Recycle More. Waste Less.

BEST – Ontario Tech University

2024 Waste Audit

Prepared For
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Executive Summary

Waste Reduction Group ("WRG") was retained by BEST to conduct a solid, non-hazardous waste audit (in compliance with the Environmental Protection Act, O. Reg. 102/94: Waste Audits and Waste Reduction Work Plans and O. Reg. 103/94: Industrial, Commercial and Institutional Source Separation Program) for their client's operations, located at Ontario Tech University – 2000 Simcoe St. N, Oshawa, Ontario (the Site). The site comprises an educational institution, campus buildings, and functional areas.

Under O. Reg. 102/94, the Site qualifies as an educational institution and is therefore subject to the regulation which is in place to encourage businesses to reduce the amount of waste they produce, reuse whatever they can, and recycle the rest. O. Reg. 102/94 requires, at a minimum, that industrial, commercial, and institutional entities meet the following requirements:

I. Conduct the waste audit;
II. Develop a waste reduction plan;
III. Implement the waste reduction plan and
IV. Update and implement the waste audit and waste work plan annually.

The objectives of the audit were to:

1. Determine the waste composition to energy and recycling streams by point of origin.
2. Using the 2023 annual data provided by Ontario Tech University, quantify the estimated 2024 annual waste generation for all waste streams.
3. Determine the waste diversion and capture rates.
4. Identify additional opportunities for waste reduction and diversion.
5. Address any specific concerns identified during the study.

The scope of the waste audit included collecting one (1) representative sample of the waste-to-energy and recycling streams from each of the functional areas of the Site buildings.

<u>Findings and Conclusions</u>

- Roughly **28.55%** of the waste-to-energy stream consisted of other materials, such as coffee cups (9.18%), other non-recyclable waste (13.36%), and scrap metal (1.45%).
- **71.45%** of the waste to energy stream contained contaminated materials: 37.57% of recyclable materials such as boxboard, kraft paper, and PP #5, and 33.88% of organic materials such as organic food waste and paper towels.
- The **Business and Information Technology Building (UB)** produced the highest overall mass of waste (**16.89%, or 13.11 kg**). The **CERL** produced the largest waste-to-energy materials, with **18.46%, or 8.29 kg**. The **UB** building produced the largest amount of recycling, with **21.09%, or 6.90 kg**.

- The **classrooms** produced the **highest quantity of divertible materials** in the waste-to-energy stream (80.84%), and the hallways contained the highest quantity of acceptable materials (61.11%).
- The **labs** produced the **most contaminated materials** in the recycling stream (56.37%), while the classrooms contained the most acceptable materials (69.18%).
- Mandatory recyclable materials were found in all functional areas of the waste-to-energy stream, with an overall percentage of **7.28%**. The mandatory recyclables found were **aluminum (1.57 MT), cardboard (0.77 MT), fine paper (2.29 MT), steel cans (0.09 MT), and glass (0.41 MT).**
- The recycling stream contained **39.19% contaminated materials** (e.g., coffee cups, paper towels, non-recyclable waste, etc.) and 60.81% acceptable materials (e.g.**, fine paper, boxboard, aluminum, etc.).**
- Existing programs at the Site include waste-to-waste-to-energy recovery, cardboard, mixed recycling, organics, wood, chemical waste, batteries, electronic waste, laboratory waste, and paint.
- **The Waste Diversion Rate was calculated to be 100.00% based on 172.03 MT produced annually, of which 172.03 MT of waste was** diverted from landfills through existing 3Rs programs.
- **Capture Rate**—The overall capture rate was 62.90%. The capture rates by diverted material were: waste to energy recovery—69.44%, cardboard—58.84%, mixed recycling—74.93%, organics—1.38%, and wood—96.41%.

Recommendations

- Implementing new waste diversion programs at the Site should improve the capture rates and reduce contamination.
    - Organic waste—Approximately 23.95 MT of organic waste (e.g., food waste, paper towels, and moulded pulp) was estimated to be generated through the waste-to-energy stream annually. Increasing the number of organic collection bins in every functional area of each building, especially in cafeterias and food service areas, could increase the capture rate in the organics stream.
    - Paper towels were observed in large quantities (14.36 MT) in the waste-to-energy stream. To increase the capture rate, it is recommended that dedicated collection bins (especially in washrooms) be picked up separately by a contractor.
    - Coffee cups and wax-lined cups—Staff and students should bring personal mugs or bottles to reduce the waste generated from single-use coffee cups and plastic bottles.
- Improve the capture rates for the cardboard (58.84%) and organic waste (1.38%) waste diversion programs.

    - Continue to update clear signage with pictures/graphics to help staff and students identify opportunities for proper disposal at the source.
    - Dedicated receptacles should be made available at each disposal location, including offices, as part of a collection program to help staff and students dispose of their waste accordingly at the source (i.e., colour-coordinated to identify the type of waste, sized accordingly based on the type of activity or use).
    - Increase the use of multi-stream sorter bins in high waste generation areas of each facility.
- Promote a culture of waste diversion through education on the importance of waste diversion and communicate the corporate goals for waste diversion and sustainability. Create a positive message around the benefits of waste diversion and the role that the individual plays. Set achievable goals and metrics, track year-over-year changes in waste diversion and capture rates, and communicate progress to staff to encourage further participation/engagement.

1. Introduction

BEST retained Waste Reduction Group ("WRG") to conduct a solid, non-hazardous waste audit for their facility, located at Ontario Tech University—2000 Simcoe St. N, Oshawa, Ontario (the Site). The audit was conducted in compliance with the Environmental Protection Act, O. Reg. 102/94: Waste Audits and Waste Reduction Work Plans, and O. Reg. 103/94: Industrial, Commercial, and Institutional Source Separation Program.

Under O. Reg. 102/94, the Site qualifies as an educational institution and is therefore subject to the regulation which is in place to encourage businesses to reduce the amount of waste they produce, reuse whatever they can, and recycle the rest. O. Reg. 102/94 requires, at a minimum, that industrial, commercial, and institutional entities meet the following requirements:

I. Conduct the waste audit;
II. Develop a waste reduction plan;
III. Implement the waste reduction plan and
IV. Update and implement the waste audit and waste work plan annually.

1.1 Purpose and Objectives

The purpose of the waste audit was to comply with Ontario Regulation 102/94 – Waste Audits and Waste Reduction Work Plans Part X, which requires educational institutions to conduct a waste audit covering the waste generated by the operation of the institution at the location or campus, and prepare and implement a waste reduction work plan on an annual basis. It is also required to confirm compliance with Ontario Regulation 103/94 – IC&I Source Separation Programs.

The objectives are as follows:

- Determine the composition of the waste to energy and recycling streams by point of origin;
- Quantify the estimated 2024 annual waste generation for all waste streams using the 2023 annual data provided by Ontario Tech University;
- Determine the waste diversion and capture rates;
- Identify additional opportunities for waste reduction and diversion; and
- Address any specific concerns identified during the study.

1.2 Site Description

The Site consisted of main campus buildings selected based on facility type to accurately depict waste volumes across all campus facilities. Waste collection within these buildings was organized based on functional areas, which indicated distinct locations where waste was generated, such as common areas, offices, classrooms, kitchenettes, and labs. Each facility consisted of the following functional areas:

- **Automotive Centre of Excellence (ACE)**
  - Office
  - Common
  - Kitchenette
  - Lab
- **Energy Systems and Nuclear Science Research Centre (ERC)**
  - Common
  - Classroom
  - Office
  - Lab
  - Kitchenette
- **Science Building (UA)**
  - Common
  - Classroom
  - Office
  - Lab
  - Kitchenette
- **Campus Corners (CC)**
  - Common
  - Office
  - Kitchenette
- **Library (LIB)**
  - Common
  - Office
- **Clean Energy Research Lab (CERL)**
  - Lab
  - Kitchenette
  - Common
- **Shawenjigewining Hall (SHA)**
  - Common
  - Classroom
  - Office
  - Lab

    - Kitchenette
- **Business and Information Technology Building (UB)**
    - Common
    - Classroom
    - Office
    - Lab
    - Kitchenette
- **Engineering (ENG)**
    - Common
    - Kitchenette
    - Lab
    - Office
- **Software and Informatics Research Centre (SIRC)**
    - Kitchenette
    - Classroom
    - Hallway
    - Office
- **U5 Portables (U5)**
    - Common
    - Classroom
    - Lab
    - Kitchenette
    - Office
- **Pavilion (UP)**
    - Classroom

The Site is considered to apply to O. Reg. 103/94 – Educational Institutions.

2. Scope of Work

To meet the objectives outlined above, the following activities were undertaken by WRG:

- Collected samples of waste to energy and recycling from each functional area of the Site on March 27th, March 28th, and April 3rd, 2024, over a 24-hour period.
- Sorted samples into predetermined categories as set out by WRG (detailed in Appendix A: List of Categories)
- Determined the total quantity of materials diverted from the waste stream through current reduction, reuse, and recycling programs implemented at the facility (provided by Ontario Tech University, Appendix B: Annual Data Request Form);
- Completed a waste audit report summarizing the audit findings and provided recommendations for increased waste diversion efficiency.

- Conducted a site tour accompanied by BEST personnel and interviewed staff to obtain information on existing waste diversion practices.

3. Sampling Methodology

Samples from the garbage and recycling waste streams were collected on March 26th, March 27th and April 2nd, 2024, and audited on March 27th, March 28th, and April 3rd, 2024, to determine the composition of each waste stream. Samples were collected from the functional areas of the campus buildings (i.e., common, classroom, office, etc.).

Qualified WRG staff sorted the materials using containers to keep them separate. Waste was sorted into individual material categories and weighed using a calibrated scale (Appendix C: Scale Calibration Certificate). It was then re-bagged and disposed of in an appropriate waste container.

Materials sources separated by the facility for recycling (e.g., cardboard, organics, wood), except for waste-to-energy recovery and mixed recycling, were not collected and categorized in the audit due to the infrequency of generation. However, annual quantities of all reused and recycled materials were reviewed and included in the audit results.

4. Waste Audit Findings

77.61 kg of waste materials were collected for the waste audit. Approximately 57.85% and 42.15% of the sample weight originated from the waste-to-energy and recycling streams, respectively, where the samples were derived from each functional area. Analysis of each waste stream sample is provided in the following sections.

4.1 Waste Quantities & Distribution

The following samples from the waste stream were collected and sorted. Table 1 illustrates the total waste collected per building based on the audit results. Table 2 ranks the total waste collected per building's functional area.

Table 1: Overall Sample Weight by Campus Buildings

Site	Weight of Sample (KG)	Percent of Sample (%)
UB	13.11	16.89%
CERL	10.65	13.72%
SHA	9.45	12.18%
U5	7.95	10.24%
ERC	7.31	9.42%
UA	7.26	9.35%
SIRC	5.48	7.06%
LIB	5.26	6.78%
CC	3.93	5.06%
ACE	2.87	3.70%
ENG	2.64	3.40%
UP	1.70	2.19%
Grand Total	**77.61**	**100.00%**

The Business and Information Technology Building (UB) contributed to the largest distribution in the sample, with 13.11 kg (16.89%). This was followed by the Clean Energy Research Lab (CERL) and the Shawenjigewining Hall (SHA), with 10.65 kg (13.72%) and 9.45 kg (12.18%), respectively. The Pavilion (UP) building had the lowest distribution, with 1.70 kg (2.19%).

Therefore, **UB, CERL, and SHA were the most significant waste generators,** accounting for approximately 42.79% of the total sample. The Engineering (ENG) and UP facilities were the lowest waste generators, accounting for only 3.40% and 2.19% of the total sample, respectively.

Table 2: Overall Sample Weight by Functional Area

Functional Area	Weight of Sample (KG)	Percentage of Sample (%)
Common	20.30	26.16%
Kitchenette	16.30	21.00%
Lab	14.55	18.75%
Classroom	14.45	18.62%
Office	11.65	15.01%
Hallway	0.36	0.46%
Grand Total	**77.61**	**100.00%**

Therefore, **common areas, kitchenettes, and labs generated the most waste overall, accounting for approximately 65.91%** of the total sample. The remaining **34.09%** were derived from the classroom, office, and hallway areas.

4.2 Waste to Energy Sample Composition

Based on the audit findings, the visual below shows the materials with the highest mass (kg) in the waste-to-energy stream.

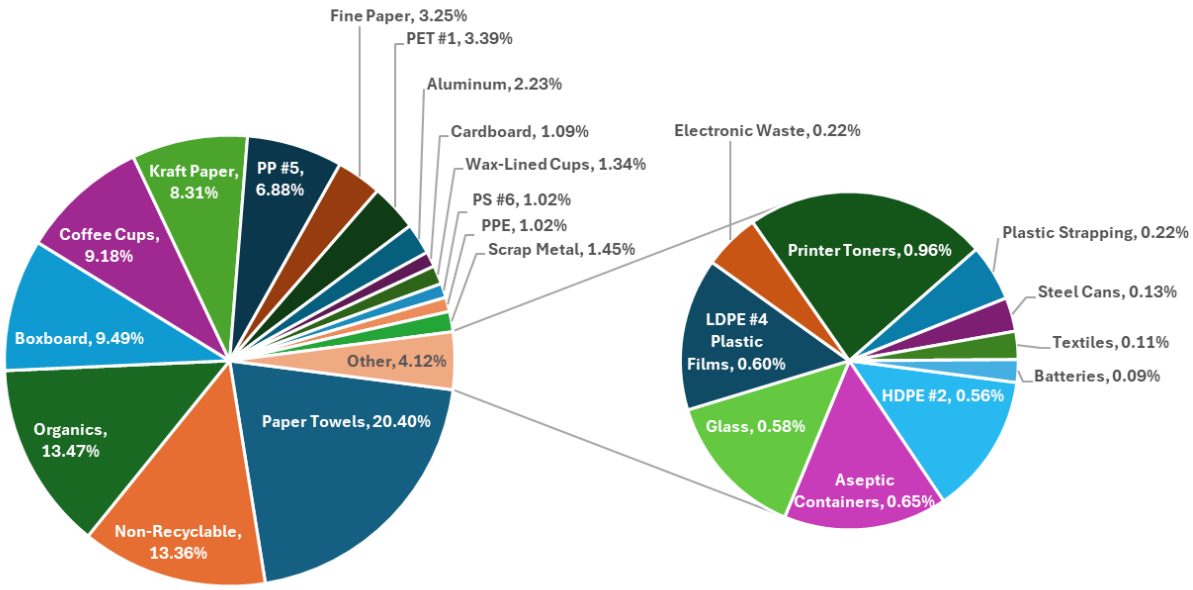

Figure 1: Waste Sample Composition by Material (in % of sample by mass).

Note: The secondary pie exemplifies materials with less than 1% values.

Paper towels (20.40%), non-recyclable (13.36%), organics (13.47%), boxboard (9.49%), and coffee cups (9.81%) had a combined weight which contributed to over 65.90% of the sample weight.

4.3 Waste to Energy Sample Mass by Campus Building (Overall)

Roughly 56.01% of the waste-to-energy sample (by weight) originated from the CERL, UB, SHA, and U5 buildings. A breakdown of the waste sample mass, which originates from the campus building, is provided below.

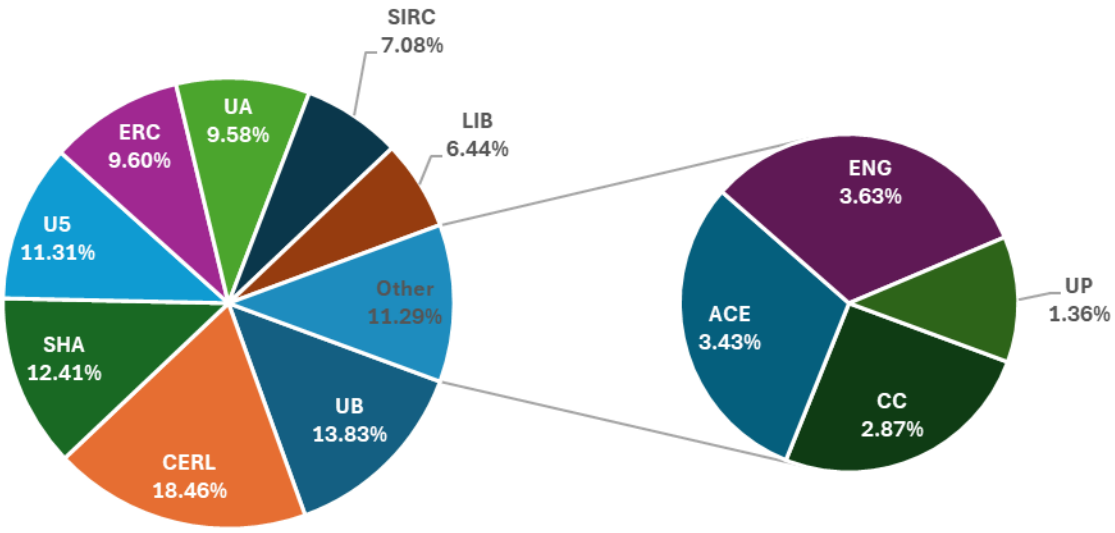

Figure 2: Waste Sample Composition By Campus Building

Note: The secondary pie exemplifies buildings with less than 5% sample mass.

4.4 Waste to Energy Sample Mass by Campus Building (Breakdown)

Based on a detailed analysis of the waste sample, the following observations were made:

- The UP facility produced the highest mass of recyclable materials (i.e., mixed plastics, mixed paper, aluminum cans, glass, etc.) (68.85% of sample mass).
- The CC building generated the highest mass of organic waste (75.97% of the sample mass).
- The ERC facility contained the highest mass of non-recyclable waste (i.e., PPE, textile, coffee cups, etc.) (44.55% of the sample mass).

The sample mass (%) by campus building and material is provided in the chart below.

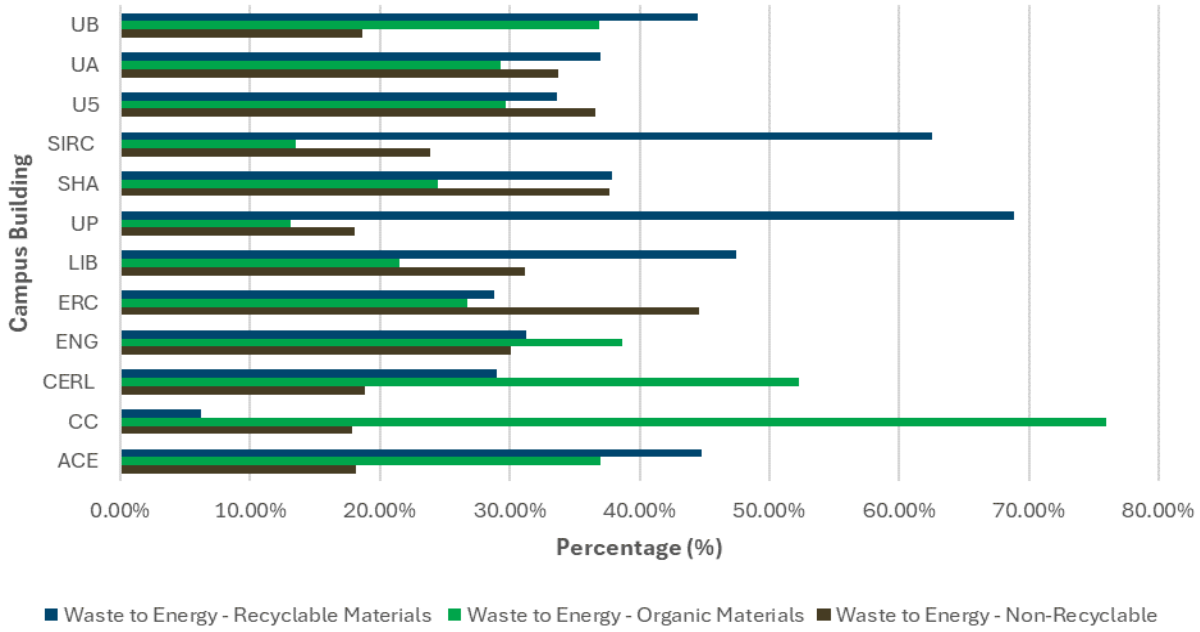

Figure 3: Sample Weight (%) by Campus Building and Material

A detailed breakdown of the waste sample composition is provided in Appendix D.

4.5 Waste to Energy Sample Mass by Functional Area (Overall)

Roughly 71.76% of the waste-to-energy sample (by weight) originated from the common kitchenette and lab areas. A breakdown of the waste sample mass originating from functional areas is provided below.

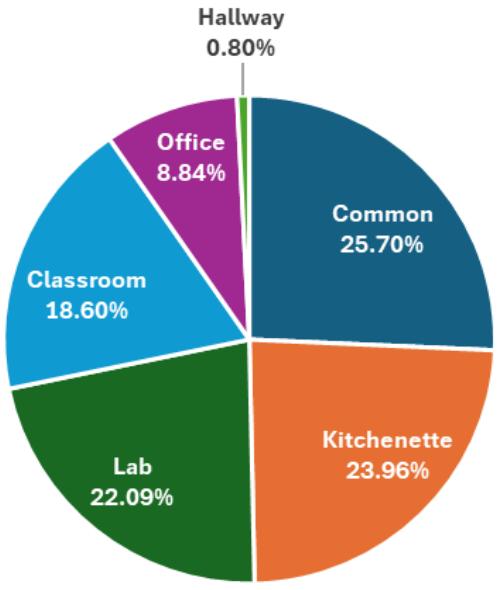

Figure 4: Waste Sample Composition By Functional Area

4.6 Waste to Energy Sample Mass by Functional Area (Breakdown)

Based on a detailed analysis of the waste sample, the following observations were made:

- The classrooms produced the highest recyclable materials (i.e., mixed plastics, fine paper, aluminum cans, glass, etc.) (56.65% of sample mass).
- The labs generated the highest mass of organic waste (44.96% of the sample mass).
- The hallways contained the highest mass of non-recyclable waste (i.e., PPE, textiles, coffee cups, etc.) (61.11% of the sample mass).

The sample mass (%) by functional building and material is provided in the chart below.

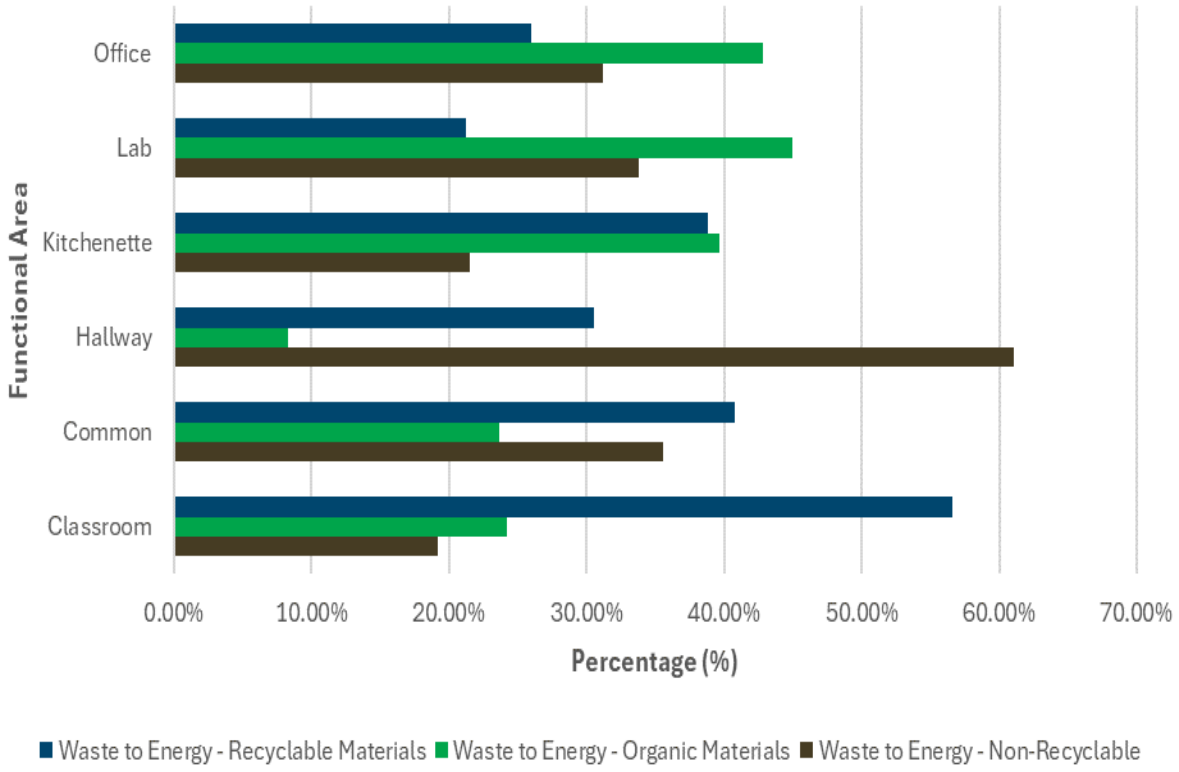

Figure 5: Sample Weight (%) by Functional Area and Material

4.7 Types of Recycling Material in the Waste to Energy Stream

Based on analysis of the waste sample composition, Mandatory Recyclables and Other Recyclables were identified in the waste stream. The sample consisted of 7.28% Mandatory Recyclables, 28.55% Other Recyclables, and 64.16% Other (Non-Recyclable) material. A description of the categories is provided below.

Mandatory Recyclables

O.Reg.193/04 requires that hospitals source separate the following materials (at a minimum):

- Aluminum food or beverage cans (including cans made primarily of aluminum);
- Cardboard (corrugated);
- Fine paper;
- Glass bottles and jars for food or beverages;
- Newsprint;
- Steel food or beverage cans (including cans made primarily of steel).

Other Recyclables

Includes the following materials:

- PET #1
- HDPE #2
- PP #5
- PS #6
- Other plastics #7
- Gable top containers
- Aseptic containers
- Coffee cups
- Boxboard
- Craft paper
- LDPE #4 plastic films
- Paper towels
- Food waste
- Electronic waste

Other (Non-Recyclables)

Includes all other non-recyclable materials.

The mandatory recyclables, other recyclables, and non-recyclables are analyzed below.

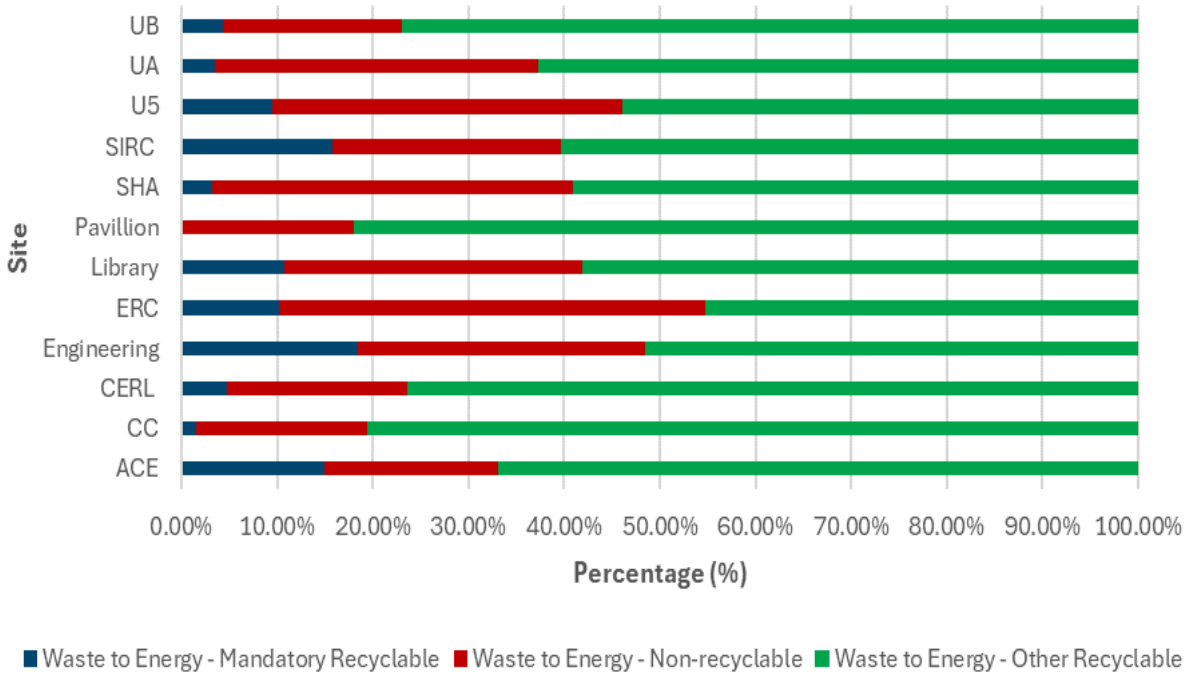

Figure 6: Composition of Waste Stream by Mandatory Source Separated Waste vs Non-Mandatory Source Separated Waste, by Campus Building

Based on the composition of mandatory recyclables in the waste stream, the overall estimated quantities of mandatory recyclables generated were calculated and provided in the figure below.

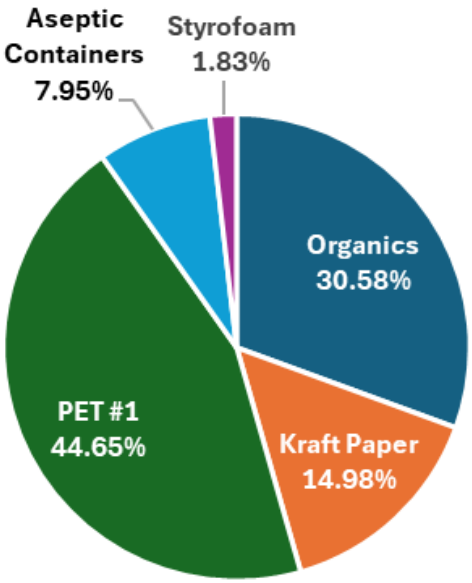

Figure 7: Composition of Mandatory Recyclables in the Waste-to-Energy Stream (%)

The total annual quantity of mandatory recyclables in the garbage stream was estimated to be 5.13 MT, largely comprising 2.29 MT of fine paper, 1.57 MT of aluminum, 0.77 MT of cardboard, 0.41 MT of glass, and 0.09 MT of steel cans.

4.8 Mixed Recycling Sample Composition

Based on audit findings, the visual below shows the materials with the highest mass (%) from the mixed recycling waste stream.

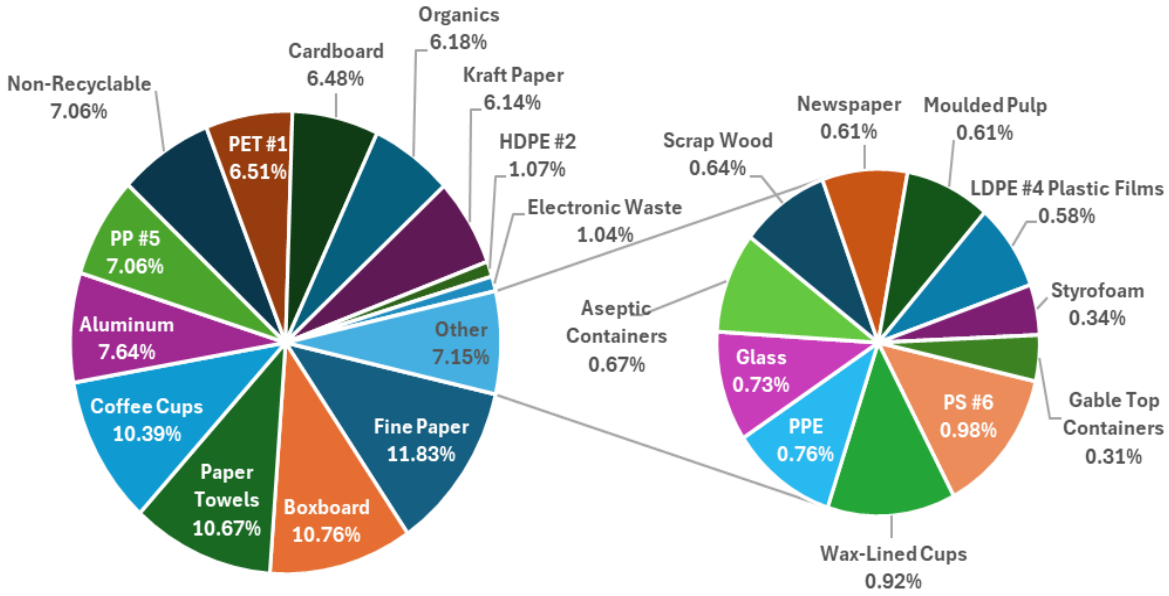

Figure 8: Recycling Sample Composition by Material (in % of sample by mass)

Note: The secondary pie exemplifies materials with less than 1% values.

Fine paper (11.83%), boxboard (10.76%), paper towels (10.67%), coffee cups (10.39%), aluminum (7.64%), PP #5 (7.06%) and non-recyclable waste (7.06%) attributed to a combined weight of 65.42% in the Recycling stream. The contamination rate is 39.19%, with contaminants such as paper towels (10.67%), coffee cups (10.39%), non-recyclable waste (7.06%), organic food waste (6.18%), and electronic waste (1.04%).

4.9 Mixed Recycling Sample Mass by Campus Building (Overall)

Roughly 68.02% of the recycling sample (by weight) originated from the UB, SHA, ERC, UA, U5, and CC buildings. A breakdown of the recycling sample mass originating from the campus building is provided below.

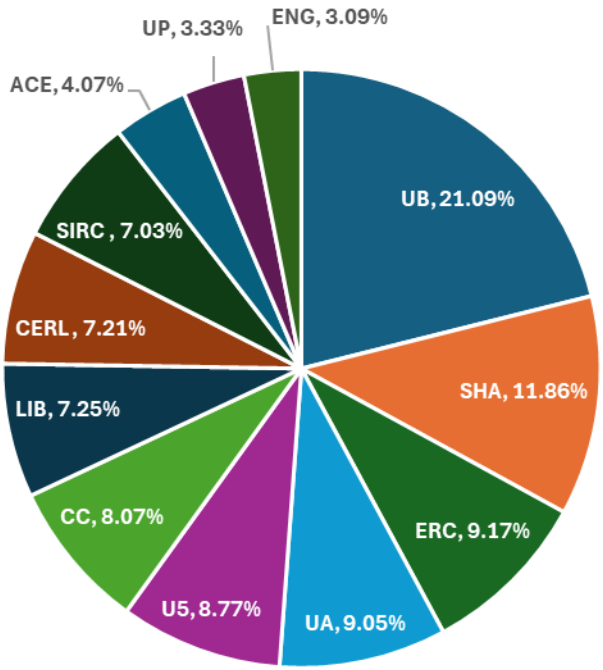

Figure 9: Recycling Sample Composition By Campus Building

4.10 Mixed Recycling Sample Mass by Campus Building (Breakdown)

Based on a detailed analysis of the recycling sample, the following observations were made:

- The ENG building produced the highest mass of recyclable materials (i.e., mixed plastics, mixed paper, aluminum cans, glass, etc.) (89.11% of sample mass).
- The U5 building generated the highest mass of organic waste (39.02% of the sample mass).
- The UP facility contained the highest mass of non-recyclable waste (i.e., PPE, textile, coffee cups, etc.) (51.38% of the sample mass).

The sample mass (%) by functional area and material is provided in the chart below.

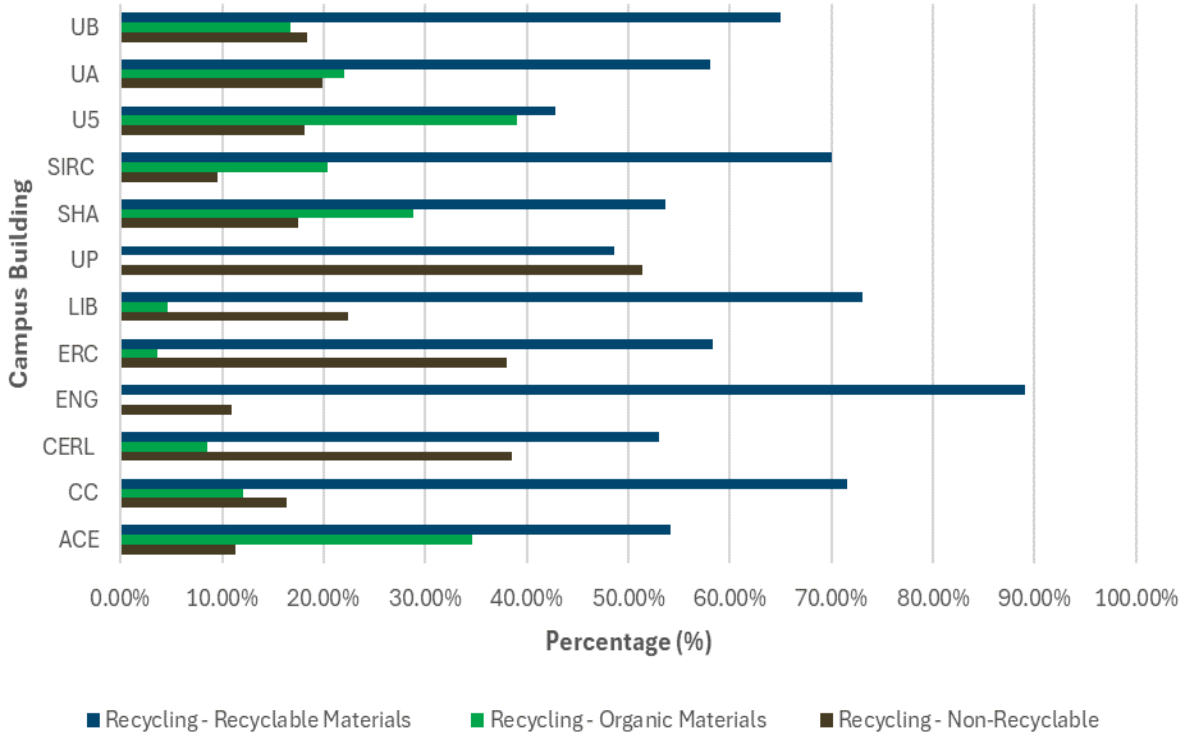

Figure 10: Sample Weight (%) by Functional Area and Material

4.11 Mixed Recycling Sample Mass by Functional Area (Overall)

Roughly 68.91% of the mixed recycling sample (by weight) originated from the common areas, offices, and classrooms. A breakdown of the mixed recycling sample mass, which originates from functional areas, is provided below. Note: No recycling samples were collected in the Site hallways.

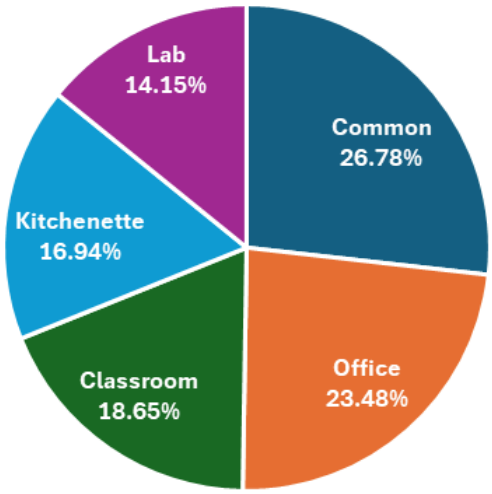

Figure 11: Mixed Recycling Sample Composition By Functional Area

4.12 Mixed Recycling Sample Mass by Functional Area (Breakdown)

Based on a detailed analysis of the mixed recycling sample, the following observations were made:

- The classrooms produced the highest recyclable materials (i.e., mixed plastics, fine paper, aluminum cans, glass, etc.) (69.18% of sample mass).
- The kitchenettes generated the highest mass of organic waste (33.94% of the sample mass).
- The labs contained the highest mass of non-recyclable waste (i.e., PPE, textile, coffee cups, etc.) (41.90% of the sample mass).

The sample mass (%) by functional building and material is provided in the chart below.

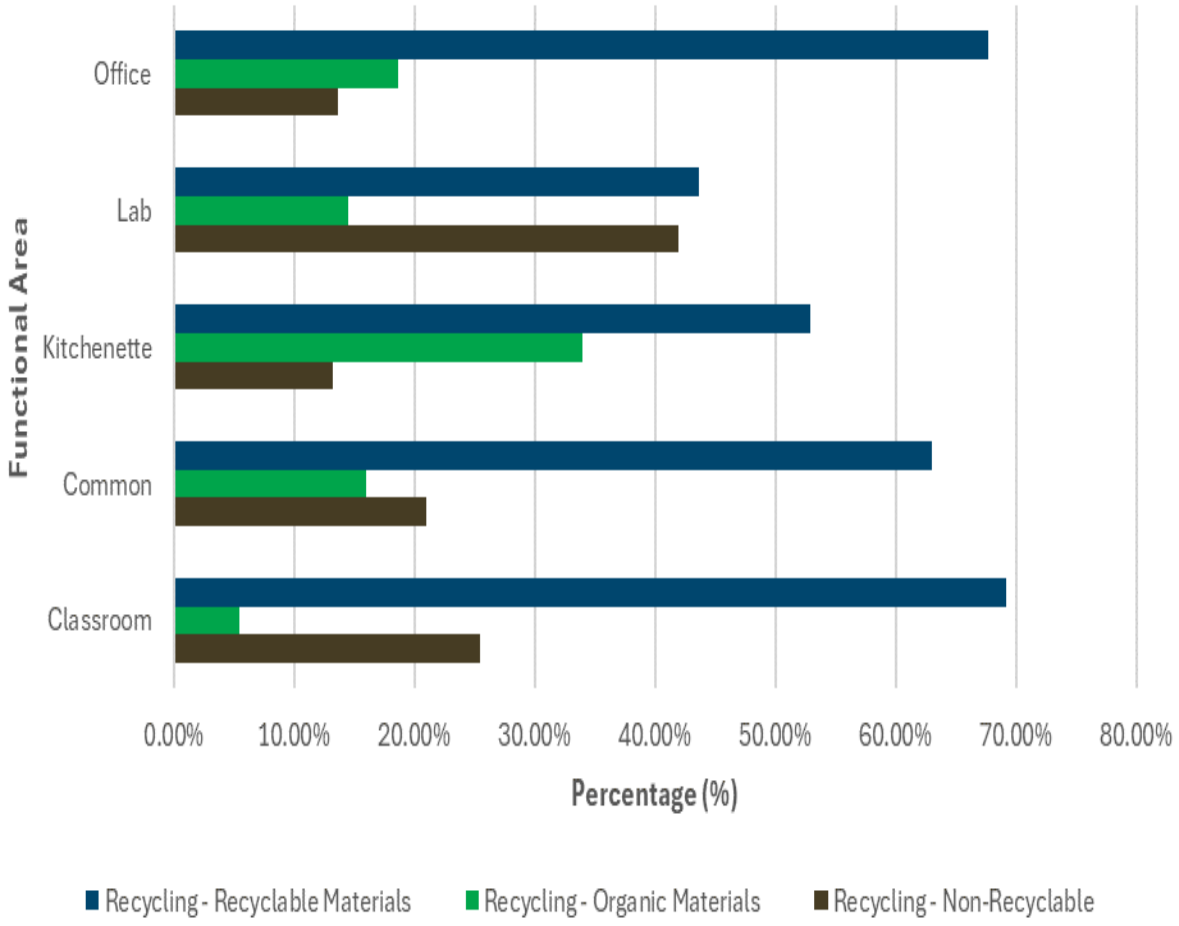

Figure 12: Sample Weight (%) by Functional Area and Material

5. Waste Diversion Programs and Disposal Systems

As part of the waste audit, WRG staff toured the Site (accompanied by BEST) to document existing waste disposal systems. They also interviewed BEST and Ontario Tech University personnel to understand the existing waste diversion programs and practices.

The following diversion programs exist at the Site:

Waste-to-Energy Recovery: Non-recyclable waste (i.e., PPE, coffee cups, Styrofoam, etc.) disposed of in the waste stream is converted into usable energy (i.e., electricity). The waste materials are collected in a 30-yard compactor or front-end bins once or twice a week (depending on the collection schedule of each building) by UPAK.

Cardboard: Cardboard recycling is provided across the campus. Cardboard boxes are flattened and placed in a 30-yard compactor or 4-yard bin serviced by UPAK weekly.

Organic Waste: This collection program includes organic food waste and paper towels. Organic waste materials are placed in 32-gallon totes and collected by UPAK once a week.

Scrap Wood: Recyclable woods are collected in a 14-yard bin by UPAK as required.

Mixed Recycling: Mixed recycling includes mixed containers (i.e., assorted plastic food and beverage containers – PET, HDPE, PP and PS, aluminum and metal cans, glass food and beverage containers, and aseptic and gable top containers) and mixed papers (i.e., newspapers, fine papers, envelopes, magazines, brochures, boxboard, packing paper, shipping/receiving supplies, paper bags, and clean food paper products). These materials are collected throughout the campus in open-top bins by UPAK once a week.

Photos of the site are provided in Appendix E.

Based on the information provided by Ontario Tech University, the Site produced 172.03 MT of waste overall in 2023, as shown below.

Table 3: Annual Waste Disposal Quantities

Material	Annual Weight (MT)	Percentage (%)
Mix Recycling	79.05	45.95%
Energy Recovery	70.39	40.92%
Wood	13.64	7.93%
Cardboard	8.42	4.90%
Organics	0.53	0.31%
Total Generated	**172.03**	**100.00%**

6. Performance Metrics

6.1 Waste Diversion Rate and Recovery Rate

The waste diversion rate is the percentage of waste materials a facility diverts from landfills due to reducing, reuse and recycling (3Rs) programs versus the total amount of waste generated (3Rs plus landfill waste). The Ministry of the Environment, Conservation and Parks defines the Waste Diversion rate calculation as follows:

$$Waste\ Diversion\ Rate = \frac{Total\ Waste\ Diverted\ (3Rs)}{Total\ Waste\ Generated} \times 100$$

Based on the total annual amount of waste generated and materials diverted, **the 2024 waste diversion rate at Ontario Tech University was determined to be approximately 100%**. The waste diversion rate does exceed the provincial objective of 60%. However, the recovery rate from the waste-to-energy stream was calculated to be **71.45%.** The materials that can be diverted from the waste stream are organic food waste, paper towels, aluminum, aseptic containers, boxboard, cardboard, fine paper, glass, HDPE #2, kraft paper, PET #1, PS #6, PP #5, and steel cans. Table 4 summarizes the quantities of waste reduced, reused, recycled and disposed. Figure 14 illustrates the materials that can be diverted from the waste stream.

Table 4: Annual Quantities of Materials Diverted and Disposed

Material	Total Waste	
	Metric Tonnes	Percent
Disposed to Landfill	0.00	0.00%
Materials Recycled	171.50	99.69%
Materials Composted	0.53	0.31%
Total Waste Generated	172.03	100.00%
WASTE DIVERSION RATE	**100.00%**	
Total Waste Diverted from Waste Stream	50.29	71.45%
Total Waste Accepted from Waste Stream	20.10	28.55%
Total Waste Generated from Waste Stream	70.39	100.00%
RECOVERY RATE	**71.45%**	

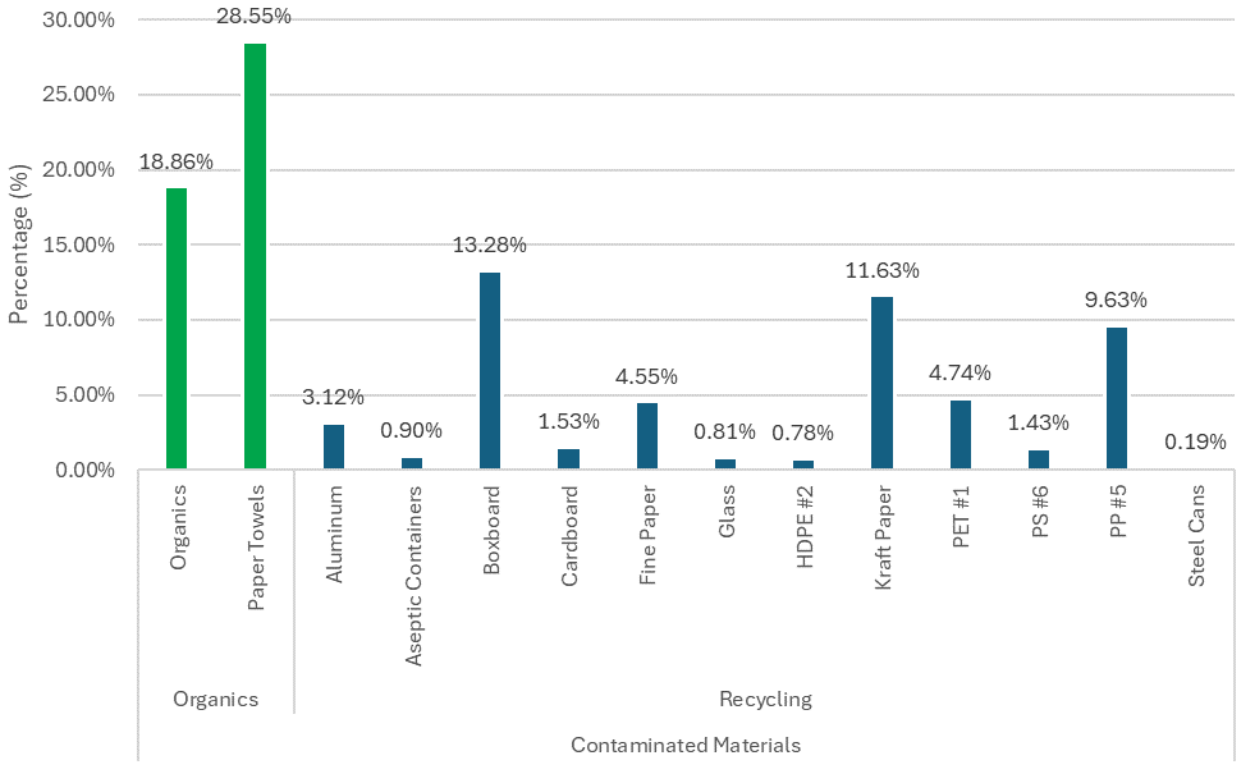

Figure 13: Overall Weight of the Contaminated Materials in the Waste to Energy Stream

6.2 Capture Rate

The capture rate is the proportion of divertible waste materials successfully diverted from disposal compared to the total amount of divertible waste materials generated. It measures the effectiveness of existing recycling programs.

Existing waste diversion programs at the Site and quantities diverted from landfill include:

- Waste-to-Energy – 70.39 MT
- Cardboard – 8.42 MT
- Mixed Recycling – 79.05 MT
- Organic Waste – 0.53 MT
- Wood – 13.64 MT

The detailed estimated quantities for each material are presented in Appendix D.

The Recycling Council of Ontario defines the Capture Rate calculation as follows:

$$Capture\ Rate = \frac{Total\ Divertible\ Material\ Captured\ (3Rs)}{Total\ Divertible\ Material\ Generated} \times 100$$

The Capture Rates for all divertible materials at the Site are provided below.

Table 5: Capture Rates for Divertible Materials

Divertible Material	Annual 3Rs Quantity Captured (MT)	Annual Material Generated (MT)	Capture Rate (%)
Energy Recovery	70.39	101.37	69.44%
Cardboard	8.42	14.31	58.84%
Mix Recycling	79.05	105.50	74.93%
Organics	0.53	38.17	1.38%
Wood	13.64	14.15	96.41%
Overall	**172.03**	**273.50**	**62.90%**

The **overall capture rate is 62.90%** based on a total quantity generated of 273.50 MT and a total divertible quantity of 172.03 MT.

7. Waste Audit Summary and Waste Reduction Work Plan

Refer to Appendix F for the Waste Audit Summary and the Waste Reduction Work Plan.

According to O.Reg.102/94, the Waste Reduction Work Plan or a plan summary must be posted at the facility where employees can review it. If a summary is posted, the entire Work Plan should also be made available for review by any employee upon request.

I hereby certify that the information provided in this Report of Waste Audit is complete and correct.		
Signature of an authorized official:	**Title:**	**Date:**

8. Findings and Conclusions

Based on the findings of the waste audit, the following conclusions can be made:

- Roughly **28.55%** of the waste-to-energy stream consisted of other materials, such as coffee cups (9.18%), other non-recyclable waste (13.36%), and scrap metal (1.45%).
- **71.45%** of the waste to energy stream contained contaminated materials: 37.57% of recyclable materials such as boxboard, kraft paper, and PP #5, and 33.88% of organic materials such as organic food waste and paper towels.
- The **Business and Information Technology Building (UB)** produced the highest overall mass of waste (**16.89%, or 13.11 kg**). The **CERL** produced the largest waste-to-energy materials, with **18.46%, or 8.29 kg**. The **UB** building produced the largest amount of recycling, with **21.09%, or 6.90 kg**.

- The **classrooms** produced the **most divertible materials** in the waste-to-energy stream (80.84%), and the hallways contained the highest quantity of acceptable materials (61.11%).
- The **labs** produced the **most contaminated materials** in the recycling stream (56.37%), while the classrooms contained the most acceptable materials (69.18%).
- Mandatory recyclable materials were found in all functional areas of the waste-to-energy stream, with an overall percentage of **7.28%**. The mandatory recyclables found were **aluminum (1.57 MT), cardboard (0.77 MT), fine paper (2.29 MT), steel cans (0.09 MT), and glass (0.41 MT).**
- The recycling stream contained 39.19% contaminated materials (e.g., coffee cups, paper towels, non-recyclable waste, etc.) and 60.81% acceptable materials (e.g.**, fine paper, boxboard, aluminum, etc.).**
- Existing programs at the Site include waste-to-energy recovery, cardboard, mixed recycling, organics, wood, chemical waste, batteries, electronic waste, laboratory waste, and paint.
- **Waste Diversion Rate** - was calculated to be **100.00%** based on 172.03 MT produced annually, of which 172.03 MT of waste was diverted from landfills through existing 3Rs programs.
- **Capture Rate**—The overall capture rate was 62.90%. The capture rates by diverted material were: waste to energy recovery—69.44%, cardboard—58.84%, mixed recycling—74.93%, organics—1.38%, and wood—96.41%.

9. Recommendations

Based on the conclusions, the following recommendations are tied to the conclusions discussed in the previous section.

9.1 New Waste Diversion Opportunities

The Site diverts 100% of generated waste through existing programs. The provincial objective for waste diversion is 60%. There are opportunities further to improve the capture rates of each waste stream:

- **Paper Towels**—20.40% of paper towels were found in the audit sample's waste stream. Promoting the addition of compostable fibres/paper towels in organics and the implementation of additional hand dryers in the washrooms would significantly increase the waste diversion rate.

- **Coffee cups** – 9.18% of coffee cups were found in the sample of the waste stream while auditing. To reduce the number of coffee cups in the waste stream, a reuse initiative can be promoted in food service areas where promotion of “bring your own

reusable cups/mugs" can be encouraged by the staff towards the customers with an incentive of a discounted/free coffee, for example. This would be further advertised with posters all over the campus regarding this program. Additionally, educating employees and students about this initiative with open suggestions for improvement could encourage participation across the Site.

- **PP #5 –** 6.88% of PP #5 plastics were found in the waste-to-energy stream, with some being utilized as take-out containers. To increase the diversion of PP #5 in the recycling stream, reduction programs should be implemented, such as the increased use of reusable ceramic dishes in cafeterias. For take-outs or deliveries, the food service providers could also implement a "Take a Box, Bring a Box" program, where students can return their used take-out containers for a new one every time they purchase take-out food. This would increase the diversion of PP #5 plastic containers in the recycling stream, which would reduce the disposal of this material in the waste stream. Additionally, staff and students should be educated on the environmental benefits of recycling PP #5 plastics and encouraged to participate in sustainability initiatives that could divert recyclable materials from the waste stream based on current waste quantities at the Site.

9.2 Improve Existing Waste Diversion Programs

The following are recommendations to improve the capture rates of existing waste diversion programs.

Divertible Recyclables

- **Mixed Containers and Mixed Papers—**Roughly 10.86 MT of mixed containers and 15.58 MT of mixed papers are estimated to be generated annually through the garbage stream. Based on current waste volumes at the Site, diverting this quantity through the existing recycling diversion programs will greatly enhance the capture rates.

Clear Signage and Consistency of Programs: Rogue bins are located throughout the campus, with no signage or consistency with size. By placing the appropriate bin design for different spaces around the Site, each recycling station is set up to properly collect the items that are most often used and tossed in that area of the university.

Educational Programs: Conduct workshops or training sessions to educate employees about the importance of recycling and the environmental impact of plastic waste.

Internal Communication: Regularly communicate recycling goals, achievements, and best practices through internal channels like newsletters, emails, or bulletin boards to keep employees and students engaged and informed.

Monitoring and Reporting: Implement a system to monitor and report on the progress of specific recyclables within the facility (i.e., cardboard, wood, etc.). Regularly assess the effectiveness of the recycling program and make adjustments as needed.

9.3 Promoting Culture

It is recommended that a committee oversee waste reduction and sustainability and promote a culture of waste diversion. Educate staff and students on the importance of waste diversion and communicate the corporate goals for waste diversion and sustainability. Create a positive message around the benefits of waste diversion and the individual's role.

Support and encourage the purchase and use of “environmentally friendly,” reusable or recyclable materials and packaging, and/or those that contain recycled content.

9.4 Continuous Monitoring and Process Improvement

Track year-over-year changes in waste diversion capture rates and communicate progress to staff/students to encourage further participation/engagement from staff/students.

Continuous monitoring and reporting for this site annually and comparison with year-over-year changes would provide insight into trends, which can be used as a basis for policy decisions regarding solid waste management for future projects. Further refinements to programs/processes can be made, and adherence to provincial requirements can be achieved.

Appendices

Appendix A: List of Categories

Material Category	Description
1. Paper and Paper Products	
Fine Paper	Includes mixed fine papers, writing paper, office paper, copy paper, bills and statements, ad mail, lottery tickets, receipts, envelopes, promotional cards, promotional calendars, printed information found within packaged products, etc. Also includes softcover books, booklets, magazines, catalogues, calendars, flyers, and inserts.
Newsprint	Major daily and weekly newspapers and community newspapers. Does not include flyers and inserts.
Boxboard	Single layered paperboard and fibre board with no corrugation. Includes cereal boxes, shoe boxes, cores from toilet paper/paper towels/gift wrap, etc.
Kraft Paper	Kraft paper bags and wrap, grocery or retail bags, potato bags, some pet food bags, etc. Includes brown, white, and coloured kraft paper and bags. No bags with bonded plastic or foil lining.
Corrugated Cardboard	Waxed or unwaxed corrugated cardboard containers. Includes Moulded pulp materials such as egg cartons, drink trays, other trays, etc.
Gable Top Containers	Polycoat containers with a gable-shaped top are used for milk, juice, some foods, etc.
Aseptic Containers	Tetra-Pak type Polycoat packaging containers used for juice, milk, some soups & broths, alternative milk beverages, alcoholic beverages, etc.

Composite Cans	Spiral wound cans with paper walls and plastic or metal tops or bottoms. Includes frozen juice, Pringles chips, dough, some raisins, etc.
2. Plastic	
#1 Polyethylene Terephthalate (PET)	All PET #1 plastics. This includes clear or coloured thermoform packaging, beverage bottles, non-beverage bottles used for food items, and non-food items such as dish soap, shampoo, mouthwash, window cleaner, floor cleaner, etc. Does not include Black Plastics.
#2 High-Density Polyethylene (HDPE)	All HDPE #2 plastics. Includes natural and coloured bottles, jugs, and containers for beverages, food items, and non-food items such as laundry soap, shampoo, bleach, vinegar, pill bottles, etc. Does not include Black Plastics.
#4 Low-Density Polyethylene (LDPE) Films	All #4 LDPE plastic films. Includes soft "stretchy" PE plastic used for items such as produce bags, overwrap for water bottles, garbage bags, kitchen liners, blue or clear recycling bags, sandwiches, freezer bags, etc. Does not include Black Plastics.
#5 Polypropylene (PP)	All #5 PP plastics. Includes clear and coloured food containers, jugs, jars, take-out beverage cups, bottles, and jars for food items, etc. Does not include Black Plastics.
#6 Non-Expanded Polystyrene (PS)	All non-expanded (rigid) #6 PS plastics. Includes clear or coloured rigid food trays, clamshells, cup lids, yogurt cups, CD and DVD cases only (no disk), etc. Does not include Black Plastics.
Non-Recyclables (#3, 4, 7)	All other recyclable plastics (#3, 4, 7). It includes items that are too small to process, sanitary, and do not fit into the other categories. Includes all Black Plastics #1-7 and unmarked.
3. Glass/Metal	

Glass	All clear and coloured glass. Includes bottles and containers for food, beverages, cosmetics, toiletries, household pharmaceutical products, candle jars, etc. Does not include non-recyclable glass such as windowpane glass, plates, drinking glasses, figures, or incandescent light bulbs.
Aluminum	All aluminum containers and foils. Includes food and beverage containers, rigid aluminum trays (pie plates, baking trays, etc.), empty aerosol containers, and containers for hair products, tubes, etc. Does not include full or partially full pressurized cans.
Scrap Metal	Bits and pieces of metal parts (e.g.,) bars, turnings, rods, sheets, wire) or metal pieces that may be combined together with bolts or soldering (e.g., radiators, scrap automobiles, railroad box cars), which, when worn or superfluous, can be recycled.
Steel	All steel containers. Includes food and beverage containers, empty spray cans (for cooking oil, whipped cream, etc.), and empty paint cans. Does not include full or partially full pressurized cans.
4. Organics	
Organic Food Waste	All edible and non-edible organic wastes that result from food items. Includes untouched and leftover bakery, meat & fish, dried food, fruits & vegetables, dairy, and other foods.
Compostable Fibres	Paper towels, paper napkins, toilet paper, facial tissues, etc.
5. Operational Waste	
Bubble Wrap/Shrink Wrap	A transparent plastic packaging material that is mainly used to pack fragile or easily breakable items. The bubbles have regularly spaced protruding air-filled hemispheres wh,ich function as the cushioning agent for sensitive and easily breakable objects.

Scrap Wood	Scrap wood is production waste from sawmills, carpenters' workshops or furniture factories and untreated wood offcuts from building sites (scaffolding planks, struts). Used wood includes wooden building parts and wooden materials such as wooden packaging (crates, palettes), but also wooden furniture
Batteries	All single-use and rechargeable batteries. Includes Alkaline-Manganese, Lithium, Silver Oxide, Zinc Air, Zinc-Carbon, etc.
Printer Toners	All ink cartridges and printer toners.
E-Waste	All Waste from Electrical and Electronic Equipment (WEEE). Anything that is battery-operated and/or can be plugged into an electrical outlet. Includes computer / IT equipment, telecom equipment, TV & audio equipment, small kitchen appliances, wires/chargers/adapters, cocks, gadgets, etc.
Plastic Strapping	All Plastic Strapping material. This material is used to bundle products together for retail sales and can come in a variety of colours and plastic materials.
Lightbulbs	There are four different types of light bulbs available for residential use: incandescent, halogen, fluorescent, and LED. Also includes non-residential varying types.
6. Non-Recyclable Waste	
Textiles	Made of interlacing natural or synthetic fibres. Fibres are spun or formed into yarn, wire, thread, etc., and are either plant-based (e.g., cotton), animal-based (e.g., wool), mineral-based (e.g., aluminum), or synthetic (e.g., nylon). It also includes coats, bedding, scrap fibres, fabric shopping bags, mesh, netting, and shoes.
Diapers	Made of synthetic disposable materials. It also includes cloth diapers.

Coffee Cups	All cups and containers are used for hot/cold beverages and food with plastic or wax lining. Multiple layered, primarily fibre, hot/cold food, and beverage containers are common in the fast-food industry. Includes paper-based cups with a plastic lining, water cooler cups, freezer boxes, etc.
Cold Beverage Wax LinedPaper Cups	All cups and containers with plastic or wax lining are used for cold beverages and food. Multiple layered, primarily fibre, cold food, and beverage containers are common in the fast-food industry.
PPE	Including gloves, gowns, shoe covers, head covers, masks, respirators, eye protection, face shields, and goggles. Unless it is specified in the facility-specific material as ‘Fabric PPE.’
Styrofoam (Expanded Polystyrene)	Includes white, coloured, and black polystyrene foam packaging. Includes food trays, clamshells, etc. Also includes foam packaging "peanuts" and foam blocks used to protect boxed products.
Facility Specific	Additional categories mentioned by the client range from any category to material.

Appendix B: Annual Request Form

Including Durham College, 2000 Simcoe, 60 Founders & 40 Conlin

ENERGY FROM WASTE DIVERSION RECAP Year 2023

SERVICE ADDRESS	LOCATION	COMMODITY	CONTAINER SIZE	UPAK Ref #	JAN WEIGHT/MT	FEB WEIGHT/MT	MAR WEIGHT/MT	APR WEIGHT/MT	MAY WEIGHT/MT	JUN WEIGHT/MT	JUL WEIGHT/MT	AUG WEIGHT/MT	SEP WEIGHT/MT	OCT WEIGHT/MT	NOV WEIGHT/MT	DEC WEIGHT/MT	YEAR TO DATE WEIGHT/MT
Durham College	Main Building	Energy Recovery	2 x 30yd C1/wk	23473	7.270	17.510	20.360	17.090	6.370	16.750	5.000	13.920	13.250	23.010	22.890	12.430	175.850
Oshawa Campus	Main Building	Energy Recovery	40yd Open OC	23473 23652	4.780	3.990	3.770	3.800	1.630	5.200	9.760	8.280	5.860	3.770	3.690	1.890	56.420
2000 Simcoe	Oshawa Grounds	Energy Recovery	2 x 8yd x 2/wk	23494	3.798	3.990	3.636	3.744	3.402	3.078	3.582	4.068	3.616	3.968	4.464	4.096	45.442
	Campus Ice Centre	Energy Recovery	8yd 2/wk	23497	2.259	1.904	2.367	2.048	2.322	2.457	2.510	2.259	2.008	1.856	2.025	1.800	25.815
	Campus Field House	Energy Recovery	4yd 1/wk	23498	0.576	0.504	0.625	0.552	0.690	0.468	0.500	0.625	0.590	0.472	0.615	0.492	6.709
	DC North Campus	Energy Recovery	4yd 1/wk	24219	0.615	0.402	0.516	0.576	0.620	0.508	0.460	0.575	0.345	0.516	0.484	0.460	6.077
	Main Building	Cardboard	1 x 30yd COC	23473	4.740	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.740
	DC North Campus	Cardboard	4yd 1/wk	24219	0.300	0.448	0.270	0.296	0.384	0.304	0.336	0.420	0.284	0.142	0.355	0.142	3.681
	Main Building	Mix Recycling	30yd C 1/wk	23473	3.670	5.650	6.060	6.320	4.620	2.830	8.400	5.540	7.380	6.610	7.950	6.310	71.340
	Campus Ice Centre	Mix Recycling	8yd 1/wk	23497	0.524	0.584	0.805	0.664	0.675	0.648	0.600	0.750	0.508	0.416	0.520	0.408	7.102
	Campus Field House	Mix Recycling	4yd EOW	23498	0.080	0.070	0.128	0.148	0.222	0.104	0.158	0.142	0.174	0.186	0.279	0.294	1.985
	UB Cafeteria	Organics	32gl 1/wk	23504	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.175	0.350	0.000	0.000	0.525
	Main Building	Wood	14yd Open OC	23652	1.020	1.100	0.910	0.940	0.960	1.100	1.610	1.620	1.360	1.170	0.990	0.860	13.640
Durham College	ACE Building	Energy Recovery	14yd Open OC	23495	0.000	0.920	1.060	1.000	0.640	0.000	0.940	0.690	0.610	0.340	1.050	0.800	8.050
Oshawa Campus																	
60 Founders																	
Durham College	SIRC Building	Energy Recovery	4yd 2/wk	23496	1.026	0.944	0.980	0.861	1.107	1.035	0.812	0.928	0.696	0.580	1.044	0.812	10.825
Oshawa Campus		Mix Recycling	4yd 2/wk	23496	0.702	0.656	0.602	0.581	0.702	0.621	0.546	0.819	0.588	0.490	0.686	0.714	7.707
40 Conlin Road																	
Ontario Tech	55 Bond Street East	Energy Recovery	96gl 1/wk	21677	2.288	2.080	3.016	1.664	2.184	1.560	1.248	1.352	2.392	3.120	2.184	2.184	25.272
University		Recycling	96gl 1/wk	21677	0.781	0.568	0.710	0.994	0.426	0.994	0.639	0.497	1.207	1.846	1.420	1.065	11.147
Ontario Tech	61 Charles Street	Energy Recovery	96gl 1/wk	21678	2.080	4.160	5.408	3.536	1.560	1.872	1.456	1.144	3.432	3.744	3.848	1.976	34.216
University		Recycling	96gl 1/wk	21678	1.846	0.923	0.426	0.923	0.923	0.923	0.994	0.710	2.130	1.562	1.846	0.994	14.200
		Organics	32gl 1/wk	21678									0.000	0.140	0.105	0.070	0.315
Ontario Tech	285 Britannia Ave W	Energy Recovery	4yd 1/4 wk	21679	0.206	0.124	0.179	0.132	0.158	0.141	0.127	0.114	0.107	0.084	0.089	0.107	1.568
University	285 Britannia Ave W	Energy Recovery Temp	40yd O/C	21679	0.000	0.000	0.000	0.000	1.780	1.890	2.080						5.700
		Cardboard	2yd 1/4 wk	21679	0.071	0.028	0.102	0.046	0.062	0.061	0.052	0.059	0.045	0.052	0.061	0.074	0.713
				Total All Sites - MT to Energy Recovery	24.898	36.528	41.917	35.003	22.463	34.959	28.425	33.955	32.906	41.460	42.388	27.047	401.944
				Total All Sites - MT Recycled	13.734	10.027	10.013	10.912	8.974	7.585	13.335	10.557	13.851	12.964	14.212	10.931	137.095
				Total All Sites - Monthly Diversion Rate	36%	22%	19%	24%	29%	18%	32%	24%	30%	24%	25%	29%	25%

Appendix C: Scale Calibration Certificate

CANADIAN SCALE COMPANY LIMITED

CALIBRATION CERTIFICATE

DATE: Feb 22, 2024 SR # 51925

CUSTOMER:
Waste Reduction Group
214 Merton St Unit 101
Toronto, ON

REMARKS

This is to certify that the following scale has been tested and verified in relation to the Standards maintained by **CANADIAN SCALE COMPANY LIMITED**, with test weights traceable to the Legal Metrology Laboratories of, Industry Canada and National Research Council, Canada.

Western bench scale model EWA
Capacity 150 kg
S/N - 202304047

CANADIAN SCALE COMPANY LIMITED is an Authorized Service Provider of Measurement Canada

Technician's signature

CANADIAN SCALE COMPANY LIMITED
305 Horner Avenue, Toronto, ON M8W 1Z4
1-800-461-0634 www.canscale.com

Appendix D: Detailed Sample Composition

Detailed Waste Sample Composition by Material Category (Sample Data)

Material Category	Waste Stream: Waste to Energy (KG)	(%)	Recycling (KG)	(%)
Fine Paper	1.46	3.25%	3.87	11.83%
Boxboard	4.26	9.49%	3.52	10.76%
Paper Towels	9.16	20.40%	3.49	10.67%
Coffee Cups	4.12	9.18%	3.40	10.39%
Aluminum	1.00	2.23%	2.50	7.64%
Non-Recyclable	6.00	13.36%	2.31	7.06%
PP #5	3.09	6.88%	2.31	7.06%
PET #1	1.52	3.39%	2.13	6.51%
Cardboard	0.49	1.09%	2.12	6.48%
Organics	6.05	13.47%	2.02	6.18%
Kraft Paper	3.73	8.31%	2.01	6.14%
HDPE #2	0.25	0.56%	0.35	1.07%
Electronic Waste	0.10	0.22%	0.34	1.04%
PS #6	0.46	1.02%	0.32	0.98%
Wax-Lined Cups	0.60	1.34%	0.30	0.92%
PPE	0.46	1.02%	0.25	0.76%
Glass	0.26	0.58%	0.24	0.73%
Aseptic Containers	0.29	0.65%	0.22	0.67%
Scrap Wood	0.00	0.00%	0.21	0.64%
Newspaper	0.00	0.00%	0.20	0.61%
Moulded Pulp	0.00	0.00%	0.20	0.61%
LDPE #4 Plastic Films	0.27	0.60%	0.19	0.58%
Styrofoam	0.00	0.00%	0.11	0.34%
Gable Top Containers	0.00	0.00%	0.10	0.31%
Bubble Wrap/Shrink Wrap	0.00	0.00%	0.00	0.00%
Printer Toners	0.43	0.96%	0.00	0.00%
Diapers	0.00	0.00%	0.00	0.00%
Plastic Strapping	0.10	0.22%	0.00	0.00%
Scrap Metal	0.65	1.45%	0.00	0.00%
Steel Cans	0.06	0.13%	0.00	0.00%
Batteries	0.04	0.09%	0.00	0.00%
Textiles	0.05	0.11%	0.00	0.00%
Other Plastics #7	0.00	0.00%	0.00	0.00%
Composite Cans	0.00	0.00%	0.00	0.00%
Lightbulbs	0.00	0.00%	0.00	0.00%
Grand Total	**44.90**	**100.00%**	**32.71**	**100.00%**

Detailed Waste Sample Composition by Material Category (Annual Data)

Material Category	Waste Stream Waste to Energy (MT)	(%)	Recycling (MT)	(%)
Aluminum	1.57	2.23%	6.04	7.64%
Aseptic Containers	0.45	0.65%	0.53	0.67%
Batteries	0.06	0.09%	0.00	0.00%
Boxboard	6.68	9.49%	8.51	10.76%
Bubble Wrap/Shrink Wrap	0.00	0.00%	0.00	0.00%
Cardboard	0.77	1.09%	5.12	6.48%
Coffee Cups	6.46	9.18%	8.22	10.39%
Cold Wax-Lined Paper Cups	0.94	1.34%	0.72	0.92%
Composite Cans	0.00	0.00%	0.00	0.00%
Diapers	0.00	0.00%	0.00	0.00%
Electronic Waste	0.16	0.22%	0.82	1.04%
Fine Paper	2.29	3.25%	9.35	11.83%
Gable Top Containers	0.00	0.00%	0.24	0.31%
Glass	0.41	0.58%	0.58	0.73%
HDPE #2	0.39	0.56%	0.85	1.07%
Kraft Paper/Other Fibres	5.85	8.31%	4.86	6.14%
LDPE #4 Plastic Films	0.42	0.60%	0.46	0.58%
Lightbulbs	0.00	0.00%	0.00	0.00%
Moulded Pulp	0.00	0.00%	0.48	0.61%
Newspaper	0.00	0.00%	0.48	0.61%
Non-Recyclable	9.41	13.36%	5.58	7.06%
Organics	9.49	13.47%	4.88	6.18%
Other Plastics #7	0.00	0.00%	0.00	0.00%
Paper Towels	14.36	20.40%	8.43	10.67%
PET #1	2.38	3.39%	5.15	6.51%
Plastic Strapping	0.16	0.22%	0.00	0.00%
PS #6	0.72	1.02%	0.77	0.98%
PP #5	4.84	6.88%	5.58	7.06%
PPE	0.72	1.02%	0.60	0.76%
Printer Toners	0.67	0.96%	0.00	0.00%
Scrap Metal	1.02	1.45%	0.00	0.00%
Scrap Wood	0.00	0.00%	0.51	0.64%
Steel Cans	0.09	0.13%	0.00	0.00%
Styrofoam	0.00	0.00%	0.27	0.34%
Textiles	0.08	0.11%	0.00	0.00%
Grand Total	**70.39**	**100.00%**	**79.05**	**100.00%**

Detailed Waste Sample Composition by Campus Building, General Waste Category and Material

(%)	Waste Stream					
	Waste to Energy			Recycling		
Material Category	Non-Recyclable	Organic Materials	Recyclable Materials	Non-Recyclable	Organic Materials	Recyclable Materials
ACE	18.18%	37.01%	44.81%	11.28%	34.59%	54.14%
CC	17.83%	75.97%	6.20%	16.29%	12.12%	71.59%
CERL	18.82%	52.23%	28.95%	38.56%	8.47%	52.97%
ENG	30.06%	38.65%	31.29%	10.89%	0.00%	89.11%
ERC	44.55%	26.68%	28.77%	38.00%	3.67%	58.33%
LIB	31.14%	21.45%	47.40%	22.36%	4.64%	73.00%
UP	18.03%	13.11%	68.85%	51.38%	0.00%	48.62%
SHA	37.70%	24.42%	37.88%	17.53%	28.87%	53.61%
SIRC	23.90%	13.52%	62.58%	9.57%	20.43%	70.00%
U5	36.61%	29.72%	33.66%	18.12%	39.02%	42.86%
UA	33.72%	29.30%	36.98%	19.93%	21.96%	58.11%
UB	18.68%	36.88%	44.44%	18.41%	16.67%	64.93%
Grand Total	28.55%	33.88%	37.57%	21.74%	17.46%	60.81%

Detailed Waste Sample Composition by Campus Building, General Waste Category and Material

(%)	WASTE STREAM					
	Waste to Energy			Recycling		
MATERIAL CATEGORY	Non-Recyclable	Organic Materials	Recyclable Materials	Non-Recyclable	Organic Materials	Recyclable Materials
Classroom	19.16%	24.19%	56.65%	25.41%	5.41%	69.18%
Common	35.53%	23.66%	40.81%	21.00%	15.98%	63.01%
Hallway	61.11%	8.33%	30.56%			
Kitchenette	21.47%	39.68%	38.85%	13.18%	33.94%	52.89%
Lab	33.77%	44.96%	21.27%	41.90%	14.47%	43.63%
Office	31.23%	42.82%	25.94%	13.67%	18.62%	67.71%
Grand Total	28.55%	33.88%	37.57%	21.74%	17.46%	60.81%

Appendix E: Site Photographs

Typical Multi-sorter Receptacle

A Waste and Recycling Receptacle

Another Multi-sorter Receptacle

Waste and Recycling Bins

Typical Recycling Tote

Solitary Waste Bin

Waste Audit – Paper Towels

Waste Audit – Fine Paper

Waste Audit – Kraft Paper

Waste Audit – PET #1

Waste Audit - PPE

Waste Audit – Cardboard

Waste Audit – Coffee Cups

Waste Audit – PP #5

Waste Audit – Non-recyclable Waste

Waste Audit – Boxboard

Waste Audit – LDPE #4

Waste Audit – Organic Waste

Appendix F: Waste Reduction Work Plan