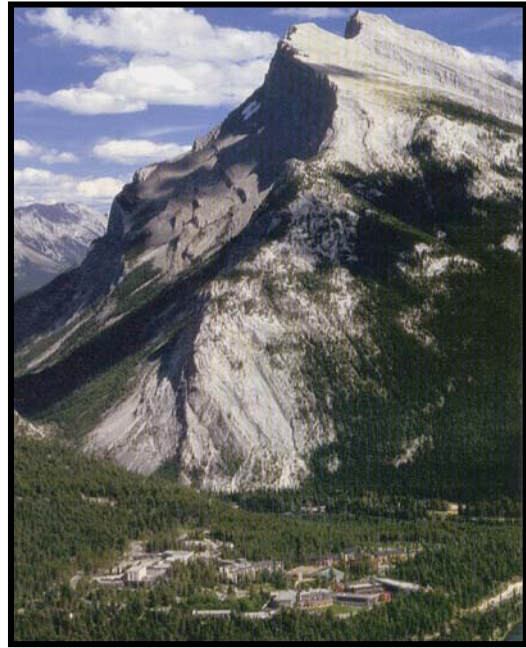


FOOD AND BEVERAGE WASTE AUDIT REPORT

**The Banff Centre
Banff National Park, AB.**



Prepared for:



THE BANFF CENTRE

Prepared by:



IRIS Environmental Systems Inc.

**Banff, Alberta
December 2006**

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1.0 Introduction

As part of the ongoing implementation of their Environmental Management System (EMS), The Banff Centre has been conducting regular waste audits in order to quantify the various components of its waste stream. On December 1, 2006, Iris Environmental Systems Inc. (IRIS) completed the fall 2006 waste audit for the food and beverage department on behalf of The Banff Centre. This waste audit contributes to the growing data set comprising information obtained from August 2001 to present.

The Food and Beverage Department assisted with the organization and procedures for the completion of the research and report.

2.0 Food and Beverage Waste Audit

The waste audit for the Food and Beverage department was conducted on December 1st, 2006. This audit was completed in compliance with the Banff Centre's EMS program and was conducted following the waste audit system formats that have previously been integrated. The food and beverage audit considered the waste produced during a normal operating day, November 30th, 2006 (7:00 am until closing, roughly 9 pm).

The totals for mass and volume of both the waste and recycle streams for the Food and Beverage audit are presented in Table 1. The waste stream constitutes a significantly greater proportion of the generated waste than the recycle stream, particularly due to the significant amount of heavy organic material (food waste) in the waste stream.

Table 1 - Food and Beverage mass and volume totals

	Waste stream	Recycle stream	Total	Percentage	
				Waste Stream	Recycle Stream
Total mass (kg)	375.00	56.25	431.25	87%	13%
Total volume (m³)	1.73	1.64	3.37	51%	49%
Density (kg/m³)	216.76	34.26	251.02	86%	14%

A breakdown of the waste stream reveals the significance of its various components, and is displayed in Figure 1 and Figure 2. It can be seen that food waste remains the most important waste category for food and beverage, particularly in terms of the mass percentage. The results also indicate that the following categories did not significantly

contribute to the waste stream: grease, polystyrene, foil, chaffing fuel containers, newspapers, magazines, metal, pop containers, and office paper. The categories of “other paper” and “other plastic” were negligible in terms of mass and total waste volume, which shows a large difference compared to the November 2005 waste audit when these categories were more significant in the audit. This change could be due to the successful source reduction of packaging materials. As it is difficult to draw conclusions from a single event, this trend will be monitored in the future auditing exercise to discern potential trends.

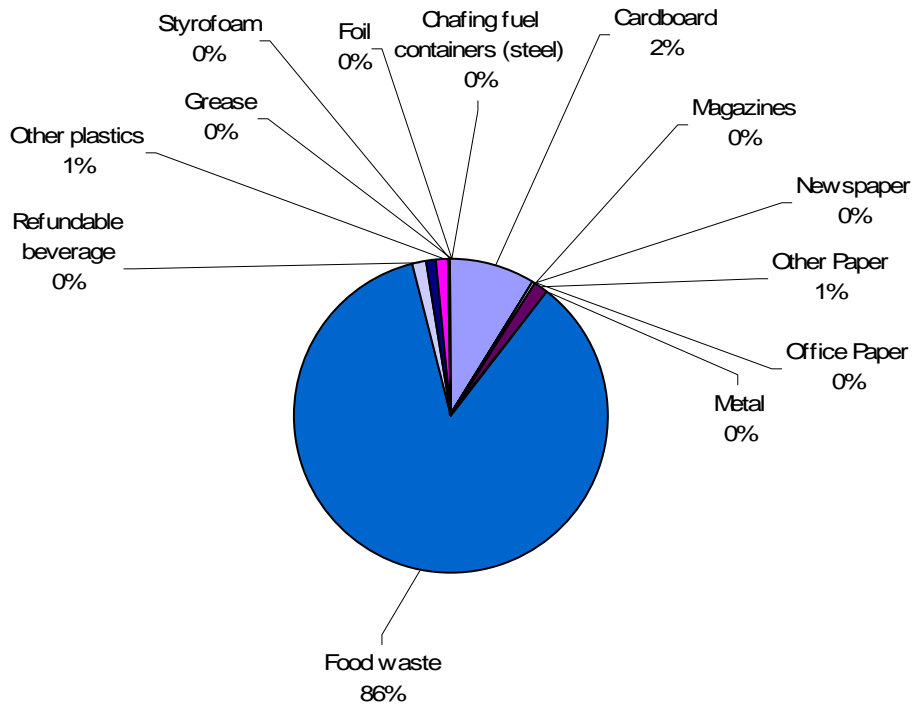


Figure 1 - Food & Beverage waste stream composition (%mass) (Dec 2006)

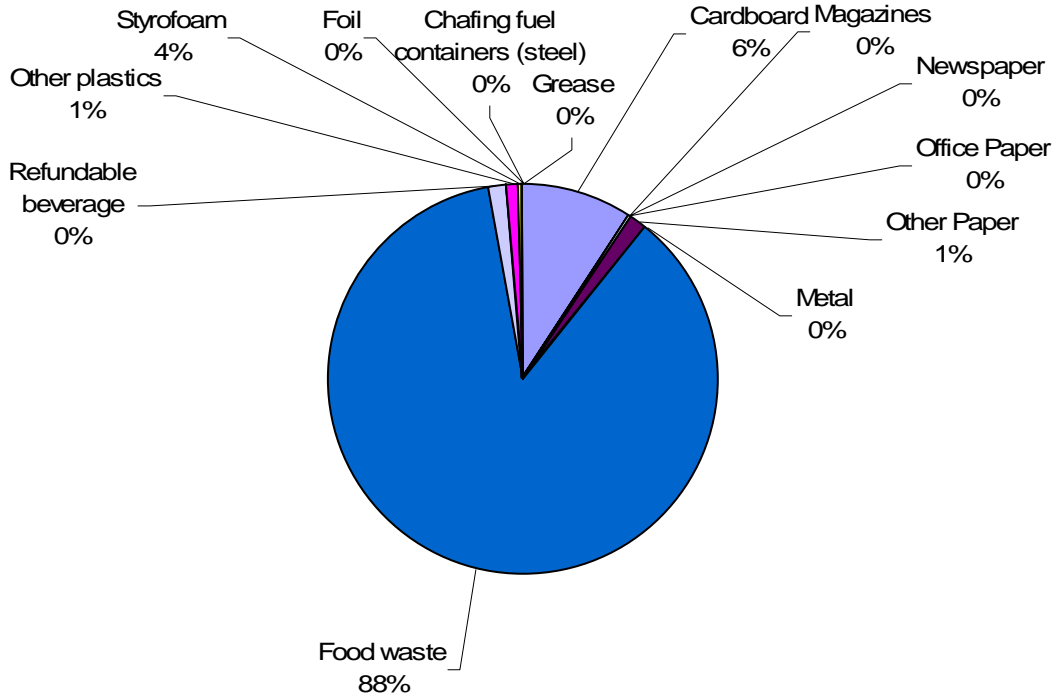


Figure 2 - Food & Beverage waste stream composition (%volume) (Dec 2006)

The composition of the recycle stream is presented in Figure 3 and Figure 4. The main component of the recycle stream was cardboard with a total mass of approximately 37.75 kg, comprising 88% of the total recyclable waste stream. This number is quite low compared to previous waste audits, however this is indicative of the intermittent nature of cardboard generation in this facility and is in fact believed to represent the low end of average daily operations. The second key recyclable components were grease and plastic jugs with a total mass of 8kg and 3kg, respectively. The grease was contained for re-use (bio-diesel) (Note: there were four full 45 gallon drums of grease waiting for recycling) and the plastic containers are compressed and sent in for recycling.

Although the waste audit on December 1, 2006 only indicated a small portion of the steel chafing containers which contain flammable solvents, there were roughly 23 containers, approx. 45kg, of these solvent containers in the vicinity of the waste station, which indicates that the department is recycling these materials, however they may wish to remove the majority of these containers from the premises for safety purposes. Cardboard recycling continues to be well planned and there was evidence of this 24-

hours prior to the waste audit, it appears that the cardboard material was recycled accordingly.

During the recycle stream waste audit there was no evidence of refundable beverage containers (cans, bottles). From observations of the operation of the department there was no indication of these materials in the waste area, it can be concluded that the majority of these containers are recycled and the department is taking the appropriate steps to have best-practices in place for these procedures.

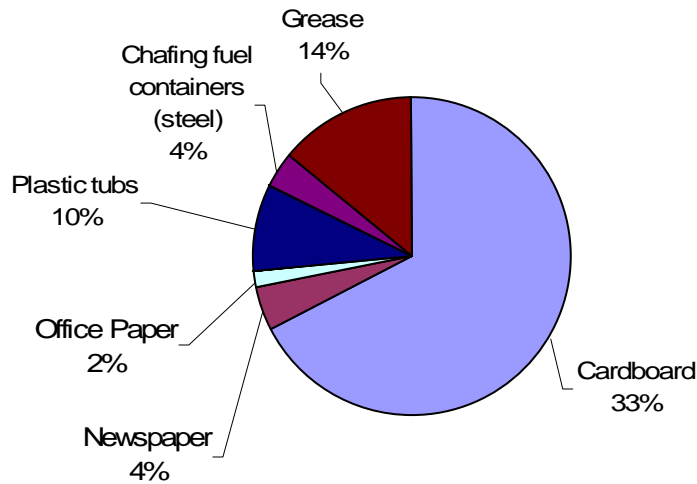


Figure 3 - Food & Beverage recycle stream composition (%mass) (Dec 2006)

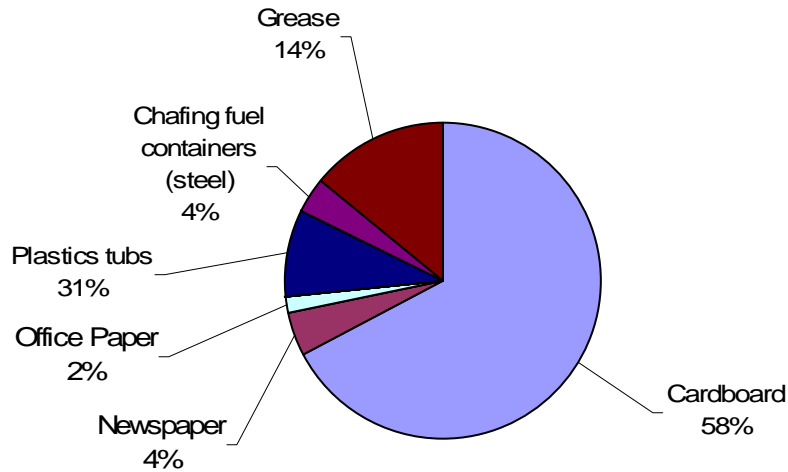


Figure 4 - Food & Beverage recycle stream composition (%volume) (Dec 2006)

Figure 5 shows changes in the composition of the food and beverage waste stream from 2003 to 2006. No significant results can be obtained from this analysis, however there appears to be a reduction in the percentage of the total mass of the other paper and other plastic categories, and an increase in the percentage of food. Once more data becomes available a statistical analysis will reveal the significance of these results.

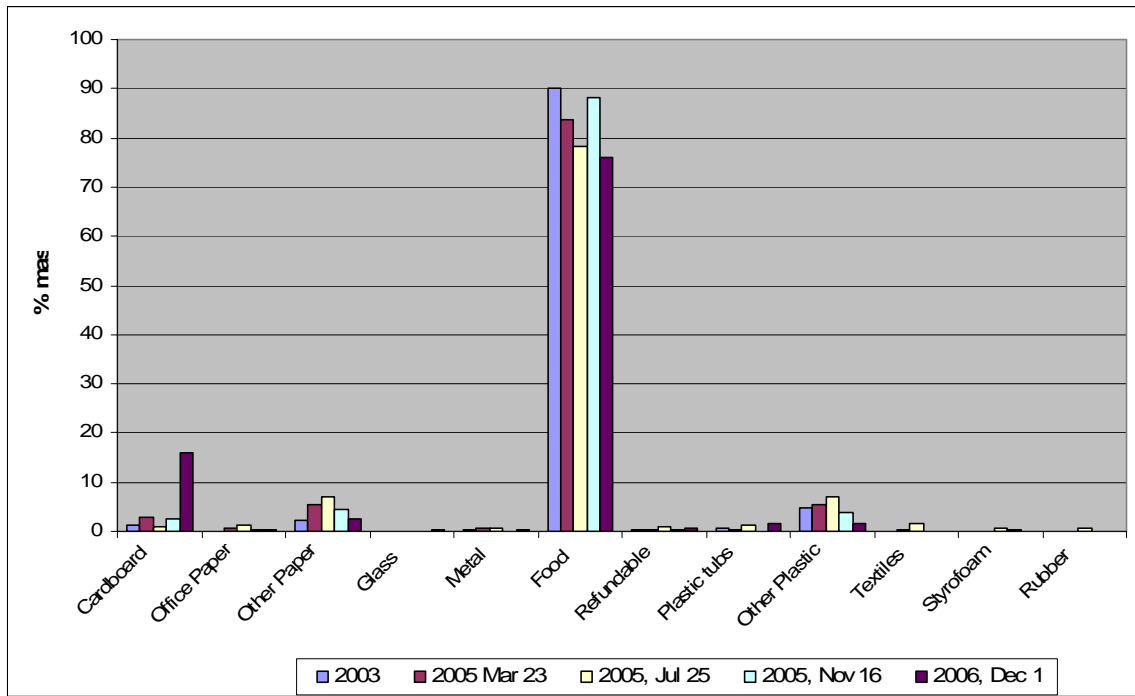


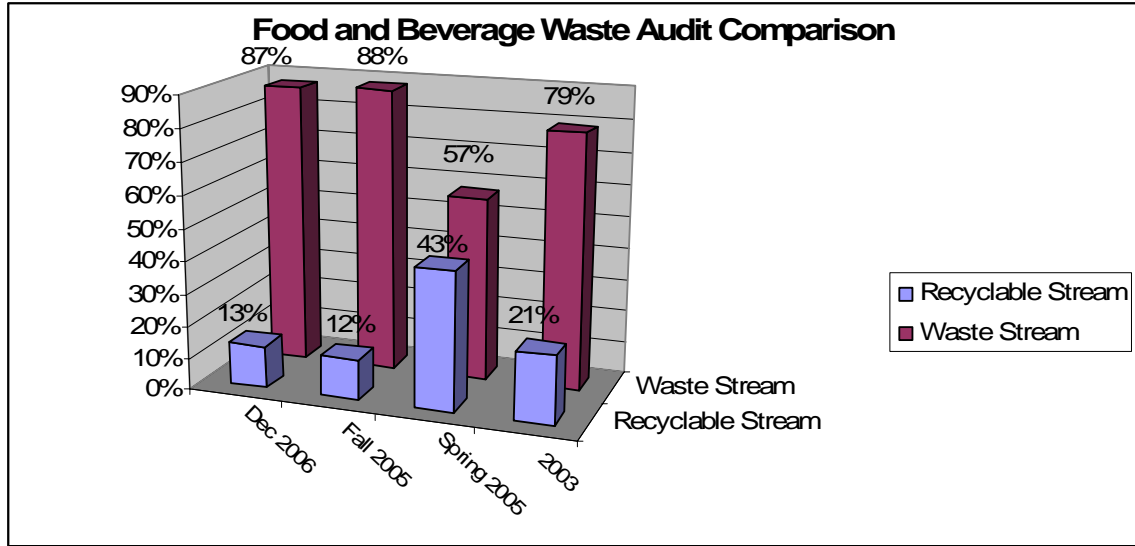
Figure 5 - Food & Beverage waste composition patterns: 2003 to 2006

3.0 Food and Beverage Annual Comparisons

It must be acknowledged that these auditing events are merely snapshots of activity occurring at the Banff Centre at a given point in time and should not be extrapolated to represent annual values. As these audits continue it may be possible in the future to identify trends arising from the data, however at this time there simply is not enough sampling events to identify statistically valid trends.

A particularly valuable parameter of performance is the amount of waste per cover.

In 2003 the waste audit revealed .22kg of waste per cover, in 2005 this value was .44 kg/ cover and in this most recent audit the value was .55 kg/cover.



4.0 Campus Waste Assessment

A Campus- wide waste assessment was not performed as part of the December 2006 audit. The audit of the distinct waste streams from the Housekeeping, Theatre and staff accommodation components of the Banff Centre will be reviewed by the Banff Centre Environmental Committee in 2007.

5.0 Conclusions and Recommendations

The December 1, 2006 waste audit revealed both strengths and weaknesses of The Banff Centre's Food and Beverage waste management program, including issues identified from previous audits. Once again, the food and beverage department should be commended for their assistance in preparing for the external audit.

From the data that was acquired it is evident that the department has continued to separate some materials for recycling, however there are areas that can continue to be improved in order to expand and broaden the departments recycling program. From the audit and research of the operations of the department there are numerous recommendations that can assist with the improvement of the program. Areas that they may wish to consider are:

- It is assumed that the food and beverage department recycles the beverage containers (plastic, bottle and cans) during the day-to-day operations of the department, however there were no records for this recycling. It is recommended that these containers are included in the waste audit so that a formal record of the process begins.
- Consider composting food and other organic waste when composting facilities become available. Efforts are now underway to develop collection strategies in Banff (Bow Valley) and once a strategy is in place in the community the Banff Centre should be prepared to participate.
- Recommend continued vigilance in the separation of recyclable materials: especially newspaper, office paper and metal.
- Discourage the use of disposable to-go cups in favour of re-usable porcelain or durable plastic mugs. Consider issuing all staff their own re-usable steel mug and adjusting beverage pricing to encourage the use of refillable containers.

- When designing the new Food and Beverage facilities consider a food service layout that would allow the elimination of disposable chafing fuel units (for a reduction in recycling and public safety).
- Consider product packaging and disposal options when placing product orders and wherever possible select products packed with natural recyclable materials such as unbleached cardboard and box-board.

6.0 References

The Banff Centre Waste Audit Report November 2005

The Banff Centre Waste Audit Report. July 2005

The Banff Centre Waste Audit Report. March 2005

The Banff Centre Waste Audit Report. April 2005

The Banff Centre Waste Audit Report. August 2001