

# Richmond Hospital

## Summary of Waste & Recycling Assessment

September 8, 2011

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## Executive summary

An assessment of the Richmond Hospital recycling and general waste streams were carried out on September 8, 2011. The assessments were undertaken by Kate Searle (ARAMARK's Environmental Sustainability Manager), Christine Ronning (Lower Mainland Health Authorities Coordinator, Reduction and Recycling) and Paddy Assenheimer (Leader, Transformation, Change & Innovation).

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 Richmond Hospital in the future.

From a 24 hour time sample, 133kg of general waste randomly was selected and hand-sorted into 24 waste categories. All recycling collected over a 24hr period was visually assessed. The 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 March 2012, 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
- Implement recycling renewal program in fall 2011
- Educate staff through newsletters, emails, on-site recycling displays, Recycling Champion training and unit specific in-services or meetings. Focus on where new bins are located and what materials can be recycled in which streams - stress the importance of segregation
- Secure the recycling cage with a door and lock so revenue generating beverage containers do not going missing in future
- Adjust recycling disposal methods to be compactor, rather than toter based. Beverage containers will continue with a toter system as they are picked up by a different company.
- Continue involvement with Sodexo composting pilot at UBC with potential to expand to other sites where Sodexo provides food services
- 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

## **Introduction**

### ***Background***

A new recycling program for mixed paper, rigid and soft plastic, and refundable beverage containers will be set up at Richmond Hospital in fall 2011. Currently most departments have some type of recycling set-up. All plastics are being accepted in the same bin. Materials currently being recycled include: old corrugated cardboard (OCC), mixed paper, rigid plastic, soft plastic, batteries, ink cartridges/toner, electronics and light bulbs. After the recycling program is implemented, the site will have an estimated 230 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 Richmond Hospital in the future.

The next waste and recycling assessments will take place in March 2012 (six months after the implementation of the recycling program).

### ***Exclusions***

The focus of this assessment was to determine what is being disposed from the site as general waste (garbage) and recycling (plastics, mixed paper and beverage containers 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
- Organics from the production kitchen

## **Methodology**

### ***Personnel***

The waste and recycling assessments were undertaken by Kate Searle (ARAMARK's Environmental Sustainability Manager), Christine Ronning (Lower Mainland Health Authorities Coordinator, Reduction and Recycling) and Paddy Assenheimer (Vancouver Coastal Health's Leader, Transformation, Change & Innovation). 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, housekeeping staff, Facilities Manager, Security and the Support Services Manager.

### ***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 outdoors in a space behind the cafeteria. This area was taped off by security in order to reserve space for the audit team. 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 daily site activities.

The assessment took place on September, 2011, starting at 8:30am and finishing at 1:00pm. Photographs of the audit set-up are provided in **Appendix B**.

#### ***Sampling***

A target sample size was determined in alignment with the BC Ministry of Environment, MJ Waste Solutions and Metro Vancouver. A sample size of 135kg was recommended to provide a reasonable level of accuracy in the types of waste typically disposed from the site. The actual sample size was 133 kg.

A temporary 20 yard waste bin was dropped off at the site to segregate a 24hr sample. Housekeeping staff deposited general waste into the temporary bin instead of the compactor from 8:00am on September 7, 2011 until 8:00am on September 8, 2011. Auditors randomly selected every 10<sup>th</sup> bag from the 24hr sample until the required weight of 135kg was reached.

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.

### ***Recycling assessment***

#### ***Set up***

The recycling assessment took place in the recycling cage at the back of the Richmond Hospital. This location allowed audit personnel to easily sort, assess and dispose of the sample and remain out of the way of daily hospital activities.

The assessment took place on September 8, 2011, starting at 8:00am and finishing at 8:30am.

### ***Sampling***

As the recycling volume at Richmond Hospital is much lower than the general waste stream, the entire volume collected over a 24hr period was assessed.

Recycling is collected in bags throughout the site and placed in recycling totes for pick-up. These bags were grouped by stream into 65 litre totes and counted. Each stream was then visually assessed for contaminated by the audit team.

## Results

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

### *Findings – General Waste*

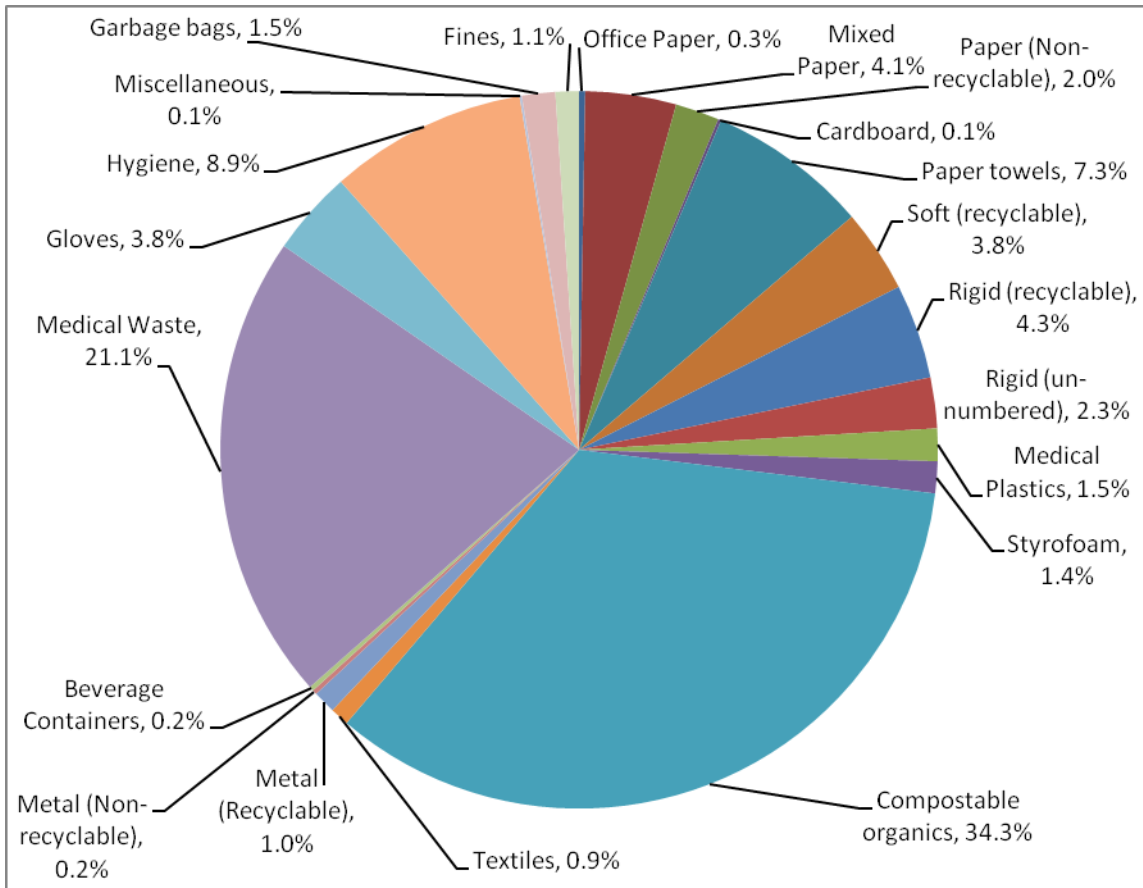
Table 1 presents a summary of the composition of the waste observed in the general waste stream. The data below is presented by category. Only those categories with associated waste are included in the table below.

**Table 1: Richmond Hospital waste assessment data – September 2011**

Material category	Percentage
<b>Paper</b>	
Office	0.3%
Mixed	4.1%
Non-recyclable	2.0%
Cardboard	0.1%
Organic (paper towels)	7.3%
<b>Plastics</b>	
Soft (recyclable)	3.8%
Rigid (recyclable)	4.3%
Rigid (un-numbered)	2.3%
Medical Plastics	1.5%
Styrofoam	1.4%
<b>Organics</b>	
Compostable organics	34.3%
Textiles (non-compostable)	0.9%
<b>Metals</b>	
Recyclable	1.0%
Non-recyclable	0.2%
<b>Beverage containers</b>	
Beverage containers	0.2%
<b>Medical/hygiene</b>	
Medical waste	21.1%
Gloves	3.8%
Hygiene	8.9%
<b>Miscellaneous</b>	
Miscellaneous	0.1%
Garbage bags	1.5%
Fines	1.1%
<b>Total</b>	<b>100%</b>

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

**Figure 1: Breakdown of waste composition (sorted), Richmond Hospital**



The data indicates that the largest proportions of the waste stream are comprised of compostable organics (34%) and medical waste (21%). Medical waste includes IV bags with medication, tubing, soiled 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 18% of materials found in the waste stream will be recyclable under the recycling renewal program implemented at Richmond Hospital in September, 2011. Rigid plastic accounted for 7%, mixed paper - 5%, soft plastics - 4% and beverage containers, office paper, cardboard, medical plastics and metal all accounted for < 1%. If a composting program was in place a further 41% of materials could be diverted from the waste stream: organics (34%) and paper towels (7%).

Hygiene accounted for 9% of the waste stream and gloves 4%. These materials are not able to be recycled. Each of the other material categories comprised less than 2% of the total waste stream.

### **Findings - Recycling**

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. Due to the methods used to assess the recycling, some of the original 24 categories have been combined to present results in Table 2.

Mixed paper = mixed paper and office paper

Soft = soft and medical plastics such as IV bags

Rigid = rigid (recyclable), rigid (un-numbered) and medical plastics such as syringes with no needles

**Table 2: Richmond Hospital recycling assessment data – September 2011**

<b>Material category</b>	<b>Percentage</b>
<b>Paper</b>	
Mixed paper	37.1%
Cardboard	1.1%
<b>Plastics</b>	
Soft	37.1%
Rigid	23.8%
<b>Beverage containers</b>	
Beverage containers	0.6%
<b>Total</b>	<b>100.0%</b>

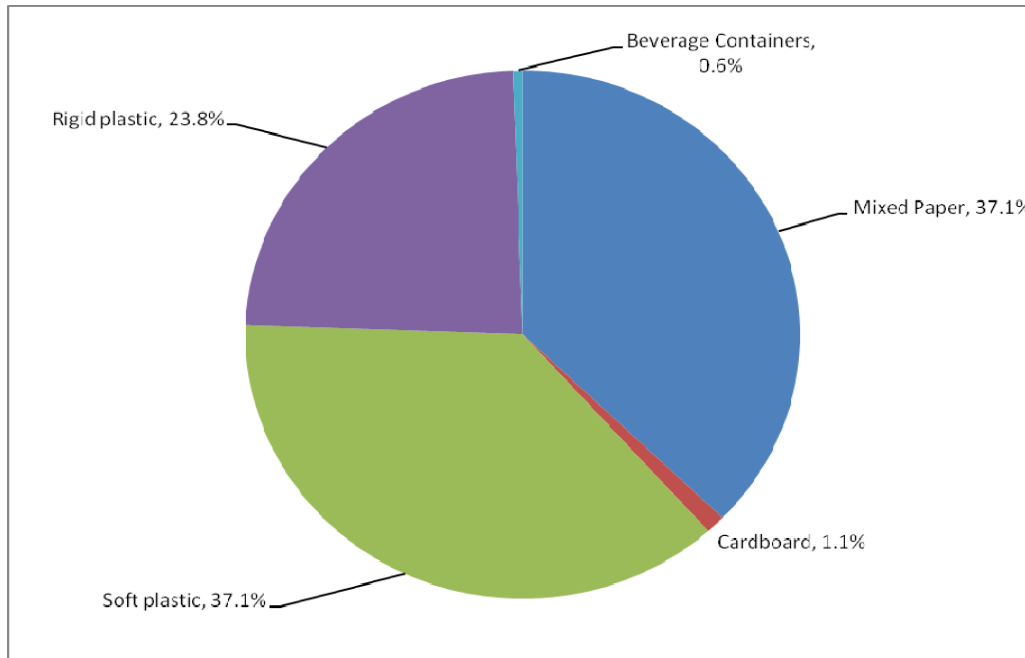
As recycling materials were not weighed, totter volume proportions were used to determine category proportions. For example the proportion of rigid plastic was calculated by taking the following steps:

(3 rigid toters – 30% contamination) + rigid plastic found in soft plastic / total volume

$$(195L - 58.5L) + 22.75L / 682.5L = 0.238 \text{ or } 23.8\%$$

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

**Figure 2: Breakdown of recycling composition (sorted), Richmond Hospital**



The data indicates that the largest proportions of the recycling stream by volume are mixed paper (37%), and soft plastic (37%). Mixed paper includes copy paper, newspapers, magazines, brochures and medical supply packaging. Soft plastics included shrink wrap, clear and coloured packaging, plastic bags and medical supply packaging. 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.

Rigid plastic represented 24% of the recycling stream and consists of any hard plastic (with or without numbers) and includes things like food containers, saline bottles and cavi-wipe bottles. Corrugated cardboard represented 1.1% of the recycling stream. This material should be collected separately from other recycling and deposited into the cardboard compactor by housekeeping staff.

Of interest, very few beverage containers were found in the recycling. This may be due to the outside storage of recycling totes, where public can openly access recycling.

When looking at contamination by stream the lowest contamination was found in the mixed paper stream at 5%, followed by soft plastic at 10% and rigid plastic at 30%. There was some rigid plastic in the soft plastic stream. In the stream with the highest contamination (rigid plastic) soft plastic, composite materials and beverage containers were found. This contamination is anticipated to decrease when the program is implemented and soft plastic containers are provided on-site.

## **Observations and recommendations**

All recommendations in this section would be carried out by Kate Searle and Christine Ronning, with support from BISS and Energy and Environmental Sustainability (Facilities Management).

### **Monitoring of recycling program**

The Richmond Hospital recycling renewal program will be launched at the site in fall 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 March 2012, 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 18%). Although there is recycling in place across some departments within Richmond Hospital, the implementation of the recycling renewal program in fall 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 lower in the next waste assessment (March, 2012).

#### ***Recommendations:***

- Implement recycling renewal program in fall 2011
- Educate staff through newsletters, emails, on-site recycling displays, Recycling Champion training and unit specific in-services or meetings. Focus on where new bins are located and what materials can be recycled in which streams - stress the importance of segregation
- Secure the recycling cage with a door and lock so revenue generating beverage containers do not going missing in future
- Adjust recycling disposal methods to be compactor, rather than toter based. Beverage containers will continue with a toter system as they are picked up by a different company.

### **Compostable materials**

Starbucks composts food waste materials at Richmond Hospital already. Introducing further composting programs to Richmond Hospital could remove over 40% of material from the general waste stream. A composting program could involve the collection of organics from any or all of the following areas:

- Food prep from the cafeteria
- 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:**

- 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 35%. 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.

**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

## Appendix A – Waste Categories

Material Category	Description
<b>Paper</b>	
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
<b>Plastics</b>	
Soft (recyclable)	Plastic film, packaging or bags
Rigid (recyclable)	All rigid plastic 1-7
Rigid (un-numbered)	Plastics without a number on them
Medical Plastics	Syringes without needles, IV bags (no medication), rinsed urine bottles
Styrofoam	Styrofoam plates and cups
<b>Organics</b>	
Compostable	Food and plant waste
Textiles (non-compostable)	Wood, leather, rubber
<b>Metals</b>	
Recyclable	All types of metal food containers e.g. tin cans
Non-recyclable	All other metal materials e.g. foil packaging
<b>Glass</b>	
Glass	Material that can be identified as container glass. Includes glass food jars and medicine bottles.
<b>Beverage Containers</b>	
Beverage containers	All refundable ready to drink beverage containers (plastic, metal, glass, tetra-paks, cartons, juice bags)
<b>Electronic Waste</b>	
Electronic waste	Electronic materials including TVs, CPUs and components
<b>Medical/hygiene</b>	
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
<b>Hazardous</b>	
Sharps	
Pharmaceuticals	
Batteries	
<b>Miscellaneous</b>	Other materials that cannot be classified

## Appendix B – Photographs of waste assessment

**Image 1: Richmond Hospital Waste Audit Set-Up**



*From left to right: Kate Searle, Paddy Assenheimer, Christine Ronning*

**Image 2: Sample**

