



# Northgate Recycling Demonstration Project

## Final Report – November 2006

### 1. Introduction

The Southern Waste Strategy Authority (SWSA), in conjunction with the Packaging Stewardship Forum (PSF) of the Australian Food and Grocery Council (formerly the Beverage Industry Environment Council), Veolia Environmental Services (formerly Collex Recycling) and Northgate Shopping Centre Management have been trialing a demonstration project at Northgate Shopping Centre (total floor space 19,241m<sup>2</sup>), to showcase improved waste minimisation techniques in the retail industry. The original details of the Northgate Proposal are attached in Appendix A, with further background information detailed in Appendix B.



This report summarises the results from the initial base line audit and the two subsequent bin audits carried out at the shopping centre on 9 December 2004 and 22 July 2005. It details the actions taken based on findings and recommendations following these audits, and finally, makes a number of recommendations based on observations and findings following the third audit and through site visits to the centre, which concluded in October 2006.

Finally, this report serves as a case study, highlighting a number of the key successes and limitations of the demonstration project.

## 2. Summary

The Northgate Demonstration Project ran for almost 2 years since its launch in October 2004. In this time a number of common issues and findings have emerged:

- It is essential that the recycling bins be closely paired with garbage bins – in a number of cases a spacing of only one or two metres adversely affected performance.
- Clear and uniform signage assists proper source separation. However, despite the majority's best intentions to 'Do The Right Thing', there is evidence of deliberate sabotage by a minority.
- A target of less than 10% contamination for the majority of bins would normally be desirable before the material is sorted for recovery. Significant improvements have been made throughout the centre (particularly in the food court area); however, ongoing education is needed to ensure the best possible chances of recovery.
- Variable quantities of total waste were recorded, depending on the day of the week, ranging from 39 to 79kg/day for this small shopping centre – averaging 65kg/day, or about 24 tonnes per annum.
- Overall, 23% of this total was beverage containers – i.e. 5.9 tonnes per annum potentially recoverable.
- Overall composition of beverage containers recovered was:  
54.7% Glass, 36.5% PET, 5.7% Aluminium, 2.8% HDPE (all weight %)
- The overall recovery of beverage containers was as follows:
  - 0% Baseline audit (before recycling infrastructure was installed)
  - 50% for Audit 2
  - 66% for Audit 3

## 3. Audit Findings

Detailed reports are listed in the reference section of this report and are available on request from SWSA. The results are summarised below:

The baseline audit involved 21 garbage bins, which were audited to determine where PPR bins should be sited. It was noted that the greatest concentration of recyclables was in the food court area and also at entrance and exit points.

### Composition of Potentially Recoverable Material in Baseline Audit

	% Glass	% PET	% Alum	% HDPE	% Total Potential Recoverable Recyclables
Baseline Audit	70	20	6	4	15.6

### Paired Bins versus Unpaired Bins

The results clearly show that the recycling/garbage bins should be closely paired.

#### % Recyclables in Garbage Bins

Audit	Paired	Unpaired
2	16.4	22.5
3	3.5	10.5

#### % Contamination in Recycling Bins

Audit	Paired	Unpaired
2	31.8	42.4
3	28.4	N/A

### Food Court versus Other Areas

The results demonstrate that superior results are achievable in the (supervised) Food Court area.

#### % Recyclables in Garbage Bins

Audit	Food Court	Other Areas
2	15.3	21.8
3	2.8	9.4

#### % Contamination in Recycling Bins

Audit	Food Court	Other Areas
2	30.0	42.9
3	20.7	38.5



### Composition of Material Recovered

	Glass kg	PET kg	Alum kg	LPB kg	HDPE kg	Total Recovered kg/day	Total Recyclables kg/day	% Recovery
2nd Audit	5.44	5.86	0.58	0.06	0.30	12.24	19.08	50
3rd Audit	6.50	2.12	0.66	0	0.32	9.6	13.40	66
<b>Total kg/day</b>	<b>11.94</b>	<b>7.98</b>	<b>1.24</b>	<b>0.06</b>	<b>0.62</b>	<b>21.84</b>	<b>32.48</b>	
<b>% Total Recyclables</b>	54.7	36.5	5.7	0.3	2.8			

## 4. Project Detail

After the baseline audit, recycling bins and extra garbage bins were introduced into the shopping complex. The second audit revealed:

- The percentage of contamination found in recycling bins was also significantly lower in the paired (with a garbage bin) bins (31.8%) compared to the unpaired bins (42.4%)
- The second audit revealed 16% potentially recoverable (based on the total audit sample), of which 50% was recovered.

Based on these findings, further changes were made in order to improve on the recovery rate of recyclables. These included:

- Pairing all recycling bins with a garbage bin.
- Improved signage and educational posters
- Training of the clean team in the food court
- Siting a further 6 garbage bins throughout the complex.

A third audit was then conducted, which found:

- The percentage of recyclables in paired garbage bins was again less than that in unpaired bins. There was also a significant improvement on the second audit results
- The percentage of contamination found in recycling bins was also significantly lower in the paired bins compared with audit two.
- The third audit revealed 12% potentially recoverable, of which 66% was recovered.

A large number of full and part full beverage containers were found in recycling bins in both audits two and three. For recycling purposes, these are considered contamination and will not be recovered at a Material Recovery Facility. They also bias the results to some degree, depending on the amount of liquid found in the containers.



Following the completion of audit number three, further signage was introduced to all recycling bins throughout the centre, which read “Empty Containers Only”. It was hoped that this would help to reduce the incidence of part-full beverage containers. Ongoing education was also recommended to reinforce this message.

Unfortunately however, a number of cases were noted of garbage being forced through recycling bin rosettes. This is difficult to control and appears to be due to the actions of a relatively small number of people who are sabotaging the program, despite signage, etc.

Therefore, when considering recycling as an option, thought should go into bin choice to minimise the chances of sabotage. Preference should also be given to side mounted rosettes rather than the top mounted rosettes that have been used at Northgate.



Currently in the Material Recycling Facility (MRF) operated by Veolia Environmental Services in southern Tasmania, 10% contamination or less is considered the acceptable benchmark for sorting and recovery. Given that 7 out of the 10 recycling bins recorded 18% or less contamination (including part full beverage containers) in either audit 2 or 3, with ongoing education, good levels of recovery appear achievable. This also suggests that on a whole, the demonstration project has been successful in its original aim of demonstrating improved waste minimisation techniques to the retail industry.

Whilst this project dealt solely with the recovery of beverage containers, future improvements may also be possible in the recovery of other materials (i.e. cardboard) with the aim to further improve on the systems in place and to increase recovery rates.

## 5. Recommendations

- Recycling bins should be paired with and sited next to (not near) a garbage bin in order to maximise recovery of recyclate and to minimise the incidence of contamination. Stand-alone recycling bins will attract higher levels of contamination.
- Keep bin signage clear and uniform and the messages simple and positive. Consider the use of an “EMPTY CONTAINERS ONLY” sign for recycling bins to reduce full and part full containers ending up in the recycling stream.
- When considering bin design, preference should be given to recycling bins with side mounted rosettes, as opposed to top-mounted, in order to discourage deliberate misuse.
- Particular attention should be given to recycling in food court areas, as these are generally more regularly monitored and serviced by cleaning staff. Therefore, a higher recovery rate with lower levels of contamination is generally more readily achievable.
- For occupational Health and Safety reasons, it is not advised, nor recommended that cleaning staff sort through recycling bins once material has been placed into the bins, unless for the purposes of auditing that material. Therefore consider the use of clear liners in recycling bins to allow for a visual inspection of contents,

without staff having to rummage through the bag. A bag with too much contamination can be placed straight into the garbage stream.

- Ongoing education of the public and cleaning staff is essential to maintain a successful recycling program. For example, the use of laminated table signage serves as a useful tool for reinforcing the recycling message to patrons seated in food court areas.

## 6. References

1. Northgate Baseline Audit Report, SWSA, Mar 2004
2. Northgate Audit 2, Athena Waste Management, 9 December 2004
3. Northgate Audit 3, Athena Waste Management, 22 July 2005

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**Nov 2006**



PACKAGING STEWARDSHIP FORUM



The National Packaging Covenant



## APPENDIX A

### DETAILS OF PROPOSAL

The SWSA and BIEC<sup>1</sup> propose that Northgate Shopping Centre will be developed as a demonstration project, to showcase improved waste minimisation techniques in the retail industry, including:

- Public Place Recycling facilities are proposed to be installed throughout the shopping mall, as indicated in the site plan attached.
- SWSA and BIEC shall provide 21 new recycling bin outer cases (see photograph) at an estimated cost of \$15,750 plus GST. Northgate Shopping Centre shall provide the plastic inner bins for these units.
- SWSA/ BIEC shall provide the maximum possible flexibility to Northgate, with respect to the precise design and colour of the bins.
- Servicing of the bins shall be the responsibility of Northgate.
- The recycling bins shall generally be sited adjacent to the existing garbage bins, with the precise locations to be agreed by Northgate.
- Integrated signage shall be supplied by SWSA and BIEC for these bins and for the existing recycling bins in the Food Court area, which are not proposed to be replaced.
- In conjunction with Northgate, SWSA/ BIEC shall liaise with cleaners and waste/ recycling contractors to optimise the efficiency of collection systems and to ensure that recyclables are reprocessed.
- SWSA and BIEC shall promote the project as a model for the region, via press releases, the SWSA website [www.southernwaste.com.au](http://www.southernwaste.com.au) and by paid advertising.
- Audits shall be used to monitor the performance of the systems and Case Studies prepared by SWSA and BIEC shall provide a template for adoption by similar businesses.
- It is intended that the project will extend to further initiatives in the future by mutual agreement. This is likely to include optimization of commercial cardboard recycling, the training of shop owners and staff, etc.

With respect to the ongoing project, SWSA and BIEC aim to defray the initial set-up costs associated with future developments; however we believe that the systems established should be self-sustaining in the longer term.

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<sup>1</sup> Since the commencement of the Northgate Demonstration Project the Beverage Industry Environment Council has undergone restructuring and is currently referred to as the Packaging Stewardship Forum of the Australian Food and Grocery Council. However, in both Appendices it appears as BIEC, as it was formerly known.

## APPENDIX B

### BACKGROUND INFORMATION

#### **Southern Waste Strategy Authority**

The SWSA is a Local Government Joint Authority, formed by the twelve southern Tasmanian councils, to implement a comprehensive waste management strategy throughout the region.

#### **Beverage Industry Environment Council**

BIEC represents the beverage industry in developing markets and assisting Councils and Contractors to establish collection systems for recyclable containers. BIEC supports the recycling industry through a number of programs including the funding of Public Place and Major Events Recycling initiatives, and supporting commercial recycling projects.

#### **Why Target Commercial & Industrial Waste?**

Commercial and Industrial (C&I) and Building & Demolition (B&D) wastes represent more than 50% of all residual waste in southern Tasmania, even after the segregation of the majority of B&D waste (clean fill).

Studies and consultations with the waste management industry during 2002/ 03, have identified the key targets for C&I recycling as paper/ cardboard and beverage containers in the tourism/ hospitality, retail and manufacturing sectors.

#### **Non-municipal Strategy**

The SWSA is implementing a pilot business waste management program in 2003/ 04, with the assistance of BIEC in specific areas.

Experience elsewhere indicates that improved waste management practices in business seldom result in substantial cost savings. The strategy therefore focuses on waste management planning and the creation of a higher public profile for those businesses that try to 'do the right thing'. Actions for 2003/ 04 include:

- Encourage transparency with regard to the setting of waste disposal charges by member councils.
- Investigate potential transport and service improvements in rural municipalities.
- Investigate potential regulatory mechanisms for B&D waste.
- Promote and supplement the information available on the Authority's website.
- Introduce a public recognition program for business, to be known as "The Clean Business Challenge" (launched on 14 October 2003).
- Implement a number of integrated demonstration projects.

## Waste Minimisation

The waste management hierarchy is commonly used to rank the key mechanisms available for waste minimisation:

- Waste reduction measures (eg light weighting of packaging materials)
- Re-use
- Resource recovery (recycling, re-processing)
- Energy Recovery
- Residual Waste Disposal

## Recycling

A number of national and international studies have demonstrated the overall benefits associated with recycling. Kerbside recycling enjoys strong community support and has been successfully introduced to most of southern Tasmania, however considerable scope exists for the extension of recycling to other spheres. The yield of recycled material is the key driver of the economic benefit, hence recycling becomes more viable as it moves beyond the home.

## Public Place Recycling

The Beverage Industry Environment Council (BIEC) has conducted extensive research into littering and recycling in Australia.

BIEC's "Non-Residential Beverage Container Recovery Feasibility Study" estimates that 50% of beer and soft drink containers in NSW derive from non-residential consumption (hotels, retail etc). The net community benefits in that State are estimated at \$10M - \$26M, if the NSW Beer and Soft Drink Industry Waste Reduction Plan targets can be met. The most significant benefits derive from avoided energy use, reduced greenhouse emissions, and the sale of recovered materials.

In southern Tasmania, BIEC and SWSA cooperate to deliver two Away-from-Home Recycling programs – Public Place and Major Events Recycling. The BIEC research provides the model for Public Place Recycling which has been adopted for southern Tasmania:

- The establishment of coordinated systems, based on local "precincts" (eg Port Arthur Historic Site) is strongly supported. Clear boundaries for a particular area are required, and the support of the site owner is essential. BIEC also believe that support from local businesses, Council, the community and media is desirable.
- A coordinator is required, to ensure that the required elements of infrastructure, education and logistics are assembled - the SWSA and BIEC aim to fulfil this role in southern Tasmania. This permits a consistent approach to be adopted throughout the region, coordinated with other regional public awareness activities.

- Improved littering behaviour is generally associated with more bins, although not in a simple manner. Systems should be designed to consider disposal behaviour, location and activities throughout the area.
- Research conducted for BIEC strongly suggests that recycling bins should be installed adjacent to rubbish bins.
- The public awareness implications of public place recycling installations need to be considered, including prominent signage and publicity.
- As recycling is implemented, it should be accompanied by audits to monitor performance, and by appropriate training.