



Government of South Australia

Zero Waste SA

Business Case for Councils to Undertake Co-Collection of Food Waste with Garden Organics

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The South Australian Government established Zero Waste SA to promote waste management practices that, as far as possible: eliminate waste or its consignment to landfill; advance the development of resource recovery and recycling; and, are based on an integrated strategy for the State.

To achieve these objectives, Zero Waste SA needs local government, industry, and the State Government working and communicating together.

Final Report

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**Business Case for Councils to
Undertake Co-Collection of Food Waste with
Garden Organics**

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Executive Summary

South Australia's Waste Strategy 2005 – 2010 sets the following target for municipal solid waste:

***By 2010, 75% of all material presented at the kerbside is recycled
(if food waste is included)***

Household waste and recyclables kerbside collection services vary between councils. The existing service that generates the highest diversion from landfill of collected materials uses 3 bins, a 120-140 litre mobile garbage bin (MGB) for waste – collected weekly, and a 240 litre MGB for recyclables and another for garden organics – both collected fortnightly. Zero Waste SA's audits show such a service typically diverts 57% of all material from landfill. It is becoming councils' preferred service and is now in place in just over half of all metropolitan municipalities.

Very few Australian councils have, to date, trialled or implemented kerbside co-collection of domestic food waste and garden organics. The small number that have done so interstate have typically processed material 'in-vessel'. Burnside Council, with funding support from Zero Waste SA, successfully trialled a system that involved open windrow processing. This method offers considerable reduction in costs.

The results of the Burnside trial were reviewed and all SA metropolitan and 3 regional councils surveyed in regard to their waste management services in research for this report. Council survey responses highlighted a strong interest in further improving landfill diversion rates but concerns about perceived cost implications. The typical variation in costs councils can expect to incur if they decide to introduce co-collection of food waste and garden organics were calculated based on information from the survey and other sources.

If a council currently provides a fortnightly garden organics waste collection service then the additional cost to introduce food waste co-collection is of the order of \$15 to \$16 per household per annum. Where this service is provided in conjunction with a weekly 120-140 litre MGB residual waste collection and a fortnightly 240 litre MGB recyclables collection service it is likely to see landfill diversion rates increase to about 66% of all material presented at kerbside.

By far the largest component of the cost of co-collection is the provision of cornstarch (compostable) bags used for collecting food waste in the household kitchen. These are estimated to cost about \$10 per household per annum. It is possible to introduce co-collection without provision of compostable bags but not recommended. Such a system is likely to have less householder acceptance and consequently participation and diversion rates are likely to be considerably less. It is also likely to lead to some householders using plastic bags to dispose of food waste and therefore lead to significant problems with contamination of collected and processed material. As demand develops it is likely that the market price of cornstarch bags will fall in price in real terms (i.e. net of inflation) and/or cost-effective substitutes will emerge.

If a council currently provides a 4 weekly garden organics collection service using a 240 litre MGB it would need to upgrade this service to fortnightly if it decided to co-collect food waste with garden organics for reasons of householder acceptance, public health and amenity. This would cost approximately a further \$10 per household per annum on average. Where a

council doesn't currently provide a garden organics collection service at all it can typically expect to incur an additional cost of \$33 per household per annum if it introduces a fortnightly service.

Where a council already has a 3 bin system with fortnightly collection of garden organics it is estimated it would save between \$1 and \$4 per household per annum by introducing co-collection of food waste and garden organics and reducing the frequency of the residual waste collection service to fortnightly. This system has no significant technical/operational impediments but will require SA Government support (e.g. to vary relevant legislative regulations) and significant initial promotion and householder education. This type of service is likely to result in landfill diversion of 77% of collected material, i.e. achievement of the 2010 Waste Strategy target. With increasing community demand for improved environmental outcomes this is a strategy that is now right for the times.

Fortnightly collection of residual waste would encourage further diversion of recyclable material from residual waste MGBs into recyclables MGBs (capacity limits would otherwise be exceeded). Where a council provides a split MGB for residual waste and recyclables it would not be able to retain this system and switch to a fortnightly collection of residual waste as the split MGB would offer insufficient recyclables capacity in such circumstances.

Co-collection of food waste with green organics would prove technically simple to implement and garden waste processors have the capacity and demand to accommodate this service. Diversion of food waste from landfill will result in less methane generation (a particularly damaging greenhouse gas) and instead the production of additional material that is highly valued for mulch and soil conditioning (with associated environmental and economic benefits).

If the landfill levy were to increase in future at a rate in excess of the rate of increase in other costs associated with waste collection services this would have the effect of reducing the increase in costs (assuming weekly collection of residual waste) or increasing the savings (if fortnightly collection of residual waste was introduced) associated with co-collection of food waste and garden organics.

1. Introduction

South Australians are rightly concerned about the impact their lifestyles have on the environment. The State Government and local governments are actively developing and implementing strategies to help our community reduce its ecological footprint.

Reducing the volume of material going to landfill as waste is one of the universal imperatives for environmental sustainability.

One of the targets (Target 3.8) in South Australia's Strategic Plan 2007 is to reduce waste to landfill by 25% by 2014 (relative to baseline 2002/03). More specifically South Australia's Waste Strategy 2005 – 2010 sets the following target for municipal solid waste:

***By 2010, 75% of all material presented at the kerbside is recycled
(if food waste is included)***

Zero Waste SA (ZWSA) has identified that kerbside co-collection of domestic food waste with garden organics could make a significant contribution to improvement in landfill diversion rates.

ZWSA engaged JAC Comrie Pty Ltd in association with TJH Management Services Pty Ltd and Sustainable Outcomes to prepare a business case to assess the costs and other issues associated with one particular system used for the kerbside co-collection of domestic food waste and garden organics (food waste collection) and its relative merits compared with other systems.

The findings of the study are intended by ZWSA to be distributed to metropolitan and other councils as appropriate to assist them in evaluating future waste strategy options and in particular to make an informed assessment of a kerbside food waste collection system.

2. The South Australian approach to reducing waste to landfill

There are two fundamental alternative approaches for recovering resources from the domestic waste stream. One is to separate at source by providing convenient collection systems to minimise the residual waste that is either landfilled or sent for further resource or energy recovery. The alternative is to rely fully on downstream sorting and processing techniques to achieve resource and energy recovery.

South Australia has sensibly adopted and built over a long-period of time on an approach based on separating waste at the source. Container deposit legislation was introduced in the 1970's and successfully encouraged the South Australian community to collect recyclables and return them to recycling depots to redeem the deposit.

ZWSA has built on this positive attitude within the South Australian community and encouraged councils to provide best practice collection systems based on source separation as the preferred and cost effective approach to recover resources from the domestic waste stream.

Reports on alternative waste technologies typically show entry level cost for significant throughputs in excess of 50,000 tonnes per year to be in the order of \$120+ per tonne. In

addition the very significant capital investment associated with this technology typically requires councils to commit waste streams and enter into contracts for periods of up to 20 years.

ZWSA and councils are appropriately seeking to cost-effectively maximise landfill diversion rates utilising current collection systems and proven technology rather than focus on further residual waste treatment or energy recovery of the domestic waste stream. In time, technological and market developments may make such options more attractive.

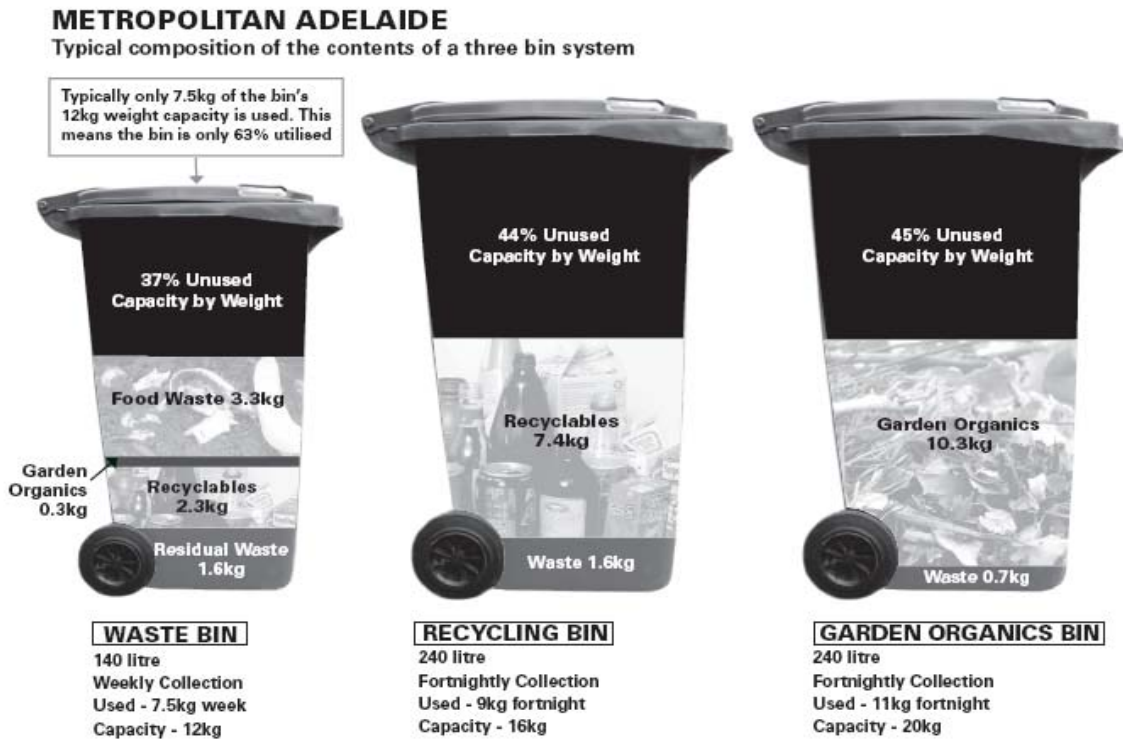
Local government is playing a lead role in progressing towards the State waste diversion targets with the policy advice and support provided by ZWSA. Substantial successes have been achieved in the past 5 to 10 years. Further significant improvements will only be possible if local government is prepared to continue to introduce innovations to its waste management and recycling practices.

Based on responses to the consultants' survey of all 20 metropolitan councils (including Adelaide Hills, Mt Barker) and three regional/rural councils, their waste management and recycling services can be summarised as follows:

- all councils except for one provide a 140 litre MGB or less weekly waste service (exception up to 240 litre MGB weekly)
- there are 10 councils that provide the 3 bin collection service, i.e.;
 - 140 litre MGB collected weekly for waste
 - 240 litre MGB collected fortnightly for recyclables
 - 240 litre MGB collected fortnightly for garden organics
- there is one council that provides the split bin and fortnightly garden organics service
- there are 21 councils that provide a 240 litre MGB recycling collection fortnightly or four weekly
- there are 20 councils that provide a 240 litre MGB garden organics collection fortnightly or four weekly.

(Note the City of Unley is assumed to operate a 3 bin system as it is currently finalising a tender for the provision of such a service.)

Based on the latest waste audit figures from ZWSA, the 3 bin collection system with fortnightly collection of garden organics achieves the highest landfill diversion rate. It currently recovers and therefore avoids disposing to landfill approximately 57% of the material presented for collection.



Total waste collected per fortnight:

<u>Bin</u>	<u>Kg</u>	
Waste	15	----- To landfill 43%
Recyclables	9	} ----- Diverted 57%
Organics	11	

Total	35	

The above representation is a metropolitan-wide average of MGB utilisation. Some households will regularly or in some weeks present considerably more material for collection in any or all of their MGBs. Although MGBs may often appear relatively full by volume they typically have considerable unused capacity by weight. Better packing of material would allow this spare capacity to be utilised and means that proposals discussed later in the report can be successfully implemented not only on average but for households that present an above average amount of material for collection.

Note: It is conventional for landfill diversion rates to be calculated based on the proportion by weight of material presented at kerbside in the residual waste MGB relative to the weight of material presented at kerbside in all (waste, residual and garden organics) MGBs adjusted for frequency of collection. For comparability purposes such an approach has been followed in this study. It is nevertheless recognised that some material presented in the recyclables and garden organics MGBs will be unsuitable for re-use and will therefore be disposed of to landfill. To the extent that this occurs quoted landfill diversion rates in this document and elsewhere overstate actual diversion rates.

3. The importance of extracting food waste from the waste stream

Modest further improvements to the landfill diversion rate could be achieved by initiatives such as:

- greater educational focus on/promotion of recycling
- encouraging all councils to provide a three bin system
- encouraging all councils to collect green organics at least fortnightly.

However as the diagram in Section 2 clearly indicates, the biggest single opportunity to improve diversion rates of domestic waste is to reduce the amount of food waste going to landfill.

The latest waste audit survey for a 3 bin collection system indicates that food waste represents about 44% of the residual waste and 19% of the total kerbside domestic waste/recyclables stream. Full extraction of food waste alone from residual waste would result in a diversion rate of about 76% using a 3 bin collection system (i.e., ignoring likely associated improved diversion of other recyclables from the residual waste stream that would arise with recycling awareness strategies associated with introducing changed food waste collection arrangements).

Co-collection of food waste with garden organics can be readily accommodated in a technical sense with systems commonly in place in most metropolitan councils.

4. The Australian experience with co-collection of food waste and garden organics

The report “Co-collection of Domestic Food Waste and Garden Organics – the Australian Experience” was published by the Department of Environment and Conservation NSW in February 2007.

It highlights that practical experience to date has been very limited. Only six Australian councils currently provide a domestic food waste and garden organics co-collection service. These have been introduced at various times over the past 10 years. Trials have been conducted by six councils in Australia over the past six years (including Burnside). The report comments that a number of other councils are considering trials or implementation of a co-collection service.

The main findings of the report are summarised in the following paragraphs. The report does not address the critical factor of cost.

(1) Diversion

The report found it was difficult to compare diversion rates because there was not a consistent way of reporting the results – results were reported either as a weight, volume and/or percentage. The results for councils on a weight basis ranged from diversion of 2.0 to 2.4 kgs per household per week.

(2) Kitchen containers

The provision of kitchen containers and compostable liner bags:

- increases diversion rates
- increases participation rates
- increases customer satisfaction levels.

(3) Collection containers

240 litre MGBs are the most suitable size for a combined organics service.

(4) Frequency of collection and integration

Weekly combined organics services appear to provide the highest diversion and participation rates and best customer satisfaction.

The reduction in the residual waste service to fortnightly and 120/140 litre MGB results in:

- higher diversion of material into the combined organics service
- increased recycling rates
- increased customer concerns (particularly associated with disposable nappies and the special needs of larger families).

(5) Contamination

Contamination levels can be minimised if the collection contractor is responsible for managing contamination. Integrating complementary contamination requirements in both the collection and processing contracts can also be effective.

(6) Processing

Most co-collection of domestic food waste and garden organics trials have processed the material with in-vessel composting systems. South Australia has a long history of open windrow composting of garden organics and has successfully processed the co-mingled food waste and garden organics material from the Burnside trial using this method. The Burnside trial's co-mingled food waste/garden organics processor (Jeffries) is confident that this success can be replicated and maintained on a much larger scale. If so this process would deliver significant cost savings relative to in-vessel composting.

(7) Product application

The addition of food has some benefits in terms of fertilizer value of the recycled green organics material.

(8) Education and promotion

This is an essential component throughout the life of the service and represents a significant expense factor.

The report *“strongly advises those councils considering trials or the implementation of a service (co-collection of domestic food waste and garden organics) to undertake a detailed investigation of options”*.

The Department of Environment and Conservation NSW engaged Hyder Consulting to conduct a Triple Bottom Line Assessment of Domestic Food Organics Management (report due to be published soon). Early indications are that that report is unlikely to reveal findings prejudicial to the outcomes of this business case study. Its financial assessment of co-collection of food waste and garden organics is not directly comparable with this study because of significant differences in assumptions. The Hyder study for example assumes 'in-vessel' rather than open windrow processing and no provision of bio-baskets (or similar) or corn starch bags and weekly collection of the combined food waste/garden organics MGB.

5. The South Australian experience with the co-collection of food waste and garden organics

5.1 City of Burnside Bio-Organics trial

A full description of the trial is presented at Appendix I.

How do the service parameters and results of the Burnside trial rate against the key findings of the Australian experience?

(1) Diversion

The trial achieved a diversion rate of 1.24 kg per household per week which is significantly less than reported results of other Australian councils (refer 4.(1)).

(2) Kitchen container

The trial met this service parameter.

(3) Collection container

The trial met this service parameter.

(4) Frequency and integration

The co-collection service was provided fortnightly and the residual waste collection was maintained as a weekly service.

(5) Contamination

Jeffries, the contractor for processing the material, indicated a reduced contamination rate over the normal green organics collection and that the material was acceptable for open windrow composting.

(6) Processing

Jeffries reported that the Environment Protection Authority (EPA) and the Department of Primary Industries and Resources South Australia (PIRSA) were confident that, with increased bio security, quality control and improved on-site practices, the co-mingled food and green organics can successfully be open windrow composted. This process does require capping (also known as a bio-filter blanket) of the co-mingled material with green organics or fully composted product for bio-security reasons which adds to processing costs.

(7) Product application

This issue was not addressed in the Burnside trial but Jeffries believes there is considerable potential market demand for the composted material with associated environmental benefits (soil conditioning and retention of moisture).

(8) Education and promotion

This was a priority for the trial and did produce positive results.

Investigation of options

East Waste identified that the Polar-Gruppen organics system trialled in Europe for the co-collection of food waste and green organics was an appropriate option for trialling by Burnside Council.

Overall, the service parameters and results of the Burnside trial rated well against the key findings of the Australian experience with some exceptions which lead to a relatively modest diversion rate. The consultants' review of the Australian experience generally supports the approach adopted by the City of Burnside.

Burnside Council concluded that the introduction of the trialled food collection system was not financially sustainable for the Council unless a number of fundamental issues were addressed:

- funding support
- introduction of a fortnightly residual waste collection (currently weekly)
- introduction of the proposed 'no plastic bag' legislation
- rejuvenating the household recycling culture with a focus on food waste.

5.2 Mount Gambier and Alexandrina Councils' food waste collection service

(1) Mount Gambier

The Council provides a simple pay for service arrangement. The service has not been reviewed in the preparation of this report.

(2) Alexandrina

The Council is considering the introduction of co-collection of food vegetable matter with garden organics. In preparation the Council has:

- obtained a composting licence for garden organics
- conducted limited vegetable waste composting trials
- raised concerns regarding the extent of contamination caused by widespread use of plastic shopping bags
- expressed concern about the high cost of cornstarch bags.

6. Key outcomes from the survey of councils

An important aspect of developing the business case was to ascertain the views of all metropolitan councils and three regional councils on a number of critical issues and seek data relevant to the business case.

This information was obtained using a questionnaire and pleasingly all councils willingly responded to it (refer to Appendices II and III).

A full set of the completed questionnaires is held by the consultants.

The issues they were prompted to comment on were:

- status of their strategic waste management plans
- plans to address domestic food waste
- attitudes to the results of the Burnside trial
- perceived barriers to co-collecting food waste with garden organics
- views on the possibility of fortnightly residual waste collections.

The information sought included:

- current waste management and recycling arrangements
- waste stream tonnages for 2005/06
- indicative costs of each council's waste management and recycling arrangements.

(1) Councils' strategic waste management plans

All councils indicated that they have a strategic waste management plan and that it is formally recognised in their (whole of organisation) strategic management plan. About 30% of councils are currently undertaking major reviews of their waste management plan.

Of note, only about 40% of the councils have adopted specific landfill diversion targets and of these councils, 80% have chosen the ZWSA targets for their council.

(2) Plans for introducing co-collection of food waste with garden organics

The majority of councils surveyed (nearly 70%) indicated that they currently have no formal plans to introduce such a system. (Note: all local governments in South Australia except Adelaide City Council elected new councils for 4 year terms in November 2006. Councils need to review their strategic management plans within 2 years of election and it is likely that many will give consideration to their future waste management strategies during this process.) Two councils advised that they are planning to conduct a co-collection trial in the next 12 months. Three councils indicated that they intend to consider a co-collection system at either the time of reviewing their waste strategy or collection contract review.

(3) Comments on the Burnside trial

Less than 50% of councils had assessed the results of the Burnside trial (a number mentioned that the information included with the survey was the first time they had seen this information).

Of those councils which had considered the results of the trial, the common view expressed was that the cost was significant relative to the outcomes achieved and other known community needs and priorities. Other comments included:

- trial was inconclusive
- arrangements and outcomes are not necessarily directly applicable to other councils.

(4) Barriers to introducing food waste/garden organics co-collection service

The main barriers nominated were:

- additional costs
- no external funding support
- clear benefit/cost justification is required
- householder resistance (participation rates may be low)
- contractual issues
- possible legislative changes required (a number of councils mentioned the Public and Environmental Health Act and the Environment Protection Act)
- contamination issues (eg, plastic bags)

One council expressed concerns about the possible negative technical impacts on baling of compacted residual waste with a reduction in food waste which currently serves to act as a lubricant in the process.

(5) Views on a fortnightly residual waste collection service

Views ranged from very supportive to limited interest at this stage.

Most councils raised the following issues:

- costs
- environmental benefits
- community resistance/concerns (eg, perceived reduction in service).

Many councils would be likely to consider the initiative more favourably provided the above issues were effectively addressed (eg, in part through a comprehensive education and promotion campaign).

Disposable nappies in the waste stream were identified as a specific issue that is likely to generate widespread concerns if residual waste was collected fortnightly.

Legislative provisions which have been interpreted to effectively require councils to collect residual waste weekly would need to be modified to enable fortnightly collections (see p.20 for further reference). One council (Barossa Valley) indicated it is currently seeking community feedback on the possibility of a fortnightly waste collection service.

In summary, the critical success factors identified through the survey of councils are:

- cost implications
- landfill diversion potential
- capability of the technology and processes
- (bio-baskets, bin liners, green organics bins, trucks, processing etc)
- behaviour and attitude of the user (including varying commitments to recycling across different communities)
- contamination issues caused by nappies.

7. Indicative costs of introducing co-collection of food waste and green organics

Methodology

The approach adopted by the consultants was to develop a database of current waste collection services provided by all metropolitan councils and the three nominated regional councils (Alexandrina, Barossa Valley and Mount Gambier).

A benchmarking cost model was also developed based on the consultants' knowledge of the cost to councils for services provided by private contractors and the costs associated with services provided by a regional subsidiary established to provide such services to member councils. (Note, costs calculated from these sources include overheads associated with the delivery of these services such as direct labour overheads (provision for annual and sick leave etc) and supervisory, corporate and admin support (payroll and accounting etc) but not those that some councils apportion in part to their waste management service under "full cost attribution" (such as executive management and other governance related costs). These costs typically would not vary to any marked degree whether a council operated its own waste collection service or outsourced it.)

Yields for each collection stream were also estimated based on average actual yields for a large cross section of metropolitan councils.

Assumptions were made on the cost of processing garden organics, the marketing and sorting of dry recyclables including contamination costs, the provision of bins and the disposal cost of waste direct to landfill or via a transfer station.

A full set of assumptions and cost estimates to develop the benchmarking model is listed at Appendix IV.

As a result of different accounting treatments one council may record and report considerably different costs for providing an identical waste management system in identical operating circumstances. For example one council may assign part of the interest incurred on its debt portfolio to such a service (eg the funding of provision of MGBs). Another may have perceived it funded such costs without incurring a cost for capital because it used existing funds (or assigned a required loan to another project) and ignored for costing purposes the opportunity cost of what the funds could have earned if invested. As mentioned above treatments in accounting for overheads also vary widely between councils. This study is based on economic costs and not the accounting practices of any particular council. For example capital is assumed to have a real (i.e. net of inflation) opportunity cost of 5% and only costs that will vary if a service is added or deleted are recognised, i.e. corporate overheads that will remain unchanged are ignored.

Actual costs will also vary between councils depending on their operating circumstances (eg high or low urban densities and varying waste transfer and landfill disposal arrangements and costs) and the degree of efficiency and under utilised capacity built into their arrangements, and where contractors are used, market conditions and respective bargaining power of the contracting parties at the time contracts were negotiated. Where full costs of a service are quoted in this report it is based on known typical costs incurred by councils.

Each council's particular collection services from the consultants' database and the estimated cost of collection, processing and disposal services were included in a

questionnaire sent to the surveyed councils requesting confirmation of cost estimates and the actual services provided.

All councils replied and provided feedback on the benchmark costing model. This confirmed that councils have a range of issues that affect their actual or recorded cost of services, such as:

- how councils account for the supply of bins
- whether collection services are provided by day labour, through a regional subsidiary, or by a contractor
- how councils allocate overheads to waste services
- whether waste is carted direct to a landfill for disposal or via a waste transfer station
- the distance to travel to processing and disposal sites
- how councils account for user-pays' services
- the extent of the rural collection component within the council area
- contractual arrangements individually or as a group with downstream processors for green organics and recyclables
- contamination disposal costs in the recyclables or garden organics streams.

The 3 bin system (with fortnightly collection of garden organics) is considered to be the most appropriate service from which to initiate co-collection of food waste with garden organics. It is the benchmark system from which additional costs associated with co-collection have been assessed. Co-collection of food waste while maintaining a four weekly garden organics collection service is likely to generate environmental health risks, negative amenity and political impacts and result in disappointing rates of diversion of food waste. The consultants consider that introducing co-collection of domestic food waste and garden organics where a council operates a split bin recyclables/residual waste service with a fortnightly green organics collection is likely to generate approximately the same per annum additional costs and outcomes as with a 3 bin system with fortnightly collection of green organics,

Face-to-face interviews were held with a collection contractor and garden organics processor to identify all the issues associated with a food waste collection. An extensive telephone interview was also conducted with the Australian company that manufactures the bio basket and imports the corn starch bags used in the Burnside trial. A summary of the key outcomes of these meetings is provided below:

Collection Contractor

- The introduction of food waste into the garden organics stream should not increase the cost of the 3 bin service. The additional weight of the corn starch bags will not significantly impact on the productivity of the garden organics collection vehicle for most of the year.

There is a possibility that in peak garden organics collection periods, i.e., spring clean-ups or extremely wet periods, the density of the material collected may exceed the axle loading limits of the truck before the volumetric capacity of the truck is full. This slight loss of productivity is expected to be offset by an improved year-round productivity in the residual waste collection.

- From discussions with the contractor and a review of maximum bin weights the following conservative upper limits were assumed:
 - 140 litre MGB 12+kgs
 - 240 litre MGB recycling 16kgs
 - 240 litre MGB green organics 20+kgs.

With these relatively conservative estimates there are no constraints to the introduction of a food waste collection or fortnightly residual collection.

- There was anecdotal evidence from the Burnside trial and the contractor's experience to indicate improved yields of recyclables when food waste/garden waste co-collection is introduced. Similarly, there is a corresponding reduction in contamination to the garden organics stream with the introduction of food waste co-collection. This would appear to be as a result of associated additional household promotion and education programs.
- PIRSA did not see any problems with garden organics/ food waste co-collection in the Burnside trial. It already has a policy that if there is a fruit fly outbreak in a collection area then all waste must be landfilled for a minimum period of 12 weeks.
- With the introduction of a garden organics collection within a council area there is not a direct "one for one" relationship between the garden organics yield and the reduction of domestic waste. This is due to householders typically using a small part of the additional space in the residual waste bin to dispose of material that would not otherwise be presented for kerbside collection. This same approach is prudent when assessing the introduction of a food waste system even though there has been no major issue made of this in the trials conducted to date.
- Councils should be able to readily negotiate the introduction of a food waste collection in the current period of their existing garden waste collection contracts. Cost changes are likely to only affect promotion and advertising budgets built into such contracts and should be able to be readily negotiated to all parties' satisfaction.

There are likely to be more significant cost impacts and therefore contractual arrangements to renegotiate from reverting to a fortnightly residual waste collection during the term of a contract. Such a system will require less collection trucks than a weekly service as sufficient trucks will only be required to collect from half the households in a council's area each week. Unless the contractor can fully utilise spare truck capacity on other contracts they are likely to seek to include costs associated with under-utilised capacity into any variation in collection arrangements within the life of an existing contract.

Garden Organics Processor

- Processing of food waste with garden organics has traditionally been considered to require in-vessel composting. Such systems typically require substantial capital (and therefore locked-in long-term arrangements, do not provide significant discount on the gate price for increased capacity and have an entry level price of \$65 - \$70 per tonne.
- From experience gained in processing the Burnside material, and after discussions with the EPA, the existing Adelaide composting industry is confident it can manage processing this product in open windrows.

The quality control systems, bio security and work practices on the site can be successfully incorporated to meet EPA licence requirements and produce an acceptable product for the market for an additional cost of \$10 per tonne on the average market rate currently charged for green organics, which is estimated to be \$30 per tonne. This costing is not sensitive to minimum or large variations in throughputs and does allow for the gradual introduction of a food waste service throughout Adelaide. There are also no market constraints in accepting the additional tonnages projected from domestic food waste/garden organics co-collection.

- Contamination rates associated with kerbside collection of garden organics are likely to be reduced with the increased education of the public required to introduce food waste co-collection.
- The use of the corn starch bag does not present any problems. The processor would like to see a distinctive colour or stripe on the corn starch bag to distinguish it from supermarket plastic bags. The widespread availability of and inappropriate household re-use of plastic bags causes contamination problems. This is likely to increase if people substitute such plastic bags for compostable but more expensive corn starch ones.
- The abolition of supermarket plastic bags would be supported by the processor. Some plastic bags are now marketed as bio-degradable. This is not the same as compostable and such plastic bags will still generate contamination problems which may increase if householders don't differentiate between the two.

Bio Basket Manufacturer and Corn Starch Bag Importer

- From experience gained overseas and in Australian and New Zealand trials, the supply and use of 3 bags per week is considered typical.
- The bio basket is currently manufactured in Australia and slight cost reductions would be achievable with increased quantities. Similarly the importation of corn starch bags could be replaced with local manufacture if the market is sufficient to warrant the capital investment. If so that is likely to result in a slight reduction in the price of the bags. Note: the corn-starch bags represent the major proportion of the total cost of co-collection of food waste and garden organics. It is likely that advances in technology and increased demand for this type of product are more likely to see real prices fall rather than rise in future for this product (and/or acceptable substitutes emerge).
- Supply of bio baskets and corn starch bags can be easily matched to the progressive introduction of food waste/garden organics co-collection in Adelaide.

Opportunities should be explored to locally manufacture appropriate bins and suitable compostable bags using Australian technology.

From the research undertaken of trials in Australia and New Zealand (including the Burnside trial in particular) and information gained from interviews with key stakeholders including the survey of metropolitan councils, the consultants developed various marginal cost model scenarios to introduce a co-collection of domestic food waste and garden organics.

Additional cost to introduce a co-collection of domestic food waste and garden organics

Assumptions:

- councils that have a green organics collection service will be able to introduce domestic food waste co-collection
- of the average 3kgs+ of food waste in the 140 litre waste bin, only 1.5kgs per household per week is assumed to be diverted to the green organics bin via the food waste collection when the green organics bin is collected fortnightly
- 90% of the avoided landfill cost in diverting 1.5kgs of food waste per household per week is assumed to be realised by councils (the other 10% is negated by additional material disposed of via the residual waste collection service)
- the bio-basket costs \$4.50 per household delivered and has a useful life of 7 years
- the compostable cornstarch bags are \$10.50 per 150 roll and effectively allows for 3 bags to be used per week
- the additional processing charge is \$10 per tonne when food waste is combined with green organics.

Promotion and advertising is \$50,000 per annum. This would vary depending on council size and existing recycling levels and associated community awareness. Such expenditure needs to be at levels that cost-effectively achieve acceptable landfill diversion rates. Many councils may find that they can actively highlight the service and address education and awareness needs by utilising existing promotional mediums (eg including editorial material in their own newspaper) without significant additional cost.

The collection cost for the green organics service will not change.

The co-collection of domestic food waste and green organics, based on the above assumptions, is graphically illustrated below and provides a diversion rate of 66%. From anecdotal evidence with the Burnside trial, there was also an increase in recycling yield which has not been modelled. Less than 50% of the available food waste in the waste stream is assumed to be diverted in this model.

Composition of the contents of a three bin system if:

- 1.5kg of domestic food waste is redirected from the waste bin to the garden organics bin using a 'bio-baskets' at the source;
- all other factors/variables remain the same.



Total waste collected **per fortnight**:

Bin	Kg	
Waste	12	----- To landfill 34%
Recyclables	9	}----- Diverted 66%
Organics	14	

Total	35	

From the best results overseas and two trials conducted in Australia, weekly diversion of food waste has been in excess of 2kg per household per week.

1. Additional cost for co-collection of food waste commingled with fortnightly garden organics collection (based on existing 3 bin or split 2 bin system)*

	Cost/ Quantity	Unit	Cost/hh/year	Comments
Purchase and delivery of bio basket	\$4.50	bin	\$0.77	Locally manufactured, 7 year life
Supply of corn starch bags	\$10.50	roll	\$10.50	150/roll yearly supply, 3 per week imported
Weekly yield: *Garden organics *Kitchen waste	5.5 1.5	kgs kgs		
Cost of processing garden + kitchen waste	\$40.00	tonne	\$5.98	\$10 per tonne above current cost
Promotion and advertising	\$50,000	per year	\$2.50	Sensitive to size of council - based on 20,000 homes
Avoided landfill cost: *Direct to landfill *Via waste transfer station	\$49.00 \$65.00	tonne tonne	(\$3.44) (\$4.56)	Assumed 07/08 solid waste levy of \$22.40/t (only 90% of diversion assumed)
Total cost where waste direct to landfill			\$16.31	
Total cost where waste to landfill via transfer station			\$15.19	

* Note: The split 2 bin system comprises a 240 litre split waste/recyclables bin and a 240 litre organics bin.

2. Additional cost for co-collection of food waste commingled with fortnightly garden organics collection (based on existing 3 bin or split 2 bin system) but without use of compostable bags

These systems have been trialled elsewhere in Australia and result in lower yields of kitchen waste diverted and complaints about odour and cleanliness in the kitchen. There is also an increase in contamination that results from residents using plastic bags to maintain cleanliness of the kitchen container and for ease of handling the kitchen waste. Under this system food waste diversion is assumed to be only 1kg instead of 1.5 kg per household per week because it is less convenient.

	Cost/ Quantity	Unit	Cost/hh/year	Comments
Purchase and delivery of small receptacle	\$4.50	bin	\$0.77	Locally manufactured, 7 year life
Supply of corn starch bags	\$0	roll	\$0	No degradable bag
Weekly yield: *Garden organics *Kitchen waste	5.5 1.0	kgs kg		Reduced yield
Cost of processing garden + kitchen waste	\$40.00	tonne	\$4.94	\$10 per tonne above current cost
Promotion and advertising	\$50,000	per year	\$2.50	Sensitive to size of council - based on 20,000 homes
Avoided landfill cost: *Direct to landfill *Via waste transfer station	\$49.00 \$65.00	tonne tonne	(\$2.29) (\$3.04)	Assumed 07/08 solid waste levy of \$22.40/t (only 90% of diversion assumed)
Total cost where waste direct to landfill			\$5.92	
Total cost where waste to landfill via transfer station			\$5.17	

3. Additional cost for co-collection of food waste commingled with fortnightly garden organics collection (based on existing 3 bin or split 2 bin system and with use of compostable bags) where a four weekly garden organics collection service currently exists

Costs in this scenario are the same as in 1. above plus those associated with additional frequency of collection of the garden organics bin and the increased garden organics that experience shows is collected with a more frequent service.

No allowance has been made for the modest savings that will arise from the fact that some of the additional 1.5kg of garden waste collected for processing with increased collection frequency would previously have been disposed of via the waste bin and therefore ended up in landfill (i.e. there would be a small additional saving in landfill costs).

	Cost/ Quantity	Unit	Cost/hh/year	Comments
Costs as per Scenario 1.				
Where waste disposed direct to landfill			\$16.31	
Where waste disposed to landfill via transfer station			\$15.19	
Increase collection costs for increase from four weekly to fortnightly collection of garden organics	\$0.15	/hh/ week	\$7.80	
Additional processing cost of garden organics	1.50	kgs/ week	\$2.34	1.5kgs increase on benchmark for 4 weekly of 4kgs (@ \$30/tonne)
Total cost where waste direct to landfill			\$26.45	
Total cost where waste to landfill via transfer station			\$25.33	

4. Additional cost for co-collection of food waste commingled with fortnightly garden organics collection (assuming separate recyclables MGB or split bin system and use of compostable bags) where no garden organics collection service currently exists

Costs in this scenario are the same as in 1. above plus those associated with introducing a garden organics collection service.

	Cost/ Quantity	Unit	Cost/hh/year	Comments
Costs as per Scenario 1.				
Where waste disposed direct to landfill			\$16.31	
Where waste disposed to landfill via transfer station			\$15.19	
Provision of green organics 240 litre MGB			\$8.84	
Collection costs for fortnightly collection of green organics	\$0.30	/hh/ week	\$15.60	
Additional processing cost of green organics	1.50	kgs/ week	\$8.58	5.5kgs @ \$30/tonne
Total cost where waste direct to landfill			\$49.33	
Total cost where waste to landfill via transfer station			\$48.21	

5. The cost of the co-collection of domestic food waste and garden organics with the frequency of the 140 litre MGB waste collection reduced from weekly to fortnightly (based on existing 3 bin system and use of compostable bags – note this option is not suitable for introduction with a split residual waste/recyclables bin)

The consultants have evaluated the opportunity to reduce the frequency of the residual waste collection service.

Trials have been conducted elsewhere where the residual waste collection is undertaken fortnightly and the major objections from householders relate to disposable nappies and a perceived reduction in service levels. The odour issue with disposable nappies in the consultants' view can be controlled by educating householders to enclose used disposable nappies in a sealed plastic bag. If this is not preferred then councils could provide a user-pays or free weekly collection service to the usually relatively small proportion of households that have infants using disposable nappies.

Public and Environmental Health (General) Regulation 4(2) under the Public and Environmental Health Act currently requires the owner of premises to take reasonable steps to ensure that refuse that is capable of causing an insanitary condition is disposed of at least once a week. Many councils are likely to want this regulation reviewed and in probability varied before considering implementation of a fortnightly residual waste collection service.

There may be concern in the community regarding a perceived reduction in overall service levels. This should be able to be overcome in most instances by promoting the environmental benefits and cost savings of this option.

Assumptions:

- o the kitchen waste yield is increased by 0.5kg per household per week to 2kgs per week
- o there is a saving in the benchmark weekly 140 litre MGB waste collection cost of 50% by introducing a fortnightly service
- o the recycling yield is increased by 1.5kgs per household per week
- o 90% of the avoided landfill cost in reducing the waste by a further 2kgs is assumed to be saved by councils.

This system is graphically illustrated below:

Composition of the contents of a three bin system if:

- 2kg of domestic food waste is redirected from the waste bin to the garden organics bin using a 'bio-baskets' at the source (represents 4kg per fortnight);
- the collection of the waste bin is changed from weekly to fortnightly resulting in 1.5kg being redirected from the waste bin to the recycling bin (represents 3kg per fortnight).



Total waste collected per fortnight:

<u>Bin</u>	<u>Kg</u>	
Waste	8	----- To landfill 23%
Recyclables	12	} ----- Diverted 77%
Organics	15	
----- Total	35	

Based on the above assumptions costs/savings associated with co-collecting food waste with garden organics and with fortnightly collection of residual waste where a 3 bin system with fortnightly collection of garden organics is already in place are as follows:

	Cost/ Quantity	Unit	Cost/hh/year	Comments
Purchase and delivery of bio basket	\$4.50	bin	\$0.77	Locally manufactured, 7 year life
Supply of corn starch bags	\$10.50	roll	\$10.50	150/roll yearly supply, 3 per week imported
Weekly yield: *Green organics *Kitchen waste	5.5 2.0	kgs kgs		Burnside trial
Cost of processing green + kitchen waste	\$40.00	tonne	\$7.02	\$10 per tonne above current cost (Jeffries)
Promotion and advertising	\$50,000	per year	\$2.50	Sensitive to size of council - based on 20,000 homes
Avoided landfill cost: *Direct to landfill *Waste transfer station	\$49.00 \$65.00	tonne tonne	(\$8.03) (\$10.65)	Assumed 07/08 solid waste levy of \$22.40/t and additional 2kg pw of other material diverted from waste to recyclables bin (but only 90% of diversion assumed saved)
Saving on waste collection fortnightly	\$0.28	/hh/ week	(\$14.30)	Benchmarking cost model
Total saving where waste direct to landfill			(\$1.54)	
Total saving where waste to landfill via transfer station			(\$4.16)	

6. Summary of additional costs/(savings) for a council from undertaking co-collection of food waste with garden organics (based on fortnightly collection of garden organics and use of compostable bags)

	<i>Cost/hh/year where not utilising waste transfer station</i>	<i>Cost/hh/year where utilising waste transfer station</i>	<i>Comments</i>
Where already have a 3 bin system with fortnightly collection of garden organics; a) maintain a weekly collection of residual waste	\$16.31	\$15.19	Also applicable where currently have split 2 bin system
b) switch to fortnightly collection of residual waste	(\$1.54)	(\$4.16)	2 bin system not suitable for fortnightly collection of residual waste
Where currently have a 3 bin system with 4 weekly collection of garden organics; a) maintain a weekly collection of residual waste	\$26.45	\$25.33	Also applicable where currently have split 2 bin system
b) switch to fortnightly collection of residual waste	\$8.60	\$5.98	2 bin system not suitable for fortnightly collection of residual waste
Where currently have no garden organics collection service; a) maintain a weekly collection of residual waste	\$49.33	\$48.21	Applicable for separate recyclables MGB or split 2 bin system
b) switch to fortnightly collection of residual waste	\$31.48	\$28.86	2 bin system not suitable for fortnightly collection of residual waste

The above analysis highlights that councils with a 3 bin system can save money by introducing co-collection of food waste with garden organics if their residual waste system goes from weekly to fortnightly. If it stays at weekly then the cost is \$15 to \$16 pa.

Councils that currently don't offer a fortnightly garden organics collection service are likely to find that such a service can be cost-effectively introduced if they also implement fortnightly collection of residual waste.

In future savings are likely to be more not less than predicted in the above analysis. For example increased environmental awareness may reduce education costs and if this also results in greater landfill diversion yields than those modestly assumed then savings will be considerable. Technology and market forces may lower the very significant cost of cornstarch bags.

If the landfill levy increased in real terms in future then councils will save of the order of a further \$0.78 (weekly residual waste service) to \$1.04 (fortnightly service) per household per annum for each further \$10 increase in the waste levy by introducing food waste co-collection with garden organics (although of course their costs to dispose of residual waste to landfill will increase).

8. Implementation issues

From the work undertaken by the consultants there are several issues that should be pursued to facilitate the introduction of a co-collection of domestic food waste with garden organics.

Partnering with suitable metropolitan councils

ZWSA should consider partnering with a suitable metropolitan council that has a representative operating environment and that is in a position to introduce food waste/garden organics co-collection to fully evaluate the level of service that arguably provides the best environmental outcome for the least cost to the community.

This approach would allow all the assumptions and issues raised in this report to be tested and provide hard data for other councils to base future food waste/garden organics co-collection decisions on.

Statutory Compliance

ZWSA should initiate a review to consider removing regulatory barriers to the introduction of a fortnightly food waste/garden organics co-collection system by councils.

Plastic Bag Legislation

The banning of plastic bags has been foreshadowed in South Australia. If this initiative was adopted it would reduce considerably the potential for contamination and subsequent processing problems with a food waste/garden organics co-collection service.

Commercial Opportunity

Work should be undertaken to better evaluate the opportunity to invest in technology to manufacture an appropriate rigid kitchen container and compostable bag for a food waste collection in Adelaide and regional centres. There could be resulting real economic development benefits to the State that were not a part of the consultants' brief to evaluate and likely cost savings for a food waste/garden organics co-collection service from such an initiative.

Appendix I

City of Burnside Bio-organics Trial

A. Introduction

In 2004, the City of Burnside initiated an audit of its waste and recycling system (which was introduced in November 1997 – see Section H). The audit was a precursor to a review of Council's waste management system, recognising the opportunity to consider a change in collection systems as part of a program to replace its fleet of collection vehicles. This approach was consistent with the Council's strategic direction.

The Council undertook an audit of its waste streams and identified that compostable matter (predominantly food waste) comprised about 56% of the residual waste stream. It was recognised that substantial progress would be gained with landfill targets if a new system had the ability to incorporate a method for the collection and processing of food waste.

Discussions regarding food waste collection options were held with the Council's waste management partners:

- East Waste (the Council's contractor for waste collection)
- Jeffries (green waste processing)
- Zero Waste SA.

East Waste identified that the Polar-Gruppen organics system trialled in Europe for the co-collection of food waste and green organics offered an appropriate solution for Burnside. The concept of various communication materials for the trial was developed from the Chifley organics trial. This proposal was supported by the Council and Zero Waste SA and the trial proceeded on this basis.

The Council's typical waste steam composition is estimated to be as follows:

	%	%
Waste		
Non-organic	20	
Food organics	24	
Sub-total		44
Recyclables		30
Green organics		26
Total		100

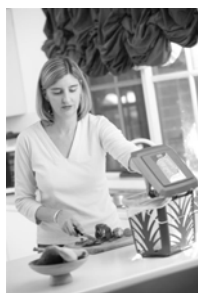
If food waste was removed from the landfill waste stream, then the landfill diversion rate would increase from 56% to 80%.

Appendix I cont.

B. Summary of trial arrangements (refer Section I)

The trial was established to gauge user satisfaction and effectiveness of the system in Adelaide's temperate climate, investigate the effectiveness of communication methods, provide insight into the cost-effectiveness of the diversion system, and examine diversion rates relating to householder use and disposal behaviours.

Food waste was collected at the source using Bio-baskets and compostable liner bags. The bags were placed in the green organic bins and collected on a fortnightly basis. The following photos demonstrate the arrangements.



In preparation for the trial, a representative area was selected based upon demographics, an appropriate mix of dwelling types (39% units and flats and 61% houses on traditional allotments) that could be expected in other Council areas, and a geographically defined area.

C. Outcomes from the City of Burnside Bio-organics trial

Trial objective: to assess the viability of diverting kitchen food waste (domestic food organics) from landfill.

Trial aims and results

(a) Increased diversion

36.3% of the food waste was diverted from land fill which represents an increase of landfill diversion of 8.6% (increased the diversion rate from 56% to 64.6%).

A summary of the results is presented in Section F.

(b) Community awareness and acceptance

There was a 98% level of awareness of the trial within City of Burnside.

There was a reported 84% use of the system with mixed views on ease of use (for example, acceptable food wastes) and no issues with odour.

A summary of the results is presented in Section G.

(c) Participation

A participation rate of 60% was achieved (75% of households presented a green organics bin and 80% of the bins contained food waste)

Appendix I cont.

(d) Contamination

Bins: 2.8% contamination by weight; 23% contamination incidents

Bags: Negligible contamination

(e) Processing of bio-organics (including food)

An independent audit reported:

- Fully compliant
- Bags breakdown in seven days
- No bio-security issues

(f) Costs

The Council estimated an annual on-going cost of about \$10 per household per annum in the City of Burnside.

D. Lessons learnt

Significant barriers to the trial included:

- Levels of green bin ownership relatively low (due to a number of factors including housing type within the trial area and a policy decision in 1997 to provide a basic monthly collection service with the option for additional collections at a nominal charge);
- Use of a split bin meant that the effective weekly capacity was 120 litres. (This limitation to increased participation and diversion would apply equally to a Council using a three bin system unless the effective capacity is reduced. This means that a 140 litre bin for residual waste needs to be collected on a fortnightly basis to encourage the greatest number of residents to participate in the service in a meaningful way, thereby diverting a maximum of their food and compostable materials (food, paper towels, tissues, soiled paper) into the green organics stream.)

If the trial were to be run again, greater emphasis may have also been placed on the provision of green organics bins for dwellings that did not have adequate access to organics disposal.

In the Burnside trial, even where participants diverted ALL their food and compostables from the residual waste stream, they were left with half a bin filled with recyclables (and a token amount of waste) that required weekly collection.

Once putrescible and compostable materials are removed from the residual waste stream, it is evident that 70 litres of space is sufficient for remaining items (or equivalent thereof) on a weekly basis, i.e. 140 litres per fortnight considering no putrescibles should remain in the bin.

In this case, an appropriate collection regime should be employed to minimise contamination in other streams or kerbside services. This may be worthy of further trials to gauge user behaviour (i.e. residual waste collections offset with green organics or recycling) and warrants a further trial to measure the responses/yields from a fortnightly residual waste service compared with weekly.

Appendix I cont.

E. Conclusion

The Council concluded that the introduction of the trialled food collection system was not financially sustainable for the Council unless a number of fundamental issues were addressed:

- Funding support
- Introduction of a fortnightly residual waste collection
- Introduce the proposed 'no plastic bag' legislation
- Rejuvenate the household recycling culture with a focus on food waste.

F. Diversion rates

(Note: some rounding errors)

Waste stream	Nature	2004 audit results		Trial period (*) (Oct 05 – March 06)	
		Tonnes	%	Tonnes (Nominal)	%
Waste	Non-organic (residual)	3,340	20	3,340	20
	Organics	4,000 (54%)	24	2,550?	15.4
Total to landfill		7,500	44	5,890	35.4
Recyclables		4,800	29	4,800	29
Bio-organics	Green organics	4,400	26	4,400	26
	Food organics	-	-	1,450	8.6
Total diverted		9,200	56	10,650	64.6
Total waste		16,700	100		100

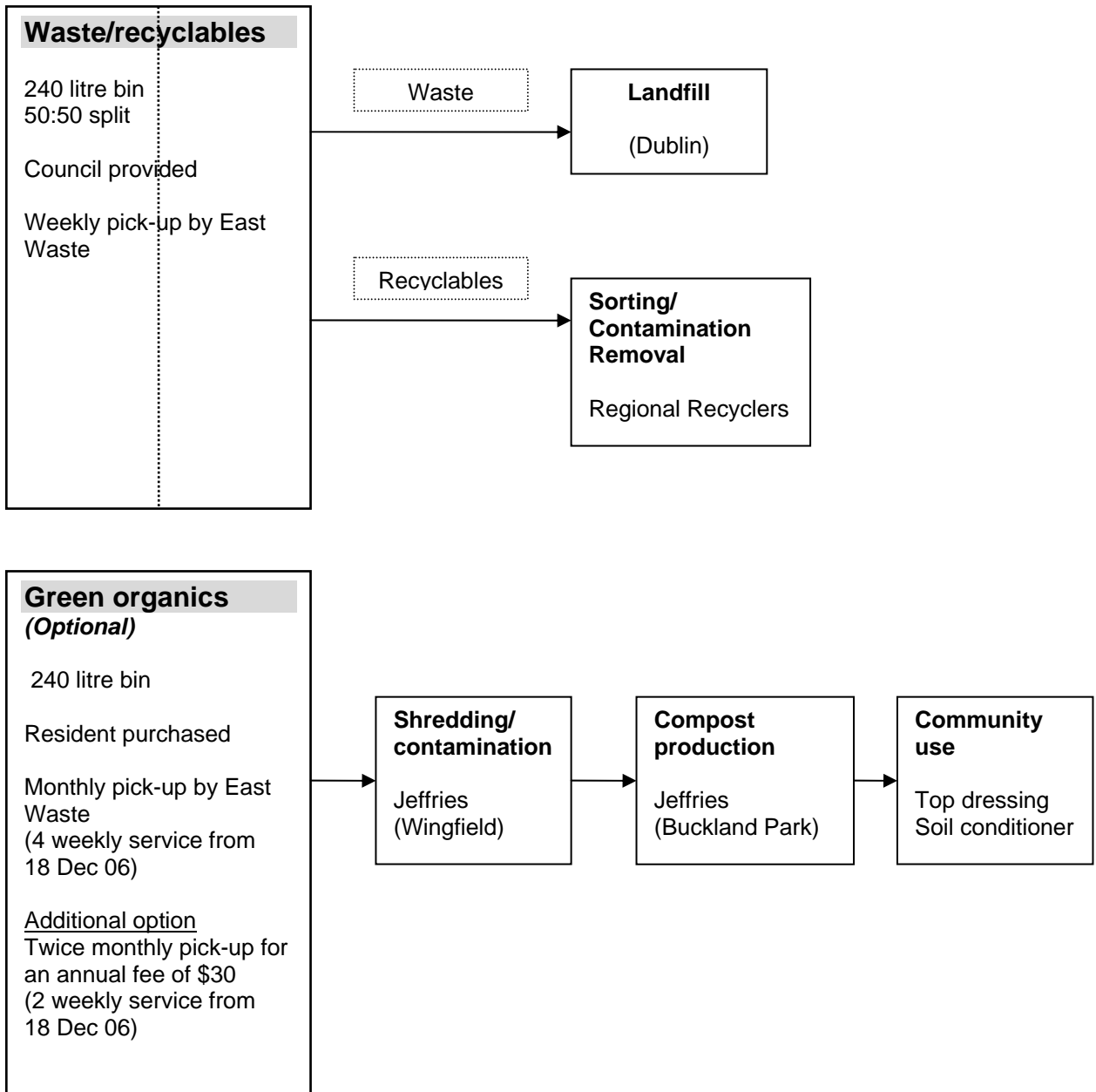
(*) from Flinders Bioremediation audit

G. Survey results

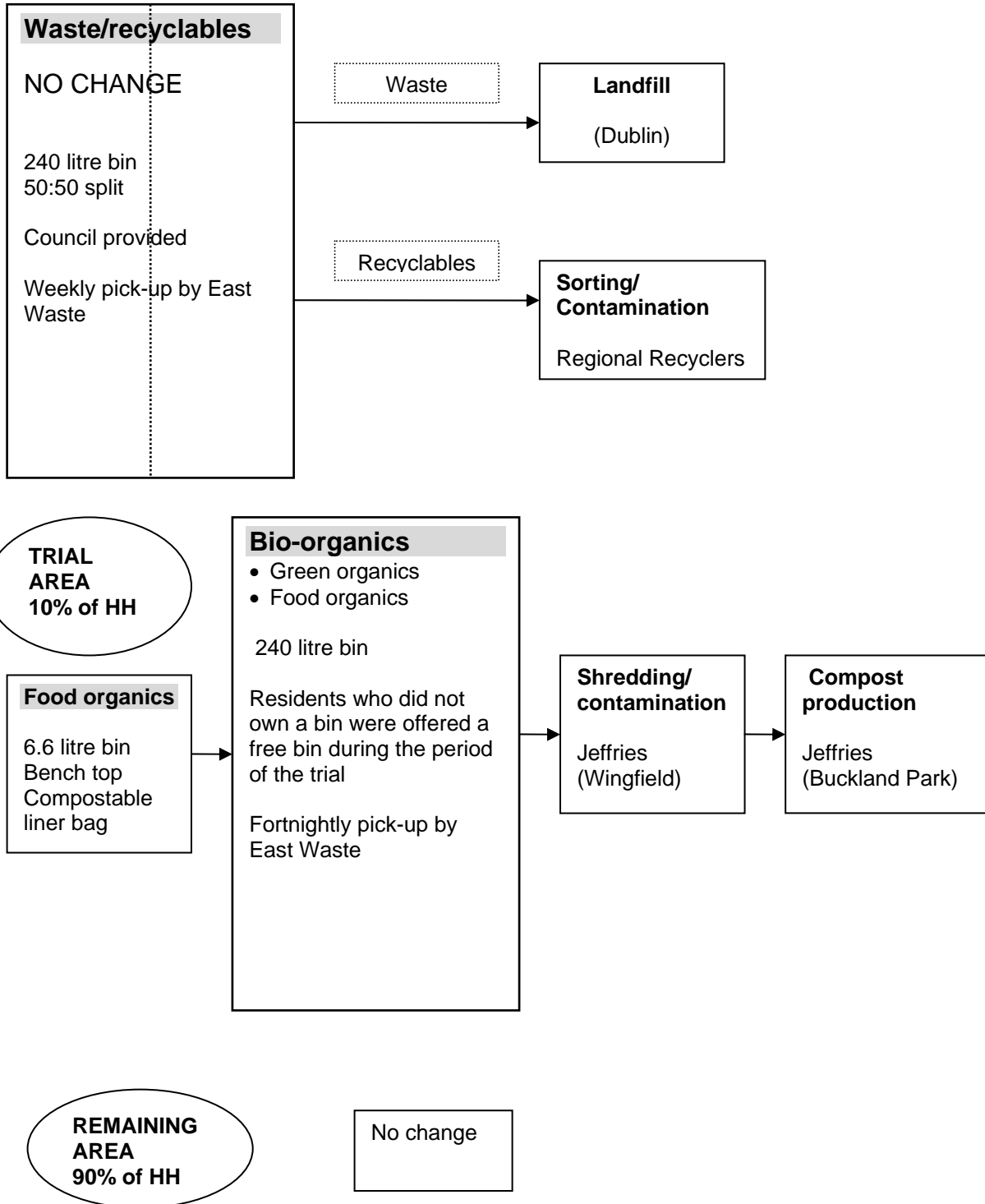
Survey conducted over the period 25 February and 9 March 2006.

Item	Number	Percentage
Residents surveyed	317	100
Had used the system	266	84
Still using	244	77
Stopped using	22	7
Reasons:		
• Rotting food in kitchen	5	1.6
• Away from home	5	1.6
• Green organics bin smells	4	1.3
• Already compost	3	0.9
• other	5	1.6
Never used the system	51	16
Reasons:		
• Already compost	18	6
• Other	33	10
<i>Not using at the time of the survey</i>	73	23

H. Existing waste and recycling service (introduced November 1997)



I. Arrangements for the Bio-organics trial (October 05 – March 06)



LIST OF COUNCILS SURVEYED

Adelaide
Adelaide Hills
Burnside
Campbelltown
Charles Sturt
Gawler
Holdfast Bay
Marion
Mitcham
Mount Barker
Norwood Payneham & St Peters
Onkaparinga
Playford
Port Adelaide Enfield
Prospect
Salisbury
Tea Tree Gully
Unley
Walkerville
West Torrens

Regional Councils:

Alexandrina
Barossa Valley
Mount Gambier

Zero Waste SA

Council food waste questionnaire

Council:

Council contact officer *(to be completed by the Council)*

- Name:.....
- Email/Telephone Contact details:.....

Introduction

As highlighted in the covering letter from the Chief Executive of Zero Waste SA, the State Government and local government have made various commitments to ecological sustainability.

Management of our waste streams is a key component of the continuing initiative to improve environmental outcomes. Local government is playing a lead role in bringing about these changes in waste management practices with in part the policy advice and support provided by Zero Waste SA.

Substantial successes have been achieved and built on over the past 10 years. Further significant improvements will only be possible if local government is prepared to continue to introduce innovations to its waste management and recycling practices.

Currently under consideration as an opportunity for making major improvements is the possibility of extracting food waste from the waste stream. This was the motivation for the recently completed Burnside Bio-organics trial.

An overview of the City of Burnside Bio-organics trial is presented at Appendix A. The trial results (including a financial analysis) are to be comprehensively assessed by the consultants and a brief summary is provided at this stage for your information.

The questions contained in the following pages address your Council's current waste management and recycling arrangements, and planned improvements with particular reference to the separation of food waste from the residual waste stream. There are a number of questions which deal specifically with the Burnside trial.

Please answer the questions thoroughly and contact the consultants to clarify any issues (contact details are provided at the end of the questionnaire).

Questions

Question 1

A summary of the waste management and recycling arrangements for your Council (Attachment 1) has been prepared by the consultants based on their knowledge.

Please check the contents of Attachment 1 and amend as necessary.

Question 2

Please complete the following table based on the material presented at the kerb for the period 2005/06.

Waste stream	Tonnes
Waste	
Recyclables	
Green organics	
TOTAL	

Question 3

An indicative cost schedule has been prepared by the consultants (Attachment 2) based on their understanding of the typical full costs of the various waste management and recycling systems in service in South Australia.

Please:

- (1) assess your Council's current costs against those shown in the schedule;*
- (2) indicate by marking the appropriate box the estimated variation between the indicative cost and your Council's actual cost (see notes (a), (b) and (c)); and*
- (3) comment where possible re possible explanations for any major cost differences.*

Note:

- (a) for contract collection arrangements, only consider the direct contract costs - do not include the Council's contract management, administration or other overhead costs. One source for the costs may be the monthly invoices from the contractor;
- (b) if you use your own day labour for one or more of the collections, only include the direct supervisory and operational management costs (i.e. those a contractor would incur);
- (c) commercial-in-confidence figures should not be reported.

Question 4

- (a) Is your Council planning or aspiring to improve its landfill diversion levels?
.....
.....
.....
- (b) If yes, what are your Council's targets or strategies?
.....
.....
.....
- (c) If your Council has landfill diversion targets or strategies are they included in the Council's strategic management plan or other plans (eg, the long term financial plan)?
.....
- (d) If yes, what are the details?
.....
.....
.....

Question 5

- (a) Has the Council plans for the introduction of a domestic food waste and garden organics co-collection service?
.....
- (b) If yes, what are the details?
.....
.....
.....
- (c) If there are no plans to introduce a food waste/garden organics co-collection service, has the Council considered such an initiative or are there intentions to do so in future?
.....
.....

Question 6

- (a) Has your council reviewed the Burnside food waste trial?
.....
- (b) If yes, what comments do you have on the trial?
.....
.....
.....
.....
.....
.....

Question 7

What are your views on the barriers or constraints of introducing a food waste collection as part of your council’s existing green organics service? The constraints may include factors related to:

- insufficient knowledge
- contractual issues in implementing a mixed green organics/food waste collection
- additional (perceived) costs
- limited or no external funding
- not aware of or still need to be convinced there is a proven system
- amenity issues
- householder resistance
- legislative changes may be required to collect food waste less frequently than weekly

.....
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Question 8

What would be your Council’s likely attitude to changing to fortnightly residual waste collections at the time of introducing a domestic food waste/garden organics co-collection service as a way of:

- offsetting the cost of collecting food waste with garden organics and
- achieving better environmental outcomes?

.....
.....
.....
.....
.....
.....

Appendix III cont.

Completing the questionnaire

You are invited and encouraged to contact either of the following consultants to clarify any of the questions or issues you may have:

John Comrie
Mobile 0414 516 566

email: john@jacomrie.com.au

Trevor Hockley
Mobile 0419 846 498

email: trevor@tjhms.com.au

The consultants would welcome the opportunity to work with you in completing the questionnaire via a telephone discussion.

Returning the questionnaire

Please return completed questionnaires to JAC Comrie Pty Ltd
by Friday 23 February 2007
(email: john@jacomrie.com.au)

The consultants may contact you after the return of the questionnaire to discuss or clarify your responses to some of the questions.

Thankyou for your cooperation.

Overview of the City of Burnside Bio-organics trial

The trial results (including a financial analysis) are to be comprehensively assessed by the consultants and a brief summary is provided at this stage for your information.

Background

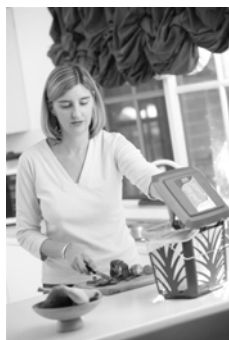
The Council's typical waste stream composition is estimated to be as follows:

	%	%
Waste		
Non-organic	20	
Food organics	24	
Sub-total		44
Recyclables		30
Green organics		<u>26</u>
Total		100

If food waste was removed from the landfill waste stream, then the landfill diversion rate would increase from 56% to 80%.

Trial arrangements

The Council chose a simple system to trial. Food waste was collected at the source using Bio-baskets and compostable liner bags. The bags were placed in the green organic bins and collected on a fortnightly basis. The following photos demonstrate the arrangements.



Trial objective: to assess the viability of diverting kitchen food waste (food organics) from landfill.

Trial aims and results

(a) Increased diversion

36.3% of the food waste was diverted from land fill which represents an increase of landfill diversion of 8.6% (increased the diversion rate from 56% to 64.8%)

(b) Community awareness and acceptance

There was a 98% level of awareness of the trial within City of Burnside.

There was a reported 84% use of the system with mixed views on ease of use and no issues with odour.

(c) Participation

A participation rate of 60% was achieved (75% of households presented a green organics bin and 80% of the bins contained food waste)

(d) Contamination

Bins: 2.8% contamination by weight; 23% contamination incidents

Bags: Negligible contamination

(e) Processing of bio-organics (including food)

An independent audit reported:

- Fully compliant
- Bags breakdown in seven days
- No bio-security issues

(f) Costs

The Council estimated an annual on-going cost of about \$10 per household per annum in the City of Burnside.

Conclusion

The Council concluded that the introduction of the trialled food collection system was not financially sustainable unless a number of fundamental issues were addressed:

- Funding support
- Introduction of a fortnightly residual waste collection
- Advance the 'no plastic bag' legislation
- Rejuvenate the household recycling culture with a focus on food waste.

Council:**Waste management and recycling arrangements
as at February 2007**

<i>Item</i>	<i>Consultants' Understanding</i>	<i>Council's Actual Position (Council to complete)</i>
1. Number of households serviced (collection points)		
2. Member of Regional Waste Subsidiary		
3. Waste		
3.1 Collection Contractor		
3.2 Summary		
3.3 Disposal		
4. Recyclables		
4.1 Collection Contractor		
4.2 Summary		
4.3 Sorting & Contamination		
5. Green organics		
5.1 Collection Contractor		
5.2 Summary		
5.3 Processing		

Council:**Indicative cost schedule***No. of Households Serviced:*

(if the actual number is different, please adjust the consultant's calculations of the indicative cost per annum)

Waste & Recycling Arrangements			Indicative Cost		Estimated Variation between Indicative Cost and Council's Actual Cost (Council to complete)			
Stream	Item	Collection Frequency (Consultants' Understanding)	Per HH Per Collection Frequency \$	Per Annum \$,000	<±10%	<±20%	≥ ±20%	Comments/Explanation for Variation
Waste	Collection							
	Disposal							
Recyclables	Collection, sorting & contamination							
Green Organics	Collection							
	Processing							
Sub Total								
Bin Costs as appropriate								
TOTAL								

KEY ASSUMPTIONS

The collection costing information above is based on benchmark contracting rates for Local Government collections in metropolitan Adelaide calculated as \$'s per household per week and is sensitive to:

- The number of services per frequency of collection
- The rural component within Council areas
- MGB's supplied by contractor or purchased by Councils.

Similarly, the disposal costs and green organics processing costs are calculated as:

- Green organics average yield per household per week in metropolitan Adelaide and an average processing cost of \$30 per tonne
- Disposal rates are also calculated by average yield per household per week in metropolitan Adelaide and a direct landfill charge of between \$34 to \$36 per tonne including solid waste levy and a transfer station rate of between \$50 to \$54 per tonne including solid waste levy.

The consultants have calculated these estimated costs based on the benchmarking model and their understanding of your Council's situation. If you can identify any reasons for significant variation, ie, greater than 10%, please note in the *Comments* column.

All costs are GST exclusive.

BENCHMARK ASSUMPTIONS

MGB – Mobile Garbage Bins

• 140 litre MGB supply and maintenance	\$0.16/household/week
• 240 litre MGB supply and maintenance	\$0.17/household/week
• 240 litre split MGB supply and maintenance	\$0.23/household/week
• 140 litre MGB weekly waste pick up	\$0.55/household/week
• 240 litre MGB weekly waste pick up	\$0.65/household/week
• 240 litre MGB fortnightly recyclable pick up	\$0.30/household/week
• Sorting and contamination fees (MRF) recyclables	\$0.15/household/week
• 240 litre MGB fortnightly green organics pick up	\$0.30/household/week
• 240 litre MGB 50:50 split collection pick up weekly	\$0.77/household/week
• Education and Promotion – PC item	
• Green organics processing	\$30.00/tonne
• Waste disposal GST exc including solid waste levy:	
○ Waste transfer station	\$54.00/tonne
○ Landfill direct	\$34.00 - \$38.00/tonne
• Average weekly yields waste:	
○ 140 litre MGB	7.5kgs
○ 240 litre MGB	12.0kgs
○ 240 litre split MGB	7.5kgs
• Average weekly yields green organics:	
○ Fortnightly	5.5kgs
○ 4 weekly/monthly	4.0kgs
• Average weekly yields recyclables:	
○ Fortnightly	4.5kgs
○ 4 weekly/monthly	4.0kgs
○ Weekly split 50:50	5.0kgs
• Loading on cost modelling as follows:	
○ Contract margin	10% - 15% on cost
○ Rural collection component	10% - 50% on cost

After careful analysis and discussion with councils, the consultants are confident that a standard metropolitan 3 bin collection system described as:

- 140 litre MGB collected weekly for waste (supplied new by council)
- 240 litre MGB collected fortnightly for recyclables (supplied new by council)
- 240 litre MGB collected fortnightly for green organics (resident owned)

in a metropolitan area with access to downstream processors at average market rates and waste disposed through a transfer station is in the order of \$120 per household per year.