

Buloke Waste Management Strategy

2012 - 2022

Prepared for
Buloke Shire Council

July 2012

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Report: P228
July 2012

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ABBREVIATIONS

ABS	Australian Bureau of Statistics
BPEM	Best practice environmental management
C&D	Construction and demolition
C&I	Commercial and industrial
CO ₂ e	Carbon dioxide equivalent
DSE	Department of Sustainability and Environment
EPA	Environment Protection Authority
EPHC	Environment Protection and Heritage Council
KPI	Key performance indicator
MGB	Mobile garbage bin
MSW	Municipal solid waste
NEPM	National Environment Protection Measure
OHS	Occupational health and safety
PIW	Prescribed industrial waste
RRC	Resource recovery centre
RW/MG	Regional Waste Management Group
TBL	Triple bottom line

Summary

Waste management is a core element of Buloke Council services, and an effective service that meets ratepayers' needs is important in maintaining a high level of community satisfaction. Waste management also provides an important avenue for council to achieve environmental benefits by providing services that encourage good waste management practices and contribute to Buloke Council's commitment to the development of a sustainable community.

This waste management strategy provides a vision for future waste management in Buloke. The strategy was developed for discussion with the local community prior to development and approval of the final waste management strategy.

Strategies for waste management in Buloke are not developed in isolation. Buloke is a member of the Central Murray Regional Waste Management Group (RWMG), together with the municipalities of Gannawarra, Loddon and Swan Hill, and Wakool in NSW. Central Murray RWMG is a statutory body with responsibilities for regional waste management planning and coordination. Planning for waste management in Buloke needs to consider the regional context, as well as Victorian and Commonwealth Government policies and regulations.

Buloke Council provides kerbside waste and recycling collection services to around 2,884 households and 258 businesses across all of the Shire's townships. 120 L bins are used to collect domestic garbage on a weekly basis; commercial waste is collected in 240L bins. Recyclables (including paper, cardboard, glass bottles/jars, milk/juice cartons, plastics 1-7, aluminium and steel cans) are collected fortnightly in 240 L bins.

In 2010/11 approximately 1,509 tonnes of domestic garbage and around 700 tonnes of recyclables were collected via kerbside services. Additional amounts of material are deposited by generators directly to one of the Shire's five landfills (at Birchip, Charlton, Culgoa, Donald and Nandaly), one transfer station (at Sea Lake) and one recycling centre (at Watchem). It is estimated that each person in Buloke generates around 0.6 tonnes of waste and 0.1 tonnes of recyclables each year.

Data since 2008/09 shows there has been no reduction in the total amount of waste generated in Buloke (it actually increased in 2010/11 although this was thought to be an anomaly explained by the flood clean-up). Regional waste and recycling data supplied by Central Murray RWMG shows that while Buloke is slightly worse and slightly better in some categories on a regional basis, there is room for greater improvement in comparison with other non-metropolitan municipalities in Victoria.

In accordance with the waste management hierarchy (which prioritises, where practicable, initiatives in the following order: waste avoidance, reduction, reuse, recycling, energy recovery, treatment and disposal), a range of options were developed around waste minimisation, community education, collection and recovery, infrastructure and monitoring. These options were assessed based on their likely environmental, social and economic impacts and a range of recommendations made for future improvement. The recommendations are summarised in Table ES1 together with a proposed program for implementation.

Table ES1 Recommendations & proposed implementation plan

Activity	Implementation timetable		
	0-5 years	5-10 years	> 10 years
MINIMISATION			
Council advocacy			
Council leadership			
Investigate frequency and/or volume based charging			
EDUCATION			
Awareness & education program			
Waste/recycling audits			
COLLECTION & RECOVERY			
Explore optional use of 80 L MGBs as part of volume-based charging system			
Call for registrations of interest in collections from rural households not current serviced			
Provide one free 'landfill pass' to replace annual hard waste collections			
Upgrade recycling bins at landfills			
Shred (not burn) garden organics dropped off at existing facilities			
Explore potential for organic waste collections & establishment of regional compost facility in southern Buloke with neighbouring councils			
Improve recycling services to C&I sector			
INFRASTRUCTURE			
Benchmark landfills & transfer station against best practice			
Improve signage, recycling bins, litter control at existing facilities			
Install lids to skips at Sea Lake transfer station			
Limit access to tipping face at existing landfills			
Call for community registrations of interest in establishment and/or operation of resale centres			
Nandaly – rehabilitate landfill & increase recycling bins in township			
Wycheproof – rehabilitate landfill & establish RRC			
Culgoa – rehabilitate landfill & establish RRC			
Donald – upgrade landfill in short term, rehabilitate landfill & establish RRC in medium term			
Charlton – upgrade landfill			
Birchip – upgrade landfill & establish RRC			
Berriwillock – rehabilitate landfill			
Update facility operating manuals for landfills & transfer station			
Increase disposal fees for self-haul waste			
MONITORING			
Review waste strategy annually & update in 3 years			
Measure & report on KPIs			

1. Introduction

Buloke Shire Council is committed to the development of “*a sustainable community where everyone is actively encouraged to participate in community life to enrich the cultural, social and economic viability of [the] Shire and to care for [the] most important asset, the natural environment*” (Buloke Shire Council 2010). Waste management is a core element of council services and an effective service that meets ratepayers’ needs is important in maintaining community satisfaction. Waste management also provides an important avenue for council to achieve environmental benefits by providing services that encourage recovery and minimisation practices.

This waste management strategy was developed with the following objectives:

- to develop a vision for waste management in the long term
- provide a framework for planning of waste management services and facilities that meet community needs and expectations for the next 10 years
- provide a strategy for the disposal and resource recovery for solid waste generated in the community.

The scope of the study involved:

- consultation with council staff, regional waste management staff and waste collection contractor
- inspection of major waste management and resource recovery facilities in the Shire
- an analysis of waste and recycling data and trends for the past three years
- review and analysis of management strategies for local applicability
- environmental, social and economic assessment of options for future services for waste and recycling services
- recommendations on optimum strategic directions.

2. Context

This chapter outlines the background and framework within which waste management and resource recovery in Buloke operates.

2.1 Council

The Shire of Buloke encompasses an area of over 8,000 km² in the north-west of Victoria. There are ten townships within the Shire (refer Figure 1), with the largest being Birchip, Charlton, Donald, Sea Lake and Wycheproof. The five smaller townships are Berriwillock, Culgoa, Nandaly, Nullawil and Watchem.

Figure 1 Buloke Shire



Source: Buloke Shire Council (www.buloke.vic.gov.au)

The primary economic activity in the Shire is agriculture (mainly grain production), with retail, education, community service and light industry also contributing to the regional economy and employment.

According to the Australian Bureau of Statistics (ABS 2011), the population of Buloke Shire was approximately 7,078 in 2009¹. The population was sparsely distributed, with a density of less than one person per square kilometre.

Previous waste management strategies were prepared in draft form in 2000 and 2006, however neither strategy proceeded to final report stage or were formally accepted by council.

2.2 Policy framework

Buloke Shire Council acts within a wider policy framework for waste management and there is a range of other policy and planning documents that need to be considered in development of a future strategy.

Central Murray Regional Waste Management Group

The Central Murray Regional Waste Management Group (RWMG) is a statutory body established under the *Environment Protection Act 1970* with responsibilities for waste management planning and coordination. Buloke is a member council of Central Murray RWMG, together with the municipalities of Gannawarra, Loddon and Swan Hill as well as Wakool in NSW.

Central Murray RWMG's vision is '*to work with communities and industries to achieve sustainable waste management in an environmentally responsible manner*'. It has developed a regional waste management plan (Central Murray RWMG 2005) which outlines the strategy for waste management and resource recovery in the region. Its objectives for 2010 included (among other things):

- recovering 60% of the domestic waste stream
- reducing the number of landfills in the region to less than 24
- aligning collection contract end dates to allow for regional contracts
- establishing markets for recycled organics in order to establish a regional garden organics processing facility
- establishing at least one value-added industry for recyclables
- encouraging reduction in packaging use, including a 75% reduction in use of plastic shopping bags
- approaching zero net greenhouse emissions
- achieving 75% cost recovery for municipal waste/resource management programs
- reducing the region's ecological footprint by 20%.

The regional waste management plan referenced a number of actions that were to be undertaken in Buloke; these are outlined in Table 1.

¹ The most recent year of ABS population projections

Table 1 **Planned activities – Central Murray regional plan 2005**

Activity	Planned completion date	Current status
Develop rehabilitation plans for closed landfill sites	2007	Completed
Rehabilitate former Charlton landfill site	2007	Partly completed
Mobile recycling trailers	2007	Completed
Recovery facilities at Birchip, Donald, Charlton & Wycheproof	2007	Partly completed
Cardboard/paper recycling containers	2007	Not completed
Implement litter controls	2010	Completed
Rehabilitate former landfill sites at Berriwillock, Corack, Curyo, Nullawil, Watchem and Watchupga	2010	Corack, Curyo, Nullawil, Watchem and Watchupga completed. Berriwillock landfill planned for rehabilitation 2011/12.
Establish transfer stations at Culgoa and Sea Lake	2010	Transfer station established at Sea Lake. Culgoa yet to be developed.

Additional regional activities are provided for in the organisation’s annual business plan. The most recent business plan (*Central Murray RWMG Business Plan 2011/12 to 2013/14*) references the conversion of existing landfills in Buloke to transfer stations as follows:

- 2011/12 Nandaly
- 2011/12 Donald and Charlton (subject to funding)
- 2013/14 Wycheproof and Culgoa (subject to funding).

The business plan also outlines planned regional strategies in areas such as data recording systems, resource recovery and education, and sets out regional diversion targets as follows:

- waste to landfill – 410 kg/household/year
- comingled packaging recycling – 355 kg/household/year
- garden organics – 155 kg/household/year
- kerbside recyclables – 45% of total tonnes
- kerbside recyclables and organics – 55% of total tonnes.

To achieve these targets, all member councils (including Buloke) will need to improve on past performance.

State Government

The overall objective of waste management policy and regulation at the state level is coordinated planning for waste management over the long term. The *Environment Protection Act 1970* is the main legislative mechanism to protect the environment in Victoria. Among other things, it provides for the development of regional waste plans, the establishment of landfill levies, and industrial waste policies.

Other regulations deal with specific waste issues such as the transport and management of prescribed industrial waste (PIW) and the licensing, siting, operation and management of waste facilities such as landfills and compost operations.

The Environment Protection Authority (EPA) has responsibility for the implementation and oversight of environmental regulations, including those which deal with waste transport, disposal and management. Sustainability Victoria has responsibility for implementing state policies on resource recovery and waste management. Both bodies are part of the Department of Sustainability and Environment (DSE), which is responsible for the development of government environmental policies.

The Victorian Government's *Towards Zero Waste Strategy* (2005) established a framework for solid waste management and resource recovery. It contained a range of waste minimisation and resource recovery initiatives, aimed at achieving a number of state-wide targets by 2014. The most recent progress report (Sustainability Victoria 2011) on the strategy's achievements shows mixed results as at 2009/10: results above target in total recovery, construction and demolition recovery and litter behaviours, and below target in total waste generation, municipal solid waste recovery and commercial and industrial recovery. A recent 2011 report by the Victorian Auditor General's Office outlined areas for improvement in achieving these targets. With the end of the *Towards Zero Waste Strategy* period nearing (2013/14), development of a new Victorian waste policy has been commenced by DSE.

Commonwealth Government

The Commonwealth Government released the *National Waste Policy: Less Waste, More Resources* in November 2009. This policy established an Australian waste framework over the next 10 years with the following aims:

- to avoid the generation of waste, reduce the amount of waste (including hazardous waste) for disposal, manage waste as a resource and ensure that waste treatment, disposal, recovery and re-use is undertaken in a safe, scientific and environmentally sound manner
- to contribute to the reduction in greenhouse gas emissions, energy conservation and production, water efficiency, and the productivity of the land.

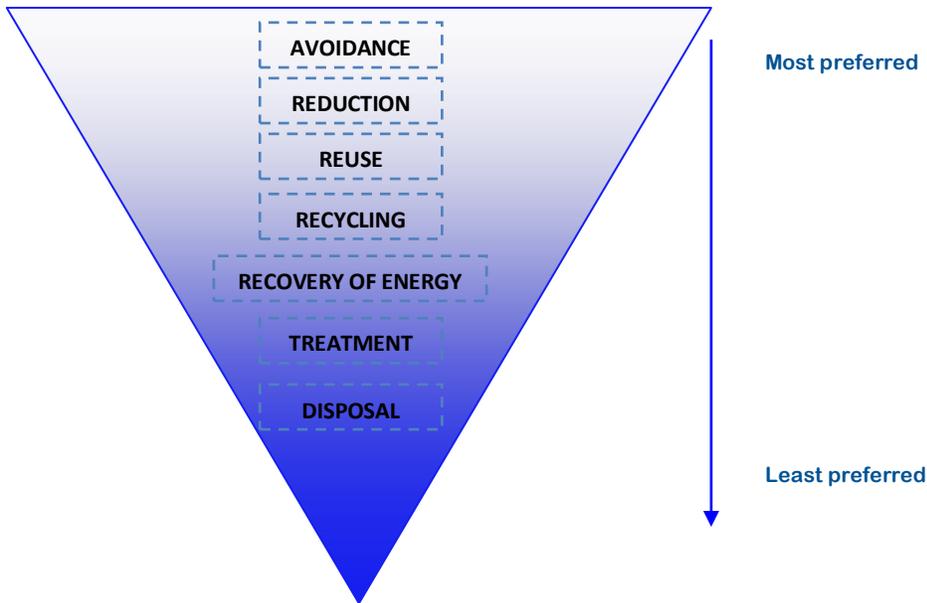
The Environment Protection and Heritage Council (EPHC) of Australia and New Zealand was established in 2001 by the Council of Australian Governments. EPHC addresses national policy issues relating to environmental protection and through National Environment Protection Measures (NEPMs) outlines agreed national objectives for protecting or managing aspects of the environment.

There are currently two waste NEPMs: Movement of Controlled Waste between States and Territories, and Used Packaging Materials. Further investigative work was carried out by EPHC on a proposed NEPM on product stewardship, however this has been overtaken by proposed product stewardship agreements between government and industry regarding specific products such as end-of-life tyres, televisions and computers. Investigations have also been undertaken regarding plastic bags and beverage containers, although no arrangements have been agreed as yet.

2.3 Guiding principles

The waste management hierarchy (refer Figure 2) is the underlying principle of waste management in Australia. The hierarchy prioritises, where practicable, initiatives that avoid and reduce waste generation ahead of reuse and recycling; treatment and disposal of waste to landfill is the least preferred option.

Figure 2 Waste management hierarchy



This principle has been adopted in creating a waste management strategy for Buloke.

3. Waste Management in Buloke

This section examines the current situation of waste management in Buloke, including data on the generation and disposal of waste and recyclables, the infrastructure available for disposal and management and charging systems.

3.1 Waste generation

Kerbside collection services

Kerbside collection of municipal solid waste (MSW) and recyclables is out-sourced by Buloke Council; the current contractor is Wimmera Mallee Waste. The existing contract is due to expire on 30 June 2012, although it allows for an optional two year extension.

In 2010/11, approximately 2,884 households and 258 businesses across all of the Shire's townships were provided with a kerbside collection. These figures included some households outside the townships which were located on the routes between collections, however some households at a distance from roads or townships are not provided with a collection service.

A mixture of 120 L and 240 L mobile garbage bins (MGBs) are used to collect garbage on a weekly basis: 120 L for households and 240 L for businesses. Recyclables are collected fortnightly in a 240 L MGB; material accepted includes paper, cardboard, glass bottles and jars, milk/juice cartons, plastics (types 1 to 7), aluminium and steel cans.

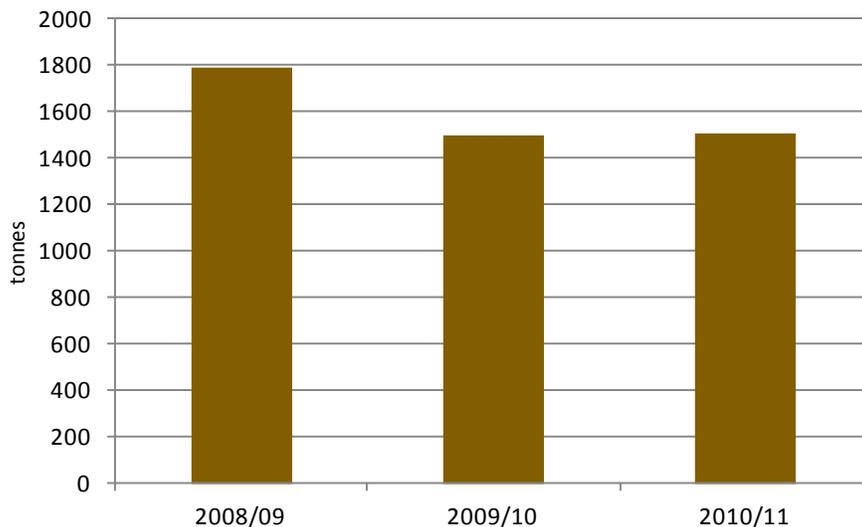
A hard waste collection is usually provided on an annual basis, however it has not occurred in the past year due to the 2011 flood disaster.

Kerbside waste

In 2010/11, approximately 1,509 tonnes of domestic garbage was collected at kerbside. The amount of waste collected at kerbside for the past three years is shown in Figure 3. This figure shows that a small reduction in the amount of waste collected has occurred since 2008/2009, although the amount has remained generally static over the past two years.

The exact amount of kerbside recyclables collected is not known but is estimated at around 700 tonnes in 2010/11.

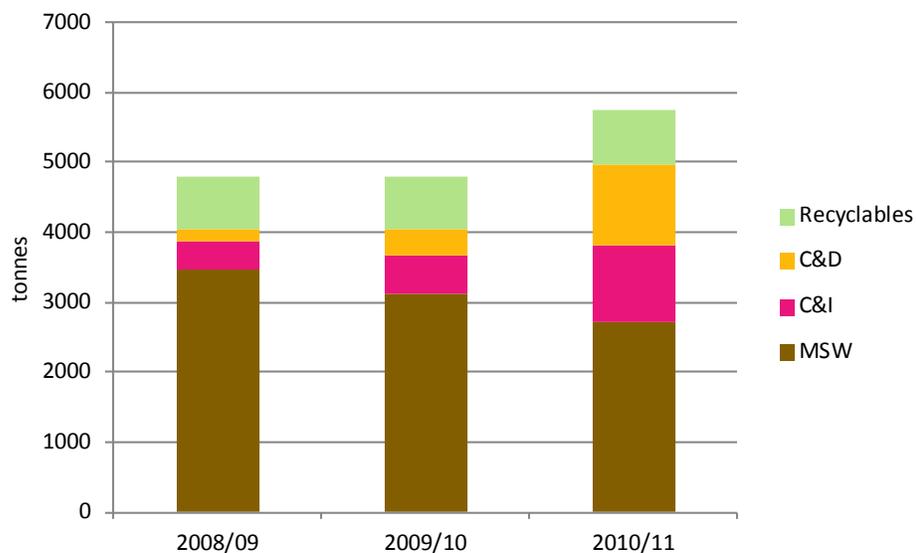
Figure 3 Kerbside garbage collected 2008/09 - 2010/11



Total waste generation

The total waste generated in Buloke for each of the past three years is shown in Figure 4. This accounts for both material collected at kerbside and deposited directly at the Shire’s waste management facilities, and includes domestic garbage (municipal solid waste or MSW), as well as waste from the commercial and industrial (C&I) sector and construction and demolition (C&D) sector.

Figure 4 Total waste generated 2008/09 – 2010/11



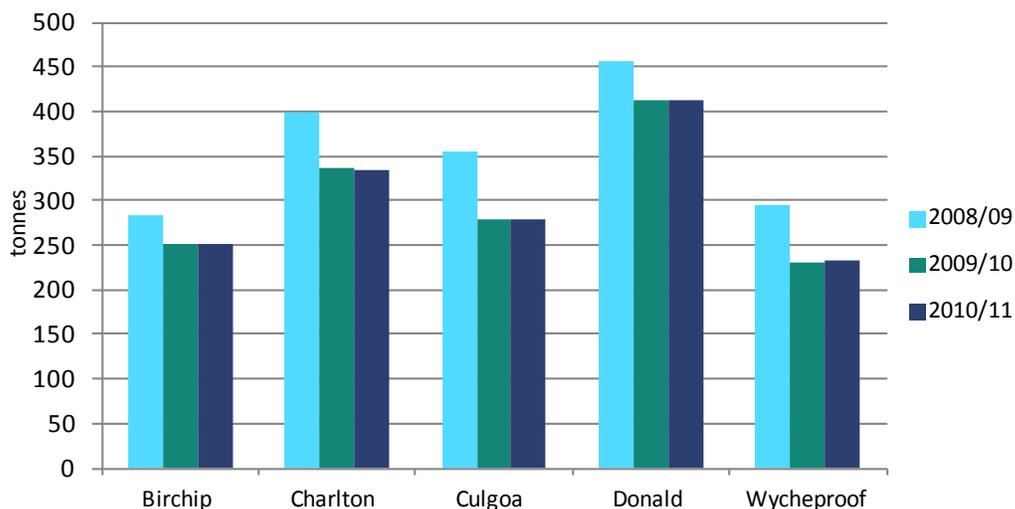
Additional material was deposited at the Shire’s facilities but diverted from landfill disposal (e.g. metals, garden organics), however tonnages for this material are not recorded.

Figure 4 shows a large increase in the total waste generated in 2010/11, however this includes the clean-up from the flood disaster experienced in the Shire in early 2011. This was an extraordinary event and is unlikely to indicate any underlying trend in waste generation.

Figure 4 shows that in 2008/09 and 2009/10, the total waste generated in the Shire remained relatively static, despite the decrease in garbage collected at kerbside in the same period (refer Figure 3). This indicates that the decrease shown in Figure 3 was largely a result of a differing mode of disposal (i.e. more waste disposed directly to landfill rather than via kerbside collections) rather than an underlying reduction in the amount of waste generated.

There has been little shift in location of waste landfilled. Figure 5 shows there has been little change in the amounts landfilled at the Shire’s five main landfills over the past three years. It is understood these figures exclude the extraordinary amount of waste generated from the 2011 flood clean-up.

Figure 5 Landfilled waste by location 2008/09 – 2010/11



Based on data from the Australian Bureau of Statistics (ABS 2011), the population of Buloke has remained relatively static over the past three years, with a current estimated population of 7,078. This indicates that each person in Buloke generates approximately 0.6 tonnes of waste and 0.1 tonnes of recyclables each year.

Sustainability Victoria collates data on waste and recyclables generation in each Victorian municipality each year. The most recent information publicly available relates to 2008/09 (Sustainability Victoria 2010), however Central Murray RWMG has more recent 2009/10 data. Buloke’s performance in 2009/10 has been compared to other municipalities in Table 2 below.

Table 2 Comparison of Buloke results 2009/10

<i>Parameter</i>	<i>Buloke</i>	<i>Central Murray RWMG average¹</i>	<i>Victorian non-metro municipalities</i>
Diversion rate	35%	34%	38%
Yield of household recyclables (kg/collection)	287	282	270
Yield of household garbage (kg/collection)	530	552	448

Source: Central Murray RWMG

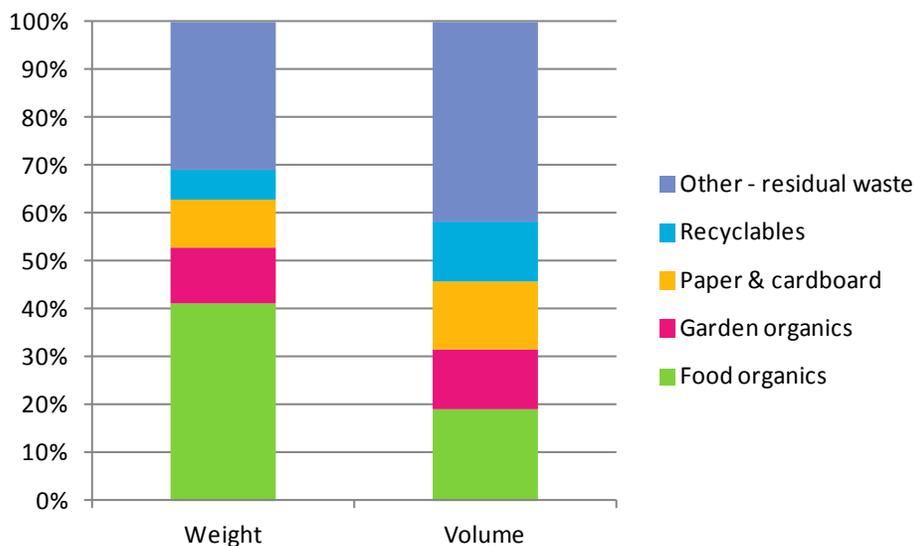
Notes: 1. Excludes Wakool (NSW)

Table 2 shows that while Buloke’s performance in recycling and diversion are in line with regional figures, there is room for significant improvement in comparison with other rural municipalities in Victoria.

Composition

The composition of waste in similar Victorian municipalities provides an indication of the likely characteristics of municipal waste in Buloke. Composition of MSW in the Goulburn Valley region is shown by both weight and volume in Figure 6.

Figure 6 Waste composition in Goulburn Valley region

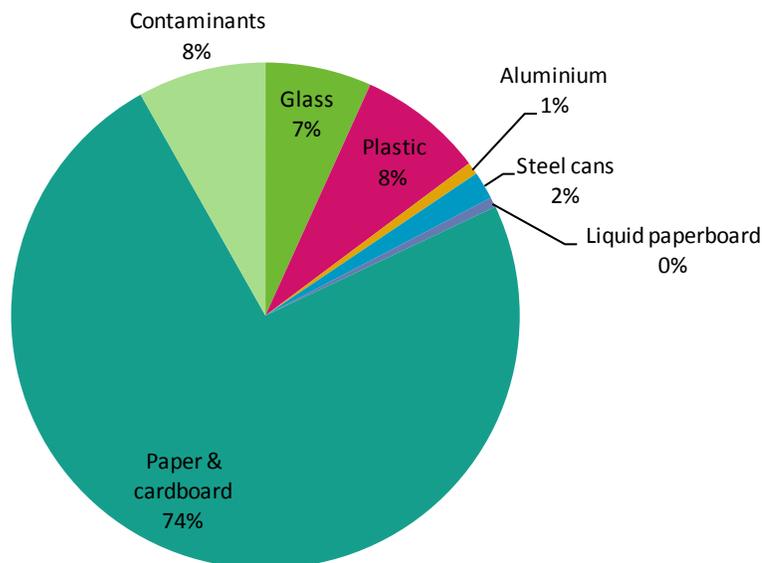


Source: Central Murray RWMG

Figure 6 shows that by weight food organics is the major constituent of MSW, however by volume residual waste is the most significant component.

Central Murray RWMG has undertaken a series of audits of recyclables generated in Buloke. The results of the June 2011 audit (shown in Figure 7 below) indicate a high recovery rate of paper and cardboard, but lower recovery rates for glass, plastic and other recyclables. The recovered material included 8% contamination, which was an increase on the 5% recorded in 2010.

Figure 7 Buloke recyclables audit June 2011



3.2 Infrastructure

The key characteristics of existing waste management facilities located in Buloke are described in Table 3 overleaf. There are some common characteristics across all or most of the facilities:

- all of the landfills in Buloke service populations of less than 5,000 and consequently are not required to be licensed by the EPA
- all facilities are staffed by council employees during opening hours
- domestic recyclables (i.e. paper and cardboard, milk/juice cartons, glass bottles and jars, plastics 1-7, aluminium and steel cans) are accepted at all facilities
- garden organic waste is accepted and diverted from landfill deposition at all facilities and is burnt on site
- metals and whitegoods are segregated at all facilities for recycling.

Common examples of waste management infrastructure in Buloke are shown in the following figures.

Figure 8 Birchip landfill - tipping face



Figure 9 Charlton landfill - cardboard recycling



Figure 10 Donald landfill – oil and whitegoods recycling



Table 3 Existing waste management facilities

<i>Location</i>	<i>Type</i>	<i>Estimated population catchment</i>	<i>Annual throughput (tonnes/year)</i>	<i>Estimated years of airspace available</i>	<i>Other</i>
Birchip	Landfill	950	250	> 50	Open for total of 16 hours on Monday, Wednesday, Friday and Sunday each week. Receives kerbside collected waste from Birchip and Watchem. Also accepts used oil, silage wrap and drumMuster for recycling. Plan to continue landfilling at site.
Charlton	Landfill	1,600	330	> 20	Open for total of 20 hours on Monday, Wednesday, Friday and Sunday each week. Receives kerbside collected waste from Charlton. Also accepts silage wrap and drumMuster for recycling. Plan to continue landfilling at site and also establish transfer station (subject to funding). Some rehabilitation has been undertaken.
Culgoa	Landfill	260	280	20	Open for total of 6 hours on Tuesday, Friday and Sunday each week. Also accepts drumMuster for recycling. Plan to continue landfilling at site.
Donald	Landfill	1,800	410	10-15	Open for total of 25 hours on Monday, Tuesday, Thursday, Friday and Sunday each week. Receives kerbside collected waste from Donald. Also accepts used oil and drumMuster for recycling. Plan to close landfill and establish as transfer station (subject to funding).
Nandaly	Landfill	60	N/A	5-10	Open for 1 hour every Thursday. Plan to close site. Rehabilitation has been undertaken as needed; little further work required.
Sea Lake	Transfer station	1,000	N/A	N/A	Open for total of 14 hours on Monday, Wednesday, Friday and Sunday each week. Accepts kerbside collected waste from Nandaly and Sea Lake. 2 x 35 m ³ skips cleared approx. fortnightly to Patho landfill. Also accepts used oil and drumMuster for recycling.
Watchem	Recycling centre	220	N/A	N/A	Open for 1 hour every Wednesday and Sunday.
Wycheproof	Landfill	1,030	230	> 5	Open for total of 14 hours on Monday, Wednesday, Friday and Sunday each week. Receives kerbside collected waste from Berrwilllock, Culgoa, Nullawil and Wycheproof. Also accepts drumMuster for recycling. Plan to close landfill and establish transfer station (subject to funding).

Note: N/A – not applicable

There is an additional landfill at Berriwillock that has been closed but is not yet fully rehabilitated; consequently council has an outstanding liability for further work to fully rehabilitate this landfill. This is currently planned for in the 2011/12 budget.

Inspections of most of the major facilities were carried out in conjunction with council staff in August 2011. Based on these inspections and comparison with industry best practice, some areas for potential improvement were noted as follows:

- **Site footprint:** The area utilised at some sites was quite large, with users being directed to areas at some distance from the gatehouse operator. A large site footprint can have a number of impacts arising from the reduced supervision possible from the gatehouse operator; this includes increased health and safety risks to users, potential for reduced segregation and increased contamination of recoverable resources, higher litter potential, lower site utilisation efficiency and increased management time and costs.
- **Tipping face:** At most of the Shire's landfills, users directly unload into the landfill cell (see Figure 7). Public access to the tipping face has high potential risk for the safety of users and their vehicles. Accidents that have occurred at similar sites in other council areas include users falling off trailers onto sharp objects, reversing trailers into the cell and becoming stuck, and cars (and passengers) falling over soft cell walls. Issues such as these have led to best practice trends which limit users' access to landfill tipping faces. At small landfills, this generally involves users depositing waste at an adjacent area some metres from the tipping face, with the waste subsequently moved to the cell by equipment such as a front-end loader when the waste is being covered.
- **Signage:** Many sites lacked clear signage directing users to different areas for deposition of material. At some sites, signage had not been moved when areas changed use; this could contribute to some confusion over where to deposit different materials (especially for new users of the site) and increase contamination. Clear and updated signage is particularly important when the site has a large footprint and users are required to visit different areas some distance apart for depositing different types of material.
- **Recycling:** Council staff reported the unwillingness of some users (particularly commercial generators of cardboard) to utilise the recycling bins available. This was a feature of the configuration of the paper and cardboard recycling bin (requiring horizontal loading, as shown in Figure 9), as well as the lack of signage and presentation of the infrastructure. Experience in other areas show that people respond more readily to recycling messages and use the relevant infrastructure when it is well-presented, well-maintained and easy to use. The existing bins are old and not in good condition, and provide little incentive for people to utilise them. It is understood that council have sought funding from Sustainability Victoria to replace them, but have been unsuccessful to date.
- **Garden organic waste:** Garden organic waste is segregated and burnt at all sites. Garden waste can often be contaminated with other matter, and this was evident at some sites. Burning of garden waste is not good utilisation of an organic resource, and risks can arise from burning of unknown contamination and sparks igniting adjacent material (the latter was experienced at one of the sites inspected).

- Litter:** Litter was more evident at some sites than others, and may be an issue of the timing of patrols by site staff. Increased patrols may be required at some sites. Litter at the Sea Lake transfer station may be a feature of its location: it is constructed on a raised platform surrounded by lower lying area and, without any shelter, is subject to the prevailing wind. Litter may be reduced by installing lids to the waste bins (the least cost option) or constructing a roofed shelter over the bin platform. The latter option would also have the benefit of providing all-weather access to users of the transfer station and reducing the ingress of water into the bins.

3.3 Charges

Charges for kerbside collection services are included in council rates, with an itemised garbage charge of \$233 per household currently applied each year.

Additional fees apply for self-hauled waste deposited directly by residents to Buloke waste management facilities. The fees that applied in 2010/11 are itemised in Table 4; these are reviewed on an annual basis.

Table 4 Waste disposal fees 2010/11

<i>Size/material</i>	<i>Fee</i>
Car boot load	\$4
120 L MGB	\$2
240 L MGB	\$4
6x4 Trailer, utility $\leq 1\text{m}^3$	\$15
Tandem trailer $\leq 2\text{m}^3$	\$30
General waste	\$15 per m^3
Commercial waste	\$11 per m^3
Construction/demolition waste	\$11 per m^3
Recyclables	Free
Televisions, computer monitors	\$5
Animal carcasses	\$2 - \$15 subject to size
Tyres	\$4 - \$136 subject to size

It is of interest that disposal fees are lower in Buloke than in surrounding councils, with some fees less than half of that charged in neighbouring municipalities. This may result in some residents from neighbouring municipalities using Buloke facilities, particularly in areas along council boundaries.

4. Management strategies

This section discusses potential options for improved management of waste and recyclables in Buloke Shire.

4.1 Minimisation

In the waste management hierarchy (refer Figure 2), waste challenges begin with avoiding and reducing the amount of waste generated. There are a number of areas that local government waste avoidance and minimisation programs can target to influence the behaviour of the community.

- **Advocacy:** Community members generally look first to their local council for information on waste and recycling. There is an opportunity for Buloke to include information on ways to avoid waste through changes in consumption and purchasing behaviours. This can also benefit local economies (e.g. consideration of ‘food miles’ encourages purchase of local produce). Achievements in reduction and recovery of waste could be communicated to the local community to raise awareness of waste issues and opportunities which the community can build on. Community education programs should also address the increasing costs for waste management as environmental management practices improve. This may include regular articles in local papers, engagement with local community groups and postings on council websites. Such activities should be undertaken in conjunction with the Central Murray RWMG in order to capitalise on existing programs and coordinate messages provided to the community.
- **Council leadership:** Councils have the opportunity to apply waste reduction to their own activities through initiatives such as:
 - benchmarking and improving existing internal recycling achievements and publishing the results
 - establishing an office compost bin or worm-farm for food waste generated by council staff
 - purchasing products in line with a green procurement system (e.g. through utilisation of guides such as ECO-buy)
 - where applicable (and in line with relevant specification standards), using recycled concrete, timber, mulched garden waste and other material on local council projects.

Council achievements in reduction and recovery of waste should be communicated to the local community to demonstrate the leadership of council and raise awareness of the opportunities for ratepayers (e.g. through regular articles in the local paper, on council website).

It is noted that some of the above activities have been implemented in Buloke, e.g. its achievements in green purchasing have been recognised through ECO-buy awards in 2009. However demonstration of leadership requires continual improvement and Buloke should endeavour to improve on past performance as a matter of course.

- **Charging mechanisms:** Waste management charges can be structured to make users aware of and accountable for the quantities of waste they dispose of. Systems can be structured so that payment is associated with collection frequency or volume. Typically user pays charges are applied to garbage only, in order to encourage recycling as well as waste avoidance.

A frequency-based charging system encourages service users to reduce the number of times bins are put out for collection. Generally a standard charge is established covering a set number of collections. Rebates are awarded to those who use the system less and, where applicable, higher charges may be applied to those using the system more. Bins need to be fitted with microchips that can identify bins and track collection dates and times.

Volume-based charging systems generally apply to the size of the waste bin supplied. Councils may supply a 120 L MGB as standard, and charge more for households wanting larger 240 L MGBs or charge less for those who opt for 80 L MGBs.

As both systems involve changes to the bins provided to residents, it can usually only be implemented in the middle of a contract period at some cost to council. Buloke should therefore only consider implementing these options at the end of the current contract period (June 2012 or two years later if the contract extension is implemented). When tenders are called for a new contract, Buloke could incorporate an option for a charging system to determine the cost considerations in implementation.

4.2 Community education

Community education is important to reduce waste generation, maximise diversion of recyclables and minimise contamination of segregated materials. Education programs to the local community should raise awareness of the role residents and businesses can play or provide information around preferred behaviours, with key messages around:

- consumption behaviours which reduce unnecessary purchases, packaging or waste products
- opportunities for reducing waste at home (e.g. through home composting, potential reuse of goods)
- ensuring residents have a sound knowledge of all of the types of materials that can and cannot be recycled through council collections (e.g. through permanent stickers on bin lids and/or annual reminders)
- addressing the manner in which recyclable materials are presented (such as no materials tied in plastic bags) and reducing contamination
- providing links to relevant information sources to local businesses (e.g. Sustainability Victoria, Central Murray RWMG)
- providing feedback to the community on the end-products and markets of materials recovered (to continue community commitment to recycling).

Waste education in Buloke is coordinated on a regional basis by Central Murray RWMG, and many of these messages are incorporated in existing regional education strategies. However consideration should be given to additional initiatives in Buloke in order to improve on its static waste performance and low benchmark compared to other non-metropolitan municipalities (refer Table 2). Potential actions in Buloke could include:

- identifying barriers and benefits to improved waste/recycling performance
- encouraging community ownership of the problem by inviting residents to participate in devising solutions
- involving community leaders or organisations who can give the program credibility
- seeking written commitments or pledges by residents and local businesses to modify their actions
- developing a graphic theme across waste/recycling messages that is specific to Buloke

- complement education with incentives and (where necessary) enforcement
- provide regular feedback to the community on how their changed behaviour is helping to tackle the issue.

The success of these education programs can be monitored through audits of the waste and recycling stream. This allows tracking of the diversion rate for particular materials and fine-tuning of the education programs to address any problem areas.

4.3 Collection and recovery

Collection systems

Studies such as Sustainability Victoria's local government data collection series from 2000/01 to 2008/09 have demonstrated that waste collection systems using smaller bins generate less waste and have greater diversion rates for recycling than those using larger garbage bins. It is believed that the lower capacity of waste bins provides impetus for residents to consider the impact of the waste they generate and more carefully separate recyclables.

There is potential for reducing the amount of waste collected for disposal by reducing the size of bins utilised by residents. This could involve offering 80 L MGBs as an option in line with a coordinated volume-based charging system (discussed in Section 4.1).

240 L MGBs are currently provided for recyclables; these should continue to be utilised for recycling in order to maximise the opportunity for diversion.

The potential for an organics collection system in Buloke is discussed below (see Organics).

All of the townships in Buloke receive a kerbside collection service. The service extends to some rural households along the main routes between the townships served but it currently does not extend to all households that have indicated interest in receiving it. Provision of a collection service to rural households (especially those off the main transport routes) can involve high transport costs for small amounts of waste; the costs of providing such services therefore need to be carefully considered. Buloke Council should consider surveying ratepayers in the areas not currently serviced (i.e. outside townships), asking householders to register their interest in receiving a collection service. More detailed analysis could then be carried out to explore the service costs and the extent of the community's willingness to pay for such a service, with the view of determining council's position prior to expiry of the current collection contract. If appropriate, new collection routes could then be incorporated in new contractual arrangements.

An annual collection of hard waste is provided in the townships of Buloke, although this did not take place in 2011 due to the flood. Data from previous hard waste collections is not available, and the experience in Buloke is unclear; further analysis is required in this area. Hard waste collections are usually valued highly by local communities, although councils face increasing risk due to occupational health and safety (OHS) issues and contractors' concerns over diminished revenue as kerbside scavenging increases.

WorkSafe Victoria is paying increased attention to hard waste collections in efforts to stamp out manual handling of waste. Some municipalities are responding to these issues by changing from an annual council-wide collection program to an 'at call' collection, whereby householders contact council and make a booking for hard waste to be collected as needed. Research by Zero Waste SA (2007) shows similar yields of material result from both at call and regular annual collections; collection arrangements and costs then determine the approach taken.

An alternative approach is to provide a free 'landfill pass' to households, mailed each year to residents with their rates notices. This substitutes for the annual collection and delivers a similar level of service to ratepayers, allowing for disposal of similar types of items without the potential liability issues and at reduced cost to councils. The main disadvantage to this approach is the issue of social equity: self-haul to a waste management facility is much more difficult for disabled and elderly people, or those who do not drive or have a trailer. In order to provide a balanced response, Buloke could consider a two-tier approach: providing a free 'landfill pass' to most residents, with an at call collection provided to socially disadvantaged people who meet criteria set by council.

Recyclable materials

The diversion results in Table 2 show there are significant volumes of potentially recyclable material (including domestic recyclables) that are not being recovered in Buloke. This indicates that maximum benefit is not being derived from the systems already in place in Buloke, and that further value could be extracted from the costs to council of providing recycling services.

Buloke should seek to optimise the use of the existing kerbside recycling service. This would involve a community awareness program to encourage householders to recycle and remind them of the range of materials that can be collected. This should not be a 'one-off', but entail recurring messages over a period of time. Collection data should be analysed on an on-going basis to identify any improvements and the results used to inform changes to the awareness program. As needed, sample waste/recyclable audits may be undertaken to assess diversion rates at the household level.

Businesses in Buloke generate significant quantities of cardboard packaging, as well as other recyclables such as glass, plastic and aluminium cans. While some businesses recycle this material at council's waste management facilities, anecdotal evidence from council staff suggests that a number (particularly large businesses) are unwilling to do so. It is believed their unwillingness relates to the time and lack of ease involved in depositing cardboard and other material in the existing recycling bins. Upgrading the bins and recycling infrastructure at council waste facilities to make it easier and more attractive to segregate material is likely to increase the diversion of cardboard and other recyclables from this sector.

Buloke Council recently received a funding grant of \$7,000 from Coca Cola, which, together with council funds of \$8,000, will be used to install public place recycling bins in the Shire's townships. Public place recycling allows householders to recycle away from home, and reinforces behaviours that contribute to successful kerbside recycling.

Organics

Garden and food organics represent a significant component of the domestic waste stream. Waste composition data from a neighbouring region (refer Figure 6) shows that organics can comprise around 50% by weight and 30% by volume of the total waste stream. Diverting this material from landfill can:

- reduce the demand for landfill airspace (thereby extending the life of existing landfills)
- decrease the potential for environmental impacts such as odour and groundwater contamination associated with leachate generation
- reduce the generation of greenhouse gas emissions such as methane (a greenhouse gas with around 21 times the global warming potential of carbon dioxide).

Currently there is provision for garden waste to be dropped off at Buloke's waste management facilities, where it is periodically burnt. Burning of garden waste used to be a management method widespread among Victorian rural councils, but over time increased regulatory pressure for improved environmental protection has seen this practice gradually cease. It is likely that Buloke will face increased pressure to stop burning garden waste in the future, and it is not seen as a viable long-term management method.

Establishment of kerbside collection systems for garden organics is becoming more widespread among Victorian councils, including the urban areas of regional municipalities. Organics collections may be either on a fortnightly, monthly or at call collection cycle, and may also be either funded by council or on a fee-for-service basis. However collection is feasible only where there are viable options for processing (such as composting) and markets for the end-products.

Options for organics collection were investigated on a regional basis by the Central Murray RWMG (2011a). It found there were opportunities in the southern areas of Buloke (combined with neighbouring councils) to establish a composting process for garden organics, and made additional recommendations as follows:

- to improve data collection on the quantities and content of organics
- to undertake community education programs to reduce the generation of food and garden organics
- to include food waste in organic collection services where these are introduced.

Buloke should liaise with Central Murray RWMG to plan for implementation of the report findings, with the longer term view of establishing a regional compost facility which services the southern part of the region (including southern Buloke). Any recovery system should be developed in line with Sustainability Victoria's *Guide to Best Practice for Organics Recovery* (Sustainability Victoria 2009a).

In the interim, there are opportunities for Buloke to shred garden waste received at municipal facilities and utilise the material in landfill rehabilitation. Processing costs could be minimised by undertaking this via a regional contract under the auspices of Central Murray RWMG and/or by utilisation of equipment owned by neighbouring councils (e.g. the shredder of Loddon Shire Council).

C&I and C&D waste

Figure 4 shows that C&I and C&D waste is a relatively small component of the total waste generated in Buloke in a normal year. This was not the case in 2010/11, when the flood clean-up resulted in relatively large amounts of waste from flooded businesses and demolished buildings being deposited direct to landfill with little diversion undertaken. While this is in part due to the overwhelming nature of the disaster, it may also indicate that recovery systems for C&I and C&D waste were not sufficiently robust to cope with the heightened recovery potential. Anecdotal evidence from some council staff suggests that many of the goods and materials that were deposited in landfill were readily reusable.

Agricultural activities represent the major component of the C&I sector in Buloke. Collection of agricultural chemical containers through the drumMuster program has been very successful to date, and the high demand should continue to be catered for.

Opportunities for additional recovery in the C&I sector are most likely to match those in demand in the domestic sector, i.e. recycling of paper/cardboard, milk/juice cartons, plastics 1-7, glass, aluminium and steel cans. Improvements to the recycling bins at Buloke waste management facilities are likely to assist in increased recovery from this sector. Consideration may also be given to extending kerbside recycling services to the 258 businesses currently serviced by council's kerbside waste service, i.e. provide a 240 L MGB fortnightly collection service for the same types of materials recovered from domestic householders.

C&D materials such as concrete, bricks and timber are segregated at most facilities but usually are generated in such small quantities that processing (e.g. crushing or mulching) is required only periodically.

4.4 Infrastructure

Industry trends

In recent years landfill environment protection measures have increased in line with our knowledge of landfill impacts. Improved engineering and management practices come at a cost and it is more efficient to provide such expensive infrastructure as a regional asset. Consequently there has been a trend of rationalisation of landfills, with closure of small landfills and replacement with transfer stations (or resource recovery centres as they are becoming known more widely as a result of their changing focus).

The potential legacy issues of old, generally unlined, landfills has also driven the move towards regional landfills. The lack of good recordkeeping in the past often means there is a lack of knowledge of the types of waste that may have been deposited in the landfill. Given that this may have included a range of hazardous wastes, and that the site's hydrogeological characteristics may see the impact of leachate on the surrounding environment for 100-200 years, the future need and cost of rehabilitation may be significant. The lack of full cost recovery included in landfill gate fees means that there may be a large gap in council resources for future rehabilitation, management and monitoring of closed landfills.

There is also an industry trend towards establishing advanced waste treatment technologies as an alternative to landfill disposal. This includes technologies such as gasification, pyrolysis, anaerobic digestion and other technologies which recover resources and generate energy from waste. However these technologies require large volumes of waste (generally involving annual throughputs in excess of 100,000 tonnes) to justify the large capital outlay involved (over \$30 million for most systems), and are not considered suitable for Buloke.

Operating standards

The EPA addresses improved requirements for landfill management in Victoria through its September 2010 publication number 788.1 *Best Practice Environmental Management: Siting, Design, Operation and Rehabilitation of Landfills* (referred to as the Landfill BPEM). While EPA works approval and licences are not required for landfills serving populations of less than 5,000 (as all of the current landfills in Buloke do), the Landfill BPEM sets out best practice for landfills in Victoria and is the standard that the local community could reasonably expect council to comply with. If any Buloke landfill impacts upon the surrounding environment such that it breaches the *Environment Protection Act 1970*, Buloke Council could expect to face prosecution regardless of the size of population the landfill serves. The size of the landfill or catchment population does therefore not exempt Buloke Council from establishing and maintaining best practice operational standards at Buloke landfills.

Landfills are also coming under increased scrutiny due to their role in generating greenhouse gas emissions. It is unlikely that any of the Buloke landfills will be captured under the provisions of the proposed carbon tax (which is expected in the first three years of the scheme to apply only to landfills generating more than 25,000 tonnes of CO₂e per year). However as the carbon tax is bedded down and potentially translates into carbon trading in future years, it is possible that further emphasis may be placed on accounting for and reporting on greenhouse emissions from all landfills. This would require Buloke to quantify the emissions via improved measurement and reporting systems.

Buloke Council should therefore consider benchmarking existing landfills against the Landfill BPEM, with the view of planning for infrastructure upgrades as necessary in the short, medium and long term. This would not be necessary for landfills which are intended for short term closure. Some areas for improvement to existing facilities have been identified in Section 3.2, however all Buloke facilities should be systematically assessed against guides such as EPA's Landfill BPEM and Sustainability Victoria's *Guide to Best Practice at Resource Recovery Centres* (Sustainability Victoria 2009b) to identify any shortfalls.

Recovery

Recovery infrastructure is an area requiring particular improvement at Buloke facilities. Buloke Council has identified opportunities for improvements to the recycling bins used for paper/cardboard and other domestic recyclables. An application was made in 2010 for funding assistance from Sustainability Victoria to upgrade the recycling bins, however the application was unsuccessful. It is anticipated that assistance will again be sought from Sustainability Victoria in the next funding round. Buloke should upgrade the recycling bins and areas for recovery at waste management facilities as a matter of priority. Failure to do so will impact on Buloke's ability to meet diversion and recycling targets, and utilise more costly landfill airspace.

Resale centres sell, often at a nominal fee, unwanted goods deposited at waste management facilities. There are regulations limiting resale of some items (such as electrical goods) but there is often a local demand for items such as furniture, timber, etc. Resale centres are generally placed adjacent to the gatehouse at landfills or transfer stations (where gatehouse operators can supervise) and require an undercover area to protect the items. Their commercial viability is generally dependent on low staff costs; consequently they are often established with the participation of a community organisation (such as “men’s shed” groups or organisations working with the disabled or socially disadvantaged). Buloke could consider establishing one or a number of resale centres where local community organisations are interested in participating. The cost of constructing the undercover area would need to be considered in the decision-making process. As an initial step, Buloke Council could call for registrations of interest from local organisations, with any subsequent steps dependent on the level of community interest shown.

Landfill closure planning

The Central Murray regional waste plan (Central Murray RWMG 2005) outlines a maximum regional travel time for urban communities of 40 minutes to a waste disposal facility, and equates this to a 40 km radius. The travel distance to existing waste management facilities in Buloke is generally lower than this, particularly in the southern part of the Shire, indicating there is some room for rationalisation of existing facilities.

There are a number of advantages of replacing landfill operations with resource recovery centres:

- reduced health and safety risks to users and staff
- reduced liability risk to council
- improved recovery opportunities
- reduced future landfill rehabilitation and monitoring costs
- provides higher level of service to local community
- less impact on surrounding environment
- improves amenity of adjacent sites.

Equally there are some disadvantages:

- requires capital outlay to construct facility
- brings forward requirement for closure and rehabilitation of landfill
- costs incurred for collection, transport and disposal of waste skips to landfill.

For the six operating landfills and one closed landfill in Buloke, the following infrastructure action plan in Table 5 is proposed.

Table 5 Proposed infrastructure action plan

<i>Year</i>	<i>Landfill</i>	<i>Comments</i>
Short term (up to 5 years)	Berriwillock	Landfill already closed; undertake rehabilitation 2011/12.
	Nandaly	2011/12 rehabilitate landfill; increase recycling bins in township.
	Wycheproof	Limit public access to the tipping face. 2013/14 commence development of RRC for operation in 2014/15. Waste from skips deposited to Birchip or Charlton landfill. Rehabilitate landfill in 2014/15.
	Culgoa	2013/14 commence development of RRC for operation in 2014/15. Waste from skips deposited to Birchip landfill. Rehabilitate landfill in 2014/15.
Medium term (5-10 years)	Donald	Upgrade as required to continue landfill operations in the medium term. Limit public access to the tipping face. 2021 commence development of RRC, rehabilitate landfill.
	Charlton	Upgrade as required to continue landfill operations in the long term. Limit public access to the tipping face.
	Birchip	Limit public access to the tipping face. Upgrade as required to continue landfill operations at Birchip in the long term. Establish RRC near gatehouse to reduce operating footprint

It is noted that the current facility operating manuals date from 2008. Since that time the EPA has revised the Landfill BPEM (in 2010) and Sustainability Victoria has released updated best practice guides for resource recovery centres and organics recovery (in 2009). Buloke Council should consider updating the staff operating manuals, with a view towards updates at least every two years or whenever relevant best practice standards or WorkSafe Victoria OHS requirements are amended.

Consideration should also be given to reviewing the level of fees charged for disposal at council waste management facilities. As noted earlier, the current disposal fees are lower than surrounding municipalities indicating there is some room for upward movement. The current fees do not incorporate the total cost of landfilling operations, and substantial increases would be required for full cost recovery. While it is unlikely to be politically acceptable to move to full cost recovery in the short to medium term, additional funds will be required to implement increasing community expectations around recycling and waste management behaviours. The cost of implementation is more equitably applied on a 'user pays' basis, with increases borne to a greater degree by waste facility users than other ratepayers. The pricing differential for recycling instead of disposal should be maintained, with free or nominal fees providing a financial incentive for recycling.

4.5 Monitoring and review

Monitoring and review of the waste management strategy is important. This strategy should be updated and improved as actions are implemented and new initiatives arise. The waste management strategy should be reviewed annually, and should have a life of no more than three years before actions incorporated into it are updated as necessary.

Key performance indicators (KPIs) and measurable targets should be used to assess annual performance. Relevant data are already collected and provided to Sustainability Victoria for the annual municipal survey of kerbside waste management services (refer Table 2). Buloke Council should review and report on these KPIs annually.

5. Assessment of options

A number of recommendations were incorporated in the discussion in Section 4. This chapter assesses these recommendations using a ‘triple bottom line’ (TBL) approach that analyses the environmental, social and economic impacts.

5.1 Assessment criteria

The following issues were considered (where appropriate) in assessing the environmental, social and economic impact of options:

- Environmental:
 - waste and litter reduction (including avoidance and minimisation)
 - resource recovery
 - contamination of recovered resources
 - resource consumption in strategy implementation
 - impact on surrounding environment.
- Social:
 - level of service to the community (including equity of access)
 - impact on amenity
 - awareness and compliance with waste management systems and policies
 - health and safety.
- Economic:
 - cost of implementation and operation.

5.2 Triple bottom line assessment

Recommendations included in the previous chapter are considered against the above environmental, social and economic criteria in Table 6 overleaf. Costs have been estimated on the basis of information provided by council on current costs together with industry estimates. The likely outcomes have been considered holistically on a positive or negative benefit basis.

Note that different weighting can be attributed to the assessment criteria and substantially affect the outcome. For the purposes of this assessment, no weighting has been applied.

Table 6 Triple bottom line assessment of recommendations

Activity	Environmental impacts	Social impacts	Estimated costs¹	Assessment
MINIMISATION				
Council advocacy	Potential for reduced waste generation & increased recovery	Establishes preferred behaviours	Staff & advertising costs - low	Positive
Council leadership	Potential for reduced waste generation & increased recovery	Establishes preferred behaviours	Staff & advertising costs - low	Positive
Frequency/volume based charging	Potential for reduced waste generation & increased recovery	Service targeted to community demand	Financial incentives, cost subject to future analysis	Uncertain; subject to future cost analysis
EDUCATION				
Awareness & education program	Potential for reduced waste generation & increased recovery Reduced consumption of resources	Establishes preferred behaviours Improved health & safety outcomes Improved policy/regulatory compliance	Costs uncertain – subject to scope of advertising & involvement of Central Murray RWMG	Uncertain; subject to breadth of program. Delivery within structured budget will provide positive benefit.
Waste/recycling audits	Potential for reduced waste generation, increased recovery & reduced consumption of resources	Benchmark existing behaviours Potential for improved health & safety outcomes	Audit cost ~ \$5,000 each – subject to involvement of Central Murray RWMG	Cost outweighed by potential benefits
COLLECTION & RECOVERY				
Offer option of 80 L MGBs	Additional resource consumption & greenhouse emissions from delivery of new bins Resource savings from reduced waste generation	Improved level of service & equipment to community	Cost subject to numbers & tender arrangements Cost of new bins partly off-set by lower disposal costs	Uncertain; subject to future cost analysis
Registration of interest – rural collections	Minimal in first instance. If implemented, increased energy consumption & generation of greenhouse emissions by council (offsets current community consumption & emissions)	Increased level of service to community, improved equity to rural households.	Staff costs and advertising – low. Additional costs subject to level of interest shown.	Uncertain; subject to future cost analysis
Landfill pass to replace hard waste collections	Increased transport emissions Potential for reduced waste generation	Improved health & safety outcomes Disabled/elderly equity issues	Cost savings equivalent to contractor costs	Positive, subject to addressing community equity

Activity	Environmental impacts	Social impacts	Estimated costs¹	Assessment
	Less diversion if council infrastructure not updated			issues
Recycling bins at landfills	Improved resource recovery Decreased waste & litter generation Reduced impact on environment	Improved level of service to community Improved health & safety	Council estimate ~\$15,000 each site. Reduced cost if funding grant obtained.	Positive
Shred (not burn) garden organics	Reduced greenhouse emissions Reduced risk of fire	Improved amenity, air quality Improved health & safety Improved compliance	Uncertain, subject to seasonal amount of waste generated & regional demand for combined service	May be medium-high costs; outweighed by risks of non-compliance
Organic collections, regional compost facility	Improved resource recovery Reduced greenhouse emissions Products conserve water use & aid landscape vegetation & rehabilitation	Improved level of service to community Improved health & safety Regional economic development	Uncertain, subject to participation of neighbouring councils, volume of feedstock, technology used & demand for end-products. Operating costs potentially high.	Uncertain, subject to involvement of other council/s & stakeholders
Recycling services to C&I sector	Improved resource recovery Decreased waste & litter generation Reduced impact on environment	Improved level of service to community Improved health & safety	Council estimate ~\$15,000 each site. Reduced cost if funding grant obtained.	Positive
INFRASTRUCTURE				
Benchmark against best practice	Minimal	Improved regulatory compliance Improved health & safety	Staff costs – low/medium	Positive
Improve signage, recycling bins, litter control	Improved resource recovery Decreased waste & litter generation Reduced impact on environment	Improved amenity Improved health & safety	Signage costs ~\$500-1,000 each site Cost of litter patrols included in current staff costs Cost of recycling bins – as above	Positive
Skip lids at Sea Lake transfer station	Reduction in litter Reduction in leachate & impact on groundwater/surface water Reduced impact on neighbouring livestock	Improved amenity for neighbouring sites	Cost subject to purchase/lease arrangements with contractor. Lid purchase ~\$2,000-5,000 subject to size	Positive
Limit access to tipping face	Reduction in litter generation	Improved health & safety Improved amenity Reduced council liability risk Improved regulatory compliance	Additional staff & equipment time in pushing waste into cell; approx. \$150/hour	Positive

Activity	Environmental impacts	Social impacts	Estimated costs¹	Assessment
Registration of interest – resale centres	Increased diversion through repair/reuse activities Reduced use of landfill airspace	Potential employment opportunities for socially disadvantaged Improved level of service to community	Staff costs and advertising – low. Additional costs subject to level of interest shown. Shed construction ~ \$20,000 each. Some income from sale of goods – low.	Uncertain, subject to level of interest shown
Nandaly – rehabilitate landfill & increase recycling bins	Reduced impact on surrounding environment Improved resource recovery	Improved service to community Improved amenity Reduced health & safety risks	Rehabilitation ~\$60,000 Additional bins ~\$1,000	Positive, subject to funding
Wycheproof – rehabilitate landfill & establish RRC	Reduced impact on surrounding environment Improved resource recovery	Improved service to community Improved amenity Reduced health & safety risks	Rehabilitation ~\$100,000 RRC construction ~\$200,000	Positive, subject to funding
Culgoa – rehabilitate landfill & establish RRC	Reduced impact on surrounding environment Improved resource recovery	Improved service to community Improved amenity Reduced health & safety risks	Rehabilitation ~\$60,000 RRC construction ~\$100,000	Positive, subject to funding
Donald – upgrade landfill in short term, rehabilitate landfill & establish RRC in medium term	Reduced impact on surrounding environment Improved resource recovery	Improved service to community Improved amenity Reduced health & safety risks	Upgrade ~\$30,000 Rehabilitation ~\$100,000 RRC construction ~\$300,000	Positive, subject to funding
Charlton – upgrade landfill	Reduced impact on surrounding environment Improved resource recovery	Improved service to community Improved amenity Reduced health & safety risks	Upgrade ~\$30,000	Positive, subject to funding
Birchip – upgrade landfill & establish RRC	Reduced impact on surrounding environment Improved resource recovery	Improved service to community Improved amenity Reduced health & safety risks	Upgrade ~\$30,000 RRC construction ~\$300,000	Positive, subject to funding
Berriwillock – rehabilitate landfill	Reduces impact on surrounding environment (including air quality, groundwater/surface water contamination, greenhouse emissions)	Improved amenity to community Compliance with environmental regulations	Approx. \$55,000	Positive; cost of regulatory non-compliance outweighs cost of rehabilitation
Update facility operating manuals	Minimal	Improved health & safety outcomes Improved compliance with regulations & policies	Staff costs - low	Positive

Activity	Environmental impacts	Social impacts	Estimated costs¹	Assessment
Increase disposal fees	Increased incentive to recycle	Improved cost equity on 'user pays' basis	Low cost to implement Improved return on community assets	Subject to political acceptance by community
MONITORING				
Review waste strategy annually & update in 3 years	Minimal	Potential for regular input increases community service & involvement Improves transparency & accountability	Staff costs low for annual review, increasing to low/medium for 3 year update	Positive
Measure & report on KPIs	Minimal	Improves transparency & accountability to community & other government organisations	Staff costs – low	Positive

Note: 1. All estimates are approximate. Rehabilitation costs as estimated by council.

6. Future directions

Current situation

The majority of Buloke residents are currently provided with kerbside collection services for waste (weekly) and recyclables (fortnightly). This service covers all of the townships within Buloke and some (though not all) rural households along collection routes between the townships.

Buloke is also serviced by a network of five landfills (at Birchip, Charlton, Culgoa, Donald and Nandaly), one transfer station (at Sea Lake) and a recycling centre at Watchem. This provides a high level of service to the community, with a facility within approximately 30 minutes travel time of most Buloke households.

Recent progress in diverting recyclables from the waste stream appears to have become static, with room for improvement in the recovery rate of recyclables. It would appear that maximum benefit is not being derived from the systems already in place in Buloke, and that further value could be extracted from the costs to council of providing recycling services.

Future vision

The waste management vision for Buloke Shire Council is to help deliver a sustainable community in Buloke through strategies which minimise waste and optimise resource recovery. By 2030 the goal is for Buloke to be more efficient in materials use, have reduced waste generation and to reuse, recover and/or recycle the majority of the waste it produces.

Recommendations have been developed to assist in achievement of this goal and are outlined in the proposed implementation plan on a short (0-5 years), medium (5-10 years) and long-term (>10 years) timeframe.

Table 7 Proposed implementation plan

<i>Activity</i>	<i>Implementation timetable</i>		
	<i>0-5 years</i>	<i>5-10 years</i>	<i>> 10 years</i>
MINIMISATION			
Council advocacy			
Council leadership			
Investigate frequency and/or volume based charging			
EDUCATION			
Awareness & education program			
Waste/recycling audits			
COLLECTION & RECOVERY			
Explore optional use of 80 L MGBs as part of volume-based charging system			
Call for registrations of interest in collections from rural households not current serviced			
Provide one free 'landfill pass' to replace annual hard			

Activity	Implementation timetable		
	0-5 years	5-10 years	> 10 years
waste collections			
Upgrade recycling bins at landfills			
Shred (not burn) garden organics dropped off at existing facilities			
Explore potential for organic waste collections & establishment of regional compost facility in southern Buloke with neighbouring councils			
Improve recycling services to C&I sector			
INFRASTRUCTURE			
Benchmark landfills & transfer station against best practice			
Improve signage, recycling bins, litter control at existing facilities			
Install lids to skips at Sea Lake transfer station			
Limit access to tipping face at existing landfills			
Call for community registrations of interest in establishment and/or operation of resale centres			
Nandaly – rehabilitate landfill & increase recycling bins in township			
Wycheproof – rehabilitate landfill & establish RRC			
Culgoa – rehabilitate landfill & establish RRC			
Donald – upgrade landfill in short term, rehabilitate landfill & establish RRC in medium term			
Charlton – upgrade landfill			
Birchip – upgrade landfill & establish RRC			
Berriwillock – rehabilitate landfill			
Update facility operating manuals for landfills & transfer station			
Increase disposal fees for self-haul waste			
MONITORING			
Review waste strategy annually & update in 3 years			
Measure & report on KPIs			

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