

Swan Hill Waste Management Strategy 2015-2020

Final report

prepared for
Swan Hill Rural City Council

September 2015





Swan Hill Waste Management Strategy 2015-2020

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September 2015**

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Abbreviations

ABS	Australian Bureau of Statistics
BAU	Business as usual
BPEM	Best practice environmental management
C&D	Construction and demolition
C&I	Commercial and industrial
EPA	Environment Protection Authority
DELWP	Department of Environment, Land, Water and Planning
DTPLI	Department of Transport, Planning and Local Infrastructure
hh	household
L	litres
MRF	Materials recovery facility
MSW	Municipal solid waste
RWMG	Regional Waste Management Group
RWRRIP	Regional Waste and Resource Recovery Implementation Plan
SHRCC	Swan Hill Rural City Council
SWOT	Strengths, weaknesses, opportunities, threats
SWRRIP	Statewide Waste and Resource Recovery Infrastructure Plan
WRRG	Waste and Resource Recovery Group

Summary

Waste management is a core element of Swan Hill Rural City Council’s services and providing the means for an effective service that meets ratepayer’s needs is important in maintaining a high level of community satisfaction. Waste management provides an important avenue for Swan Hill Rural City Council (SHRCC) to achieve environmental benefits through services that encourage good waste and recycling practices and contribute to SHRCC’s commitment to the development of a sustainable community.

The draft *Swan Hill Waste Management Strategy 2015-2020* has been developed in the context of regional, state and Commonwealth policies and regulations, with the objective of:

- minimising the amount of waste generated
- maximising opportunities for reuse and recycling of materials
- decreasing the impact of waste on the community and natural environment
- encouraging sustainable solutions to waste management.

Current services

SHRCC provides kerbside waste and recycling collection services to around 8,316 households throughout the municipality (or around 99% of households). It also provides an optional kerbside garden organics collection service to 609 households in Swan Hill. In 2013/14 approximately 4,750 tonnes of garbage, 1,840 tonnes of recyclables and 210 tonnes of garden organic waste were collected through kerbside services. Additional amounts of waste and recycling are deposited at SHRCC’s waste facilities.

It is estimated that in 2013/14 each person in the municipality generated around 330 kg of waste and 70 kg of recycling (or total generation of 400 kg/person/year or 1 tonne/household/year). Total generation in recent years is shown in Figure ES1.

Figure ES1 Total waste generation 2010/11 – 2013/14

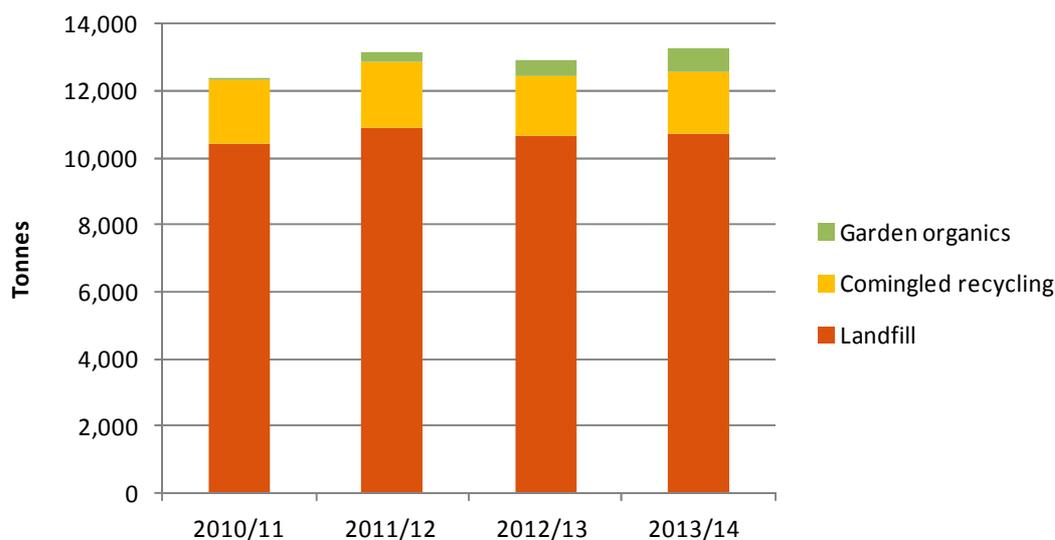
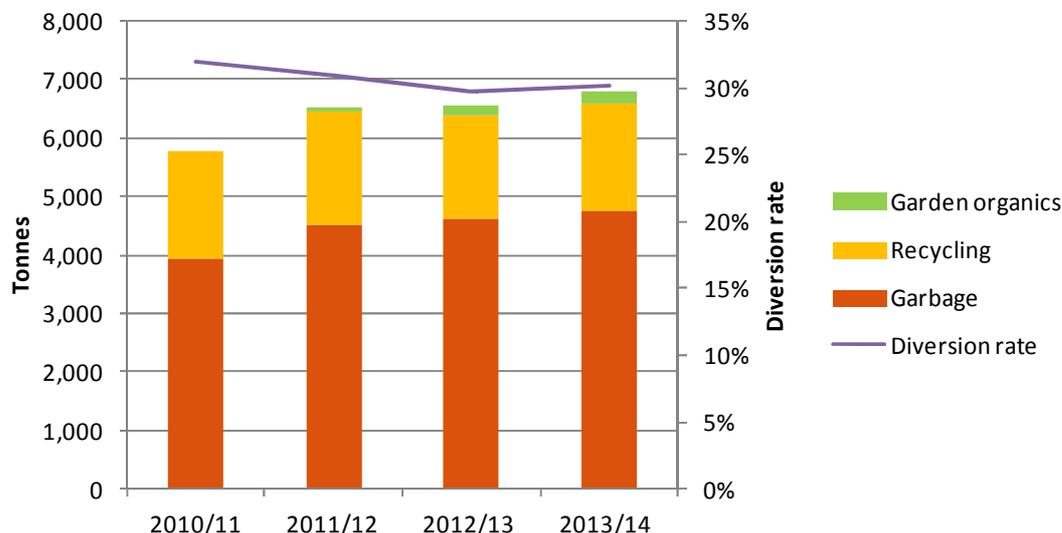


Figure ES1 shows that total waste generated in the municipality has remained relatively static and, if anything, has risen slightly in more recent years. This is in line with the recycling diversion rate which has declined to 30% in 2013/14 from 32% in 2010/11 (refer to Figure ES2).

Figure ES2 Kerbside collection services' performance 2010/11 – 2013/14



Recent audits show that kerbside recycling is also heavily contaminated with waste. Contaminant levels are around 20% (which is much higher than the recycling industry's generally accepted standard of around 5%). Unless significant improvement is made, this level of contamination may jeopardise acceptance of the material for reprocessing.

Most of the community is within a 30 minute travel time to a waste management facility. Residents and businesses in the municipality are serviced by a network of two landfills (at Swan Hill and Robinvale), three transfer stations (at Manangatang, Piangil and Ultima) and a materials recovery facility (at Swan Hill). A major redevelopment of the Swan Hill landfill (including establishment of a transfer station) is currently underway; this may include consolidating the materials recovery facility operations at the landfill site. Some minor upgrades of the other sites would be required to meet best practice standards and council should refer to Sustainability Victoria's *Guide to Best Practice at Resource Recovery Centres* (Sustainability Victoria 2009) for guidance on best practice design, management and operation benchmarks. Swan Hill also has a number of former landfill sites that have been converted to transfer stations and require or are undergoing rehabilitation (summarised in Table ES1).

Table ES1 Status of former landfill sites

Former landfills	Status
Boundary Bend – operating unlicensed landfill	Closed, to be rehabilitated
Chinkapook – closed, undergoing rehabilitation	Closed, rehabilitated
Manangatang – closed, transfer station	Transfer station, to be rehabilitated
Piangil – closed, undergoing rehabilitation	Transfer station, to be rehabilitated
Ultima – closed, transfer station	Transfer station, to be rehabilitated

Future directions

SHRCC has an opportunity to improve the environmental, social and financial outcomes of managing waste. Key opportunities in the areas of waste minimisation, community education, collection and

recovery systems, engagement with the business sector, waste and recycling infrastructure, and monitoring and reporting have been identified. Recommendations are summarised and a plan for implementation included in Table ES2.

Table ES2 Recommendations & implementation plan

Action	Timetable		
	2015-17	2017-20	> 2020
Waste minimisation			
Provide leadership in waste minimisation & recovery achievements			
Council advocacy in the community			
Examine potential financial incentives for waste minimisation			
Community education			
Raise community awareness through education programs (in conjunction with Loddon Mallee WRRG)			
Collection & recovery			
Assess potential for expansion of collection services to rural households			
Assess feasibility of option for 80L and/or standard 120L garbage bin system			
Undertake regular waste and recycling audits			
Assess interest in & feasibility of providing kerbside comingled recycling collection services to small businesses			
Develop action program to reduce recycling contamination			
Investigate Robinvale recycling contamination and carry out targeted communications			
Increase take-up of garden organics collection services by Swan Hill residents through promotion activities			
Assess feasibility of expanding garden organics collection services in other townships			
Examine potential to add food organics to garden organics collection			
Establish composting system capable of processing garden & food organics			
Identify recycling options for agricultural plastics			
Identify opportunities to participate in product stewardship initiatives as they are implemented			
C&I sector			
Establish local business education programs			
Encourage contractor to expand cardboard & plastic recycling			
Monitor NSW landfill levies & consider impacts on SHRCC landfills			
Identify C&I organics diversion opportunities			
Investigate cross municipal movement of waste			
Infrastructure			
Benchmark landfills to best practice standards & manage accordingly			
Monitor landfill throughput & remaining airspace to plan for new cells			
Develop proposed Swan Hill transfer station & implement best practice standards			

Action	Timetable		
	2015-17	2017-20	> 2020
Carry out landfill gas emission monitoring from Swan Hill landfill			
Assess future operation of Robinvale landfill			
Upgrade resource recovery systems at Robinvale landfill			
Upgrade Manangatang transfer station to meet best practice			
Upgrade Piangil transfer station to meet best practice			
Upgrade Ultima transfer station to meet best practice			
Review patronage and coverage of landfill and transfer station network			
Review facility management contracts			
Research cost-benefit of bringing waste management services in-house			
Rehabilitate, monitor and manage closed landfill sites			
Research and negotiate for alternative nightsoil management			
Research and negotiate an alternative management option for nightsoil waste and close nightsoil depots			
Review current landfill and transfer station disposal fees			
Build and maintain a relationship with the planning section of council			
Investigate funding opportunities to incorporate MRF facility at Swan Hill landfill			
Monitoring and reporting			
Upgrade recycling data recording systems			
Monitor traffic movements at transfer stations			
Review and update waste strategy as required			
Monitor financial and carbon emission issues			

Following review of these recommendations, SHRCC has developed a detailed management action plan (provided as an appendix to this report).

1. Introduction

The *Swan Hill Waste Management Strategy 2015-2020* has been developed to provide a strategy for sustainable solutions for the management of waste generated in the Swan Hill municipality over the next 5 years. The strategy builds on the principles of Swan Hill Rural City Council's commitment to contribute to... *"good environmental outcomes for the natural environment. We recognise community wellbeing is linked to a healthy, sustainable natural environment. We will reduce any detrimental impact our works and services have on the natural environment and encourage others to do the same"* (Swan Hill Rural City Council Plan 2013-2017, Swan Hill Rural City Council 2013).

Swan Hill Rural City Council (SHRCC) manages a wide range of waste and recycling facilities and services on behalf of the community. The municipality encompasses an area of approximately 6,116 km² and 15 townships. The council shares borders with five other councils in north-west Victoria and south-west New South Wales.

In accordance with SHRCC principles, this strategy aims to:

- minimise the amount of waste generated
- maximise opportunities for reuse and recycling of materials
- decrease the impact of waste on the community and natural environment
- encourage sustainable solutions to waste management.

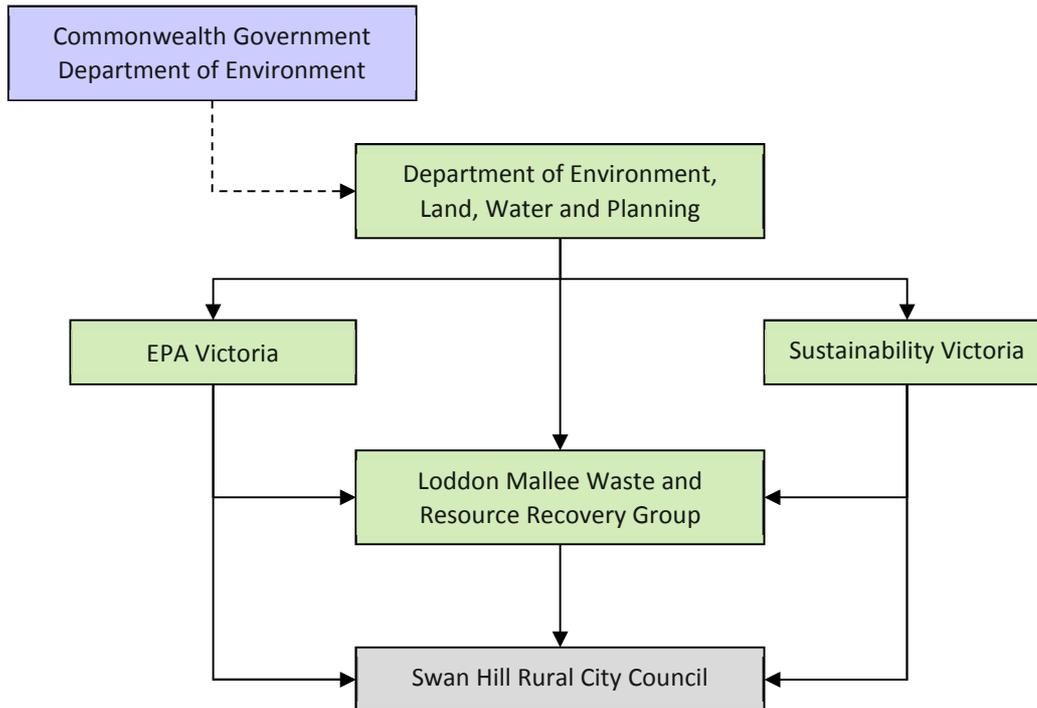
The strategy was developed on the basis of:

- consultation with council staff and regional waste management group
- review and analysis of strategic context
- assessment of waste management and resource recovery facilities in the municipality
- analysis of waste and recycling data and trends
- environmental, social and economic assessment of options for future services for waste and recycling services
- recommendations on optimum strategic directions.

2. Strategic context

SHRCC acts within a wider policy framework for waste management and there is a range of policy and planning documents that need to be considered in development of the Swan Hill waste strategy. This section discusses key policies and legislation relevant to Swan Hill. Figure 1 provides an overview of the organisational framework for SHRCC within the Victorian and Australian context.

Figure 1: Organisational framework



2.1 Commonwealth Government

The *National Waste Policy: Less Waste, More Resources* was released by the Commonwealth Government in 2009. The policy established a national framework on waste based on the following principles:

- 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 Commonwealth Government also established National Environment Protection Measures (NEPMs); these set the basis for agreed national objectives for protecting or managing aspects of the environment (and are enforced through state legislation). Waste-related NEPMs currently in place address used packaging materials and the movement of hazardous waste between states/territories.

National product stewardship arrangements (between government and industry) are also in place for televisions/computers and end-of-life tyres, with future arrangements likely to be established to cover additional waste materials.

2.2 Victorian Government

The *Environment Protection Act 1970* is the key legislative mechanism for environmental protection in Victoria. Among other things, it provides for the development of regional waste plans, the establishment of landfill levies and industrial waste policies, as well as supporting regulations for waste and recycling facilities (such as the siting, operation and closure practices for landfills and compost facilities).

The Environment Protection Authority (EPA) has responsibility for enforcement of the *Environment Protection Act 1970*, while Sustainability Victoria has responsibility for implementing Victorian Government policies on resource recovery and waste management.

Sustainability Victoria has developed the *Statewide Waste and Resource Recovery Infrastructure Plan 2013-2043* (SWRRIP). The SWRRIP (Sustainability Victoria 2015) aims to guide future planning, decision-making and investment in waste management and resource recovery infrastructure in Victoria through the sharing of data and information. The SWRRIP will inform the future development of the Loddon Mallee Regional Waste and Resource Recovery Implementation Plan which will have flow-on implications for Swan Hill.

Sustainability Victoria has also developed a range of other strategies, including the *Draft Victorian Organics Resource Recovery Strategy* (Sustainability Victoria 2014) which identifies actions to improve management of organic waste.

2.3 Local and regional initiatives

Together with seven other Victorian councils (Buloke, Gannawarra, Greater Bendigo, Loddon, Macedon Ranges, Mildura and Mount Alexander) and one NSW council (Wakool), Swan Hill is a member of the Loddon Mallee Waste and Resource Recovery Group (Loddon Mallee WRRG). The group was formed in 2014 and incorporates the former Central Murray Regional Waste Management Group (of which Swan Hill was also a member), together with additional members.

The Loddon Mallee WRRG is responsible for developing a Regional Waste and Resource Recovery Infrastructure Plan (RWRRIP); this is expected to be drafted in late 2015. Until that time, the Central Murray Regional Waste Management Plan (Central Murray RWMG 2005) remains the most recent regional framework document relevant to Swan Hill. This regional plan outlined various targets and strategies for Swan Hill, both individually and regionally.

Many of these targets were incorporated into the *Swan Hill Rural City Council Waste Management Strategy 2007-2012*, which this current waste management strategy will replace.

3. Current situation

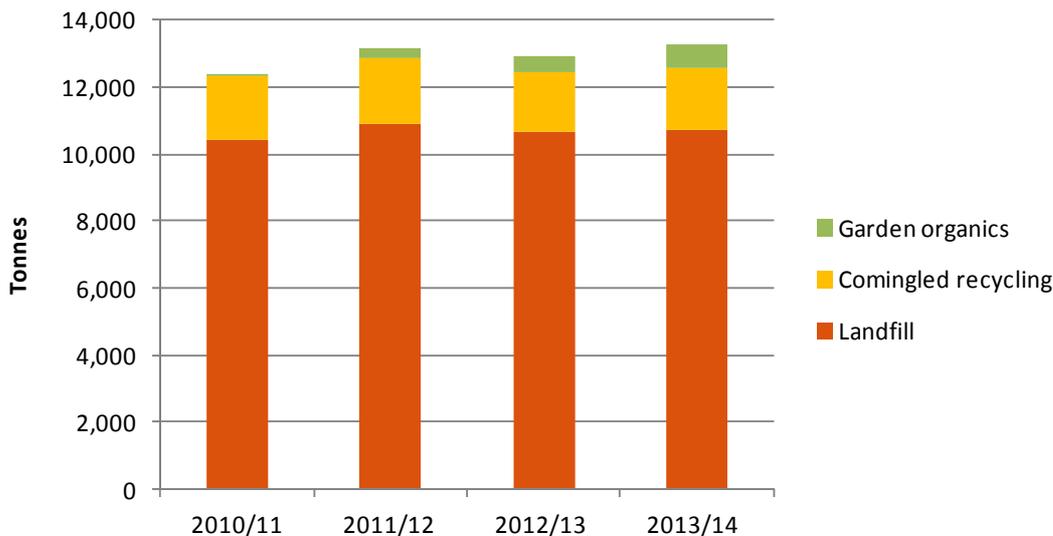
This section examines the current status of waste management within the SHRCC municipality, including waste generation, collection services and infrastructure available for waste management and resource recovery.

3.1 Waste generation

A range of municipal solid waste (MSW), commercial and industrial (C&I) waste and construction and demolition (C&D) waste is generated in the municipality. It is understood that some C&I waste is transported by private contractors (which council has no control over) across the municipality (e.g. for disposal within the region) although no data on the quantity, source or disposal point is held.

Based on SHRCC data that is available, the total amount of waste and recovered material generated in the municipality over the past four years has been estimated in Figure 2. This data shows generation has remained at relatively stable levels for the past four financial years (ranging from around 12,380 tonnes in 2010/11 to 13,240 tonnes in 2013/14).

Figure 2: Total generation of waste and recycling in SHRCC - 2010/11 to 2013/14



Note there are some issues affecting the accuracy and completeness of this data:

- Figures for waste quantities accepted at Robinvale landfill prior to 2011/12 (when a weighbridge was installed) are considered unreliable as no weights were recorded
- Additional recyclables and materials are diverted at all transfer stations and landfills in Swan Hill, however data on the quantity recovered is not available
- 2010/11 data does not include waste deposited at Boundary Bend, Manangatang, Piangil and Ultima Landfills which were operational until April 2011 (they subsequently changed to transfer stations, at which time waste volumes were included in Swan Hill and Robinvale landfill data)
- Figure 2 excludes any waste generated in the municipality but disposed of outside the municipality (e.g. to landfills in neighbouring councils).

Based on data from the Australian Bureau of Statistics (ABS 2013) in 2015 the population in the municipality was estimated to be 20,867 (in around 8,316 households). In the same year, around 6,960 tonnes of waste was deposited in SHRCC landfills and 1,460 tonnes recycled through kerbside collections. This indicates an annual generation rate of around 330 kg of waste and 70 kg of recycling per person (approximately 400 kg/person/year or 1 tonne/household/year in total).

3.2 Collection services

Services

SHRCC provides a range of kerbside collection services as outlined below. All of these services are carried out by a contractor (currently Ellwaste) under arrangements which expire in 2017 (with an option to extend to 2020).

- Garbage:** Collections of kerbside garbage are provided for 3,523 households in Swan Hill, 849 households in Robinvale and a further 2,000 households in rural towns. 1,935 households in units/flats above commercial premises are also provided with a garbage collection service (8,316 services in total). Collections are made on a weekly basis from 120 L or 240 L bins.

In 2013/14 the garbage collection service collected approximately 4,750 tonnes or around 571 kg per household.
- Comingled recyclables:** Collections of comingled recyclables are provided for 3,523 households in Swan Hill, 849 households in Robinvale and a further 2,000 households in rural towns. 1,935 households in units/flats above commercial premises are also provided with a garbage collection service (8,316 services in total). Collections are made on a fortnightly basis from 240 L bins and accept paper, cardboard, glass bottles and jars, milk and juice (liquid paperboard) cartons, plastic containers (types 1-7), aluminium foil, cans and aerosols and steel cans.

In 2013/14 the service collected approximately 1,840 tonnes or around 222 kg per household.
- Garden organics:** This is an optional kerbside service provided only to households in Swan Hill (on a fee-for-service basis). The number of participating households has risen steadily since the introduction of the service in January 2012; by March 2015 around 609 households had signed up for the service. Collections are made on a fortnightly basis from 240 L bins and accept grass clippings, garden prunings, weeds, leaves, flowers and small branches (up to 75 mm in diameter).

In 2013/14 the service collected around 398 kg per household.
- Hard waste:** A hard waste collection service is provided annually to townships excluding Swan Hill and Robinvale.

Residents are required to pay a yearly charge for garbage and garden organics waste collection services, which are summarised in Table 1.

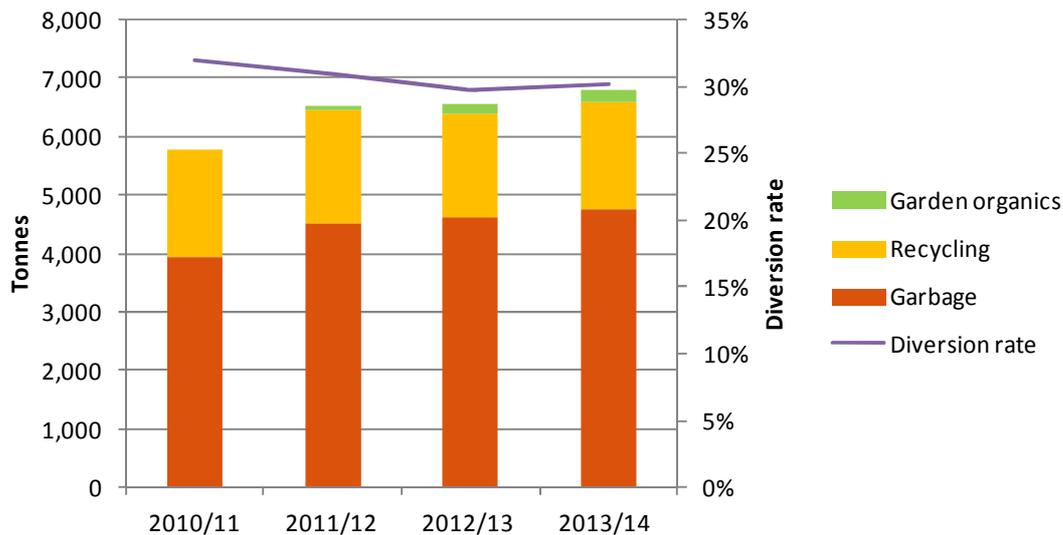
Table 1: 2015/16 collection service charges

Service	Bin size	Charge per year
Garbage/recycling service	240L garbage + 240L recycling	\$418
	120L garbage + 240L recycling	\$275
Garden organics service (optional)	240L	\$110

Performance

Figure 3 shows the amount of material collected in kerbside services from 2010/11 to 2013/14, as well as the diversion rate. This shows that total quantities of waste and recycling have risen slightly over time and that the introduction of the garden organics collection service has increased overall tonnage collections.

Figure 3: Kerbside collection services' performance



Overall, a kerbside recovery rate of 30% was achieved in 2013/14; this has decreased slightly from 2010/11 (when the rate was 32%).

Annual audits of kerbside recycling have been carried out in Swan Hill since 2008 (no audit was carried out in 2012). Figure 4 shows the composition of recycling collected in Swan Hill in 2013 and 2014.

Figure 4: 2013-2014 recycling audit results

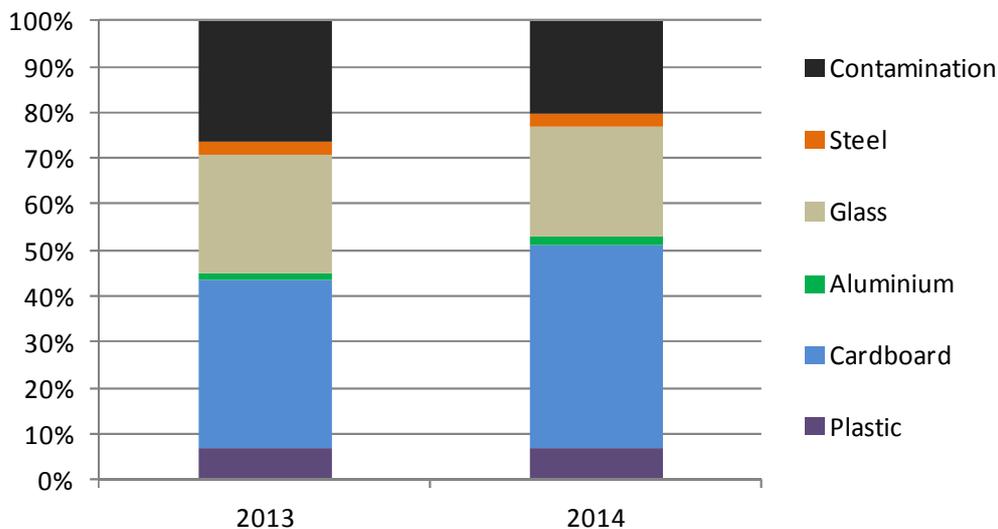


Figure 4 shows that contamination has slightly decreased over this time from 26% in 2013 to 20% in 2014. However this change can be accounted for almost exclusively through the increase in cardboard recycling, which rose by 8%, while the composition of other materials remained relatively constant over the same period. Overall, contamination made up 20% of recycling material by weight collected in SHRCC in 2014. This level of recycling contamination is above contaminant levels generally accepted by the recycling industry (around 5%), and may jeopardise the acceptance of the material for reprocessing. Significant improvement is needed to secure continued provision of the service.

Table 2 provides a comparison of overall SHRCC performance with regional, state and national data.

Table 2: Benchmark of performance measures

Performance measure	SHRCC ¹	CMRWGMG ²	Non-metro Victoria ³	All Victoria ³
Year of data	2013/14	2012/13	2010/11	2010/11
Kerbside garbage (kg/hh)	571	518	450	488
Kerbside recycling (kg/hh)	222	253	266	279
Kerbside organics (kg/hh)	341	-	310	367
Overall recovery	30%	32%	43%	45%

Source:

1: Swan Hill Rural City Council

2: Central Murray Regional Waste Management Group Annual Report 2012/13 (Central Murray RWMG 2012)

3: Victorian Local Government Annual Survey 2010/11 (Sustainability Victoria 2013)

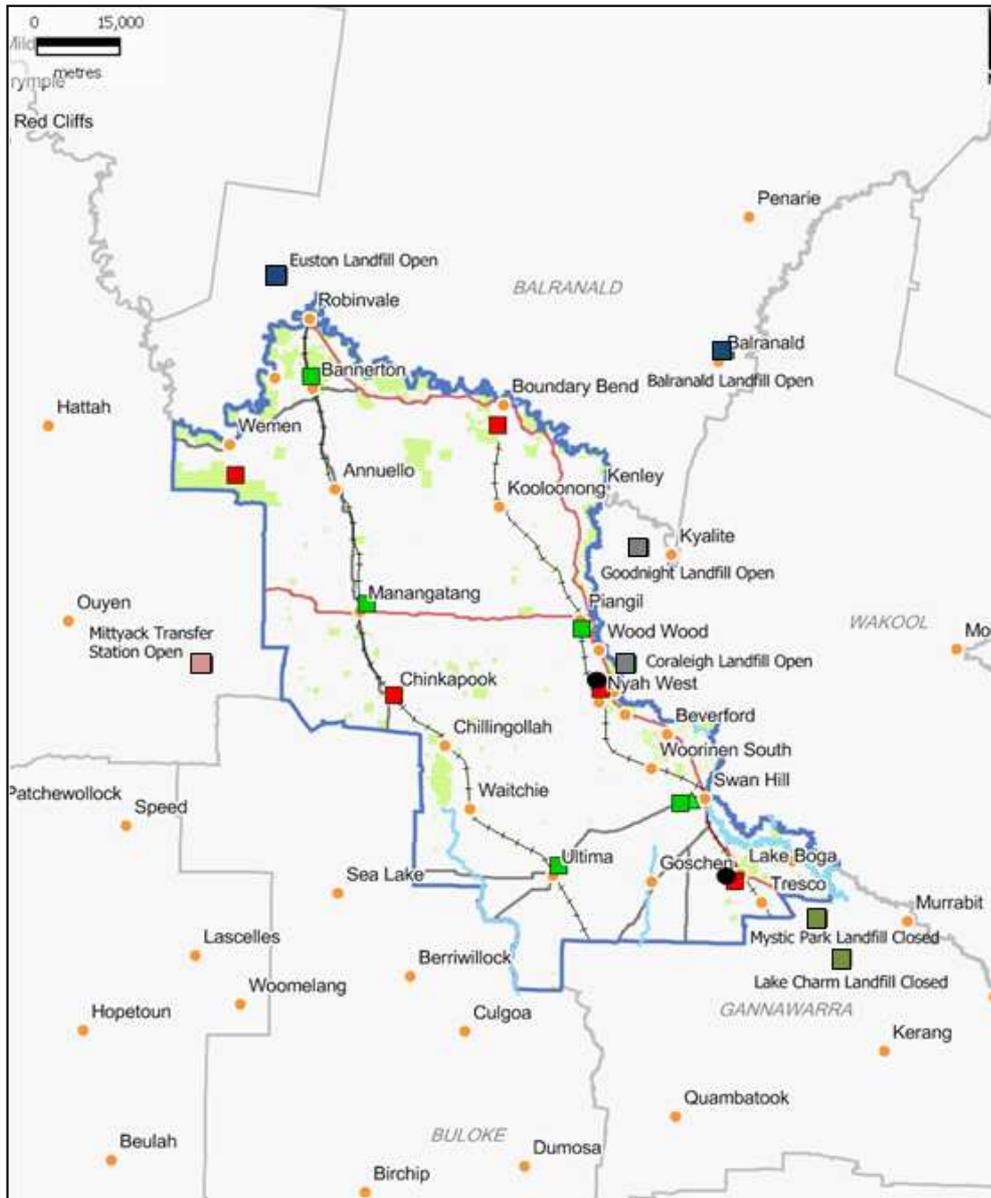
The comparison in Table 2 shows that household generation of waste in SHRCC is higher than other averages and that the municipality has a lower diversion rate. This suggests that residents in SHRCC produce more garbage in comparison to the amount they recycle through recycling and organics collections. The data for SHRCC and the regional and state groups presented in Table 2 are for kerbside collections of waste only and do not take into account data on material diversion carried out at waste management facilities (such as transfers stations and landfills).

3.3 Infrastructure

SHRCC currently has two operating landfills (Swan Hill and Robinvale) and three transfer stations (Manangatang, Piangil and Ultima), as well as a materials recovery facility in Swan Hill. All of the facilities are operated by a contractor (currently Ellwaste) on behalf of SHRCC; these contractual arrangements are due to expire in 2017 (unless an option to extend to 2020 is activated). Swan Hill also manages two nightsoil deposit sites and is looking to close these facilities in favour of alternative management options.

The location of these facilities and facilities in neighbouring municipalities has been mapped in Figure 5. An analysis of population distribution across the municipality indicates that most residents are within an estimated 30 minute travel time to a disposal facility.

Figure 5: Location of facilities in SHRRC and neighbouring councils



Key:

● Night Soil Depots	■ Wakool Shire Landfills
▲ Recycling Centre	■ Balranald Shire Landfills
■ Landfill or Transfer Station	■ Mildura Rural City Council Landfills
■ Closed Landfill	□ Shire Boundary
■ Gannawarra Shire Landfills	

The SHRCC facilities were inspected in conjunction with a council officer in January 2015. The findings of the inspections are summarised in Table 3, together with recommended actions.

Table 3: Infrastructure status and action plan

Facility	Current status	Actions required
<p>Manangatang transfer station</p> <p>The site is currently open three half-days per week: 1:00-4:00pm Tuesday 9:00am-1:00pm Thursday 9:00am-12:00pm Sunday</p> <p>Materials recovered include: Comingled recyclables, drumMUSTER, garden organics, e-waste, metals, motor oil, tyres</p>	<p>Manangatang transfer station is a small transfer station, located at a closed but currently unrehabilitated landfill. Infrastructure at the site incorporates 1 x 12 m³ waste skip and 2 x 3 m³ comingled recycling skips located alongside a drop-off retaining wall. There is a drumMUSTER cage, a used oil facility and a container-based site office.</p> <p>The skips are cleared approximately every 3 months and waste is deposited at Swan Hill landfill. The waste skip is not weatherproof and has only a shade-cloth covering. Odour and water ingress into the waste (generating leachate) are potential management issues.</p> <p>A range of materials are separated for recovery at the site, although it would appear some materials (e.g. metals, e-waste, garden organics) have been stockpiled for some time pending processing. There is a stockpile of bricks, concrete and tiles although it is understood it is not accepted for recycling at this facility.</p> <p>Site activities occur over a large footprint, making supervision of users difficult by a lone operator. This is expected to improve with council's planned changes to the site, including moving the site office and drop-off areas closer to the waste and recycling skips.</p> <p>There are a number of issues which do not meet best practice guidelines, including the unsecure site fencing and operation of the retaining wall gates (which were left open), although significant infrastructure upgrades have recently occurred.</p> <p>The low usage of the site may allow some rationalisation of opening hours.</p>	<p>The site does not currently meet best practice standards. The following upgrades are recommended:</p> <ul style="list-style-type: none"> • capping of former landfill • provide waterproof lids or covers to waste skips • improve site supervision by concentrating drop-off areas across smaller area • upgrade perimeter fencing to fully secure the site • improve management of safety barriers • provide weatherproof containers for recovered e-waste • upgrade signage for recovered materials • record vehicle movements at site and assess opportunities to rationalise operating hours.
<p>Piangil transfer station</p> <p>The site is currently open two days per week: 9:00am-3:00pm Wednesday 1:00-4:00pm Sunday.</p> <p>Materials recovered include:</p>	<p>Piangil transfer station is also located at a closed but currently unrehabilitated landfill. Infrastructure at the site was upgraded approximately 18 months ago. The facility utilises 1 x 15 m³ waste skip and 2 x 3 m³ comingled recycling skips alongside a drop-off retaining wall. There is also a container-based site office.</p> <p>The waste skip is collected approximately every 6 weeks and waste is deposited at Swan Hill landfill. Neither the waste nor recycling skips are weatherproof: the waste skip is covered with shade-cloth and the recycling skips are mesh cages, both of which help to prevent windblown litter but not</p>	<p>The site does not currently meet best practice standards. The following upgrades are recommended:</p> <ul style="list-style-type: none"> • capping of former landfill • provide waterproof lids or covers to waste and recycling skips • upgrade perimeter fencing to fully secure the site • provide weatherproof containers for recovered e-

Facility	Current status	Actions required
<p>Comingled recyclables, e-waste, garden organics, gas bottles, mattresses, metals, tyres</p>	<p>water ingress or odour control. The facility is generally tidy, although the perimeter fencing does not allow the site to be properly secured. The facility receives the highest patronage of the three transfer stations in the municipality.</p>	<p>waste</p> <ul style="list-style-type: none"> provide secure storage for gas bottles away from direct sunlight and with appropriate safety signage.
<p>Robinvale landfill</p> <p>The facility is currently open five days per week: 9:00am-3:00pm (closed Thursday and Saturday).</p> <p>Materials recovered include: Batteries – lead acid, bricks, concrete & tiles, clean soil, comingled recyclables, drumMUSTER, e-waste, garden organics, gas bottles, mattresses, metals, motor oil, paint, paper and cardboard, timber, tyres</p>	<p>Robinvale landfill services the northern part of the municipality. As the catchment population is less than 5,000, the EPA does not require the site to be licenced. The site incorporates approximately 50 ha, although not all of the site is currently used for filling purposes. It is estimated that the final contour for filling of the current cell at the Robinvale landfill will be reached (at current filling rates) in 2018. Prior to that time, an assessment needs to be made on whether the site should continue to be an active landfill or whether the site should become a transfer station and waste disposed of at an alternative landfill. Site infrastructure includes a weighbridge, gatehouse and various recycling bays and enclosures. There is a fenced compound with site amenities for use by contract staff. A large range of materials are separated for recycling, although recovered material is dispersed across a large footprint and some drop-off areas are not well signed or maintained. Some materials are not managed in accordance with best practice (e.g. batteries and paint are not stored in bunded areas, drumMUSTER drums are not stacked to prevent water ingress) and some areas of site housekeeping could be improved. The site also receives large amounts of waste plastic piping; this is currently separately stored on site pending a management solution.</p>	<p>The future use of the site as a landfill or transfer station should be determined. Inspection of the site identified areas where resource recovery facilities needed improvement. Upgrades in these areas could be undertaken in the short term, although implementation of any infrastructure upgrades should be deferred pending a decision on the long-term direction of the site.</p> <p>To meet best practice for material recovery the following upgrades are recommended:</p> <ul style="list-style-type: none"> upgrade site signage provide bunded areas for the storage of batteries and paint provide appropriate storage for drumMUSTER drums to prevent water ingress.
<p>Swan Hill landfill</p> <p>The facility is currently open seven days per week: 9:00am-2:00pm Saturday 9:00am-4:00pm all other days</p> <p>Materials recovered include: Batteries – lead acid, bricks, concrete & tiles, clean soil, comingled recyclables, cooking oil,</p>	<p>Swan Hill landfill is an EPA-licenced facility and is the major landfill in the municipality. The site has an area of approximately 42 ha, of which 20 ha are currently used for landfill. Approximately 8,250 tonnes/year of waste and recyclable materials are received each year. Current infrastructure at the landfill includes a weighbridge, gatehouse and sheds for a recovery and resale shop. Planned improvements at the site which are due to be finished in December 2015 include:</p> <ul style="list-style-type: none"> establishment of a permanent collection site for household hazardous waste (under Sustainability Victoria's <i>Detox Your Home</i> program) development of a transfer station at the site, including upgraded areas 	<p>The site appears to meet most best practice requirements of a resource recovery centre. Some consolidation of the recyclables drop-off area would improve site logistics and management, however this is expected to be an outcome of the planned new transfer station in the second half of 2015. There is an opportunity to improve inventory control and turnover of items at the resale shop, as it would appear some items have low saleability and/or have been retained beyond their optimum sale period.</p>

Facility	Current status	Actions required
<p>drumMUSTER, e-waste, garden organics, gas bottles, mattresses, metals, motor oil, paint, paper and cardboard, timber, tyres, reusable items for resale</p>	<p>for recyclables and residual waste</p> <ul style="list-style-type: none"> establishment of a new site office upgrade to traffic management, service roads and additional parking for the reuse shed. 	
<p>Swan Hill materials recovery facility</p>	<p>Council also owns a small materials recovery facility (MRF) in Swan Hill; this is used by council's waste contractor for consolidation and compaction of cardboard and plastic collected from commercial premises, prior to transport to markets in Melbourne. A skip is also located at the MRF to allow drop-off of these materials directly to the site.</p> <p>Development of housing on currently vacant land adjacent to the site is expected to occur in the short to medium term, making the viability of the MRF in the longer term questionable at that location.</p>	<p>The MRF operations are expected to transfer to the Swan Hill landfill site as part of future upgrade and redevelopment plans. Once this occurs, the site will no longer be needed for waste management activities.</p>
<p>Ultima transfer station</p> <p>The facility is currently open two mornings per week: 9:00am-1:00pm Wednesday 9:00am-1:00pm Sunday</p> <p>Materials recovered include: Comingled recyclables, drumMUSTER, e-waste, garden organics, metals</p>	<p>Ultima transfer station is a small transfer station upgraded in 2013, located at a closed but currently unrehabilitated landfill. Infrastructure at the site incorporates 1 x 15 m³ waste skip and 2 x 3 m³ comingled recycling skips located alongside a drop-off retaining wall; there is also a drumMUSTER cage, a small shed and a water tank.</p> <p>The skips are cleared on an 'at call' basis and waste is deposited at Swan Hill landfill. It is estimated that the waste skip is often retained on site for 4-5 months between collections. Neither the waste nor recycling skips are weatherproof: the waste skip is covered with shade-cloth and the recycling skips are mesh cages, both of which help to prevent windblown litter but not water ingress or odour control.</p> <p>Site activities occur over a large footprint, making supervision of users difficult by a lone operator. There are a number of issues which do not meet best practice guidelines, e.g. site fencing, retaining wall gates, site amenities. As evidenced by the length of time it takes to fill one 15 m³ waste skip, usage of the site is low, with past traffic data suggesting that perhaps three vehicles visit the site per month. This indicates that either continued operation of the site may not be needed or some reduction in opening hours may be appropriate.</p>	<p>The continued use of the site should be assessed and the need for ongoing operation or reduced hours determined. Regardless of the site closing or continuing operation, the former landfill area should be capped.</p> <p>If the transfer station continues operation, the following upgrades are recommended to meet best practice:</p> <ul style="list-style-type: none"> provide waterproof lids or covers to waste and recycling skips improve site supervision by concentrating drop-off areas across smaller area upgrade perimeter fencing to fully secure the site provide weatherproof containers for recovered e-waste.

Disposal charges apply for some materials at all SHRCC facilities (although charges vary between facilities) and these materials are shown in Table 4. Recovery of readily-recyclable material is encouraged through free drop-off at all facilities.

Table 4: Fee and non-fee item disposal at SHRCC facilities 2015/16

	Category	Items
Disposal fee items	Non-weighted vehicles (including garden organics)	Car boot only, station wagon, utility, utility high sided, single axel trailer (6 × 4), tandem axle trailer (8 × 5), mattress (any size).
	Tyres	Car and motorcycle, light commercial, truck (standard) and forklift, wide band super single, tractor, earthmover (small, medium, large).
	Weighted vehicles (cost per tonne)	Commercial and industrial (including concrete), low level contaminated soil (category C), asbestos (category C – minimum ½ tonne commercial).
Free drop-off items	Scrap metal, small rubble (bricks, crushed concrete, etc) used motor oil, clean fill, gas cylinders, drumMUSTER, white goods, televisions, computer monitors and accessories, domestic clean uncontaminated timber.	

Other sites

SHRCC also has a number of closed landfill sites, the status of which is summarised below:

- Boundary Bend: The landfill was closed in July 2014 and council is currently in the process of developing a capping and rehabilitation plan for the site.
- Chinkapook: The site was closed in October 2005 and is currently undergoing rehabilitation by council. The site is scheduled to be handed over to DELWP for management in 2019.
- Nyah West: The landfill was closed and capped in 2003. Council has completed rehabilitation of the site and is in the process of handing management over to DELWP.
- Lake Boga: The landfill was closed and capped in 2005. Rehabilitation is now complete and the site is currently managed by DELWP.
- Wemen: The landfill was closed and capped in 1998. Council is currently investigating options for rehabilitation of the site.

Nightsoil depots

SHRCC currently has two nightsoil depot sites for the deposit of nightsoil materials at Lake Boga (adjacent to the closed landfill site) and Nyah West. These sites are licenced with the EPA and operated and maintained by two local contractors. Currently, waste is deposited into trenches where it is allowed to dry and then covered. It is the intention of council to close the two sites as the disposal method is outdated and has the potential to harm the environment. SHRCC currently has an application before the EPA to close the sites and is investigating alternative disposal methods with Lower Murray Water (LMW) and neighbouring shires.

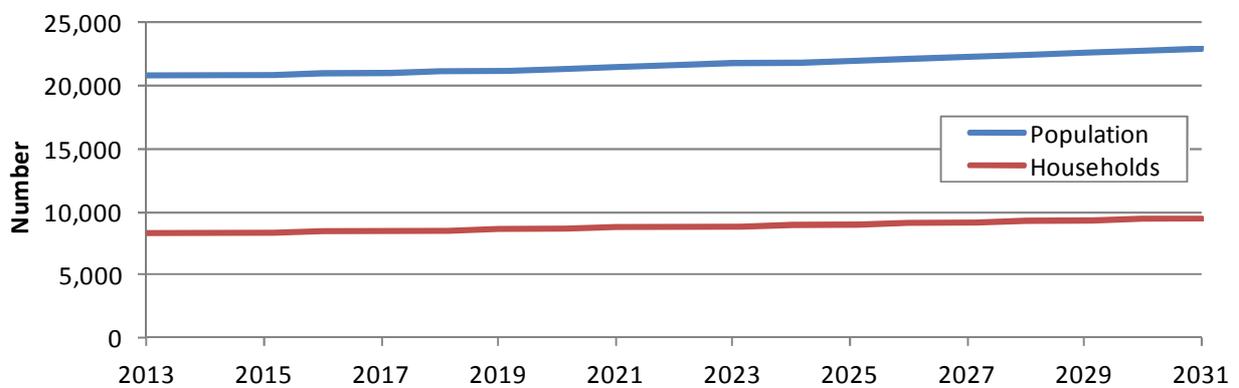
3.4 Future projections

In planning for strategic options for future waste management, it is valuable to consider what waste quantities would arise from continuation of “business as usual” (BAU). Some calculations can be made on the basis of population and waste generation trends.

Population and waste projections

Population data from *Victoria in Future* (DTPLI 2014) was used to estimate the likely population and household numbers in the municipality to 2031. Data provided by SHRCC was combined with the estimated annual rate of change (as derived from DTPLI data) and used to predict the two variables. The output of this is provided in Figure 6.

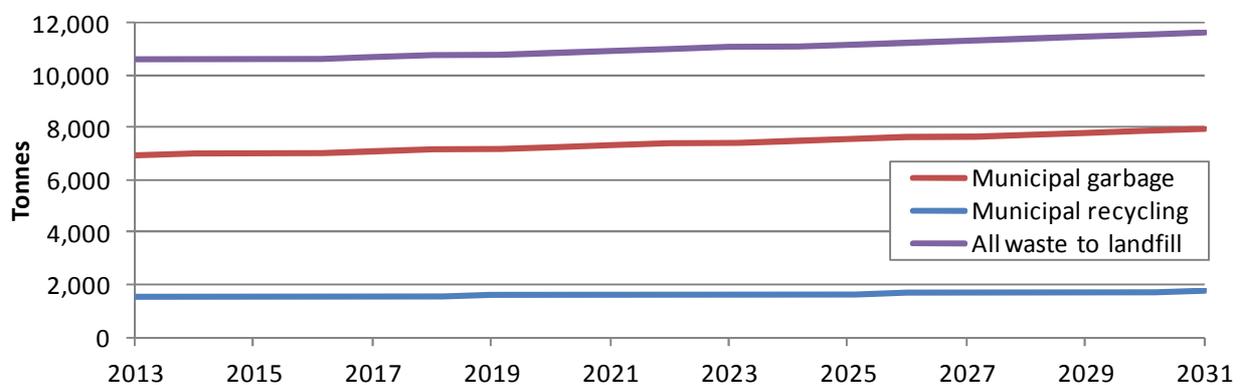
Figure 6: Population projections



The average annual rate of change for the municipality is 0.47% for population and 0.69% for households. It is predicted that in 2031 there will be around 22,923 residents living in 9,471 households (up from the 2015 estimate of 20,867 residents and 8,316 households). In effect, population levels are projected to be relatively static.

Using existing per capita generation rates (refer Section 3.1), projected trends in waste generation are expected to follow a similar pattern to population trends (as presented in Figure 7), marginally increasing over time.

Figure 7: Waste generation trends



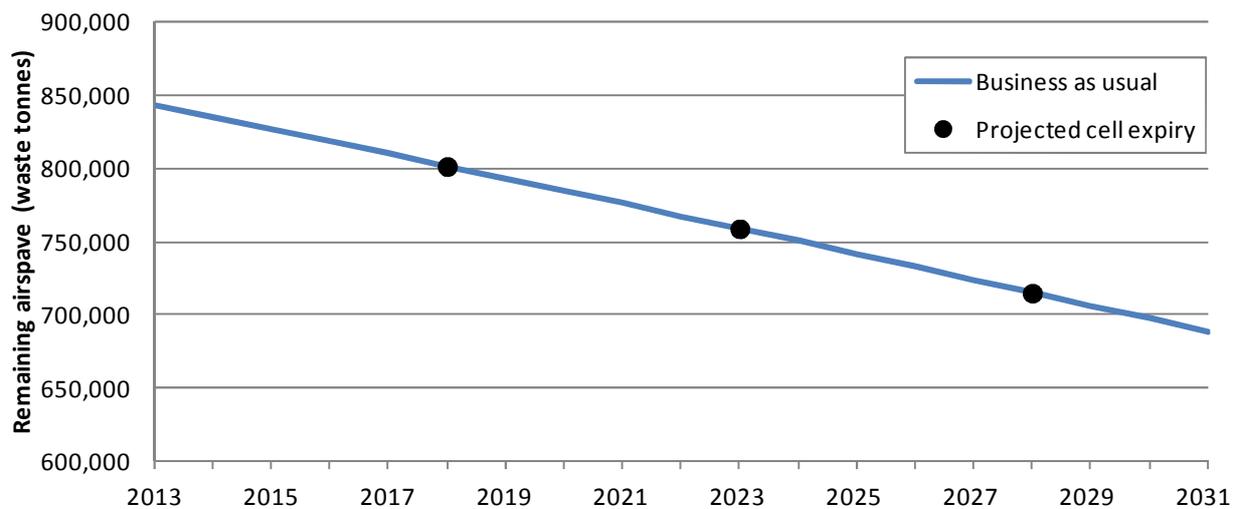
Major changes to existing waste generation behaviours will be needed to make any inroads to the amount of waste requiring management by SHRCC in coming years.

Landfill airspace

If waste generation remains stable under a BAU scenario, the amount of landfill airspace available for disposal of waste will steadily decline.

Projections of remaining waste volume capacity for Swan Hill landfill are presented in Figure 8.

Figure 8: Swan Hill landfill remaining capacity



Information used in this analysis was taken from the *Swan Hill Landfill Development Plan* (Golder Associates 2014). The plan assumes a waste density of approximately 0.70 tonnes/m³ and states that:

- the existing landfill has approximately 104,000 m³ airspace with 73,000 tonnes of waste volume available
- the proposed cell 1 has approximately 78,000 m³ airspace with 55,000 tonnes of waste volume available
- the proposed cells 2 to 12 have approximately 93,000 m³ airspace with 65,000 tonnes of waste volume available each
- the total existing and proposed landfill has approximately 1,205,500 m³ airspace with 843,000 tonnes of waste volume available.

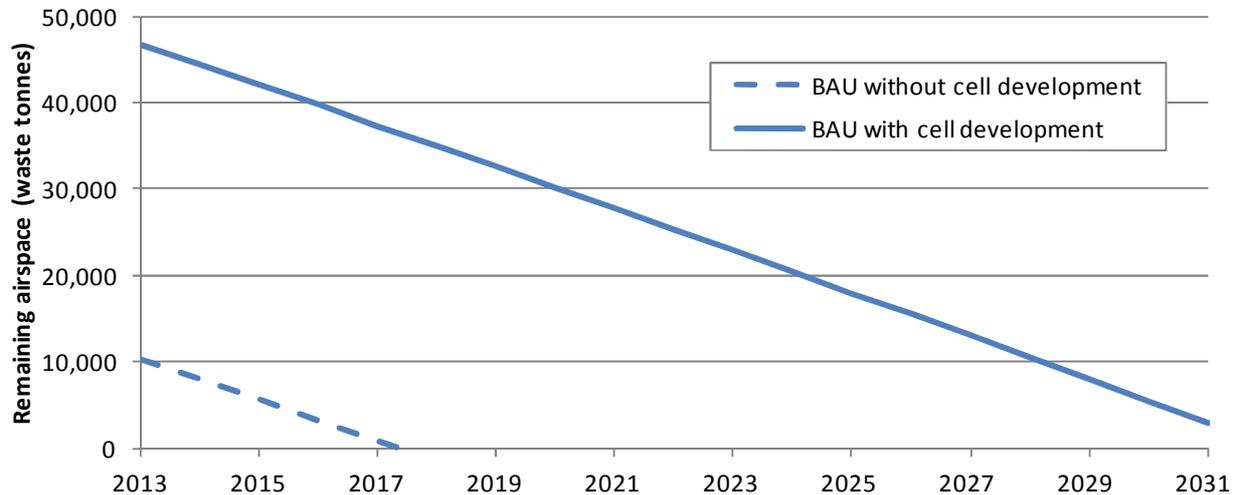
The BAU scenario presented in the analysis is based on the current total waste volumes accepted at Swan Hill landfill in 2013 and projected forward using population projections for all of SHRCC to 2031. This analysis also takes into account anecdotal evidence from SHRCC regarding more recent increases in waste tonnage data.

Under the BAU scenario the current landfill airspace is projected to expire in 2018. If the landfill was further developed as per the *Swan Hill Landfill Development Plan* the proposed cell 1 would be filled by 2023 and cell 2 by 2028. New cells would be required every five years after 2028. This analysis does not take into account the transfer station site upgrade work currently underway and the reductions in

available land for landfill cell development which may occur due to the increased footprint of the new site.

Projections of remaining waste volume capacity for Robinvale landfill are presented in Figure 9.

Figure 9: Robinvale landfill remaining capacity



Information used in this analysis was taken from the *Landfill Development Plan Robinvale Landfill* (Golder Associates 2011). This analysis assumes that:

- from a survey carried out in 2008 to the conceptual top of the landfill contour, the current site has approximately 27,000 m³ airspace (“BAU without cell development”)
- the approximate airspace provided by the proposed cell development (as outlined in the plan) adds an additional 52,000 m³, for a total of 79,000 m³ (“BAU with cell development”)
- the waste quantities entering the landfill between 2008 and 2011 were 1,100 tonnes per year (as provided by council in the plan); after 2011, accurate measurements of tonnages entering the site are available
- with waste entering the landfill having a density of approximately 0.70 tonnes/m³, calculations show that in 2011 the site had approximately 18,900 tonnes of available waste volume under the BAU without cell development scenario and 55,300 tonnes of available waste volume under the BAU with cell development scenario.

The BAU scenarios presented in the analysis are based on the current total waste volumes accepted at Robinvale landfill in 2013 and projected forward using population projections for all of SHRCC to 2031. Two scenarios are presented for BAU: one where council does not further develop the current landfill cell (dotted line) and another where the site is developed to accept more waste (solid line).

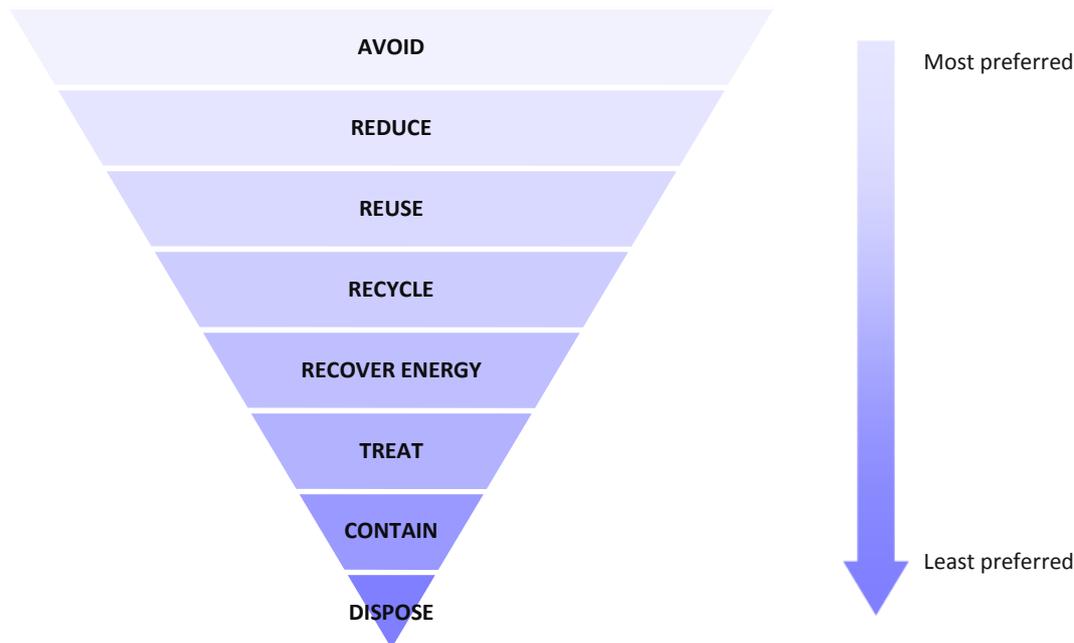
Under the BAU without cell development scenario the current landfill is projected to be full just after 2017. Under the BAU with cell development scenario the landfill is projected to be full beyond 2031.

4. Management options

This section discusses potential options for improved waste and recycling management in Swan Hill in line with the waste hierarchy.

The waste management hierarchy (refer Figure 10) is the underlying principle of waste management in Australian legislation and policy. The hierarchy sets out the preferential way in which waste should be managed, placing avoidance as the most preferred option and disposal as the least preferred.

Figure 10: Waste management hierarchy



4.1 Waste minimisation

A key action in minimising waste is influencing the behaviour of waste producers and there are a number of areas that SHRCC can target to help achieve this.

Council leadership

SHRCC has the opportunity to apply waste reduction and avoidance activities in their day-to-day operations. Initiatives could include:

- improving internal waste reduction and recycling and monitoring and publicising achievements
- establishing an office compost bin or worm-farm for food waste generated by council staff
- purchasing products in line with a green procurement system (including purchase of products with recycled content)
- using recycled materials (e.g. concrete, timber, mulched garden waste) on local projects.

Achievements in waste avoidance and reduction by SHRCC should be communicated to residents to demonstrate council leadership and to raise awareness of similar opportunities for the broader

community. This could be achieved through various communication channels, including regular articles in the local newspaper, news articles on council's website, notification with rates notices, etc.

SHRCC should look to continuous improvement of achievements as an important feature in demonstrating leadership.

Advocacy

Community members generally look first to their local council for information on waste and recycling. There is an opportunity for SHRCC to further advocate in the local community for waste avoidance through changes in consumption and purchasing behaviours. Where resources allow, this could include participation in programs such as *Love Food, Hate Waste*, the *Garage Sale Trail* and *Kerbside Pride*, assisting business programs for alternatives to disposable plastic bags, encouraging consideration of 'food miles' (which supports purchase of local produce and development of local businesses), and similar campaigns. Initiatives could be undertaken with local community groups to help build community sustainability and well-being.

Charging mechanisms

Waste management charges can be structured to make residents aware of, and accountable for, the quantities of waste they dispose of. Systems can be structured so that payment is associated with kerbside collection frequency or volume.

Volume based charging systems generally apply to the size of the garbage bin supplied to households; this has been acknowledged by the existing fee structure in Swan Hill (refer Table 1) which applies a lower fee for collection of smaller volume garbage bins. While the existing fees differentiate only between 120 L and 240 L bins, there is an option to include alternative sizes.

Some trials have also been undertaken on charging by weight, however there remain technological challenges in making this feasible. Frequency-based charging also encourages households to reduce the number of times bins are put out for collection. Usually a standard charge is established covering a set number of collections. Rebates are then given to households who use the system less and higher charges may be applied to those that use it more. To implement these systems, bins would need to be fitted with microchips and trucks with the ability to read them so that bins can be identified and collections tracked. While the reliability and cost-effectiveness of such a system may not be sufficient for SHRCC to investigate a change to this service type in the short term, council should maintain a watching brief to ensure they are aware of advances and improvements to such systems. Any investigations into weight based or frequency based charging systems should fully consider the costs of implementation, maintenance and the reliability of such systems.

Both volume and frequency charging systems involve changes to bins, and consequently it can only be implemented in the middle of a contract period at some cost to council. Consideration of these options should therefore be undertaken by SHRCC only towards the end of the current contract (2017 or later if the contract extension is implemented). When tenders are called for a new contract, SHRCC could incorporate an option for an alternate system to determine what cost considerations would apply and whether it was financially viable to proceed.

4.2 Community education

Community education is important to reduce waste generation, maximise diversion of recyclables and minimise contamination of segregated materials. The continuing high contamination rate of kerbside recycling (refer Section 3.2) indicates a significant gap in waste education achievements.

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 local businesses with links to relevant information sources (e.g. Sustainability Victoria)
- providing feedback to the community on the end-products and markets of materials recovered (to continue community commitment to recycling)
- environmental impacts and consequences to residents (fines) associated with illegal dumping and littering.

Waste education is coordinated on a regional basis by Loddon Mallee WRRG, and many of these messages are relevant to regional education strategies. While the transition from Central Murray RWMG has seen some pause in spending on regional education strategies, community education initiatives in Swan Hill should be undertaken in consultation with Loddon Mallee WRRG; this will reduce mixed messages and spending overlaps.

In consultation with regional education officers, consideration could be given to localised initiatives in Swan Hill such as:

- encouraging community ownership of waste issues by inviting residents to participate in devising solutions
- involving community leaders or organisations who can give the program local credibility
- developing a graphic theme across waste/recycling messages that is specific to SHRCC
- complementing education with incentives and where necessary enforcement
- providing regular feedback to community groups on how their changed behaviour is helping to reduce waste.

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 performance in contamination levels, and fine-tuning of the education programs to address any problem areas.

4.3 Collection and recovery

Collection systems

SHRCC states that, of the estimated 8,361 households in the municipality, around 99.9% of these are provided with kerbside collection services for garbage and comingled recycling. This includes all townships in the municipality and is a high rate of coverage for rural shires.

Sustainability Victoria's local government data collection survey has consistently shown that, since 2000/01, councils with smaller garbage collection bins have generated less waste and had higher diversion rates than those with larger bins. In 2010/11, the most recent publically available report, Sustainability Victoria found that councils with an 80 L garbage bin generated on average 38% less waste than those

with a 240 L bin. Providing households with a smaller bin encourages residents to consider the impact of the waste they generate and more carefully separate recyclables or better manage garden and food organic waste. There is potential for introducing a smaller garbage bin or making the 120 L bin standard in SHRCC to reduce the amount of garbage collected for disposal. This could involve:

- offering households an optional 80 L garbage bin as part of the current volume-based charging system (discussed in Section 4.1)
- making the 120 L bin standard for all households and only offering the option of a 240 L bin for households in certain circumstances (as reviewed by council).

It is recommended that SHRCC investigate the viability of making the 120 L bin system standard instead of the current arrangement which gives residents the option of a 120 L or 240 L bin.

Comingled recycling collection services appear to be well utilised, although there are significant issues with contamination. SHRCC's 2014 audit of comingled recycling showed high contamination levels; an average of 20% by weight was recorded across the municipality, with some collection zones experiencing contaminant levels of almost 40% by weight (Robinvale). The recycling industry generally uses a benchmark of around 5% contamination as an acceptable level before it can affect the viability of recovering material although this depends largely on the composition of materials and the sorting equipment used. Unless contamination is reduced, it may jeopardise the long-term viability of kerbside recycling in the municipality.

An action program is needed to reduce this level of contamination; additional measures may need to be introduced in targeted areas where contamination is especially high. Actions could include both incentives and disincentives, such as education activities (e.g. media campaigns, provision of labels for recycling bins, publicising good and bad recycling behaviours), on-going monitoring (e.g. regular checks by the collection contractor, additional audits) and penalties for poor performance (e.g. written warnings to particular households graduating to withdrawal of the service if improvement is not shown).

While SHRCC carries out annual audits of kerbside recycling, it is noted that similar audits of the garbage stream are not carried out. This results in a lack of data on the real diversion rate of recyclables, i.e. whether there are additional recyclable materials disposed of in the garbage bin rather than deposited in the recycling bin. Without this data it is not clear whether optimum usage is being made of the kerbside recycling service. It is possible that existing recycling collection systems have additional capacity that is not being utilised, and maximum value is not being extracted from the costs currently incurred by SHRCC for provision of comingled recycling systems. While the cost of additional waste audits is acknowledged, there may be opportunities to reduce these through participation in regional waste audit programs.

SHRCC does not provide kerbside collection services to the commercial and industrial (C&I) sector; businesses are serviced by private waste/recycling contractors on a fee-paying basis. Given the variable characteristics of the C&I waste stream, it is not recommended that SHRCC service this sector. However there may be opportunities for SHRCC to extend the domestic recycling service to small businesses in major centres (such as Swan Hill and Robinvale). This would involve the provision of 240 L recycling bins to small businesses on the same conditions as households (e.g. fortnightly service paid for via waste management charges). The level of interest in this type of service from existing businesses is not known and should be investigated by SHRCC prior to implementation.

Organics

Garden and food organics can make up a significant component of the waste stream. Diverting this material from landfill can have a number of benefits, including extending the life of existing landfills, reducing the generation of methane (a greenhouse gas) and providing an opportunity to produce a valued resource (such as compost and soil conditioners).

SHRCC provides a voluntary garden organics collection service to households in Swan Hill. In February 2015, 609 households were taking part in the service (or 17% of households in Swan Hill who also receive a recycling service). As the garden organics service is now servicing over 600 households, the cost to residents of receiving the service will decrease in 2015/16 by \$15 to \$110 per year. This is due to reduced contractor collection costs from the economies of scale involved. A possible further reduction in price will occur once 1,200 households take up the service.

There is scope for considerable expansion of the garden organics collection service in Swan Hill and potentially other areas of the municipality. The take-up of voluntary organics collection services has proven in other areas to be cost-sensitive, however now that the first cost reduction milestone has been met, further promotion of the service to the community is likely to see a greater rate of take-up.

There is also future potential for food organics to be collected in the same bin as garden organics, however a processing technology capable of managing both food and garden organics would first need to be established.

Currently garden organics collected from kerbside services, as well as materials deposited at waste facilities throughout the municipality, are stockpiled and mulched on an 'as-needed' basis. Mulched garden organic material at Swan Hill and Robinvale landfills is used for rehabilitation or is given to residents for use in gardens. This management regime does not manage the resource to its full potential. Without a heat treatment phase, the mulching process also does not address biosecurity risks from the potential spread of weed seeds, pests and pathogens. This is of particular concern in areas of the municipality in the Greater Sunraysia Pest Free Area (fruit fly exclusion zone) and it is recommended that council investigate the improved management of garden organics to the appropriate Australian Standards.

Central Murray RWMG investigated organic management opportunities in the region (Central Murray RWMG 2011) and identified the potential for an organics processing facility in the Swan Hill area. An aerated windrow composting system was identified as the most feasible option; this system is capable of managing both garden and food organics and produces a higher-value product than mulch. It is also capable of managing industrial organics (discussed further in Section 4.4).

Special wastes

There are some waste streams that either by volume or waste characteristic can prove to be problematic to manage; there are other wastes that systems for management or recovery are expected to undergo change in the future (e.g. through establishment of product stewardship schemes). Those of particular relevance to SHRCC are discussed below:

- **Agricultural plastics:** Large volumes of waste irrigation piping, chemical drums, silage wrap, fertiliser bags, vine covers and similar plastics are produced by the agricultural sector. Recycling programs such as drumMUSTER and Plasback target some chemical drums and silage wrap, however this is only a part of the material in question. Much of this material (especially irrigation piping) is stockpiled at Robinvale landfill; it is not suitable for deposition in landfill cells (due to compaction issues) and there are no current recycling or reuse practices in place.

There are some potential options for recycling which could be explored:

- some drumMUSTER processors can also recycle other plastic drums
- some industrial recyclers accept plastic pipes.

The feasibility of either of these options to SHRCC will depend on a range of issues such as location of the recycling facility, transport logistics and cost, and the amount of material collected and

generated on a regular basis. Further research into the options for recycling agricultural plastics is needed by SHRCC to consider recycling feasibility.

- **Air-conditioners and refrigerators:** Both of these items were included on the Minister of the Environment's 2014/2015 product list for consideration of some form of future accreditation or regulation under the *Product Stewardship Act 2011*. A recent decision was made to remove these from the product list, although there is some industry pushback on this decision. Recovery of these in the Swan Hill region is generally handled under existing metal recycling systems; it is unclear whether a product stewardship scheme will be in place in the near future or what impact any future regulation or product stewardship scheme may have on the recycling system.
- **E-waste:** e-waste (including televisions, computers and other electronic waste materials) is currently being separated for recovery at most facilities in the Swan Hill area. Recovery of some of these materials is managed under product stewardship arrangements established via the National Television and Computer Recycling Scheme. Targets included in the scheme have led to some perverse outcomes, with some approved recyclers refusing to accept recovered material beyond their targeted quantity. On-going discussions between Commonwealth and State Governments and industry stakeholders are being held, with a view to improving recovery outcomes. It is possible that some revision of targets will see recyclers reinvigorate the e-waste recovery system to the benefit of local government.

The Victorian Government has also indicated that it is considering a landfill ban on e-waste. If this is implemented by 2018 as planned, there will be further emphasis on the need for robust e-waste recovery systems in the region during the term of this strategy.

- **Household batteries:** In conjunction with various government bodies, battery manufacturers have in recent years been investigating options for recovery and recycling of small household batteries. To date recovery of these items has been minimal, with most being deposited to landfills; this has environmental consequences due to their material components (such as heavy metals and acids). A product stewardship scheme for non-rechargeable handheld batteries (< 5 kg) has been proposed, although there are current industry differences as to whether this should be a voluntary or mandatory scheme.
- **Household hazardous waste:** Household hazardous waste (incorporating a range of hazardous chemicals) is collected via Sustainability Victoria's *Detox your home* collection program. In the past this has been provided via *ad hoc* mobile collections, however development of the new Swan Hill transfer station will include infrastructure to establish a permanent collection site.
- **Mercury-containing lamps:** A voluntary product stewardship scheme (FluoroCycle) has been established to recover mercury-containing lamps from commercial and public space lighting. There are no current plans to extend this to cover lamps from the domestic sector, although there are some alternative collection systems for fluorescent tubes at various places across Victoria.
- **Paint:** Paint has comprised a significant component of past household hazardous waste collections, to the point that Sustainability Victoria has worked with paint manufacturers to establish a national industry-based recovery scheme. Current discussions indicate a product stewardship scheme launch date of around May 2016, with a potential 15c/litre recovery levy to be charged on new paint sold.
- **Tyres:** Tyres were identified as a priority waste stream in the 2007-2012 Swan Hill Waste Management Strategy. Tyres are being separated for recovery at most facilities and stockpiled on site. The indefinite stockpiling of large numbers of tyres has been identified as a concern by the EPA, particularly the potential for fires and the resulting health and environmental risks. EPA developed an interim *Waste Management Policy (Storage of Waste Tyres)* (EPA 2014a) and will implement 2015 regulations which address management of large stockpiles (more than 5,000 tyres). The Country Fire Authority also developed the *Fire Services Guideline: Open Air Storage of New or Used Tyres* addressing tyre stockpile characteristics for fire control purposes, regardless of how many tyres are

stockpiled. Additional recycling initiatives are expected to be put in place as part of the product stewardship scheme for end-of-life tyres. The form of such future initiatives is not yet known, although current research is being undertaken at Commonwealth and Victorian Government level.

- **Nightsoil waste:** Council currently manages two nightsoil depots where contractors collect nightsoil waste and deposit this in trenches where it is left to dry before being covered. It is recommended that SHRRC negotiates with Lower Murray Water (LMW) and other treatment facilities in neighbouring councils to accept the nightsoil waste for disposal at their facilities. If an alternative management arrangement could be agreed to, SHRCC would be able to close the existing depot facilities.

Some flexibility in provision of infrastructure, equipment and contractual arrangements for these special waste streams may need to be considered in the term of this strategy, in order to respond to changing product stewardship arrangements and regulations. SHRCC should keep abreast of new requirements as they are implemented.

4.4 C&I sector

The commercial and industrial (C&I) sector is serviced by private contractors, with SHRCC seeing some minimal amounts of C&I waste deposited at Swan Hill or Robinvale landfills. Anecdotal evidence suggests that there is movement of waste occurring between SHRRC and neighbouring councils. The quantity and frequency of this activity requires further investigation by Swan Hill and it may be appropriate to put in place a more formal agreement with neighbouring councils for the movement of waste. Historically, some of the C&I waste generated in the Swan Hill region was transported outside the region for disposal, e.g. to the privately owned Patho landfill, or to Buronga and Balranald landfills in NSW. This is generally for logistical reasons (e.g. commercial services provided by Ellwaste include disposal at their own landfill at Patho) or cost reasons (e.g. disposal costs at NSW landfills are cheaper as no landfill levy currently applies). However there is no guarantee that these alternative disposal pathways will continue. If the NSW Government applied landfill levies to all rural landfills the cost differential from local disposal would disappear and Swan Hill landfills would likely see a major increase in C&I waste.

Local government collaboration with the C&I sector on waste issues has historically been low, however there is increasing recognition that resource efficiencies and recycling can lead to improved cost outcomes for businesses and economic opportunities for the local community. SHRCC has to date participated in some waste initiatives targeted on the C&I sector:

- Large volumes of cardboard and plastics from Swan Hill businesses are accepted for recycling at the Swan Hill MRF (operated for SHRCC by Ellwaste). The material is sorted, compacted and transported to recycling markets in Melbourne.
- Large volumes of construction and demolition (C&D) waste (especially concrete) generated during recent redevelopment projects in Swan Hill were diverted for recycling. It is understood the cost benefits of diverting the material have led to operational changes by the local contractor.

However there are further opportunities, some of which include:

- Community waste education programs could be expanded to include the C&I sector. Collaboration with resource efficiency programs run by other organisations (e.g. Sustainability Victoria) could help to deliver triple bottom line outcomes.
- Domestic kerbside recycling services could be extended to small businesses in major centres (discussed in Section 4.3). This would see 240 L comingled recycling bins for businesses added to the existing collection system.

- There may be opportunities to expand the current recycling of cardboard and plastic at the Swan Hill MRF to include additional businesses. Liaison with council's contractor (Ellwaste) will help to identify the current coverage of businesses and the potential for expansion to others.
- Central Murray RWMG's organic waste investigation (Central Murray RWMG 2011) identified various industrial organics being generated in the municipality, including olive pomace, almond skins and abattoir waste. This waste could contribute to the feasibility of establishing a compost facility in the area, managing municipal garden and food organics as well. SHRCC could explore this opportunity with known industrial organic generators.

4.5 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 historic lack of full cost recovery included in landfill gate fees means 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. The technologies suited to MSW treatment 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 SHRCC. There may, however, be opportunities for development of small-scale technologies targeted to particular waste streams with high calorific value (e.g. anaerobic digesters treating wet organics, energy generation from combustion/gasification of dry organics). The feasibility of these small-scale facilities in Victoria has generally relied on industry/private sector participation and localised demand for electricity.

Operating standards

The EPA addresses improved requirements for landfill management in Victoria through its 2014 *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 (like the Robinvale landfill), the Landfill BPEM sets out best practice for landfills in Victoria and is the standard that the local community could reasonably expect SHRCC to comply with. If any landfill impacts upon the surrounding environment such that it breaches the *Environment Protection Act 1970*, SHRCC 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 SHRCC from establishing and maintaining best practice operational standards at both Swan Hill and Robinvale landfills.

SHRCC should therefore consider benchmarking both landfills against the Landfill BPEM, with the view of planning for infrastructure upgrades as necessary in the short, medium and long term. Some areas for

improvement have been identified in Section 3.3 and are discussed in the section below, however SHRCC should aim for continuous improvement at all facilities as part of accepted best practice.

While groundwater (and when available, surface water) is currently monitored through bores at Swan Hill landfill, monitoring and analysis of landfill gas emissions does not occur on a regular basis. It is recommended that SHRCC undertake a program of regular monitoring of landfill gas emissions and report to the EPA if any levels exceed the action levels as outlined in the Landfill BPEM. It is also important that SHRCC monitors landfill gas emissions to ensure it does not have an obligation to register and report its emissions to the Clean Energy Regulator under the *National Greenhouse and Energy Reporting Act 2007*. If emissions are found to be above the threshold levels for a particular year then SHRCC would be required to register, report and monitor their gas emissions.

From discussions with SHRCC staff it is evident that in the coming years the development of the Swan Hill township is likely to encroach closer to Swan Hill landfill. Proposed developments over the next 5 years include a solar power plant site and residential development, both to the east and within 2 km of the boundary of the current landfill. The Landfill BPEM sets out required buffer zones for the siting of new landfill facilities however these can also be applied to existing landfill sites. The Swan Hill landfill is currently licenced to accept putrescible waste, solid inert waste and some category C prescribed industrial waste. Under the Landfill BPEM this classifies the site as a 'type 2' landfill which in turn sets buffer distances which must be maintained between the landfill and sensitive land uses and receptors such as surface waters, buildings or structures and airports. Table 5 specifies different land uses and their buffer distances applicable to Swan Hill landfill.

Table 5: Landfill buffer distance for type 2 licenced landfills

Land use	Buffer distance
Surface water	100 m
Building or structures	500 m
Aerodrome for piston-engine propeller driven aircraft	1,500 m
Aerodrome for jet aircraft	3,000 m

The Landfill BPEM also specifies buffer distances which are required to be maintained for post-closure landfills. For type 2 landfills a 500 m buffer distance must be maintained from buildings or structures post-closure.

To ensure the buffer zones around the landfill are maintained, collaboration is recommended between the waste management and planning sections within council. As a referral authority for planning decisions, SHRCC has a responsibility to uphold the required buffer distances for the landfill. The *Victorian Planning Provisions* (DELWP 2014) set out a strategy for waste and resource recovery facilities to "ensure buffers for waste and resource recovery facilities are defined, protected and maintained". Following these provisions will help to maintain the required buffer zones around Swan Hill landfill and reduce the risk of liability to council.

Facility upgrades

Inspection of SHRCC facilities (outlined in Section 3.3) identified a number of areas to be addressed. Recommended actions are summarised in Table 3, however there are some additional management issues that SHRCC should consider and these are discussed below.

- **Swan Hill landfill**

Current filling rates indicate that Swan Hill landfill will have a lifespan of over 80 years, although new landfill cells would need to be developed in 2018 and every five years after. However this is subject to a 'business as usual' waste generation scenario; if waste minimisation initiatives are successful the timing for additional cells may be extended, which in turn would extend the lifespan of the landfill. If increased quantities of waste are accepted (e.g. through population increases, major developments in the area or C&I waste diverted from NSW landfills if NSW levies take effect), the landfill airspace will be utilised at an increased rate. SHRCC should continue to closely monitor the waste disposed of at the facility (including the amount of material recovered) and develop appropriate response plans.

The site is due to be extensively improved this year (by December 2015), with upgrades to include the development of a transfer station, service roads, site office and permanent *Detox Your Home* collection site. While the scope of the upgrade is in its final stages of development, SHRCC should refer to Sustainability Victoria's *Guide to Best Practice at Resource Recovery Centres* (Sustainability Victoria 2009) for further guidance on best practice design, management and operation benchmarks for the proposed transfer station. The guide also outlines the need for inventory control at resale shops, an area identified for improvement during inspection of the site.

Future upgrades to the site are likely to include the relocation of the Swan Hill MRF. The current site, on Gray street in Swan Hill, is adjacent to an anticipated housing development precinct and if the facility were to remain in this location will have the potential to cause nuisance to nearby residential properties. Relocation of the MRF to the landfill site would mitigate any potential problems and could also make waste management in Swan Hill more cost effective and efficient. SHRCC should investigate and where applicable apply for funding opportunities to carry out the works needed to establish the MRF at the landfill site.

- **Robinvale landfill**

It is estimated that the final contour for filling of the current cell at the Robinvale landfill will be reached (at current filling rates) in 2018. Prior to that time, an assessment needs to be made on whether the site should continue to be an active landfill or whether the site should become a transfer station with waste disposed of at an alternative landfill. A number of factors need to be considered as part of this assessment including (but not limited to):

- the cost of landfill cell development
- the suitability of the site for landfilling given current EPA landfill standards
- the cost of alternative development as a transfer station
- alternative disposal points and the cost of waste transport/levy
- the level of service the community wants and its willingness to pay for it.

SHRCC should undertake this assessment in the short-term so there is sufficient time to implement the outcomes before completion of the current airspace in 2018.

Inspection of the site also identified areas where resource recovery facilities needed improvement, both in equipment and management systems. Upgrades in these areas could be undertaken in the short term, although implementation of any infrastructure upgrades should be deferred pending a decision on the long-term direction of the site.

- **Transfer stations – Manangatang, Piangil & Ultima**

SHRCC has funded significant infrastructure improvements at these sites in recent years, with closure of landfill activities and establishment of transfer facilities. To comply with best practice (as outlined by Sustainability Victoria's 2009 *Guide to Best Practice at Resource Recovery Centres*), some additional

measures would need to be taken; there are also areas which could be investigated for improved feasibility. Key upgrade areas for each transfer station are outlined in Table 3.

SHRCC should also continue to assess the patronage and coverage of their landfill and transfer station system with the aim of identifying sites that could be closed. In particular, it has been noted that Ultima transfer station receives very low patronage and as a result SHRCC should investigate the potential impacts of closing this site.

In addition to this, SHRCC should undertake annual reviews of the disposal fees charged at landfill and transfer station sites to ensure that disposal fees:

- cover the total cost of disposal and management of waste and recyclables (including post-closure activities at each site and facility replacement as needed)
- are appropriate for each material.

SHRCC could consider making fees consistent at each facility; this may prevent some disposal behaviours with perverse environmental outcomes (e.g. residents travelling past their nearest facility to a more distant facility with cheaper disposal fees).

As part of the review, consideration should also be given to the fees charged in neighbouring councils with the view to preventing perverse behaviours such as the movement of waste to landfills that have cheaper fees in neighbouring councils. This is especially relevant to SHRCC which shares a border with New South Wales where a landfill levy is not applied to rural landfills.

Contract management

The contract with Ellwaste for the operation of the two landfills and three transfer stations is due to expire in 2017 (unless an option to extend to 2020 is activated). Leading up to this period it is important that SHRCC has a sound understanding of the current contract terms and value for money. This is especially relevant for Robinvale where low volumes of waste are received for a comparatively higher cost than those incurred at Swan Hill. It is recommended that SHRCC review the current contracts and the volume of waste deposited at each facility in relation to the contract amount. Council should also carry out an in-depth review of the terms of the current contract and draw on their experiences with this to formulate a new contract brief. This will provide council with an in-depth understanding of the current contract and the needs of any new contract negotiations or tendering process when the current contracts expire.

Council has also expressed an interest in potentially bringing the services fulfilled by their current waste management contractor in-house. A detailed analysis of the costs and benefits of such a proposal should be completed at least one year prior to the expiry date of the current contract in order to provide sufficient time for the decision-making process (and timely implementation if applicable).

Closed landfill sites

SHRCC has a number of closed landfill sites, including those closed in recent years and legacy sites. Table 7 outlines the status of known sites and additional work required by SHRCC.

Table 6: Closed landfill sites

Sites	Current status	Work required
Boundary Bend	Developing a capping and rehabilitation plan	Following rehabilitation, monitoring and management required
Chinkapook	Undergoing rehabilitation	Following rehabilitation, monitoring and management required
Lake Boga	Rehabilitation complete	On-going monitoring and management
Manangatang	Closed	To develop capping & rehabilitation plan; following rehabilitation, monitoring & management required
Nyah West	Rehabilitation complete	On-going monitoring and management
Piangil	Closed	To develop capping & rehabilitation plan; following rehabilitation, monitoring & management required
Ultima	Closed	To develop capping & rehabilitation plan; following rehabilitation, monitoring & management required
Wemen	Investigating options for rehabilitation	Following rehabilitation, monitoring and management required

While these landfills were not required to be licensed by the EPA and rehabilitation is not required to be approved by the EPA, guidance on best practice rehabilitation and aftercare can be found in the EPA's *Best Practice Environmental Management: Siting, Design, Operation and Rehabilitation of Landfills* (EPA 2014b).

4.6 Monitoring and reporting

There are a number of areas where data recording and monitoring at current facilities can be improved:

- There are gaps in data recorded on the amount of material entering and being recovered at existing facilities for recycling. This was noted as an issue in Section 3.1 when trying to benchmark current diversion within the municipality. Data recording systems could be improved to track the amount of material leaving each site for recycling destinations. Provision of information on recovered material leaving the site could be sourced from council contractors; this could be included as a requirement in future contract arrangements and would give SHRCC better information on community recycling efforts and allow targeted education initiatives; it may also lead to cost savings.
- Given the low usage rates of some facilities, there is value in better understanding current patterns of use. In particular, monitoring of the timing of traffic movements at smaller facilities (such as Manangatang, Piangil and Ultima) would allow targeting of resources to busiest times, and allow some rationalisation of operating hours. An examination of the traffic movements at Robinvale landfill may also prove beneficial in matching future operating hours with available resources.
- As mentioned in Section 3.3, there is opportunity to improve the inventory control system of material diverted for resale at Swan Hill landfill. Regular monitoring of material at the resale centre and improved presentation can increase community interest in the materials for sale and improve amenity, management and turnover at the facility.
- Establishment of the new transfer station at Swan Hill landfill has the potential to change the pattern of use of the site. Upon its completion, monitoring systems should be implemented to allow SHRCC to gain an understanding of how well the transfer station meets its objectives.

Regular monitoring and review of the waste management strategy is important to ensure the continued evolution of waste management services in Swan Hill. This strategy should be reviewed and updated as actions are implemented and new initiatives arise throughout the municipality.

Financial issues

A number of issues can impact upon the financial operations of the waste management services offered by SHRCC.

Funding opportunities may be available from external sources such as the Victorian Government (e.g. Sustainability Victoria or Regional Development Victoria) to improve landfill or transfer station infrastructure or for the implementation of new collection services. Other bodies (such as the Australian Packaging Covenant or Keep Victoria Beautiful) may also from time to time provide funding or in-kind support for specific waste activities or equipment. Some of these funding opportunities may be facilitated on a regional basis by Loddon Mallee WRRG; SHRCC should maintain communication with the WRRG to ensure they are aware of, and can act on, relevant funding opportunities as they arise.

There may be other revenue-enhancing opportunities open to SHRCC, including increasing revenue from sale of recovered items, e.g. through the resale shop at Swan Hill landfill, and improving return of income from sale of materials separated for recycling. These avenues are subject to existing contractual arrangements with council's waste management contractor (currently Ellwaste) and would need to be examined as part of any new contractual negotiations in 2017 (discussed in Section 4.5). Should SHRCC continue to outsource waste management to a private contractor, criteria for contractor selection should include options for optimising value-for-money. This may not necessarily be solely a financial criterion, but include a 'triple bottom line' consideration to deliver environmental, social and financial sustainability for SHRCC residents.

Landfill levies are applied by the Victorian Government and collected by the EPA. From 1 July 2015, the basis of landfill levy rates changed to a monetary unit, and it is likely that CPI indices will apply on future monetary units every financial year. SHRCC should plan for applicable annual rises in the landfill levy when setting disposal charges for waste at their landfills. Through the Loddon Mallee WRRG, SHRCC should also maintain awareness of any planned changes or government discussion on the level of landfill levies.

When examining the rate of disposal fees to be charged each financial year, SHRCC should also consider rates applying at nearby facilities. With a number of SHRCC facilities located close to boundaries with neighbouring municipalities, differential disposal fees may encourage use of SHRCC facilities by non-residents; alternatively SHRCC residents and businesses may utilise external facilities, with resulting impacts on SHRCC relationships with neighbouring municipalities. SHRCC should incorporate these considerations into pricing decisions that deliver optimum benefit for long-term waste planning.

Pricing decisions should also be based on total recovery of waste management costs. As well as covering existing costs of collection and management, this should include provision for future costs arising from infrastructure management and development (such as landfill cell construction, site rehabilitation, ongoing management and monitoring, and development of replacement sites where needed).

Future costs may also arise from the management of greenhouse emissions from landfilled waste. While the current Australian Government repealed the carbon tax (and its cost implications on landfills accepting putrescible waste), it is likely that some form of control on carbon emissions will take effect in the long term. Should this take the form of a market-based instrument (such as an emissions trading scheme), SHRCC may face financial implications arising from landfill operation. It would be prudent for

SHRCC to continue to monitor the legislative context of carbon emissions from landfills, and to budget for any financial impacts in waste disposal charges when known.

5. Assessment of options

5.1 SWOT analysis

An analysis of strengths, weaknesses, opportunities and threats (SWOT) was carried out in order to highlight issues relevant to development of future strategies for waste management. The analysis (in Figure 11) is consistent with standardised approaches to SWOT issues, in which strengths and weaknesses are of internal origin and opportunities and threats are external. In developing a strategy for waste management, the objective is to build on strengths, address weaknesses and threats, and transform opportunities to action.

Figure 11: SWOT analysis

STRENGTHS
<ul style="list-style-type: none"> Established kerbside collection services to majority of households in the municipality High service levels to community includes 3-bin system for garbage, comingled recycling and organic waste collection Existing facilities provide good coverage of population centres, with most residents within a 30 minute travel time to a waste and recycling facility Centralised contract management and administration capabilities in SHRCC Sole contractor allows flexibility in management across services and sites Long remaining lifespan of main landfill at Swan Hill, and potentially Robinvale landfill Financial resources established through annual waste management charges and competitive disposal fees
WEAKNESSES
<ul style="list-style-type: none"> High contamination levels in kerbside recycling undermine future viability of comingled recycling Significant number of closed landfills require rehabilitation, on-going monitoring and/or management Distance to recycling markets in metropolitan areas involves high transport costs Information & data gaps on recycling performance Limited resources (human or financial) available for large waste projects or community education programs Small volumes of waste limit some options and economies of scale which could otherwise be achieved Reduced airspace at Swan Hill landfill and costs associated with new cell planning, development and construction
OPPORTUNITIES
<ul style="list-style-type: none"> Opportunity for increased community engagement in waste minimisation and recycling activities Potential for collaboration and resource-sharing with other councils under regional arrangements via Loddon Mallee WRRG Victorian Government infrastructure and program funding opportunities likely to continue in foreseeable future (although reduced from previous levels) Localised recycling initiatives can lead to 'green' employment opportunities Potential to expand garden organics collection service Potential for establishing local/regional organics processing facility

-
- Increased C&I recycling opportunities could improve local business efficiencies
 - Extension of national product stewardship schemes may underwrite opportunities for enhanced recycling
-

THREATS

- Enhanced environment protection measures likely to be regulated over time, with potential for increased landfill standards and subsequent costs in future
 - Potential landfill ban on e-waste
 - Uncertainty over waste quantities and source entering Swan Hill landfill
-

5.2 Triple bottom line assessment

Criteria

Potential options discussed in Section 4 have been listed and assessed in Table 7 (page 32) using a 'triple bottom line' approach that analyses environmental, social and financial impacts. The overall likely outcomes have been considered on a net positive or negative basis.

The following issues were considered in assessing the environmental, social and financial impact of waste management 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.
- Financial:
 - cost of implementation and operation

All costs estimated in Table 7 (page 32) are based on current prices. Note some costs are highly dependent on the scope and methodology of the option involved (e.g. education campaigns, infrastructure size, public or private development); where costs cannot be estimated, a low/medium/high category has been allocated as applicable.

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

Table 7: Environmental, social and financial impact assessment

	Management action	Environmental impact	Social impact	Financial impact	Overall assessment
MINIMISATION	Council leadership	Reduced waste generation, increased recycling, improved eco-footprint	Establishes preferred behaviours, meets community expectations	Low – staff time and external communication	Positive
	Advocacy	Potential reduction in waste generation, increased recovery	Establishes preferred behaviours, supports local enterprises & community initiatives	Low – staff time and external advertising	Positive
	Charging mechanisms	Potential reduction in waste generation and increased recovery	Service targeted to community demand	Financial incentives, cost subject to tender costs & community demand	Uncertain, subject to analysis at contract expiry
EDUCATION	Awareness and education program	Potential reduction in waste generation, increased recovery & reduced consumption of resources	Establishes preferred behaviours, improves policy compliance	Costs uncertain, subject to scope of program & external input (Loddon Mallee WRRG)	Positive, though degree subject to program. Delivery within structured budget likely to provide positive benefit.
COLLECTION & RECOVERY	Potential extension of collection services to rural households	Potential increased recovery, additional resource consumption & emissions from increased transport	Improved level of service to small number of households (numbers unknown without further analysis)	Costs unknown as households & services to be provided unknown.	Uncertain, subject to further analysis
	Offer option of 80 L and/or make 120 L garbage bins standard	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. Reduced income from rates. Reduced disposal fees.	Uncertain, subject to further analysis
	Waste/recycling audits	Potential for improved recovery	Provision of recycling service threatened by high contamination rates Improved data reporting & management systems	Costs per audit (~\$5,000-10,000 subject to regional participation) less than impact of withdrawal of recycling service	Positive
	Develop action program to reduce recycling contamination	Potential for improved recovery and reduced waste to landfill	Establishes preferred behaviours, improves policy compliance	Minimal costs in development of action plan. Further costs dependent on scope and breadth of required actions.	Positive

Management action	Environmental impact	Social impact	Financial impact	Overall assessment
Investigate Robinvale recycling contamination levels and carry out targeted education program if necessary	Potential for improved recovery and reduced waste to landfill	Establishes preferred behaviours, improves policy compliance	Minimal costs in further investigations. Cost communication campaigns subject to scope and breadth	Positive
Potential extension of recycling services to small businesses	Potential for improved recovery	Increased level of service Potential for improved viability of local businesses	Costs subject to level of business interest	Uncertain, subject to further analysis
Expand garden organics collection service	Increased diversion of organics from landfill, reduced greenhouse emissions	Increased level of service to community	Service costs passed on to residents; some additional staff costs in promoting take-up	Positive
Expand garden organics collection to other townships	Increased diversion of organics from landfill, decreased landfill emissions, increased vehicle emissions from new collection routes	Improved services to community, encourages further participation in resource recovery	Service costs passed on to residents, some additional upfront costs (amount unknown) for council (administration, promotion, etc)	Uncertain, subject to further analysis of scope, take-up rates, etc
Examine potential to add food organics to current organics collection	Potentially large reduction in waste to landfill, reduction in greenhouse gas emissions from landfill	Improved service to community Regional employment opportunities from new infrastructure required	Implementation includes processing infrastructure development; costs may be medium/high subject to public/private sector involvement, level of regional cooperation, etc	Uncertain, subject to further analysis
Improved method of organics processing to Australian Standard levels	Reduced environmental impact Generation of value-add products for soil improvement & enhanced growing conditions	Improved amenity Regional employment opportunities from new infrastructure required	Implementation includes processing infrastructure development; costs may be medium/high subject to public/private sector involvement, level of regional cooperation, etc	Uncertain, subject to further analysis
Research end markets for agricultural plastics	Potential for increased recovery	Improved service to community	Research costs <\$5,000 Material transport costs subject to recycling feasibility	Positive (implementation subject to further analysis)

Management action	Environmental impact	Social impact	Financial impact	Overall assessment
Stay informed on product stewardship developments	Potential for improved environmental management of hazardous waste & increased recovery	Potential for increased level of service to community and cooperative arrangements with industry & government	Additional staff costs minimal; information sharing via Loddon Mallee WRRG	Positive
Expand education programs to C&I sector	Potential for improved waste management & resource efficiencies	Increased engagement with local businesses Potential for improved sustainability of businesses	Costs uncertain, subject to scope of program & external input (e.g. Loddon Mallee WRRG, Sustainability Victoria)	Positive, though degree subject to program.
Expansion of kerbside cardboard & plastic recycling to C&I sector	Potential for increased recovery	Increased level of service to business community	Costs & revenue to private contractor. Minimal council staff costs incurred in encouraging contractor to expand service	Positive
Investigate with Ellwaste the current coverage of C&I recycling services. Assess opportunities to expand the service.	Potential for increased recovery	Increased level of service to business community	Costs & revenue to private contractor. Minimal council staff costs incurred in investigating current coverage.	Positive
C&I SECTOR Monitor application of NSW waste levy	Slow reaction to changing levies may increase need for additional landfill airspace	Maintains service to community	Implementation of appropriate charging regime to maximise revenue & minimise costs	Positive
Identify C&I organics diversion opportunities	Potential for improved environmental protection, decreased greenhouse emissions	Provision of local solutions for waste Increased level of service to business community Potential employment opportunities from new infrastructure & services	Research costs <\$5,000 Implementation costs subject to need for new infrastructure	Positive
Investigate the amount and frequency of C&I waste deposits at SHRCC landfills from neighbouring jurisdictions	Reduced waste to landfill	Greater understanding for council staff on origins of waste Improved relationship with neighbouring jurisdictions	Council staff costs Failure to investigate/act may lead to landfill reaching capacity before projected	Positive

Management action	Environmental impact	Social impact	Financial impact	Overall assessment
Benchmark landfills to best practice standards and manage accordingly	Potential for improved environmental protection	Improved community amenity Decreased risk of council liability Increased knowledge of council staff	Benchmark costs ~\$5,000-10,000 Additional costs subject to improvement works required Decreased risk of EPA fines	Positive, dependent on required works
Monitor landfill throughput & remaining airspace to plan for new cells	Provision of adequate infrastructure for appropriate landfill disposal of waste	Maintains service to community	Annual costs for council staff & landfill engineers. Costs uncertain, subject to need for volumetric surveys & timing. High cost of lack of planning (new infrastructure development costs).	Positive
Swan Hill landfill & transfer station upgrades	Improved recovery & reuse Improved environmental management	Improved level of service to community	Development costs subject to design of transfer station (currently being developed by council)	Uncertain, subject to infrastructure costs
Carry out landfill gas emission monitoring from Swan Hill landfill	Potential for improved environmental protection	Improved community amenity Decreased risk of council liability	Annual cost to council for monitoring program and analysis of results. Reduces risk of council liability	Positive
Assess future operation of Robinvale landfill	Potential for improved recovery and enhanced environmental protection	Maintain service to community Potential to improve community amenity	Assessment costs ~\$20,000-25,000 Ongoing infrastructure costs subject to findings	Positive
Upgrade resource recovery systems at Robinvale landfill	Improved recovery Improved environmental protection	Provision of best practice standards for community use Improved OHS outcomes Reduced risk of council liability	Upgrade costs ~\$30,000-50,000 subject to scale, equipment source, etc	Positive
Upgrades to Manangatang transfer station	Improved recovery Improved environmental protection	Provision of best practice standards for community use Improved OHS outcomes Reduced risk of council liability Better targeting of council resources	Upgrade costs ~\$20,000-30,000 subject to scope	Positive
Upgrades to Piangil transfer station	Improved recovery Improved environmental protection	Provision of best practice standards for community use Improved OHS outcomes Reduced risk of council liability	Upgrade costs ~\$20,000-30,000 subject to scope	Positive

INFRASTRUCTURE

Management action	Environmental impact	Social impact	Financial impact	Overall assessment
Upgrades to Ultima transfer station	Improved recovery Improved environmental protection	Provision of best practice standards for community use Improved OHS outcomes Reduced risk of council liability Better targeting of council resources	Upgrade costs ~\$20,000-30,000 subject to scope	Positive
Review patronage and coverage of landfill and transfer station network	Dependent on outcome of review Decreased resource recovery Improved environmental protection	Potential reduction to community access to waste facilities	Minimal staff cost Uncertain depending on outcome of review	Positive
Review current facility management contracts	Dependent on outcome of review Improved resource recovery	Maintain service to community Potential to improve community amenity	Minimal staff cost Uncertain depending on outcome of review of current contracts Increased value for money	Positive
Research cost-benefit of bringing waste management services in-house	Dependent on outcome of research Potential for improved outcome for waste and resource recovery	Dependent on outcome of research Maintain service to community Potential to improve community amenity	May require external consultant Dependent on outcome of research Potential for reduced cost of services	Positive. Slight uncertainty around results of research
Rehabilitate, monitor & manage closed landfill sites	Improved environmental protection	Improves community amenity Reduces risk of council liability Reduces OHS risk Asset potentially available for public re-use	High rehabilitation and ongoing monitoring costs, scale subject to timing, local availability of materials, etc. Costs less than potential financial liability of failure to act.	Positive
Research and negotiate for an alternative management option for nightsoil waste and close nightsoil depots	Improved outcome for waste Improved environmental protection	Improves community amenity Reduces risk of council liability Reduces OHS risk	Uncertain dependent upon alternative management option	Positive. Slight uncertainty around cost of alternative management
Review current landfill and transfer station disposal fees	Improved outcome for waste Improved environmental protection Improved resource recovery	Maintain service to community Potential to improve community amenity	Minimal staff cost. Dependent on changes to disposal fees	Positive
Upgrade recycling data recording systems	Minimal	Improved information management systems Enhanced accountability	Minimal staff costs; to be incorporated into future contractor reporting requirements	Positive

Management action	Environmental impact	Social impact	Financial impact	Overall assessment
Build and maintain a relationship with the planning section of council	Minimal	Improved community amenity Decreased risk of council liability Maintains service to community	Minimal staff cost	Positive
Investigate funding opportunities to incorporate MRF facility at Swan Hill landfill	Minimal	Improved community amenity Decreased risk of council liability Maintains service to community	Minimal staff costs Medium/high – dependent on cost required to move facility	Positive
MONITORING & REPORTING	Expand monitoring of traffic movements at transfer stations	Improved information management systems Better targeting of council resources	Minimal staff costs Potential for cost savings from rationalisation of operating hours	Positive
	Review and update waste strategy as required	Continuously improved service to community, improves transparency and accountability	Low/medium – staff time low for annual review, medium for more in-depth updates	Positive
	Actively monitor regional, state and Commonwealth informational streams for issues which may have a financial impact	Minimal. Depends on nature of issue if they arise	Unknown	Low/medium – staff time low for monitoring. Depends on nature of issues if they arise

6. Conclusions & recommendations

Current situation

Nearly all residents in the municipality are serviced with kerbside collection services for waste and recycling. The service covers all townships within the municipality and more than 99% of households. Kerbside garden organics collections are currently provided to residents only in Swan Hill on an optional, fee-for-service basis.

While recycling systems are well established, there is a significant issue with contamination. Specifically, there is a high rate of contamination in recycling bins from the Robinvale township and this requires further investigation and potential education campaigns. It is also apparent that the overall diversion rate is relatively low in comparison to regional, state and national data and that this rate has become relatively static (see Figure 3). As a result there is significant scope to improve recycling outcomes.

Residents are serviced by a network of two landfills (at Swan Hill and Robinvale) and three transfer stations (at Manangatang, Piangil and Ultima). A major redevelopment of the Swan Hill site (including establishment of a transfer station) is currently underway. Some minor upgrades of the other sites would be required to meet best practice standards. Most of the community is within 30 minute travel time of a waste management facility.

Council also manages the contracts for two nightsoil deposit depots and negotiations with Lower Murray Water (LMW) and/or adjacent councils with treatment facilities are in train to accept nightsoil waste for disposal in their facilities.

Future direction

Swan Hill Rural City Council recognises the importance of providing a sustainable natural environment to the community and its role in helping to grow the economic and community wellbeing throughout. With this in mind, the strategies developed as part of this waste management strategy seek to minimise waste and optimise resource recovery.

Recommendations have been developed to assist in achieving these goals and are outlined in the proposed implementation plan on a short (0-2 years), medium (3-5 years) and long (greater than 5 years) timescale. Table 8 (overleaf) provides a summary of the proposed recommendations and implementation plan.

In response to the implementation plan SHRRC has developed a detailed management action plan which can be found in Appendix A. This plan nominates specific actions, responsible council officers and dates for completion of actions as appropriate.

Table 8: Recommendations & implementation plan

Action	Timetable		
	2015-17	2017-20	> 2020
Waste minimisation			
Provide leadership in waste minimisation & recovery achievements			
Council advocacy in the community			
Examine potential financial incentives for waste minimisation			
Community education			
Raise community awareness through education programs (in conjunction with Loddon Mallee WRRG)			
Collection & recovery			
Assess potential for expansion of collection services to rural households			
Assess feasibility of option for 80L and/or standard 120L garbage bin system			
Undertake regular waste and recycling audits			
Assess interest in & feasibility of providing kerbside comingled recycling collection services to small businesses			
Develop action program to reduce recycling contamination			
Investigate Robinvale recycling contamination and carry out targeted communications			
Increase take-up of garden organics collection services by Swan Hill residents through promotion activities			
Assess feasibility of expanding garden organics collection services in other townships			
Examine potential to add food organics to garden organics collection			
Establish composting system capable of processing garden & food organics			
Identify recycling options for agricultural plastics			
Identify opportunities to participate in product stewardship initiatives as they are implemented			
C&I sector			
Establish local business education programs			
Encourage contractor to expand cardboard & plastic recycling			
Monitor NSW landfill levies & consider impacts on SHRCC landfills			
Identify C&I organics diversion opportunities			
Investigate cross municipal movement of waste			
Infrastructure			
Benchmark landfills to best practice standards & manage accordingly			
Monitor landfill throughput & remaining airspace to plan for new cells			
Develop proposed Swan Hill transfer station & implement best practice standards			
Carry out landfill gas emission monitoring from Swan Hill landfill			
Assess future operation of Robinvale landfill			
Upgrade resource recovery systems at Robinvale landfill			

Action	Timetable		
	2015-17	2017-20	> 2020
Upgrade Manangatang transfer station to meet best practice			
Upgrade Piangil transfer station to meet best practice			
Upgrade Ultima transfer station to meet best practice			
Review patronage and coverage of landfill and transfer station network			
Review facility management contracts			
Research cost-benefit of bringing waste management services in-house			
Rehabilitate, monitor and manage closed landfill sites			
Research and negotiate for alternative nightsoil management			
Research and negotiate an alternative management option for nightsoil waste and close nightsoil depots			
Review current landfill and transfer station disposal fees			
Investigate funding opportunities to incorporate MRF facility at Swan Hill landfill			
Monitoring and reporting			
Upgrade recycling data recording systems			
Monitor traffic movements at transfer stations			
Review and update waste strategy as required			
Monitor financial and carbon emission issues			

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Appendix A

Swan Hill Rural City Council detailed management action plan

In Table A1, action officer descriptions refer to:

- SWMO – Senior Waste Management Officer
- PE – Projects Engineer
- PO – Projects Officer
- EDU – Economic Development Unit
- LMWRRG – Loddon Mallee Waste and Resource Recovery Group.

Table A1: Detailed management action plan

Action	Action officer	Date for completion
Waste minimisation through council leadership		
Investigate methods of improving internal waste reduction and recycling	SWMO	2018
Publicise achievements in Council's newsletter	Media	Ongoing
Investigate composting bin for food waste generated	Environment	2017
Investigate using recycled products on local projects	PE	2018
Waste minimisation through advocacy		
Participating in waste reduction programs through the state government and LMWRRG	SWMO	Ongoing
Waste minimisation through charging mechanisms		
Investigate alternative charging systems for waste collection through frequency or weight based charging systems	SWMO	2017
Community education		
Investigate and implement where viable education programs/awareness around the following areas;		
– waste reduction around the home		
– waste collection services	SWMO/	Ongoing
– recycling services	LMWRRG	
– recycling options at the landfill		
– promotion of the Big Green Shed		
– illegal dumping.		
Investigate adding additional links to Council website with regards to waste education/recycling	SWMO/PO	2016
Produce/supply a regular article in the Council newsletter	Media	Ongoing
Investigate the cost of producing a multipage "Household Waste and Recycling Guide"	PO	2016
Collection and recovery through collection systems		
Investigate the viability of making the 120 litre bin the standard bin	SWMO	2017
Identify and investigate options to reduce contamination levels in the kerbside recycling service	SWMO	2016
Investigate the option of carrying out annual audits of the waste collection bins (similar to the recycling audit)	PO	2017
Investigate the level of interest in expanding the kerbside and recycling	SWMO/Rates	2017

Action	Action officer	Date for completion
service to small businesses in Swan Hill and Robinvale		
Collection and recovery of organics		
Continue expanding current green waste collection through promotion of the service	PO	Ongoing
Investigate the interest and viability of expansion of the green service to other towns (Lake Boga and Robinvale)	PO	2016
Investigate the viability of including the collection of food organics with the green waste and the technology available to process the waste	PO	2017
Investigate methods to improve garden waste processing to achieve an Australian Standard level	Environment	2018
Collection and recovery of special wastes		
Research end markets for agricultural plastics	SWMO	2019
Stay informed on product stewardship developments for;		
– E-waste	SWMO	Ongoing
– tyres		
Investigate alternate methods of disposal for specific waste streams, as new technologies become available	SWMO	Ongoing
Continue to participate in the Detox Your Home Program	SWMO	Ongoing
Continue to participate in the drumMuster program	SWMO	Ongoing
Collection and recovery through commercial and industrial sector		
Develop an education program for the C&I sector	SWMO/ LMWRRG	2016
Investigate the expansion of the cardboard and plastic recycling service with waste contractor	SWMO	2017
Investigate with waste contractor the current coverage of C&I recycling services and assess opportunities to expand the service	SWMO	2017
Monitor the application of the NSW waste levy	SWMO	Ongoing
Identify Commercial and Industrial organic diversion opportunities	EDU	2018
Investigate the amount and frequency of C&I waste deposited at the Swan Hill landfill from neighbouring municipalities	SWMO	2016
Infrastructure		
Assess landfill against best practice standards and implement actions where needed	SWMO	2017
Monitor waste volumes through weighbridge and available airspace for planning of new cells	SWMO	Ongoing
Carry out upgrades to the Swan Hill landfill and transfer station/resource recovery area	PE	2016
Continue environmental monitoring of the landfill site (landfill gas and groundwater monitoring)	SWMO	Ongoing
Assess the future of the Robinvale landfill site prior to the start of the next management contract	SWMO	2017/2020
Assess the resource recovery area at the Robinvale landfill against best practice standards and upgrade as necessary	PE	2017

Action	Action officer	Date for completion
Assess Manangatang transfer station against best practice standards and upgrade as necessary	PE	2017
Assess Piangil transfer station against best practice standards and upgrade as necessary	PE	2016
Review Ultima transfer station with the intention to close the site at the end of the current management contract	SWMO/PO	2017/2020
Review patronage and coverage of landfill and transfer station network	SWMO	2016
Continue to rehabilitate, monitor and manage closed landfill sites	SWMO	Ongoing
Research and negotiate for an alternative management option for nightsoil waste and close nightsoil depots	SWMO	2016
Continually review landfill and transfer station disposal fees	SWMO	Ongoing
Review data collection and recording systems	SWMO	2016
Investigate funding opportunities to incorporate MRF facility at Swan Hill landfill	SWMO	Ongoing
Monitoring and reporting		
Monitor transfer station usage	SWMO	Ongoing
Review and update waste strategy as required	SWMO	Ongoing
Monitor regional, state and commonwealth information streams for issues which may have a financial impact	SWMO	Ongoing
Review Swan Hill landfill risk assessment profile	SWMO	2016
Engage a consultant to review landfill surrounding land uses and develop plans to assess future surrounding development requirements	Planning	2016