

Royal Columbian Hospital

Summary of Waste & Recycling Assessment

March 18, 2011

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Executive summary

An assessment of the Royal Columbian Hospital recycling and general waste streams were carried out on March 14, 2011 and March 18, 2011 respectively. The assessments were undertaken by Kate Searle (ARAMARK's Environmental Sustainability Manager) and Christine Hill (VCH's Coordinator, Reduction and Recycling).

The purpose of the waste assessment was to:

- Determine the composition of solid waste & recycling currently being disposed from the site
- Identify opportunities for further improving waste management systems at Royal Columbian Hospital in the future.

An 87.6 kg sample of general waste and an 81.4kg sample of recycling were collected and hand-sorted into 24 waste categories. The main recommendations from the assessment were as follows:

- Undertake visual audits every two weeks for the first two months of the program, and monthly thereafter.
- Undertake a full waste and recycling assessment in November 2011, six months after the implementation of the program, and on an annual basis thereafter.
- Report progress and provide further staff education at department meetings in addition to email, poster and newsletter communication as required. Education will focus on rationale and logistics of material segregation into appropriate recycling streams.
- Continue to segregate and document confidential information in waste and recycling assessments and report breaches to the appropriate Information & Privacy staff.
- Educate waste vendors on types of medical waste, providing details on what is hazardous and what is not, with the aim of increasing the types and volume of material able to be accepted for recycling.

Introduction

Background

A new recycling program for mixed paper, rigid and soft plastic, and refundable beverage containers will be set up at Royal Columbian Hospital on May 6, 2011. Currently single stream recycling is in place in some departments throughout the hospital, although the majority of recycling comes from the OR. Materials currently being recycled include: old corrugated cardboard (OCC), mixed paper, rigid plastic, soft plastic and batteries. After the recycling program is implemented, the site will have an estimated 300 bins throughout the facility, collecting waste from each of the four new recycling streams.

This report outlines the objectives of the waste and recycling assessments; the methodology used in collecting and sorting the samples; the results of the assessments; and observations and recommendations.

Objectives

The waste and recycling assessments were undertaken in order to:

- Determine the composition of solid waste and recycling currently being disposed from the site
- Identify opportunities for further improving waste management systems at Royal Columbian Hospital in the future.

The next waste and recycling assessments will take place in November 2011 (six months after the implementation of the recycling program), and will be repeated on an annual basis thereafter.

Exclusions

The focus of this assessment was to determine what is being disposed from the site as general waste (garbage) and recycling (plastics and mixed paper only). The assessment excluded the following types of waste and/or recycling (that is currently disposed of separately to general waste or plastic/paper recycling):

- Biomedical waste (sharps containers, yellow and red bags)
- OCC (old corrugated cardboard)
- Batteries
- Confidential shredding
- Electronics and furniture
- Patient tray food preparation organics

Methodology

Personnel

The waste and recycling assessments were undertaken by Kate Searle (ARAMARK's Environmental Sustainability Manager), Christine Hill (Lower Mainland Health Authorities Coordinator, Reduction and Recycling). The team also sought expertise from MJ Waste Solutions on auditing methodology and approach. Assistance with separating a valid waste sample was provided by ARAMARK's Operations Manager, supervisor and housekeeping staff.

Waste categories

A total of 24 waste categories were selected by the audit team. These categories were established to allow for the identification of materials currently able to be diverted to recycling, and for additional materials that may be able to be diverted for recycling or composting in the future. A full list and description of the categories can be found in **Appendix A**. These categories were used for both the waste and recycling assessments.

Waste assessment

Set up

The waste assessment took place in the chute room for the Columbia Tower building. This location allowed audit personnel to easily collect the sample, dispose of it after the study was complete and remain out of the way of housekeeping daily activities.

The assessment took place on March 18, 2011, starting at 8am.

Sampling

A target sample size was determined in consultation with the Sustainable Business Services team at Metro Vancouver. A sample size of at least 80-90kg was determined to provide a reasonable level of accuracy in the types of waste typically disposed from the site. The actual sample size was 87.6 kg.

Garbage from the Health Centre and Columbia Tower buildings are collected in chute rooms and then taken to the compactor room. Garbage from all other areas of the hospital is hand collected and taken directly to the compactor room. A housekeeping staff member brought each cart of garbage to the chute room before going to the centralized compactor in order for the audit team to pull a sample.

It was estimated that 15 carts of garbage would be cleared from 12:00am, Thursday, March 17th - 12:00pm, Friday March 18th. In order to obtain a 90kg sample, we determined 6kg would need to be pulled from each cart. Only eight carts were emptied during this time period, so we extended our sample time until 2:00pm, Friday March 18th. As we sampled slightly more than 6kg per cart from the first eight, and obtained bags from carrier carts that came through, we only needed to sample from one more cart during the extended time period.

It should be noted that food preparation waste from the Food Services department is composted and not included in this audit. In addition, the cafeteria was not particularly busy on our sample day, resulting in organics waste being under reported in this audit.

The total sample was hand-sorted into 24 material categories. Each category was weighed to provide information on the composition of the solid waste stream. Photographs of sorted materials are provided in **Appendix B**.

Recycling assessment

Set up

The recycling assessment took place on the floor of the Emterra Environmental recycling plant. This location allowed audit personnel to easily collect the sample, dispose of it after the study was complete and remain out of the way of recycling plant daily activities.

The assessment took place on February 14, 2011, starting at 10am.

Sampling

A target sample size was determined in consultation with the Sustainable Business Services team at Metro Vancouver. A sample size of at least 80-90kg was determined to provide a reasonable level of accuracy in the materials typically disposed from the site. The actual sample size was 81.4 kg.

The compactor from Royal Columbian Hospital containing seven days worth of recycling (February 7 – February 14) was unloaded in a designated area at the Emterra Environmental recycling plant. The auditing team pulled a random sample from this load for sorting.

The on-site Business Support Services Manager, Kevin McClain was present during the sampling phase of the audit and estimated that 70% of the recycling in the load came from the OR.

The total sample was hand-sorted into 24 material categories. Each category was weighed to provide information on the composition of the solid waste stream. Photographs of sorted materials are provided in **Appendix C**.

Results

This section summarizes the waste & recycling assessment findings and provides detailed results from each of the samples.

Table 1 presents a summary of the composition of the waste observed in the garbage stream. The data below is presented by category. Only those categories with associated waste are included in the table below.

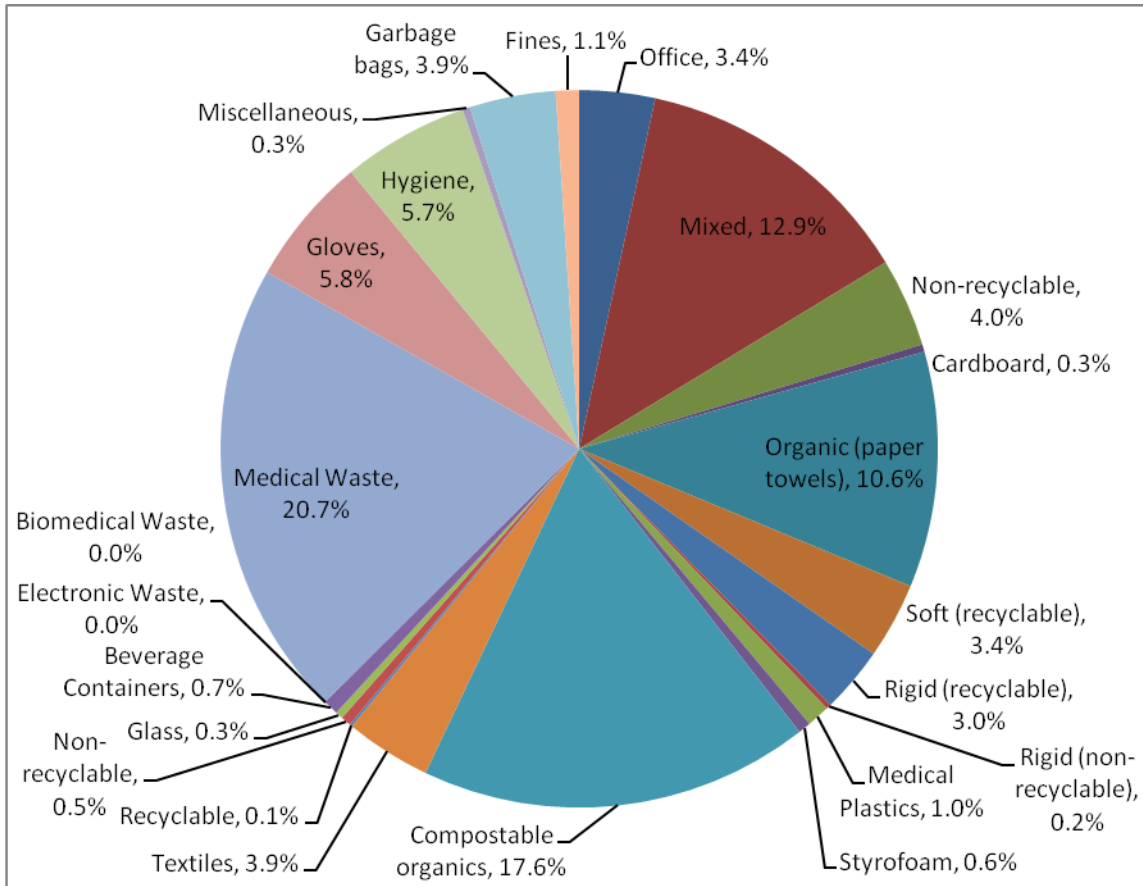
Table 1: Royal Columbian waste assessment data – March 2011

Material category	Percentage
Paper	
Office	3.4%
Mixed	12.9%
Non-recyclable	4.0%
Cardboard	0.3%
Organic (paper towels)	10.6%
Plastics	
Soft (recyclable)	3.4%
Rigid (recyclable)	3.0%
Non-recyclable	0.2%
Medical Plastics	1.0%
Styrofoam	0.6%
Organics	
Compostable organics	17.6%
Textiles (non-compostable)	3.9%
Metals	
Recyclable	0.1%
Non-recyclable	0.5%
Glass	
Glass	0.3%
Beverage containers	
Beverage containers	0.7%
Medical/hygiene	
Medical waste	20.7%
Gloves	5.8%
Hygiene	5.7%
Miscellaneous	
Miscellaneous	0.3%
Garbage bags	3.9%
Fines	1.1%
Total	100%

Findings

Figure 1 below illustrates the proportions of different materials in the sorted waste stream.

Figure 1: Breakdown of waste composition (sorted), Royal Columbian Hospital



The data indicates that the largest proportions of the waste stream are comprised of medical waste (21%) and compostable organics (18%). Medical waste included used IV bags, tubing, blue wrap, gowns, head and booty covers and face masks. The majority of these items were soiled with blood or bodily fluids. The organics category included food scraps and used coffee grounds.

A total of approximately 24% of materials found in the waste stream will be recyclable under the recycling renewal program implemented at Royal Columbian Hospital in May, 2011. Mixed paper accounted for 13%, rigid and soft plastics – 6%, office paper – 3% and beverage containers – < 1%. If a composting program was in place a further 29% of materials could be diverted from the waste stream: organics (18%) and paper towels (11%).

Non-recyclable paper (coffee cups, soiled napkins and sticker paper) comprised 4% of the total waste stream. Gloves accounted for 6%, hygiene 6%, textiles 4% and garbage bags 4%. These materials are not able to be recycled from the site at this time.

Each of the other material categories comprised less than 2% of the total waste stream.

Table 2 presents a summary of the composition of the recycling observed. The data below is presented by category. Only those categories with associated materials are included in the table below. It is important to note that clean medical plastics (i.e. syringes with no sharps) and rigid plastics with no recycling number were included in the rigid plastics category for this audit.

Table 2: Royal Columbian recycling assessment data – February 2011

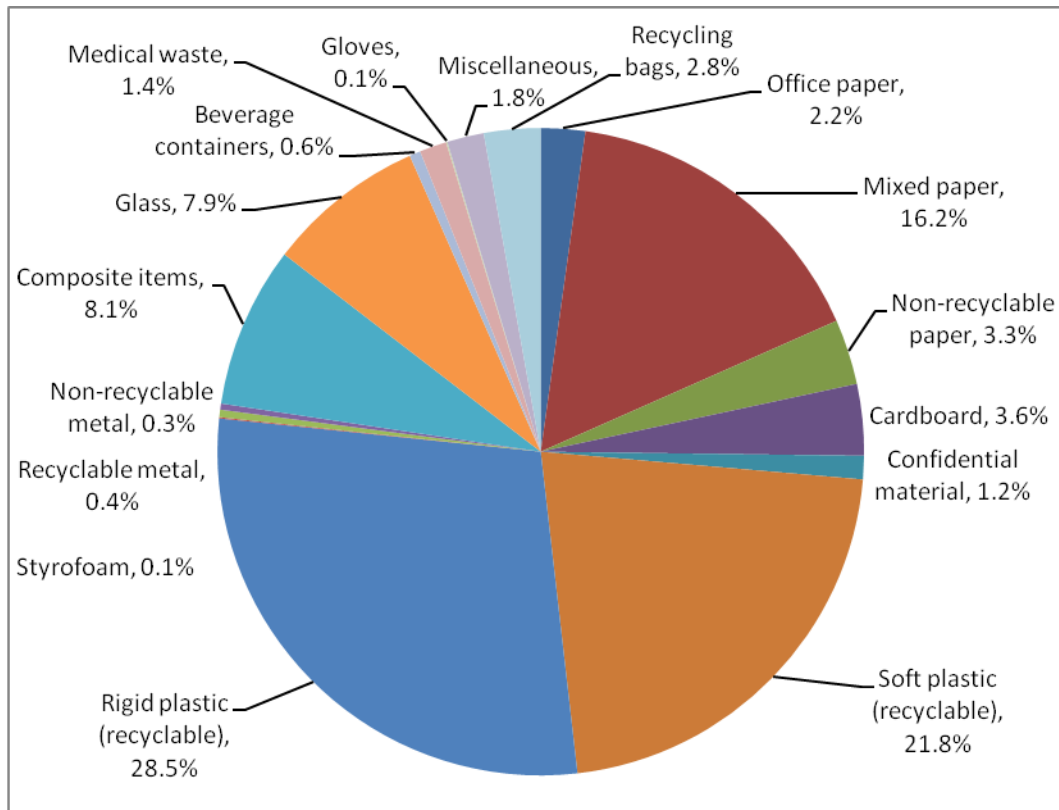
Material category	Percentage
Paper	
Office	2.2%
Mixed	16.2%
Non-recyclable	3.3%
Cardboard	3.6%
Plastics	
Soft (recyclable)	21.8%
Rigid (recyclable) ¹	28.5%
Styrofoam	0.1%
Organics	
Compostable organics	0.4%
Textiles (non-compostable)	0.3%
Metals	
Recyclable	0.1%
Non-recyclable	0.5%
Glass	
Glass	7.9%
Beverage containers	
Beverage containers	0.6%
Medical/hygiene	
Medical waste	1.4%
Gloves	0.1%
Miscellaneous	
Miscellaneous	1.8%
Recycling bags	2.8%
Composite	8.1%
Confidential material	1.2%
Total	100.0%

¹ Includes medical plastic and rigid plastic with no recycling number

Findings

Figure 2 below illustrates the proportions of different materials in the sorted recycling stream.

Figure 2: Breakdown of recycling composition (sorted), Royal Columbian Hospital



The data indicates that the largest proportions of the recycling stream are comprised of rigid plastic (29%) and soft plastic (22%). Rigid plastic includes any hard plastic, e.g. saline bottles, cleaning bottles and food containers. Soft plastics included shrink wrap, clear and coloured packaging and plastic bags. Soft plastic can be recycled, but only if it is segregated into an individual stream. When included in the single stream recycling system, it generally goes to garbage as it congests the sorting machinery.

Mixed paper represents 16% of the recycling stream and included newspapers, magazines, brochures and medical product packaging. Glass represented 8% of the recycling stream and was comprised of mostly glass medication bottles. Glass can be recycled if segregated from all other materials, but is not currently part of the recycling renewal program. Corrugated cardboard represented 3.6% of the recycling stream. This material should be collected separately from other recycling and deposited into the cardboard compactor by housekeeping staff.

Approximately 25% of materials found in the recycling stream go to garbage. The majority of this is soft plastics (as it is not currently segregated) with the other categories represented by composite items (8%) and non-recyclable paper (3%). Composite items are those that contain two different types of recyclable material (i.e. a medical item package with paper on one side and plastic on the other). A large proportion of this material could be recycled if materials were separated.

Each of the other material categories comprised less than 2% of the total waste stream.

Observations and recommendations

Monitoring of recycling program

The RCH recycling renewal program will be launched at the site on May 11, 2011. Regular waste and recycling audits will be carried out to monitor progress and identify any problems with the program.

Recommendations:

- Undertake visual audits every two weeks for the first two months of the program, and monthly thereafter.
- Undertake a full waste and recycling assessment in November 2011, six months after the implementation of the program, and on an annual basis thereafter.
- Report progress and provide further staff education at department meetings in addition to email, poster and newsletter communication as required. Education will focus on rationale and logistics of material segregation into appropriate recycling streams.

Recyclable materials

As presented in the finding section of this report, the volume of recyclable material in the waste stream is significant (approximately 24%). Although there is recycling in place across some departments within Royal Columbian Hospital, the implementation of the recycling renewal program in May 2011 will increase the number of bins and types of materials that can be recycled. Given these enhancement to the current system, it is reasonable to consider that the volume of recyclable materials found in the garbage will be significantly lower in the next waste assessment (November, 2011).

Approximately 25% of materials found in the recycling stream go to garbage. The majority of this is soft plastics (as it is not currently separated) with the other categories represented by composite items (8%) and non-recyclable paper (3%).

Recommendations:

- Implement recycling renewal program on May 6th, 2011
- Educate staff on where new bins are located and what materials can be recycled in which streams. Stress the importance of segregation.

Confidential material

Although confidential material represented less than 2% of the recycling stream, the health authority is obliged to ensure that patient information is handled confidentiality and does not end up in the general waste or recycling stream. Photographs of confidential material were taken and sent to the Information & Privacy department of Fraser Health Authority for follow-up.

Recommendations:

- Continue to segregate and document confidential information and report breaches to the appropriate Information & Privacy staff.

Compostable materials

Food Services composts food preparation materials at Royal Columbian Hospital already. Introducing further composting programs to Royal Columbian Hospital could remove almost

30% of material from the general waste stream per month. A composting program could involve the collection of organics from any or all of the following areas:

- Food prep from the cafeteria and Tim Horton's
- Patient tray waste coming back to the food services kitchen
- Staff kitchens in clinical and administration areas
- Paper towels from major hand washing locations

These issues will need to be addressed before programs are implemented.

Recommendations:

- Investigate and document composting programs being undertaken at Eagle Ridge Hospital to provide a toolkit for Site Support Managers to implement composting at their sites if desired.
- Continue involvement with Sodexo composting pilot at UBC with potential to expand to other sites where Sodexo provides food services.

Medical waste

Non-hazardous medical waste comprised the largest proportion of the waste stream at 21%; when including the categories of gloves, hygiene and medical plastic this proportion increases to 33%. Opportunities for reducing the volume of soiled medical waste are limited, and would require a full review of operational practices. Opportunities for reducing the volume of clean, unused medical waste are more readily available.

It is unclear how much medical waste observed in the waste stream was clean (or likely to have been clean when placed in the garbage). A significant proportion of the medical waste was from the operating rooms, including blue wrap and tubing/medical waste. Educating both clinical staff and waste vendors on types and correct disposal of clean medical waste has the potential to reduce the total volume of waste.

Medical waste represented less than 2% of the recycling stream; however the presence of any medical waste in recycling puts the recycling at risk.

Recommendations:

- Develop staff education session for OR staff on correct disposal (e.g. recycling) of blue wrap and other OR-specific materials.
- Educate staff on the importance of medical and biomedical waste going to regular garbage or biomedical waste streams, respectively.
- Educate waste vendors on types of medical waste, providing details on what is hazardous and what is not, with the aim of increasing the types and volume of material able to be accepted for recycling.
- If existing waste vendors are unable or unwilling to accept additional materials, consider approaching other vendors for specific items (e.g. recycling programs specifically for blue wrap have been very successful in the US).

Appendix A – Waste Categories

Material Category	Description
Paper	
Office	Copy paper (confidential and non-confidential)
Mixed	Boxboard, newspaper, magazines
Non-recyclable	Coffee cups, paper contaminated with food
Old corrugated cardboard	Shipping boxes, containerboard cartons
(Organic) Paper towels	Paper towels
Plastics	
Soft (recyclable)	Plastic film, packaging or bags
Rigid (recyclable)	All rigid plastic 1-7
Non-Recyclable	Plastics without a number on them
Medical Plastics	Syringes without needles, rigid tubing
Styrofoam	Styrofoam plates and cups
Organics	
Compostable	Food and plant waste
Textiles (non-compostable)	Wood, leather, rubber
Metals	
Recyclable	All types of metal food containers e.g. tin cans
Non-recyclable	All other metal materials e.g. foil packaging
Glass	
Glass	Material that can be identified as container glass. Includes glass food jars and medicine bottles.
Beverage Containers	
Beverage containers	All refundable ready to drink beverage containers (plastic, metal, glass, tetra-paks, cartons, juice bags)
Electronic Waste	
Electronic waste	Electronic materials including TVs, CPUs and components
Medical/hygiene	
Medical waste	Clean and soiled medical supplies including tubing, IV bags, blue wrap, head and booty covers, gloves, single-use scissors
Gloves	Clean and soiled nitrile/latex gloves
Hygiene	Human hygiene products including diapers and sanitary products
Biomedical waste	Human fluid blood and blood products, items saturated or dripping with blood, body fluids contaminated with blood and body fluids removed for diagnosis during surgery, treatment or autopsy
Hazardous	
Sharps	
Pharmaceuticals	
Batteries	
Miscellaneous	Other materials that cannot be classified

Appendix B – Photographs of waste assessment

Image 1: Medical Waste (including IV bags, gauze and masks)



Image 2: Soft plastics



Image 3: Rigid Plastic



Image 4:

