Riverina
And
Murray
Regional
Organisation of
Councils

Regional Waste Strategy 2014-2020

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Contents

1. Introduction 1
   1.1 The Region 1
   1.2 Introduction to the Strategy 2
   1.3 Policy context 2
2. Where are we today? 8
   2.1 Population and demographic information 8
   2.2 Waste and resource recovery collection systems 9
   2.3 Waste and resource recovery tonnage data 11
   2.4 Waste and resource recovery collection, processing and disposal contracts 17
   2.5 Current and planned waste and recycling infrastructure within the region 17
3. Where do we want to get to? 23
   3.1 Vision for the strategy 23
   3.2 Strategic outcomes 24
   3.3 Targets and performance measures 24
4. How are we going to get there? 25
   4.1 Identifying options and delivery mechanisms 25
   4.2 Theme One: Avoid and reduce waste generation 27
   4.3 Theme Two: Increase Recycling 28
   4.4 Theme Three: Divert More Waste From Landfill 29
   4.5 Theme Four: Manage problem wastes better 30
   4.6 Theme Five: Reduce the incidence of litter 31
   4.7 Theme Six: Reduce illegal dumping 32
5. How will the strategy be implemented? 33
   5.1 Action plan 33
   5.2 Tasks list per theme 34
6. Appendix A – Regional Landfill Rationalisation Review 38
7. Appendix B – Model Transfer Station Design 43
8. Appendix C – FOGO collection/processing in Griffith, Leeton and Narrandera 47
9. Appendix D – Mini MRF processing facility in Griffith, Leeton, Narrandera 50
10. Appendix E – Deniliquin Community Drop Off Centre 54
11. References 57

Abbreviations

Abbreviation	Full form
C&D	Construction and Demolition (waste)
C&I	Commercial and Industrial (waste)
CMRWMG	Central Murray Regional Waste Management Group
DCP	Development control plans
EPR	Extended Producer Responsibility
FOGO	Food organics and garden organics
HH	Household
MRF	Materials Recovery Facility
MSW	Municipal Solid Waste
MUDs	Multi-unit dwellings
pa	per annum
RAMROC	Riverina and Murray Regional Organisation of Councils
Residual waste	Garbage waste disposed in the red-lidded bin
Rest of NSW	Includes the 80 most remote NSW LGAs
RWMWG	Regional Waste Minimisation Working Group
SME	Small to medium enterprises
SWMMP	Site Waste Minimisation and Management Plan
SUDs	Single unit dwellings
tpa	Tonnes per annum
TS	Transfer station
WARR	Waste and Resource Recovery Strategy
WLRM	Waste Less Recycle More
WMC	Waste Management Centre
WRAPP	Waste Reduction and Purchasing Policy
wk.	Week

1. Introduction

1.1 The Region

The Riverina and Murray Region lies in south-western NSW and is bordered on the south by the state of Victoria and on the east by the Great Dividing Range. The primarily rural agricultural land encompasses the Murray, Murrumbidgee, Lower Murray-Darling and Lachlan Valley catchment areas. While the area includes a mix of regional centres and medium sized towns, it is predominately made up of rural shires large in area but small in population.

The region is regarded as Australia's food bowl. The high soil fertility, flat plains, warm to hot climate and abundance of water in the Riverina floodplain makes the region one of the most productive farming areas in the country, producing more of Australia's fruit and dairy produce than any other region. Agricultural production includes rice, wheat, maize, canola, citrus and wine grapes, as well as significant general horticulture and mixed farming. In addition to agriculture, manufacturing and tourism also play a part in the region's economy.

Established in 2007, the Riverina and Murray Regional Organisation of Councils (RAMROC) is a voluntary local government group that brought together the former Murray ROC and Riverina ROC and represents the interest of eighteen member Councils (Figure 1). The two separate and separately funded groups that operate under the RAMROC banner are the Murray Waste Group and Riverina Waste Group.

Figure 1 The RAMROC region

Of the 18 member Councils that make up RAMROC, 17 are participating in this Regional Waste Strategy (Table 1). Urana Shire Council has membership with two waste groups and has chosen to participate in the Regional Waste Strategy of the Riverina Eastern Regional Organisational of Councils.

Table 1 RAMROC Councils

Region	RAMROC Councils	
Murray Waste Group	Albury	Deniliquin
	Greater Hume	Conargo
	Corowa	Wakool
	Berrigan	Wentworth
	Murray	Balranald
Riverina Waste Group	Hay	Leeton
	Jerilderie	Griffith
	Narrandera	Carrathool
	Murrumbidgee	

1.2 Introduction to the Strategy

RAMROC does not currently have a regional waste strategy in place. Therefore this is the first time the member Councils have come together to collectively agree on a future strategic direction for improving waste management and resource recovery practices across the region.

This *Regional Waste Avoidance and Resource Recovery Strategy* (Strategy) demonstrates RAMROC's commitment to adopting a strategic approach to waste management. Having been developed according to the Environment Protection Authority's 2014 guidelines, this Strategy is also consistent with the State Government's NSW Waste Avoidance and Resource Recovery Strategy 2013-21 (WARR Strategy) and sets the stage for a unified approach to waste management issues in the region.

This strategic and cooperative approach to the way waste is managed across the region will support individual Councils not only in improving resource recovery and directing waste away from landfill but also in addressing the increased costs associated with waste management.

Implementation of this Strategy can assist individual Councils to:

- Improve recycling and resource recovery rates;
- Reduce contamination of recyclables;
- Reduce waste going to landfill;
- Achieve cost savings;
- Deliver educational campaigns to improve waste management behaviour;
- Achieve higher environmental standards; and
- Improve community reputation and standing.

Waste management and resource recovery in particular, has been a major challenge for the RAMROC region as the Councils are geographically large, sparsely-populated, and rural/remote in nature. The low volumes of waste generated in rural townships and large travel distances have hindered the aggregation of waste materials for recycling and the rationalising of landfill operations. The Strategy explores options for addressing current waste management challenges and for introducing effective and sustainable waste and resource recovery practices across the region.

1.3 Policy context

1.3.1 National legislation and policy

NATIONAL WASTE POLICY

The Commonwealth Government has limited constitutional powers to engage directly in domestic waste management issues. This responsibility rests largely with State, Territory and local governments. However,

the Commonwealth Government has taken on a strategic involvement in waste policy development, releasing the 2009 *National Waste Policy*: *Less Waste, More Resources*.

The broad aims of the policy are to:

- Avoid the generation of waste;
- Reduce the amount of waste (including hazardous waste) for disposal;
- Manage waste as a resource;
- Ensure that waste treatment, disposal, recovery and re-use is undertaken in a safe, scientific and environmentally sound manner; and
- Contribute to the reduction in greenhouse gas emissions, energy conservation and production, water efficiency and the productivity of the land.

The National Waste Policy Implementation Plan outlines the roles and responsibilities of all levels of governments in working towards achieving sixteen priority waste strategies. These strategies include reducing biodegradable organic material sent to landfill, improving the reuse of C&I waste streams, removing impediments to the development of effective markets for recovered resources, improving certainty and reducing costs for investment in waste infrastructure.

Extended Producer Responsibility Schemes

At a national level, select waste streams are also managed through a number of Extended Producer Responsibility (EPR) schemes. EPR schemes aim to minimise waste generation and maximise recycling by having manufacturers take responsibility for the impact that a product's lifecycle has on the environment. Although participation in EPR schemes is generally voluntary, the majority of them are funded or supported by government in various ways.

A number of EPR schemes are operating in Australia (Table 2). The most widely supported scheme by individual RAMROC Councils is the provision of Drum*MUSTER* collection points at Council landfills and transfer stations. ChemClear, another popular EPR scheme collected over 600L of leftover chemical waste from the region's farmers in 2013 while the participation of many of the region's Councils in the Computer and Electronic waste program has resulted in a large quantity of e-waste being diverted for recycling.

Under the Product Stewardship Act 2011 any future mandatory or co-regulatory approaches that will be developed or considered in the following year must be published before regulations may be made for that class of product. As of June 2013 the 2013-14 Product List identified packaging, paint, hand held batteries (under 2 kg), and refrigerators and air-conditions with small gas charges as some of the products for which a regulatory approach was being considered.

Councils are required to support EPR programs implemented by the Commonwealth and/or State Governments and are expected to assist in their implementation at a local level. The most recent EPR scheme to be put in place in Australia is the National Tyre Product Stewardship Scheme, which was established in January 2014.

Table 2 EPR schemes in Australia

Waste Type	Waste of Concern [a]	Type of Scheme	Scheme description
Packaging	Yes	Co-regulatory	Australian Packaging Covenant 2010 applies to any 'brand owner' of a product. Signatories are required to prepare action plans and demonstrate continually improvement to reducing packaging waste.
Mobile Phones	Yes	Voluntary	MobileMuster is funded by telecommunications carriers and handset brand owners through a 42c levy on each handset sold.
Agricultural and veterinary chemicals and drums	Yes	Voluntary	ChemClear and Drum*MUSTER* are operated by AgStewardship Australia. The programs have been in operation since 2003, and are funded by a 4c per L (or kg) levy collected under the Industry Waste Reduction Scheme.
PVC	Yes	Voluntary	The PVC Product Stewardship Program is an industry led scheme by the Vinyl Council of Australia.
Used Oil and Lubricants	Yes	Regulated	The Product Stewardship for Oil program was the first, and until recently, only regulated product stewardship scheme run by the Australian Government.
Tyres	Yes	Voluntary	The National Tyre Product Stewardship Scheme is administered by Tyre Stewardship Australia. The scheme will place a 25 cent levy on tyres to increase domestic tyre recycling, expand the market for tyre-derived products and reduce the number of end-of-life tyres that are sent to landfill, exported as baled tyres or illegally dumped
Mercury Containing Lamps	Yes	Voluntary	The FluoroCycle program is a government and industry initiative to increase recycling of mercury-containing lamps from the commercial and public lighting sector. The program is funded by the Commonwealth, which has engaged Lighting Council Australia to manage the program.
Computers and Televisions	Yes	Co-regulatory	National Television and Computer Stewardship Scheme, importers, manufacturers and suppliers of new TVs and computers will meet their product stewardship obligations by either becoming a member of an approved 'Product Stewardship Organisation' arrangement or seek approved arrangement administrator status as an individual company.
Newspapers	No	Voluntary	EPR scheme run by the Publishers National Bureau since 1990.

Source/Notes

a) As identified by the Environmental Protection and Heritage Council and the 2007 NSW EPR Priority Statement (http://www.epa.nsw.gov.au/resources/warr/101012EPRrpt.pdf)

1.3.2 State legislation and policy

The NSW State Government's waste management framework aims to provide a consistent regulatory and policy approach to minimise harm to the environment and encourage waste avoidance and resource recovery. To achieve this, the NSW State Government uses a mix of legislative, policy, strategy, educational and economic tools (Table 3).

The NSW Government administers the waste regulatory framework through the state's primary environment protection legislation, the *Protection of the Environment Operations (POEO) Act 1997*, together with the *Waste Avoidance and Resource Recovery (WARR) Act 2001* and the *Protection of the Environment Operations (Waste) Regulation 2005*. These key statutes contain the requirements for managing, storing, transporting, processing, recovering and disposing of waste.

Since 2005, the Government has implemented a levy on landfilled waste as a regulatory measure to drive waste avoidance and resource recovery by providing an economic incentive to reduce waste disposal and

stimulate investment and innovation in resource recovery technologies. The Waste and Environment Levy (also known as the Section 88 or s.88 levy) is charged at the gate of landfills that operate in 'regulated areas' – the Sydney Metropolitan Area, the Extended Regulated Area and the Regional Regulated Area. 'Non-regulated areas' are termed '*Rest of NSW*' and include the RAMROC region as well as other relatively remote areas of NSW.

Effectively the waste levy is a tax paid by the waste generator and collected by landfill operators, on behalf of the NSW government. Funds collected are allocated to the state's general revenue, and some portion is earmarked for reinvestment in the waste sector and for increasing waste diversion from landfill.

At present, as RAMROC does not sit within the regulated areas, there is no requirement for the region's landfill operators to pay a levy on waste deposited at their site. However, the POEO Act is currently under review and it is expected that landfills that receive more than a few thousand tonnes per year may be captured by the Section 88 levy in the future. To assist with the transition, it is also expected (based on a verbal commitment made by the NSW EPA) that the NSW government will provide up to $50,000 towards the cost of a weighbridge for sites affected by the soon-to-be-announced changes to the POEO Act.

Table 3 NSW waste legislative, regulatory and policy framework

Legislation	Policy and Strategy	Guidelines
• Environmental Planning and Assessment (EP&A) Act 1979 • Protection of Environment Operations (POEO) Act 1997 • Waste Avoidance and Resource Recovery (WARR) Act 2001 • Protection of the Environment Operations (Waste) Regulation 2005 • Protection of Environment Operations (Waste) Amendment (Residue Wastes) Regulation 2005	• Draft Waste Avoidance and Resource Recovery (WARR) Strategy 2013-2021 • Extended Producer Responsibility Priority Statement 2010 • Waste Reduction and Purchasing Policy • Waste Less Recycle More Initiative 2013 • NSW Illegal Dumping Strategy 2013-15 • NSW Energy from Waste Policy Statement 2014	• Environmental Guidelines: Solid Waste Landfills, 1996 • Environmental Guidelines Use and Disposal of Biosolid Products, 2000 • Environmental Guidelines: Composting and Related organics Processing Facilities, 2004 • Good Practice Performance Measures for Kerbside Recycling Programs, 2004 • Reducing Contamination of Dry Recyclables and Garden Organics at Kerbside, 2007 • Crackdown on Illegal Dumping: Handbook for Local Government, 2007 • Guidelines for Conducting Household Kerbside Residual Waste, Recycling and Garden Organics Audits in NSW Local Government Areas, 2008 • Waste Classification Guidelines, 2009 • Preferred Resource Recovery Practices by Local Councils Best Bin Systems, 2012

The management of waste is a key priority for the NSW State Government. Waste related goals in '*NSW 2021: A plan to make NSW number one*' include achieving recycling targets as a key priority ('Goal 23'), as well as reducing litter ('Goal 23'), reducing illegal dumping ('Goal 22'), and supporting community recycling drop off centres to improve the management of household hazardous wastes (Goal 23).

NSW released its first waste strategy in 2003. It was subsequently updated in 2007 and again in 2013. The Draft 2013 WARR Strategy is one of the key policy tools being used to meet a number of waste management goals, including the updated targets for reducing waste to landfill (Table 4).

Table 4 NSW recycling rates and diversion from landfill targets

Waste type	RAMROC 2013 Diversion	NSW 2010-11 Diversion	2014 Diversion Targets	2022 Diversion Targets
MSW recycling	27%	52%	66%	70%
C&I recycling	Not reported	57%	63%	70%
C&D recycling	Not reported	75%	76%	80%
Overall diversion from landfill	n/a	n/a	n/a	75%

Overall, the Draft 2013 WARR Strategy sets the strategic agenda for recycling and waste avoidance in NSW. It is designed to provide a continuing framework that will guide actions to achieve the NSW State Government's policy objectives of minimising environmental harm from waste generation, and conserving and maximising resource use. The WARR Strategy establishes targets for six key result areas that have been identified as waste management priorities in NSW (Table 5).

Table 5 WARR Strategy key result area and targets

	Key Result Area	Target
1	**Avoid and reduce waste generation**	By 2021-22 reduce the rate of waste generation per capita
2	**Increase recycling**	By 2021-22 increase recycling rates for: - MSW from 52% in (2010-11)to 70% - C&I from 57% (in 2010-11) to 70% - C&D from 75% (in 2010-11 to 80%
3	**Divert more waste from landfill**	By 2021-22 increase waste diverted from landfill from 63% to 75%
4	**Manage problem waste better**	By 2021-22 establish or upgrade 86 drop off facilities or services for managing household problem waste state-wide
5	**Reduce litter**	By 2016-2017 reduce the number of litter items by 40% compared to 2011-12 levels and then continue to reduce litter items to 2021-22
6	**Reduce illegal dumping**	Implement the NSW Illegal Dumping Strategy 2013-15. By 2016-2017 establish baseline data to allow for setting targets.

Waste Less Recycle More

The NSW EPA's Waste Less Recycle More (WLRM) initiative is funded by revenue raised by the landfill waste levy and aims at improving waste management and resource recovery practices to achieve the targets set out in the WARR Strategy. The WLRM initiative provides for a total of $465.7 million over a 5 year period to 2017 to be invested directly into waste related activities.

The first round of grant program funding to become available has been:

- Householders' Asbestos Disposal Scheme;
- Local Government Organics Collection Systems;
- Community Recycling Centres;
- Resource Recovery Facility Expansion and Enhancement;
- Combating Illegal Dumping: Clean-Up and Prevention;
- Love Food, Hate Waste;
- Organics Infrastructure (Large And Small) Fund;
- Major Resource Recovery Infrastructure Fund; and
- Litter Prevention Grants Program.

RAMROC member Councils have taken advantage of the first round of grant funding that closed in February and March 2014 and submitted a number of funding proposals. Applications submitted by individual Councils included proposals for Community Recycling Centres at Albury, Deniliquin, Murray and Griffith; an expression-of-interest application for Combating Illegal Dumping and a litter Prevention Gran by the Riverina Waste Group; and a regional RAMROC application for the Love Food Hate Waste program.

The WLRM initiative includes a Local Government Waste and Resource Recovery program that will provide $7 million to support regional and rural local councils with landfill consolidation and closure, building and upgrading of transfer stations, and environmental improvements to small landfills servicing rural communities. A number of RAMROC member Councils have expressed a particular interest in this program, however specific funding opportunities have yet to be announced by the EPA.

1.3.3 Relevant Regional Strategies

With the exception of the Councils listed below, most of the 17 RAMROC members do not have individual waste strategies in place:

- Deniliquin Council Waste Strategy implemented in 2010;
- Conargo Shire Council Strategic Waste Management Plan 2014;
- Albury Waste Strategy 2012-2020;
- Greater Hume Waste Strategy 2012-2017; and
- Murray Waste Management Strategy (draft released in mid 2014).

Wakool Council does not have an individual strategy; however, it has adopted the neighbouring Victorian Central Murray Regional Waste Management Group's (CMRWMG) Waste Management Plan. Wakool Council's Vision 2023 Community Strategic Plan states that Council will 'reduce waste to landfill through effective waste management and using Central Murray Regional Waste Management Group waste minimisation strategies'.

At a sub-regional level, the Regional Waste Minimisation Strategy 2008 aimed to review the management of the Albury Waste Management Centre (WMC). The main objective of the RWMWG Strategy was to extend the life of Albury's main landfill. Twelve priority recommendations were outlined in the Strategy, one of which was reviewing and increasing the Albury landfill gate fee, and introduce a voluntary levy. The recommendation was implemented and the funds raised from the levy were used to design and deliver 'Halve Waste': a waste minimisation and public awareness and education campaign covering all waste streams. The Albury WMC is the largest landfill in the region, and the largest landfill in NSW outside of the Sydney metropolitan area. The Regional Waste Minimisation Working Group's (RWMWG) Strategy was developed by the three RAMROC Councils of Albury City, Corowa and Greater Hume in cooperation with the neighbouring Victorian Councils of Indigo, Towong and Wodonga.

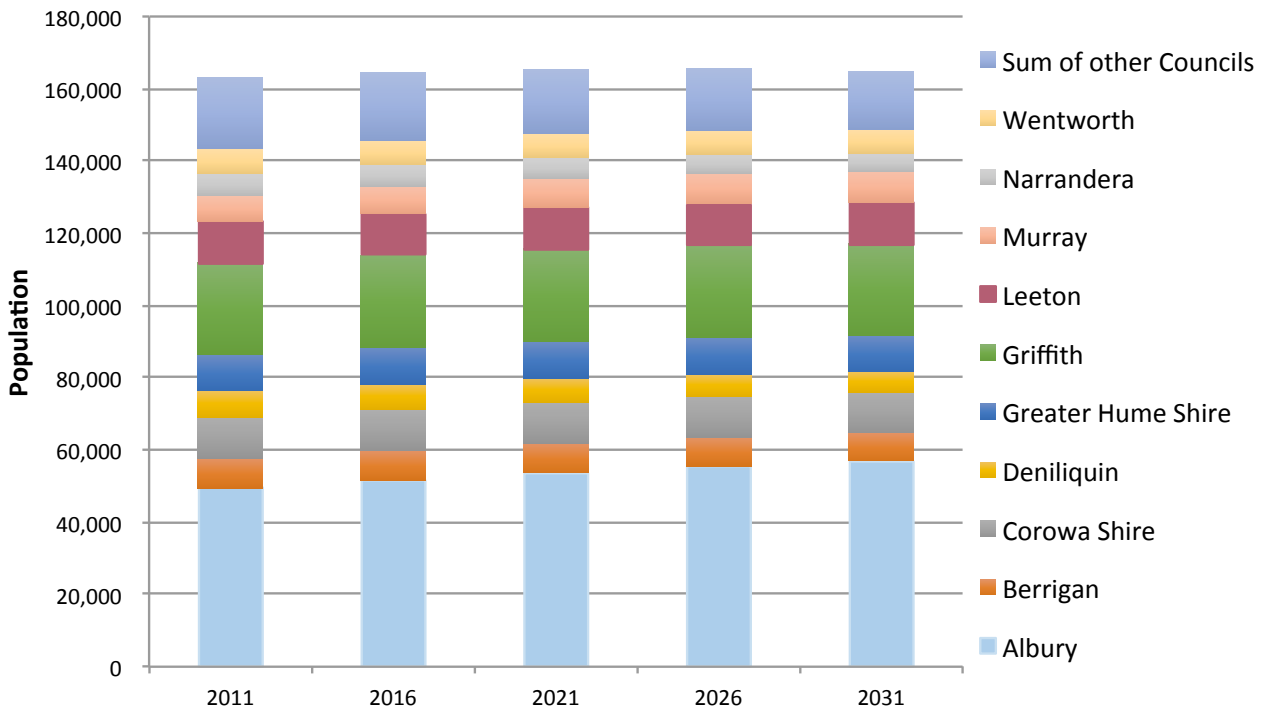
2. Where are we today?

2.1 Population and demographic information

The RAMROC region is relatively sparsely populated with a population of just over 166,000 persons across an area of 126,595km^2. Approximately 30% of the region's population lives in the regional hub of Albury. Together the four Councils of Albury, Griffith, Leeton and Corowa comprise 84% of RAMROC's total population.

The 2014 NSW Statistical Local Area Population Projections show that overall annual rate of population growth in RAMROC is expected to decline in the future with 14 of the 17 member Councils expecting a decrease in population. The population growth anticipated in Albury, Conargo, Griffith and Murray will lead to a slight net regional population increase over the next years, bringing the region's overall population to approximately 165,000 persons in 2031 (Figure 2).

Figure 2 Future population projections



Source: Department of Planning (2014) New South Wales Statistical Local Area Population Projections, 2011-2031.

Of the region's 66,558 households, 61,038 receive a kerbside residual waste collection service (92% of all households) while 51,676 also receive a kerbside recycling collection service (78% of all households). As RAMROC is a predominately rural area, 96.5% of the population lives in single unit dwellings, or SUDs. Table 6 shows that Albury, Deniliquin and Leeton have the highest proportions of multi-unit dwellings or MUDs (12%, 9% and 8% respectively).

Table 6 Demographic profile of the RAMROC region

Council	Number of Individual Households [a]	% SUDs	% MUDs	Socio –Economic Index (rank)[b]	Population Density (person/km^2)[c]
Albury	21,435	88%	12%	91	161
Balranald	893	99%	1%	46	0.1
Berrigan	3,000	95%	5%	59	4
Carrathool	1,419	100%	0%	80	0.1
Conargo	733	100%	0%	129	0.2
Corowa	5,485	100%	0%	75	4.9
Deniliquin	3,356	91%	9%	39	51.1
Greater Hume	3,240	98%	2%	102	1.7
Griffith	7,852	94%	6%	72	15.4
Hay	1,226	98%	2%	26	0.3
Jerilderie	803	96%	4%	112	0.5
Leeton	4,732	92%	8%	61	9.8
Murray	3,798	100%	0%	99	1.6
Murrumbidgee	879	98%	2%	28	0.7
Narrandera	3,349	96%	4%	24	1.5
Wakool	1,769	96%	4%	86	0.5
Wentworth	2,689	96%	4%	88	0.3
RAMROC	**66,658**	**93.5%**	**6.5%**		**14.9**

Source/Notes

a) NSW Local Government Data Report 2011-12

b) All NSW areas are ordered from the lowest to highest score, then the area with the lowest score is given a rank of 1, highest rank is 153

c) ABS Population Density (estimated resident population) 30 June 2011

2.2 Waste and resource recovery collection systems

All RAMROC Councils, except for the predominantly rural Conargo Shire, provide a kerbside residual waste collection service in major townships. Ten of the seventeen participating member Councils also provide a kerbside recycling collection service. This service offering is set to increase in 2014 as Wentworth has recently tendered to introduce a household kerbside recycling collection service[1].

Albury City and Corowa Shire will soon be the first RAMROC Councils to introduce a compulsory weekly FOGO collection service. The introduction of a FOGO collection service was scheduled to have already commenced, however opposition to building an organics processing facility in neighbouring Greater Hume Shire has delayed its launch. When the FOGO collection service is introduced, the new organic bins will be collected weekly and the general waste and recycling bins will be collected fortnightly on alternate weeks.

Griffith City, Murray Shire, Leeton Shire, Narrandera Shire, Wentworth Shire and Deniliquin Councils, have all expressed an interest in introducing an organics collection service in the future. Greater Hume Shire Council reviewed the cost of introducing an organics collection service but has ruled against the possibility at present due to the increased cost that would be incurred by rate payers. Table 7 summarises the household collection services provided by RAMROC Councils.

[1]The tender process was undertaken in partnership with the neighbouring Mildura Rural City Council located in Victoria.

Table 7 Council household collection services (2011/2012)

Council	Residual Waste		Recycling		FOGO
	Bin Size	Frequency	Bin Size	Frequency	Details
Albury	140L	Weekly	240L	Fortnightly	To commence soon
Balranald	240 L	Weekly	*No service*		*No service*
Berrigan	120 L	Weekly	240 L	Fortnightly	*No service*
Carrathool	240L	Weekly	*No service*		*No service*
Conargo	*No service*		*No service*		*No service*
Corowa	240 L	Weekly	240L	Fortnightly	To commence soon
Deniliquin	240 L	Weekly	*No service*		*No service*
Greater Hume	240 L	Weekly	240 L	Fortnightly	*No service*
Griffith	240 L	Weekly	240 L	Fortnightly	*No service*
Hay	240L	Weekly	*No service*		*No service*
Jerilderie	240 L	Weekly	*No service*		*No service*
Leeton	240 L	Weekly	240 L	Fortnightly	*No service*
Murray	140 L	Town – weekly Rural – fortnightly	240 L	Fortnightly	*No service*
Murrumbidgee	240 L	Weekly	240 L	Fortnightly	*No service*
Narrandera	240 L	Weekly	240 L	Fortnightly	*No service*
Wakool	120 L	Weekly	240 L	Fortnightly	*No service*
Wentworth	240 L	Weekly	240 L	Fortnightly[2]	*No service*

Collected residual household waste is disposed at one of the local, Council owned landfills. At present, there are no local operators or facilities to process recyclable or organic waste in RAMROC. To reduce landfill space consumption, organic waste is source separated and collected at landfills or transfer station sites and is generally burnt on site.

Kerbside recyclables formerly processed by the Cleanaway MRF that was decommissioned in August 2012, are now collected and transported to a Materials Recovery Facility (MRF) in Wagga Wagga or to various facilities located in Victoria. A new MRF is under construction in Albury and scheduled for operation by December 2014.

RAMROC Councils also provide opportunities for households to recycle various materials at local transfer stations and some of the 43 landfill sites across the region. Table 8 details the additional resource recovery services offered by each Council. As the individual resource recovery collection points are not available at every landfill or transfer station, collection of some materials is limited to different parts of a Council area.

[2] Scheduled to commence in July 2014.

Table 8 Resource recovery collection services offered by RAMROC Councils (2011/2012)

Council	White Goods	Paper/cardboard	Plastics	Glass	Metals	Batteries	E-waste	Gas bottles	Motor Oil	Green waste	Mattresses	C&D	Tyres	Drum*MUSTER*	Paint
Albury	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Balranald Shire					✓					✓		✓		✓	✓
Berrigan		✓			✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Carrathool					✓	✓				✓		✓	✓	✓	✓
Conargo		✓			✓	✓			✓					✓	
Corowa		✓		✓	✓	✓	✓	✓	✓	✓	✓[3]	✓	✓	✓	✓
Deniliquin	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Greater Hume		✓	✓		✓	✓		✓	✓	✓		✓	✓	✓	✓
Griffith	✓				✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Hay	✓	✓			✓				✓	✓			✓		✓
Jerilderie					✓		✓		✓	✓		✓			
Leeton	✓	✓			✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Murray	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓			
Murrumbidgee					✓				✓	✓		✓	✓		✓
Narrandera		✓			✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Wakool		✓			✓	✓	✓		✓	✓		✓	✓	✓	✓
Wentworth		✓			✓	✓		✓	✓	✓	✓	✓	✓	✓	✓

2.3 Waste and resource recovery tonnage data

A total of 83,286 tonnes of domestic waste was collected from households in the RAMROC region in 2011/2012. Of this total, 35% was from the highly populated area of Albury City Council. As Albury City Council uses kerbside recycling bins extensively and has a well-established and long running waste management system that focuses heavily on waste diversion from landfill, the household resource recovery rate at Albury was 42.2%. Only two other Councils, Berrigan and Wakool, recorded a higher resource recovery rate of 47.7% and 44.5% respectively. These resource recovery rates have been reported to the EPA by individual Councils and were obtained from the *NSW Local Government Waste and Resource Recovery Data Report 2011-2012*. The total domestic waste collection and resource recovery rates for each Council are shown in Table 9.

Leeton is the only Council that provides a kerbside clean up service in addition to the general household waste collection services. In 2011/2012, the service collected 4 tonnes of waste, of which 3 tonnes were recovered and diverted from landfill. Across the region, it was estimated that drop off recycling contributed a further 2,414 tonnes of collected waste, 98% of which was recovered (Table 10).

[3] Scheduled to start soon.

Table 9 Kerbside domestic resource generation, recovery and disposal (2011/2012)

Council	Total Recovered (t)	Total Disposed (t)	Total Domestic Generation (t)	Recovery Rate (%)
Albury	13,693	18,737	32,430	42.2%
Balranald	-	676	676	0.0%
Berrigan	1,449	1,590	3,039	47.7%
Carrathool	-	398	398	0.0%
Conargo	-	1,332	1,386	0.0%
Corowa	1,204	8,788	9,992	12.0%
Deniliquin	208	4,453	4,661	4.5%
Greater Hume	764	2,630	3,394	22.5%
Griffith City	2,067	7,203	9,270	22.3%
Hay	286	2,448	2,734	10.5%
Jerilderie	-	160	160	0.0%
Leeton	1,123	3,046	4,168	26.9%
Murray	412	2,529	2,941	14.0%
Murrumbidgee	154	391	545	28.2%
Narrandera	622	2,288	2,910	21.4%
Wakool	677	845	1,522	44.5%
Wentworth	-	3,059	3,059	0.0%
RAMROC	**22,658**	**60,573**	**83,286**	**27%**
Rest of NSW	189,724	341,324	531,049	36%
NSW	1,656,880	1,865,963	3,522,843	47%

Source: NSW Local Government Waste and Resource Recovery Data Report 2011-2012 as Reported by Councils.

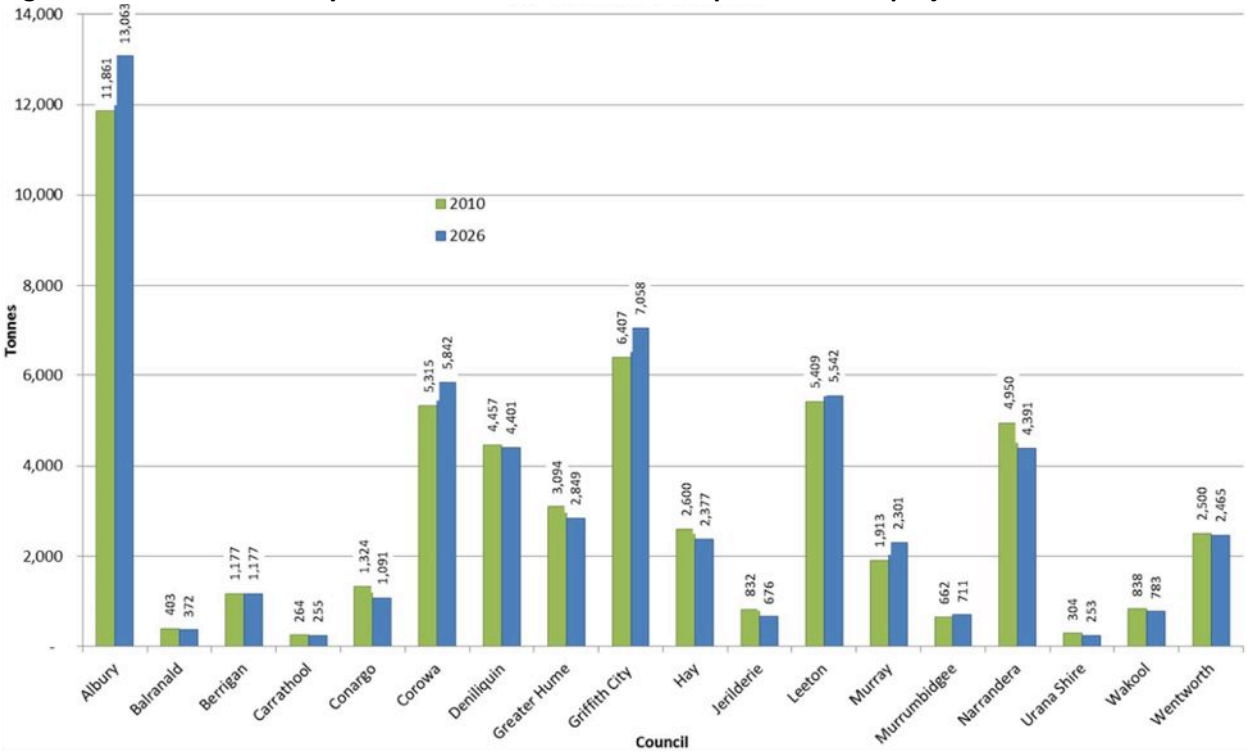
Table 10 Drop Off and Clean Up Recycling (2011/2012)

	Drop Off Recycling		Clean Up Recycling	
Council	Collected (t)	Recovered (t)	Collected (t)	Recovered (t)
Albury	475	435	-	-
Balranald	-	-	-	-
Berrigan	8	-	-	-
Carrathool	-	-	-	-
Conargo	55	55	-	-
Corowa	120	120	-	-
Deniliquin	208	208	-	-
Greater Hume	62	62	-	-
Griffith City	500	500	-	-
Hay	286	286	-	-
Hay	286	286	-	-
Jerilderie	-	-	-	-
Leeton	52	52	4	3
Murray	126	126	-	-
Murrumbidgee	-	-	-	-
Narrandera	182	182	-	-
Wakool	54	51	-	-
Wentworth	-	-	-	-
RAMROC	**2,414**	**2,363**	**4**	**3**
Rest of NSW	22,288	21,440	648	569
NSW	69,462	67,800	10,316	8,892

2.3.1 Waste trends and projections

Waste generation in Australia has a positive correlation with total population. As only the five Councils of Albury, Corowa, Murray, Murrumbidgee and Griffith are expected to experience an increase in population growth in the future these Councils are also likely to see an increase in waste generation. Waste generation by 2026 is projected to decrease in all other Council areas (Figure 3).

Figure 3 Waste landfilled by member Councils in 2010 compared to 2026 projections



Source: GHD (2013) RAMROC Audit of Regional Waste Facilities

2.3.2 Waste composition

Albury City Council is the only Council within RAMROC that has performed a residual kerbside bin audit. It is understood that the demographics of Albury are unique in comparison to other regional Councils within RAMROC, however in the absence of audit data from the other councils, Albury's results from the 2012 audit are used as a proxy for the waste composition of the region[4].

The 2012 Albury audit reported that the kerbside residual waste stream contained almost 70% potentially recyclable materials including Food/Kitchen Waste, Timber/Wood, and Garden/Vegetation Waste. Paper and cardboard accounted for almost half of the dry recyclable material lost to landfill. Glass bottles and jars and plastic containers numbers 1-5 represented the majority of the remaining lost recyclables. A FOGO collection service is yet to be introduced in Albury therefore 51% of the total content of residual bins consisted of food/kitchen waste (35.7%) and garden/vegetation waste (15.2%). A breakdown of the waste in the audited bins is presented in Figure 4.

In comparison to the State average, the Albury region is performing relatively well in terms of separating domestic kerbside waste. In 2012, residual bins in Albury contained approximately 4.2% less potentially recyclable material than the NSW State average. Nonetheless, Albury and NSW average composition profiles are quite similar, with the most notable difference being that the quantity of recyclable plastics found in the average NSW bin is more than double that found in the average Albury bin (Figure 5).

[4] Following the finalisation of the investigative part of this study, Murray Shire Council completed a kerbside audit.

Overall it was determined that with a three bin system in place and better waste source separation at the household level, kerbside waste sent to landfill could be reduced by as much as 69% in Albury.

Figure 4 Composition by weight of the domestic kerbside residual waste stream

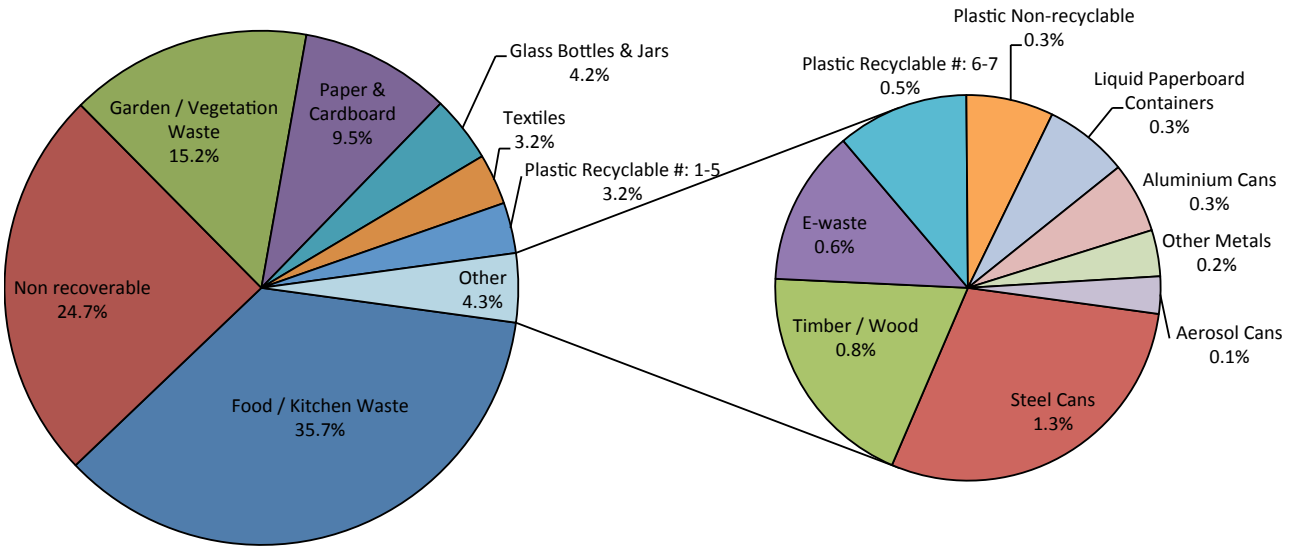
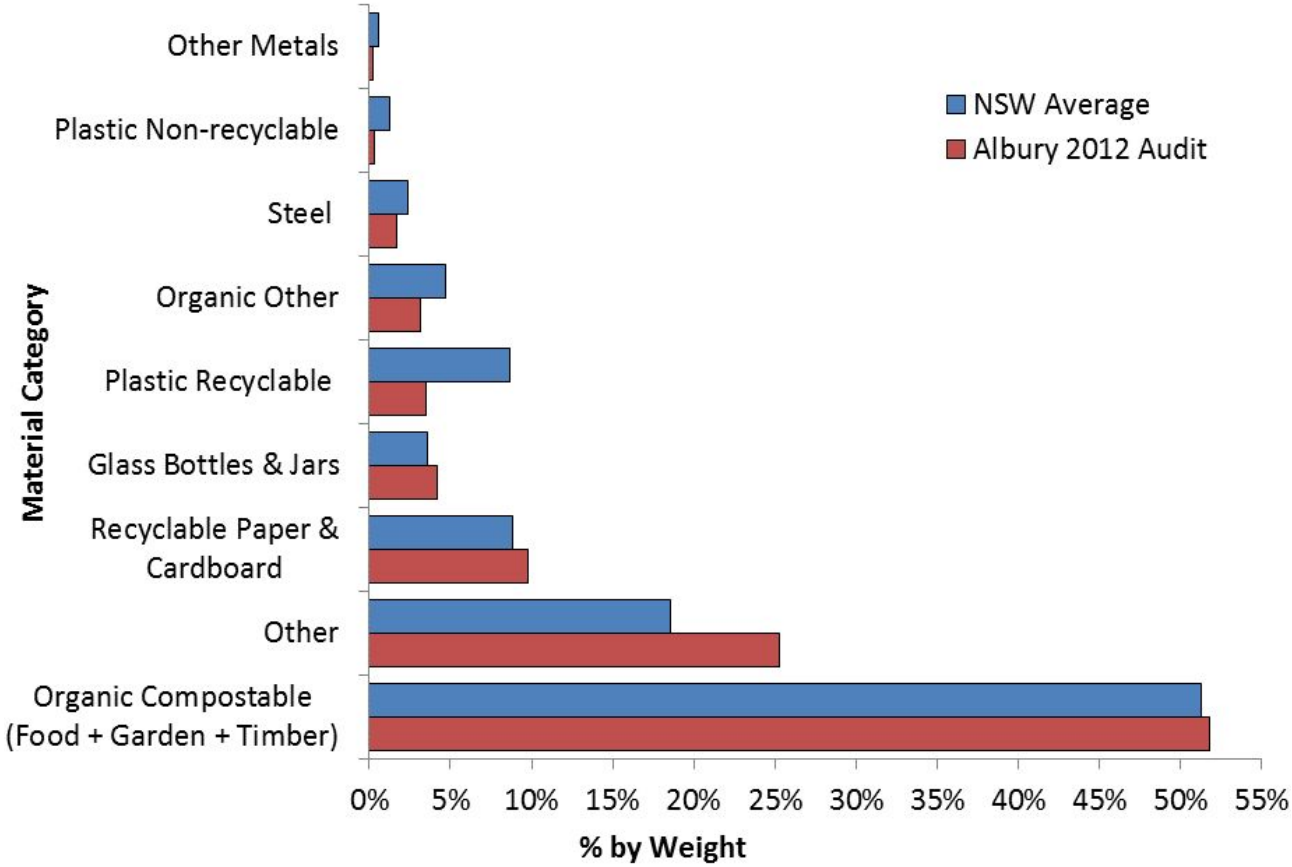


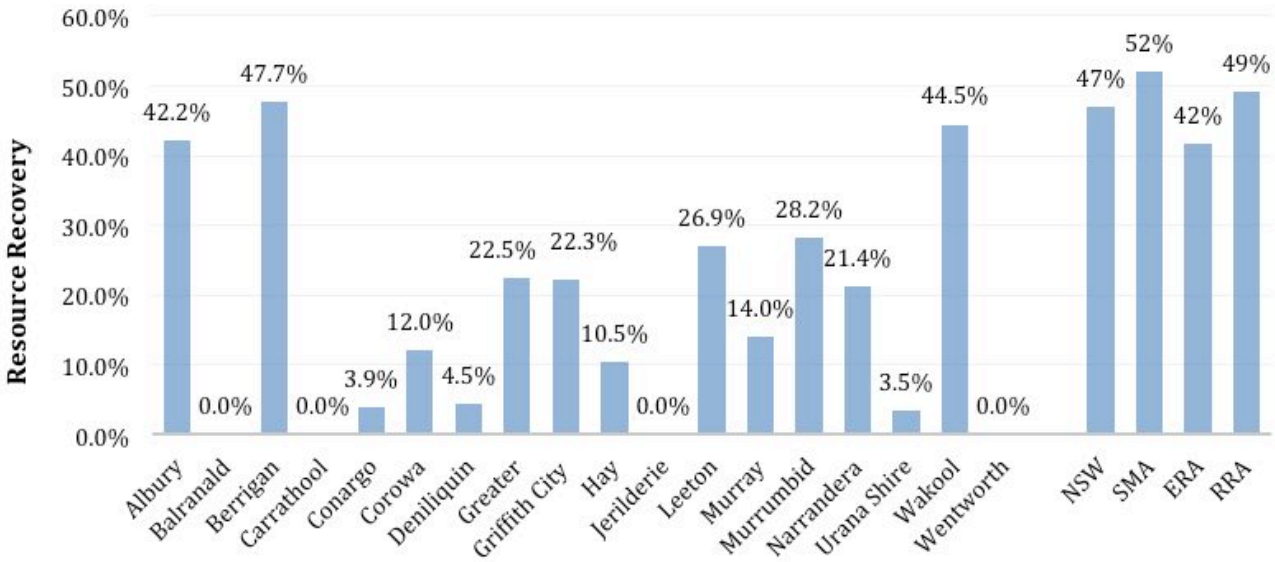
Figure 5 Comparison of domestic residual waste bin content - NSW average vs. Albury



2.3.3 Kerbside waste performance analysis

Seven of the seventeen participating RAMROC Councils do not currently provide a kerbside recycling service. Of these, Conargo recovers some of the domestic waste stream at the landfill. The performance of the ones that offer kerbside collection is variable with three Councils achieving overall resource recovery of above 40%, five achieving 20% or more and the rest ranging from 3.5% to 14% (Figure 6). As a result the overall rate of kerbside resource recovery is relatively low at 27%.

Figure 6 Resource recovery rate for the domestic waste stream 2011/2012



Regional waste data shows that RAMROC residents generate on average 9.0kg/capita/week of kerbside collected material. This is slightly lower than the NSW average of 9.4kg/capita/week and lower than the 10.3kg/capita/week waste generation rate for the Rest of NSW (Table 11).

Four of the 15 Councils that offer a recycling collection service have introduced smaller, 120L or 140L, bins for the residual stream. All other Councils provide both a 240L residual waste and a 240L recycling collection bin. Household resource recovery figures show that Councils with smaller residual waste bins achieve higher resource recovery rates. Albury City, Berrigan Shire, and Wakool Shire Councils utilise 120L or 140L residual waste bins and have achieved resource recovery rates of 42%, 47% and 44% respectively.

This is in line with the EPA's a preferred resource recovery practice for local councils to use 120L residual bins alongside a 240L yellow recycling collection bin[5] which aims to encourage and reinforce recycling and waste avoidance behaviours. Although this is a valid argument, experience has shown that in some instances the reason that there is a perceived high resource recovery rate for households with smaller residual waste bins is because as the residual bin becomes full, residual waste spills over into the kerbside recycling bin. Of the Councils that achieve more than 40% recovery, only Albury City has carried out kerbside recycling bin audits. To better assess recycling performance, it is recommended that future kerbside bin audits in all Councils also include the kerbside recycling bin.

[5] OEH (2011) Domestic Kerbside Waste and Recycling in NSW, Report on the results of waste audits of household kerbside collection systems 2007-2008

Table 11 Kerbside generation yield in RAMROC (kg/capita/week) in 2011/2012

Council	Per Capita (kg/wk.)		
	Recovered	Disposed	Total generation
Albury	5.32	7.28	12.61
Balranald	0.00	5.51	5.51
Berrigan	3.36	3.69	7.06
Carrathool	0.00	2.87	2.87
(Conargo)[6]	0.66	16.16	16.82
Corowa	2.05	14.95	17.00
Deniliquin	0.55	11.70	12.25
Greater Hume	1.46	5.04	6.50
Griffith City	1.57	5.48	7.05
Hay	1.78	15.20	16.98
Jerilderie	0.00	2.01	2.01
Leeton	1.89	5.14	7.03
Murray	1.11	6.79	7.90
Murrumbidgee	1.27	3.22	4.48
Narrandera	1.95	7.19	9.14
Wakool	3.19	3.98	7.17
Wentworth	0.00	8.67	8.67
RAMROC all	**1.6**	**7.3**	**8.9**
RAMROC offering kerbside service	**2.1**	**8.1**	**10.1**
Rest of NSW	3.7	6.6	10.3
NSW	4.4	5.0	9.4

Regional Waste Charges

At present RAMROC member Councils have a low average domestic waste management charge of $217 per household (Table 12). This is 24% lower than the '*Rest of NSW*' which is made up of councils with similar characteristics to those of RAMROC's members. If RAMROC was to increase this relatively low domestic waste management charge it would secure funds to expand waste collection services and therefore achieve higher resource recovery. The current low waste charges provide an opportunity for RAMROC Councils to consider reviewing their waste charges in the future. In increasing those charges, RAMROC needs to engage with residents and stakeholders in order to achieve community support, as there are considerable differences within the region. Currently some Councils are struggling with introducing gate fees to waste facilities while Conargo does not have a domestic waste management charge.

Table 12 Regional Waste Charges ($/household)

Region	Average charge
RAMROC	$217
Sydney Metropolitan Area (SMA)	$335
Extended Regulatory Area (ERA)	$321
Regional Regulated Area (RRA)	$347
Rest of NSW (incl. RAMROC)	$285

[6] Conargo does not offer a kerbside collection. The waste generation, recovery and disposal is for domestic, rural and business.

2.4 Waste and resource recovery collection, processing and disposal contracts

Five independent waste contractors have been engaged individually by Councils to provide waste collection services while some Councils such as Deniliquin, continue to operate their own waste service. The majority of collection contracts provide for collected household waste to be taken directly to local landfills for disposal. Table 13 outlines the service arrangements of each Council.

Table 13 Council collection contracts.

Council	Service	Service Provider	Contact Duration	Contract Expiry
Albury	MSW & recycling	Transpacific Cleanaway	12	2024
Balranald	MSW	Handford Earthmoving	ongoing	
Berrigan	MSW & recycling	DS Kendall	7	2015
Carrathool	MSW	Council	ongoing	
Conargo	No service			
Corowa	MSW & recycling	Transpacific Cleanaway	12	2024
Deniliquin	MSW	Council		
Greater Hume	MSW and recycling	Transpacific Cleanaway	12	2024
Griffith	MSW & recycling	JR Richards & Sons	10	2018
Hay		Handford Earthmoving	3.5	2014
Jerilderie	MSW	Deni Works Deniliquin Council	3	2016
Leeton	MSW & Recycling	JJ Richards	10	2018
Murrumbidgee	MSW	Council	ongoing	
	Recycling	JJ Richards	5	2015
Murray	MSW & Recycling	Ellwaste Pty Ltd	10	2017
Narrandera	MSW & Recycling	Transpacific Cleanaway	10	2020
Wakool	MSW & Recycling	Ellwaste Pty Ltd	5	2016
Wentworth	MSW	Transpacific Cleanaway (expired) New provider TBC	Expired November 2013 - Council is currently evaluating tenders, under a contract scheduled to cover 1 July 2014 to 30 June 2024.	
	Recycling	TBC	Council is currently evaluating tenders for this new service under a contract scheduled to cover 1 July 2014 to 30 June 2024	

2.5 Current and planned waste and recycling infrastructure within the region

CURRENT WASTE INFRASTRUCTURE

The 2013 RAMROC Audit of Regional Waste Facilities identified that 54 waste infrastructure sites, 42 landfills (two of which are located in Urana) and 12 individual transfer stations, were owned and managed by member Councils. Figure 7 provides an overview of the location and type of each facility while Table 14 provides more detail on each site.

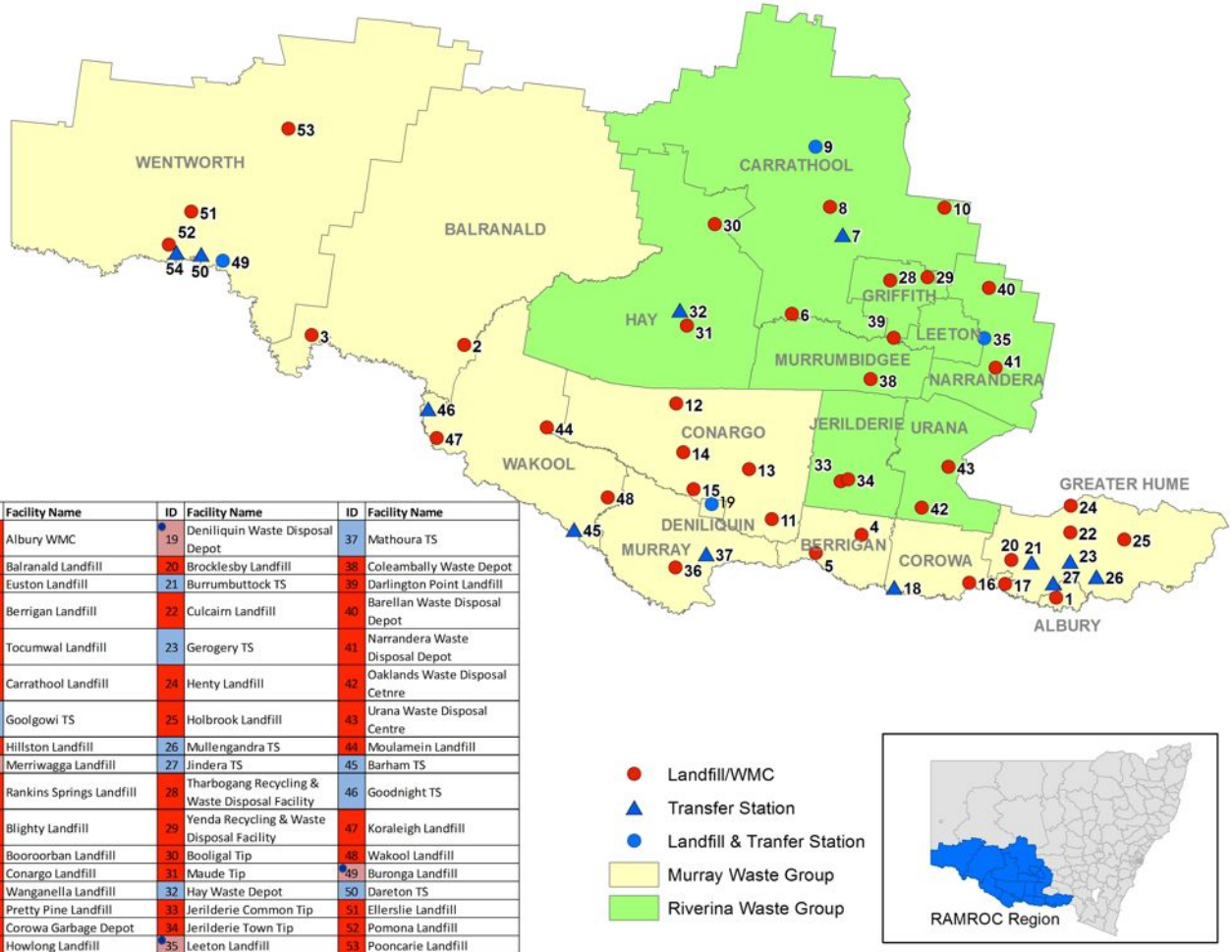
The majority of landfills are small rural sites with 23 of these receiving an annual reported tonnage of 500 tonnes or under. Only the Deniliquin, Albury WMC, Tharbogang WMC (Griffith), Leeton Landfill, and Moama Solid Waste Depot at Murray Shire Council have a disposal capacity in excess of 5,000tpa. These facilities, with the exception of Deniliquin, are also the only ones that have a weighbridge.

Resource recovery practices at landfills and transfer stations vary across the region. The most commonly collected materials for recovery are metals (separated further to ferrous and non-ferrous), cardboard, paper, gas bottles, motor oil and car bodies. However less than half of the sites reported collecting these materials (refer to Table 8).

Only a few sites process green waste for recovery or alternative use, and in general the green waste that is collected is burnt when stockpiles reach a certain size. In most instances, the green waste is burnt without being sorted and may therefore be contaminated with waste material, in particular plastics.

Landfill Tip Shops are currently operated at Leeton Shire Council and Deniliquin Shire Council, with another planned by Albury City Council.

Figure 7 Location of regional landfills and transfer stations



ID	Facility Name	ID	Facility Name	ID	Facility Name
1	Albury WMC	19	Deniliquin Waste Disposal Depot	37	Mathoura TS
2	Balranald Landfill	20	Brocklesby Landfill	38	Coleambally Waste Depot
3	Euston Landfill	21	Burrumbuttock TS	39	Darlington Point Landfill
4	Berrigan Landfill	22	Culcairn Landfill	40	Barellan Waste Disposal Depot
5	Tocumwal Landfill	23	Gerogery TS	41	Narrandera Waste Disposal Depot
6	Carrathool Landfill	24	Henty Landfill	42	Oaklands Waste Disposal Cetnre
7	Goolgowi TS	25	Holbrook Landfill	43	Urana Waste Disposal Centre
8	Hillston Landfill	26	Mullengandra TS	44	Moulamein Landfill
9	Merriwagga Landfill	27	Jindera TS	45	Barham TS
10	Rankins Springs Landfill	28	Tharbogang Recycling & Waste Disposal Facility	46	Goodnight TS
11	Blighty Landfill	29	Yenda Recycling & Waste Disposal Facility	47	Koraleigh Landfill
12	Booroorban Landfill	30	Booligal Tip	48	Wakool Landfill
13	Conargo Landfill	31	Maude Tip	49	Buronga Landfill
14	Wanganella Landfill	32	Hay Waste Depot	50	Dareton TS
15	Pretty Pine Landfill	33	Jerilderie Common Tip	51	Ellerslie Landfill
16	Corowa Garbage Depot	34	Jerilderie Town Tip	52	Pomona Landfill
17	Howlong Landfill	35	Leeton Landfill	53	Pooncarie Landfill
18	Mulwala TS	36	Moama Solid Waste Depot	54	Wentworth TS

Table 14 Regional waste facilities

Council	Landfills		Transfer Stations
	Facility Name	Remaining void (yrs.)	Facility Name
Albury	Albury Waste Management Centre	40	
Balranald Shire	Balranald Landfill		
	Euston Landfill		
Berrigan	Berrigan Landfill	25	Finley Recycling Centre
	Tocumwal Landfill	5	
Carrathool	Carrathool Landfill	20	Goolgowi Transfer Station
	Hillston Landfill	20	
	Merriwagga Landfill (incl. TS)		
	Rankins Springs Landfill		
Conargo Shire	Blighty Landfill	38	
	Booroorban Landfill	298	
	Conargo Landfill	18	
	Pretty Pine Landfill	14	
	Wanganella Landfill	230	
Corowa	Corowa Landfill		
	Howlong Landfill	40	Mulwala Transfer Station
Deniliquin	Deniliquin (incl. small TS)	40	
Greater Hume	Brocklesby Landfill	2	Jindera Transfer Station
	Culcairn Landfill	50	Gerogery Transfer Station
	Henty Landfill	2	Mullengandra Transfer Station
	Holbrook Landfill	50	Burrumbuttock Transfer Station
Griffith	Tharbogang WMC(Council to add TS)	12	
	Yenda WMC		
Hay	Booligal Tip	20	
	Hay Waste Disposal Depot	40	Hay Transfer Station (within the depot)
	Maude Tip	10	
Jerilderie	Jerilderie Common Landfill		
	Jerilderie Town Landfill		
Leeton	Leeton (incl. TS)	60	
Murray	Moama	75	Mathoura Transfer Station
Murrumbidgee	Coleambally Landfill		
	Darlington Point Landfill		
Narrandera	Barellan Waste Landfill	30	
	Narrandera Waste Disposal Depot	15	
Wakool	Koraleigh Landfill	20	Goodnight Transfer Station
	Moulamein Landfill	20	Barham Transfer Station
	Wakool Landfill	20	
Wentworth	Buronga (incl. TS)		
	Ellersile		Dareton Transfer Station
	Pomona		Wentworth Transfer Station
	Pooncarie		

Landfill Management Practices

The characteristics of each landfill site vary substantially. In general, operators have access to at least one piece of key equipment (compactor, excavator, bulldozer or front-end loader/wheeled loader) to manage the landfill. Although size and operational complexity are the most striking differences, there is also considerable variability in terms of provided services and the types of controls applied. At most sites customers pay at the gate according to the amount and type of waste; however there are a number of smaller sites where there is no charge as the sites are unmanned and unlocked.

The 2013 landfill audit recognised that there is an opportunity to improve landfill management across the region. Most landfill sites did not have basic operational documentation such as operations manuals and workplace health and safety plans, or environmental and landfill documentation. The audit supported the findings of a *Risk Assessment of Landfills and Transfer Stations* report completed by MRA for RAMROC in 2011. The risk assessment was conducted for 26 landfills and transfer stations within the Murray Waste Group region, and specified a range of performance standards for landfills and transfer stations. The risk assessment recommended a number of actions to remedy a number of high risk issues.

Key risks identified at landfill sites by both audits are:

- Vehicle and driver risks associated with reversing toward landfill and transfer station tipping faces;
- Green waste build-up and associated fire risk;
- Clean fill and soil contamination;
- Lack of litter control;
- Lack of odour management;
- Proximity to watercourses and lack of leachate management;
- Uncovered waste leading to litter and vermin issues; and
- Oil drums, batteries and chemicals being stored in unfenced areas.

Landfill fires pose an ongoing problem in the region. In 2012, changes were introduced to the management of the Jerilderie Council's landfills as the tip was continually being set alight while in December 2013 there was a suspicious fire at the Darling Point landfill in Murrumbidgee during a period of extreme fire conditions. The significant number of landfill fires in the past few years, some of which have been quite destructive, highlight the need for Councils to adopt and enforce strict environmental management practices.

In addition to fire risks, a number of landfills are located in sensitive environmental areas prompting some agencies to recommend improvements in management or even their closure. The Henty Landfill in the Greater Hume Shire Council highlights the potential threats to the environment of waste management facilities. The landfill is located adjacent to the Doodle Cooma Swamp a declared nature reserve covering 890 hectares. The area is prone to cyclical flooding, and for approximately six months of 2011 the access road to the landfill was impassable.

An additional environmental issue identified during site visits was the impact of landfill litter. Litter is an ongoing and consistent problem at many of the landfills where daily covering of waste is not a common practice. As a result, waste litter can be seen strewn across landfills as well as neighbouring properties - even at landfills enclosed by 10ft tall security fencing (Figure 8).

Figure 8 Litter on rice fields adjacent to a fenced landfill

Landfill Pricing

The majority of landfills in the region incur high operating costs per tonne of incoming waste. More importantly, some of the facilities appear to be unable to account for the full cost of operating a landfill. An initial review of the information presented in the audit showed that 13% of Councils claimed to have operating costs of under $30 per tonne, 32% were not able to provide the requested data on operating costs and 44% had operating costs above $100 per tonne. Only 11% of the landfills were confident that their operating cost was reasonable at between $30 and $100 per tonne. In order for Councils to be able to better assess the operation of their facilities, it is important that they proceed with performing a full cost accounting for the landfills they are operating and compare to costs at similar facilities in the region and nationally.

Given the number of landfills in the region and their high operating costs, a succinct business case was developed to evaluate the economic benefit of converting some landfills to transfer stations and using larger landfill sites within the region for disposal. In addition to reducing Councils operating costs through achieving economies of scale, converting small landfills to transfer stations will also significantly reduce the environmental risks associated with operating a waste disposal site (refer to Appendix A – Regional Landfill Rationalisation Review, for more information).

Transfer Stations

Past waste management practices in the region have favoured the construction of landfills over transfer stations as evident in Table 14. All of the 12 transfer stations in operation across the region are locked, and only open to the public at varying and limited times. The majority of these transfer stations provide stockpile and storage areas for metals, green waste, and batteries. Facilities in more populated areas also offer resource recovery for cardboard, tyres, C&D waste, gas bottles, motor oils, paint, e-waste, DrumMuster, cardboard, glass, and comingled waste.

Given the high cost and potential environmental issues associated with operating landfills, RAMROC member Councils would benefit from converting smaller landfills into transfer stations and use them to transport waste to larger, better managed, landfills.

Councils that decide to convert smaller landfills to transfer stations and transport waste to more cost-effectively operated landfills also stand to save considerable amounts.

The average industry cost of operating a transfer station is $25 per tonne, a significantly lower cost than that of most landfills in the region. Basic 'drive-up and tip-off' transfer stations would operate as an alternative to landfills and allow residence to drop waste into large suitably sized skip bins that are then transported to a nearby landfill. Modelling has shown that the cost of transporting the waste would be offset by the savings in operating the landfill (refer to Appendix B – Model Transfer Station Design).

FUTURE WASTE MANAGEMENT PLANS

Table 15 Future waste management plans

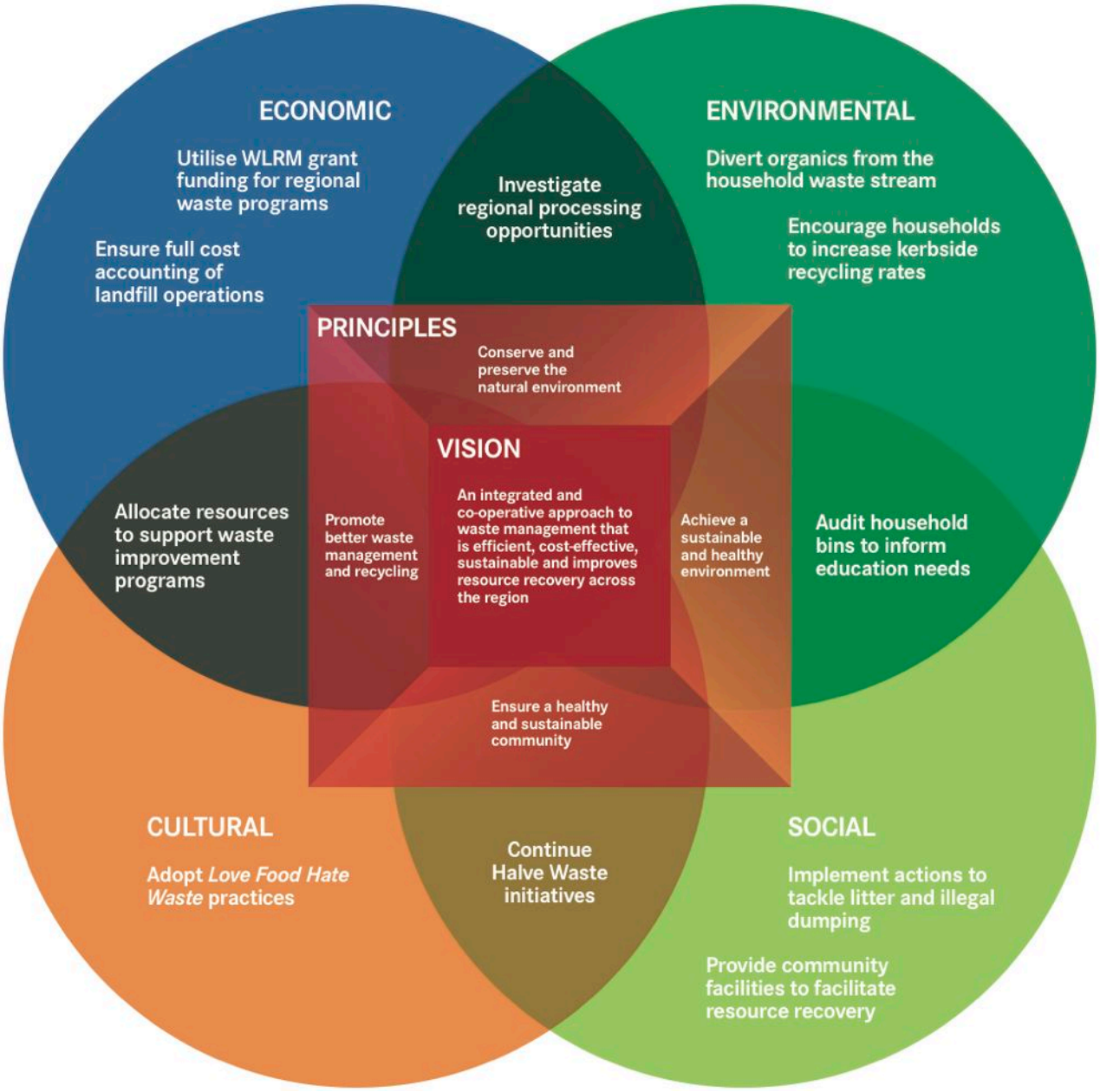
Council	Future Plans
Albury	The immediate priority for Council is the introduction of the FOGO collection service that was intended to commence in 2012. In addition to new waste infrastructure plans that are in place for the Albury WMC, the Council has also lodged five funding applications totalling $1.2m in the February 2014 round of WLRM grants. The outcome of those applications will influence the Council's waste management focus.
Berrigan	The Council is looking to build a transfer station at the Tocumwal landfill.
Conargo	The Council's 2014 Strategic Waste Management Plan provides future strategic direction, sets out alternative options for landfills with limited life expectancy and pledges that no landfills will be closed in the short term.
Corowa	Council is looking at the opportunity to convert one of its landfill sites to a transfer station and provide residents with a three bin system (introduction of organics collection service).
Deniliquin	There are plans to convert the landfill site to a large transfer station that will have the capacity to process a number of waste streams. The 2010 Deniliquin Landfill Strategic Plan recommended that the Council develop a dedicated Resource Recovery Centre, with associated office, weighbridge, tipping area, appropriate bins for small volume recyclables and large bins for the separation of general waste. The Council has also been approached for their organic waste stockpiles to be used as feedstock for a bio-digester ethanol plant following its construction. A WLRM grant application was made in February 2014 to assist in establishing a community recycling centre.
Greater Hume	Greater Hume is focused on identifying opportunities to improve waste management costs by rationalising its waste management infrastructure. Future planned landfill closures are in line with the outcomes of the Greater Hume Waste Management Strategy 2012-2017 (it should be noted that progress has been dampened due to community resistance to local landfill closures). Brocklesby Landfill is scheduled to close on 1 July 2015 and Henty Landfill is to either close or convert to a transfer station on 1 July 2015.
Murray	The Council is currently preparing an individual waste strategy which will focus on the feasibility of introducing a three bin system. A WLRM grant application was made in February 2014 to assist in establishing a community recycling centre.
Wentworth	There are long term plans to convert the smaller landfill of Pooncarie to a transfer station and significantly increase Buronga Landfill's capacity to a large regional landfill to meet future disposal needs. The Council has a strong working relationship with its neighbouring Mildura Council in Victoria whom they have tendered with for a household recycling collection service.

3. Where do we want to get to?

3.1 Vision for the strategy

An integrated and co-operative approach to waste management that is: efficient, cost-effective, sustainable and improves resource recovery across the region.

Figure 9 Vision, principles, and strategy action



3.2 Strategic outcomes

By working together to create a regional waste strategy, RAMROC Councils are committed to improving regional cooperation and looking to cooperatively identify opportunities to make recycling and resource recovery practices more economically viable in the region.

The key outcomes that RAMROC is aiming to achieve through development of this long term Strategy are to:

- Make a significant contribution towards the achievement of NSW's WARR Strategy targets;
- Reduce the amount of waste that is being directed to landfill;
- Improve and increase current services for household recycling and organics collection;
- Provide community education on best practice waste management; and
- Provide a sustainable and healthy environment through reducing the incidences of litter, illegal dumping, and number of landfills across the region.

3.3 Targets and performance measures

To ensure that as a region RAMROC is contributing towards achieving State wide waste objectives, RAMROC has chosen to develop regional targets that are in line with the WARR Strategy's six key result areas (Table 16).

Table 16 RAMROC waste strategy targets

WARR Strategy Key Result Areas	RAMROC Target
Avoid and reduce waste generation	Maintain regional waste generation at 9kg per capita.
Increase recycling	Achieve a regional resource recovery rate of 50% by 2017 and 70% by 2020.
Divert more waste from landfill	Six Council areas to have introduced household FOGO collection by 2020.
Manage problem wastes better	Build or upgrade six community recycling centres in the region.
Reduce litter	Establish a baseline, if possible for 2014-2015, and reduce the incidence of litter by 10% by 2017.
Reduce illegal dumping	Establish a baseline, if possible for 2014-2015, and reduce the incidence of illegal dumping in the region by 10% by 2017.

4. How are we going to get there?

4.1 Identifying options and delivery mechanisms

The success of this Strategy is dependent on identifying the best opportunities and mechanisms available to achieve RAMROC's identified targets. Identifying suitable delivery mechanisms requires consideration of different options and the contribution that those options will make towards putting in place realistic actions that can be adopted by each Council.

Through a consultative process, RAMROC considered a number of potential opportunities and delivery mechanisms. These delivery mechanisms focused not only on options to improve household waste management practices, but also C&D and C&I recovery and solutions to address the infrastructure needs of the region. RAMROC identified potential measures to improve waste management across the region.

From the list of possible delivery mechanisms (Table 17), RAMROC prioritised options that will be implemented as part of the regional Action Plan (section 5.1).

Table 17 Options of potential opportunities

Area for change	Potential opportunities
Landfill Management	Regional landfill rationalisation review Landfill gas capture Carbon pricing Landfill compaction rate study Weighbridges at landfills
Transfer Station Management	Investing in balers Compaction rate study Model transfer station design Explore the potential for installing weighbridges
Organics collection and processing	FOGO collection services Composting and shredding opportunities Home composting Food/protein processing Green waste marketing plan
Resource recovery	Kerbside collection services Regional mini MRF processing Increased recovery rates through education Community recycling centres Household hazardous waste service Public place recycling Bin audits Bin reconciliation study Tip Shops Regional governance review Charity bins Tyre recycling E-waste collection Mattress collection
C&I and C&D Waste Resource Recovery	Onsite separation for C&I/C&D Small and medium businesses C&I recycling Hard plastic recycling

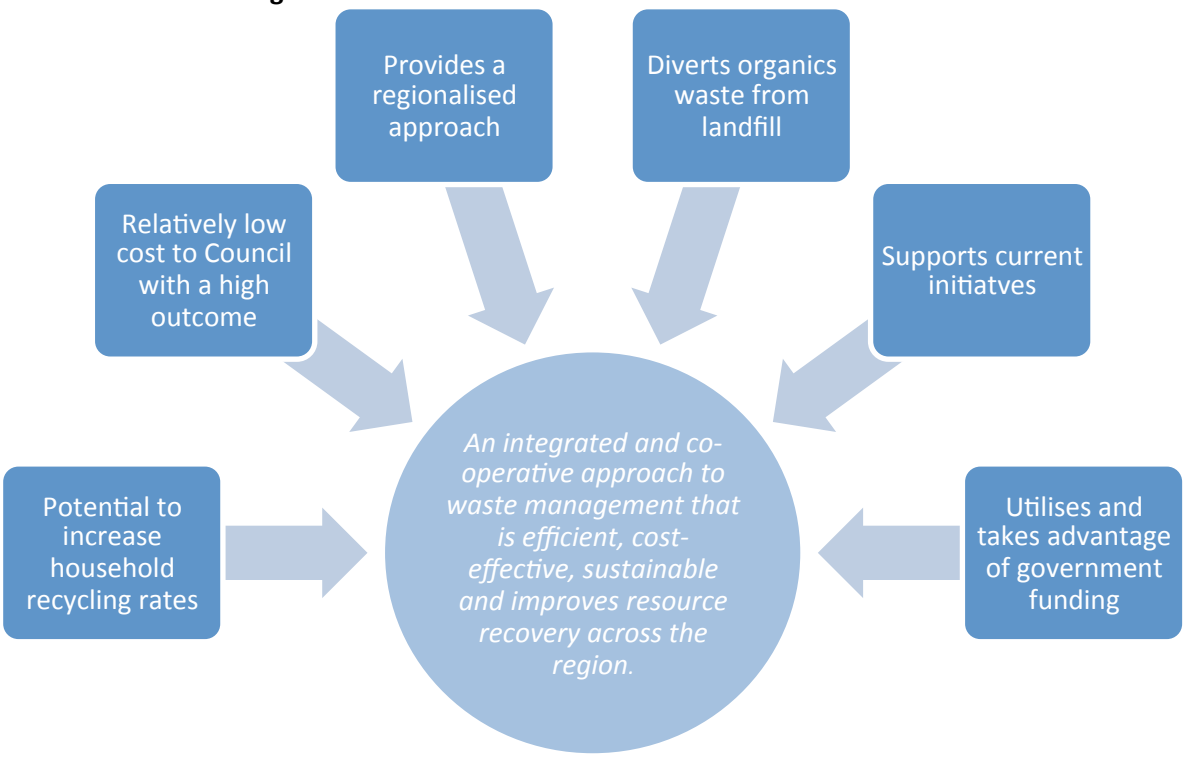
Area for change	Potential opportunities
Other	Illegal dumping Littering Asbestos Plastic bag ban Household pick-up (bulky waste collections for pensioners or others in similar need)

An initial assessment has looked at potential costs and savings of the following actions: (the business cases are provided in the Appendix)

- regional landfill rationalisation;
- model transfer station design;
- FOGO collection services;
- regional mini MRF; and
- community recycling centre.

The Strategy Action Plan includes further opportunities that have the potential to successfully address the key criteria presented in Figure 10. As RAMROC is a large area with diverse population, community needs, and economic ability, it is important that identified options and actions take into account local, sub-regional and regional needs and circumstances to ensure that the Strategy vision is achieved.

Figure 10 Criteria for assessing suitable actions



4.2 Theme One: Avoid and reduce waste generation

Target: Maintain regional waste at 9kg per capita

Between 1996-97 and 2006-07, the volume of waste produced per person in Australia grew at an average annual rate of 5.4%. In order to reduce this growth it is imperative to halt new waste generation. Therefore the WARR Strategy recognises waste avoidance as its first key result area.

At present RAMROC produces less than 9kg of kerbside waste per capita. This is less than the *Rest of NSW* average of 10.3kg per capita and overall NSW average of 9.4kg per capita. In consultation sessions it has emerged that rural landowners may landfill significant amounts of waste on private land thus pushing RAMROC's per capita waste generation figures lower than in the rest of NSW. A lot of this waste is organic and therefore harmless however waste disposal on private land is an issue that RAMROC will examine as part of its waste strategy to ensure that it does not pose any environmental threats. Therefore, to maintain this current level of per capita waste generation RAMROC will put in place education and communication programs to encourage proper disposal of waste in rural areas and overall waste avoidance, reuse and reduction.

On a regional level, RAMROC has had in place two programs to engage the community in waste avoidance measures. The Garden Smart workshops, aimed at resident, were first introduced in 2008 and provide community participants with information on composting, worm farming, and water use. In addition to general take home literature, participants were also provided with Garden Smart Diaries. Over the years, the level of participation and interest in the workshops has fallen. Council members believe that the primary reason for this decline in interest is that the workshops have reached saturation point in terms of available audiences. RAMROC has also provided a regional schools education program, the EnviroMentors program, run by Keep Australia Beautiful. The program takes place over 4 weeks of the year and is offered to both primary and secondary schools in the region. The program is linked to appropriate stages of each school's curriculum and promotes good environmental behaviour around waste and recycling as well as other environmental practices. The workshops are fully booked each year and RAMROC has expressed an interest to pursue other options for regional education such as expansion of the Halve Waste Schools Education Program.

A number of member Councils have supported the EPA's *Love Food, Hate Waste* campaign. The *Love Food, Hate Waste* campaign assists local councils reduce waste generation through providing low-level education initiatives that use targeted actions, such as running workshops and liaising directly with the community to reduce food wasting practices. As a key element of the WARR Strategy, RAMROC member Councils will continue to participate in the *Love Food, Hate Waste* campaign and explore opportunities to expand the program and engage increased number of households.

Albury, Greater Hume and Corowa Councils are active contributors and participants in the Halve Waste campaign. The Halve Waste campaign provides tools to the community to decrease waste to landfill by providing a targeted 'toolbox' for residents, businesses, and schools. For example, each business and school in the participating Council has been offered a free waste assessment that identifies where potential savings could be made. Halve Waste is a high-level, advertising-based campaign running ads in the local newspapers, leaflets, a website, contests and more. This approach has been successful in informing the general community about the campaign and why halving waste to landfill is important. Participating Councils will continue funding the Halve Waste campaign furthering the objectives of this regional Strategy while other RAMROC members should consider joining the program in order to expand it across the region.

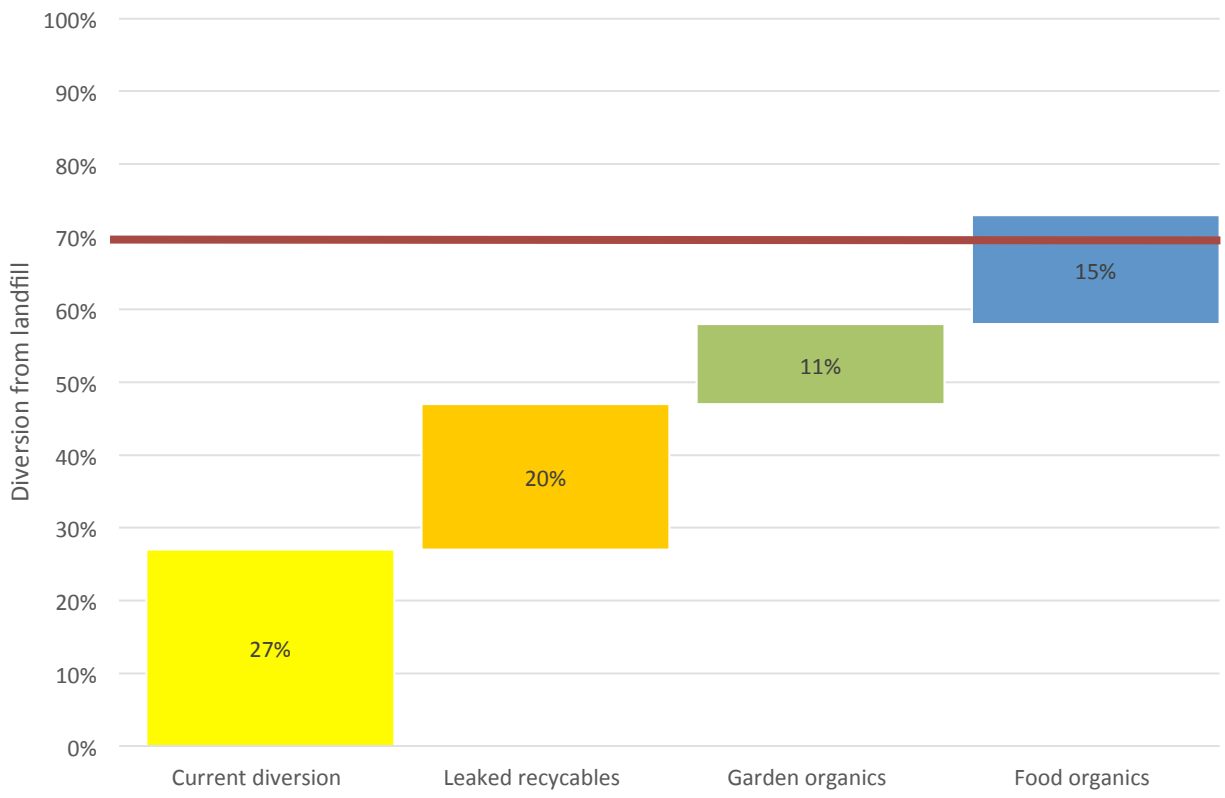
4.3 Theme Two: Increase Recycling

Target: Achieve a regional resource recovery rate of 50% by 2017 and 70% by 2020

RAMROC's regional resource recovery rate of 27% is low compared to the 2011-12 NSW average of 47%. The two main reasons for this is that eight Councils in the region do not currently provide a kerbside recycling service and of the Councils that do provide a service the majority have a low diversion rate. This Strategy aims to improve the overall recycling practices amongst households through education programs and the extension of services (where financially viable).

RAMROC aims to take a staged approach to achieve a regional resource recovery rate of 50% by 2017 and 70% by 2020 (Figure 11). Improving the current resource recovery rate by 20% will put RAMROC in line with the NSW State average of 47%. This is achievable through improved community education practices and the introduction of new kerbside recyclable collection services across the regions. Wentworth Shire Council will be introducing a new kerbside recycling service in 2014. The longer term plan by a number of Councils to introduce a FOGO collection services would further increase resource recovery rates.

Figure 11 Staged approach to meeting the NSW 70% MSW resource recovery by 2021 target



The quantity of C&I and C&D waste entering landfills across the RAMROC region is unknown. The 2008 RWMWG Regional Waste Minimisation Strategy identified the need to make significant improvements in the recycling of C&I and C&D waste streams in the Albury Wodonga regions. At the time C&I and C&D waste represented 80% to 85% of the waste received at the Albury Waste Management Centre. In response, action has been taken through the Halve Waste program to divert C&I and C&D by introducing a $2.50 levy on all waste entering the landfill and undertaking waste audits for businesses. These actions have been successful in reducing the level of C&I and C&D waste entering the Albury WMC.

Currently, there is little incentive to decrease C&I waste from entering other RAMROC landfills. The price to landfill C&I waste is still relatively low and Councils have no control over the services provided to businesses as C&I collection is managed via private companies.

While RAMROC has chosen not to set a specific target for reducing C&I and C&D waste in the region, a number of actions for improving recycling rates have been identified and are outlined in Table 18.

Table 18 Strategies for improving C&I and C&D recycling

Option	Business Incentive
Pricing	As waste contractors and transporters are very price sensitive, they will seek out the lowest costs of managing a specific waste type. By increasing landfill gate fees to reflect the true cost of landfilling Councils would have a direct and immediate effect in driving more tonnes toward recycling rather than landfill and encourage recycling in the C&I sector.
Provision of Waste Services to SME	Councils can offer a kerbside recycling services to commercial properties by providing recycling bins to source separate C&I waste generated by SME using their existing 240 litre bin service on a fee for service basis (or subsidised by the residents through general rates). Bins would need to be registered with Council and invoiced in advance. Regular audits would need to be conducted to ensure that commercial properties do not take advantage of the system without paying.
C&I & C&D sorting	A regional C&I/C&D sorting facility (MRF) would ensure that recyclables are diverted from the C&I/C&D sector. However, due to economic and logistics constraints a more viable regional approach for RAMROC would be to focus on establishing a regional C&I/C&D sorting platform.
Council DA requirements	In line with EPA guidelines, Councils can introduce Site Waste Minimisation and Management Plans as a condition of DA approvals for developments to impose a commitment for diverting waste from landfill.

4.4 Theme Three: Divert More Waste From Landfill

Target: Six Council areas to have introduced household FOGO collection by 2020

At present Albury City Council and Corowa are the only Councils that are likely to have a household organics collection service in place within the next twelve months. While a number of other RAMROC members have expressed an interest in introducing a three bin system, financial constraints and lack of economies of scale have held back progress. WLRM funding and a regional approach to waste management will enable Councils to reassess the viability of introducing organics collection services.

To improve regional resource recovery rates, local Councils who currently only offer a single bin collection service may consider introducing an organics collection service as an alternative to a kerbside recycling bin. Introducing an organics collection bin over a kerbside recycling bin offers two main advantages:

1. <u>Increased waste diversion</u>

   Introducing a FOGO collection bin will divert more waste from landfill than a kerbside recycling bin as the potentially recoverable content in the region's residual bins is mostly organic. On average,

the content of a residual bin is made up of 40% food waste, 11% garden waste and 23% dry recyclables. In addition, as 9% of the dry recyclable content is generally made of paper and cardboard this organic material can be placed in the organic recycling bin to decompose, thereby increasing the total diversion rate from a residual waste bin to 60%.

2. More affordable collection service

   As many of the townships within RAMROC are in isolated rural areas, the travel costs associated with collecting recyclables and transporting them to MRF facilities for separation and then further afield for processing makes the service unviable. In comparison, organic windrow composting facilities offer affordable low technology options for processing organics within the region. Moreover, the resulting compost can also be sold and used locally.

To address issues of economies of scale associated with organics collection services, RAMROC member Councils can combine organic collection services and have waste processed at a single site. As a potential sub-regional opportunity the cost associated with Griffith, Leeton and Narrandera Councils offering a FOGO collection service processed at regional windrow composting site in Leeton was assessed (Appendix C). The business case analysis showed that this strategy offered cost savings due to the reduced gate fee paid for composting in comparison to landfill disposal.

4.5 Theme Four: Manage problem wastes better

Target: Build or upgrade six community recycling centres in the region

RAMROC is interested in improving the collection and recycling opportunities available for managing hazardous and problem waste and diverting these wastes streams from landfill. The six problem wastes that have been identified by WLRM are batteries, fire extinguishers, fluorescent tubes and lights, gas cylinders, oil and paint.

At present, services for the collection and disposal of hazardous and problem waste is limited to the collection of plastic drums, paint and motor oil at some landfill and transfer station sites. While some Councils do provide for a limited number of waste streams to be stockpiled and source separated, the overall service is inadequate and the facilities on offer are in need of improvement for both access and safety.

Options available to RAMROC to manage hazardous and problem waste are outlined in Table 19. Drum*MUSTER* is relatively well supported in the RAMROC region with 10 Councils providing collection points at landfills and transfer stations. In addition, collection points are also offered at other Council operated community sites.

The ChemClear program requires farmers to register their property as sites for the pickup of chemicals. Information provided by the Industry Waste Reduction Scheme (that operate Drum*MUSTER* and its sister program, ChemClear) showed that unwanted chemicals were collected in only three RAMROC areas in the 2012 reporting period. RAMROC's role in the program is limited to advertising and supporting the program in the local community. There appears to be an opportunity for Councils to provide further support for the program to increase community participation.

In the last two years, there has been no Household Chemical CleanOut event in the RAMROC region. As Household Chemical CleanOut events are organised by the EPA, RAMROC is only able to participate when State funding has been allocated to the region. Local Councils have indicated a willingness to participate in any future scheduled Household Chemical CleanOut events.

Table 19 Hazardous and problem waste service options

Program	Details
Drum*MUSTER*	A national program for the collection of empty chemical drums – currently in operation across RAMROC.
ChemClear	A national program that provides collection of unwanted agricultural and veterinary chemicals – limited operation in RAMROC.
Household Chemical CleanOut	Scheduled program operated in NSW and held at different locations across the State for household quantities, up to a maximum of 20 litres or 20 kilograms of a single item. Items that may be collected include solvents and household cleaners, fluorescent globes and tubes, paint, household chemicals, car batteries, motor oils, fuels and fluids.
Community Recycling Centres	The WARR Strategy has set a target of establishing 86 community recycling centres in NSW. RAMROC Councils have sought funding under the EPA WLRM grants program to establish or upgrade community recycling centres for the collection of the problem waste identified by WLRM as well as e-waste and other locally significant waste streams.

To improve the management of problem waste in the region RAMROC aims to establish a network of community recycling drop off centres. Four Councils - Albury, Deniliquin, Murray and Griffith – applied for EPA WLRM grant funding in February 2014 to build or upgrade community recycling centres. Having in place community recycling centres to capture problem waste will assist households to recycle and remove problem wastes from kerbside bin systems.

Murray Shire Council, which does not currently offer a hard waste collection service to its residents, is considering the introduction of an on-call bulky waste collection service or regular schedule collection service for households without access to adequate transport (such as a utility vehicle) and particularly disabled or pensioner residents. Mattresses are common bulky waste items and therefore it is advisable that RAMROC Councils explore potential synergies in jointly delivering such a community service under the EPA's problem waste program.

4.6 Theme Five: Reduce the incidence of litter

Target: Establish a baseline and reduce the incidence of litter by 10% by 2017

The WARR Strategy sets a NSW state target to reduce the number of litter items by 40% compared to 2011-12 levels by 2016-17. Preventing the occurrence of litter is a prime objective for the NSW EPA. Amongst other factors people generally litter because they do not regard the material as being litter, they cannot find a bin, there is a lack of social pressure to do the right thing, or there is an absence of penalties to prevent littering. According to the EPA, the most common forms of litter include cigarette butts, small pieces of paper, chip and confectionary wrappers, fast-food packaging materials, bottle caps, plastic straws, glass pieces, glass alcohol bottles, and soft drink bottles. Throughout NSW, litter is increasingly being viewed as an environmental issue and cause for serious concern, rather than simply an aesthetic issue.

To reduce the incidence of litter in the region RAMROC members have installed public place bins on major streets and parks and on roadside stops. Installation of litterbins reduces the cost to Council associated with cleaning litter, provides an extra service to the community, and assists in improving waste management practices.

As the cost of implementing and servicing public place litterbins is significantly higher than that of household mobile garbage bins, Councils are not looking to increase the number of public place litter bins in the immediate future. Rather, the focus will be on undertaking litter audits in identified areas to establish littering levels and implementing a litter education public campaign to reduce the incidence of litter.

4.7 Theme Six: Reduce illegal dumping

Target: Establish a baseline and reduce the incidence of illegal dumping by 10% by 2017

Illegal Dumping is the unlawful disposal of waste larger than litter onto land or into water and can range in size from a small bag of garbage to illegal landfilling. Combating illegal dumping is a key priority of the WARR Strategy as it is a constant and highly visible problem in NSW. Parties that partake in illegal dumping often do so to avoid the associated costs of waste disposal or effort required to follow legal waste disposal procedures.

The community has a large part to play in combatting illegal dumping. Providing the community with effective tools to do the right thing, ensuring that they know their legal responsibilities regarding waste and the relevant processes for reporting illegal activities is critical to combating illegal dumping.

While illegal dumping is considered endemic across the RAMROC region, quantitative evidence of the scale of the problem at a regional level is unavailable as very few Councils keep records of illegal dumping complaints. Most RAMROC Councils have relatively small populations, vast tracts of land within their boundaries and limited funds and resources available to monitor and record incidents of illegal dumping. An initial step in tackling illegal dumping in the region will be for member Councils to develop a baseline of the problem in their local area. Such data will assist in identifying hotspots for illegal dumping (sites that have had at least two incidents of dumping in the last year), establishing the full extent of the issue in region and setting reduction targets.

Both Albury and Greater Hume Councils have submitted grant application to introduce illegal dumping measures as part of the WLRM initiative. The Riverina Waste Group has also sought WLRM grant funding to secure a Regional Investigation Officer. The Regional Investigation Officer would be responsible for following up on investigations at serial dumping sites, sites contaminated with hazardous materials (including asbestos), or major dumping events.

The dedicated Regional Investigation Officer would be responsible for:

a) Attending to all reported sites;
b) Gathering and documenting available evidence; and
c) Undertaking additional investigation and research work to identify possible persons responsible for the illegal dumping activity.

Through this process, it is hoped that Councils will be able to gather enough evidence to begin taking legal action against illegal dumpers in the region.

5. How will the strategy be implemented?

5.1 Action plan

Action Plan - RAMROC Regional Waste Strategy 2014 -2020									
Our Vision ***An integrated and co-operative approach to waste management that is efficient, cost-effective, sustainable and improves resource recovery across the region.***									
Target	**Description of Target**	**Key Performance Indicator**	**Year 2014**	**Year 2015**	**Year 2016**	**Year 2017**	**Year 2018**	**Year 2019**	**Year 2020**
1	Maintain regional waste generation at 9kg per capita	Number of programs in operation	√	√	√	√	√	√	√
2	Achieve a regional resource recovery rate of 50% by 2017 and 70% by 2020	Proportion of household waste to landfill				√			√
3	Six Council areas to have introduced household FOGO collection by 2020	Number of Councils that have introduced a FOGO collection service							√
4	Build or upgrade six community recycling centres in the region	Number of community recycling centres built or upgraded.		√					
5	Establish a baseline and reduce the incidence of litter by 10% by 2017	Result of litter audits				√			
6	Establish a baseline, if possible for 2014-2015, and reduce the incidence of illegal dumping by 10% by 2017	Number of reported incidents of illegal dumping		√		√			

5.2 Tasks list per theme

Action	Detail of Action	Performance Measure	Timescale	Responsibility
Theme: Avoid and reduce waste generation				
Participate in waste avoidance programs	Ten RAMROC councils to participate in the *Love Food Hate Waste* campaign	Number of Councils actively participating in the campaign	2017	Identified Councils
	Extend the 'Halve Waste-reduce, reuse and recycle' campaign	Number of Councils actively participating in the campaign and number of new initiatives	2018	Albury, Corowa, Greater Hume Councils
Establish two additional Tip Shops in the region.	Pursue grant funding to implement two new Tip Shops in identified Council areas	Number of Tip Shops in the region	2020	Albury and Griffith Councils
Investigate the real cost of landfill and collection services	Explore options to rationalise the 43 landfill assets and replace with transfer stations to reduce costs and maximise resource recovery	Number of landfills converted to transfer stations	2020	All RAMROC Councils
	Use a cost benefit analysis as a basis for evaluating waste management options for new waste services	Number of Councils to have explored new waste services	Ongoing	All RAMROC Councils
	Undertake full cost of landfill studies that include operating costs, capital costs, asset replacement, remediation and post closure monitoring	Number of Councils to have completed full cost of landfill study	2016	All RAMROC Councils
Improve waste data collection	Seek funding to install weighbridges at landfills	Number of weighbridges	2016	All Councils with landfills that take in more than 1,000 tpa
Theme: Increase Recycling				
Provide services and educational material to improve recycling practices	Households are provided with waste recycling education material on an annual basis to improve recycling and resource recovery practices	Number of households that receive waste educational material	Ongoing	All Councils with a recycling collection service
	Investigate and if appropriate introduce household recycling services in new areas as it becomes economically feasible to do so	Number of Councils providing household recycling services	Ongoing	Hay, Balranald, Carrathool, Conargo, Deniliquin, (Urana[7]) Councils
Improve waste service contract provisions	Ensure future collection contracts include education awareness initiatives to improve recycling practices (to be delivered by Council or independent provider)	Number of Council contracts that stipulate education provisions	Ongoing	All Councils with a recycling collection service
	Review existing waste collection contracts to	Number of Council contracts reviewed	2018	All RAMROC Councils

[7] Urana Council is not participating in this strategy but participation in joint action can be mutually beneficial and could be explored on a case by case basis.

Action	Detail of Action	Performance Measure	Timescale	Responsibility
	include properties en route between collection towns			
	Advocate to government to facilitate the use of a NSW Model Waste Collection and Processing contract	Model Contract available for use	2016	All RAMROC
Review opportunities to improve C&I and C&D recycling	Introduce yellow top bins for the C&I sector and integrate this with the domestic kerbside collection service	Number of new recycling bins provided to C&I sector	2016	All Councils with a recycling collection service
	Introduce differential landfill gate pricing for C&D materials that are most suited for source separation, reuse and recycling	New landfill pricing introduced	2015	Corowa, Griffith, Murray Council (Note: action already undertaken by Albury City Council)
	Assess the feasibility of investing in a regional C&D sorting excavator	Feasibility review completed	2015	Albury City Council
	Ensure that building permits comply with the Councils 'Code of waste management and minimisation practice for building sites'	Annual monitoring completed	2014	Albury City Council
	Every DA has a Site Waste Minimisation and Management Plan (SWMMP) for developments identified as Complying Developments in accordance with the EPA's Model Waste Not DCP Chapter 2008	Number of DA's approved with a SWMMP	Ongoing	All RAMROC Councils
	Identify and put in place practices to increase resource recovery and reduce C&D material generated from Council operations being sent to landfill	The introduction of such new practices	2015	All RAMROC Councils

Action	Detail of Action	Performance Measure	Timescale	Responsibility
Conduct regular bin audits to analysis the impacts of new services and education plans	Conduct regular audits of household kerbside bins (all streams) to gauge contamination and leakage of waste materials into the incorrect stream. A region wide audit conducted by RAMROC will provide cost savings and ensure uniformity.	Number of Councils that have conducted bin audits in the given year. Minimum frequency of one full audit every 3 years fore each Council.	Ongoing	All Councils that provide recycling services
Theme: Divert More waste from Landfill				
Introduce kerbside FOGO collection	Ensure the introduction of FOGO collection in already identified Council areas	FOGO collection service introduced	2015	Corowa and Albury Councils
	Review and where viable introduce FOGO collection in the Griffith, Leeton, Narrandera and Murray	FOGO collection service introduced.	2015	Griffith, Leeton, Narrandera, and Murray Councils
	Support the development of a regional organics composting site in Leeton	Organics facility operational	2016	Leeton, Griffith, Narrandera Councils
Identify regional opportunities to improve resource recovery practices	Develop regional contracts for waste services (allow for staggered starts)	Number of sub-regional collection services	Ongoing	All RAMROC Councils
	Review the possibility of purchasing a sub-regional shredder	Review completed	2016	All RAMROC Councils
Theme: Manage Problem Wastes Better				
Build or upgrade community recycling centres	Apply for WLRM funding to build or upgrade community recycling centre's	Funding applications submitted and (where successful) facilities established or upgraded	2015	Albury, Deniliquin, Murray, Griffith Councils
	Take part in EPA funded Household Chemical CleanOut events across the region	Number of Chemical CleanOut events in the region	Ongoing	All RAMROC Councils
	Market existing product stewardship schemes for TVs and computers and e-waste across the region	Annual volume of e-waste collected	Ongoing	All RAMROC Councils

Action	Detail of Action	Performance Measure	Timescale	Responsibility
Theme: Reduce Litter				
Allocate funding and resources to promote litter control	Councils to commit ongoing funds towards public place waste disposal	Annual expenditure on public place waste disposal	Ongoing	All RAMROC Councils
	Apply for funding to undertake litter surveys in Albury, Griffith, Leeton and Corowa	Litter surveys completed	2015	Albury, Griffith, Leeton and Corowa Councils
	Apply for funding for a regional car litter advertising campaign	Reduced visible roadside litter based on survey litter count	2016	All RAMROC Councils
	Councils to promote litter management as part of large event management	Number of events where Council promoted litter management	Ongoing	All RAMROC Councils
Theme: Reduce Illegal Dumping				
Allocate funding and resources to combat illegal dumping in the region.	Each Council to establish reporting process for recording illegal dumping incidence	Data capture processes in place	2018	All RAMROC Councils
	Prepare a review of illegal dumping in the region to determine the extent of the issue	Investigation completed	2017	All RAMROC Councils
	Seek funding for a Regional Investigation Officer as a pilot step for a possible future Regional Illegal Dumping (RID) squad consisting of 1 member per sub region that is funded by the EPA	Regional Investigation Officer position in place	2018	All RAMROC Councils

6. Appendix A – Regional Landfill Rationalisation Review

Opportunity Description

In September 2013, the RAMROC Audit of Regional Waste Facilities documented 54 waste infrastructure sites across the region. A review of the audit findings revealed that many of the landfills were operating at financially unsustainable terms. Moreover, in some cases Councils were unable to provide specific data on operational and capital costs possibly due to incorrect budgeting allocation processes or due to a lack of understanding of the true cost of landfill operations.

Waste industry standards for running a rural landfill in a cost effective manner assume and expense of $30-$100 per incoming tonne of waste. Analysis of the data provided in the audit identified that 13% of Councils claimed to have an operating cost of under $30, 32% were not able to provide data on operating cost, and 44% had operating costs above $100 per tonne. Only 11% of the landfills had an industry conforming cost of $30 - $100 per tonne.

This business case has been prepared to highlight the importance of effective economic decisions on the management of waste infrastructure. To assist Councils in identifying the most appropriate and sustainable waste management options and determine potential cost savings, the cost of transporting waste from a poorly operating landfill to one managed in a financially viable manner was calculated.

Background

Operating a landfill is a costly and time consuming expense, this is especially true for rural and remote Councils with limited staff and equipment. The majority of RAMROC landfills are unlicensed small, remote, accept very low quantities of waste and the Councils operating them are short of funds and resources. Only 19 RAMROC landfills reported to take in more than 1,000 tonnes of waste per year.

Being small, most RAMROC landfills do not have licence imposed obligations and therefore they often do not abide by standard planning and quality systems or have basic operational documentation. As a result, operational practices are often inadequate. Most sites have no leachate management, litter, noise, dust, odour, vermin, or vector controls.

Appropriate landfill management requires the purchase and maintenance of plant and equipment, the construction of new cells, ongoing rehabilitation and a range of other fixed capital and operational costs. As such the overall cost of running a small landfill can become costly especially when viewed as a function of incoming waste (cost per tonne). This was particularly evident in RAMROC where some Councils had excessively high costs per tonne of waste landfilled - $417 at the Brocklesby Landfill, $494 at Balranald Landfill, $566 at Hillston Landfill, $796 at Urana Waste Disposal Centre and $1,629 per tonne at the Barellan Waste Disposal Depot due to maintenance activities undertaken in that year.

Objectives

- Demonstrate alternative waste management options;
- Identify landfills that are not operating cost effectively; and
- Determine potential costs savings if waste is transported to alternative landfills.

Assumptions

The following assumptions have been made:

- Data reported in the GHD Audit of Regional Waste Facilities (GHD Audit) is correct and reliable;
- Truck capacity is 25 tonnes, travels at an average speed of 80km/hr. and costs $120/hr. to operate;
- The cost of operating a simple, rural transfer station is $25 per tonne;
- The per tonne gate fee set at each landfill is sufficient to cover its operational, maintenance and future rehabilitation costs;
- The largest variable that significantly affects the cost savings is the gate fee to be paid at the alternative landfill; and
- All RAMROC members could benefit from a regionalisation of landfills irrespective of whether they participate in this strategy.

Modelling Process

Modelling was based on the data and information provided in the GHD Audit. Facilities suitable to receive waste ('go to' landfills) from smaller ones were defined as:

- larger landfills that received over 1,000 tpa; and
- had a reasonable operating budget of between $30-$100 per tonne.

However, given transport distances, a secondary preference was made for the next closest landfill in large rural areas to be the 'go to'. Any potential cost savings were then calculated taking into account the amount of waste to be transported, the distance to be travelled, the cost of transporting the waste to that landfill and the gate fee at the proposed landfill.

Results

Based on the data provided and landfills modelled, seven Councils could expect to make savings by diverting waste from 'low performing' landfills and instead transporting the waste to other regional landfills. Table 20 provides indicative estimates of the potential savings that individual Councils could make by transporting waste to an alternative landfill site.

It should be noted that sites that only receive small quantities of waste also have, in absolute numbers, relatively low operational expenses and maintenance requirements and are therefore cheap to run. Bringing in additional volumes of waste would result to their operational expenses increasing. Since all waste disposal would be weight based, it is anticipated that the additional revenue earned through gate fees will be sufficient to cover these higher operating costs. It is possible that in order to receive additional waste some of these sites might require expansion, modifications or additional infrastructure and equipment. These costs, along with any community and political issues will have to be studied carefully on a case by case basis prior to the commencement of any infrastructure regionalisation project.

Table 20 Indicative estimates of potential cost savings that could be brought about by a landfill regionalisation project[8]

Council	Facility name	Annual tonnage	Annual expenditure/ Operational expenses	Annual capital cost	Annual cost per tonne	Alternative landfill	Distance (km)	Gate fee ($/t)	Total cost ($/t)	Cost saving ($/t)	Annual Savings ($)
Balranald	Balranald Landfill	202	$99,880	$99,800	$988.5	Euston	98	100	$130.9	$857.6	**$173,242**
Berrigan	Berrigan Landfill	1,400	$103,600	$126,800	$164.6	Howlong	90	125	$155.4	$9.2	**$12,840**
	Tocumwal Landfill	130	$122,300	$133,300	$1,966.2	Howlong	120	125	$157.2	$1,809.0	**$235,164**
	Tocumwal Landfill	130	$122,300	$133,300	$1,966.2	Moama Solid Waste Depot	102	100	$131.1	$1,835.0	**$238,554**
Conargo	Wanganella	343	$10,459	$7,143	$51.3	Booroorban	34	0	$27.0	$24.3	**$8,327**
Hay	Booligal Tip	100	$189,198	$219,198	$4,084.0	Hay landfill	88	0	$30.3	$4,053.7	**$405,368**
	Maude Tip, scenario	100	$600	$12,600	$132.0	Booroorban	100	0	$31.0	$101.0	**$10,100**
	Maude Tip, scenario 2	100	$600	$12,600	$132.0	Hay	52	0	$28.1	$103.9	**$10,388**
Narrandera	Barellan	128	$23,500	$208,500	$1,812.5	Leeton	45	70	$97.7	$1,714.8	**$219,494**

[8] Possible capital expenditure for the expansion and/or upgrade of the alternative landfill have not been considered as they differ from site to site. Careful analysis of any such required expenditure will be necessary on a case by case basis prior to the regionalisation of facilities. Such a detailed study should also review and take into account the community needs and political reaction of each potential change to the structure and operation of the current waste management facilities.

Council	Facility name	Annual tonnage	Annual expenditure/ Operational expenses	Annual capital cost	Annual cost per tonne	Alternative landfill	Distance (km)	Gate fee ($/t)	Total cost ($/t)	Cost saving ($/t)	Annual Savings ($)
Wakool	Moulamein	150	$44,000	$44,000	$586.7	Koraleigh	80	63	$92.8	$493.9	**$74,080**
	Wakool	150	$44,000	$38,700	$551.3	Koraleigh	155	63	$97.3	$454.0	**$68,105**
(Urana[9])	Oaklands, scenario 1	152	$31,000	$31,000	$407.9	Corowa	60	125	$153.6	$254.3	**$38,653**
	Oaklands, scenario 2	153	$31,000	$31,000	$405.2	Howlong	90	125	$155.4	$249.8	**$38,224**
	Urana, scenario 1	152	$121,000	$121,000	$1,592.1	Corowa	90	125	$155.4	$1,436.7	**$218,379**
	Urana, scenario 2	152	$121,000	$121,000	$1,592.1	Narrandera	85	63	$93.1	$1,499.0	**$227,849**

[9] Urana Council is not participating in this strategy but participation in joint action can be mutually beneficial and could be explored on a case by case basis.

Conclusion

Although the total annual cost of running small landfills might seem low, most of these landfills are currently very expensive to run from a cost per tonne perspective (column 6 in Table 20). Economically, and from a waste management perspective, these facilities do no provide a satisfactory return on investment.

RAMROC member Councils would benefit from reviewing the true costs of managing their landfills and consider options for landfill rationalisation to reduce expenditure. For those Councils interested in reducing waste management expenditure it is recommended that they:

a) Undertake a true cost of landfill study to properly evaluate operating costs, capital costs, asset replacement, remediation and post closure monitoring;
b) Review the operational cost and explore alternative arrangements for small landfills;
c) Quantify and review the impact of additional waste to the alternative landfill:
    - Will there be a requirement for modifications and/or additional infrastructure?
    - Can any such capital expenditure be covered under a WLRM grant?
    - Will the gate fee be sufficient to cover any increases in operational expenditure?
d) Consider any community concerns and political implications; and
e) Review the operational cost and explore alternative arrangements for all landfills with an annual operating cost of more than $100 per tonne.

Options should be considered for closing landfills or converting them to rural transfer stations and transporting the waste to an alternative landfill.

The rationalisation of regional landfills can enable Councils to channel limited resources into better managing a smaller number of waste facilities, reduce the risk of environmental harm and limit exposure to the potential hazards associated with managing landfills. The current WLRM funding offers an excellent opportunity for pursuing a facility rationalisation program to interested Councils. In order to achieve the best environmental and financial outcomes, any regionalisation project should focus on the annual cost of disposal on a per tonne basis and take into account political and community considerations.

7. Appendix B – Model Transfer Station Design

Opportunity Description

The design of a model transfer station provides information on infrastructure costs for RAMROC Councils interested in rationalising landfills and introducing alternative arrangements. The proposed design of a model rural transfer station is based on the NSW EPA's Handbook for Design and Operation of Rural and Regional Transfer Stations. These simple design principles may also be applied to existing transfer stations in need of upgrades.

Background

The majority of landfills in RAMROC are small, unlicensed facilities that take in under 1,000 tonnes of waste per year. Due to tight budgets and insufficient staffing, a considerable number of landfills in the RAMROC region struggle to operate in accordance with environmental guidelines. The region's landfills are generally not adhering to best-practice design, construction, and operation and are overall not performing in accordance with modern expected practices. Many of these landfills service towns and villages in remote areas where alternative arrangements are currently unavailable.

At present, there are 12 transfer stations in the region. All of these transfers stations are locked and gated facilities only open to the public at certain, restricted times. Most Councils open their transfer stations three days a week for varying hours while Greater Hume Council only opens one of its transfer stations once a month on an allocated Sunday.

The majority of these transfer stations provide stockpile and storage areas for metals, green waste, and batteries while transfer stations in more populous areas also offer resource recovery for cardboard, tyres, C&D waste, gas bottles, motor oils, paint, e-waste, plastic drums, glass, and comingled waste.

Skip bins used to collect general waste on site at the current transfer stations range in size from $55m^3$ to $3m^3$. Material is also stockpiled in bulk bins, caged areas, on the ground or in shipping containers used to store e-waste (e.g. Jindera, Greater Hume Councils). All sites charge an entrance fee based on a visual inspection of load type and size or vehicle size.

Objectives

- Meet minimum design specifications for transfer stations;
- Reduce the number of small unmanned landfills;
- Reduce waste management costs to Councils; and
- Improve existing regional waste infrastructure.

Figure 12 a) Single ramp up and down to single skip bin; b) Single skip bin, dual ramp with hand rails

Figure 13 View to site access gate from the top of the transfer station platform

Assumptions

The following assumptions have been made in designing a rural transfer station for the RAMROC region:

- Residential drop off only;
- Private vehicle drop off only; and
- Annual handling of 500 tonnes.

As this business case has been prepared to provide design and costing information for the conversion of an existing landfill site to a transfer station it does not cover considerations such as planning, feasibility assessment, public consultation and other issues that are more relevant to 'green field' sites.

Construction costs

Wagga Wagga City Council has recently constructed three transfer stations that were in line with the proposed model transfer station for a cost of $50,000 per site. This cost was based on material costs only as the Council used internal labour resources to construct the transfer station.

The Wagga Wagga City Council design construction costs are based on a transfer station built to the following dimensions:

- A total of 30 meters in length – 10 m ramp + 10 m platform + 10m ramp;
- The ramp is at a 10 degree angle;
- Railway sleeper retaining wall with steel posts;
- Balustrades 1 m high to Building Code of Australia requirements; and
- Surface of crusher dust fill compacted.

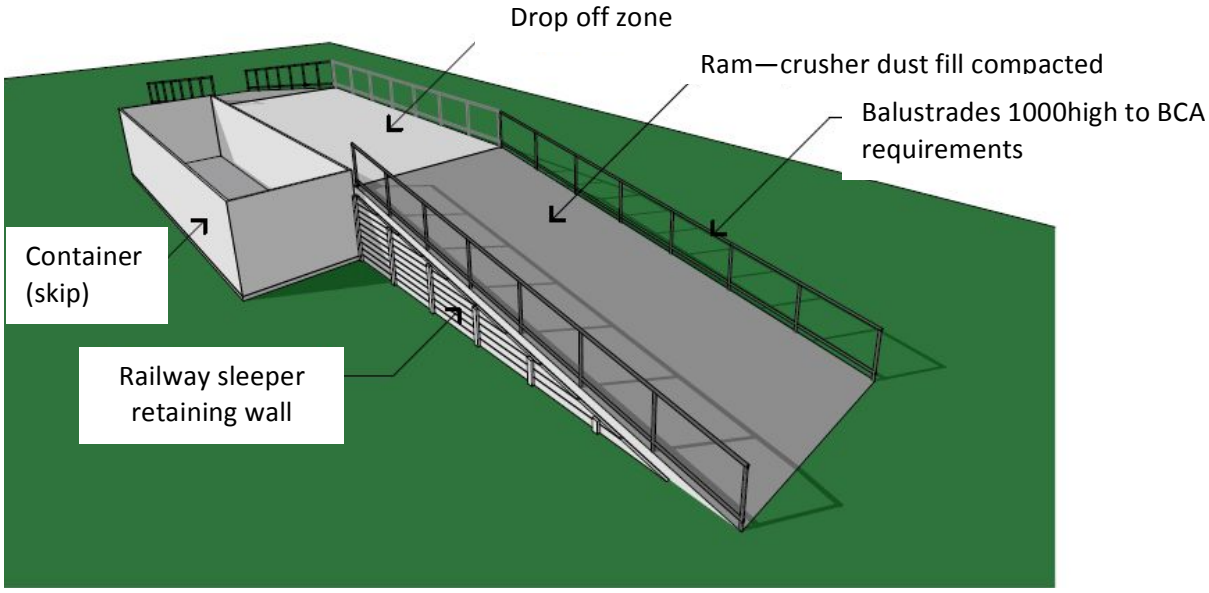
MRA has sourced the following indicative costs to demonstrate the expected price depending on the final choice of material:

a. Combination of Steel I-Beams with timer sleepers ≈ $50,000 + crusher dust
b. Precast concrete walls (e.g. crib wall) ≈ $75,000 + crusher dust
c. Steel sheet piles ≈ $100,000 + crusher dust
d. Fully reinforced concrete walls (cast in-situ) ≈ $150,000 +$20,000 concrete

Therefore, the final cost for material, labour and planning is estimated to be up to $170,000 depending on the materials used. Additional costs that have not been accounted for include any required site planning approvals, fencing (if the site is not already enclosed) and any additional site improvements required at the site. MRA recommends that Councils seek detailed quotes before commencing such a project.

A sketch outlining the proposed transfer station design is presented in Figure 14.

Figure 14 Model rural transfer station design (single ramp up and down, single skip)



Results

A basic drive up and drive off transfer station ramp can be designed for between $50,000 and $150,000.

The cost of a basic transfer station construction should be weighed by Councils against the ongoing maintenance cost and risk associated with operating small rural landfills. As the ongoing cost of maintaining a transfer station is $25 per tonne, some Councils would benefit for completing a cost-benefit analysis of the longer-term savings that could be gained from converting a landfill to a transfer station.

Conclusion

A 2010 national review of the application of landfill standards concluded that regional landfills are performing marginally and 'should be phased out in favour of nearby larger facilities that offer improved resource recovery and the scale for future residual waste processing along with environmentally sound waste disposal controls'[10].

[10] Review of the Application of Landfill Standards, Wright Corporate Strategy Pty Limited, March 2010

The audit of waste infrastructure across the region was in line with findings of the national review. A number of improvement requirements were identified for existing landfills to meet best practice standards. As RAMROC is a large rural area, a significant number of sites are small, remote and accept very low quantities of waste. The location of sites and the small quantities of waste being disposed of means that some sites are being undermanaged and do not have basic operational or environmental documentation. Issues that needed addressing across a number of sites include:

- Lack of basic operational documentation (i.e. operation and workplace health and safety plants);
- Waste disposal records;
- Problematic leachate management;
- Environmental controls for dust, litter, and noise;
- Vermin and vector control; and
- Access to plant and equipment for pushing, moving, and compacting waste.

Rather than maintaining poorly operated landfills across the region, a future strategic direction that Councils should consider is converting smaller landfills to transfer stations and transporting waste to larger and better managed landfills. Replacing small landfills with transfer stations will provide rural areas with economically viable solutions for providing resource recovery services by consolidating materials from smaller towns and villages for more efficient processing.

In NSW, waste management policy supports a general trend towards the construction of large rural landfills rather than maintaining small rural and unsupervised landfills. The move towards having fewer landfills and increasing opportunities for improved resource recovery aligns with current State waste targets. RAMROC will explore opportunities for taking advantage of the current WLRM funding to pursue the rationalisation of the region's waste management infrastructure.

8. Appendix C – FOGO collection/processing in Griffith, Leeton and Narrandera

Project Description

A regional waste strategy allows councils to combine their resources and put in place resource recovery practices that would not be cost effective for individual councils. This business case undertakes a cost analysis for the joint introduction of a three bin system in Griffith, Leeton and Narrandera Councils. The collected organic material would be taken to a composting facility in Leeton Council.

Background

At present none of the RAMROC Councils provide an organics collection service. However, all member Councils have separate green waste collection sites at their local landfills. In most instances, the collected green waste is burnt except for a small number of sites where collected green waste is composted, mulched, shredded, or otherwise processed. In Wakool Shire Council, for instance green waste is processed by a contractor twice a year with the product being sold to local dairy farmers or used in Council works.

On average, residual waste bins of households that do not have separate recycling or organics collection services consist of 60% organic material (food, garden and paper). In NSW, an average of 319 kg of organic material per household was collected at the kerbside in 2011-12. This equates to an average weekly collection of 6.1 kg per household. For the rural LGAs (*Rest of NSW*) the average organic material collected is lower at 230kg per household annually or 4.4kg per household per week.

Objectives

The objectives of a FOGO collection and composting service are to:

- Reduce waste to landfill;
- Increase resource recovery;
- Improve Council services to households; and
- Educate the community on preferred waste management practices.

Assumptions

Table 21 presents the key financial assumptions used in this business case.

Table 21 Cost Assumptions

Variable	Assumption
Recycling bin lift cost (per bin)	$2.50
Residual bin lift cost (per bin)	$2
Organics bin lift cost (per bin)	$2
FOGO diversion rate from residual bins	36%
Open windrow composting gate fee (per tonne)	$55
Griffith Council's landfill gate fee (per tonne)	$130
Leeton Council's landfill gate fee (per tonne)	$70
Narrandera Council's landfill gate fee (per tonne)	$75[11]

[11] A $75/t gate fee was assumed, in line with Leeton landfill's gate fee.

Modelling

All collected organic waste was assumed to be transported for processing at the Leeton landfill. The landfill is located at 723 Corbie Hill Road Leeton, 8.9 km from the town of Leeton. The site has development approval for organics composting but it is currently not in use - the site was previously used for fertilising and composting operations using waste from feedlots, grape and orange farmers. It has been assumed that the site is 2km from any residences and therefore windrow composting is possible. Bin lift collection costs used in each of the three service scenarios are provided at Table 22.

Table 22 Monthly bin lift collection costs

	Scenario 1: Existing			Scenario 2: Go introduction			Scenario 3: FOGO introduction		
	Cost	Services per month	Total	Cost	Services per month	Total	Cost	Services per month	Total
Recycling bin	$2.50	2	$5	$2.50	2	$5	$2.50	2	$5
Residual bin	$2.00	4	$8	$2.00	4	$6	$2.00	2	$4
Organic bin	$2.00	-	$0	$2.00	2	$4	$2.00	4	$8
Total			**$13**			**$15**			**$17**

RAMROC is a rural region with ample space available allowing for a composting operation to be sited in place not impacting neighbouring properties. Therefore the potentially odour generating but much cheaper open windrow composting technology was chosen as the preferred processing option. The cost of open windrow composting has been assumed to be $55 per incoming tonne.

The tonnage of FOGO collected and diverted from landfill is based on a conservative estimate of diverting 36% of the residual waste reported by each Council to the EPA for 2011/2012 (Table 23).

Table 23 Organics disposal diversion and costs

Council	Households	Residual Waste to Landfill (t)	New Diversion with FOGO (t)	Landfill Gate Fee ($/t)	Windrow composting cost ($/t)	Disposal saving ($/t)
Leeton	3,672	3,012	1,084	$70	$55	$15
Griffith	7,852	7,126	2,565	$100	$55	$45
Narrandera	2,093	2,248	809	$75	$55	$20
Total	**13,617**	**12,386**	**4,459**			

Results

Given that the per tonne cost of processing organics in an open windrow is lower than sending organics to landfill, the results show that the Leeton, Griffith and Narrandera Councils would achieve significant cost savings from introducing place a FOGO collection service. Based on current gate fee pricing the total value of these savings is estimated to be $93,424 annually (Table 24). In addition, just under 4,500 tonnes of organic waste would be diverted from landfill.

Table 24 Total savings

Council	Cost of extra pick up	Savings from landfill gate fees	Cost of processing organics	Total savings
Leeton	$ 14,688	$ 75,902	$ 59,638	$ 1,577
Griffith	$ 31,408	$ 256,536	$ 141,095	$ 84,033
Narrandera	$ 8,372	$ 60,696	$ 44,510	$ 7,814
			Total	**$ 93,424**

Conclusion

By diverting organic waste from landfill, Councils also stand to preserve valuable landfill void thus delaying the need to replace the landfill. This has significant financial and planning implications unique to each of the landfills explored and should be considered a valuable side benefit of FOGO collection systems.

Further financial benefits, in addition to the annual savings explored here, should be expected if the NSW landfill levy is extended to the RAMROC region. For each landfill, these savings will be equivalent to the amount of the levy times the total tonnes of diverted organics.

The encouraging results of this cost analysis have been based on a conservative estimate of diverting 36% of the total waste in a household residual bin. However, the average NSW residual waste bin consists of 60% organic material, most of which can be composted alongside garden organics. Therefore, if Councils were to introduce a household FOGO service the new service would target 60% of organic material in existing residual waste bins.

For the purpose of this business case it is not proposed that the Councils bear the cost of processing the organic waste but rather this process is undertaken by a third party contractor who will be responsible for processing and on selling the composted product. A joint tender for the collection and processing of FOGO is recommended for the three Councils both on environmental and financial terms.

9. Appendix D – Mini MRF processing facility in Griffith, Leeton, Narrandera

Opportunity Description

Recycling costs in the region are high, partly because unsorted material needs to be hauled to Wagga Wagga for processing. A local mini MRF would decrease transport requirements and therefore significantly reduce such costs. An alternative option would be to build a regional transfer station in order to consolidate recyclable loads into bigger trucks prior to shipment to the Wagga Wagga MRF. This business case assesses the financial implications of these scenarios for Griffith, Leeton and Narrandera Councils.

Background

The largest cost associated with resource recovery in regional areas is the cost of hauling collected material to larger regional centres for processing. At present, collection trucks are used to transport waste up to 190 km direct to Wagga Wagga following the completion of their collection service. While collected material is compressed, the total weight of recyclables that can be transported in one collection truck is limited to 6.5 tonnes per load. Given that the three Councils generate around 3,800 tonnes of recyclables per year, there is an opportunity to reduce transportation costs by considering the option of having the collected material processed at a local mini MRF or alternatively shipping recyclables through a transfer station compacting them into 26 tonne loads.

Objectives

The objectives of this business case is to determine the benefit to Councils in having waste processed at a mini MRF in Leeton or, alternatively transferred in consolidated loads via a transfer station in Leeton or in Griffith.

Assumptions

A number of regional MRFs were surveyed to gauge the market gate fee per tonne for regional 4,000 t/pa facilities. The quoted prices varied from $50/t to $70/t with proximity to transportation linkages being the key variable. To provide a range of prices, gate fees of a future Leeton MRF were modelled at $60/t and $100/t. The existing Wagga Wagga MRF, which receives the household recycling waste stream from Leeton, Griffith and Narrandera, has an annual processing capacity of 12,000tpa and has a gate fee of $78/t. Table 25 lists the assumptions used in modelling this business case.

Table 25 Business Case Assumptions

Variable	Assumption
Truck cost per hour (Truck, wages, fuel, maintenance)	$120/h
Truck speed	80 Km/h
Transportation journey	Transportation costs are calculated based on a return trip for trucks with an addition 30 minutes added for drop off
Transfer Station handling fee	$20/t
Truck collection load weight	6.5 tonnes
Bulk truck load weight	23 tonnes

The cost of building and operating a MRF have not been modelled as it is expected that Councils would tender for an independent party to build and operate the facility in exchange for a per tonne gate fee.

Modelling

The following scenarios have been developed.

- Scenario 1 – Base Case - Direct collection truck transportation to Wagga Wagga (current situation).
- Scenario 2 – Delivery of recyclables to a mini MRF in Leeton for processing. Two gate fees have been modelled:
  - (2a) Price A - $60
  - (2b) Price B - $100
- Scenario 3 – consolidated transport of waste to Wagga Wagga via Leeton transfer station
- Scenario 4 – Delivery of recyclables to a mini MRF in Griffith for processing. Two gate fees have been modelled:
  - (4a) Price A - $60
  - (4b) Price B - $100

Scenario 1

Modelling the current system, Scenario 1 calculates the costs associated with collection trucks transporting recyclables to Wagga Wagga following the completion of their collection route (Table 26).

Table 26 Scenario 1 – Transportation to Wagga Wagga

	Distance to Wagga (km)	Return trip duration incl. drop-off (hrs)	Truck cost per trip ($)	Cost per tonne ($/t)	MRF Gate fee ($/t)	Total cost ($/t)
Leeton	130	3.75	$450	$69	$78	$147
Griffith	190	5.25	$630	$97	$78	$175
Narrandera	100	3	$360	$55	$78	$133

Scenario 2

Scenario 2 estimated a cost per tonne figure for the transportation of materials to a proposed MRF facility based at Leeton (Table 27). The viability of the facility is linked to a range of factors including the international market price of plastic and fibres.

Table 27 Scenario 2 – Transportation to Leeton MRF

					MRF Gate Fee – Price A		MRF Gate Fee – Price B	
	Distance to Leeton (km)	Return trip duration incl. drop-off (hrs)	Cost per Trip ($)	Cost per tonne ($/t)	MRF Gate fee A ($/t)	Total cost A ($/t)	MRF Gate Fee B ($/t)	Total cost B ($/t)
Leeton	0	0.5	$60	$9	$60	$69	$100	$109
Griffith	58	1.95	$234	$36	$60	$96	$100	$136
Narrandera	30	1.25	$150	$23	$50	$73	$100	$123

Scenario 3

Scenario 3 modelling provides a cost per tonne figure for the transportation of material to a proposed transfer station at Leeton (Table 28). Upon tipping at Leeton loads would be consolidated and transported

to the Wagga Wagga MRF in 26 tonne loads. Consolidating loads before transportation to Wagga Wagga would significantly reduce the number of truck movements and achieve cost savings.

Table 28 Scenario 3 – Transportation to Wagga Wagga MRF via Leeton TS

	Distance to Leeton (km)	Transport to Leeton ($/t)	TS Handling Fee ($/t)	Distance to Wagga (km)	Truck cost per trip ($)	Bulk transport ($/t)	MRF Gate fee ($/t)	Total cost ($/t)
Leeton	0	$9	$20	130	$450	$17	$78	$125
Griffith	58	$36	$520	130	$450	$17	$78	$151
Narrandera	30	$23	$20	130	$450	$17	$78	$138

SCENARIO 4

Scenario 4 estimated a cost per tonne figure for the transportation of materials to a proposed MRF facility based at Griffith (Table 30). The viability of the facility is linked to a range of factors including the international market price of plastic and fibres.

Table 29 Scenario 4 – Transportation to Griffith MRF

					MRF Gate Fee – Price A		MRF Gate Fee – Price B	
	Distance to Griffith (km)	Return trip duration incl. drop-off (hrs)	Cost per Trip ($)	Cost per tonne ($/t)	MRF Gate fee A ($/t)	Total cost A ($/t)	MRF Gate Fee B ($/t)	Total cost B ($/t)
Leeton	58	1.95	$234	$36	$60	$96	$100	$136
Griffith	0	0.5	$60	$9	$60	$69	$100	$109
Narrandera	96	2.9	$348	$54	$50	$104	$100	$154

Results

A key conclusion of the scenario modelling is that transportation is a big cost component in the management of recyclables. For all Councils involved, Scenarios 2, 3 and 4 mostly achieve significant cost savings compared to the business as usual situation (Table 30).

Table 30 Collection and processing costs per tonne for each Council

Scenario		Leeton	Griffith	Narrandera
Scenario 1	**BAU -** Existing transport to Wagga	$147	$175	$133
Scenario 2 A	Leeton regional MRF ($60/t)	$69	$96	$73
Scenario 2 B	Leeton regional MRF ($100/t)	$109	$136	$123
Scenario 3	Transport via regional TS	$125	$151	$138
Scenario 4 A	Griffith regional MRF ($60/t)	$96	$69	$104
Scenario 4 B	Griffith regional MRF ($100/t)	$136	$109	$154

At a Council level, a reasonably priced Leeton MRF (Scenario 2A) was found to be the most competitive price option for Leeton and Narrandera Councils on a per tonne basis. Savings, albeit smaller, are achieved even at the high MRF gate fee (Scenario 2B) revealing that the current situation (Scenario 1) is relatively costly. For Griffith Council, the scenario 4 options are the cheapest (Table 31).

Table 31 Per tonne cost savings compared to BAU (scenario 1)

Council	Annual recyclables (t)	Scenario 2A savings ($/t)	Scenario 2B savings ($/t)	Scenario 3 savings ($/t)	Scenario 2A savings ($/t)	Scenario 2B savings ($/t)
Leeton	953	$78	$38	$23	$51	$11
Griffith	2,144	$79	$39	$24	$106	$66
Narrandera	662	$60	$10	-$5	$30	-$20

At a regional level, any of the modelled alternatives would significantly reduce total annual recyclables processing costs when compared to the business as usual Scenario 1. Even under Scenarios 3 and 4B, where Narrandera accrues higher total fees, savings achieved at Leeton and Griffith more than offset this cost at a regional level. Overall, scenario 4A, where the MRF gate fee is assumed to be $40/t, achieves the highest annual savings. Scenario 4B, where the MRF gate fee is assumed to be $100/t also secures savings both when compared to Scenario 3 and the equally priced MRF at Leeton (Scenario 2B) (Table 34).

Table 32 Total cost savings compared to BAU (scenario 1)

Council	Annual recyclables (t)	Scenario 2A annual savings ($)	Scenario 2B annual savings ($)	Scenario 3 annual savings ($)	Scenario 4A annual savings ($)	Scenario 4B annual savings ($)
Leeton	953	$74,365	$36,229	$21,634	$48,843	$10,707
Griffith	2,144	$169,211	$83,451	$50,631	$226,604	$140,844
Narrandera	662	$39,924	$6,824	-$3,310	$19,758	-$13,342
Total (all Councils combined)		**$283,500**	**$126,504**	**$68,956**	**$295,206**	**$138,210**

Conclusion

Transportation represents the most significant cost incurred by Narrandera, Leeton and Griffith in managing their recyclables stream. Therefore any alternative system reducing this cost will have a significant impact on total recyclables management cost. Of the modelled scenarios, the delivery of collected recyclable material to a regional MRF at Griffith would achieve the greatest cost savings for Councils. The resulting reduction in truck movements is also expected to increase road safety and reduce road deterioration. In addition, a local MRF would provide a boost to the local economy and create local employment opportunities. It is therefore recommended that the Councils consider combining future collection contracts and tendering for a local mini MRF operator to process recyclable material at Griffith.

10. Appendix E – Deniliquin Community Drop Off Centre

Opportunity Description

Deniliquin Council is considering options for the expansion of the existing Deniliquin Waste Disposal Depot. One of these options is the construction of a new community recycling centre which will provide specialist infrastructure for the collection and handling of household problem waste including paints, oils, batteries, gas bottles, fluorescent globes, and smoke detectors.

Background

Although Deniliquin is the smallest Council in the RAMROC region (130km^2), it has a relatively large population of around 7,900 and is one of the largest centres in the area behind Albury City Council.

At present, Deniliquin provides households with a weekly general waste collection service but not a recycling service. Residents are able to recycle items by taking them to the Deniliquin Waste Disposal Depot (Figure 15) located just less than 5km from the town of Deniliquin. The Depot is open from 8.30am - 4.00pm seven days a week and provides separate stockpiles and storage areas for paper and cardboard, paints, mattresses, batteries, separated glass, plastic, tyres, scrap metal, green waste, C&D waste, motor oil, white goods and e-waste.

Figure 15 Aerial image of Deniliquin Waste Disposal Depot

While the current facility has collection systems in place for oils, paints and batteries, there is no capacity for gas bottles, fluorescent globes, and smoke detectors. The proposed community recycling centre will provide for the capture of all forms of problem waste and provide a single easy to use drop off site for households.

Funding availability

WLRM funding opportunities include grants for Improved Systems for Household Problem Wastes - Community Recycling Centres. The Improved Systems for Household Problem Wastes – Community Recycling Centres is a four year state-wide $11.35 million grants program aimed at establishing infrastructure that will be used for community recycling centres or similar mobile services.

Contestable grants are available to upgrade existing facilities, construct new community drop off centres, or trial innovative solutions where a fixed facility is not practicable.

Where the infrastructure is built on publicly owned land funding of up to $250,000 is available for local government authorities. Alternatively, up to $125,000 is available where local government controlled entities partner with a private business and the community recycling centre is proposed to be constructed on privately owned land.

The funding may be used for various aspects including project management, equipment purchase, design plans, site works, improved access and egress road works, safety equipment or site security. The funding is not available for land purchase or leasing costs, projects not located in New South Wales or costs of equipment not dedicated to the project purpose (e.g. vehicles, buildings) or infrastructure for the collection of commercial problem wastes or non-household waste.

Four annual grant rounds are available – February 2014 (closed), August 2014, and then anticipated rounds in August 2015 and August 2016.

General assumptions

The following assumptions have been used in developing this business case:

- The community recycling centre will be constructed on site at the Deniliquin Waste Disposal Depot. As the land is owned by Council, there will be no project costs associated with land purchase.
- The specification of the community recycling centre will be consistent with the WLRM household problem waste Community Recycling Centre (Drop Offs) grant program.
- No additional labour will be required to operate the proposed facility, as these duties will be carried out by the existing Deniliquin Waste Disposal Depot staff.

Cost assumptions

The estimated construction costs and the costs associated with introducing the facility to local residents are provided in Table 33 and Table 34 respectively.

Table 33 Construction costs

Cost item	Cost ($)
Concrete pad	$ 40,000
Landscaping works	$ 30,000
Shed roof	$ 110,000
Shed side enclosures	$ 80,000
Signage (physical)	$ 15,000
Safety equipment	$ 5,000
Facility Design	$ 20,000
Training accreditation cost for internal personnel	$ 3,000
Total Costs	**$ 303,000**

Table 34 Facility advertising costs

Community education/information activity	Cost
Community Flyer - What can be recycled and dangers	$ 12,000
Community Radio Advert	$ 10,000
Community Radio Advert Airing	$ 1,000
Advertising in the Pastoral Times (half page x 2)	$ 3,000
Total Costs	**$ 26,000**

Overall the project is expected to cost $329,000. The operation of the proposed community recycling centre facility will not require additional labour costs as the existing Deniliquin Waste Disposal Depot staff will take responsibility for operations. For the first three years of operation all items will be collected by and processed under the existing NSW problem waste disposal agreements.

Conclusion

The construction of the proposed household problem waste community recycling centre represents a significant step forward in the enhancement of Deniliquin waste management services. Targeting and collecting problem wastes will reduce the indiscriminate landfilling or potentially hazardous substances. By providing a free and safe disposal pathway, the project also has the potential to reduce dumping incidents and prevent environmental harm.

It is recommended that Council seek the maximum amount of funding available, $250,000, to secure the majority of costs required for the construction and initial advertising costs for the project.

11. References

Australian Bureau of Statistics, Measures of Australia's Progress, http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1370.0~2010~Chapter~Waste%20per%20person%20 (6.6.3)

Conargo Shire Council, (2014). Strategic Waste management Plan

DCCEE, (2011). A-Z Government Initiatives, Department of Climate Change and Energy Efficiency, Australian Government, http://www.climatechange.gov.au/government/initiatives

DECCW, (2010). Review of Waste Strategy and Policy in NSW, Department of Environment, Climate Change and Water, New South Wales Government, http://www.environment.nsw.gov.au/resources/warr/101034RevWasteStrat.pdf

DECCW, (2010a). Waste Avoidance and Resource Recovery Strategy Progress Report, Department of Environment, Climate Change and Water, New South Wales Government, http://www.environment.nsw.gov.au/resources/warr/110060WARRSPRvolume1.pdf

DECCW, (2010). Review of Waste Strategy and Policy in New South Wales, Department of Environment, Climate Change and Water, New South Wales Government, http://www.environment.nsw.gov.au/resources/warr/101034RevWasteStrat.pdf Accessed 4th May 2013

DEWHA, (2010). National Waste Report, Department of the Environment, Water, Heritage and the Arts, Australian Government, http://www.scew.gov.au/archive/waste-management/pubs/wastemgt_nat_waste_report_final_20_fullreport_201005_0.pdf

Department of Planning, (2009). New South Wales Statistical Local Area Population Projections, 2006-2036.

EPA (2013) NSW Local Government Waste and Resource Recovery Data Report as Reported by Councils 2011–2012, Environmental Protection Authority, New South Wales, http://www.environment.nsw.gov.au/resources/warr/120834lgdata2010-11.pdf

EPA (2013) Waste Less, Recycle More, Environmental Protection Authority, New South Wales, http://www.environment.nsw.gov.au/resources/waste/130050WLRM.pdf

EPA (2013) Litter, Environmental Protection Authority, New South Wales, http://www.environment.nsw.gov.au/warr/litter.htm

EPHC (2010) National Waste Policy Report, Environmental Protection and Heritage Council, http://www.environment.gov.au/wastepolicy/index.html

GHD (2013), RAMROC Audit of Regional Waste Facilities Volume 1- Project Report, September 2013

GHD (2013), RAMROC Audit of Regional Waste Facilities Volume 2 – Site Inspection Reports, September 2013

Greater Hume Shire Council Waste Management Strategy 2010-2015

Hyder (2012) Place-Based Approaches to Commercial and Industrial Waste and Recycling, http://www.environment.gov.au/wastepolicy/publications/pubs/place-based-approaches.pdf

MRA, (2010). Review of reform proposals for NSW recycling and diversion of waste from landfill, Mike Ritchie and Associates

OEH, (2011). Domestic Kerbside Waste and Recycling in NSW, Report on the results of waste audits of household kerbside collection systems 2007-2008

OEH, (2011). Waste Management and Resource Recovery Framework, Office of Environment and Heritage, New South Wales

RWMWG, (2008). Regional Waste Minimisation Working Group, Regional Waste Minimisation Strategy, 2008

Southern Riverine News, http://www.mmg.com.au/local-news/finley/waste-money-jerilderie-to-introduce-tip-charges-1.21598

Southern Riverina News, http://www.mmg.com.au/local-news/finley/jerilderie-tip-fee-dropped-1.33797

The Observer, http://www.colypointobserver.com.au/story/1950419/investigation-of-darlington-point-landfill-fire/

Wakool Shire Council, (2013). Vision 2023 Community Strategic Plan