05μCi or less per gram of medium **and** any mixture of radionuclides having a half-life of 90 days or less, with no other radioactive materials present.
Category SR Liquid Scintillation Vials	Scintillation vials containing organic solvent-based scintillation cocktails with a specific activity for ^{45}Ca of 300μCi or less per gram of medium; may also contain ^{32}P, ^{35}S, , ^{86}Rb, and/or ^{125}I at 300μCi or less per gram of medium, and ^{3}H or ^{14}C at 0.05μCi or less per gram of medium.
Category SM Liquid Scintillation Vials	Scintillation vials containing organic solvent-based scintillation cocktails with a specific activity for ^{45}Ca of 0.001μCi or less per gram of medium; may also contain ^{32}P, ^{35}S, ^{86}Rb, and/or ^{125}I at 0.001μCi or less per gram of medium, and ^{3}H or ^{14}C at 0.05μCi or less per gram of medium.

D. **Any radioactive waste which is not exactly described by one of the above-listed waste categories cannot be disposed of at the present time. Contact the RSO for more information.**

8. **Marking and labeling of laboratory waste containers:** Each accumulation container or waste receptacle located in a laboratory shall be marked with the words "Radioactive Waste" and the radiation symbol. The container shall be clearly labeled as to the Waste Category, Half-life Category, and permitted radionuclides, in accordance with the segregation requirements of Paragraph 7, and should also be labeled with the warning "Do Not Empty".

9. **Documentation of waste:** Accumulation of radioactive wastes must be recorded on a separate Radioactive Waste Log for each waste container. This log must list the nuclide and amount of activity placed in the container, and is to be updated at the end of each experimental procedure. If the waste contains chelating agents (EDTA, DPTA, citrates, etc.) at concentrations greater than 0.1% by weight, the total weight of these agents must be accurately estimated and listed on the log.

10. **Transfer of wastes to the radioactive waste bunker:** Users must arrange a time in advance before delivering radioactive wastes to the Science Center waste bunker. All wastes must be accompanied by a separate, properly completed Radioactive Waste Internal Manifest (RWIM) for each container of waste delivered. The names of all the radionuclides in the waste container, their total activities, and the amounts of any chelating agents will be obtained from the Radioactive Waste Log for that container and declared on the RWIM. The Science Center Administrative Director will inspect the waste and approve the RWIM before permitting the waste to be transferred. Any waste which appears not to meet proper accumulation guidelines will be refused; such problems would include but not be limited to signs of moisture in dry waste containers, excess liquid in absorbed liquid containers, bags which are too full to be closed properly, or apparent discrepancies in the Radioactive Waste Log.

    The Administrative Director will assign a Manifest Number to all properly packaged waste. This Manifest Number will then be marked on the RWIM, as well as on each waste bag, scintillation vial tray, or other container to which the RWIM applies.

11. **Inspections and surveys of stored wastes:** Waste containers in storage will be visually inspected at least monthly for signs of degradation or leakage. Radiation levels will be surveyed each time waste containing hard beta or gamma emitters is brought into the waste bunker, and at least quarterly thereafter while such wastes are in storage. The maximum permissible radiation level at the immediate perimeter of the radioactive waste cage shall be 1 mR/hr as surveyed with a Bicron Surveyor 50 and a calibrated end-window GM probe, or equivalent. Radiation levels in excess of this limit shall be reduced by appropriate shielding.

    Low-level contamination surveys using a Bicron Surveyor 50 with pancake GM probe or equivalent, and a wipe test of shelving and the outside of all accumulation drums will be performed quarterly, provided that new wastes have been brought into the waste bunker during the period.

12. **Shielding required for stored wastes:** If the radiation level as surveyed at the immediate perimeter of the radioactive waste cage exceeds 1 mR/hr, shielding sufficient to maintain radiation levels below this maximum shall be provided. Lead shielding shall be used for gamma emitters; for hard beta emitters such as ^{32}P, shielding of $\frac{1}{2}$" thick polyethylene or an equivalently-absorptive low-atomic-number material shall be used so as to minimize Bremsstrahlung radiation.

13. **Disposal of waste scintillation cocktails containing only ^{3}H or ^{14}C at a specific activity of 0.05μCi or less per gram of medium:** These wastes will be stored until the next hazardous waste disposal shipment is made, which will be at approximately 6- to 8-month intervals, or as required by EPA regulations. Scintillation vials, preferably in their original cardboard trays, will be placed in HDPE secondary-containment trays on shelves, or will be

accumulated directly in DOT 17H drums per EPA regulations and the requirements of our hazardous waste transporter. Final packing of the disposal drums, manifesting, and required labeling will be performed by the hazardous waste transporter.

14. **Other radioactive wastes destined for off-site disposal** will be accumulated in DOT 7A Type A drums in the radioactive waste bunker. Before waste bags or other containers are first placed in an accumulation drum, the Science Center Administrative Director will ensure that the drum contains the required amount, if any, of absorbent material. As waste is added to each drum, the amount of radioactivity and volume of liquid listed on the corresponding RWIM will be entered on the numbered Radioactive Waste Disposal Record for that drum, and the Radioactive Waste Disposal Record number will in turn be marked on the RWIM. The Administrative Director will supervise the addition of the waste containers to the accumulation drums, ensuring that all bags and other waste containers to be placed in the drum are marked with the proper Manifest Numbers, and that the drums are not permitted to be filled beyond the capacities specified by the waste handler.

15. **When an accumulation drum has been filled,** the Administrative Director will have the inner and outer drums sealed, and will arrange with the RSO to survey the drum to determine the maximum radiation level at the surface and to perform a wipe test to ensure that there is no significant removable contamination on the outside of the drum.

    - "No significant removable contamination" shall mean a maximum permissible level of 22 dpm per square centimeter of drum surface area.

    The Administrative Director or RSO will label the drum per DOT and NRC or EPA regulations, as applicable, as well as according to the requirements of the waste handler. Results of the survey and the wipe test will be noted on the Radioactive Waste Disposal Record for each drum, a copy of which, together with the Radioactive Waste Internal Manifests for the contents of the drum, will be maintained permanently on file in the Science Center Administrative Director's office.

16. **Wastes to be disposed by decay-in-storage:** Waste bags or other containers of materials to be decayed-in-storage will be placed in a numbered storage container or shelf tray. Liquid wastes will be stored in HDPE bottles or carboys with a capacity of 5 gallons or less each. These bottles will then be placed in a deep HDPE secondary-containment tray capable of holding one-and-one-half times the contents of the largest bottle or carboy contained therein. A sufficient number of secondary-containment trays will be provided to permit wastes to be segregated by half-life category and chemical compatibility. Scintillation fluids will be stored in their original vials, and if possible, in the original cardboard trays; vials will then be stacked in HDPE secondary-containment trays. Dry waste bags will be placed inside new 3-mil yellow plastic bags standing in shallow trays. The Administrative Director will supervise the addition of the waste bags or other waste containers to the storage containers or trays, ensuring that all bags and other waste containers are marked with the proper Manifest Numbers and that the shelf tray or storage container identification number is entered on the RWIM.

17. **Disposal of wastes after decay-in-storage:** The Administrative Director will periodically review the RWIMs for waste being held for decay-in-storage. When a waste bag or container is found to have been in storage for at least 10 times the half-life category (equivalent to 10 times the half-life of the longest lived nuclide permitted in the waste), the bag shall be removed from its storage container or shielding, relocated to a low-background area if necessary, opened, and surveyed for residual radioactivity with a suitable survey meter (Bicron Surveyor 50 equipped with pancake GM probe, or equivalent). The radiation level and date of survey shall then be entered on the RWIM.

If the radiation level is indistinguishable from background by the survey meter (typically approximately 50 cpm with the Bicron Surveyor 50 and Bicron PGM pancake GM probe), the waste may be disposed. Dry, non-hazardous wastes shall be checked for the presence of any remaining radioactive labels. Any so found shall be defaced, and the wastes transferred to an ordinary trash bag for regular lab waste disposal. Non-hazardous aqueous wastes will be poured down the drain. Hazardous wastes shall be transferred to the hazardous waste holding area for disposal with the next scheduled hazardous waste shipment.

If the radiation level measures higher than background, an investigation will be initiated by the RSO and the Administrative Director to determine whether the measured level of activity is reasonable, based on the declared amount of radioactivity on the RWIM and the time in storage. If the level is questionable, the generator of the waste will be notified immediately, and no further waste will be accepted from that individual until the investigation is complete. In any case, the waste will be decayed for two additional half-lives and surveyed again to determine whether the rate of decay is consistent with the expected half-life. If so, the waste will be allowed to decay a sufficient number of half-lives to reduce the measured level of radioactivity to background, and will then be disposed as described above. However, if there are any indications that the waste has been contaminated with long-lived nuclides, the waste will be transferred to a long-lived radioactive waste accumulation drum and will be disposed as long-lived waste.

If the investigation finds either that contamination of the waste with undeclared long-lived nuclides has occurred or that the amount of permitted short-lived nuclides actually in the waste differs from the amount declared on the RWIM, the user in question will immediately cease all use of radionuclides until the investigation resolves how the errors occurred, and until assurances satisfactory to the RSO are made that such errors will not recur.

Appendix

Description of radioactive waste storage facility

1. **The radioactive waste bunker** consists of a section of the flammable materials storage bunker. This room is constructed entirely of reinforced concrete, and is windowless except for two blow-out panels in the roof. It is located exterior to the main Science Center building, partially below grade, but is directly connected to it. The floor area of this space totals 350 net square feet, of which approximately 10% or 35 square feet of floor space is used for radioactive waste storage.

2. **Access controls:** Access to this space is obtained only by passing through two locked doors (stockroom entrance and chemical storeroom entrance) and then through two fire-resistant doors. The radioactive waste section is separated from the rest of the bunker by a locked wire-mesh cage to prevent tampering by unauthorized personnel.

3. **Posting and signage:** Both the door to the bunker and the radioactive waste cage are posted with purple and yellow "Radioactive Materials" signs that include the radiation symbol.

4. **Ventilation** of the bunker is 100% fresh air via a dedicated explosion-proof exhaust fan. A steam coil maintains the temperature of the space above freezing year-round.

5. **Fire protection** for this space is provided by sprinklers. The floor level of the room is approximately 3 inches lower than the adjacent storeroom to reduce the chances for spread of flammable liquids in the event of a spill or fire.

6. **Emergency response:** In the event of any fire or other emergency on campus, Campus Security is called.; the Campus Security dispatcher is then responsible for calling in the appropriate emergency personnel.

Due to the presence of various classes of hazardous materials in the Science Center building, in case of fire or similar emergency in the Science Center, the Administrative Director and/or the Natural Sciences Division Chair will be called to be present as part of the response team. This person will provide information, advice, and assistance to emergency personnel regarding potential hazards in the involved spaces, calling in individual faculty, the RSO, or others as necessary to augment his or her own knowledge of the situation.

In addition to these procedures, the members of our local fire department are periodically given tours of the Science Center building to help familiarize them with the locations where hazardous materials are used or stored, and in 1994 we conducted a mock disaster drill at the Science Center involving most of the emergency response organizations in the town of Middlebury and in the surrounding communities.

7. **Radioactive waste accumulation drums:** All long-lived radioactive wastes to be shipped off-site are either dry wastes or solidified aqueous liquids. These wastes are accumulated in DOT 7A Type A drums lined with 5-mil polyethylene liners. A similar drum is used for decay-in-storage of short-lived waste having β^- energies less than 150-kev.

8. **Shelf storage of short-lived waste:** Small containers of short-lived waste for decay-in-storage are accumulated on a total of 30 ft^2 of shelving. Liquid wastes are stored in HDPE bottles of 2L capacity or less each, placed inside deep HDPE secondary-containment trays capable of holding the entire contents of the bottles, and grouped by half-life category and chemical compatibility. Scintillation fluids are stored in their counting vials, in the original cardboard trays, if possible; then placed in HDPE secondary-containment trays. Dry wastes are stored in 3-mil yellow plastic bags placed in shallow trays.

9. **The maximum total volume of LLRW** that can be stored in the present radioactive waste bunker is approximately 90 cubic feet, with a maximum of 50 cubic feet available for drummed long-lived wastes. Rates of LLRW generation over the years 1988-94 have averaged under 8 cubic feet/year, with slightly less than half of this being long-lived wastes. This would allow over 10 years of waste accumulation in the existing space even before taking into consideration the ongoing disposal of wastes after decay-in-storage. All wastes are NRC Class A wastes.

   Because we expect to be able to ship out waste after 1996, the combined total activity for ^{3}H and ^{14}C that will accumulate during the period is expected to be less than 300 μCi. For ^{45}Ca, the total activity is expected to be less than 500 μCi. Once shipping begins, the maximum accumulated long-lived waste in storage should be half the above maxima.

   Wastes disposed by decay-in-storage are of course unaffected by the availability of land disposal sites. The combined total activity of wastes being disposed by decay-in-storage is projected to be less than 1 mCi for all nuclides as a maximum, with a more typical figure being less than 300 μCi total for all nuclides.

   Thus, the total activity for all radioactive wastes in the waste storage bunker in not expected to exceed 1.8 mCi at any time.

Revised 9/94

Middlebury College
Radioactive Waste Disposal Handbook
for Faculty

1. Introduction

Accumulation and disposal of all radioactive wastes must follow the requirements of Middlebury's *Standard Operating Procedures for Radioactive Waste Disposal.* This *Handbook* provides a simplified version of those requirements for ease of use. For information about procedures that aren't discussed here, or to find about what happens to the waste after it leaves your lab, please refer to the complete *Standard Operating Procedures.*

Each faculty member who is listed as a user on Middlebury College's Radioactive Material License is responsible for ensuring that all wastes from his or her laboratory are properly accumulated and packaged for disposal. This involves making sure that wastes are accumulated and disposed only in licensed laboratories and within prescribed limits, verifying that all wastes are segregated by half-life and certain physical and chemical characteristics, and providing proper documentation for the waste.

2. Accumulation and disposal of radioactive wastes in laboratories

Radioactive wastes may be accumulated or disposed only in designated Limited Access Areas and not in any Occasional Use Areas. As of August, 1994, these designated Limited Access Areas are Science Center 307, 309, 327, 337, and 520.

The NRC permits direct disposal of certain low-level radioactive wastes within strictly defined limits:

A. Aqueous-based liquid scintillation cocktail containing ***only*** ^{3}H or ^{14}C at a total concentration of 0.5 μCi or less per gram of medium may be disposed to the sanitary sewer system. Empty the vials into running water in a *designated* sink. Rinse the scintillation vials three (3) times and then treat them as ordinary trash.

B. Most other aqueous radioactive waste effluents may also be discharged to the sanitary sewer. These wastes are defined as:

   1) the water-soluble waste supernatants or fluids from any experiment involving radioactive materials, or
   2) the water-dispersed biological wastes contained in such supernatants or fluids, or
   3) the first decontamination wash (using *Count-OFF®*, etc.) of all glassware and apparatus used for such experiments, or
   4) aqueous-based scintillation cocktails containing radionuclides other than ^{3}H or ^{14}C, and which may also contain ^{3}H or ^{14}C at a total concentration of 0.5 μCi or less per gram of medium,

   They may be discharged to the sewer **only via designated laboratory sinks in Limited Access Areas, and only if *all* of the following conditions are met:**

   1) The quantity of waste discharged must not exceed any of the activity limits listed in Table A in the Appendix of this *Handbook*, and
   2) The waste must be completely dissolved in water before disposal, or must be miscible with water in all proportions. Also permissible: Biological wastes only may be dispersed in the aqueous waste rather than dissolved, and
   3) The waste must not be flammable, toxic, contain heavy metals, or otherwise be subject to EPA, Vermont DEC, or other regulations as a hazardous waste, and

4) All pathogenic or infectious agents in the waste must be rendered non-viable.

C. Animal carcasses containing *only* ^{3}H or ^{14}C at a total concentration of 0.5 μCi or less per gram averaged over the body weight of the entire animal will be incinerated. Contact the RSO for more information.

Radioactive wastes that cannot be disposed by one of the immediate methods listed above must be accumulated in a designated Limited Access Area for eventual disposal. Radioactive waste generated in an Occasional Use Area cannot be accumulated in that area, *even overnight*, but must be transferred to a designated Limited Access Area at the end of each experiment.

3. Segregation of radioactive wastes

In order to permit proper disposal, wastes must be segregated into separate containers according to both the half-life of the radionuclide (Half-life Category) and the type of waste (Waste Category). This second category includes the waste's physical form and any contamination it may have with other hazardous substances. Most users will only need to separate waste by half-life and physical form (liquid or dry). However, you should know that, in general, the greater the variety of materials and number of different nuclides you use, the greater the number of separate waste containers you will need to maintain.

The following categories are to be used to segregate wastes by half-life. To determine the half-life category for a given waste, use the *longest-lived* nuclide included in the waste. Unless samples need to be labeled with multiple radionuclides, however, please do not combine radioactive wastes with different half-life categories in the same waste container, as this makes disposal more expensive. Furthermore, if the waste storage bunker becomes overcrowded, wastes of mixed half-life will be the first to be returned to the original generator to be held for decay.

Half-life Category	Actual half-life	Applicable nuclides for which we are licensed
LONG	$t_{1/2} > 90$ days	^{3}H, ^{14}C, ^{45}Ca
90	90 days $\geq t_{1/2} >$ 60 days	^{35}S
60	60 days $\geq t_{1/2} >$ 30 days	^{125}I
30	30 days $\geq t_{1/2} >$ 15 days	^{86}Rb
15	15 days $\geq t_{1/2} >$ 5 days	^{32}P
5	5 days $\geq t_{1/2}$	^{24}Na, ^{42}K

The most common Waste Categories are listed in Table B of the Appendix. If your waste is not described exactly in this table, you will need to refer to the complete *Standard Operating Procedures* for more information. **In any case, be sure you understand the waste categories applicable to your laboratory procedures *before* you begin to accumulate any radioactive wastes.**

Once you have determined the number of waste categories you have, you will know how many separate waste containers you need. The following are the requirements for waste accumulation containers for laboratories;

- Solid radioactive wastes must be accumulated in closable containers lined with the labeled heavy yellow polyethylene radioactive waste bags available from the stockroom. Do not use ordinary trash bags.
- Bulk liquid wastes are to be accumulated in suitable closed containers. Liquid accumulation containers must also stand in leakproof trays.
- Scintillation fluids must remain in their plastic counting vials — do not empty. As a convenience in handling, vials should be replaced in their original packing trays, if available.

Table B

Waste Categories for the most commonly used waste types

In order to permit wastes to be readily and properly disposed at the lowest possible cost, it is essential that the listed segregation categories be strictly adhered to.

For radioactive wastes consisting only of materials with a half-life of 90 days or less, the following Waste Categories must be used to further segregate the wastes into separate waste containers when accumulating wastes for disposal. All wastes in this section will be held for 10 half-lives to permit decay and then disposed as either EPA hazardous waste or ordinary waste, as appropriate.

Category DW-Hold Short-lived dry and wet wastes; must be non-hazardous	Solid dry waste with small amounts of absorbed or pourable aqueous liquids, wet items (vials, test tubes, etc.), and/or aqueous liquid waste in vials containing 50mL or less of liquid. There must be no organic solvent contamination, no heavy metals or other EPA hazardous waste, and no radioactive waste of any other kind. Any pathogenic or infectious material must be rendered non-viable. **Very Important!** **All radioactive labels, warning legends, and symbols on any item must either be removed or completely defaced before that item is placed inside the waste collection bag or container!**
Category SO-Hold Liquid Scintillation Vials	Scintillation vials containing organic solvent-based scintillation cocktails with radionuclides having a half-life of 90 days or less and with no radioactive waste of any other kind.
Category L-Hold Aqueous Liquids	Aqueous wastes having an activity level in excess of that which may be discharged to the sanitary sewer, with no organic solvent contamination, no heavy metals, azides, cyanides, or other EPA hazardous waste, and no radioactive waste of any other kind. Any pathogenic or infectious material must be rendered non-viable.

For radioactive wastes which contain *any* material with a half-life greater than 90 days, the following categories must be used to further segregate the waste. All wastes in this section will be shipped to an appropriate radioactive or hazardous waste site for disposal. All *Hold* Category wastes will be held for decay of the short-lived component(s) prior to final disposal.

Category D Dry Waste Only	Solid dry waste with **no absorbed or pourable liquid of any kind,** no wet items (vials, test tubes, etc.), no animal carcasses, and no organic solvent contamination. If the waste contains chelating agents (EDTA, DPTA, citrates, etc.) at concentrations greater than 0.1% by weight, the total weight of these agents must be accurately estimated and declared.
Category L Solidified Liquids	Aqueous liquid waste with a pH between 6 and 9 solidified using an approved solidification agent. There must be **no organic solvent contamination** and no other radioactive waste of any kind. Any pathogenic or infectious liquids must be rendered non-viable. If the waste contains chelating agents (EDTA, DPTA, citrates, etc.) at concentrations greater than 0.1% by weight, the total weight of these agents must be accurately estimated and declared.
Category SX Liquid Scintillation Vials	Scintillation vials containing organic solvent-based scintillation cocktails with a specific activity for ^{3}H or ^{14}C of 0.05μCi or less per gram of medium, and with no other radioactive materials present.
Category SX-Hold Liquid Scintillation Vials	Scintillation vials containing organic solvent-based scintillation cocktails with a specific activity for ^{3}H or ^{14}C of 0.05μCi or less per gram of medium **and** any mixture of radionuclides having a half-life of 90 days or less, with no other radioactive materials present.

Appendix

Table A

Permitted discharges of radioactive effluents from designated Limited Access Areas:

Nuclide	Half-life	Maximum amount allowed on site	NRC-permitted effluent concentrations		Permitted release from EACH Limited Access Area†	
			Air, μCi/mL	Release to sewer, μCi/mL	Release to sewer, μCi/day	Maximum release to sewer, μCi/year
^{3}H	12.3 y	250 mCi total 100 mCi per sample	1×10^{-7}	1×10^{-2}	20,000	5×10^{5}
^{14}C	5,730 y	50 mCi	3×10^{-9}	3×10^{-4}	600	1×10^{5}
^{24}Na	15 h	1 mCi	7×10^{-9}	5×10^{-4}	1,000	1×10^{5} combined total for all nuclides other than ^{3}H & ^{14}C
^{32}P	14.3 d	10 mCi	1×10^{-9}	9×10^{-5}	180	
^{35}S	87.2 d	50 mCi	2×10^{-8}	1×10^{-3}	2,000	
^{42}K	12.4 h	1 mCi	7×10^{-9}	6×10^{-4}	1,200	
^{45}Ca	165 d	1 mCi	1×10^{-9}	2×10^{-4}	400	
^{86}Rb	18.6 d	1 mCi	1×10^{-9}	7×10^{-5}	140	
^{125}I	59.9 d	5 mCi	3×10^{-10}	2×10^{-5}	40	

† **Note:** The table above applies **TO EACH** of the following five (5) designated Limited Access Areas in the Science Center: SC307, 309, 327, 337, and 520. It would also apply if up to five (5) additional Limited Access Areas in the Science Center were to be so designated on our license at some time in the future. This table would no longer apply if more than a total of ten (10) Limited Access Areas were to be designated, nor would it apply to any Limited Access Areas at locations other than in the Science Center building, should any be so designated. The dilution factor for each Limited Access Area is based on a total Science Center building wastewater generation of 2×10^{4} L/day or 6×10^{5} L/month.

Table B

Waste Categories for the most commonly used waste types

In order to permit wastes to be readily and properly disposed at the lowest possible cost, it is essential that the listed segregation categories be strictly adhered to.

For radioactive wastes consisting only of materials with a half-life of 90 days or less, the following Waste Categories must be used to further segregate the wastes into separate waste containers when accumulating wastes for disposal. All wastes in this section will be held for 10 half-lives to permit decay and then disposed as either EPA hazardous waste or ordinary waste, as appropriate.

Category DW-Hold Short-lived dry and wet wastes; must be non-hazardous	Solid dry waste with small amounts of absorbed or pourable aqueous liquids, wet items (vials, test tubes, etc.), and/or aqueous liquid waste in vials containing 50mL or less of liquid. There must be no organic solvent contamination, no heavy metals or other EPA hazardous waste, and no radioactive waste of any other kind. Any pathogenic or infectious material must be rendered non-viable. **Very Important!** **All radioactive labels, warning legends, and symbols on any item must either be removed or completely defaced before that item is placed inside the waste collection bag or container!**
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