

R E P O R T

**WASTE COLLECTION AND DISPOSAL
STRATEGY
EAST GIPPSLAND SHIRE COUNCIL 2010-2030**

Prepared For

East Gippsland Shire Council

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EXECUTIVE SUMMARY

Meinhardt Infrastructure & Environment Pty Ltd (Meinhardt) was contracted by East Gippsland Shire Council (EGSC) to undertake a study of current and potential future Waste Collection and Disposal Strategies (WS).

The purpose of this project is to model and understand waste management in East Gippsland from logistical, service provision and financial perspectives. This project was commissioned as a direct result of the \$2 million per annum deficit between service provision costs and fees and charges of the EGSC waste management system and aims to provide analysis of a range of methods for reducing this deficit. The project aims to provide EGSC with detailed understanding of current and potential future waste management options. Modelled outputs were used to provide EGSC with a sound basis for a Waste Strategy to the year 2030.

To achieve the purpose of the study it was necessary to create an accurate model of the current waste management system for EGSC. This then provided the basis for modelling future options that aimed to achieve cost efficiencies without a reduction in the quality of waste services provided to EGSC citizens. The objective therefore was to provide EGSC with a model for its current and potential future waste management options that provides a similar or improved level of service and the ability to minimise the current waste management financing deficit through cost reduction, revenue increase or a combination of the two.

The study was undertaken in two stages. The first stage entailed the creation of waste models that estimated the cost and landfill diversion of current and potential future options. The models were then used as a basis for the second stage of the project, the design of a waste collection and disposal strategy.

Modelling was undertaken of both the current waste collection and disposal system for EGSC and potential future options, to explore methods for achieving improved cost efficiencies and landfill diversion rates. Models were designed to reflect the following scenarios:

- **Base Case:** No change from current Waste Management.
- **Option 1:** No Change in waste collection. Only Bairnsdale and Orbost Landfills remain operational and both are Victorian EPA Best Practice Environmental Management – Siting, Design, Operation and rehabilitation of Landfills (BPEM) compliant.
- **Option 2:** Maximised roll out of kerbside collection services. Significant closure of Transfer Stations and Transfer Trailers. Only Bairnsdale and Orbost Landfills remain operational and both are BPEM compliant.
- **Option 3:** Full roll out of kerbside collection to 'coastal corridor' along the Princes Highway. Significant closure of facilities in the 'coastal corridor'. Only Bairnsdale and Orbost Landfills remain operational and both are BPEM compliant.
- **Option 4:** Same as Option 1 but with staffing of all Transfer Stations and Transfer Trailers to recoup a gate fee from all users.
- **Option 3A:** Same as Option 3 but with kerbside green waste only provided to household in Bairnsdale and Lakes Entrance region.

The modelling has shown that there is little scope for EGSC to achieve a greater rate of landfill diversion, however there is significant ability to make cost savings.

Modelled costs indicate that Option 2, Option 3 and Option 3A would provide approximately \$1 million in savings compared to the current Base Case. With these Options entailing a net deficit in 2010 of approximately \$1.6-1.8 million per annum, compared to the Base Case which is modelled to be \$2.7 million per annum.

The work undertaken indicates that cost savings are the most important method of reducing the net deficit to EGSC. The lowest total cost modelled, for 2010, was for Option 3A and Option 2 at \$5.9 million, whilst the Base Case provided the highest cost at \$6.9 million.

Analysis of the modelling indicated that the major savings arose as a result of:

- reduction in the number of waste management facilities operated
 - total landfill costs for all of the Options were lowest at \$1.8 million compared to the highest cost Base Case at \$2.2 million;
 - total transfer station costs for Option 2 were lowest at \$0.8 million compared to the highest cost Base Case and Option 4 at \$1.4 million;
 - total transfer station costs for Option 2 were lowest at \$41,000 compared to the highest cost Option 4 at \$157,000 and Base Case cost of \$110,000.
- for Option 3A, removal of the green waste kerbside collection service to the Orbost and Omeo regions provided it with the lowest kerbside collection cost at \$1.7 million compared to Option 2 and Option 3 which entailed a collection cost of \$1.9 million.

The total revenue of all of the Options was found to not be a significant factor in differentiating the costs. All of the Options accrue between \$4.2 million and \$4.3 million of revenues in 2010.

A key recommendation of the report is that EGSC needs to revise the gate fees charged at landfills and transfer stations to better reflect the full cost per tonne of waste management at these facilities.

The analysis concludes that the financial benefits of rationalising the waste facilities, as modelled in Option 2, Option 3 and Option 3A, outweigh the increased costs incurred by increased roll out of kerbside collection.

Furthermore Option 2, Option 3 and Option 3A should provide EGSC with:

- a greater level of service to the public;
- improved control of waste received at EGSC owned facilities;
- better composting of green waste;
- greater environmental protection through the use of BPEM compliant landfills.

The report indicates that Option 2 or Option 3A are the best Options for EGSC to implement.

As such, it is recommended that EGSC adopt a waste strategy that moves towards one of these options. It should be noted that Option 3 is a natural step in the progression to implementing either of these options.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
1. Introduction	1
1.1. Purpose.....	1
1.2. Objectives	1
1.3. Report overview.....	1
1.4. Council overview	2
1.5. Strategic context	3
1.6. Waste overview	4
2. Strategic Framework	5
2.1. Key federal and state legislation and policies	5
2.2. Gippsland Regional Waste Management Group (GRWMG)	6
2.3. Local Council.....	6
3. Current Waste Management	7
3.1. Municipality	7
4. Waste Management Infrastructure	13
4.1. Current waste management infrastructure.....	13
4.2. Landfills	14
4.3. Transfer stations	15
4.4. Transfer trailers	16
5. Modelling & Options.....	17
5.1. Introduction to modelling of waste management options.....	17
5.2. Base Case	18
5.3. Option 1	19
5.4. Option 2	21
5.5. Option 3	22
5.6. Option 4	23
5.7. Option 3A.....	25
6. Modelling Results	26
6.1. Waste arisings	26
6.2. Financial assessment of modelling results.....	27
6.3. Landfill diversion rates.....	35
7. Discussion	36
7.1. Comparison of EGSC provided and Base Case modelled data	36
7.2. Analysis of modelled scenarios cost	38
7.3. Analysis of modelled scenarios - Revenue	38
7.4. Analysis of landfill diversion.....	39

7.5.	Analysis of modelled scenarios – Council deficit	39
7.6.	Cost per tonne analysis of modelled data	39
7.7.	Contamination	44
7.8.	Collection policy	44
7.9.	Estimate for upgrading to best practice standard	45
8.	Conclusion and Recommendations	46
9.	References	49

List of Figures

Figure 1	Waste management hierarchy	4
Figure 2:	Total modelled cost for all scenarios 2010 – 2030	28
Figure 3:	Waste collection costs for all scenarios 2010 - 2030	29
Figure 4:	Kerbside MSW, co-mingled recycling and green waste collection costs for all scenarios 2010 – 2030.....	29
Figure 5:	Transfer station costs for all scenarios 2010 - 2030	30
Figure 6:	Transfer trailer costs all options 2010 – 2030	30
Figure 7:	Total landfill costs for all scenarios 2010 – 2030	31
Figure 8:	Total revenue generated for all scenarios 2010 – 2030	32
Figure 9:	Service charge revenues for all scenarios 2010 - 2030	33
Figure 10:	Public gate fee revenues for all scenarios 2010 - 2030	34
Figure 11:	Gross financial implications for all scenarios 2010 – 2030	34
Figure 12:	Cost per tonne analysis of transfer stations in all scenarios 2010-2030.....	42
Figure 13:	Cost per tonne analysis of a selection of transfer stations.....	43
Figure 14:	Transfer trailer cost per tonne for all scenarios 2010 -2030	44

List of Tables

Table 1:	Population and Dwellings – Current and Projected	2
Table 2:	Regions of East Gippsland used in this report	3
Table 3:	Overview of waste contracts.....	8
Table 4:	Summary of kerbside collection systems.....	9
Table 5:	Summary of other collection systems.....	9
Table 6:	2010 Collection quantities from data provided by EGSC	9
Table 7:	Summary of waste tonnages from EGSC figures provided.....	11
Table 8:	Estimated breakdown of 2010 household MSW composition	12
Table 9:	Current East Gippsland waste management facilities	13
Table 10:	Summary of landfill facilities in East Gippsland.....	14
Table 11:	Summary of transfer station facilities in East Gippsland.....	15
Table 12:	Base Case infrastructure.....	18
Table 13:	Summary of Option 1	20
Table 14:	Summary of Option 2	21
Table 15:	Summary of Option 3	22
Table 16:	Summary of Option 4	24
Table 17:	Summary of Option 3A.....	25
Table 18:	Projected waste arisings taken from Base Case model 2010 -2030	26
Table 19:	2010 Total modelled collection quantities	27
Table 20:	Total modelled cost in millions of dollars for all scenarios 2010 - 2030	28
Table 21:	Landfill construction cost for all scenarios 2010 -2030	31
Table 22:	Landfill operation costs for all scenarios 2010 -2030	32
Table 23:	Landfill diversion rates for all scenarios 2010 -2030	35
Table 24:	Comparison of EGSC provided and Base Case modelled waste service costs.....	36
Table 25:	Comparison of EGSC provided and Base Case modelled waste services income figures	37

Table 26:	Cost per tonne breakdown of each Option.....	40
Table 27:	Cost per tonne analysis of modelled Kerbside MSW collection 2010 - 2030	40
Table 28:	Cost per tonne analysis of modelled Kerbside co-mingled collection 2010 -2030.....	41
Table 29:	Cost per tonne analysis of modelled kerbside green waste collection 2010 - 2030	41
Table 30:	Landfill construction costs per tonne.....	41
Table 31:	Landfill operation cost per tonne	42
Table 32:	Estimated cost for upgrading transfer stations to best practice standards.....	45

1. INTRODUCTION

Meinhardt Infrastructure & Environment Pty Ltd (Meinhardt) was contracted by East Gippsland Shire Council (EGSC) to undertake a study of current and potential future Waste Collection and Disposal Strategies.

1.1. Purpose

The purpose of this project was to model and understand waste management in East Gippsland from logistical, service provision and financial perspectives. The project aims to provide EGSC with detailed understanding of current and potential future waste management options through the use of waste and cost modelling. The outputs from this will provide EGSC with a sound basis for a Waste Strategy to the year 2030. This project is a direct result of the \$2 million per annum deficit between service provision costs and fees and charges of the EGSC waste management system and aims to provide analysis of a range of methods for reducing this deficit

1.2. Objectives

To achieve the purpose of the study it was necessary to create an accurate model of the current waste management strategy used in EGSC. This then provided the basis for modelling future options that aim to achieve cost efficiencies without a reduction in the service level provided to EGSC's ratepayers. The objective therefore was to provide EGSC with a robust model for its current and potential future waste management options that provides Council with an ability to reduce the current deficit in the financing of waste management through cost reduction, revenue increase or a combination of the two.

1.3. Report overview

The study was undertaken in two stages. The first stage entailed the creation of waste models that estimated the cost and landfill diversion of current and potential future options. The models were designed with a brief of maintaining or improving current service provision, maximising landfill diversion and minimising cost, and with the ability for EGSC to amend key data in the future to understand changing influences on the waste management system. The models were then used as a basis for the second stage of the project, the design of a waste collection and disposal strategy.

The Waste Collection and Disposal Strategy (WS) describes potential strategies and actions to be undertaken by EGSC over the next 20 years (2010-2030), with the key aims to guide the development and improvement of current waste management practices. Sustainable approaches to waste management need to be integrated into all future policies, strategies and planning decisions made by EGSC.

The future directions of waste management within this municipality need to be consistent and work towards those of the region and Victoria as a whole. As such, the key drivers for this strategy are:

- Government policies and commitments relating to the Towards Zero Waste strategy and targets;
- The need to deal with the projected population increases and economic growth of East Gippsland, in terms of sustainability outcomes for waste and materials recovery;
- The need to manage and reduce greenhouse gas emissions and energy and water consumption in response to climate change; and
- Government policies seeking to increase energy generation from renewable sources.

The management of waste including collection and disposal, hard waste, litter, and street litter bins is a major component of EGSC's annual budget therefore it needs to be appropriately managed.

Similarly, the collection and disposal of waste is the biggest single greenhouse gas generator, (in particular landfill methane emissions) of EGSC.

1.4. Council overview

East Gippsland Shire Council is the eastern most municipality in Victoria and is the second largest shire in the State with a total area of 21,051 square kilometres, see Figures 1 and 2 in Appendix A. According to the Australian Bureau of Statistics (ABS) EGSC had a population of 41,361 in 2006¹. The predominant industries include agriculture, forestry, fishing and tourism².

1.4.1. Local waste management

Waste management in EGSC includes a wide range of activities including:

- bin collections for recyclables, green organics and residual waste;
- disposal and processing of material collected;
- transfer station/depot waste;
- transfer trailer waste;
- street litter bins;
- litter collection; and
- dumped rubbish pick up;

The cost of providing these services for the 2008/09 year was in excess of \$6.7 million compared to fees and charges of \$4.5 million in the same period. The EGSC deficit for waste management was therefore \$2.2million in 2008/09.

1.4.2. Local population characteristics

The current population of East Gippsland Shire is 41,361 based on the ABS census 2006 data. This is a 3% increase since 2001. The region has reported total growth between 1996 and 2006 of 3.4%, as such there was little population growth between 1996 and 2001. Future Victoria estimates that East Gippsland Shire's population will grow by 1.2% p.a. in the future. The table below provides a summary of the impact that 1.2% growth will have on the population in 2010, 2020 and 2030.

Table 1: Population and Dwellings – Current and Projected

	2010 (Current)		2020 (Projected)		2030 (Projected)	
	Residents	Dwellings	Residents	Dwellings	Residents	Dwellings
Number	43,991	17,949	50,342	19,080	53,792	20,281
Growth Rate (per annum)	1.2%	0.6%	1.2%	0.6%	1.2%	0.6%

Population within the shire is concentrated in higher density population centres in the south east and along the coast with the northern mountainous areas remaining sparsely populated.

¹<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/LGA22110Population/People12002-2006?opendocument&tabname=Summary&prodno=LGA22110&issue=2002-2006>

² Victorian Local Sustainability Accord, *Local Environmental Sustainability Priority Statement Shire of East Gippsland* June 2007

For the purpose of this plan EGSC has been divided into four main areas as shown in the table below:

Table 2: Areas of East Gippsland used in this report

Area	Towns Included
Bairnsdale & Lakes area	This is the South Eastern corner of the East Gippsland where the majority of the population lives. This area includes, Bairnsdale, Lindenow, Paynesville, Metung, Lakes Entrance, Lake Tyers, Swan Reach, Forge Creek, Calulu, Buthen and Nowa Nowa. This area represents 78% of the East Gippsland population and receives a significant amount of the tourism trade.
Omeo area	This area is in the North of East Gippsland. The main population centres are based along the key access roads to the Alpine region of Victoria. The main population centres are: Ensay, Swifts Creek, Omeo, Anglers Rest, Glen Wills and Benambra.
North East area	This is the most remote and sparsely populated area in East Gippsland running along the North Eastern boundary with New South Wales. The main population centres in this area are: Deddick, Tubbut, Dellicknora, Bonang, Goongerah and Bendoc.
Orbost area	This area is a band of approximately 75km width running along the Western Coastal area of East Gippsland. The major population centres include Orbost, Bete Bolong, Newmerella, Brodribb River, Marlo, Bemm River, Cann River, Tamboon, Combienbar, Club Terrace, Chandlers Creek, Genoa, Gypsy Point and Mallacoota.

Refer to Figure 3 in Appendix B for a map of the East Gippsland area and the area boundaries.

In recent years the average age of EGSC population and the number of “holiday homes” has increased. The trend for retiree and holiday homes is for growth to be focused on costal and urban areas. As such, it is expected that there will be a greater proportional growth in population in the Bairnsdale & Lakes Area and the Orbost Area of EGSC over the next 20 years³.

1.4.3. Key issues for the municipality

Key issues that EGSC has to tackle regarding waste management within the municipality relate to:

- Very low population densities in much of EGSC, especially the North;
- Large fluctuations in the tourism population throughout the year;
- Maintenance of high service levels for waste management provision;
- Traditional dependence on small unlicensed landfills; and
- Strong political and social desire to divert waste from landfill.

1.5. Strategic context

The Waste Collection and Disposal Strategy (WS) has been developed inline with relevant legislation and policies that have been developed at both Federal and State level. These documents include:

- Environment Protection Act 1970 (EP Act);
- Federal Government’s *National Waste Policy*;
- State Government’s *Our Environment Our Future: Victoria’s Sustainability Framework*; and,
- State Government’s *Towards Zero Waste Strategy (TZW)*.

³ Victorian Local Sustainability Accord, *Local Environmental Sustainability Priority Statement Shire of East Gippsland* June 2007

The key principle underpinning the waste management strategy is the waste management hierarchy, promulgated under the EP Act. The waste management hierarchy places waste avoidance as the most preferred option and waste disposal (to landfill) the least preferred. All the waste management policies developed by all levels of government are based on this principle.

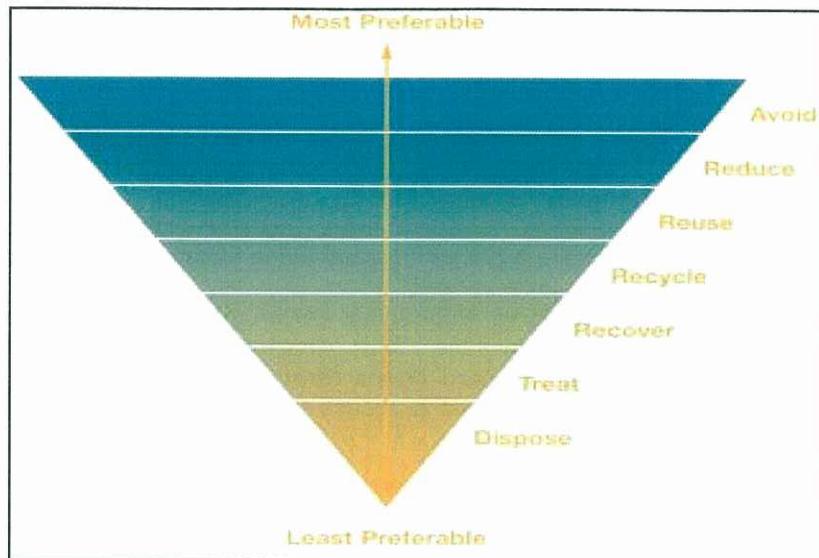


Figure 1: Waste management hierarchy

1.6. Waste overview

The WS incorporates the strategies and actions for the management of a variety of waste materials. The focus of the strategy is on Municipal Solid Waste (MSW) although, where appropriate, the strategy addresses Commercial and Industrial (C&I) waste and Construction and Demolition (C&D) waste. The MSW materials include:

- kerbside collected Municipal Solid Waste, including recyclables, green waste and residual bins;
- transfer stations;
- transfer trailers;
- street litter (including street litter bins);
- Public Place Recycling (PPR); and
- illegally dumped waste;

2. STRATEGIC FRAMEWORK

2.1. Key federal and state legislation and policies

Key federal and state legislation and policies, detailed in Appendix A, include:

- **National Waste Policy** – the policy aims to set objectives and priorities for the next ten years with regards to waste management in Australia (currently being developed).
- **Carbon Pollution Reduction Scheme (CPRS)** – framework for reducing carbon pollution in Australia. CPRS comprises a 'cap and trade' scheme which will require emitters of greenhouse gases to acquire a permit for every tonne of carbon dioxide equivalents (CO₂-e) they emit (legislation yet to be passed).
- **National Initiatives - National Packaging Covenant (NPC)** - voluntary initiative by government and industry to reduce the effects of packaging on the environment.
- **State Government - Towards Zero Waste Strategy (TZW)** - objectives of TZW are to reduce and recover solid waste, and to reduce the environmentally damaging impacts of waste

Some of the TZW targets are:

- **Reduce** the amount of waste generated by 1.5 million tonnes per annum by 2014, compared to 2002/03.
- Increase the **recovery** rate in all solid waste generated from the current 48% (2003) to 75% by 2014 comprising:

65% recovery rate (by weight) of MSW for reuse and recycling by 2014. An interim target of 45% recovery rate is established for 2008-09;

80% recovery (by weight) of (C&I) solid waste for reuse and recycling by 2014. An interim target of 65% is established by 2008-09; and

80% recovery rate (by weight) of (C&D) solid waste for reuse and recycling by 2014. An interim target of 65% is established for 2008-09.

25% reduction in littering behaviour compared with 2003 levels.

- **Victorian Litter Strategy – Creating Cleaner, Safer Places** – strategy to prevent litter and improve litter management practices to meet the TZW littering behaviour target and achieve clean and safe public places.
- **Solid Industrial Waste Management Plan** - developed to establish goals and targets for solid waste management (e.g. C&I and C&D waste) in Victoria.
- **Other waste issues or initiatives** include Eco-Buy program that encourages the purchasing of environmentally preferable products and services; current and future disposal costs and levies; other EPA policy initiatives; product stewardship programs, contamination issues and occupational health and safety.

2.2. Gippsland Regional Waste Management Group (GRWMG)

EGSC is a member of the Gippsland Regional Waste Management Group (GRWMG) which is established under the Environment Protection Act 1970. The overall objectives of the group are to minimise municipal solid waste generation, prevent litter, maximise resource recovery and recycling and minimise waste disposal to landfills.

To achieve this, GRWMG created the Regional Waste Management Plan in 2007 to provide leadership and establish strategic direction for municipal solid waste management programs and activities. The plan provides a vision of sustainable waste management in Gippsland in the year 2014. It is the GRWMG's intention to work toward the achievement of the following targets by the year 2014:

- All resource recovery facilities, transfer stations and landfills will endeavour to incorporate best practice environmental management systems.
- Unlicensed landfills posing an unacceptable environmental risk will have been replaced with transfer stations.
- Minimise landfilling of the following materials
 - Paper/cardboard;
 - Clean soil (except when used for cover material);
 - Metals;
 - Green waste;
 - Plastic codes 1-5;
 - Tyres;
 - Timber and sawdust (except chemically treated material);
 - Concrete; and
 - Electronic waste.
- Public place recycling at all high visitation locations.
- The amount of garbage generated per household per year will aim to be 250kg compared with 398kg in the year 2005/06.
- The amount of solid waste recovered for further use will aim to be 64% in comparison to 39.5% in the year 2005/06.
- Reduce litter by 25% through improvements in littering behaviour, which includes litter reduction, prevention and behaviour change.
- All significant event venues, all state and local government offices, 40% of schools and 10% of small businesses will be certified as Waste Wise.

2.3. Local Council

Environmental strategy in EGSC is further guided by the "*Victorian Local Sustainability Accord for the Shire of East Gippsland 2007*". This accord identifies within its priority environmental or sustainability issues a number of areas that impact upon waste management including:

- **Reduce waste and encourage re-use** – The size of the municipality and dispersed population means the provision of waste services and facilities to the community requires a significant infrastructure and services network. Facilitating and encouraging waste reduction by households and businesses, and increasing recycling requires cultural change and innovative approaches. Key issues include the ongoing conversion of landfills, management of increasing costs associated with transportation of waste, providing smaller and remote communities with feasible recycling options and investigating green/organic processing options.
- **Improving landfill practises and rehabilitation** – Council is progressively improving landfill practises and rehabilitation to achieve improved land and biodiversity outcomes.
- **Waste reduction / recycling accreditation and community action** – Council recognises that it is appropriate for Council operations to achieve waste reduction and for its purchasing practices to be more sustainable.

3. CURRENT WASTE MANAGEMENT

3.1. Municipality

EGSC has a number of systems for the collection and disposal of waste across the Shire. These systems have been developed due to the challenges presented by a significantly varied population density across the shire.

Waste collection can effectively be split into three zones:

- **High density population areas** – Kerbside collection of MSW, co-mingled and green waste collection services provided to the majority of households, with a lower proportion receiving green waste collection services. Currently households pay a service fee of \$181 per year for the MSW and co-mingled collection and an additional \$16 per year if they receive green waste collection.
- **Medium density population areas** – Transfer station provided with 30m³ or 10m³ bins for MSW and, depending on the transfer station, there are receptacles/areas of varying sizes for steel, other recyclables and green waste. Local residents deliver their household waste to the transfer station and segregate it on site. The majority of these sites are staffed, but some are not. When staffed, gate fees apply for everything except some recyclables. Transfer of waste to the management facility occurs when the bins reach capacity.
- **Low density population areas** – Unstaffed transfer trailer provided for local residents to deliver their household waste too. All waste collected is treated as MSW. There is no direct cost to users for the provision of this service. Contractually transfer trailers are collected on a weekly or fortnightly basis, although during peak holiday seasons extra collections occur.

Once collected, the waste enters a range of different management streams depending on whether it is destined for composting, recycling or final disposal. A brief summary of each stream is provided below:

- **Recyclables** – Co-mingled recyclables collected from the kerbside, public place recycling and transfer stations are sent to a Materials Recycling Facility (MRF) in Bairnsdale for further separation before sale to third party processors. Segregated collections from transfer stations are sold directly to third parties.
- **Green Waste** – Kerbside collected green waste is stored and mulched at Bairnsdale Landfill before haulage to Gippsland Water's Dutson Downs composting facility in Wellington Shire for composting. Bairnsdale and Lakes Entrance Transfer stations collected waste is also mulched and delivered to the Dutson Downs composting facility. Green waste at all other Transfer Stations is collected and burned on site when conditions are appropriate.
- **Municipal Solid Waste** – Kerbside, transfer station and transfer trailer collected MSW is disposed of at one of the landfill facilities within the Shire. The major landfills for the Shire are Bairnsdale and Lakes Entrance medium sized landfills are located at Orbost, Cann River and Mallacoota and minor landfills at Benambra, Bendoc and Bonang. Bairnsdale Landfill is the only Landfill in the region with a cell constructed to EPA BPEM standards with all of the other landfill facilities being trench and fill operations.

3.1.1. Overview of current EGSC waste contracts

EGSC uses three contractors to provide its waste management services. The companies and their role for EGSC are summarised below:

- Gippsland Waste Services Ltd: Operates Bairnsdale, Lakes Entrance and Orbost landfills and transfer stations. Also operates Cann River and Mallacoota landfills.

- Tambo Waste: Provides kerbside collection services for MSW, Co-mingled and green waste collections throughout EGSC. Also undertakes public litter and public place recycling in the more populated areas of the shire where kerbside collection occurs.
- Orbost Civil & Civic: Undertakes management of rural landfills and the transfer trailer network.

The details of these contracts are further elaborated in Table 3 below.

Table 3: Overview of waste contracts

Service	Contractor	Number of Services	Annual Cost	Contract Expiration (plus extensions)
Kerbside MSW Collection	Tambo Waste	16,855	\$826,545	01/09/2014
Kerbside Co-mingled Collection	Tambo Waste	16,855	\$479,511	01/09/2014
Kerbside Green waste collection	Tambo waste	13,872	\$423,006	01/09/2014
Waste Disposal Operation – Bairnsdale, Lakes Entrance, Orbost, Cann river and Mallacoota landfills	Gippsland Waste Services	N/A	\$1,305,087	25/06/2019
Bairnsdale, Lakes Entrance and Orbost transfer stations	Gippsland Waste Services	N/A	\$678,939	25/06/2019
Stand alone transfer station Operation (TS not co-located at a landfill)	Indigo Shire Council	N/A	\$700,047	30/06/2011
Transfer trailer collection, Bonang, Bendoc and Benambra landfill management and collection of street litter bins in more rural areas.	Orbost Civil and Civic	N/A	\$507,115	30/06/2011
Street litter bins collection	Tambo Waste	N/A	\$183,100	01/09/2014
Public Place Recycling (PPR) Bins Collection	Tambo Waste	N/A	\$9,360	01/09/2014
Total			\$5,112,710	

3.1.2. Collection

Kerbside collection services provided by EGSC are as follows:

Table 4: Summary of kerbside collection systems

Waste Type	Collection system residential	Collection frequency residential
Garbage	120L MGB	Weekly
Recyclables	240L MGB	Fortnightly
Green waste	240L MGB	Fortnightly

Table 5: Summary of other collection systems

	Collection system	Collection frequency
Transfer Station	30m ³ Hook bin	As required
Transfer Trailer	4 x 4 truck	Contractually weekly and/or fortnightly. Although extra pick ups can be arranged as required.
Public place recycling	Compaction system rear loader	Weekly/As required

3.1.3. Waste quantities

Exact figures for all waste arisings in East Gippsland are not available. Table 6 below provides an estimate of the tonnages of waste arising that EGSC have reported. The table only provides an estimate, as EGSC maintains a weighbridge at the Bairnsdale and Lakes Entrance facilities only and all other tonnages are based on conversion of volume estimates.

Table 6: 2010 Collection quantities from data provided by EGSC

	Current quantities (tonnes)	Source
MSW - Bairnsdale landfill	8,000 (max)	EGSC Management and Operation of Landfills Contract (pg 7)
Industrial Waste – Bairnsdale landfill	11,200 (max)	EGSC Management and Operation of Landfills Contract (pg 7)
MSW – Lakes Entrance Landfill	4,600 (max)	EGSC Management and Operation of Landfills Contract (pg 7)
Industrial Waste – Lakes Entrance Landfill	3,600 (max)	EGSC Management and Operation of Landfills Contract (pg 7)
Waste – Other Landfills	5,700	Landfill facilities and Transfer Trailers and Litter Bins Contract(pg62) – Note Waste volumes are compacted volume estimates multiplied by a density of 0.5t per m ³
Kerbside Recyclables	3,960 (max)	Communication with Tambo Waste of MRF tonnage throughput.

	Current quantities (tonnes)	Source
PET & HDPE – Orbost and Mallacoota	8	Landfill facilities and Transfer Trailers and Litter Bins Contract(pg62) – Note: Waste volumes are compacted volume estimates multiplied by a density of 0.1t per m ³
Glass – Orbost, Mallacoota and Gipsy Point	22.5	Landfill facilities and Transfer Trailers and Litter Bins Contract(pg62) – Note: Waste volumes are compacted volume estimates multiplied by a density of 0.25t per m ³
Aluminium & Steel – Orbost, Mallacoota, Cann River and Wairewa	68.6	Landfill facilities and Transfer Trailers and Litter Bins Contract(pg62) – Note: Waste volumes are compacted volume estimates multiplied by a density of 0.14t per m ³
Batteries – Orbost, Mallacoota	Number 300	Landfill facilities and Transfer Trailers and Litter Bins Contract (pg62)
Tyres – Orbost, Mallacoota, Cann River and Wairewa	Number 900	Landfill facilities and Transfer Trailers and Litter Bins Contract(pg62)
Oil – Orbost and Mallacoota	6,000 Litres	Landfill facilities and Transfer Trailers and Litter Bins Contract(pg62)
Kerbside Green Waste- Estimated 2009/10	3,100	EGSC Management and Operation of Landfills Contract (pg 12)
Green Waste – Bairnsdale Landfill	1,109	EGSC Management and Operation of Landfills Contract (pg 12)
Green Waste – Lakes Entrance Landfill	900	EGSC Management and Operation of Landfills Contract (pg 12)
Green waste – other landfills and transfer stations	860	Landfill facilities and Transfer Trailers and Litter Bins Contract(pg62) – Note volume estimates multiplied by a density of 0.2t per m ³
Concrete received – Bairnsdale Landfill (2007/08)	1,553	EGSC Management and Operation of Landfills Contract (pg 11)
Concrete received – Lakes Entrance Landfill (2007/08)	1,017	EGSC Management and Operation of Landfills Contract (pg 11)

Table 7 below collates all of the separate sources for waste arising in EGSC.

Table 7: Summary of waste tonnages from EGSC provided figures

	Current quantities tonnes	Kg / hh / yr
Number of Households		17,949
MSW	18,300	1,020
Industrial Waste	14,800	N/A
Recyclables	4,060	226
Green Waste	5,969	333
Concrete	2,570	N/A
Total Waste Generation	45,699	1,579
	(including industrial waste)	
Diversion rate %	27.5%	32%

The tonnage estimates for EGSC from the information provided from the waste management facilities appear to be high. The Gippsland Regional Waste Management Plan 2007 estimates that the average waste arising per household per year in East Gippsland was 750.6 kg⁴ under half of the figure shown in Table 7.

3.1.4. Composition

Current waste composition across the municipality has been estimated from an All Environmental Concepts waste audit report undertaken for the Gippsland Regional Waste Management Group in 2008⁵. The report details the average waste composition for an East Gippsland's Kerbside household, the results of which have been used as the basis for the urban waste composition in this report.

Meinhardt has inferred current waste composition for waste arising at transfer stations and the transfer trailers (low and medium density areas) by using the urban kerbside waste composition data and then assuming the influence of the following factors:

1. Reduction in green waste arising due to home composting and lack of desire by households to transport to facility; and,
2. Reduction in kitchen waste arising due to home composting and use as a feedstock for pets and livestock.

It is envisaged that these factors will be more pronounced for users of transfer trailers rather than transfer stations due to their proximity to the facility, provision of separate green waste collection at the transfer station and the larger size of property in the more rural areas where transfer trailers are provided.

The variation in the waste arising per household with the use of different waste collection systems is summarised in the table below. Kerbside collection is estimated to have the highest volume of waste arising as it is assumed that the ease of use of the service and the urban nature of the user means there will be low use of garden and kitchen organics in home composting. The transfer stations are considered to be in semi-rural locations so there is greater use of home composting. The transfer trailers are located in rural areas and so greater use home composting and organics use (e.g. feeding of chickens) has been assumed.

⁴ Table 4.1 Gippsland regional Waste Management Plan 2007

⁵ All Environmental Concepts *Gippsland regional waste management group Waste audits July – August 2008*

Table 8: Estimated breakdown of 2010 household MSW composition

Waste Type	Kerbside kg/hh (% Composition)	Transfer Station kg/hh (% Composition)	Transfer Trailer kg/hh (% Composition)
MSW (incl Kitchen waste)	347 (33%)	273 (32%)	231 (37%)
Garden waste	349 (33%)	210 (25%)	35 (6%)
Recyclables	357 (34%)	357 (43%)	357 (57%)
Total	1,053	840	623

4. WASTE MANAGEMENT INFRASTRUCTURE

4.1. Current waste management infrastructure

EGSC utilises 35 different waste management facilities. Of these facilities, 31 are managed by EGSC, two are privately owned and two are illegal landfills that are operated by members of the public. EGSC utilises Tambo Waste's Materials Recycling Facility (MRF) at Bairnsdale and Gippsland Water's Dutson Downs composting facility in neighbouring Wellington Shire. The illegal landfills are located at Gelantipy and Wulgulmerang. A summary of the facilities used in East Gippsland waste management is provided below and in Figure 10 Appendix B:

Table 9: Current East Gippsland waste management facilities

Facility	Location	
Landfill and transfer station	- Bairnsdale	- Orbost
	- Lakes Entrance	- Mallacoota
Landfill	- Cann River	- Bendoc
	- Bonang	- Benambra
Transfer station	- Metung	- Buchan
	- Lindenow	- Newmerella
	- Bruthen	- Marlo
	- Swifts Creek	- Bemm River
	- Omeo	- Genoa
Transfer trailer	- Ensay (x2)	- Goongerah
	- Anglers Rest	- Chandler's Creek
	- Glen Wills	- Combiobar
	- Deddick	- Club Terrace
	- Tubbut	- Brodribb river
	- Dellicknora	- Furnell
		- Gipsy Point
Material Recycling Facility (MRF)	- Bairnsdale	
Composting facility	- Dutson Downs, Wellington Shire	
Illegal landfill not operated by EGSC or a contractor.	- Gelantipy	- Wulgulmerang

4.2. Landfills

There are 10 landfills in East Gippsland. The best quality landfill is the EPA licensed facility at Bairnsdale which is clay lined, has leachate management, annual reporting and receives thousands of tonnes of waste a year; the lowest quality landfills are the illegal 'trench and fill' landfills at Gelantipy and Wulgulmerang that are assumed to receive minimal amounts of waste per annum. The table below provides a summary of the landfills and their characteristics.

Table 10: Summary of landfill facilities in East Gippsland

Landfill Location	License	Construction Type	Modelled tonnage
Bairnsdale	Licensed to receive putrescible waste, clean fill, C&I and C&D waste. No liquid waste accepted.	Current cell is clay lined, previous cells are not.	15,754
Lakes Entrance	Licensed to receive putrescible waste, clean fill, low contamination soils, Asbestos, C&D and C&I waste. No liquid waste accepted.	No liner. Current cell will receive a BPEM standard cap.	5,741
Orbost	Licensed for putrescible waste, solid inert waste and clean fill material. Domestic, C&D waste are accepted at the landfill, excluding liquid wastes.	No liner. Trench and fill operation.	1,081
Cann River	Unlicensed. Receives putrescible waste, clean fill, C&D waste. No liquid waste accepted.	No liner. Trench and fill operation.	311
Mallacoota	Licensed to receive Prescribed Industrial Waste – Abalone Gut. Also receives putrescible waste, clean fill and C&I waste. No liquid waste accepted.	No liner. Trench and fill operation.	617
Bendoc	Unlicensed. No liquid waste accepted.	No liner. Trench and fill operation.	30
Bonang	Unlicensed. No liquid waste accepted.	No liner. Trench and fill operation.	66
Benambra	Unlicensed. No liquid waste accepted.	No liner. Trench and fill operation.	12
Gelantipy	Not Council owned or operated, unlicensed and illegal.	Assumed to be trench and fill operation.	?
Wulgulmerang	Not Council owned or operated, unlicensed and illegal.	Assumed to be trench and fill operation.	?

East Gippsland's desire is to change the current landfill practice from a large number of mainly small unlicensed sites to a few or even one landfill that is licensed and lined in accordance with the BPEM.

4.3. Transfer stations

EGSC maintains 15 transfer stations across the shire ranging from large staffed facilities to unstaffed facilities with a basic transfer bin set up with at least two bins, one for MSW and the other for scrap steel. Unstaffed transfer stations are open to misuse and abuse, with a recent case of 200 tyres being deposited at the Cann river landfill/transfer station. A summary of the transfer stations in East Gippsland is provided in the table below:

Table 11: Summary of transfer station facilities in East Gippsland

Location	Staffed/ Unstaffed	Recyclable materials received	Tonnage (2010 est) ⁶
Bairnsdale	Staffed	Glass, Aluminium, Paper, Cardboard, Motor oil, Batteries, Steel & Alloy, Gas Bottle, PET & HDPE Plastic, Concrete.	3,112
Lakes Entrance	Staffed	Glass, Aluminium, Paper, Cardboard, Motor oil, Batteries, Steel & Alloy, Gas Bottle, PET & HDPE Plastic, Concrete.	912
Metung	Staffed	Glass, Aluminium, Paper, Cardboard, Motor oil, Batteries, Steel & Alloy, Gas Bottle, PET & HDPE Plastic.	97
Lindenow	Staffed	Glass, Aluminium, Paper, Cardboard, Motor oil, Batteries, Steel & Alloy, Gas Bottles, PET & HDPE Plastic.	43
Omeo	Staffed	Glass, Aluminium, Paper, Cardboard, Motor oil, Batteries, Steel & Alloy, Gas Bottle, PET & HDPE Plastic.	32
Swifts Creek	Staffed	Glass, Aluminium, Paper, Cardboard, Motor oil, Batteries, Steel & Alloy, Gas Bottle, PET & HDPE Plastic.	16
Wairewa	Staffed	Glass, Aluminium, Paper, Cardboard, Motor oil, Batteries, Steel & Alloy, Gas Bottle, PET & HDPE Plastic.	68
Buchan	Staffed	Glass, Aluminium, Paper, Cardboard, Motor oil, Batteries, Steel & Alloy, Gas Bottle, PET & HDPE Plastic.	76
Bruthen	Staffed	Glass, Aluminium, Paper, Cardboard, Motor oil, Batteries, Steel & Alloy, Gas Bottle, PET & HDPE Plastic.	70
Orbost	Staffed	Glass, Aluminium, Paper, Cardboard, Motor oil, Batteries, Steel & Alloy, Gas Bottle, PET & HDPE Plastic.	176
Newmerella	Staffed	Glass, Aluminium, Paper, Cardboard, Motor oil, Batteries, Steel & Alloy, Gas Bottle, PET & HDPE Plastic.	14
Marlo	Staffed	Glass, Aluminium, Paper, Cardboard, Motor oil, Batteries, Steel & Alloy, Gas Bottle, PET & HDPE Plastic.	45
Bemm River	Unstaffed	Glass, Aluminium.	31
Cann River	Unstaffed	Glass, Aluminium, Paper, Cardboard, Motor oil, Batteries, Steel & Alloy, Gas Bottle, PET & HDPE Plastic.	140
Genoa	Unstaffed	Glass, Aluminium, Steel & Alloy.	57
Mallacoota	Staffed	Glass, Aluminium, Paper, Cardboard, Motor oil, Batteries, Steel & Alloy, Gas Bottle, PET & HDPE Plastic.	186

⁶ Note transfer station tonnages contain both commercial and public waste figures.

East Gippsland would like to see the transfer station that it maintains move towards greater landfill diversion through best practice operation.

4.4. Transfer trailers

East Gippsland utilises a system of transfer trailers to provide waste management services to its more dispersed and rural communities. The trailer is available 24 hours a day, seven days a week for waste disposal and is emptied on a weekly or fortnightly basis depending on the intensity of use.

The system provides a cost effective waste management service to these remote communities, however it is open to abuse. Discussions with EGSC indicate that some transfer trailers are believed to receive a significant amount of waste from campers and non-local communities. The reasons for this are two fold. Firstly, the camp grounds within DSE land operate a 'take in take out' policy for waste, so that campers take their waste to the first waste receptacle available, often a transfer trailer such as the Furnell transfer trailer. Secondly, as the transfer trailer is unmanned it does not charge for the disposal of waste so non-local persons use the facility preferentially to their local transfer station, a good example of this is the Gypsy Point transfer trailer.

Further issues with the transfer trailers include waste disposal volume exceeding capacity of the trailer and contamination. Where the volume of waste disposal exceeds the trailer volume, excess waste is deposited around the trailer, providing an eyesore and a route for contamination of land from windblown litter, vermin spread litter and direct leakage to ground. Contamination occurs when hazardous substances, tyres or prohibited weeds are deposited, thus creating problems with haulage and disposal of the waste. The transfer trailers are also utilised for the disposal of inappropriate items such as mattresses and animals, which cause associated issues with blocking up the trailer and odour.

EGSC would like the control of the transfer trailer system to be improved to ensure that the waste entering the trailer is acceptable and to potentially receive revenue from customers (local and visitors) depositing waste.

5. MODELLING & OPTIONS

5.1. Introduction to modelling of waste management options

Meinhardt undertook modelling of current waste management in East Gippsland using data provided by EGSC. The data provided indicated that an important area for development within the waste management system was reporting of waste tonnages and movements within East Gippsland to understand exactly what is occurring. Due to the nature of modelling and the data gaps in the information provided, a number of assumptions were made with regard to the modelling of waste management. A summary of the assumptions used in the modelling is provided in Appendix C.

The six options modelled were:

- **Base Case:** No change from current Waste Management.
- **Option 1:** No change in waste collection. Only Bairnsdale and Orbost Landfills remain operational and both are BPEM compliant.
- **Option 2:** Maximised roll out of kerbside collection services. Significant closure of transfer stations and transfer trailers. Only Bairnsdale and Orbost Landfills remain operational and both are BPEM compliant.
- **Option 3:** Full roll out of kerbside collection to 'coastal corridor' along the Princess Highway. Significant closure of facilities in the 'coastal corridor'. Only Bairnsdale and Orbost Landfills remain operational and both are BPEM compliant.
- **Option 4:** Same as Option 1 but with manning of all transfer stations and transfer trailers to recoup a gate fee from all users.
- **Option 3A:** Same as Option 3 but with kerbside green waste only provided to household in Bairnsdale and lakes region.

The base case was used as a comparison to the various alternative waste management options, as agreed with EGSC. Below is a description of the base case and the four options which were modelled by Meinhardt.

5.2. Base Case

The Base Case models current waste management practice in East Gippsland. The table below summarises the key waste management infrastructure in the key areas of East Gippsland and waste collection and disposal. See Figure 4 Appendix B for graphical representation of the Base Case.

Table 12: Base Case infrastructure

Area	Infrastructure	Collection method (s)	Disposal method(s)
Bairnsdale & Lakes Entrance area	<ul style="list-style-type: none"> Landfills: Bairnsdale, Lakes Entrance Transfer Stations: Bairnsdale, Lindenow, Lakes Entrance, Metung, Bruthen. 	<ul style="list-style-type: none"> Kerbside Collection Direct Delivery to TS 	<ul style="list-style-type: none"> MSW – Bairnsdale and Lakes Entrance Landfill Kerbside co-mingled recyclables processed at Bairnsdale MRF TS Recyclables direct haul to processor Kerbside, Bairnsdale TS and Lakes Entrance TS green waste mulched and hauled to Dutson Downs composting facility. All other TS green waste is burnt at TS
Omeo area	<ul style="list-style-type: none"> Benambra landfill Transfer Station s: Omeo, Swifts Creek Transfer Trailers: Anglers Rest, Glen Wills, Ensay TT (X2) 	<ul style="list-style-type: none"> Kerbside collection provided to Ensay, Swifts Creek and Omeo Direct Delivery to Benambra Landfill, all TS and TT's. TT collected and emptied at Omeo and Swifts Creek TS by Orbst Civil and Civic. 	<ul style="list-style-type: none"> MSW – all Kerbside, TS and TT to Lakes Entrance Landfill, except direct haul to Benambra landfill. Kerbside co-mingled recyclables processed at Bairnsdale MRF TS Recyclables direct haul to processor Kerbside green waste mulched and hauled to Dutson Downs composting facility. All other TS green waste is burnt Anglers rest and Glen Wills TT's are collected and bulked at Omeo TS. Ensay TT's are collected and bulked at Swifts creek TS.
North East area	<ul style="list-style-type: none"> landfill: Bonang, Bendoc Transfer Trailer: Dellicknora, Tubbut, Deddick, Goongerah 	<ul style="list-style-type: none"> Direct haul to all facilities All TT's collected and emptied by Orbst Civil & Civic. 	<ul style="list-style-type: none"> Tubbut, Deddick, Goongerah and 50 % of Dellicknora TT collected and disposed of at Bonang Landfill. 50% Dellicknora TT collected and disposed of at Bendoc Landfill. Landfill Recyclables direct haul to processor

Area	Infrastructure	Collection method (s)	Disposal method(s)
Orbost area	<ul style="list-style-type: none"> Landfill: Orbost, Cann River, Mallacoota. Transfer station: Orbost, Cann River, Mallacoota, Wairewa, Buchan, Newmerella, Marlo, Bemm River, Genoa. Transfer trailer: Brodribb River, Combienbar, Club Terrace, Chandler's Creek, Furnell, Gypsy Point. 	<ul style="list-style-type: none"> Kerbside collection provided Orbost, Cann River, Genoa and Mallacoota. Direct haul to TS and TT by HH's. Wairewa, Buchan, Newmerella, Marlo and 50% of Bemm River TS' use Orbost landfill. Genoa and 50% of Bemm River TS' use Cann river landfill. All TT's collected and emptied by Orbost Civil & Civic. 	<ul style="list-style-type: none"> MSW – all Kerbside goes to Lakes Entrance Landfill Kerbside co-mingled recyclables processed at Bairnsdale MRF Kerbside green waste mulched and hauled to Dutson Downs composting facility. Wairewa, Buchan, Newmerella, Marlo and Bemm River TS' use Orbost landfill. Genoa and Bemm River TS' use Cann river landfill. Brodribb river TT disposed of at Orbost Landfill. Club terrace, Combienbar and Chandler's Creek TT's disposed of at Cann River landfill. Gypsy point disposed at Mallacoota landfill. TS Recyclables direct haul to processor

5.3. Option 1

Option 1 provides EGSC with an understanding of what the cost implications of moving to having 2 BPEM standard landfills for all of EGSC's waste. The option sees the closure of all landfills except Bairnsdale and Orbost, which are then operated to BPEM standard.

All of the other landfills that have a transfer station are upgraded to be a best practice transfer station, Bonang landfill is developed into a best practice transfer station for the North East Region and Benambra and Bendoc are replaced with transfer trailers.

Full details of the option are provided in the table below. See Figure 5 Appendix B for graphical representation of Option 1.

Table 13: Summary of Option 1

Area	Infrastructure	Collection method (s)	Disposal method(s)
Bairnsdale & Lakes Entrance area	<ul style="list-style-type: none"> Landfill Bairnsdale Transfer station: Bairnsdale, Lindenow, Lakes Entrance, Metung Bruthen. 	<ul style="list-style-type: none"> Kerbside collection of MSW, Co-mingled recyclables and green waste provided to all except Bruthen. Direct Delivery to TS 	<ul style="list-style-type: none"> All MSW to Bairnsdale Landfill Kerbside co-mingled recyclables processed at Bairnsdale MRF TS Recyclables direct haul to processor Kerbside, Bairnsdale TS and Lakes Entrance TS green waste mulched and hauled to Dutson Downs composting facility. All other TS green waste is burnt at the TS
Omeo area	<ul style="list-style-type: none"> Transfer station: Omeo, Swifts Creek. Transfer trailer: Benambra, Anglers Rest, Glen Wills, Ensay (X2). 	<ul style="list-style-type: none"> Kerbside collection of MSW, Co-mingled recyclables and green waste provided to Ensay, Swifts Creek and Omeo TT's collected and emptied at Omeo and Swifts Creek TS by Orbst Civil and Civic. 	<ul style="list-style-type: none"> All Kerbside, TS and TT MSW to Bairnsdale Landfill Kerbside co-mingled recyclables processed at Bairnsdale MRF TS Recyclables direct haul to processor Kerbside green waste mulched and hauled to Dutson Downs composting facility. All other TS green waste is burnt at the TS Anglers rest, Glen Wills and Benambra TT's disposed of to Bairnsdale. Ensay TT's are collected and bulked at Swifts creek TS.
North East area	<ul style="list-style-type: none"> Transfer station: Bonang. Transfer Trailer: Bendoc, Dellicknora, Tubbut, Deddick, Goongerah. 	<ul style="list-style-type: none"> Direct haul to all facilities All TT's collected and emptied by Orbst Civil & Civic. 	<ul style="list-style-type: none"> All TS and TT MSW to Orbst Landfill TT's bulked at Bonang TS. TS Recyclables direct haul to processor TS green waste burnt at the TS
Orbst area	<ul style="list-style-type: none"> Landfill: Orbst Transfer Stations: Orbst, Cann River, Mallacoota, Wairewa, Buchan, Newmerella, Marlo, Bemm River, Genoa. Transfer Trailers: Brodribb River, Chandler's Creek, Club Terrace, Combienbar, Furnell, Gypsy Point 	<ul style="list-style-type: none"> Kerbside collection of MSW, Co-mingled recyclables and green waste provided to Orbst, Cann River, Genoa and Mallacoota. Direct haul to TS and TT by HH's. All TS' use Orbst landfill. All TT's collected and emptied by Orbst Civil & Civic. 	<ul style="list-style-type: none"> Kerbside MSW goes to Bairnsdale Landfill All TT and TS MSW to Orbst landfill. Kerbside co-mingled recyclables processed at Bairnsdale MRF Kerbside green waste mulched and hauled to Dutson Downs composting facility. All TS green waste burnt at TS TS Recyclables direct haul to processor

5.4. Option 2

Option 2 provides significant rationalisation of the facilities provided along with a greater roll out of the kerbside collection service. The option introduces rural kerbside collection services where aggregations of MGBs at collection points for rural households are provided in locations that are accessible for a collection vehicle. For example if there were 10 households located on a side road of the Princes highway, MGBs for the 10 households would be provided at the junction with the Princes Highway in a location where household and the collection vehicle could safely load and unload the MGBs.

Landfills are kept the same as in Option 1 with Bairnsdale and Orbost operating to BPEM standard. There is a significant reduction in the provision of transfer stations with best practice facilities remaining in key locations based on population serviced and distance to the facility. The transfer trailer system is maintained in the North East Region only; all other transfer trailers are closed. See Figure 6 Appendix B for graphical representation of Option 2.

Table 14: Summary of Option 2

Area	Infrastructure	Collection method (s)	Disposal method(s)
Bairnsdale & Lakes Entrance area	<ul style="list-style-type: none"> Landfill: Bairnsdale Transfer station: Bairnsdale Lakes Entrance 	<ul style="list-style-type: none"> Kerbside collection of MSW, Co-mingled recyclables and green waste to all. Direct Delivery to TS 	<ul style="list-style-type: none"> All MSW to Bairnsdale Landfill Kerbside co-mingled recyclables processed at Bairnsdale MRF TS Recyclables direct haul to processor Kerbside, Bairnsdale TS and Lakes Entrance TS green waste mulched and hauled to Dutson Downs composting facility.
Omeo area	<ul style="list-style-type: none"> Transfer station: Omeo 	<ul style="list-style-type: none"> Kerbside collection of MSW, Co-mingled recyclables and green waste provided to all Direct Delivery to TS 	<ul style="list-style-type: none"> MSW – all Kerbside and TS to Bairnsdale Landfill Kerbside co-mingled recyclables processed at Bairnsdale MRF TS Recyclables direct haul to processor Kerbside green waste mulched and hauled to Dutson Downs composting facility. All TS green waste is burnt at TS
North East area	<ul style="list-style-type: none"> Transfer station: Bonang Transfer trailer: Bendoc, Dellicknora, Tubbut, Deddick, Goongerah. 	<ul style="list-style-type: none"> Direct haul to all facilities 	<ul style="list-style-type: none"> All TT's disposed of at Orbost Landfill after bulking at Bonang TS. TS Recyclables direct haul to processor All TS green waste is burnt at TS
Orbost area	<ul style="list-style-type: none"> Landfill: Orbost Transfer station: Orbost, Cann River, Mallacoota, Buchan. 	<ul style="list-style-type: none"> Kerbside collection of MSW, Co-mingled recyclables and green waste provided to all. Direct haul to TS by HH's. All TS' use Orbost landfill. 	<ul style="list-style-type: none"> MSW – all Kerbside goes to Bairnsdale Landfill Kerbside co-mingled recyclables processed at Bairnsdale MRF Kerbside green waste mulched and hauled to Dutson Downs composting facility TS Green waste is burnt at TS All TS' use Orbost landfill TS Recyclables direct haul to processor

5.5. Option 3

Option 3 provides a partial roll out of Option 2 with the coastal corridor along the Princess Highway receiving full kerbside collection and significant rationalisation of waste management facilities in the Orbost and Bairnsdale & Lakes regions. Again there is use of rural kerbside collection systems. The North East and Omeo regions do not alter from Option 1 using a mix of kerbside collection, transfer stations and transfer trailers. See Figure 7 Appendix B for graphical representation of Option 3.

Table 15: Summary of Option 3

Area	Infrastructure	Collection method (s)	Disposal method(s)
Bairnsdale & Lakes Entrance area	<ul style="list-style-type: none"> Landfill: Bairnsdale Transfer station: Bairnsdale, Lakes Entrance. 	<ul style="list-style-type: none"> Kerbside collection of MSW, Co-mingled recyclables and green waste to all. Direct Delivery to TS 	<ul style="list-style-type: none"> MSW – Bairnsdale Landfill Kerbside co-mingled recyclables processed at Bairnsdale MRF TS Recyclables direct haul to processor Kerbside, Bairnsdale TS and Lakes Entrance TS green waste mulched and hauled to Dutson Downs composting facility.
Omeo area	<ul style="list-style-type: none"> Transfer station: Omeo, Swifts Creek Transfer trailer: Benambra, Anglers Rest, Glen Wills, Ensay (X2) 	<ul style="list-style-type: none"> Kerbside collection of MSW, Co-mingled recyclables and green waste provided to Ensay, Swifts Creek and Omeo TT's collected and emptied at Omeo and Swifts Creek TS by Orbost Civil and Civic. 	<ul style="list-style-type: none"> MSW – all Kerbside, TS and TT to Bairnsdale Landfill Kerbside co-mingled recyclables processed at Bairnsdale MRF TS Recyclables direct haul to processor Kerbside green waste mulched and hauled to Dutson Downs composting facility. All other TS green waste is burnt at TS Anglers rest, Glen Wills and Benambra TT's disposed of to Bairnsdale. Ensay TT's are collected and bulked at Swifts creek TS.
North East area	<ul style="list-style-type: none"> Transfer station: Bonang Transfer trailer: Bendoc, Dellicknora, Tubbut, Deddick, Goongerah. 	<ul style="list-style-type: none"> Direct haul to all facilities 	<ul style="list-style-type: none"> All TT's disposed of at Orbost Landfill after bulking at Bonang TS. TS Recyclables direct haul to processor All other TS green waste is burnt at TS
Orbost area	<ul style="list-style-type: none"> Landfill: Orbost Transfer station: Orbost, Cann River, Mallacoota, Buchan. 	<ul style="list-style-type: none"> Kerbside collection of MSW, Co-mingled recyclables and green waste to all. Direct haul to TS by HH's. All TS' use Orbost landfill. 	<ul style="list-style-type: none"> All Kerbside MSW to Bairnsdale Landfill Kerbside co-mingled recyclables processed at Bairnsdale MRF Kerbside green waste mulched and hauled to Dutson Downs composting facility. TS Green waste burnt at TS All TS MSW disposed of at Orbost landfill. TS Recyclables direct haul to processor

5.6. Option 4

Option 4 provides EGSC with an understanding of the impact of manning all of the unmanned transfer trailers from Option 1. As a consequence the only difference in the Option compared to Option 1 is the operational cost of facilities that were unmanned and the revenue generated by EGSC from gate fees that can be charged as a consequence. A summary of Option 4 is provided below. See Figure 8 Appendix B for graphical representation of Option 4.

Table 16: Summary of Option 4

Area	Infrastructure	Collection method (s)	Disposal method(s)
Bairnsdale & Lakes Entrance area	<ul style="list-style-type: none"> Landfill: Bairnsdale Transfer station: Bairnsdale, Lindenow, Lakes Entrance, Metung, Bruthen. 	<ul style="list-style-type: none"> Kerbside collection of MSW, Co-mingled recyclables and green waste to all except Bruthen. Direct Delivery to TS 	<ul style="list-style-type: none"> All MSW to Bairnsdale Landfill Kerbside co-mingled recyclables processed at Bairnsdale MRF TS Recyclables direct haul to processor Kerbside, Bairnsdale TS and Lakes Entrance TS green waste mulched and hauled to Dutson Downs composting facility. All other TS green waste is burnt at TS
Omeo area	<ul style="list-style-type: none"> Transfer station: Omeo, Swifts Creek. Transfer trailer: Benambra, Anglers Rest, Glen Wills, Ensay (X2). 	<ul style="list-style-type: none"> Kerbside collection of MSW, Co-mingled recyclables and green waste provided to Ensay, Swifts Creek and Omeo TT's collected and emptied at Omeo and Swifts Creek TS by Orbst Civil and Civic. 	<ul style="list-style-type: none"> All Kerbside, TS and TT MSW to Bairnsdale Landfill Kerbside co-mingled recyclables processed at Bairnsdale MRF TS Recyclables direct haul to processor Kerbside green waste mulched and hauled to Dutson Downs composting facility. All TS green waste is burnt at TS Anglers rest, Glen Wills and Benambra TT's disposed of to Bairnsdale. Ensay TT's are collected and bulked at Swifts creek TS.
North East area	<ul style="list-style-type: none"> Transfer station: Bonang Transfer trailer: Bendoc, Dellicknora, Tubbut, Deddick, Goongerah. 	<ul style="list-style-type: none"> Direct haul to all facilities All TT's collected and emptied by Orbst Civil & Civic. 	<ul style="list-style-type: none"> All TT's disposed of at Orbst Landfill after bulking at Bonang. TS Recyclables direct haul to processor TS Green waste burnt at TS
Orbst area	<ul style="list-style-type: none"> Landfill: Orbst Transfer station: Orbst, Cann River, Mallacoota, Wairewa, Buchan, Newmerella, Marlo, Bemm River, Genoa. Transfer trailer: Brodribb river, Combianbar, Club Terrace, Chandler's Creek, Furnell, Gypsy Point 	<ul style="list-style-type: none"> Kerbside collection of MSW, Co-mingled recyclable and green waste provided Orbst, Cann River, Genoa and Mallacoota. Direct haul to TS and TT by HH's. All TS' use Orbst landfill. All TT's collected and emptied by Orbst Civil & Civic. 	<ul style="list-style-type: none"> MSW – all Kerbside goes to Bairnsdale Landfill Kerbside co-mingled recyclables processed at Bairnsdale MRF Kerbside green waste mulched and hauled to Dutson Downs composting facility. All TS and TT MSW to Orbst landfill. TS Green waste burnt at TS TS recyclables direct haul to processor

5.7. Option 3A

Option 3A provides EGSC with an appreciation of the cost and landfill diversion for kerbside green waste collection form the Omeo and Orbost regions. The Option aims to highlight that the collection of green waste form these regions provides little or no environmental benefit whilst providing a significant capital cost to EGSC. A summary of Option 3A is provided in the table below. Option 3A provides the same graphical representation as Option 3, therefore See Figure 7 Appendix B for graphical representation of Option 3A.

Table 17: Summary of Option 3A

Area	Infrastructure	Collection method (s)	Disposal method (s)
Bairnsdale & Lakes Entrance	<ul style="list-style-type: none"> Landfill: Bairnsdale Transfer station: Bairnsdale, Lakes Entrance. 	<ul style="list-style-type: none"> Kerbside Collection to all. Direct Delivery to TS 	<ul style="list-style-type: none"> MSW – Bairnsdale Landfill Kerbside co-mingled recyclables processed at Bairnsdale MRF TS Recyclables direct haul to processor Kerbside, Bairnsdale TS and Lakes Entrance TS green waste mulched and hauled to Dutson Downs composting facility.
Omeo Region	<ul style="list-style-type: none"> Transfer station: Omeo, Swifts Creek Transfer trailer: Benambra, Anglers Rest, Glen Wills, Ensay (X2). 	<ul style="list-style-type: none"> Kerbside collection of MSW and Co-mingled recyclables provided to Ensay, Swifts Creek and Omeo TT's collected and emptied at Omeo and Swifts Creek TS by Orbost Civil and Civic. 	<ul style="list-style-type: none"> All Kerbside, TS and TT MSW to Bairnsdale Landfill Kerbside co-mingled recyclables processed at Bairnsdale MRF TS Recyclables direct haul to processor All TS green waste is burnt on site Anglers rest, Glen Wills and Benambra TT's disposed of to Bairnsdale. Ensay TT's are collected and bulked at Swifts creek TS.
North West Region	<ul style="list-style-type: none"> Transfer station: Bonang. Transfer trailer: Bendoc, Dellicknora, Tubbut, Deddick, Goongerah. 	<ul style="list-style-type: none"> Direct haul to all facilities 	<ul style="list-style-type: none"> All TT's disposed of at Orbost Landfill after bulking at Bonang TS. TS Recyclables direct haul to processor
Orbost Region	<ul style="list-style-type: none"> Landfill: Orbost Transfer station: Orbost, Cann River, Mallacoota, Buchan. 	<ul style="list-style-type: none"> Kerbside collection provided all. Direct haul to TS by HH's. All TS' use Orbost landfill 	<ul style="list-style-type: none"> MSW – all Kerbside goes to Bairnsdale Landfill Kerbside co-mingled recyclables processed at Bairnsdale MRF Kerbside green waste mulched and hauled to Dutson Downs composting facility. TS Green waste collected and burnt All TS' use Orbost landfill.

6. MODELLING RESULTS

The modelling exercise provided a range of data relating to current and potential waste management in EGSC. Two key sets of data were provided from the modelling information on the potential financial implications of the different systems as well as an indication of the landfill diversion rates that could be expected.

6.1. Waste arisings

The modelling exercise indicated that there was a significant difference between the tonnage of waste arising in EGSC in the modelled Base Case when compared to the collated waste arising figures provided by EGSC as reported in Section 3.1.3. As noted in Section 3 it is believed that the reported figures for facilities other than Bairnsdale and Lakes Entrance are estimates and that the reported tonnages are significantly higher than reality.

The variation between the waste arisings reported by EGSC and that modelled is due to a lack of quantifiable data for a significant proportion of waste management facilities. Only Bairnsdale and Lakes Entrance landfills maintain a weighbridge and as such, only the data from these can be considered accurate on a tonnage basis.

Furthermore, the data that is reported for some of the smaller, more rural facilities is believed to be high. For example, MSW received at the other landfills is reported as 5,700 tonnes, whilst it is modelled at 2,117 tonnes. It is believed the 5,700 tonnes is incorrect as this would equate to 2.05 tonnes per household, even taking into account industrial waste, this seems very high for regions where waste arisings are assumed to be below one tonne per household due to home composting and feeding of pets/livestock⁷.

In the waste modelling exercise average household waste arisings of 1.05 tonnes per annum have been used in 2010. This figure has been adopted after review of available data and discussion with EGSC. Table 18 below shows the modelled waste arisings per household over the 20 year time period the modelling exercise was carried out for.

Table 18: Projected waste arisings taken from Base Case model 2010 -2030

	2010 (Current) kg/hh/yr	2020 (Projected) kg/hh/yr	2030 (Projected) kg/hh/yr
MSW	656	639	614
Recyclables	226	282	322
Green waste	172	223	250
Total	1,054	1,144	1,186

The projected waste arisings for East Gippsland over the period 2010 -2030 has been modelled using a number of key parameters. Household growth has been modelled at 0.61% in line with Future Victorias predictions and a waste growth per household of:

- 2010 – 1%
- 2015 – 0.75%
- 2020 – 0.5%
- 2025 – 0.25%
- 2030 – 0%

⁷ The Gippsland Regional waste management Plan 2006 has a reported state average household waste arising in 2005/06 of 957 kg per year.

The projections also model an increase in the capture rates of the co-mingled and green waste collection systems and as such, the tonnage arising for these waste streams increases at the detriment of the MSW stream.

Table 19: 2010 Total modelled collection quantities

	Current Quantities tonnes	kg / hh / yr	kg / pp / yr
MSW	11,707	658	272
Recyclables	4,026	226	88
Green Waste	3,061	172	75
Waste Generation	18,794	1,056	435
Diversion Rate (%)	37.7%	37.7%	37.7%

6.2. Financial assessment of modelling results

Financial assessment of the current and potential waste management options has been broken down into three component sections:

- cost;
- revenue; and
- gross implications to EGSC.

The modelling exercise provided a significant volume of data on the financial implications of the different scenarios for EGSC. Below is a breakdown of the three components, stated above, and their key subsections that differentiate the scenarios modelled. A full breakdown of the key components of waste management costs and revenues modelled are provided in Appendix D. It should be noted that there are a number of assumptions that underpin the financial modelling undertaken. The assumptions made are summarised in Appendix C.

6.2.1. Cost analysis

The modelling exercise provided significant variation in the cost implications of the different waste management options, with 2010 modelling indicating a total cost range of \$5.9 million for Option 3A to \$6.9 million for the Base Case.

The results also indicate that there will be a significant increase in the cost of waste management for EGSC, with 2030 costs being approximately double 2010 costs for all options. The graph below provides a summary of the total cost for each option between 2010 and 2030 at 5 year intervals.

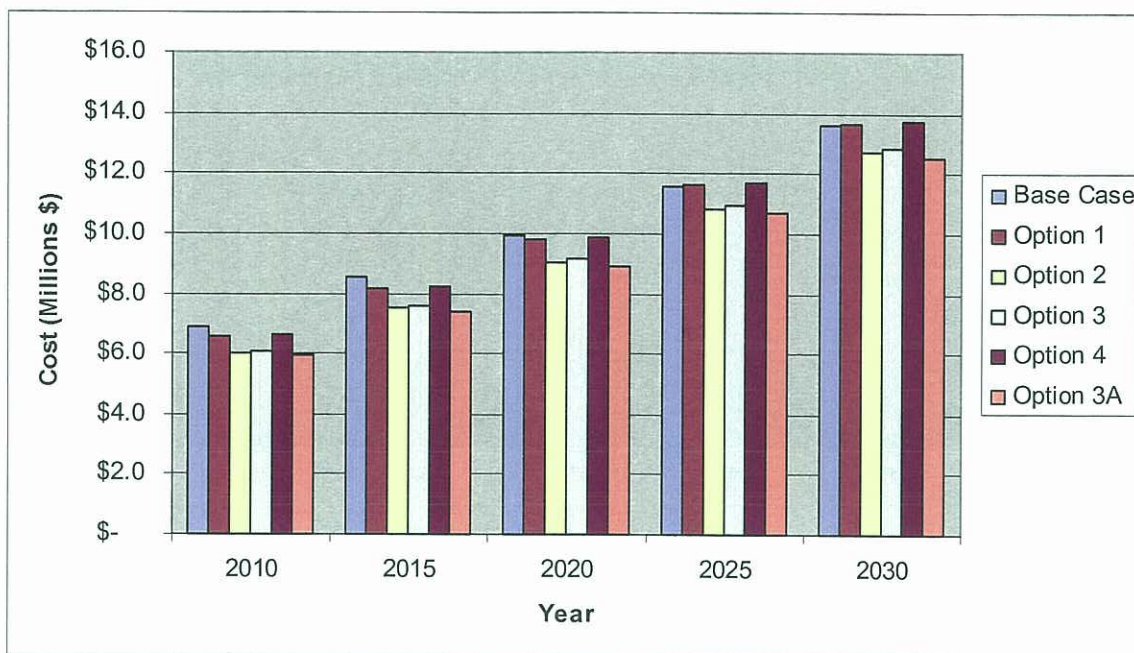


Figure 2: Total modelled cost for all scenarios 2010 – 2030

Table 20: Total modelled cost in millions of dollars for all scenarios 2010 - 2030

	2010	2015	2020	2025	2030
Base Case	\$ 6.90	\$ 8.52	\$ 9.93	\$ 11.59	\$ 13.58
Option 1	\$ 6.59	\$ 8.19	\$ 9.82	\$ 11.67	\$ 13.69
Option 2	\$ 5.99	\$ 7.51	\$ 9.08	\$ 10.84	\$ 12.76
Option 3	\$ 6.09	\$ 7.63	\$ 9.19	\$ 10.96	\$ 12.88
Option 4	\$ 6.62	\$ 8.22	\$ 9.86	\$ 11.71	\$ 13.73
Option 3A	\$ 5.92	\$ 7.43	\$ 8.96	\$ 10.69	\$ 12.57

6.2.2. Waste collection cost

Breakdown of the total cost indicates that for all options, the most significant component is the cost for providing collection infrastructure and vehicles to EGSC. It should be noted that this includes the cost for the operation and management of transfer stations and transfer trailers throughout EGSC.

The modelled results indicate that Option 1 and 4 have the highest cost for waste collection at \$3.4 million while the lowest cost modelled is for Option 3A at \$2.7 million.

A summary of the collection costs for each option over the 20 year modelling period is provided below.

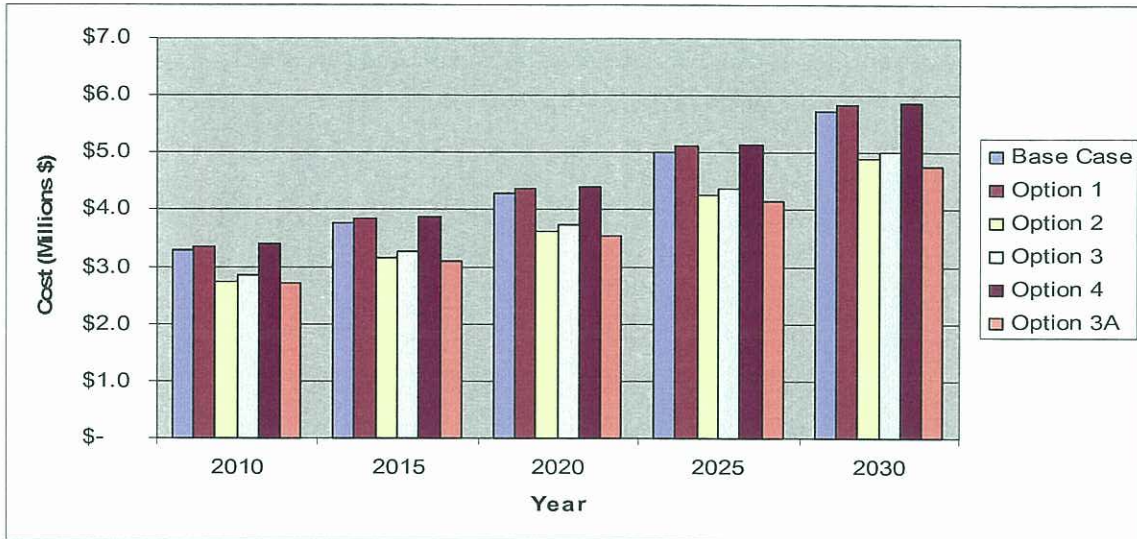


Figure 3: Waste collection costs for all scenarios 2010 - 2030

The waste collection costs can be further divided into the cost for kerbside collection, transfer station and transfer trailer cost for each scenario.

Results for the kerbside collection costs indicate that there is only a \$0.2 million between all of the options in 2010 ranging from \$1.7 million for Option 3A to \$1.9 million for Option 2 and 3. The figure below provides graphical representation of the Kerbside collection costs for all scenarios over the 20 year period modelled.

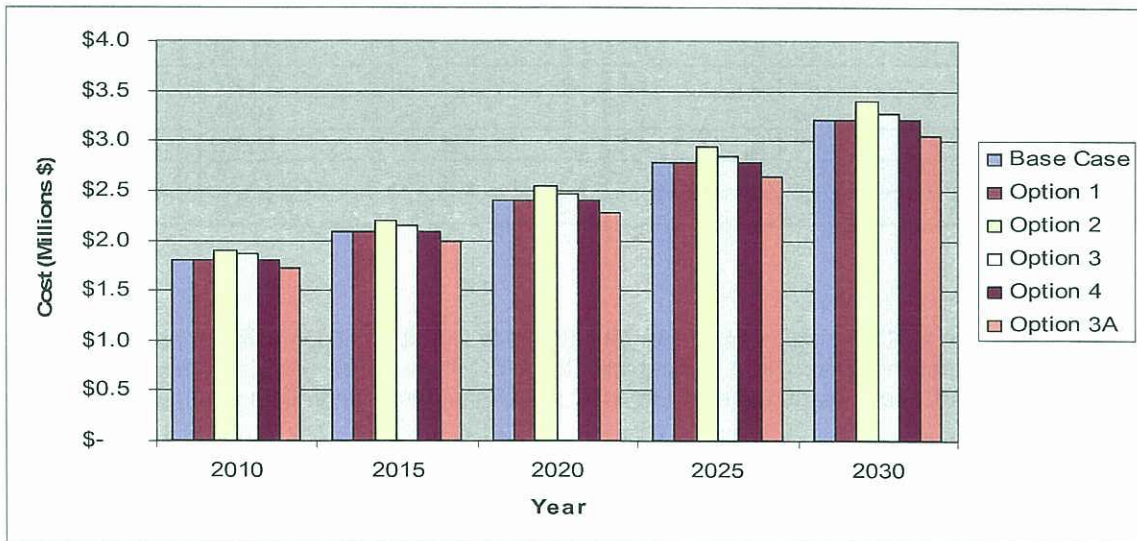


Figure 4: Kerbside MSW, co-mingled recycling and green waste collection costs for all scenarios 2010 – 2030

The modelled results for the management of transfer stations in each scenario indicate that there is a significant difference in cost between the scenarios with a total difference of \$0.6 million in 2010 between the highest cost Base Case, Options 1 and 4 at \$1.4 million and the lowest cost \$0.8 million Option 2.

The modelling indicates that with time the cost for management of transfer stations will increase and the difference in costs between the scenarios will increase proportional to the increase in overall transfer station cost. The figure below provides a graphical summary of the different scenarios over the 20 year modelling period.

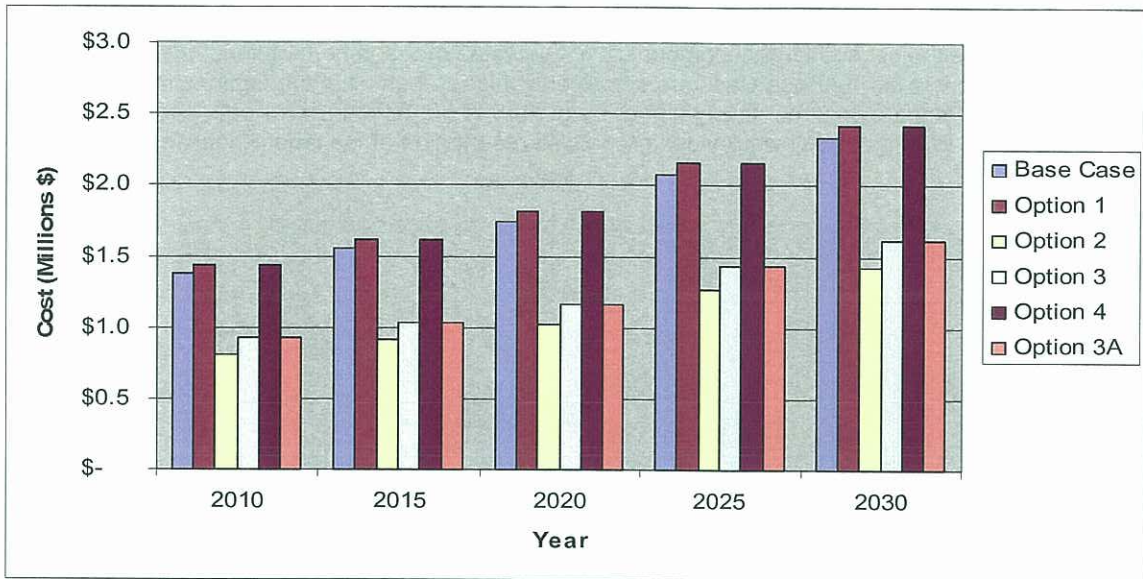


Figure 5: Transfer station costs for all scenarios 2010 - 2030

The modelled results for the transfer trailer costs indicate a significant difference in cost between the lowest cost Option 2 at \$41,000 and the highest cost Option 4 at \$157,000 representing a \$116,000 difference in transfer trailer cost. The transfer trailer costs are expected to increase significantly by the year 2030 with Option 2 costing \$56,000 and Option 4 costing \$223,000. The figure below provides graphical representation of the different scenarios over the 20 year period modelled.

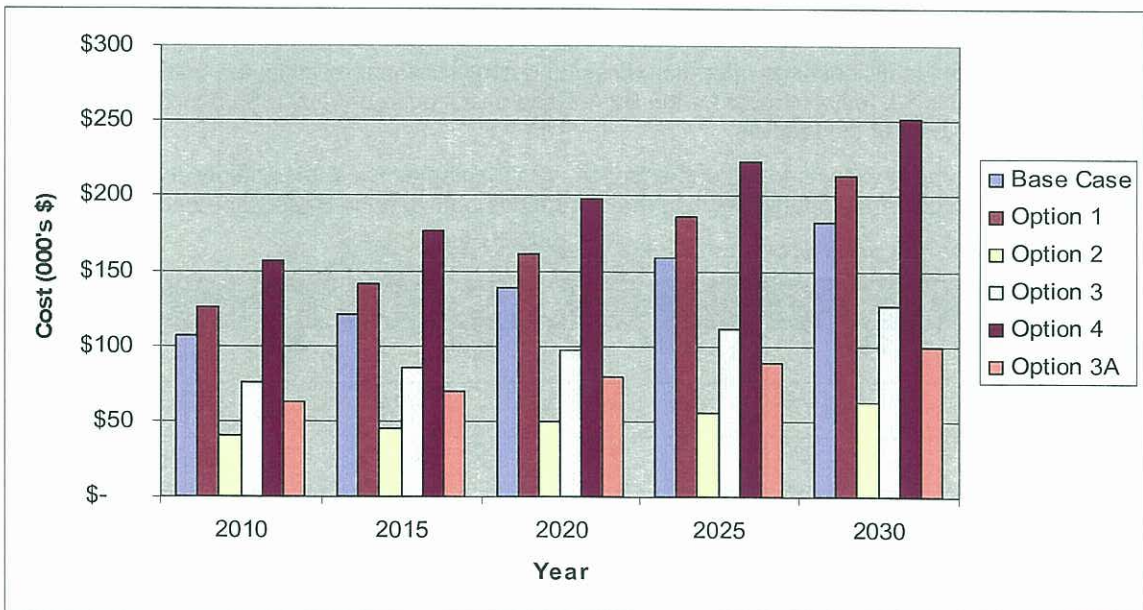


Figure 6: Transfer trailer costs all options 2010 – 2030

6.2.3. Landfill costs

Landfill costs are the second largest component of the waste management options, after waste collection. The costs for the Base Case are significantly higher than all of the Options from 2010 – 2020, However they are only marginally higher from 2025-2030. All of the Options have the same cost for landfills. The figure below provides graphical presentation of the landfill costs modelled.

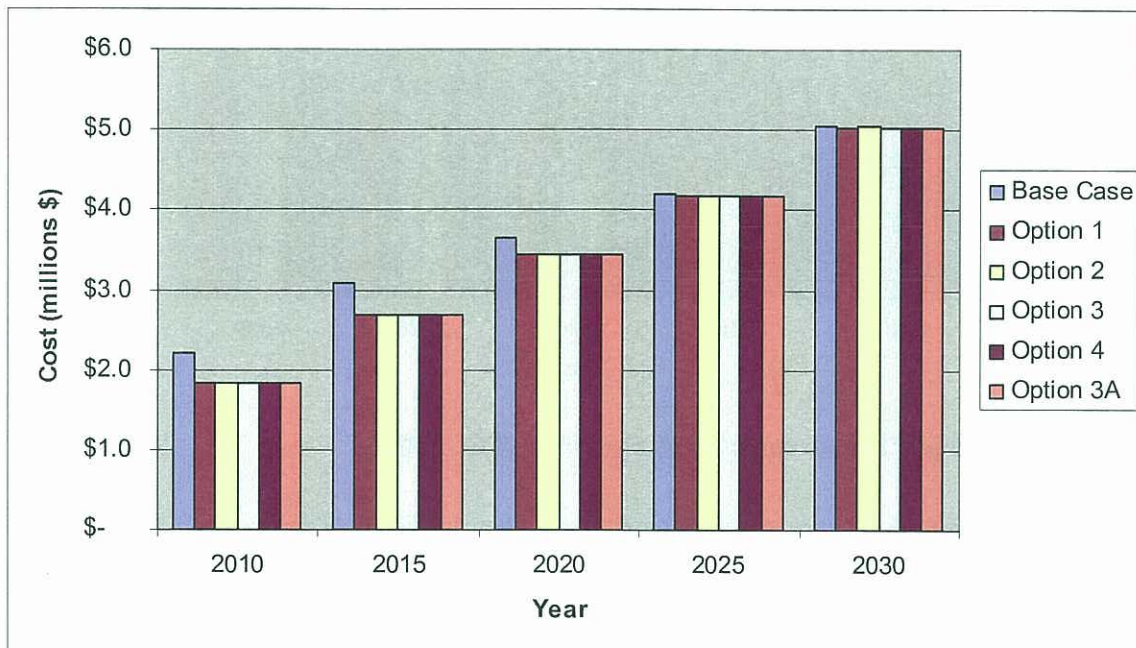


Figure 7: Total landfill costs for all scenarios 2010 – 2030

Breakdown of the landfill cost into operational cost and construction cost indicates that whilst the construction cost is \$0.1million lower for the Base Case this is overcome by a \$0.5 million increase in the operating costs of the landfills.

The tables show that the costs for all of the Options are the same. The tables below show the cost for operation and construction, highlighting the differences between the Base Case and the Options.

Table 21: Landfill construction cost for all scenarios 2010 -2030

Scenario	Cost (\$million)				
	2010	2015	2020	2025	2030
Base Case	0.9	1.6	2.3	2.9	3.6
Option 1	1.0	1.8	2.4	3.1	3.8
Option 2	1.0	1.8	2.4	3.1	3.8
Option 3	1.0	1.8	2.4	3.1	3.8
Option 4	1.0	1.8	2.4	3.1	3.8
Option 3A	1.0	1.8	2.4	3.1	3.8

Table 22: Landfill operation costs for all scenarios 2010 -2030

Scenario	Cost (Millions \$)				
	2010	2015	2020	2025	2030
Base Case	1.3	1.5	1.3	1.3	1.4
Option 1	0.8	0.9	1.0	1.1	1.3
Option 2	0.8	0.9	1.0	1.1	1.3
Option 3	0.8	0.9	1.0	1.1	1.3
Option 4	0.8	0.9	1.0	1.1	1.3
Option 3A	0.8	0.9	1.0	1.1	1.3

6.2.4. Revenue analysis

The revenue generated by each of the scenarios varies by \$0.1 million in 2010 with Options 2, 3 and 3A generating \$4.3 million whilst the Base Case, Options 1 and 4 accrue \$4.2 million.

Using the assumptions made, especially for increasing gate fee for commercial waste, this revenue is modelled to increase almost threefold for all scenarios. The figure below provides the modelled results for total revenue for 2010 – 2030.

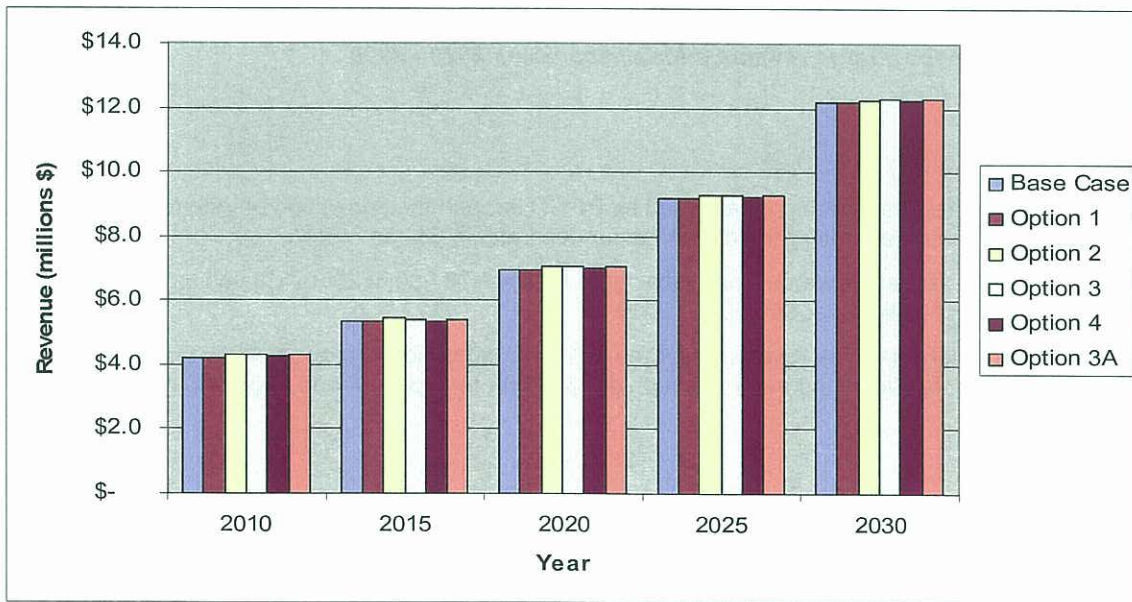


Figure 8: Total revenue generated for all scenarios 2010 – 2030

6.2.5. Service charge revenue

The service charge revenue for the scenarios differs in proportion to the number of households receiving a kerbside collection. Option 2 has the largest roll out of kerbside collection to households and as a consequence raises the highest service charge revenue.

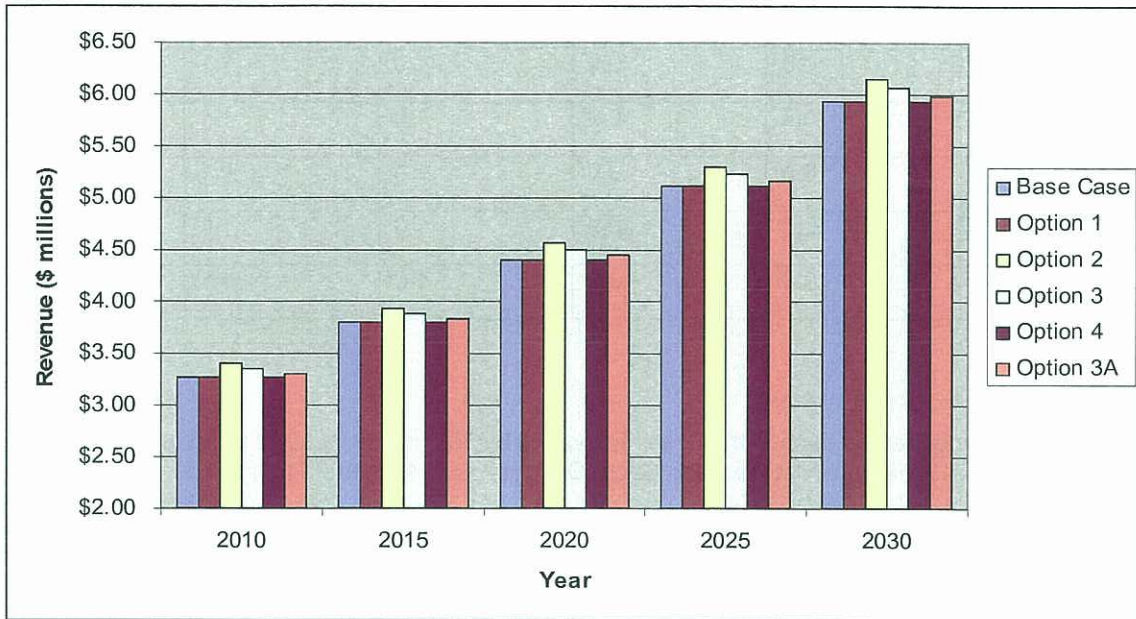


Figure 9: Service charge revenues for all scenarios 2010 - 2030

6.2.6. Public gate Fees

Public gate fees represent the capital raised by EGSC through the imposition of gate fees at the transfer station and the transfer trailers, the latter occurring in Option 4 only.

Option 4 has the highest revenue from public gate fees at \$78,000 in 2010. The lowest figure for public gate fees is Option 2 at \$45,000 in 2010.

The growth in public gate fee revenue over the 2010 – 2030 period is proportionally the same for the scenarios with a significant increase to a high of \$352,000 for Option 4 and \$205,000 for Option 2 in 2030.

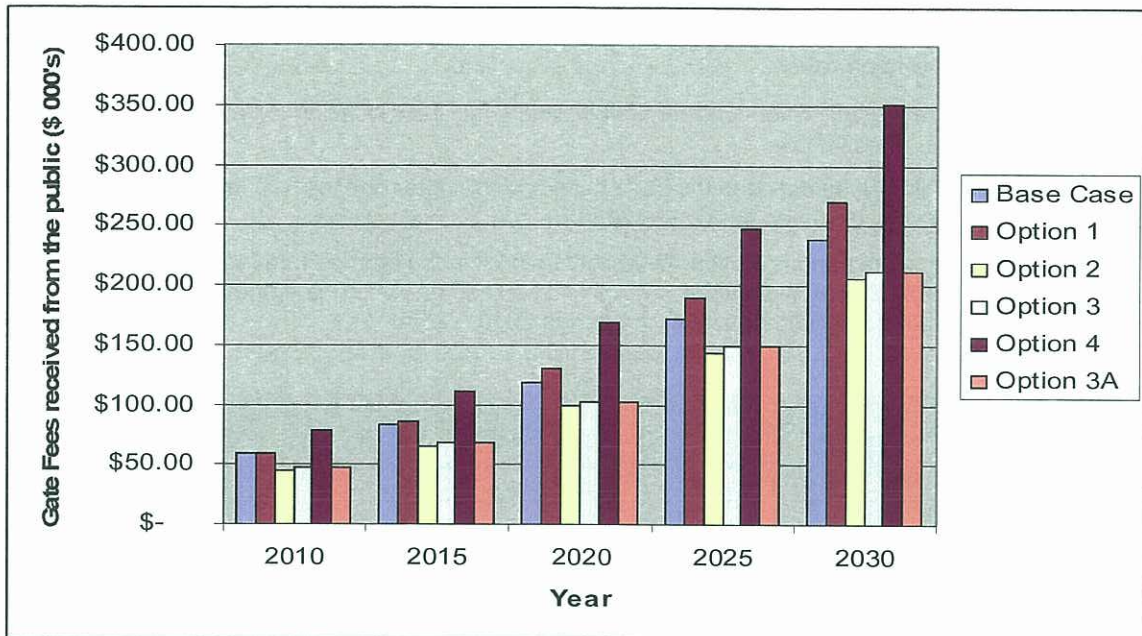


Figure 10: Public gate fee revenues for all scenarios 2010 - 2030

6.2.7. Gross financial implications of modelled result to EGSC

In all of the scenarios modelled there is a deficit, which means that the EGSC would have to make up for the difference between the revenue and the costs.

However, there is significant difference in the deficit that EGSC will have to make up, ranging from \$2.7 million for the base case to \$1.6 million for Option 3A in 2010.

All of the scenarios see a reduction in the deficit by 2030 with Option 3A showing the lowest difference at \$0.3 million whilst Options 1 and 4 all provide a modelled difference of \$1.5 million. The total gross financial implications of the different scenarios between 2010 and 2030 are provided in the figure below.

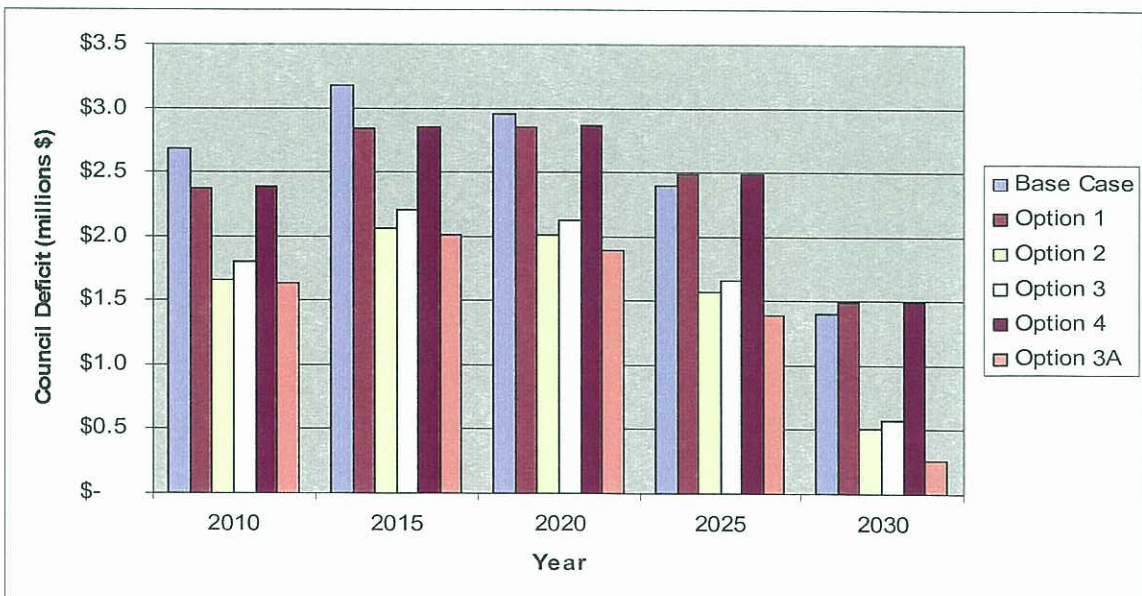


Figure 11: Gross financial implications for all scenarios 2010 – 2030

6.3. Landfill diversion rates

EGSC has a reported landfill diversion rate of 48%, however, the modelling exercise indicates that the landfill diversion rate is 36%.

There is very little difference between the base case and the other options with landfill diversion ranging from 36-37% in 2010 and 46-47% in 2030.

The worst performing scenario is Option 3A whilst Option 2 is the best performing scenario for all modelled years. Table 21 below provides a graphical representation of the modelled landfill diversion rates for all of the scenarios over the period 2010 – 2030.

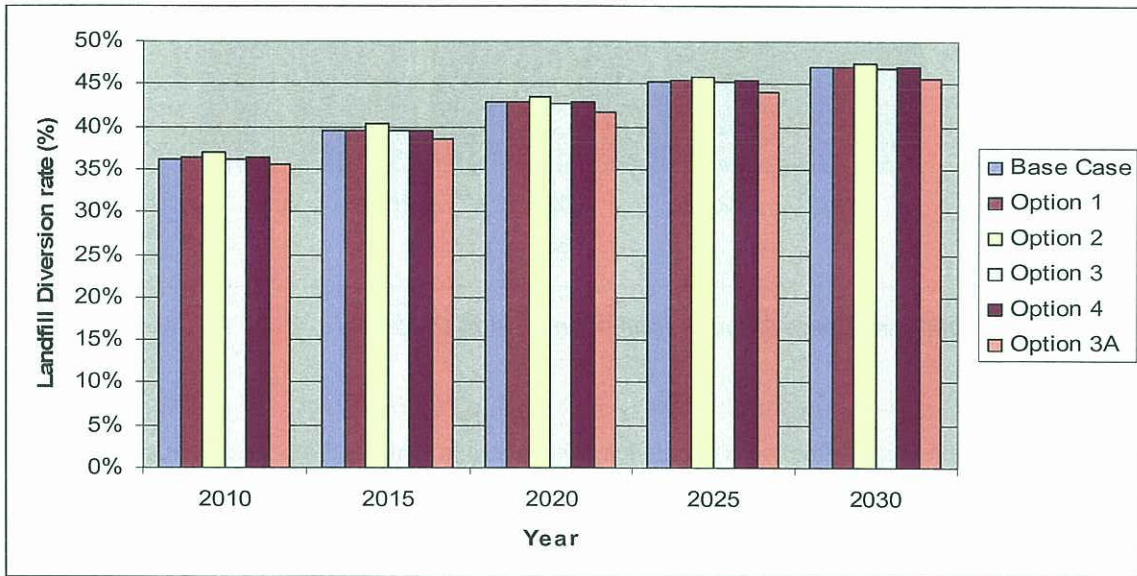


Table 23: Landfill diversion rates for all scenarios 2010 -2030

7. DISCUSSION

7.1. Comparison of EGSC provided and Base Case modelled data

Data supplied by EGSC provided the foundation of the Base Case model and therefore the whole modelling exercise. However there are some significant differences in the total cost and total revenue. The table below provides a summary of the key financial costs from the EGSC data and the Base Case model.

Table 24: Comparison of EGSC provided and Base Case modelled waste service costs.

Cost Item	EGSC Supplied Data (Nov 2007)	Base Case (2010)	Difference
Kerbside Collection MSW and Co-mingled recyclables	\$1,210,191	\$1,382,498	\$172,307
Landfill Construction/Depreciation	\$538,800	\$869,589	\$330,789
Waste Disposal Operations & Transfer Stations	\$2,682,639	\$2,830,641	\$148,002
Kerbside Green Waste	\$626,895	\$553,179	\$-73,716
Bin cost ¹	\$118,580	\$126,940	\$8,360
Other cost ²	\$586,746	\$657,265	\$70,519
Public Litter Bins, Public Place Recycling and Front Loader Bins.	\$208,870	\$226,643	\$17,773
Future Landfill Rehabilitation	\$98,519	\$250,000	\$151,481
Total	\$6,071,240	\$6,896,755	\$825,515
Note			
¹ The bin cost represents the annual cost of the bins used in the kerbside collection service, i.e. replacement, provision to new households and distribution as required.			
² Other cost includes Council costs for the operation of the waste management system, Non contract costs, consultant costs and land depreciation.			

The difference in costs associated with the majority of cost items are due to inflation between 2007 and 2010. The exceptions to this are the cost of kerbside MSW and co-mingled collection, landfill construction/depreciation, kerbside green waste and future landfill rehabilitation. The Kerbside MSW and co-mingled collection costs impacted by an increase in service provision with time as the number of households is set to increase, specifically in more urban and coastal areas. However a significant proportion of the increase in cost is still due to inflation.

The costs modelled indicate that there are some costs that EGSC are currently not fully taking into account in their cost estimates for waste management in East Gippsland. The two areas of note with regard to this are the landfill construction costs and the future landfill remediation costs.

1. The landfill construction costs have been modelled with a 57% increase in cost in 2010 compared to the November 2008 figures. The reason for this is that the modelling includes the cost for future capping of Bairnsdale and Lakes Entrance landfills at an estimated cost of \$15 per tonne of waste input. The costing provided by EGSC estimates the depreciation based upon the use of Bairnsdale landfill only.

The estimate is calculated using the construction cost for Cell 2 at Bairnsdale, which does not include the cost for capping of the landfill that is yet to be done. It should also be noted that EGSC intend to cap Lakes Entrance and there is a potential for the EPA to require this to be done to BPEM standard and therefore this cost should be incorporated into a cost per tonne figure for a BPEM cap at the Lakes Entrance Landfill.
2. A figure of \$2 per tonne for aftercare and rehabilitation has been included into the modelled calculation for the cost of Bairnsdale and Lakes Entrance Landfill. This has not been taken into account in the landfill construction/depreciation costing of EGSC. This \$17 increase in the cost per tonne at the Bairnsdale and Lakes Entrance landfills equates to a \$365,415 increase in annual cost when the tonnage received at these two facilities is taken into account.

Future landfill remediation provides the other major increase in cost that is not factored into the EGSC costing. This is because the calculation carried out by EGSC was for the Bairnsdale landfill only. The figure provided in the modelling captures the rehabilitation cost for the legacy landfills that have been operated in East Gippsland as well as the current landfills operated. A cost of \$250,000 per hectare of rehabilitation and a rehabilitation rate of 1 hectare per annum has been included in all the models.

The other cost increases, except kerbside green waste, are in line with expected growth due to CPI and waste arising increases over a 3 year period. The green waste costing is lower than that reported in 2007 due to 2007 being the roll out year and an exact costing not being known by EGSC at that point in time. The modelled green waste kerbside collection figure has been calculated using the contract green waste bin lift cost and the number of properties provided with a green waste bin.

Table 25: Comparison of EGSC provided and Base Case modelled waste services income figures

Income Item	EGSC Supplied Data (Nov 2007)	Base Case (2010)	Difference
Service Charge including Green waste service charge	\$2,684,220	\$3,271,893	\$587,673
Commercial and TS Gate Fees	\$1,015,891	\$919,492	-\$96,399
Other income	\$22,132	\$23,252	\$1,120
Total	\$3,722,243	\$4,214,637	\$492,394
Note: Kerbside and TT Gate Fees are an expense and an income as they are rebated.			

The income figures provided by EGSC and those calculated in the Base Case model are not considered to be significantly different when inflationary costs are taken into account over the 3 year time period. It is noted a significant amount of the income difference is due to the basic service charge and the green waste service charge. These have increased in the period due to greater roll out of the kerbside collection system and the introduction of the green waste service charge between 2007 and 2010 providing an extra \$221,000 p.a.

It should also be noted that the modelled figures do not, currently, include the gate fee for kerbside and transfer trailer MSW as the cost is rebated to the contractor.

The impact of the financial data provided by EGSC compared to the Base Case modelled indicates that where EGSC data provided a Council deficit of \$2.3 million the Base Case models this to be closer to \$2.6 million. The main reason for this is that EGSC have not incorporated the full cost of landfill construction/depreciation or rehabilitation of current and former landfills.

7.2. Analysis of modelled scenarios cost

The results, as shown in Figure 2 indicate that Options 2, 3 and 3A are significantly lower cost than the Base Case and Options 1 and 4 in all of the years modelled. The main reason for the cost saving is due to the significant rationalisation of waste management infrastructure and, more specifically, the number of operational landfills and transfer stations. The closure of these facilities creates a modelled saving between the Base Case and Option 2 and 3 of \$0.8 million \$0.7 million respectively, see Figure 5, Figure 6 and Figure 7.

Breakdown of the 2010 savings indicates that the rationalisation of the landfill infrastructure of East Gippsland to 2 BPEM standard landfills one at Bairnsdale and one at Orbost is modelled to provide a \$0.4 million saving in Landfill construction and operation costs, see Figure 7.

The other area where significant savings are made in the Options is in the closure of transfer stations. The lowest cost option is Option 2 where closure of transfer stations occurs in the Bairnsdale & Lakes, Orbost and Omeo regions providing a saving of \$0.5 million compared to the Base Case in 2010 see Figure 5.

The cost of transfer trailers does not significantly impact the overall cost of waste collection and disposal strategy adopted by EGSC. Modelling estimates that the maximum cost for transfer trailer operation and management is \$157,000 in Option 4 where waste is collected for 3 hours when the transfer trailer is manned and a gate fee is imposed on users. The lowest cost arises in Option 2, \$41,000, where transfer trailers are used in the North East region only, see Figure 6.

The total savings to be made from rationalisation of landfill facilities decreases with time due to the Base Case modelling the closure of Lakes Entrance landfill post 2015 and Mallacoota landfill post 2020. Therefore whilst the savings from closure of transfer stations increases in line with inflation the savings from the rationalisation of operating landfills is reduced to \$0.1 million by 2030. Indeed the savings made by the Base Case from the landfill closures cause it to change from the most expensive scenario in 2010 to being slightly less than Options 1 and 4 in 2030, with Option 4 just being the most costly scenario modelled, see Figure 7.

The increase in kerbside and kerbside rural collection of household waste that is needed to justify the closure of the transfer stations produces cost implications- for Options 2 and 3 of \$1.9million, than the Base Case and Options 1 and 4 at \$1.8 million. Option 3A with no green waste kerbside collection to the Omeo or Orbost regions has the lowest kerbside collection cost at \$1.7million. The cost increase with greater kerbside roll out is significantly lower than the cost savings from the closure of waste facilities, causing Options 2, 3 and 3A to be significantly lower cost than the Base Case and Options 1 and 4. See Figure 4.

7.3. Analysis of modelled scenarios - Revenue

The results of the modelling indicate that there is no significant difference in the revenue generated by any of the scenarios. There is a small increase of \$0.1 million in the revenue for Options 2 and 3, whilst all of the other scenarios have revenue of \$4.2 million. The reason for there being very little difference in the revenue is where transfer stations are replaced by kerbside collection services; both generate income for EGSC one by direct charging at the gate the other by charging a service fee. Of further note is that whilst Option 4 generates a significantly higher income from public gate fees, due to the manning of all facilities, this is not significant on the total revenue scale due to the relatively small revenue stream this source represents overall. See Figure 8.

7.4. Analysis of landfill diversion

EGSC currently achieve a good rate of landfill diversion when one takes into account the difficulties that are inherent due to the location and population characteristics of East Gippsland.

Modelling indicated that the recommended changes in EGSCs waste infrastructure would cause a maximum of 1.5% difference in waste diversion from landfill between all of the scenarios. Option 2 has the highest landfill diversion achieving 37% in 2010 and 48% in 2030.

The increase in landfill diversion occurs as a result of the provision of kerbside collection services to communities that had previously only received a transfer station or transfer trailer service. It is envisaged there will be a greater capture of co-mingled and green waste at the kerbside bins than at the transfer stations.

A further example of where the population density is integral to the impact of landfill diversion due to kerbside service roll out is in Option 3A where kerbside green waste collection is not provided to the Omeo or Orbost regions. The removal of this service causes a 0.6% percent reduction in landfill diversion from the Option 3, where green waste collection is provided to these regions.

7.5. Analysis of modelled scenarios – Council deficit

All of the scenarios modelled calculate that there will be a significant amount of Council deficit in waste collection and disposal in East Gippsland. The modelling indicates that the current Council deficit is \$2.7 million per annum and if there is no change in the system this deficit will increase with time. Options 2 and 3A provide the lowest Council deficit in 2010 at \$1.7 million. See Figure 11.

The significant reduction in Council deficit arises as a result of the reduction in Council costs not due to increased revenues. As such the lowest cost systems provide the least Council deficit. Therefore Options 2, 3 and 3A provide the Council with the greatest reduction in the deficit, whilst the Base Case has the highest deficit.

Options 1 and 4 provide a small saving over the Base Case in 2010; however by 2025 they have a higher deficit. This is a result of the closure of Lakes Entrance and Mallacoota landfills reducing costs in the Base Case. See Figure 11.

In all of the Scenarios the gate fee has been increased above inflation as one of the key actions to reduce the Council deficit. Increasing the Commercial & Industrial gate fee by 3% more than inflation causes the Council deficit to be reduced to \$1.4 million in 2030 for the Base Case and down to \$300,000 for Option 3A. See Figure 11. This has been undertaken as the Council currently subsidises commercial landfilling and should increase the cost per tonne to commercial businesses to incorporate the full cost to Council, as a minimum. Further detail is provided on this issue in section 7.6 below.

7.6. Cost per tonne analysis of modelled data

Cost per tonne analysis has been carried out to provide greater depth of understanding when calculating what fees and charges should be applied at facilities under the different scenarios to reduce the Council deficit.

7.6.1. Cost per tonne for each Option

Analysis has been undertaken to highlight the difference in cost per tonne for each of the Options. As would be expected the cost per tonne follows the same pattern as the total cost, with Option 3A being the lowest and the Base Case the highest. Table 26 below provides a breakdown of the cost per tonne for each option and what the main components are of the costing.

Table 26: Cost per tonne breakdown of each Option.

	Base	Option 1	Option 2	Option 3	Option 4	Option 3A
Kerbside Collection MSW - Bin Lift	\$ 51	\$ 51	\$ 54	\$ 53	\$ 51	\$ 53
Kerbside Collection Co-mingled - Bin Lift	\$ 30	\$ 30	\$ 31	\$ 31	\$ 30	\$ 31
Landfill Costs - Less Operation	\$ 51	\$ 61	\$ 61	\$ 61	\$ 61	\$ 61
Landfill Operation costs	\$ 79	\$ 46	\$ 46	\$ 46	\$ 46	\$ 46
Kerbside Green Waste - Bin Lift	\$ 25	\$ 25	\$ 26	\$ 26	\$ 25	\$ 18
Processing Green	\$ 9	\$ 8	\$ 8	\$ 8	\$ 8	\$ 7
TS Costs	\$ 81	\$ 92	\$ 56	\$ 62	\$ 92	\$ 62
TT Costs	\$ 6	\$ 7	\$ 2	\$ 4	\$ 9	\$ 4
All bin Cost	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7
Other Costs	\$ 39	\$ 39	\$ 39	\$ 39	\$ 39	\$ 39
Future Landfill Rehabilitation Costs	\$ 15	\$ 15	\$ 15	\$ 15	\$ 15	\$ 15
PLBs, PRPs & Front loader	\$ 13	\$ 13	\$ 13	\$ 13	\$ 13	\$ 13
Commercial Gate fees	-\$ 50	-\$ 51	-\$ 51	-\$ 51	-\$ 51	-\$ 51
Average HH service charge	\$ 355	\$ 344	\$ 308	\$ 315	\$ 346	\$ 305

Table 26 highlights how the cost of the transfer station facilities has a significant impact on the total cost per tonne of each Option and consequentially the overall cost.

The other key differentiator is the cost of landfill operation which is \$23⁸ larger than the saving made from construction of the current trench and fill operations that are operated in the main.

It is interesting to note that the other costs do not differ a great deal between the options, highlighting the transfer station and landfill operational costs influence on the overall costs of each option.

7.6.2. Kerbside collections per tonne

Analysis of the three kerbside collection services is shown in the tables below. The costs reflect a cost per tonne cost of the service, not a cost per household.

Table 27: Cost per tonne analysis of modelled Kerbside MSW collection 2010 - 2030

	2010	2015	2020	2025	2030
Base Case	\$ 82	\$ 93	\$ 107	\$ 123	\$ 141
Option 1	\$ 82	\$ 93	\$ 107	\$ 123	\$ 141
Option 2	\$ 84	\$ 95	\$ 109	\$ 125	\$ 143
Option 3	\$ 83	\$ 94	\$ 108	\$ 124	\$ 142
Option 4	\$ 82	\$ 93	\$ 107	\$ 123	\$ 141
Option 3A	\$ 83	\$ 94	\$ 108	\$ 124	\$ 142

⁸ Calculated by subtracting the Landfill operation cost from the Landfill costs less operation.

Table 28: Cost per tonne analysis of modelled Kerbside co-mingled collection 2010 -2030

	2010	2015	2020	2025	2030
Base Case	\$ 141	\$ 139	\$ 140	\$ 143	\$ 154
Option 1	\$ 141	\$ 139	\$ 140	\$ 143	\$ 154
Option 2	\$ 143	\$ 142	\$ 143	\$ 146	\$ 157
Option 3	\$ 142	\$ 140	\$ 141	\$ 144	\$ 155
Option 4	\$ 141	\$ 139	\$ 140	\$ 143	\$ 154
Option 3A	\$ 142	\$ 140	\$ 141	\$ 144	\$ 155

Table 29: Cost per tonne analysis of modelled kerbside green waste collection 2010 - 2030

	2010	2015	2020	2025	2030
Base Case	\$ 175	\$ 166	\$ 161	\$ 166	\$ 173
Option 1	\$ 175	\$ 166	\$ 161	\$ 166	\$ 173
Option 2	\$ 174	\$ 169	\$ 168	\$ 176	\$ 187
Option 3	\$ 177	\$ 169	\$ 164	\$ 169	\$ 176
Option 4	\$ 175	\$ 166	\$ 161	\$ 166	\$ 173
Option 3A	\$ 153	\$ 147	\$ 144	\$ 149	\$ 155

The analysis shows that the most expensive kerbside collection system per tonne is the green waste collection then the co-mingled recyclables and lastly the MSW collection service. The reasons for this are the capture rates, density of material and tonnages collected per lift for the different collection systems. The cost per bin lift for MSW is higher than that for green waste and co-mingled waste. Analysis of the data provided in the Base Case modelling shows there is a greater per tonne efficiency in the MSW collection system with each bin containing an average of 12.1kg of waste per bin lift compared to the co-mingled bins that contain 8.2kg and the green waste bins with 6.7 kg per bin lift⁹. These lower bin lift tonnages could be a reflection of a two factors including:

- lower capture rates meaning the co-mingled recycling bins and green waste bins are not full to capacity; or,
- lower densities of co-mingled and green waste causing a reduction in the tonnage that can be carried in the same volume area of the collection vehicle.

The Council provides a 240 litre MGB for co-mingled recyclables and green waste and a 120 litre MGB for MSW therefore the second point would seemingly not be the reason for the difference in tonnages collected at the household. As such the results indicate that EGSC should focus on increasing capture rates for co-mingled recyclables and green waste.

7.6.3. Landfilling cost per tonne

Knowing the landfill cost per tonne for all of the scenarios is important for EGSC to have an understanding of the gate fees that should be charged at the landfill facilities to recoup the full cost to EGSC. The costs do not include costs associated with rehabilitation of legacy landfills. The tables below reflect the costs that have been modelled for all of the scenarios.

Table 30: Landfill construction costs per tonne

	2010	2015	2020	2025	2030
Base Case	\$ 37	\$ 63	\$ 88	\$ 104	\$ 120
Option 1, 2, 3, 4 & 3A	\$ 44	\$ 71	\$ 92	\$ 108	\$ 125

⁹ Calculated by dividing the tonnage of kerbside collected by the number of households receiving kerbside collection service divided by the number of weeks a year service is provided.

Table 31: Landfill operation cost per tonne

	2010	2015	2020	2025	2030
Base Case	\$ 57	\$ 60	\$ 49	\$ 45	\$ 47
Option 1, 2, 3, 4 & 3A	\$ 33	\$ 35	\$ 38	\$ 40	\$ 42

The results indicate that the total cost per tonne (sum of construction and operational costs) for the modelled base case is \$94 per tonne while the Options were calculated at \$77 per tonne. All of the Options provided the same cost per tonne figure as they all use Bairnsdale and Orbost landfills and all of the Options send similar total tonnages of waste to landfill.

The figures that have been modelled indicate that EGSC is currently subsidising waste received from C&I and public drop off. The C&I gate fee is currently \$73 per tonne whilst public drop off is \$68 per tonne. The difference between the fee charged and the actual cost is \$21 and \$26 respectively; this is currently made up by EGSC and is a significant component of the Council deficit. This report would recommend commercial users pay above the actual cost of landfilling to aid in reduction of the Council deficit and to promote diversion of waste from landfill by commercial businesses through financial incentive.

7.6.4. Transfer station cost per tonne

Review of the transfer station cost per tonne provides a good insight into how significant cost reductions are achieved through the rationalisation of transfer stations. The range of costs modelled in 2010 is from \$211-319 per tonne. As shown in Figure 12 below the trend in the cost per tonne is very similar to the overall cost for transfer stations. Furthermore there is a gradual downward trend due to waste arising being slightly higher than inflation. This means that the tonnages handled by the transfer station increase faster than the cost for the transfer station operation which is assumed to be able to handle the extra tonnage without increasing operational costs above inflation.

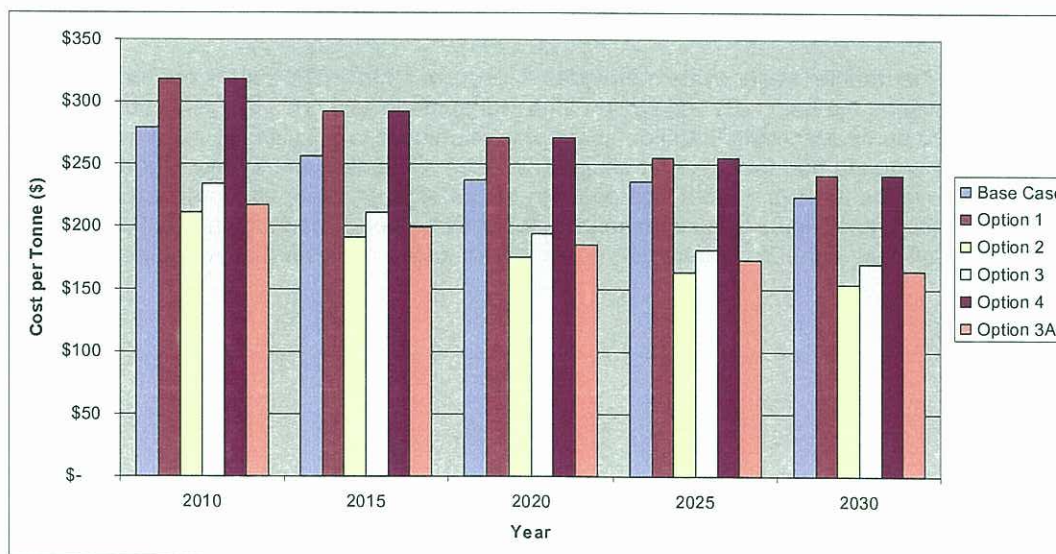


Figure 12: Cost per tonne analysis of transfer stations in all scenarios 2010-2030

The reason for the significant differences in the average cost per tonne of the transfer stations between the options is that the smaller transfer stations that are closed in Options 2, 3 and 3A are, in the main, modelled in 2010 to receive less than 100 tonnes per year but cost at least \$30,000 dollars a year to operate. This causes the operational cost per tonne for these facilities to be very high as indicated in Figure 13 below.

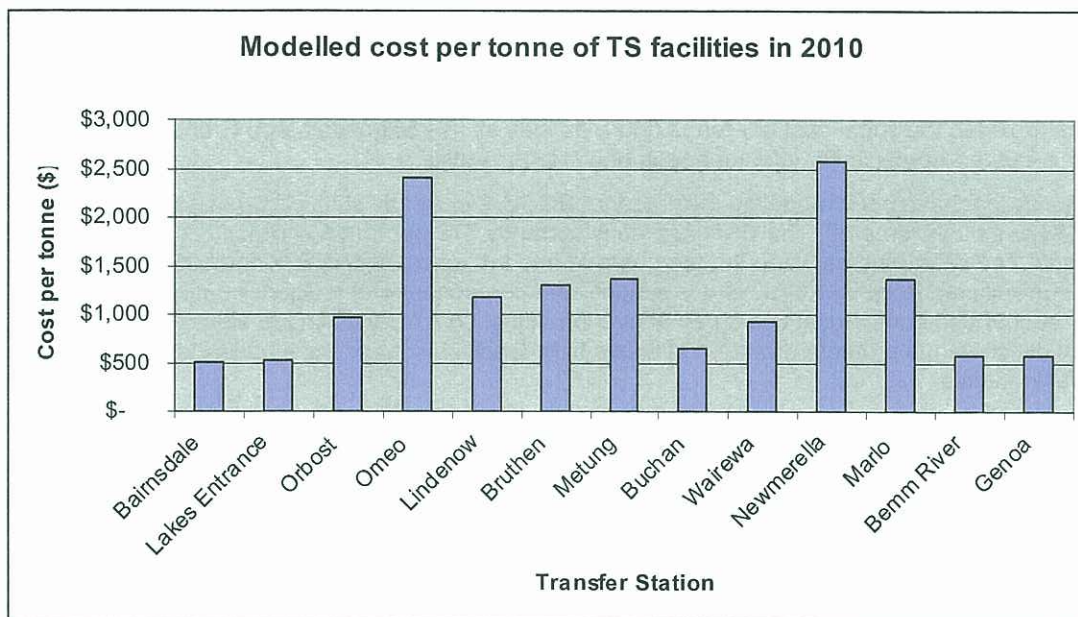


Figure 13: Cost per tonne analysis of a selection of transfer stations

7.6.5. Transfer trailer

Cost per tonne for the transfer trailer system provides a range of \$338 – 576 dollars per tonne with the Base Case providing the best cost and Option 2 providing the lowest. This is a reflection of the Base Case having a number of transfer trailers that are located near to landfill facilities and as such have a lower cost per tonne due to reduced transport distance. Options 2 and 3 have higher cost per tonne as they remove the transfer trailers located nearer to landfills and keep the more expensive North East region transfer trailers. This increase in cost per tonne does not cause a significant impact on the overall cost of these Options due to the low tonnages of waste that are collected from transfer trailers.

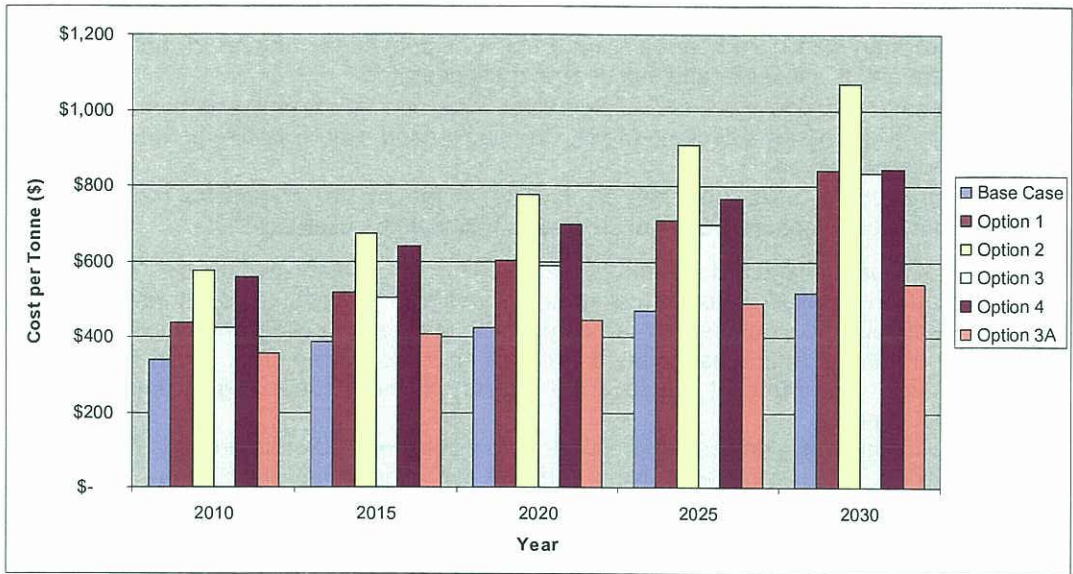


Figure 14: Transfer trailer cost per tonne for all scenarios 2010 -2030

7.7. Contamination

EGSC reports that it currently has a 27% contamination rate for co-mingled recyclables, well above the 10% target of Sustainability Victoria. Not only does this reflect a large cost to EGSC, it also means that the landfill diversion rates are actually lower than reported. It is important for contamination to decrease significantly in the near future for EGSC to achieve high recycling rates and reduce costs

It would be recommended that EGSC further investigates methods to increase capture rates and reduce contamination. The main methods that are used to achieve this are

- Education – of the household using the bin of what can be recycled and why they should recycle;
- Reward – for the waste collection operator for increasing the tonnages diverted from landfill; and
- Enforcement – punishment of households for not utilising the system correctly or punishment of the operator for not achieving set goals.

It is recognised that for these to occur EGSC will need to look at greater resourcing of the current two person waste team, however the potential savings would, it is believed, outweigh the costs.

7.8. Collection policy

To ensure that EGSC maintains a high level of service to the public it is recommend that they create a waste collection policy. In this way the Council can ensure that when facilities are removed and replaced with kerbside and rural kerbside they achieve at least the same level, or better, of waste service provision. The Options that have been used in this report have been designed under the premise that the following is an acceptable waste policy:

- Where possible all landfills will be BPEM compliant.
- Where possible all transfer stations will be designed to best practice standards.
- At least 1 transfer Station will be provided in all of the regions highlighted in this report. More than 1 facility will be provided where there are significant populations more than 35km from the nearest Transfer Station.
- Where kerbside collection is provided for MSW it will always be provided for co-mingled recyclables as well.
- Where possible kerbside rural collection points will be located to take into account location of households serviced, distance from the main road to households and the ability for the collection vehicle and waste users to safely load and unload the MGBs provided. It is envisaged that collection points will be spread out along the main roads that service

communities/households located off of this main track. The kerbside collection vehicle will not go more than 5km up a non-major road unless a community of over 25 households is located there and it is feasible and safe for the truck operator.

- As a minimum kerbside rural collection will be provided at current waste management facilities and shall provide adequate MSW, Co-mingled and, where viable, green waste bins for the population served.
- EGSC should try to utilise the nearest facility for the waste streams to reduce waste transport costs and impacts. Potential distances that could be used are:
 - MSW be transported no more than 200km for final disposal. The distance is required to allow kerbside collection of waste in Mallacoota to go to Bairnsdale landfill. EGSC could review the potential to maintain a collection vehicle at Orbest landfill in the future, especially if Option 2 or 3 is operated. This would significantly reduce the transport distance for waste in the Orbest region should it be implemented.
 - Co-mingled recyclables be transported no more than 200km to primary treatment or bulking. This is required to allow kerbside collection of recyclables from Mallacoota to be processed at the MRF in Bairnsdale.
 - Green waste is transported no more than 100km for composting, mulching or burning. It is not believed that the transportation of green waste to greater distances than this provides financial or environmental benefit.

7.9. Estimate for upgrading to best practice standard

Integral to future waste collection and disposal systems in EGSC is the upgrading of key waste infrastructure to best practice standards as outlined by EPA Victoria and Sustainability Victoria. As such, an estimate of the capital cost to upgrade the landfills and transfer stations, that are not already best practice, to best practice standards is provided in the table below. Please note that these are estimated costs for guidance only.

Table 32: Estimated cost for upgrading transfer stations to best practice standards

	Estimated Cost
Minor Upgrades	\$30,000 - \$50,000
Major Upgrades	\$80,000 - \$200,000
Note: Costs based on Meinhardt estimations.	

The estimated cost for the development of a transfer station at Bonang, not including the cost for land and infrastructure beyond the boundary is \$0.5 - \$1 million.

8. CONCLUSION AND RECOMMENDATIONS

Meinhardt has undertaken a modelling exercise of the current waste collection and disposal system for EGSC and future Options to explore methods for achieving improved cost efficiencies and landfill diversion rates. Models were designed to reflect the following scenarios:

- **Base Case:** No change from current Waste Management.
- **Option 1:** No Change in waste collection. Only Bairnsdale and Orbest Landfills remain operational and both are BPEM compliant.
- **Option 2:** Maximised roll out of kerbside collection services. Significant closure of Transfer Stations and Transfer Trailers. Only Bairnsdale and Orbest Landfills remain operational and both are BPEM compliant.
- **Option 3:** Full roll out of kerbside collection to 'coastal corridor' along the Princes Highway. Significant closure of facilities in the 'coastal corridor'. Only Bairnsdale and Orbest Landfills remain operational and both are BPEM compliant.
- **Option 4:** Same as Option 1 but with manning of all transfer stations and transfer trailers to recoup a gate fee from all users.
- **Option 3A:** Same as Option 3 but with kerbside green waste only provided to household in Bairnsdale and lakes region.

The modelling has shown that there is little scope for EGSC to achieve a greater rate of landfill diversion, however there is significant ability to make cost savings.

The work undertaken indicates that cost savings can be made through:

- Reduction in the number of waste management facilities operated (Landfills, Transfer Stations and Transfer Trailers); and
- For Option 3A removal of the green waste kerbside collection service to the Orbest and Omeo regions.

These savings outweigh the increased costs that would be incurred to ensure that residents of EGSC still receive a high standard of waste management. These cost increases would arise due to:

- Increased collection cost of all kerbside systems due to their increased roll out;
- Increased green waste handling costs as an increased percentage is kerbside collected and composted rather than burnt at the transfer stations;
- Increased cost for the construction of BPEM compliant landfills.

The cost benefit of rationalising waste management infrastructure is shown to outweigh the increased costs that occur from the greater roll out of kerbside collection, improved composting of green waste and use of BPEM compliant landfills.

The report indicates that Option 2 or Option 3A are the best Options for EGSC to implement. As such it is recommended that EGSC adopt a waste strategy that moves towards one of these options. It is noted that Option 3 is a natural step in the progression to either of these options.

This report recommends that EGSC:

- Work with the GRWMG and create an education system to increase understanding of the waste management facilities provided, what can be recycled and where and why landfill diversion is a benefit to all;
- Investigate a system for enforcement of use of co-mingled recycling and green waste bin use, specifically targeting contamination of the bins provided;
- Undertake an assessment of the actual cost for upgrading all Transfer Stations that are not to be closed to meet Best Practice standards;
- Initiate discussions with the EPA regarding the licensing and upgrading to BPEM standards of Orbost landfill. It is recommended that within this discussion EGSC discuss a 'trade off' whereby for the reduction down to 2 BPEM compliant landfills the EPA allow for an increased airspace or new site for the Orbost landfill;
- Review the price for Commercial businesses to use EGSC landfill and bring them in line, as a minimum, with the actual cost per tonne of waste landfilled;
- Review the price charged for public drop off of waste to an EGSC landfill and potentially bring them in line with the cost per tonne of waste landfilled;
- Review the provision of waste services to Gelantipy and Wulgulmerang and ensure the closure of the non-compliant landfills;
- Consider removing the kerbside green waste collection service provided to the Orbost and Omeo regions;
- Adopt a collection policy that clearly states the level of service that EGSC intends to provide its residents;
- Create an action plan to undertake the actions recommended in Option 2, which achieves the greatest cost efficiencies and landfill diversion rates. It is noted that Option 3 is a natural progression towards achieving Option 2;
- Undertake a full and proper risk assessment of historic and current landfills that require rehabilitation to allow scheduled closure of the former landfill sites based on risk (rehabilitate high risk sites first); and,
- Install a system to collect data on all of the waste movements within East Gippsland to allow for real data analysis and greater understanding of waste management within the Shire.

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**APPENDIX A KEY FEDERAL AND STATE LEGISLATION AND
POLICIES AND OTHER INITIATIVES**

KEY FEDERAL AND STATE LEGISLATION AND POLICIES

1.1. KEY FEDERAL LEGISLATION AND POLICIES

1.1.1. National Waste Policy

The Australian Federal Government is in the process of developing a National Waste Policy that will set objectives and priorities for the next ten years with regards to waste management in Australia. The policy will articulate the respective roles for each level of government and provide overarching vision, objectives and targets that enable local government and industry to drive change and provide a basis for measuring performance.

The overarching aims of the National Waste Policy will be to:

- Avoid the generation of waste;
- Reduce the amount of waste for disposal;
- Manage waste as a resource; and
- Ensure that waste disposal is undertaken in a safe, scientific and environmentally sound manner.

Note: this section will require review once the National Waste Policy is released (expected to be November 2009)

1.1.2. Proposed National Legislation – Carbon Pollution Reduction Scheme (CPRS)

The Australian government has proposed the Carbon Pollution Reduction Scheme (CPRS) as part of a framework for reducing carbon pollution in Australia. CPRS comprises a 'cap and trade' scheme which will require emitters of greenhouse gases to acquire a permit for every tonne of carbon dioxide equivalents (CO₂-e) they emit. The quantity of emissions produced by corporations will be monitored, reported and audited. At the end of each year, each liable entity will need to surrender a permit for every tonne of CO₂-e emitted by their operations in that year. The number of permits issued by the government each year will be limited and corporations will have to compete in an open market environment to purchase the number of permits that they require. A number of sectors are included under the CPRS, including waste. The proposed legislation will potentially impact on entities that produce greater than 25 ktCO₂-e per annum (e.g. council operated waste facilities).

The cost of disposing waste to landfill is likely to be increased under CPRS due to methane emissions from landfill.

Note: This section will require review once legislation is released.

1.1.3. National Initiatives

National Packaging Covenant

The National Packaging Covenant (NPC) is a voluntary initiative by government and industry to reduce the effects of packaging on the environment. The covenant provides a comprehensive list of commitments that signatories should consider when developing required action plans with regard to packaging.

Some of the overarching targets of the covenant with respect to recycling and waste minimisation include:

- Increasing the amount of post consumer packaging recycled from its current rate of 48% (2003 baseline data) to 65% in 2010;
- Increasing the recycling of difficult or non-recycled materials, including plastics coded (4) to (7) and non-recyclable paper and cardboard packaging from the existing 10% (2003 baseline data) to 25% by 2010; and
- Ensuring that there is no increase in the amount of packaging going to landfill (against 2003 baseline data)

The "Recycle Right at Home" project is partly funded by the NPC. Recycle Right at home is a joint initiative of the MWMG, SV and local government. The successful implementation of this scheme will reduce the level of contamination of the recycling stream and increase the recovery of recyclable packaging.

1.2. KEY STATE POLICIES AND INITIATIVES

1.2.1. Towards Zero Waste Strategy

The Sustainability in Action: Towards Zero Waste Strategy (TZW) was developed in-line with the EP Act. The objectives of TZW are to reduce and recover solid waste, and to reduce the environmentally damaging impacts of waste.

The strategy sets out the overall Environmental Sustainability Framework and state waste recovery targets for Sustainability Victoria (SV), the Environment Protection Authority (EPA), Regional Waste Management Groups and Local Government with regard to solid waste management in Victoria.

Some of the TZW targets are:

- Reduce the amount of waste generated by 1.5 million tonnes per annum by 2014, compared to 2002/03.
- Increase the recovery rate in all solid waste generated from the current 48% (2003) to 75% by 2014 comprising:
- 65% recovery rate (by weight) of MSW for reuse and recycling by 2014. An interim target of 45% recovery rate is established for 2008-09;
- 80% recovery (by weight) of (C&I) solid waste for reuse and recycling by 2014. An interim target of 65% is established by 2008-09; and
- 80% recovery rate (by weight) of (C&D) solid waste for reuse and recycling by 2014. An interim target of 65% is established for 2008-09.
- 25% reduction in littering behaviour compared with 2003 levels

Sustainability Victoria (SV) released a progress report in 2006-07 which indicated that recovery of C&I and C&D waste were on track to meet the TZW recovery targets (see Table 1 below). To meet the 65% target for MSW recovery more significant change is required, particularly with the recovery of green organics. It is expected that metropolitan councils and some larger regional councils will have to exceed the 65% MSW diversion target if the State wide target is to be met. In effect the target of metropolitan councils is therefore 70%.

Table 1.1 Waste Recovery in Victoria

	Actual	TZW Recovery Targets	
	2006-07	2008-09	2013-14
MSW (Metro Melbourne)	41% (43%)	45%	65%
C&I waste	68%	65%	80%
C&D waste	71%	65%	80%

1.2.2. Victorian Advanced Resource Recovery Initiative (VARRI)

To support the implementation of the Strategic Plan and new initiative VARRI was instigated by the State Government to facilitate the development of ARRT facilities in metropolitan Melbourne. The incorporation of ARRT facilities into waste management practices in Victoria could significantly increase the quantities of material recovered from the waste stream, particularly garden and food organic material which currently make up a large proportion of waste disposed to landfill. The aim is to have two ARRT facilities well advanced by 2010.

The WMS of councils will need to be reviewed in light of the project's recommendations.

1.2.3. Solid Industrial Waste Management Plan

The Solid Industrial Waste Management Plan was developed to establish goals and targets for solid waste management (e.g. C&I and C&D waste) in Victoria. The outlined goals of the plan included:

- To increase materials-use efficiency and reduce waste generation
- To increase the sustainable recovery of materials for recycling and reprocessing; and
- To reduce the environmentally damaging impacts of waste.

The key targets are:

- Reduce the quantity of waste generated by 1.5 million tonnes by 2013;
- 65% recovery rate in SIW by July 2008 (towards an 80% rate by 2013);
- Reducing greenhouse emissions, litter and toxic materials in the waste stream.

Waste from households and Council activities are classified as municipal waste and are not addressed in this plan. However, it does include household waste delivered by a commercial operator.

1.3. OTHER WASTE ISSUES OR INITIATIVES

Eco-Buy Program

Eco-buy is an initiative funded by the Department of Sustainability and Environment (DSE) and Sustainability Victoria (SV), which encourages the purchasing of environmentally preferable products and services. Both State and Local Governments have incorporated Eco-buy recommended products for internal purchasing, demonstrating the commitment of government in attaining a more sustainable future.

Discussion of Current and Future Disposal Cost / Levies

Landfill levies have increased since their inception in 2001 from \$ 4 / tonne for both municipal waste and industrial waste to \$9 / tonne and \$15 / tonne for municipal and industrial waste respectively. Landfill levies are likely to increase further as Victorians moves towards favouring resource recovery rather than disposal to landfill. Such an increase will result in higher costs at the landfill gate.

Other EPA Policy Initiatives

The following activities are planned over the next 12 months by the EPA:

1. Impact strategy study on banning organics to landfill – detailed assessment to be conducted;
2. Input to the landfill levy development – new legislation being developed by DSE;
3. Publication 508 - Organic regulations and guidelines reviewed;
4. Develop regulations and guidelines for future ARRTs; and
5. Review Landfill BPEM.

Note. This WMS may need to be reviewed in light of these activities.

Contamination – Problematic Waste Items

Separation of waste materials at source (e.g. using separate bins at home) is fundamental to promoting cost-effective resource recovery and processing. Separation by the resident helps to reduce the labour and energy required to sort materials and manage contamination at processing sites. Comprehensive education programs about the appropriate use of the kerbside system are required to improve kerbside collections by reducing inappropriate disposal of potentially hazardous materials and items that damage processing infrastructure and end-product markets. Contamination can also pose health and safety risks for collectors and processors and cause equipment damage.

Problematic waste items include plastic in green waste, non-recyclable plastics such as meat containers, hazardous materials such as batteries in recyclables bins and clinical waste such as needles and syringes.

Occupational Health and Safety

There have been significant OH&S issues identified with the kerbside collection of waste, as a result Workcover has identified the industry as posing a high risk to employee health and safety. Occupational Health and Safety Guidelines for the Collection of Domestic and Commercial Non-Hazardous Waste and Recyclable Materials were released in 2003.

The OH&S issues addressed in the guidelines include:

- A 'No-Lift' approach to the handling of containers;
- A 'No-Riding on the outside of vehicles' approach to prevent serious injuries and fatalities;
- A 'No-work at heights' approach except in workshops or by fully equipped service crews; and
- Compliance with OH&S legislative requirements.

Kerbside collection systems that require manual lifting have been replaced with mechanical collection trucks. Hard waste collections still pose an employee and community risk, particularly if waste is required to be left on the nature strip in the front of residential properties

Worksafe Victoria have developed a handbook titled *Safe Collection of Hard Waste*, November 2008, that provides information on how to safely collect domestic hard waste and bundled green waste applying a risk management approach to address specific hazards. It states that "Councils and collectors need to assess their own circumstances and apply the safest collection practice".

Product Stewardship Programs

By taking responsibility for the end-of-life cycle of products and materials, the environmental impacts associated with those materials can be significantly reduced. Producers, users and consumers share the responsibility from design and manufacture to use and end-of-life management. The Federal and State Government have both introduced initiatives for product stewardship schemes.

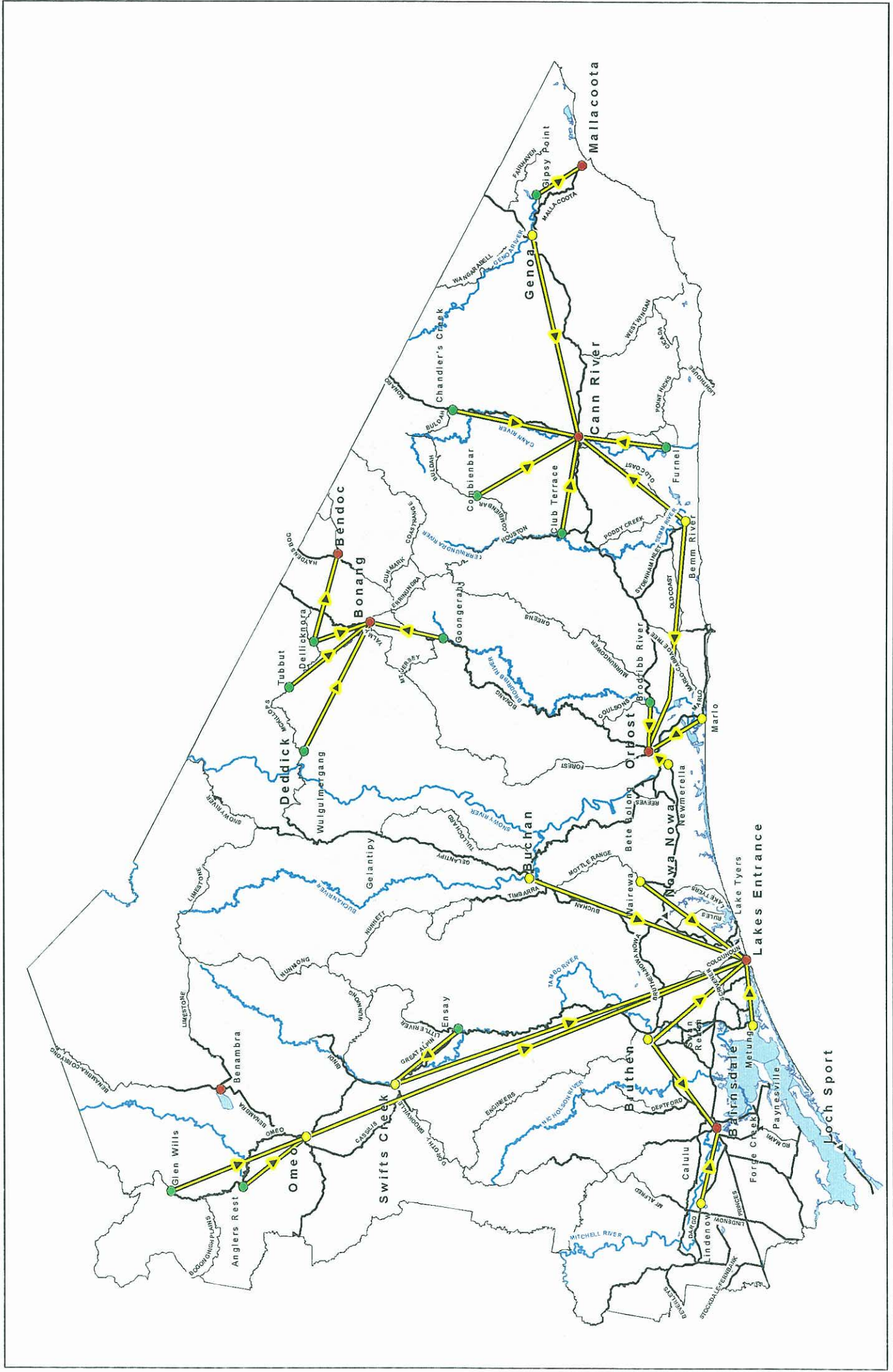
The Federal Government has product stewardship initiatives for:

- Degradable plastics;
- Oil;
- Tyres; and
- PVC

E-waste has been identified as a national priority waste due to the significant quantities being produced and the hazardous nature of the waste. The inclusion of televisions and computers in the product stewardship initiative is currently being developed by the Federal Government. Local government is a key stakeholder in management of e-waste. Much of this material is placed out for council hard waste collection. This mode of collection is likely to continue as part of any new scheme.

Council supports proposals for a product stewardship scheme and seeks to ensure that its role in the full life cycle management of e-waste is recognised and appropriately resourced with any national initiative.

APPENDIX B FIGURES

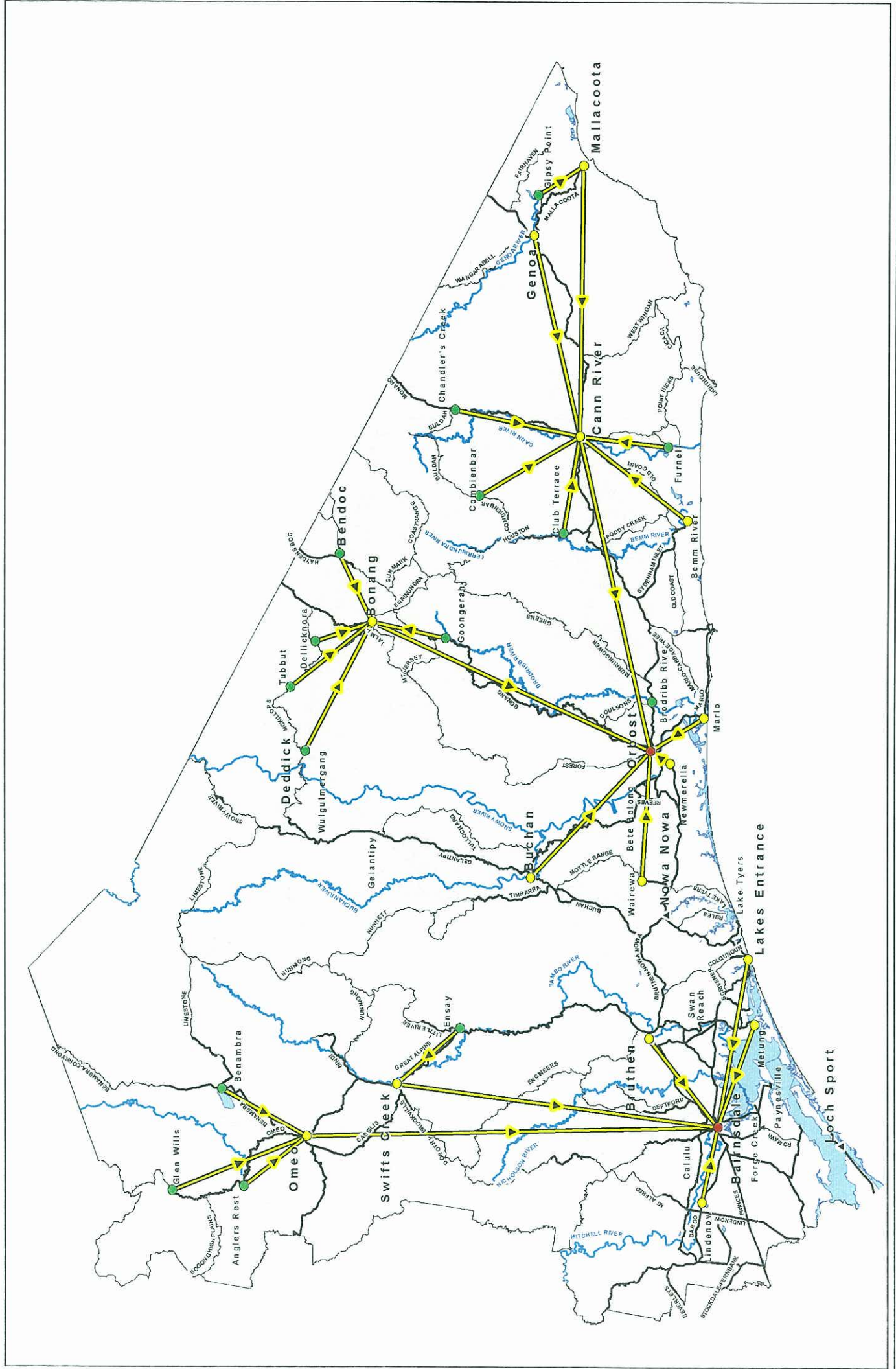


Legend

- Major towns (Red circle)
- Minor towns (Green circle)
- Waste management facilities (Yellow triangle)
- Landfill (Red circle)
- Transfer Station (Green circle)
- Transfer Trailer (Yellow triangle)
- Waste transfer (Yellow arrow)
- Main roads (Black line)
- Sealed (Black line)
- Unsealed (Dashed black line)
- Main watercourses (Blue line)
- Waterbodies (Blue area)
- LGA Boundaries (Black outline)



Figure 4: Base Case
Map projection GDA 1994, MGA zone 55

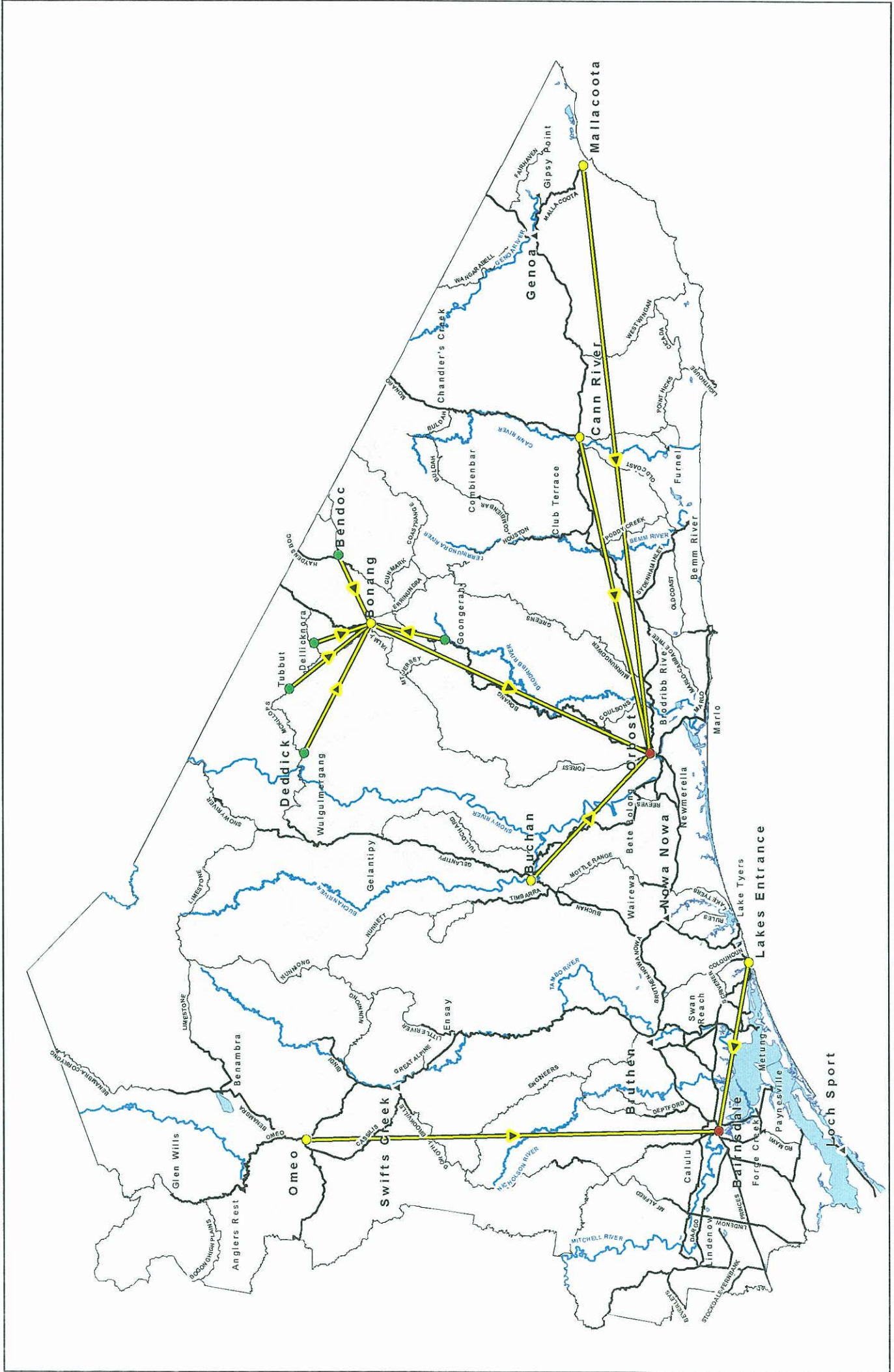


Legend

- Major towns (Triangle symbol)
- Minor towns (Small triangle symbol)
- Main roads (Thick line)
- Waste transfer (Yellow arrow)
- Waste management facilities (Circle symbol)
- Landfill (Red circle)
- Transfer Station (Yellow circle)
- Transfer Trailer (Green circle)
- Main watercourses (Blue line)
- Waterbodies (Blue area)
- LCA Boundaries (Dashed line)
- Sealed (Solid line)
- Unsealed (Dashed line)

Figure 5: Option 1
Map projection GDA 1994, MGA zone 55

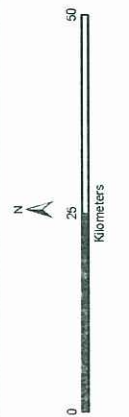
0 25 50
Kilometers

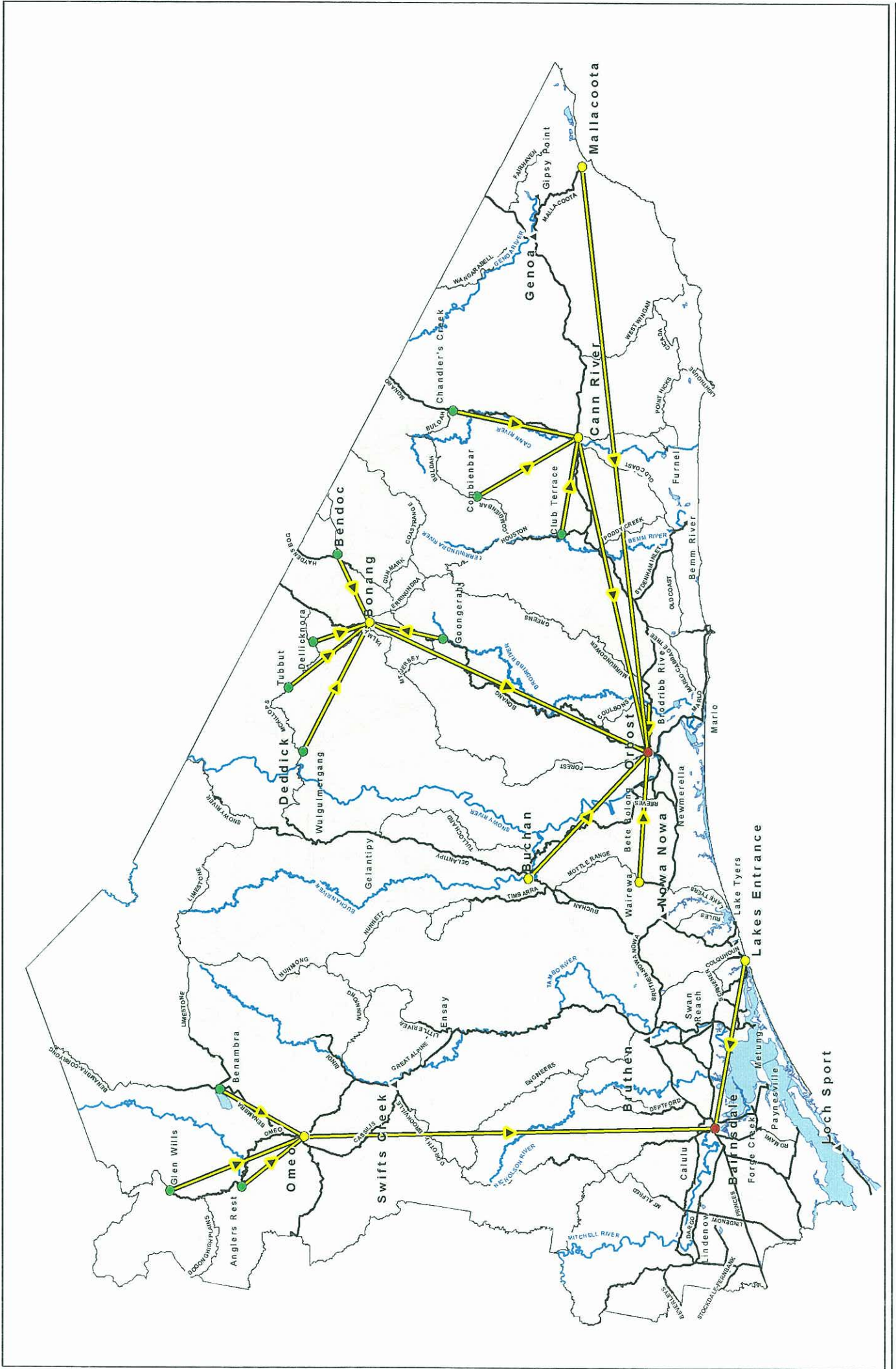


Legend

- Major towns (black triangle)
- Minor towns (grey triangle)
- Waste management facilities (yellow triangle)
- Landfill (red circle)
- Transfer Station (yellow circle)
- Transter/Trailer (green circle)
- Main roads (thick black line)
- Sealed (thin black line)
- Unsealed (dashed black line)
- Waterbodies (blue area)
- LGA Boundaries (dotted line)

Figure 6: Option 2
 Map projection GDA 1994, MGA zone 55



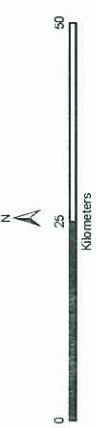


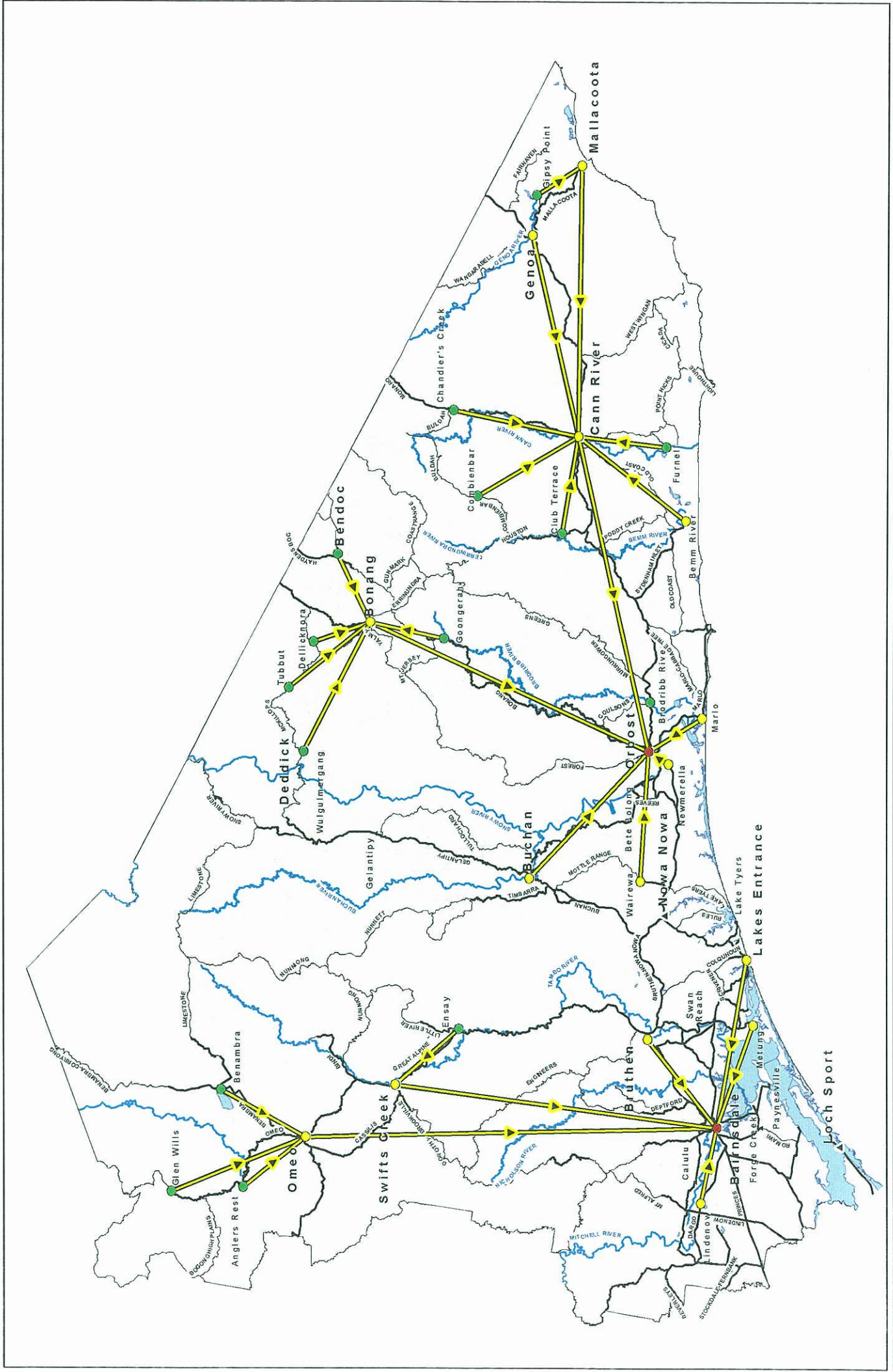
Legend

- ▲ Major towns
- ▲ Minor towns
- ◆ Waste management facilities
- ◆ Landfill
- ◆ Transfer Station
- ◆ Transfer Trailer
- ◆ Waste transfer
- ◆ Landfill
- ◆ Transfer Station
- ◆ Transfer Trailer
- Main roads
- Sealed
- Unsealed
- Main watercourses
- Waterbodies
- LGA Boundaries

Figure 7: Option 3

Map projection GDA 1994, MGA zone 55

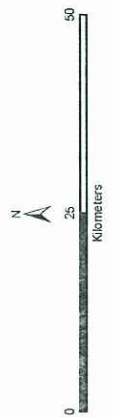




Legend

- Waste management facilities
 - Landfill (Red circle)
 - Transfer Station (Yellow circle)
 - Transfer/Trailer (Green circle)
- Waste transfer
 - Waste transfer (Yellow arrow)
- Main roads (Solid line)
- Sealed (Dashed line)
- Unsealed (Dotted line)
- Major towns (Large triangle)
- Minor towns (Small triangle)
- Main watercourses (Blue line)
- Waterbodies (Light blue area)
- LGA Boundaries (Thin grey line)

Figure 8: Option 4
 Map projection GDA 1994, MGA zone 55



APPENDIX C ASSUMPTIONS AND TABLES

ASSUMPTIONS FOR EGSC MODELLING

Household growth is 0.61% in line with Victoria in Future predictions. This has been split to be 0.63% growth for Urban and Coastal areas and 0.3% growth for rural communities.

Households that use a Transfer Station produce 80% of the amount of waste that a Kerbside collection household produces due to greater home composting.

Households that use a Transfer Trailer produce 59% of the amount of waste that a kerbside collection household produces due to significant home composting and feeding of pets with organics.

Consumer Purchasing Index is 2.5%

The cost for operating the landfill facilities will change from their current contracts by \$5 per tonne to reflect greater fuel use, consumables use, Daily Cover etc.. There will not be a step increase in the contracts due to employment of extra persons or machinery at the site. The current facilities can handle the increase in tonnage with no change to manning and machinery.

Landfill Levy will increase at a faster rate than CPI, this will be driven by political decision processes.

A Transfer Station at Bonang will cost the same to operate as the Transfer Station at Buchan.

A Transfer Trailer at Benambra will cost the same as the current Transfer Trailer at Angler's Rest

A Transfer trailer at Bendoc will cost the same as the current transfer trailer at Deddick.

A transfer trailer at Tubbut will cost the same as a Transfer Trailer at Deddick.

Commercial and Industrial waste will grow at 2% to reflect increase waste from operators and increased number of operators.

C&I waste Gate Fees will increase at 3% p.a. on top of CPI to ensure C&I users pay the full cost of landfilling.

Increasing C&I Gate Fees will cause an increase in the percentage of C&I waste recycled.

Annual growth in Public Litter Bins will be 1%.

Annual growth in Public Place recycling will grow by 15% in 2010, 10% in 2015, 5 % in 2020, 2.5 % in 2025 and 1% in 2030 as a consequence of greater roll out of recycling bins to the majority of points that have Public Litter Bins.

Rehabilitation of 1m³ landfill capping throughout East Gippsland will on average be \$25 for all costs associated with rehabilitation.

EGSC need to provide for 1 hectare of rehabilitation to occur each year.

Urban areas have 99% Kerbside collection these include: Bairnsdale, Lakes Entrance, Orbost and Metung.

Semi Urban Areas have a 90% Kerbside collection provision, these include: Cann River, Mallacoota, Omeo, Swifts Creek, Lindenow, Bruthen, Newmerella, Marlo and Genoa.

Teach Transfer Trailer Services 25 Households.

Where there is a known high tourist use of a Transfer Trailer the number of Households has been increased to 35.

Ensay has 50 rural properties on top of its Kerbside collection properties as a consequence of having 2 Transfer Trailers.

C&I waste has a density of $0.65t/m^3$.

Green waste has a density of $0.2t/m^3$.

Mulched Green waste has a density of $0.5t/m^3$.

The current regional contracted kerbside collection bin lift cost for MSW, Co-mingled recyclables and green waste will be the same for any new households added.

Rural Communities that receive a Kerbside collection system will go to a Kerbside rural system, whereby the bins for a number of households will be aggregated in a position that the collection truck can collect from and that is conveniently located for the household. In the worst case this will be location of the MGBs at the location of the current Transfer Station or Transfer Trailer being replaced.

Transfer Stations are to be provided in the main urban areas and or within 40km of them.

Each Region (North West, Omeo, Orbost and Bairnsdale & Lakes) must be provided with at least one Transfer Station.

Transfer Trailer Costs include the Gate Fee for landfilling waste collected for all scenarios bar Option 4 where manning of the Transfer Trailers passes the cost onto the Households.

Assumed that Mallacoota and Cann River Transfer Stations will cost the same as Lindenow TS.

APPENDIX D FINANCIAL SUMMARY SHEETS ALL SCENARIO

Total Cost Summary

	2010	2015	2020	2025	2030
Kerbside Collection MSW - Bin Lift	\$ 874,870	\$ 1,015,417	\$ 1,178,514	\$ 1,367,776	\$ 1,587,399
Kerbside Collection Co-mingled - Bin Lift	\$ 507,628	\$ 589,100	\$ 683,636	\$ 793,331	\$ 920,615
Landfill Costs - Less Operation	\$ 869,589	\$ 1,582,385	\$ 2,341,490	\$ 2,935,406	\$ 3,626,071
Landfill Operation costs	\$ 1,344,406	\$ 1,512,457	\$ 1,300,377	\$ 1,265,562	\$ 1,423,757
Kerbside Green Waste - Bin Lift	\$ 423,006	\$ 478,849	\$ 542,063	\$ 613,622	\$ 694,626
Processing Green	\$ 130,173	\$ 174,080	\$ 228,259	\$ 282,611	\$ 345,120
TS Costs	\$ 1,378,986	\$ 1,551,360	\$ 1,745,280	\$ 2,080,824	\$ 2,340,927
TT Costs	\$ 107,248	\$ 121,005	\$ 138,447	\$ 158,952	\$ 182,987
All bin Cost	\$ 126,940	\$ 150,765	\$ 179,062	\$ 212,669	\$ 252,584
Other Costs	\$ 657,265	\$ 779,023	\$ 923,423	\$ 1,094,687	\$ 1,297,826
Future Landfill Rehabilitation Costs	\$ 250,000	\$ 281,250	\$ 316,406	\$ 355,957	\$ 400,452
PLBs, PRPs & Front loader	\$ 226,643	\$ 281,544	\$ 349,190	\$ 424,967	\$ 509,435
Total - Non of the coloured cells	\$ 6,516,582	\$ 8,061,905	\$ 9,381,482	\$ 10,947,796	\$ 12,836,228
Total- All cells	\$ 6,896,755	\$ 8,517,235	\$ 9,926,147	\$ 11,586,364	\$ 13,581,799

Total Revenue Summary

	2010	2015	2020	2025	2030
TS Gate Fees	\$ 59,048	\$ 83,147	\$ 118,855	\$ 171,277	\$ 238,222
Commercial Gate fees	\$ 860,444	\$ 1,432,161	\$ 2,409,772	\$ 3,871,836	\$ 5,988,561
Other Income	\$ 23,252	\$ 26,308	\$ 29,765	\$ 33,676	\$ 38,102
Service Charge Basic Ker	\$ 3,050,755	\$ 3,541,103	\$ 4,110,195	\$ 4,770,671	\$ 5,537,200
Green waste extra charge	\$ 221,138	\$ 256,681	\$ 297,932	\$ 345,808	\$ 401,371
Total Revenue	\$ 4,214,637	\$ 5,339,400	\$ 6,966,520	\$ 9,193,269	\$ 12,203,456
Council deficit	\$ 2,682,118	\$ 3,177,835	\$ 2,959,627	\$ 2,393,096	\$ 1,378,343

East Gippsland Waste Collection and Disposal Strategy Base Case summary of financial results

Project No: 103822-00

Table: 1

Revision: 00



Total Cost Summary

	2010	2015	2020	2025	2030
Kerbside Collection MSW - Bin Lift	\$ 874,870	\$ 1,015,417	\$ 1,178,514	\$ 1,367,776	\$ 1,587,399
Kerbside Collection Co-mingled - Bin Lift	\$ 507,628	\$ 589,100	\$ 683,636	\$ 793,331	\$ 920,615
Landfill Costs - Less Operation	\$ 1,047,833	\$ 1,794,519	\$ 2,450,844	\$ 3,062,862	\$ 3,774,880
Landfill Operation costs	\$ 792,476	\$ 891,536	\$ 1,002,978	\$ 1,128,350	\$ 1,269,394
Kerbside Green Waste - Bin Lift	\$ 423,006	\$ 478,849	\$ 542,063	\$ 613,622	\$ 694,626
Processing Green	\$ 130,057	\$ 173,947	\$ 228,107	\$ 282,438	\$ 344,922
TS Costs	\$ 1,571,062	\$ 1,767,445	\$ 1,988,376	\$ 2,236,923	\$ 2,516,538
TT Costs	\$ 122,998	\$ 143,066	\$ 171,361	\$ 206,782	\$ 250,378
All bin Cost	\$ 126,940	\$ 150,765	\$ 179,062	\$ 212,669	\$ 252,584
Other Costs	\$ 657,265	\$ 779,023	\$ 923,423	\$ 1,094,687	\$ 1,297,826
Future Landfill Rehabilitation Costs	\$ 250,000	\$ 281,250	\$ 316,406	\$ 355,957	\$ 400,452
PLBs, PRPs & Front loader	\$ 226,643	\$ 281,544	\$ 349,190	\$ 424,967	\$ 509,435
Total - Non of the coloured cells	\$ 6,350,722	\$ 7,891,264	\$ 9,469,447	\$ 11,141,969	\$ 13,073,676
Total- All cells	\$ 6,730,778	\$ 8,346,461	\$ 10,013,961	\$ 11,780,364	\$ 13,819,049

Total Revenue Summary

	2010	2015	2020	2025	2030
TS Gate Fees	\$ 59,753	\$ 86,261	\$ 129,858	\$ 189,465	\$ 269,288
Commercial Gate fees	\$ 867,413	\$ 1,442,444	\$ 2,425,327	\$ 3,895,018	\$ 6,022,528
Other Revenue	\$ 23,252	\$ 26,308	\$ 29,765	\$ 33,676	\$ 38,102
Service Charge Basic Ker	\$ 3,050,755	\$ 3,541,103	\$ 4,110,195	\$ 4,770,671	\$ 5,537,200
Green waste extra charge	\$ 221,138	\$ 256,681	\$ 297,932	\$ 345,808	\$ 401,371
Total Revenue	\$ 4,222,311	\$ 5,352,797	\$ 6,993,078	\$ 9,234,639	\$ 12,268,489
Council deficit	\$ 2,508,468	\$ 2,993,664	\$ 3,020,883	\$ 2,545,725	\$ 1,550,561

East Gippsland Waste Collection and Disposal Strategy Option 1 summary of financial results

Project No: 103822-00

Table: 2

Revision: 00



Total Cost Summary

	2010	2015	2020	2025	2030
Kerbside Collection MSW - Bin Lift	\$ 920,247	\$ 1,067,048	\$ 1,237,264	\$ 1,434,660	\$ 1,663,578
Kerbside Collection Co-mingled - Bin Lift	\$ 534,353	\$ 619,657	\$ 718,563	\$ 833,254	\$ 966,250
Landfill Costs - Less Operation	\$ 1,045,133	\$ 1,790,698	\$ 2,445,035	\$ 3,055,072	\$ 3,765,089
Landfill Operation costs	\$ 792,476	\$ 891,536	\$ 1,002,978	\$ 1,128,350	\$ 1,269,394
Kerbside Green Waste - Bin Lift	\$ 449,815	\$ 517,939	\$ 596,855	\$ 688,300	\$ 794,273
Processing Green	\$ 135,273	\$ 180,317	\$ 235,841	\$ 291,615	\$ 355,798
TS Costs	\$ 948,267	\$ 1,066,801	\$ 1,200,151	\$ 1,350,170	\$ 1,518,941
TT Costs	\$ 40,582	\$ 46,985	\$ 55,562	\$ 66,073	\$ 78,887
All bin Cost	\$ 126,940	\$ 150,765	\$ 179,062	\$ 212,669	\$ 252,584
Other Costs	\$ 657,265	\$ 779,023	\$ 923,423	\$ 1,094,687	\$ 1,297,826
Future Landfill Rehabilitation Costs	\$ 250,000	\$ 281,250	\$ 316,406	\$ 355,957	\$ 400,452
PLBs, PRPs & Front loader	\$ 226,643	\$ 281,544	\$ 349,190	\$ 424,967	\$ 509,435
Total - Non of the coloured cells	\$ 5,741,721	\$ 7,211,997	\$ 8,708,083	\$ 10,288,202	\$ 12,116,257
Total- All cells	\$ 6,126,993	\$ 7,673,563	\$ 9,260,330	\$ 10,935,774	\$ 12,872,507

Total Revenue Summary

	2010	2015	2020	2025	2030
TS Gate Fees	\$ 44,984	\$ 65,281	\$ 98,560	\$ 144,229	\$ 205,309
Commercial Gate fees	\$ 867,413	\$ 1,442,444	\$ 2,425,327	\$ 3,895,018	\$ 6,022,528
Other revenue	\$ 23,252	\$ 26,308	\$ 29,765	\$ 33,676	\$ 38,102
Service Charge Basic Ker	\$ 3,163,321	\$ 3,669,897	\$ 4,257,493	\$ 4,939,139	\$ 5,729,887
Green waste extra charge	\$ 229,625	\$ 266,391	\$ 309,037	\$ 358,508	\$ 415,895
Total Revenue	\$ 4,328,595	\$ 5,470,323	\$ 7,120,183	\$ 9,370,570	\$ 12,411,721
Council deficit	\$ 1,798,398	\$ 2,203,241	\$ 2,140,148	\$ 1,565,203	\$ 460,785

**East Gippsland Waste Collection and Disposal Strategy
Option 2 summary of financial results**

Project No: 103822-00

Table: 3

Revision: 00



Total Cost Summary

	2010	2015	2020	2025	2030
Kerbside Collection MSW - Bin Lift	\$ 902,397	\$ 1,046,913	\$ 1,214,524	\$ 1,408,949	\$ 1,634,478
Kerbside Collection Co-mingled - Bin Lift	\$ 522,921	\$ 606,602	\$ 703,655	\$ 816,230	\$ 946,809
Landfill Costs - Less Operation	\$ 1,046,317	\$ 1,792,353	\$ 2,447,676	\$ 3,058,671	\$ 3,769,677
Landfill Operation costs	\$ 792,476	\$ 891,536	\$ 1,002,978	\$ 1,128,350	\$ 1,269,394
Kerbside Green Waste - Bin Lift	\$ 439,548	\$ 497,531	\$ 563,146	\$ 637,414	\$ 721,476
Processing Green	\$ 131,291	\$ 175,143	\$ 229,221	\$ 283,528	\$ 346,018
TS Costs	\$ 1,063,533	\$ 1,196,475	\$ 1,346,035	\$ 1,514,289	\$ 1,703,575
TT Costs	\$ 74,442	\$ 86,972	\$ 104,672	\$ 126,862	\$ 154,290
All bin Cost	\$ 126,940	\$ 150,765	\$ 179,062	\$ 212,669	\$ 252,584
Other Costs	\$ 657,265	\$ 779,023	\$ 923,423	\$ 1,094,687	\$ 1,297,826
Future Landfill Rehabilitation Costs	\$ 250,000	\$ 281,250	\$ 316,406	\$ 355,957	\$ 400,452
PLBs, PRPs & Front loader	\$ 226,643	\$ 281,544	\$ 349,190	\$ 424,967	\$ 509,435
Total - Non of the coloured cells	\$ 5,852,482	\$ 7,329,714	\$ 8,834,361	\$ 10,423,087	\$ 12,259,544
Total- All cells	\$ 6,233,773	\$ 7,786,107	\$ 9,379,989	\$ 11,062,572	\$ 13,006,013

Total Revenue Summary

	2010	2015	2020	2025	2030
TS Gate Fees	\$ 46,761	\$ 67,691	\$ 102,022	\$ 149,069	\$ 212,037
Commercial Gate fees	\$ 867,413	\$ 1,442,444	\$ 2,425,327	\$ 3,895,018	\$ 6,022,528
Other Revenue	\$ 23,252	\$ 26,308	\$ 29,765	\$ 33,676	\$ 38,102
Service Charge Basic Ker	\$ 3,121,329	\$ 3,621,943	\$ 4,202,731	\$ 4,876,601	\$ 5,658,471
Green waste extra charge	\$ 226,253	\$ 262,541	\$ 304,640	\$ 353,486	\$ 410,161
Total Revenue	\$ 4,285,008	\$ 5,420,928	\$ 7,064,485	\$ 9,307,851	\$ 12,341,299
Council deficit	\$ 1,948,765	\$ 2,365,179	\$ 2,315,503	\$ 1,754,721	\$ 664,715

East Gippsland Waste Collection and Disposal Strategy Option 3 summary of financial results

Project No: 103822-00

Table: 4

Revision: 00



Total Cost Summary

	2010	2015	2020	2025	2030
Kerbside Collection MSW - Bin Lift	\$ 902,397	\$ 1,046,913	\$ 1,214,524	\$ 1,408,949	\$ 1,634,478
Kerbside Collection Co-mingled - Bin Lift	\$ 522,921	\$ 606,602	\$ 703,655	\$ 816,230	\$ 946,809
Landfill Costs - Less Operation	\$ 1,046,317	\$ 1,792,353	\$ 2,447,676	\$ 3,058,671	\$ 3,769,677
Landfill Operation costs	\$ 792,476	\$ 891,536	\$ 1,002,978	\$ 1,128,350	\$ 1,269,394
Kerbside Green Waste - Bin Lift	\$ 300,330	\$ 340,000	\$ 384,910	\$ 435,751	\$ 493,309
Processing Green	\$ 112,897	\$ 148,555	\$ 192,397	\$ 236,799	\$ 287,933
TS Costs	\$ 1,063,533	\$ 1,196,475	\$ 1,346,035	\$ 1,514,289	\$ 1,703,575
TT Costs	\$ 62,530	\$ 70,346	\$ 79,140	\$ 89,032	\$ 100,161
All bin Cost	\$ 126,940	\$ 150,765	\$ 179,062	\$ 212,669	\$ 252,584
Other Costs	\$ 657,265	\$ 779,023	\$ 923,423	\$ 1,094,687	\$ 1,297,826
Future Landfill Rehabilitation Costs	\$ 250,000	\$ 281,250	\$ 316,406	\$ 355,957	\$ 400,452
PLBs, PRPs & Front loader	\$ 226,643	\$ 281,544	\$ 349,190	\$ 424,967	\$ 509,435
Total - Non of the coloured cells	\$ 5,701,352	\$ 7,155,558	\$ 8,630,592	\$ 10,183,595	\$ 11,977,247
Total- All cells	\$ 6,064,249	\$ 7,585,363	\$ 9,139,396	\$ 10,776,351	\$ 12,665,632

Total Revenue Summary

	2010	2015	2020	2025	2030
TS Gate Fees	\$ 46,761	\$ 67,691	\$ 102,022	\$ 149,069	\$ 212,037
Commercial Gate fees	\$ 867,413	\$ 1,442,444	\$ 2,425,327	\$ 3,895,018	\$ 6,022,528
Other Revenue	\$ 23,252	\$ 26,308	\$ 29,765	\$ 33,676	\$ 38,102
Service Charge Basic Ker	\$ 3,121,329	\$ 3,621,943	\$ 4,202,731	\$ 4,876,601	\$ 5,658,471
Green waste extra charge	\$ 182,333	\$ 211,644	\$ 245,667	\$ 285,160	\$ 331,003
Total Revenue	\$ 4,241,087	\$ 5,370,031	\$ 7,005,512	\$ 9,239,525	\$ 12,262,140
Council deficit	\$ 1,823,162	\$ 2,215,332	\$ 2,133,884	\$ 1,536,826	\$ 403,492

East Gippsland Waste Collection and Disposal Strategy Option 3A summary of financial results

Project No: 103822-00

Table: 5

Revision: 00



Total Cost Summary

	2010	2015	2020	2025	2030
Kerbside Collection MSW - Bin Lift	\$ 874,870	\$ 1,015,417	\$ 1,178,514	\$ 1,367,776	\$ 1,587,399
Kerbside Collection Co-mingled - Bin Lift	\$ 507,628	\$ 589,100	\$ 683,636	\$ 793,331	\$ 920,615
Landfill Costs - Less Operation	\$ 1,047,833	\$ 1,794,519	\$ 2,450,844	\$ 3,062,862	\$ 3,774,880
Landfill Operation costs	\$ 792,476	\$ 891,536	\$ 1,002,978	\$ 1,128,350	\$ 1,269,394
Kerbside Green Waste - Bin Lift	\$ 423,006	\$ 478,849	\$ 542,063	\$ 613,622	\$ 694,626
Processing Green	\$ 130,057	\$ 173,947	\$ 228,107	\$ 282,438	\$ 344,922
TS Costs	\$ 1,571,062	\$ 1,767,445	\$ 1,988,376	\$ 2,236,923	\$ 2,516,538
TT Costs	\$ 156,774	\$ 176,371	\$ 198,417	\$ 223,219	\$ 251,122
All bin Cost	\$ 126,940	\$ 150,765	\$ 179,062	\$ 212,669	\$ 252,584
Other Costs	\$ 657,265	\$ 779,023	\$ 923,423	\$ 1,094,687	\$ 1,297,826
Future Landfill Rehabilitation Costs PLBs, PRPs & Front loader	\$ 250,000	\$ 281,250	\$ 316,406	\$ 355,957	\$ 400,452
Total - Non of the coloured cells	\$ 6,384,497	\$ 7,924,568	\$ 9,496,503	\$ 11,158,406	\$ 13,074,419
Total- All cells	\$ 6,764,554	\$ 8,379,766	\$ 10,041,017	\$ 11,796,801	\$ 13,819,793

Total Revenue Summary

	2010	2015	2020	2025	2030
TT Gate Fees	\$ 18,206	\$ 25,175	\$ 38,734	\$ 57,576	\$ 82,521
TS Gate Fees	\$ 59,753	\$ 86,261	\$ 129,858	\$ 189,465	\$ 269,288
Commercial Gate fees	\$ 867,413	\$ 1,442,444	\$ 2,425,327	\$ 3,895,018	\$ 6,022,528
Other Income	\$ 23,252	\$ 26,308	\$ 29,765	\$ 33,676	\$ 38,102
Service Charge Basic Ker	\$ 3,050,755	\$ 3,541,103	\$ 4,110,195	\$ 4,770,671	\$ 5,537,200
Green waste extra charge	\$ 221,138	\$ 256,681	\$ 297,932	\$ 345,808	\$ 401,371
Total Revenue	\$ 4,240,517	\$ 5,377,972	\$ 7,031,812	\$ 9,292,215	\$ 12,351,010
Council deficit	\$ 2,524,037	\$ 3,001,793	\$ 3,009,205	\$ 2,504,586	\$ 1,468,783

East Gippsland Waste Collection and Disposal Strategy Option 4 summary of financial results

Project No: 103822-00

Table: 6

Revision: 00

