
University of British Columbia Okanagan

Waste Audit Results

October 22, 2008

Prepared for
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by

Regional Waste Reduction Office

*A program of the City of Kelowna,
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Waste Audit Report

University of British Columbia Okanagan (UBCO)

Executive Summary

In September 2008, the Waste Reduction Office was requested to support a waste audit on the UBCO campus. On Oct 21, 2008, all the waste for seven of the on-campus buildings (Arts, Fipke, Fine Arts, Library, Portables & Gym, Science, and the Student Services Centre (SSC)) was collected in clear plastic bags. It was brought to the middle of the UBCO courtyard for the audit the next day in order to maximize educational opportunities. The 143 bags collected were sorted by source building. Staff from the Regional Waste Reduction Office, UBCO Sustainability Club volunteers, UBCO Voice Study, and other volunteers from the student body carried out the audit.

The audit found a large volume of recyclables and compostables in the garbage. Overall results indicated 10,830 Liters of waste produced on Oct. 21, 2008. This is the equivalent of 3.5 standard 4 yd dumpsters or 120 standard household garbage cans. Recyclable materials comprised 42% of the waste and 30% was potentially compostable. Only 28% was considered garbage. Of the seven buildings involved in the audit, the Portables and Gym produced more than a quarter of the waste. The Library and Fine Arts buildings produced the least.

Key recommendations include:

- Appoint key permanent staff to form a “Sustainability working group” to coordinate internal sustainability related initiatives. Perhaps this could be connected to or a part of the Okanagan Sustainability Institute. Include a person to oversee, prioritize, and coordinate waste reduction initiatives.
- Educate janitorial staff on your recycling program, ask them to monitor its effectiveness and report back to key staff.
- Check the availability of recycling stations for handling the materials identified in the audit starting with the high waste volume sources and finishing with the lower. Keep garbage and recycling collection bins together so that students and staff have essential disposal options easily available. Educate students and staff on their use.
- Test the relative merits of composting or replacing hand towels with electric hand dryers to see which avenue would likely be most advantageous from economic, environmental, and social (ease of use, efficacy, hygiene) perspectives.
- Establish clearly labelled mixed mandatory recyclables collection containers in communal areas where garbage cans are located.
- Remove as many disposable cup sources from UBCO as possible. In places where disposable cups are unavoidable, replace the current varieties with compostable cups, lids, and stir sticks.

- Install clearly labelled “organics” collection bins where food is purchased, prepared, and/or consumed in as many areas as your new composting program can handle. Use biodegradable bags to ease handling.
- Educate students and staff on your waste reduction programs on a frequent and consistent basis (see section 4.0).

1.0 Introduction

In September 2008, Brittany Daigle, Carin Martins and Crystal Birnie of the UBCO Voice Study approached the Waste Reduction Office about the possibility of doing a waste audit on campus. After considerable preparation by UBCO students and staff, all the waste generated from seven of the on-campus buildings (Arts, Fipke, Fine Arts, Library, Portables & Gym, Science, and the Student Services Centre (SSC)) on October 21, 2008 was collected in clear plastic bags. It was brought to the middle of the UBCO courtyard for the audit the next day in order to maximize educational opportunities. On October 22, 2008, the 143 bags collected were sorted by source building. Staff from the Regional Waste Reduction Office, UBCO Sustainability Club volunteers, UBCO Voice Study, and other volunteers from the student body carried out the audit.

The objectives of the waste audit were:

- To record the amount and type of waste generated at UBCO identifying recycling and composting opportunities;
- To set a baseline in order to record the effects of future waste reduction efforts at UBCO and to compare to Okanagan College's simultaneous initiative;
- To help raise awareness about waste related issues on campus;
- To be as cost efficient as possible.

2.0 Methods

The bags were visually inspected and the loose volumes of 11 categories of waste were estimated. The bags were then unpacked and resorted into recyclable, compostable, and garbage categories. Safety precautions used during the inspection included hazardous waste suits, puncture proof gloves, safety glasses, and tongs. The resulting bags were deposited into two 6 yard dumpsters (one for recycling, the other for garbage and compostables) provided by the waste hauler (BFI Canada).

The volume based methodology was used in order to maximize the sample size and minimize time spent on the audit and resulting costs. It is a good method for measuring loose waste. Items such as plastic film, plastic containers, and tissue paper tend to weigh very little and yet take up large volumes. If the results are to be extrapolated to compacted waste (its state in the landfill and a common method of handling large volumes), then the effect of these light compressible materials will be exaggerated. Similarly, the effect of metal, glass, and office paper will be underestimated.

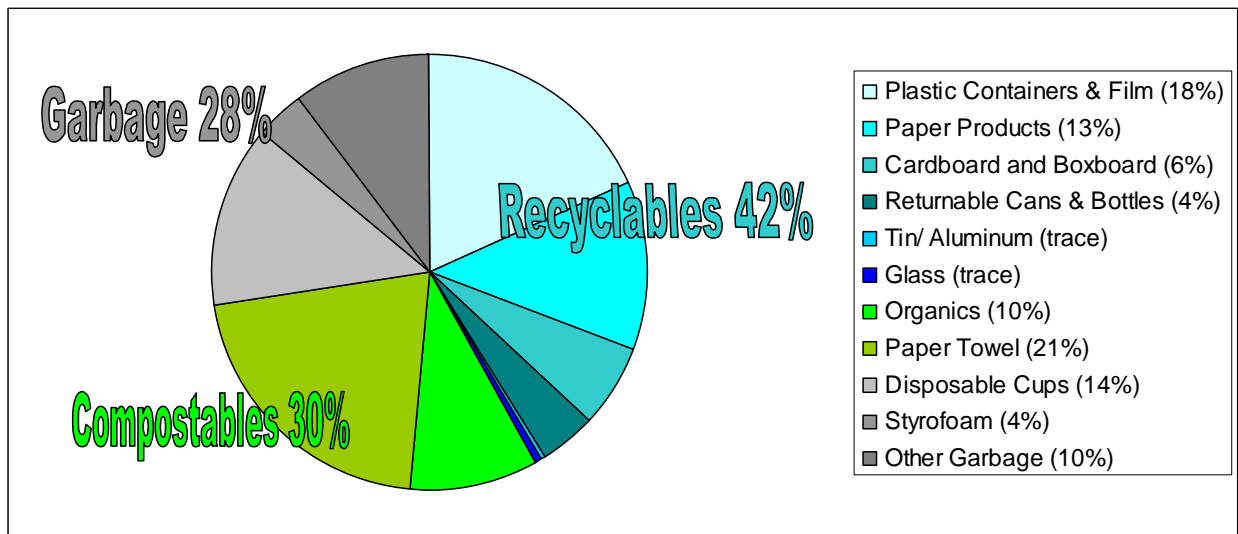
3.0 Observations and Recommendations

UBCO already has many waste reduction practices in place and a composting project under development. It currently collects and recycles or reuses:

- Paper
- Cardboard
- Metal food containers
- Plastic containers and film
- Returnable beverage containers
- E-waste, batteries and fluorescent tubes
- Other Metal
- Hazardous waste.
- Large toilet paper rolls that are not quite used up.
- Animal waste and fats
- Ink printer cartridges

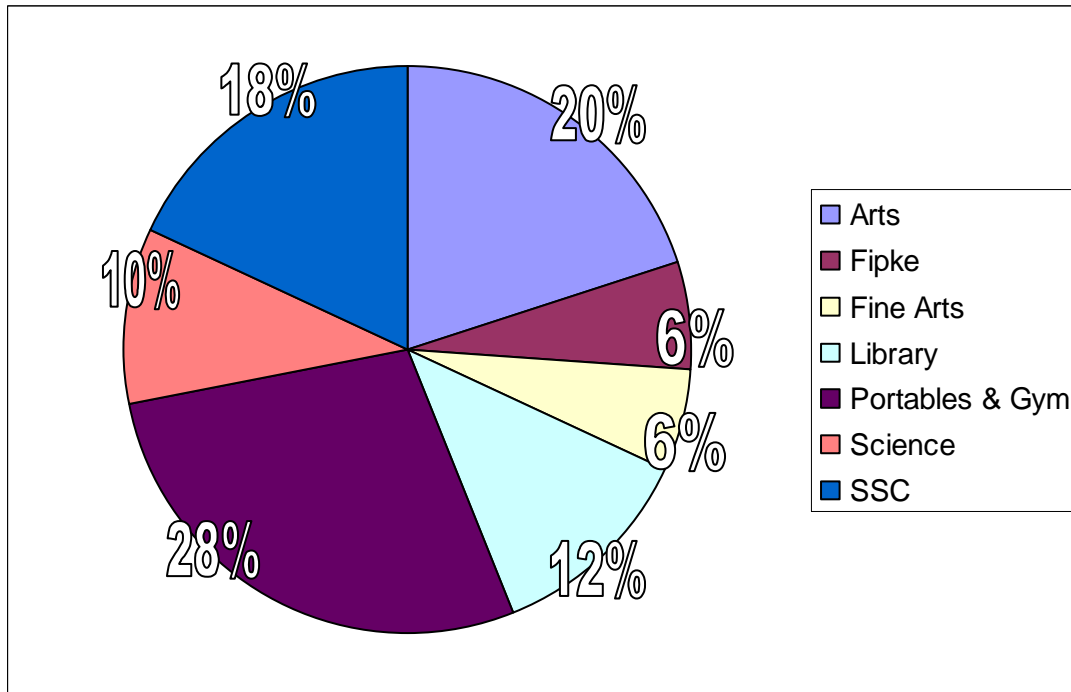
Overall results indicated 10,830 Liters of waste produced for Oct. 21, 2008 (See Summary Table in Appendix A). This is the equivalent of 3.5 standard 4 yd dumpsters or 120 standard household garbage cans. Of this waste 42% is currently recyclable and 30% potentially compostable (see Chart 1 below). Only 28% was considered garbage.

Chart 1: Volume of UBCO Waste by Type.



Of the seven buildings involved in the audit, the Portables and Gym produced more than a quarter of the waste (See Chart 2 below). The Library and Fine Arts buildings produced the least (6% each)

Chart 2: Volume of UBCO Waste by Origin.



General Recommendations:

- Appoint key permanent staff to form a “Sustainability working group” to coordinate internal sustainability related initiatives. Perhaps this could be connected to or a part of the Okanagan Sustainability Institute. Include a person to oversee, prioritize, and coordinate waste reduction initiatives.
- Educate janitorial staff on your recycling program, ask them to monitor its effectiveness and report back to key staff.

3.1 Materials Found and Diversion Opportunities:

The audit found large volumes of recyclables and compostables in the garbage. The following delineates the products in greater detail and includes recommendations on how the recyclables can be collected and sent for processing instead of being sent to the landfill.

The first four material categories (Plastic container and film, Paper products, Cardboard and Boxboard, and Metal containers) are mandatory recyclables. The recycling bylaw requires that all businesses and institutions have the facilities and hauling service in place for recycling these materials. The next two (Returnable beverage containers and Glass) are also easily recyclable. The following two categories (Tissue paper and Organics) reflect UBCO's interest in composting. Finally Styrofoam, Disposable Cups, and Other Garbage are currently considered garbage.

This report reflects only a one day sampling of materials found in UBCO's garbage. We did not, therefore, find materials that may only appear periodically such as E-waste, fluorescent tubes, hazardous waste, and ink printer cartridges. Their importance to waste reduction initiatives cannot be overstressed, however, since despite small volumes, they carry hazardous materials. Fortunately, recycling programs for these materials are in place at UBCO.

Recommendations:

- Keep garbage and recycling collection bins together so that students and staff have essential disposal options easily available.
- Organize janitorial staff to empty mixed recycling bins regularly. Keeping the bins free of clutter is helpful to a recycling program.
- Approach the following recommendations with large volume items first (i.e. Mandatory recyclables first then Tissue Paper, Disposable cups, Organics, and finally the other categories). Hazardous waste such as medical waste, e-waste, and fluorescent tubes also deserve a high priority.
- See the section on Education for more general recommendations related to education.

3.1.1 Mandatory recyclables

Plastic containers and film comprised the second largest quantity (18%) of the waste. More than a third of the total waste (36%) was composed of mandatory recyclables ((Plastic containers and film, Paper, Cardboard, Metal containers). These items are not only recyclable, but easily included in recycling collection programs in the Central Okanagan.

Recommendations:

- Establish clearly labeled mixed mandatory recyclables collection containers in communal areas where garbage cans are located. Signs that are graphic and easy to read are helpful. (See Appendix B for an example).
- Educate students and staff on recycling opportunities available and how to use them (see section 4.0).

3.1.2 Beverage Containers

UBCO collects and recycles pop cans and some juice boxes through the Kelowna Self Advocates Program. Some pop cans, water bottles, plastic beverage bottles and juice boxes (4%) were found in the waste.

Recommendations:

- Educate students and staff on how the money collected through returnables recycling is used (see <http://kdscl.bc.ca/selfadvocate.shtml> for more information). Post a note to that effect on the collection containers.
- Make sure that clearly labelled collection containers are available where returnables are likely to be discarded.

3.1.3 Glass

Very little glass (0.4%) was found in the waste. Being that it is of little consequence to the landfill other than taking up space and that the amounts are currently very low, it should be the last of the waste to be examined.

Recommendations:

- Continue maintaining current recycling options.
- Re-examine your glass recycling program once other waste reduction efforts are complete.

3.1.4 Paper Towel

Bathroom tissue comprised the highest volume of waste category identified in the audit. Therefore, options for reducing paper towel waste should be seriously considered. There are two

approaches to take to addressing the issue of waste paper towel: replacing their function with air hand dryers, or composting the towels and using the resulting product.

There are a number of new electric hand dryers which claim to be more effective and less expensive than hand towels. See http://en.wikipedia.org/wiki/Hand_dryer for more information. Previous studies have indicated cost savings related to the elimination of paper towels for hand drying.

Recommendations:

- Test the relative merits of composting or replacing hand towels with electric hand dryers to see which avenue would likely be most advantageous from economic, environmental, and social (ease of use, efficacy, and hygiene) perspectives.
- Implement the preferred system based on the results.

3.1.5 Organics

Food waste comprised a tenth of the waste found during the audit. With a composting facility being considered at UBCO, all this waste could potentially be diverted into this new program. Currently collection bins are in place in the UBCO Cafeteria in preparation for their new composting initiative.

Recommendations:

- Install clearly labelled “organics” collection bins where food is purchased, prepared, and/or consumed in as many areas as your new composting program can handle. Use biodegradable bags to ease handling.
- Investigate the use of tube magnets to catch metal food utensils as food is deposited into your organics bins in cafeterias. Metal contamination can be a problem with food waste.
- Place small, clearly marked collection buckets with lids beside garbage cans so people can easily separate their compostables in areas that are not likely to produce high volumes.
- Put someone in charge of taking care of the bins, or implement a rotation system of putting different people in charge.
- Investigate the use of worm bins in areas where small amounts of organics are generated and staff or students are keen to maintain them. The bin could even be kept in a cupboard or closet so it is out of sight. If properly maintained, worm bins have no odour or insects. Further, the material produced by the worms makes excellent soil to use in office plants, or perhaps the person in charge of maintaining the bin could use the soil for on campus use.

3.1.6 Disposable Cups

Disposable coffee cups made up the largest volume (14%) of waste materials that were neither recyclable nor compostable. Efforts to reduce this kind of waste will depend heavily on alternatives.



Disposable cups

Recommendations:

- Investigate current use of ceramic coffee mugs and reusable spoons throughout all areas of UBCO and identify opportunities for increasing their use. Purchase dishwashers where necessary. In the long run, the savings from not buying disposable products may offset the cost of purchasing mugs and spoons.
- Remove as many disposable cup sources from UBCO as possible, including paper cones at the water coolers and in meeting rooms. Ensure coffee suppliers don't leave cups with the coffee delivery. In places where disposable cups are unavoidable, replace the current varieties with compostable cups, lids, and stir sticks or recyclable cups at water coolers.
- Encourage students and staff to bring morning coffee in travel mugs. Offer cost savings to beverage consumers who use them and monitor the effectiveness of this incentive.

3.1.7 Styrofoam and Booster Juice Cups

Styrofoam coffee cups and loose Styrofoam made up a small but noticeable amount of garbage. A large proportion of it was composed of "Booster Juice" cups from an on-campus concession.

Recommendations:

- Implement a "no Styrofoam" policy. Inform purchasing, concessions, and all staff that Styrofoam is not an acceptable material for beverage containers or packing material. Request recyclable packing materials from suppliers. If non-disposable dishware is not an option, use compostable or recyclable products in place of Styrofoam.
- Offer cost savings to beverage consumers who use reusable cups and monitor the effectiveness of this incentive.
- Contact Jim Ripley of Turtle Tanks (tel:250-863-8372) about the possibility of recycling large amounts of clean styrofoam.

3.1.8 Other Garbage

About 10% of the garbage was not separated into easily recognizable categories. It was composed of single service cream containers, food and candy wrappers, medical equipment, non recyclable plastic, composite materials such as padded mailers, wax paper and milk containers. Small amounts of metal materials, a computer battery, and some medical waste (IV catheters and sealed needle) were also found. Increased awareness around disposal of these latter items could help eliminate these altogether.

Recommendations:

- Gear purchasing decisions as much as possible to recyclable or compostable items.
- Bulk purchasing of single service food items such as creamers can cut down on waste packaging.
- Improve awareness of recycling of odd pieces of metal, computer peripherals and batteries (see education section 4.0 below)
- Consult 2008 commercial recycling directory (attached as Appendix D) for items for which recycling or safe disposal opportunities are not known.
- Check on procedures for medical waste to see if items such as catheters and sealed IV needles belong in the garbage or should have specialized handling.

3.2 Origin of Waste and Waste Handling Recommendations.

Of the seven sources surveyed, two stood out as sources of the most waste (Arts and Portables/Gym). The composition of their waste was very similar to the overall trend at UBCO with the exception of compostables in the Portables/Gym. There was a reversal of the normal high volume of paper towels and low other organics in this building. Two buildings had very low waste volumes (Fipke and Fine Arts).

Recommendations

- Check the availability of recycling stations for handling the materials identified in the audit starting with the high waste volume sources and finishing with the lower.
- Set up recycling stations (See Appendix C for sources of recycling containers) where the need is identified. Ensure bins are emptied regularly and that janitorial staff understand where to properly empty the materials.
- Incorporate recycling bins next to garbage bins in all common or public areas.
- Label all recycling stations in a clear and consistent manner.



Recycling Station

4.0 Education

In order for the recommendations to succeed, UBCO staff and students must be aware of what options are available for disposal, why the program is being implemented and how to participate correctly. The keys to successful education programs are consistency and frequency. To implement excellent communications practices the following tactics are recommended:

4.1 Internal Communications

- Assign at least one permanent staff person to coordinate recycling and educational programs. Maintain a vibrant and mutually supportive connection with the sustainability club and other student organizations.
- Hold an educational seminar for permanent staff, so that management can then convey the importance of programs to students and staff.
- Set up a website for students and staff to stay current on waste reduction initiatives. See <http://www.enquiro.com/hr/enquiro-earth.asp> for some ideas. Post instructions related to recycling containers on this site.
- Hold meetings with students and staff to communicate with them. Confirm instructions with e-mails or memos.
- Hold kick-off events to celebrate a new milestone. Educate students at the same time about waste reduction opportunities.
- Hold a friendly competition for the “greenest” faculty, department or staff member.
- Develop posters with simple graphic descriptions about “what goes where.”
- Place posters, memos, et cetera in staff rooms, in entryways, and on bulletin boards.
- Place notices in pay check envelopes. Carry recycling/ waste disposal instructions in a “sustainable campus” section of the student planner.

4.2 External Communications

- Issue a press release once a new program is in place.
- Put up environmental policy and posters in reception areas.
- Host an open house to show off your successes.
- Advertise in various media including ubco.tv
- Compete with UBC Vancouver for greenest campus.

5.0 Implementation

Before implementing or changing a waste reduction program consider the following recommendations. It is important to remember that monitoring and reviewing the program are equally as important as setting it up.

- **Put someone in charge**
 - An organized, enthusiastic and dedicated team leader can oversee steps to get the program up and running. Setting up a “Green Team” can also be effective.

- **Organize the new program**
- **Educate staff and students**
 - Employee and student awareness and education are the cornerstones to a successful program. Keep staff posted on the program through the suggestions given in the 'Education' section.
- **Start the program**
 - Replace outdated or damaged collection bins with new bins containing simple instructions on how to use them properly and where to put materials.
 - Launch the program with a kick-off event such as lunch or coffee and doughnut, and introduce the staff "Green Team" and student sustainability club or key people involved in implementing the program.
- **Monitor the program**
 - Ensure bins are emptied regularly to ensure greater participation.
 - Watch for contamination in the bins and remind staff what can and cannot go in them. Implement ongoing internal communications. Involve janitorial staff in this key aspect of their work.
- **Review and expand the program**
 - Amend the program as needed (i.e. increase educational activities, add more bins, etc). Keep participation high by ensuring the bins are neat and tidy.

6.0 Benefits of Implementing a Waste Reduction Program

Notwithstanding that UBCO is taking the lead to building a more sustainable Okanagan, there are many benefits and compelling arguments to create a robust reuse/recycling and waste reduction program, including:

- Although recycling is not as sustainable as reduction or reuse, it does save 30-95 percent of energy and resources from using virgin materials. This reduction in energy and resource use also reduces CO₂ emissions.
- Materials diverted from landfills help conserve landfill space, an increasingly valuable resource for our community.
- The City's Solid Waste Management bylaw requires all institutions to have onsite recycling programs for all recyclable materials including, all paper, cardboard, #1 – 7 plastics, plastic film, and tin/aluminium cans.
- Working to conserve natural resources and protect the environment is a positive message that can be communicated to staff, students and the community at large.

More Information

For more information, please contact:

Regional Waste Reduction Office

1450 KLO Road
Kelowna, BC V1W 3Z4

Phone: (250) 469-6250

Fax: (250) 762-7011

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Appendix A: Summarized Data for UBCO Waste Audit.











Table 1: Volume of Waste (in Liters) by Type of Waste and Origin.

	Arts	Fipke	Fine Arts	Library	Portables & Gym	Science	SSC	Total
Plastic Containers & Film	334	136	62	106	765	123	456	1982 (18%)
Paper Products	371	46	69	47	680	75	79	1367 (13%)
Cardboard and Boxboard	79	28	14	20	99	56	348	645 (6%)
Returnable Cans & Bottles	113	47	19	87	64	38	94	461 (4%)
Tin/ Aluminum	1	0	0	4	17	3	17	42 (trace)
Glass	1	0	5	26	1	0	0	33 (trace)
Total Recyclables	899	258	169	289	1627	295	993	4530 (42%)
Organics	55	73	47	156	409	47	252	1040
Paper Towel	393	144	246	414	174	422	483	2276
Total Compostables	448	217	293	570	583	470	735	3316 (30%)
Disposable Cups	491	120	39	244	433	101	59	1486
Styrofoam	131	18	8	50	99	9	79	394
Other Garbage	206	49	105	155	287	223	80	1104
Total Garbage	828	187	151	448	819	333	218	2984 (28%)
Total Waste Volume	2175 (20%)	661 (6%)	612 (6%)	1308 (12%)	3029 (28%)	1098 (10%)	1947 (18%)	10830

Appendix B: Mandatory Recyclables Recycling menu

What Can Be Recycled

RECYCLING MENU

<p>Tin Cans</p> <ul style="list-style-type: none"> ● All tin cans ● Empty and rinse ● Labels ok ● NO beverage containers 	<p>Boxboard & Heavy Paper</p> <ul style="list-style-type: none"> ● Cereal box-type cardboard, brown envelopes, paper bags, cardboard egg cartons, neon paper, gift wrap, etc. ● Flatten boxes and remove liners ● NO waxed, plastic-coated cartons or foil gift wrap 
<p>Aluminum</p> <ul style="list-style-type: none"> ● Foil and food containers ● Empty and rinse ● Labels ok ● NO beverage containers (return for refund) 	<p>Books & Magazines</p> <ul style="list-style-type: none"> ● All magazines and catalogues, books without hard covers 
<p>Newspapers</p> <ul style="list-style-type: none"> ● All newspapers and flyers, including all inserts and all ad mail ● DO NOT bundle separately 	<p>Plastic Containers and Film</p> <ul style="list-style-type: none"> ● All plastic containers with # 1-7 recycling symbols -rinse and flatten  <ul style="list-style-type: none"> ● All stretchy plastic film, including grocery bags ● NO plastics without the #1-#7 recycling symbol ● NO Styrofoam, no motor oil or chemical containers ● NO LIDS 
<p>Writing Paper</p> <ul style="list-style-type: none"> ● All white, neon and coloured paper and envelopes ● All computer paper, labels and envelopes with windows ● NO carbon paper, used tissue or paper towels 	<p>Phone Books</p> <ul style="list-style-type: none"> ● All phone directories 
<p>Corrugated Cardboard</p> <ul style="list-style-type: none"> ● Clean cardboard only ● Must be flattened ● NO waxed or plastic coated cardboard 	
<p>NO GLASS</p>	

The materials listed above are accepted for recycling. These recyclable products are **NOT ACCEPTED** as garbage.

For more information call
Waste Reduction Office: 469-6250



Appendix C: Sources of Recycling Containers.

Local Manufacturer:

Paul Mart: 3385 Webber rd. Westbank, BC tel: 250-768-9595 e:pborys@telus.net (Wood recycling bins)

Local Retailers:

RONA:1711 Springfield rd., Kelowna tel: 250-762-7389 Web: <http://www.rona.ca/content/home>

Office Depot: 1540 Keehn, Kelowna tel: 250-868-8549 Web: <http://www.officedepot.ca/>

Staples: 430-2339 Hwy 97 N, Kelowna tel:250-979-7920 Web: <http://www.staples.ca>

Home Depot: 2515 Enterprise, Kelowna tel: 205-979-4500 and 401-3550 Carrington Westbank tel: 250-707-2300 web: <http://www.homedepot.ca>

Home Hardware: 1650 Springfield Rd., Kelowna tel: 250-860-4663 and 2-2475 Westbank tel:250-768-3125 web: <http://www.homehardware.ca>

Canadian Tire:1655 Leckie rd., Kelowna tel:250-860-5744 web: <http://www.canadiantire.ca>

Industrial Paints and Plastics: 1-1934 Windsor Rd. Kelowna tel: 250-763-9426 e:Kelowna@ippnet.com web: <http://www.ippnet.com>

Other suppliers:

Rollins machinery Ltd.

http://www.rollinsmachinery.ca/refuse_recycling_containers.htm (Langley and Vernon)

Econoserve (West Vancouver)

<http://www.recyclebins.ca>

Varsak Trading Group (Richmond, BC)

<http://varsektrading.com/products/>

Techstar Plastics

<http://www.techstarplastics.com/recycling.htm> (Ontario) Ak West (Calgary tel:403-278-9303)

Busch Systems (Ontario)

<http://www.buschsystems.com/centralized.html>

T&T Industrial Supplies (Ontario)

http://www.ttindsupplies.com/product.html?sub_id=160

SSI Schaeffer

<http://www.ssi-schaefer.ca/WR/WRproAP.html#wr1> (Ontario)

Many links for recycling container suppliers here:

<http://www.rrfb.com/pages/Secondary%20pages/wasteseparation.html> (Eastern Canada)

Other sources:

<http://www.uline.ca/AdvSearchResult.asp?Ref=Pwrshp&Source=ALL&keywords=Recycling+containers> (Ontario)

http://www.usplastic.com/catalog/category.asp?catalog%5Fname=USPlastic&category%5Fname=90&Page=1&utm_source=yahoosem&utm_medium=ppc&utm_campaign=usp&cookie%5Ftest=1 (Ohio,USA)

EZ sorter: NI Plastics

<http://www.fortune1000.ca/ni/>

Bags:

<http://www.multibag.com/contactus.asp>

Appendix D: Commercial Recycling Directory