



Composting as Recycling at St. Paul's College

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ERS 250
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Table of Contents

	Page
Introduction.....	1
Project Definition.....	2
History.....	3
Research System.....	5
Actors.....	7
Research Methods.....	8
Limiting Factors.....	10
Results and Discussion.....	11
Conclusions.....	15

Appendices

Appendix A – Ethics Form

Appendix B – Letters of Information and Consent

Appendix C – Interview Questions

Appendix D – Letters of Appreciation

Appendix E – Raw Data

List of Figures and Tables

Figure 1 – The St. Paul’s cafeteria food system.....	6
Table 1 – Results from a two week audit of organic waste at St. Paul’s College...	12
Table 2 – Projected waste accumulation from a two audit at St. Paul’s College...	12
Table 3 – Estimated total number of bins needed and cost to St. Paul’s.....	12

Introduction

On October 1st 1990, University President Dr. Douglas Wright introduced the WATgreen initiative to the University of Waterloo. He announced that the project was a positive step towards the creation of an environmentally sensitive campus. Over 20 years later the WATgreen initiative is still operating at the University and has contributed greatly to improving sustainability on campus. The goals of WATgreen include improving the quality of the environment and applying sustainable alternatives to lessen the environmental impact of on campus activities (WATgreen 2003).

Currently, waste disposal and waste management are barriers preventing sustainability. An option, which has helped municipalities and institutions sustainably manage waste, is the implementation of recycling programs. The main focus of these programs is to divert waste going to landfill sites and to reuse it in another manner.

When we mention 'recycling' we often think of recycling glass bottles, aluminum cans and newspapers. However, approximately 30 percent of the household waste sent to landfills can actually be recycled through composting. Composting is nature's way of recycling organic waste into natural fertilizers. Food scraps, grass clippings, teabags, and other biodegradable organic wastes can all be composted (Soil Saver, 2003). Organic fertilizers reduce the need for chemicals, which can cause soil and water pollution. Compost promotes plant, garden and lawn growth by enriching soil with nutrients and aids in moisture retention (U.S. Environmental Protection Agency, 2003).

Issues of waste diversion and sustainability are becoming increasingly important to government, thus the importance of composting has also increased. Initiatives have been undertaken by both the municipal and provincial government. Locally, the Regional

Municipality of Peel has set a goal of diverting 70 percent of their waste by 2016. Provincially, the recently elected Liberal government has plans to phase in a ban on organic wastes in landfill sites across Ontario (CBC, 2003).

Composting is a very important aspect of recycling, thus we feel it is necessary to do a research project on the feasibility of implementing such a system on campus at the University of Waterloo.

Project Definition

Our research has been designed with the intention of determining the feasibility of implementing a composting program at St. Paul's College. In the context of our study, feasibility reflects the three pillars of sustainability: economic, societal and environmental implications of organic waste generation and disposal. St. Jerome's University has recently implemented a successful composting program through a contract with a company called Planet Earth Recycling. The company removes bins containing all organic and decomposable matter from the cafeteria. We deem the above model appropriate for St. Paul's College. Can the St. Jerome's University model for composting be applied at St. Paul's College? The feasibility of the composting system will be assessed based on the expert opinions of the Deans of Residences at St. Paul's and St. Jerome's; Paul Koop and Darren Becks respectively. This will help gauge the degree to which the composting program has affected community life at St. Jerome's and how it is likely to affect St. Paul's.

Within the scope of our research is a comparison between the food systems of the two colleges. The positive and negative aspects of the St. Jerome's model were used to determine whether it would be feasible for St. Paul's College to sign a contract for composting with a company like Planet Earth Recycling.

The ultimate goal of the project is to improve sustainability on campus by introducing a compost system at St. Paul's College. St. Paul's would be acting as a positive influence for initiating compost programs at other food service locations both on campus and in the community. It may also promote awareness of the amount of wasted food generated by a buffet style meal plan. The importance of this project can be seen through the increasing support of composting programs, in many forms, across Ontario. It is also important, because, even in the early stages of our study, we noticed support from our key informants at St. Paul's College.

History

The current St. Paul's composting project developed through consultation with Paul Koop and Patti Cook as well as reviewing relevant literature. Previous student WATgreen projects as well as University of Waterloo waste audits were used to direct our study. Research completed in 1992, entitled "Feasibility Study of Composting at St. Jerome's and St. Paul's Colleges" assessed the possibility of backyard composting at the colleges. Due to frozen ground in fall and winter terms when most students are in school, backyard composting was determined to be unfeasible. The study concluded that it was not practical due to the low number of students in residence during the spring term, which has a negative affect on participation. (Arsenault et al., 1992). The issues associated with backyard composting at St. Paul's are also obstacles for vermiculture and windrow types of composting. Our present study on organic waste disposal at the college does not analyze the options mentioned above. The audit performed for the "Feasibility Study of Composting at St. Jerome's and St. Paul's Colleges" monitored and measured the amount of organic waste generated by the two colleges at every meal for three weeks (Arsenault et al., 1992). The amount of time required for such an intensive audit is not a

feasible option for a one-term study, nor is it necessary for accurate estimates of the quantity of organic waste produced (Cook, 2003).

Another student project analyzing a compost program at St. Paul's identified a lack of education of students and staff at the college, as a limitation to the study (Fagan et al., 1997). Education was addressed in our current project, by explaining the Planet Earth process to the Dean of Residence at St. Paul's College, Paul Koop, as well as Chef Manager for Chartwells Food Services at the College, Ron Turner. Following these discussions, we found both to be in favour of the proposed program. The result was expected, since the "Feasibility Study of Composting at St. Jerome's and St. Paul's Colleges" found a positive response to the idea of composting from both administration and students (Arsenault et al., 1992).

A University of Waterloo solid waste audit was performed in 1992 by other WATgreen students in response to the passing of Bill 143, The Waste Management Act. Under Bill 143, which was released in mid 1993, large institutions are required to perform waste audits and develop work plans (Wright, 1992). The audit found that compostables comprised the greatest amount of garbage at 16.1 percent of the total solid waste output by the University (Wright, 1992). An analysis of the audit recommended that "Waste reduction initiatives should be directed toward reducing compostable food waste that is sent to landfill from the cafeterias on campus." (Cook & Carrell, 1994). Implementing the proposed system for organic waste disposal at St. Paul's will directly decrease the amount of food waste sent to landfill sites.

The need for a better waste management system at St. Paul's College is clearly an issue that has been relevant for some time. It is especially pertinent for the College to develop a new system, because the residence community is expanding (Koop, 2003). With an increased number

of students living at St. Paul's, more waste will be created. As a result of greater participation in the program there is potential to increase awareness about composting on campus.

The System

The current meal system at St. Paul's College disposes of organic waste with non-organic waste; all materials being disposed of at the local landfill site. The St. Paul's meal system begins with the input of raw materials from farms or factories. The kitchen staff of Chartwells Food Services prepares the food with all the waste from those meals being thrown away. Meals are served buffet style and when finished eating, residents place trays with all food scraps onto trolleys. The kitchen staff is then responsible for scraping and disposing of the food waste at the end of the scheduled mealtime. All this waste is deposited in dumpsters for a local waste removal company to collect and transport to a landfill site. Organic waste disposed of in garbage bags will poorly decompose therefore the potential benefits to its decay will be lost (Soil Saver, 2003).

There are various differences between the two colleges that will influence how a composting program will function at St. Paul's. For example, as mentioned above, instead of students scraping food waste from their own plates as at St. Jerome's, the kitchen staff of St. Paul's will hold that responsibility. The current setup of the St. Paul's cafeteria does not allow for the same degree of student responsibility the more spacious St. Jerome's cafeteria permits. Kitchen staff at St. Jerome's is required to separate organic from non-organic waste when preparing meals. St. Paul's staff will also be required to do so providing that a Planet Earth system is implemented. Because Planet Earth recycles all meal waste, including meat products and serviettes, there is very little organic waste separation required after meals. Theoretically, once Planet Earth has picked up the waste from St. Paul's, they will transport it back to their site

at Concord, Ontario where it is transferred to larger bins before being shipped to their compost site in Bracebridge, Ontario. The waste decomposes there before being re-sold to the public as products such as fertilizer (Planet Earth Recycling, 2003).

The Proposed Compost System for St. Paul's College

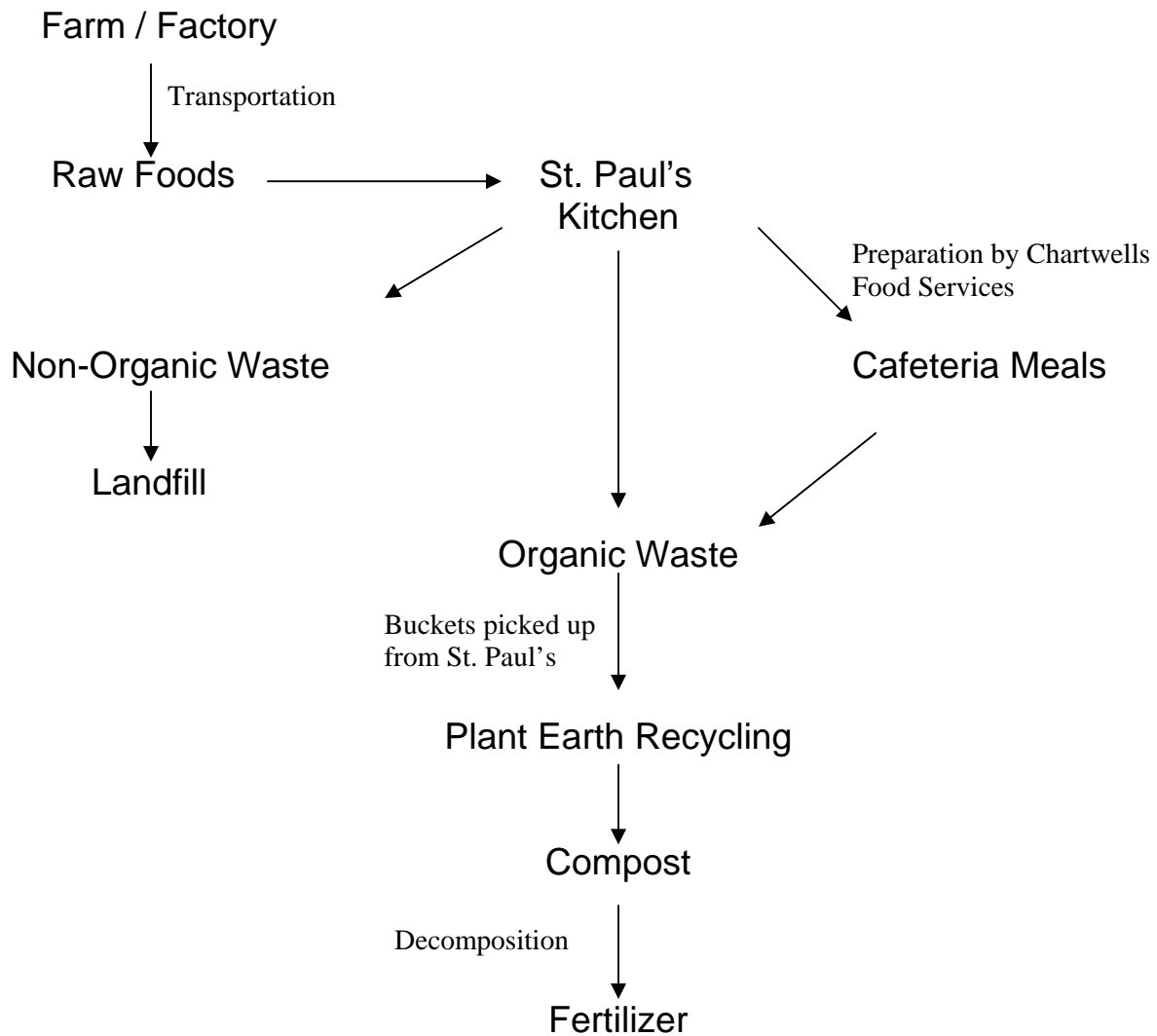


Figure 1. The St. Paul's cafeteria food system.

Actors

The people involved in the decision making process are known as actors. The following actor system discussed is based on classifications prior to the potential implementation of a composting program at St. Paul's. Actors can be classified into three categories: core, supporting and shadow. Classification is dependent upon their degree of involvement (Murphy, 2002).

Core actors are those who are considered to be required to make the system function. Thus, Paul Koop, Ron Turner, St. Paul's administration, and some St. Paul's students are considered to be core actors because without their participation the system would not be feasible (Murphy, 2002). St. Paul's administration is considered a core actor because they would ultimately be financially responsible for the expenses associated with a composting program. Some St. Paul's students may express significant interest in a composting program and quite possibly demonstrate initiative in aiding its implementation.

Supporting actors are those who are less involved than core actors but can have a significant impact on decision making (Murphy, 2002). Throughout our research, Darren Becks, Patti Cook, and Planet Earth are considered supporting actors as they provided information regarding the company's function, cost and process. Some St. Paul's kitchen staff and students are likely to become supporting actors once the decision making process is further advanced.

Shadow actors are those who are affected by the decision being made but are not involved in the decision making process (Murphy 2002). The remaining St. Paul's kitchen staff and students (those who are not core or supporting actors) and those in the waste management sector at both the University of Waterloo and in the community may be considered shadow

actors. University of Waterloo administration is also considered to be a shadow actor because of possible change composting would create on campus.

The dynamics of the above actor system is likely to change following the implementation of a composting system, thus the classification of these actors is also likely to be modified. For example, Planet Earth would become a core actor because they would be responsible for the removal of the bins containing compostable materials. The classification of the waste management sector is also likely to change as a result of possible contract negotiations caused by the decreased amount of waste being taken to the landfill from St. Paul's.

Research Methods

Both qualitative and quantitative research methods were used to collect a variety of information sources, which is necessary to ensure triangulation. The following section outlines our research methods clearly so that our study is reliable and could be reproduced in other cafeterias on campus. Our methods allow the feasibility of the St. Jerome's model of organic waste removal to be considered as an alternative to traditional waste disposal.

A quantitative approach uses numerical precision and avoids over identifying with the values and perspectives of the group being studied (Palys, 2003). A waste audit at St. Paul's College was necessary to ensure there is sufficient food waste to support a composting program similar to that of St. Jerome's University. To calculate the amount of food waste generated the waste audit was performed daily for a period of two weeks. The audit sample frame was systematic with a random start. The St. Paul's cafeteria, operated by Chartwells Food Services, provides residents with nineteen meals per week, served buffet style. The attendance data collected at every meal by the kitchen staff aided in the calculation of the quantity of waste

generated per person. All of the food waste generated by the cafeteria was measured by volume and weight, using an audit kit borrowed from the Ecology Lab at the University of Waterloo.

Starting Monday, November 3rd, 2003 the kitchen staff of St. Paul's separated the organic waste from non-compostable materials created during both food preparation and the disposal of food waste from tray cleanup after each meal. The garbage bags containing organic material were left in the kitchen each evening for two members of the research team to audit after the kitchen closed. Our audit was done by first physically transferring the waste into a three gallon bucket. The process was repeated until all the waste was measured by volume. The volume of waste was an important measurement because Planet Earth Recycling charges per 64 gallon bin. The volume was therefore indicative of how many bins are necessary; enabling us to calculate the projected expense of implementing the Planet Earth system at St. Paul's. We also measured the weight of each three gallon bucket of compost starting from November 11th. We were unable to obtain a strong enough scale to support the weight of the organic waste before this date. The weight of organic waste generated was measured because it may be a persuasive factor when presenting results of our study to administration. It may also be used when comparing data with previous audits performed on campus that only measured weight of organic material. The methodology of our audit was repeated nightly until Sunday, November 16th, 2003.

A qualitative approach takes into account the day-to-day realities of the people being studied (Palys, 2003). We accounted for these realities by interviewing key informants from St. Paul's and St. Jerome's who understand the social structures and issues of importance at each college. The interviews were a significant component in the collection of information concerning composting initiatives. Please see Appendix C for a list of questions that were posed during our interviews.

Through interviewing Darren Becks, the Dean of Residence at St. Jerome's University, we gained significant knowledge of the composting process at the residence. Our interview with Paul Koop, the Dean of Residence at St. Paul's College, was important to discover his opinion on composting and the feasibility of the Planet Earth Recycling model for St. Paul's. Ron Turner, the Chef Manager for Chartwells Food Services at St. Paul's was also interviewed as a key informant for our analysis because of his interaction with the kitchen staff and his knowledge of the kitchen facilities.

Both quantitative and qualitative data and a literature review were included in this study to encompass all aspects of social, economic and environmental factors of the proposed compost program.

Limiting Factors

Limiting factors restrict the extent and the boundary of our study. Although thorough, our research had limitations that were unavoidable. Limitations were encountered during both interviews with key informants and the waste audit.

During the short time frame within which the study was conducted, all of our key informants went on holidays, so we were limited by their availability. Paul Koop and Ron Turner were interviewed to give an idea of how a composting program might impact the social community at St. Paul's College. Mr. Koop and Mr. Turner's opinions may not accurately reflect the beliefs of the majority of students and administration. With respect to Planet Earth, it was very difficult to find public information on the company. When we were able to contact them, a manager was unavailable, thus, our knowledge of Planet Earth is a result of information given over the phone by company employees. At our request, Ron Turner was responsible for educating the St. Paul's kitchen staff to properly separate organic waste from garbage to the

Planet Earth standards. It is likely that some organic waste was thrown out and so not included in our audit. The above assumption can be made based on the fact that on a few occasions non-organic materials were found in the organic waste.

Time, low budget and inconsistencies were possible limiting factors during the waste audit. Our audit was conducted over a two week period. More time would have allowed further development of understanding social impacts and more comprehensive data for the audit results. The accuracy of the audit was also limited by having only estimates of the volume of waste generated. Estimations occurred when there was insufficient waste remaining to completely fill the bucket. Between pickups by Planet Earth, the waste accumulating in the bins settles, allowing for a greater quantity of waste to be placed in each bin (Becks, 2003). Although the weight was measured, as was in previous studies, it is difficult to assess the quantity of organic matter generated, because the weight of different types of food waste varies. The consistency of the audit measurements were lessened due to different researchers performing the audit each night.

Results and Discussion

The results of our quantitative research are from our waste audit. In the following chart, the numbers from our two-week audit are recorded. These numbers show the amount of organic waste produced each day from cafeteria meals by volume and weight. The maximum amount of waste produced in one day was 19.5 gallons and the minimum was 6.0 gallons.

Table 1. Results from a two week audit of organic waste at St. Paul's College

Date	Weight (kg)	Volume (gallons)
November 3, 2003		12.00
November 4, 2003		19.50
November 5, 2003		12.00
November 6, 2003		18.00
November 7, 2003		15.00
November 8, 2003		12.00
November 9, 2003		16.50
November 10, 2003		12.00
November 11, 2003	41.00	13.00
November 12, 2003	28.90	10.50
November 13, 2003	33.60	10.50
November 14, 2003	42.20	15.75
November 15, 2003	27.50	10.50
November 16, 2003	19.30	6.00
TOTALS	192.50	183.25
AVERAGE / DAY	32.08	13.09

Table 2. Projected waste accumulation from a two week audit at St. Paul's College

	# of Garbage
	Total Weight
	Total Volume
	Bags
	of Waste
	of Waste
	(kg)
	(gallons)
Estimated Waste / Person / Meal	N/A
	0.07
	0.03
Projected Waste / Week	16.00
	224.58
	91.63
Projected Waste / Fall Term	224.00
	3144.17
	1282.75

Table 3. Estimated total number of bins needed and cost to St. Paul's

	Exact Value	Actual Value
Bins Needed per Week	1.43	2
Bins Needed per Term	20.04	21
Cost per Term at \$13/Bin	260.56	273

Using the values from table 1, we calculated the amount of waste that could potentially be diverted from the landfill in one fall term: 1282.75 gallons or 3144.17 kg (table 2). Planet Earth Recycling provides 64-gallon bins for their clients to fill. They are emptied at a rate of \$13 per bin (Planet Earth Recycling, 2003).

There is no economic advantage of implementing the Planet Earth model at St. Paul's. The current contract that St. Paul's has with Waste Management is about \$3723 annually for

12

both waste and cardboard removal (Campbell, 2003). With a Planet Earth contract, based on our projections, there would be an additional cost of approximately \$300 per term for removal of organic waste based on occupancy at capacity as seen in table 3. Though the economic aspects of using Planet Earth's services are not beneficial to the college, in the future St. Paul's could potentially re-negotiate its waste management contract with the university taking into account the reduced amount of landfill waste.

Currently, Planet Earth Recycling is not taking on any more large contracts as they are working on becoming more efficient rather than expanding. St. Paul's relatively small waste production and the proximity of St. Paul's to St Jerome's are beneficial because it would not inconvenience Planet Earth to pick up an additional couple of bins from campus per week (Planet Earth Recycling, 2003). Since St. Jerome's University implemented a Planet Earth Recycling program, each week they have required approximately 17 bins, generating about 1088 gallons of organic waste (Becks, 2003). Between October 2002 and March 2003, over 18

thousand gallons of compost was collected at St. Jerome's University, creating an additional yearly cost of approximately \$5000 (Becks, 2003).

Although St. Paul's creates significantly less garbage than St. Jerome's, there is still a sufficient amount of waste to warrant exploring disposal alternatives. St. Jerome's cafeteria feeds 285 residents, 60 faculty and staff, cash customers and caters to a number of special functions. St. Paul's cafeteria feeds 191 residents, occasionally up to 11 faculty and staff, minimal cash customers and caters few special functions. The above illustrates the reason for St. Jerome's higher waste production. (Becks, 2003; Koop, 2003).

13

Our interview with Darren Becks revealed that the Planet Earth model of composting diverts a significant amount of garbage from the St. Jerome's waste system. The appearance of an overflowing dumpster is unaesthetic and reflects poorly on the college. Since implementation there has been a noticeable reduction in the number of bags in the once-overflowing dumpsters. When the program was first implemented at St. Jerome's University, there were a few student complaints regarding the smell and appearance of scraping bins in the cafeteria. These complaints abated after the program became routine for the students (Becks, 2003). Mr. Becks had the program implemented at St. Jerome's with the knowledge that it would incur additional costs to the College, but he felt that the environmental benefits exceeded the economic burden (Becks, 2003). Darren Becks and Paul Koop both stated in their interviews that the compost program appealed to them mainly out of environmental interests because it would make their cafeterias more sustainable.

Our interviews with Paul Koop and Ron Turner revealed support for a composting initiative at St. Paul's College. Koop revealed that he is interested in implementing a compost

program because awareness of environmental issues is increasing and the Canadian government is taking positive steps towards sustainability, as demonstrated by the country's commitment to the Kyoto Protocol. Despite economic setbacks Mr. Koop believes waste diversion is a key issue and will one day be mandatory. He indicated that student interest in a compost program may help convince management to overlook the economic disadvantages (Koop, 2003). Mr. Koop anticipates that any extra effort required by kitchen staff will not be an issue because it will be written into their Chartwells Food Services contract (Koop, 2003). Ron Turner, Chef Manager, composts at home and would welcome the Planet Earth system at St. Paul's. He believes that the

14

data collected from our waste audit will be influential in the implementation of a composting program and that it would not hinder the operation of the cafeteria in any way (Turner, 2003).

Conclusions

When determining whether or not the St. Jerome's model for composting can be applied to St. Paul's college we assessed the economic, social, and environmental implications of the program. On the surface, Planet Earth's composting service appears to be an economic burden for St. Paul's. However, to reduce the economic impacts of composting, it might be possible for St. Paul's to re-negotiate its waste management contract with the University, considering the reduced amount of landfill waste. The results from our data show that implementing the Planet Earth composting program would cost St. Paul's significantly less than it does St. Jerome's, which is beneficial to both St. Paul's and to Planet Earth. Although we feel that the economic burden will be minimal in the long run it is ultimately the responsibility of St. Paul's administration to budget the fee charged by Planet Earth for the disposal of organic waste materials.

Socially, implementing a composting program at St. Paul's College would have a positive impact on both the college and the community. The program would increase the College's social reputation by being a model for sustainability and waste management to other food services on campus and in the community. Within the College, students would not be directly involved in the composting program as the kitchen staff would have full responsibility for scraping and separating the organic and non-organic wastes produced during meals. Composting is beneficial for the community of Waterloo as sustainability and waste management are becoming increasingly important to government. The program could also be used to promote

15

awareness of the amount of food wasted in residence cafeterias. Paul Koop, Darren Becks, and Ron Turner all indicated that they felt a composting program would be a very positive initiative for St. Paul's College to implement.

Increased pressure has been placed on the environment as a result of growing landfill sites. Composting recycles organic food waste by turning it into usable nutrients for natural fertilizers, thus reducing landfill waste. By implementing a composting program, St. Paul's would help to lessen the amount of waste going to the local landfill. Compost decreases the need for chemicals and improves plant, garden and lawn growth.

In conclusion, we deem the St. Jerome's model of composting to be a feasible option for St. Paul's College. Therefore we recommend for St. Paul's College to implement a Planet Earth Recycling system in their cafeteria. We feel that the environmental and social benefits of the Planet Earth composting system offers an advanced method of recycling food waste that should be considered by food services across the province.

Appendix A: Ethics Form**UNIVERSITY OF WATERLOO
OFFICE OF RESEARCH ETHICS****APPLICATION FOR ETHICS REVIEW OF RESEARCH INVOLVING HUMAN PARTICIPANTS
IN NON-THESIS COURSE PROJECTS**

A. GENERAL INFORMATION1. **Title of Project:** Composting as Recycling at St. Paul's College

2. Faculty Supervisor(s) Paul Kay pkay@fes.uwaterloo.ca	Department ERS	Ext: 5796	e-mail:
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3. Student Investigator(s) Number:	Department	e-mail:	Local Telephone
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Tamanna Urmi	ERS	tshehree@fes.uwaterloo.ca	498-0484

4. **Level of Project:**
Non-thesis Course Project [X] Undergraduate [] Graduate Specify course and number:
ERS 2505. a. **Indicate the anticipated commencement date for this project:** October 27, 2003b. **Indicate the anticipated completion date for this project:** December 1, 2003**B. SUMMARY OF PROPOSED RESEARCH**

1. Purpose and Rationale for Proposed Research

Briefly describe the purpose (objectives) and rationale of the proposed project and include any hypothesis(es)/research questions to be investigated.

The purpose of the project is to determine if the composting program currently being used at St. Jerome's University is suitable for St. Paul's College.

2. Methodology/Procedures

a. Which of the following procedures will be used? Provide a copy of all materials to be used in this study.

Note for studies that only use tissue/bodily fluid specimens from other sources, use ORE Form 101T.

- Survey(s) or questionnaire(s) (mail-back) Are they standardized? All Some None
- Survey(s) or questionnaire(s) (in person) Are they standardized? All Some None
- Computer-administered task(s) or survey(s) Are they standardized? All Some None
- Interview(s) (in person)
- Interview(s) (by telephone)
- Focus group(s)
- Audiotaping
- Videotaping
 - Invasive physiological measurement
 - Venipuncture
 - Catheter insertions
 - Muscle biopsies
 - Collection of other tissue
 - Other, specify _____
 - Non-invasive physiological measurement
 - Exercise
 - Muscle stimulation
 - Electromyography
 - Heart rate
 - Blood pressure
 - Other, specify _____
- Analysis of secondary data (no involvement with human participants)
- Unobtrusive observations
- Other, specify _____

b. Provide a brief, sequential description of the procedures to be used in this study. For studies involving multiple procedures or sessions, use of a flow chart is recommended.

We will be performing an audit of the food waste from the kitchen/cafeteria at St. Paul's College. Following the audit we hope to interview Darren Becks, Dean of Residence at St. Jerome's, Paul Koop Dean of Residence at St. Paul's and Ron Turner, Chef Manager at St. Paul's. From these interviews we plan on inquiring about how they feel a composting program would influence the community of St. Paul's.

3. Participants Involved in the Study

a. Indicate who will be recruited as potential participants in this study.

- UW Participants: Undergraduate students
 Graduate students
 Faculty and/or staff
- Non-UW Participants: Children
 Adolescents
 Adults
 Seniors
 Persons in Institutional Settings (e.g. Nursing Homes, Correctional Facilities, etc.)
- Other (specify) _____

- b. Describe the potential participants in this study including group affiliation, gender, age range and any other special characteristics. If only one gender is to be recruited, provide a justification for this.**

All those to be interviewed are faculty and staff of St. Paul's College and St. Jerome's University.

- c. How many participants are expected to be involved in this study?** 3

4. Recruitment Process and Study Location

- a. From what source(s) will the potential participants be recruited?**

- UW undergraduate and/or graduate classes
 UW Psychology Research Experiences Group
 Other UW sources (specify) St. Paul's College and St. Jerome's University
 Local School Boards (ORE Form 102 must be completed)
 Kitchener-Waterloo Community
 Agencies
 Businesses, Industries, Professions
 Health care settings, nursing homes, correctional facilities, etc.
 Other, specify (e.g. mailing lists) _____

- b. Identify who will recruit potential participants and describe the recruitment process.**

Provide a copy of any materials to be used for recruitment (e.g. posters(s), flyers, advertisement(s), letter(s), telephone and other verbal scripts).

Participants in our study will be recruited based on their position with the Colleges at the University of Waterloo. Letters requesting their participation will be provided.

- c. Where will the study take place? If procedures involve direct contact with participants or occur in an off-campus setting, please ensure question D2 is completed.**

- On campus Location St. Paul's College and St. Jerome's University
 Off campus Location _____

5. Compensation of Participants

Will participants receive compensation (financial or otherwise) for participation? Yes No

If Yes, provide details:

6. Feedback to Participants

Briefly describe the plans for provision of feedback and attach a copy of the feedback letter to be used. Wherever possible, written feedback should be provided to study participants including a statement of appreciation, details about the purpose and predictions of the study, contact information for the researchers, and the ethics review and clearance statement. Refer to the Checklist for Feedback Sheets on ORE web site:

<http://www.research.uwaterloo.ca/ethics/human/samples/checklistfeedback>

Note: When available, a copy of an executive summary of the study outcomes also should be provided to participants.

We will provide letters of appreciation to the St. Paul's kitchen staff, Darren Becks, Paul Koop and Patti Cook.

C. POTENTIAL BENEFITS FROM THE STUDY

1. Identify and describe any known or anticipated direct benefits to the participants from their involvement in the project.

Potential benefits include and increased awareness of the potential need and importance of a composting program at St. Paul's College.

2. Identify and describe any known or anticipated benefits to society from this study.

There is potential for a composting program to be implemented at St. Paul's College. This will help to recycle waste that would have otherwise been sent to landfills, thus prolonging the life of existing landfills and reducing the need to create new sites.

D. POTENTIAL RISKS TO PARTICIPANTS FROM THE STUDY

1. For each procedure used in this study, provide a description of any known or anticipated risks/stressors to the participants. Consider physiological, psychological, emotional, social, economic, legal, etc. risks/stressors. A study-specific medical screening form must be included when physiological assessments are used and associated risk(s) to participants are minimal or greater.

No known or anticipated risks
Explain why no risks are anticipated:

The participants are not going to be exposed to any known social or emotional stressors as a result of our interview questions because we are not asking any personal or psychological questions. The interviews will be conducted at a mutually convenient time and place with at least 2 group members present. (ORE # 11230)

Minimal risk
Description of risks:

Greater than minimal risk

Description of risks:

2. Describe the procedures or safeguards in place to protect the physical and psychological health of the participants in light of the risks/stresses identified in D1.

It will be stressed that participation is purely voluntary

D2. POTENTIAL RISKS TO RESEARCHERS FROM THE STUDY

1. Describe any known or anticipated risks (e.g. physical, psychological, emotional, social, legal, public health hazards, and any other risks/stresses) that could impact the safety and/or well-being of the researcher(s) or other members of the study team during the conduct of the study (especially during recruitment and data collection phases). If the study is being conducted off-campus, consider risks to the researchers associated with the location of the study, political climate of the country, nature of the study population, remote contact with the supervisor, and any other risks.

At least two group members will be present for all interviews to assure accuracy of the collected information

2. Describe the procedures, safeguards, and contingency plans in place to deal with/protect against these risks. For student research, on or off-campus, provide an explanation of how the student has been briefed to deal with these risks, the safeguards and contingency plans to be used, and the arrangements for supervision.

N/A.

E. INFORMED CONSENT PROCESS

Refer to requirements for content under Elements for Information Letters and Consent Forms, including suggested wording:

<http://www.research.uwaterloo.ca/ethics/human/samples/ElementsInfoLtrConsentForm1.htm>

1. What process will be used to inform the potential participants about the study details and to obtain their consent for participation?

Information letter with written consent form; provide a copy (ORE # 11230)

Information letter with verbal consent; provide a copy

Information/cover letter; provide a copy

Other (specify) _____

2. If written consent cannot be obtained from the potential participants, provide a justification.

F. ANONYMITY OF PARTICIPANTS AND CONFIDENTIALITY OF DATA

1. Explain the procedures to be used to ensure anonymity of participants and confidentiality of data both during the research and in the release of the findings.

We will obtain written consent prior to any personal interviews. We will take the consent forms with us to the interviews and have them signed prior to starting the interviews. (ORE # 11230)

2. Describe the procedures for securing written records, questionnaires, video/audio tapes and electronic data, etc.

We will refrain from publishing any information given to us off the record and will respect the wishes of our participants.

3. Indicate how long the data will be securely stored, the storage location, and the method to be used for final disposition of the data.

- Paper Records
 - Confidential shredding after _____ years
 - Data will be retained indefinitely in a secure location
 - Data will be retained until completion of specific course.

- Audio/Video Recordings
 - Erasing of audio/video tapes after _____ years
 - Data will be retained indefinitely in a secure location
 - Data will be retained until completion of specific course.

- Electronic Data
 - Erasing of electronic data after _____ years
 - Data will be retained indefinitely in a secure location
 - Data will be retained until completion of specific course.

Other _____
(Provide details on type, retention period and final disposition, if applicable)

Specify storage location: We will be storing the collected data at our place of residence.

G. DECEPTION

N/A

=====

Researchers must ensure that all supporting materials/documentation for their applications are submitted with the signed, hard copies of the ORE form 101/101A. Note that materials shown below in bold are required as part of the ORE application package. The inclusion of other materials depends on the specific type of projects.

* Researchers are advised to review the Sample Materials section of the ORE web site:
http://www.research.uwaterloo.ca/ethics/human/sample_mat.htm

Please **check** below all appendices that are attached as part of your application package:

- Recruitment Materials:** A copy of any poster(s), flyer(s), advertisement(s), letter(s), telephone or other verbal script(s) used to recruit/gain access to participants.
- Information Letter and Consent Form(s)*.** Used in studies involving interaction with participants (e.g. interviews, testing, etc.) (ORE # 11230)
- Information/Cover Letter(s)*.** Used in studies involving surveys or questionnaires.
- Parent Information Letter and Permission Form*.** For studies involving minors.
- Medical Screening Form:** Must be included for **all** physiological measurements involving greater than minimal risk and tailored for each study.
- Materials:** A copy of all survey(s), questionnaire(s), interview questions, interview themes/sample questions for open-ended interviews, focus group questions, or any standardized tests used to collect data.
- Feedback letter *** (ORE # 11230)

- [] ORE Form 102: To be submitted by applicants who wish access to students and/or teachers from the local school boards.
- [] Other: _____

NOTE: The submission of incomplete application packages will increase the duration of the ethics review process.

To avoid common errors/omissions and to minimize the potential for required revisions, applicants should ensure that their application and attachments are consistent with the *Checklist For Ethics Review of Human Research Applications*
<http://www.research.uwaterloo.ca/ethics/form101/checklist.htm>

Remember to print and sign the application and forward TWO copies of the application with all supporting materials to the Office of Research Ethics, NH 3015.

INVESTIGATORS' AGREEMENT

*I have read the Office of Research Ethics **Guidelines for Research with Human Participants** and agree to comply with the conditions outlined in the **Guidelines**. In the case of student research, as a Course Instructor, my signature indicates that I have read and approved the application and proposal, deem the project to be valid and worthwhile, and agree to provide the necessary supervision of the student(s).*

Signature of Course Instructor

Date

Signature of Student Investigator(s)

Date

Signature of Student Investigator(s)

Date

Signature of Student Investigator(s)

Date

Signature of Student Investigator(s)

Date

Signature of Student Investigator(s)

Date

FOR OFFICE OF RESEARCH ETHICS USE ONLY:

Susan E. Sykes, Ph.D., C. Psych.
Director
Office of Research Ethics

Date

Appendix B: Letters of Information and Consent

University of Waterloo
ERS 250
Greening the Campus and Community
Fall 2003

October 29, 2003

Dear Mr. Becks,

The Greening the Campus and Community course (ERS 250) provide students at the University of Waterloo with the opportunity to make a direct contribution to sustainability on campus and in the community. Through the completion of a research project we are given the opportunity to provide recommendations based on our findings.

Our study focuses on using the composting program at St. Jerome's University as a model for a similar program at St. Paul's College. This second year research project is being conducted through the Department of Environment and Resource Studies under the supervision of Professor Paul Kay. Because of your position as Dean of Residence at St. Paul's College, your opinions may be important to our study. Thus, we would appreciate the opportunity to speak with you about this.

As part of our research process, we hope to conduct a waste audit of the organic waste generated in the St. Paul's cafeteria. Our intention is to complete the audit every evening for two weeks starting Monday, November 3 through Sunday, November 17, 2003.

Participation in this study is voluntary and would also involve a thirty minute interview at a convenient location and time. There are no known or anticipated risks to your participation in this study. The questions are quite general, centring around the compost system at St. Jerome's and your opinions on its potential effectiveness at St. Paul's. You may decline answering any questions you feel you do not wish to answer. All information you provide will be attributed to you in any publications of our study and the interview will not be tape recorded. The information collected through this study will be kept indefinitely with other WATgreen and Greening the Campus and Community projects at the University of Waterloo.

If after receiving this letter you have any questions about this study, or would like additional information to assist you in reaching a decision about participation, please feel free to contact Professor Paul Kay at 888-4567, Ext. 5796.

We would like to assure you that this study has been reviewed and received ethics clearance through the Office of Research Ethics. However, the final decision about participation is yours. Should you have comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes in the Office of Research Ethics at 888-4567, Ext. 6005.

We will be in contact with you to verify if you are interested in participating in our study.

Thank you for your assistance.

Sincerely,

Victoria Black Lyn Garrah Ashley LeMaistre
vblack@fes.uwaterloo.ca, egarrah@fes.uwaterloo.ca alemaist@fes.uwaterloo.ca

Vikki Maines Tamanna Urmi
vdmaines@fes.uwaterloo.ca tshehree@fes.uwaterloo.ca

I agree to participate in the interview being conducted by Victoria Black, Lyn Garrah, Ashley LeMaistre, Vikki Maines and Tamanna Urmi of the Department of Environment and Resource Studies under the supervision of Professor Paul Kay. I have made the decision based on the information I have received in the information letter and have had the opportunity to receive any additional details I wanted about the study. As a participant in this study, I realize that I will be asked to take part in a thirty minute interview and that I may decline answering any of the questions, if I so choose. I understand that I will be credited for any information that I provide and that I may be identified in the report or publication of this study. I understand that I may withdraw this consent at any time by asking that the interview be stopped.

I acknowledge that this project has been reviewed by and received ethics clearance through the Office of Research Ethics at the University of Waterloo and that I may contact the office if I have any comments or concerns about my participation in this study.

Participant's Name: _____

Participant's Signature: _____

Name of Witness: _____

Signature of Witness: _____

Date: _____

University of Waterloo
ERS 250
Greening the Campus and Community
Fall 2003

October 29, 2003

Dear Mr. Koop,

The Greening the Campus and Community course (ERS 250) provide students at the University of Waterloo with the opportunity to make a direct contribution to sustainability on campus and in the community. Through the completion of a research project we are given the opportunity to provide recommendations based on our findings.

Our study focuses on using the composting program at St. Jerome's University as a model for a similar program at St. Paul's College. This second year research project is being conducted through the Department of Environment and Resource Studies under the supervision of Professor Paul Kay. Because of your position as Dean of Residence at St. Paul's College, your opinions may be important to our study. Thus, we would appreciate the opportunity to speak with you about this.

As part of our research process, we hope to conduct a waste audit of the organic waste generated in the St. Paul's cafeteria. Our intention is to complete the audit every evening for two weeks starting Monday, November 3 through Sunday, November 17, 2003.

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We will be in contact with you to verify if you are interested in participating in our study.

Thank you for your assistance.

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I acknowledge that this project has been reviewed by and received ethics clearance through the Office of Research Ethics at the University of Waterloo and that I may contact the office if I have any comments or concerns about my participation in this study.

Participant's Name: _____

Participant's Signature: _____

Name of Witness: _____

Signature of Witness: _____

Date: _____

University of Waterloo
ERS 250
Greening the Campus and Community
Fall 2003

October 29, 2003

Dear Mr. Turner,

The Greening the Campus and Community course (ERS 250) provide students at the University of Waterloo with the opportunity to make a direct contribution to sustainability on campus and in the community. Through the completion of a research project we are given the opportunity to provide recommendations based on our findings.

Our study focuses on using the composting program at St. Jerome's University as a model for a similar program at St. Paul's College. This second year research project is being conducted through the Department of Environment and Resource Studies under the supervision of Professor Paul Kay. Because of your position as Chef Manager at St. Paul's College, your opinions may be important to our study. Thus, we would appreciate the opportunity to speak with you about this.

As part of our research process, we hope to conduct a waste audit of the organic waste generated in the St. Paul's cafeteria. Our intention is to complete the audit every evening for two weeks starting Monday, November 3 through Sunday, November 17, 2003.

Participation in this study is voluntary and would also involve a thirty minute interview at a convenient location and time. There are no known or anticipated risks to your participation in this study. The questions are quite general, centring around the compost system at St. Jerome's and your opinions on its potential effectiveness at St. Paul's. You may decline answering any questions you feel you do not wish to answer. All information you provide will be attributed to you in any publications of our study and the interview will not be tape recorded. The information collected through this study will be kept indefinitely with other WATgreen and Greening the Campus and Community projects at the University of Waterloo.

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I acknowledge that this project has been reviewed by and received ethics clearance through the Office of Research Ethics at the University of Waterloo and that I may contact the office if I have any comments or concerns about my participation in this study.

Participant's Name: _____

Participant's Signature: _____

Name of Witness: _____

Signature of Witness: _____

Date: _____

Appendix C: Interview Questions

Questions for Darren Becks:

1. How and when did the current composting program at St. Jerome's begin?
2. Who is in charge of overseeing the operations of the program?
3. What is St. Jerome's University role in the composting process now that the program has been established? Is there any student participation?
4. Do you feel that the composting program is successful?
5. Have there been any benefits or drawbacks since the implementation of the program? Please touch on economic, community and environmental concerns.
6. Have you received any feedback from students or staff at St. Jerome's? If yes, please explain.
7. Why did you choose Planet Earth Recycling?
8. Could you tell us about your experience in dealing with Planet Earth Recycling? Has this been a positive experience?

Questions for Paul Koop:

1. Do you feel that a composting program could be successful at St. Paul's College?
2. What are some of the barriers that may prevent a composting program from being implemented at St. Paul's College?
3. Why have past attempts at implementing composting programs at St. Paul's failed?
4. Have you personally considered the implementation of a composting program at St. Paul's?
5. Do you have any knowledge of the composting program at St. Jerome's?
6. Do you feel the results of our audit will be influential in the implementation of a composting program?

Questions for Ron Turner:

1. Do you feel that a composting program could be successful at St. Paul's College?
2. What are some of the barriers that may prevent a composting program from being implemented at St. Paul's College?
3. Why have past attempts at implementing composting programs at St. Paul's failed?
4. Have you personally considered the implementation of a composting program at St. Paul's?
5. Do you have any knowledge of the composting program at St. Jerome's?
6. Do you feel the results of our audit will be influential in the implementation of a composting program?
7. How do you feel the implementation of a Planet Earth Recycling program would affect the operations of the St. Paul's kitchen? Would you and your staff be willing to accommodate these changes?

Appendix D: Letters of Appreciation

University of Waterloo
ERS 250
Greening the Campus and Community
Fall 2003

December 1, 2003

Dear Mr. Becks,

We would like to thank you for your participation in this study. As a reminder, the purpose of our study is to focus on the composting program at St. Jerome's University as a model for a similar program at St. Paul's College.

The data collected during interviews will contribute to a better understanding of the appropriate direction of the future development of composting as a waste reduction strategy at St. Paul's College.

Please remember that any information you provided us with will be attributed to you in our reports. Once all the data are collected and analyzed for this project, we plan on sharing this information with the research community through a presentation and written report. If you are interested in receiving more information regarding the results of this study, or if you have any questions or concerns, please contact any one of us at either the phone number or email address listed at the bottom of the page.

As with all University of Waterloo projects involving human participants, this project was reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. Should you have any comments or concerns resulting from your

participation in this study, please contact Dr. Susan Sykes in the Office of Research Ethics at 519-888-4567, Ext., 6005.

Sincerely,

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Ashley LeMaistre
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Vikki Maines
vdmaines@fes.uwaterloo.ca

Tamanna Urmi
tshehree@fes.uwaterloo.ca

University of Waterloo
ERS 250
Greening the Campus and Community
Fall 2003

December 1, 2003

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Sincerely,

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University of Waterloo
ERS 250
Greening the Campus and Community
Fall 2003

December 1, 2003

Dear Mr. Turner,

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The data collected during interviews will contribute to a better understanding of the appropriate direction of the future development of composting as a waste reduction strategy at St. Paul's College.

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Appendix E: Raw Data

Date	# of Garbage Bags	Total Weight of Waste (kg)	Total Volume of Waste (gallons)	Additional Comments
Monday November 3	2.00		12.00	
Tuesday, November 4	4.00		19.50	extra dinner
Wednesday, November 5	3.00		12.00	
Thursday, November 6	3.00		18.00	some plastic bags
Friday, November 7	2.00		15.00	
Saturday, November 8	2.00		12.00	
Sunday, November 9	2.00		16.50	
Monday November 10	2.00		12.00	one bag was really big
Tuesday, November 11	2.00	41.00	13.00	very heavy, some cans
Wednesday, November 12	2.00	28.90	10.50	
Thursday, November 13	2.00	33.60	10.50	
Friday, November 14	2.00	42.20	15.75	
Saturday, November 15	2.00	27.50	10.50	
Sunday, November 16	2.00	19.30	6.00	small bags

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