



Goulburn Valley Waste and Resource Recovery Implementation Plan

June 2017

Front cover images:

*Concrete for crushing
Compost ready for use
Dismantling e-waste*



Goulburn Valley Waste and Resource Recovery Implementation Plan

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Authorised and published by the Goulburn Valley Waste and Resource Recovery Group

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Image: Portrait of Wendy Buck

Foreword

The Goulburn Valley Waste and Resource Recovery Implementation Plan (GV implementation plan) outlines the Goulburn Valley region's waste and resource recovery infrastructure needs and how they will be met over next 10 years. Its focus is on sustainable resource recovery and it is based on the best evidence available after consultation with state government, councils, industry, businesses and the community.

The GV implementation plan is established with other regional plans from six waste and resource recovery groups to maximise opportunities to share resources, minimise costs and encourage innovation. All the plans are aligned with the 30-year goals of the *Statewide Waste and Resource Recovery Infrastructure Plan*.

The strategic objectives of the statewide and regional plans aim to increase resource recovery through diverting more recyclable materials from landfill, improve consolidation and aggregation of materials for reprocessing and ensure that waste and resource recovery infrastructure is suitably located. An effective regional system that maximises economic outcomes, provides cost effective service delivery and reduces community, environment and public health impacts will contribute to an effective integrated statewide system with many associated benefits.

Priorities for the region include increasing the capacity of infrastructure to manage organics and ensuring infrastructure is available to manage priority materials of tyres, textiles and

e-waste. Increasing the diversion of industrial waste from landfill relies on establishing pre-sort infrastructure which requires support from both councils and industry.

Significant challenges for the region include developing data collections and reporting methods that enhance and support waste and resource recovery decision making. Another challenge is creating pathways to ensure councils and industry better integrate waste and resource recovery with land use planning.

Significant engagement with government, councils, industry, businesses and the community has occurred throughout the development of the plan. This included data collection, a community survey completed by 650 residents and an extensive market sounding process to inform the draft plan. The public consultation on the draft plan included a range of feedback opportunities and provided important refinements to the final plan. We thank everyone for their participation and input.

We have outlined 13 actions for the 10-year period of the GV implementation plan but it also allows for flexibility to plan for current or future policy changes within the period, such as the Victorian Government's commitment to ban e-waste from landfill.

We all want to improve the way we care for the environment and we believe the GV implementation plan will do this. It is not just based on 'business as usual' but identifies new opportunities to establish sustainable recovery systems with secure end markets for valuable materials that are not currently recovered. We are committed to improving and establishing innovative waste and resource recovery systems to create jobs and foster a viable and sustainable regional economy.

Wendy Buck
Former Chair



Executive summary

The Goulburn Valley Waste and Resource Recovery Region is in the central north of Victoria, has a total area of over 21,000 square kilometres and spreads across six council areas ranging from Melbourne's urban fringe to rural areas bordering the Murray River and southern New South Wales.

Two key features impacting on the demands for waste and resource recovery infrastructure in this diverse region are the rapidly growing residential fringes of Melbourne in the Mitchell Shire and agricultural production and the associated industries across the region.

Over 195,000 people live in the Goulburn Valley region. By 2031 overall population is projected to increase by 42%, with Mitchell Shire's population projected to increase by 145% or nearly 51,000 people¹.

Around 25% of the value of Victoria's agricultural production² in the dairy, viticulture, fruit growing and other agricultural sectors is produced on over 80% of the region's land³.

In 2014, the Gross Regional Product (GRP) of the region was \$7.4 billion, or 11.7% of the total regional Victorian GRP. The region's GRP has an annual growth rate of 1.8%, double the Victorian average³.

Greater Shepparton is a major fruit production area, while livestock and grain crops are the main products in Campaspe and Moira Shires. Nearly a third of all businesses are located in Greater Shepparton.

Some of the types of waste generated by irrigated dairy farming, vegetable production, broadacre cropping, food and dairy processing manufacturers are easily recyclable in existing systems, while other types of wastes present challenges.

In 2013-14, around⁴ 387,000 tonnes of waste and recovered materials were generated in the region. Of this 66% was estimated to be recovered for recycling and 34% went to landfill⁵.

It is estimated over 30,000 tonnes of the waste generated within the region flows out of the region for reprocessing⁶. This includes commingled recyclables from council kerbside collections, a range of materials from resource recovery centres and materials including paper and cardboard from reprocessors and the materials recovery facility. At the same time 52,000 tonnes of waste enters the region for landfilling, organics reprocessing and recycling.

Approximately 132,000 tonnes (or 34%) of material generated in the region was landfilled. Of this, over a third (35%) consisted of food, garden organics and wood/timber. Other recyclable material categories were paper/cardboard (12%) and plastics (10%). This means that nearly 60% of materials landfilled are potentially recyclable⁵.

It is estimated that in 2016, the region's waste and resource recovery sector supported approximately 125 full time equivalent (FTE) landfill and 675 FTE resource recovery jobs either directly or indirectly⁷.

1 Department of Environment, Land, Water and Planning (2014) Victoria in the Future - Population and Household Projections (see Table 4)

2 Regional Development Victoria, 2015 in *Goulburn Valley Infrastructure capacity and needs assessment*, Blue Environment, unpublished, 2015

3 *Demographic and economic profile of the Goulburn Valley region*, prepared by .id, unpublished, 2015

4 Data is modelled and rounded to the nearest thousand (>10,000 closest 1000, <1000 closest 100, <100 = 100)

5 Victorian Regional Waste and Resource Recovery Database v3; 2013-14 waste and resource recovery data provided by Sustainability Victoria

6 *Survey and analysis of regional reprocessors and material recovery facility operators: Goulburn Valley Waste and Resource Recovery Group regional report*, Sustainable Resource Use for Sustainability Victoria, unpublished, 2015

7 *Goulburn Valley Waste and Resource Recovery Group Economic Analysis*, Essential Economics and Blue Environment, unpublished, 2016



Image: Worker at former Shepparton materials recovery facility

In 2014-15, economic output associated with the Goulburn Valley region's waste and resource recovery sector is estimated at \$44 million, of which \$34 million is identified as value-added output. The value of recovered materials in the Goulburn Valley region was estimated to be \$29 million, mainly associated with recovered metals materials (\$23.6 million)⁸.

With the addition of services that commenced between 2014 and 2016, approximately 50% of households in the region are now serviced by household food and garden organics collections. It is estimated this will result in a further 5,000 tonnes of food and garden organics to be processed in 2018-19.

However as current infrastructure in the region is nearing capacity, establishing additional food and garden organics processing is the most pressing need in the region. This projected gap presents a market opportunity for infrastructure development and the implementation plan provides a clear pathway for this to occur and includes supporting the required growth in end markets of recycled organics products.

The increased recovery of organics will reduce the amount of organic material sent to landfill which will result in positive environmental benefits through an estimated reduction of 7,000-11,000 tonnes of CO₂-e a year⁹.

The plan has a key focus on contingency planning with a priority on adaptation measures to respond to a changing climate that

impacts directly or indirectly on the operations of waste and resource recovery infrastructure and services.

Assuming 2015 recycling rates continue, and based on the expected population increases, waste generated in the region is projected to be 464,000 tonnes a year by 2025, an increase of around 20% or 77,000 tonnes a year⁹. The region needs to ensure that this additional material can be effectively managed, either locally or at facilities in other areas. The modelling¹⁰ suggests that, while overall waste generation increases, it is the amount of material recovered that will show the greatest increase, compared to a slower increase in the amount of waste landfilled.

As part of developing the implementation plan, the Goulburn Valley Waste and Resource Recovery Group (GVWRRG) ran a market sounding process that engaged private and council waste and resource recovery facility operators to identify new or expanded facilities to meet the region's growing needs and opportunities. The research and data analysis identified the region's needs and opportunities that were tested in the market sounding process.

⁸ Goulburn Valley Waste and Resource Recovery Group Economic Analysis, Essential Economics and Blue Environment, unpublished, 2016

⁹ Goulburn Valley Infrastructure capacity and needs assessment, Blue Environment, unpublished, 2015

¹⁰ Victorian Regional Waste and Resource Recovery Database v3; 2013-14 waste and resource recovery data provided by Sustainability Victoria

Market sounding presented the need for additional food and garden organics reprocessing facilities and to expand recycling collections to the commercial sector. Sorting industrial waste would recover valuable materials and reduce waste to landfill. Opportunities to increase recovery of plastics, wood and timber, and aggregates, masonry and soil and to establish reprocessing facilities for e-waste, textiles and tyres were also confirmed during the process.

The market sounding process received a submission for a new energy from waste facility that will source its feedstock from the industrial sector and is planned to be operational in 2017. As well as establishing this type of infrastructure in the region as a demonstration of new technology it will recover material that is likely to be currently landfilled.

Modelling established that the region does not require additional landfill capacity within the next 10 years, even with the expected increase in waste entering landfills¹¹. This is complemented by the strategic objective to reduce waste to landfill, which will extend the life of the landfills and minimise any potential environmental or health impacts. This creates opportunities to establish new technologies to increase the recovery of materials, particularly organics, and to reduce waste to landfill.

A cost benefit analysis of benefits of the plan¹¹ found \$20 million to \$30 million of investment in resource recovery infrastructure will be required over the 10 years of the plan to cater for waste diverted from landfill. This was under a business as usual scenario. However investment levels will increase as the region moves away from business as usual and achieves the plan's objectives to reduce waste to landfill and increase recovery.

By 2025 under business as usual, an additional 150 resource recovery and 25 landfill FTE jobs would be created highlighting the employment generating capacity of the sector, especially in resource recovery¹¹.

By 2025, the value of recovered materials in the region is forecast to increase from \$29 million to \$35 million a year¹¹.

The GV implementation plan weighs the benefits of an expanded waste and resource recovery system that delivers jobs and growth, against the financial benefits that might be offered by transporting materials out of the region.

The plan has five regional strategic objectives, which are aligned to the goals and strategic directions of the *Statewide Waste and Resource Recovery Infrastructure Plan* (state infrastructure plan). The action plan includes 13 actions to achieve the regional strategic objectives. It shows the relationship between the state and regional plans, identifies the stakeholders, timeframe and performance indicators.

A draft plan was released for broad consultation supported by a range of opportunities for all stakeholders to review and provide feedback on the draft plan. The consultation provided valuable information that shaped the final plan.

The GV implementation plan is one of seven plans developed to achieve the goals of the state infrastructure plan and an integrated statewide system. Sustainability Victoria reviewed the post-consultation plan to ensure it was aligned to the state infrastructure plan, the Environment Protection Authority Victoria reviewed it to identify any objection to any particular proposed scheduled landfill and a legal review was undertaken to ensure all the legislative requirements had been met. The final step was to work with the other six waste and resource recovery groups to ensure all of the plans were integrated.

The GV implementation plan outlines the waste and resource recovery needs and opportunities of the Goulburn Valley region and how they will be managed throughout the next decade.

¹¹ *Goulburn Valley Waste and Resource Recovery Group Economic Analysis*, Essential Economics and Blue Environment, unpublished, 2016

Image: Sorting of construction and demolition material for reprocessing





1 About this plan

1.1 Purpose

The Goulburn Valley Waste and Resource Recovery Implementation Plan (GV implementation plan) has been developed as the key guiding document for waste and resource recovery to assist the needs of councils, industry, the community, business and other stakeholders in their own waste and resource recovery infrastructure planning for at least the next 10 years.

The plan is based on sustainable resource recovery that requires a positive business case, employment opportunities, a market for the recovered goods and materials and improved outcomes for the community, environment and public health.

The plan also recognises the principles of environmental justice that are based on the concepts of equity and participation.

For waste and resource recovery planning in Victoria, this means the community must be involved in determining the waste and resource recovery priorities and have opportunities to participate in the long term planning to establish a safe, integrated waste and resource recovery system.

The plan provides the outcomes of the detailed analysis of the available data on waste generated, recovered and landfilled and on waste and resource recovery infrastructure capacity and needs. It includes the outcomes of the engagement with industry and councils seeking solutions to the identified needs and opportunities for the region. GVWRRG has actively sought innovative solutions such as energy from waste (EfW) technologies. The plan also proposes the appropriate solutions to the Goulburn Valley region's needs for waste and resource recovery infrastructure for the next 10 years.

1.2 Statutory objective of this plan

The objective of the GV implementation plan is to set out how the waste and resource recovery infrastructure needs of the Goulburn Valley region will be met over at least a 10-year period.

Developing the GV implementation plan is a requirement of 2014 changes to the *Environment Protection Act 1970* (EP Act).

The EP Act established the Victorian Waste and Resource Recovery Infrastructure Planning Framework (Framework) to establish a waste and resource recovery system that:

- effectively manages the expected mix and volumes of waste
- reflects the principles of environmental justice to ensure that impacts on the community, environment and public health are not disproportionately felt across communities
- supports a viable resource recovery industry
- reduces the amount of valuable materials going to landfill.

Statewide Waste and Resource Recovery Infrastructure Plan vision

Victoria has an integrated statewide waste and resource recovery system that provides an essential community service to:

- protect the community, environment and public health
- recover valuable resources from our waste
- minimise long term costs to householders, industry and government.

About the regional implementation plans

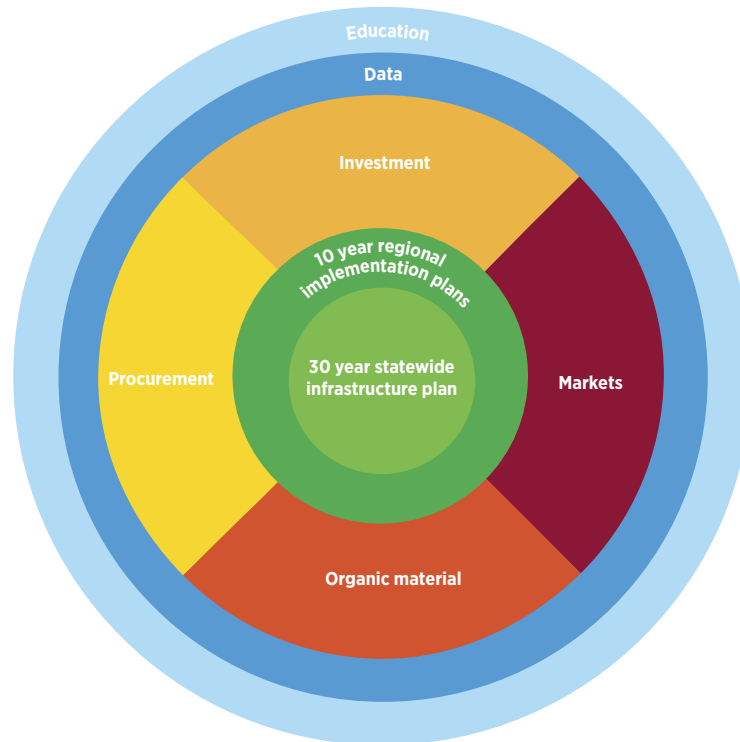
- Seven regional implementation plans have been developed.
- Each regional implementation plan will be the key guiding document for waste and resource recovery for that region.
- Sections 50B(A-H) of the EP Act outline requirements for the preparation, objective, content, consultation, integration with the state infrastructure plan, publication and amendment of regional implementation plans.
- Councils are required to perform their waste management functions consistently with the regional implementation plan:
 - > that covers their municipality
 - > for the regions in which they dispose of their waste.
- It is a legislative requirement that any person involved in the generation, management or transport of waste in Victoria must not do anything in relation to that waste that is inconsistent with the relevant regional implementation plan.

Statewide Waste and Resource Recovery Infrastructure Plan, Sustainability Victoria, 2015

Figure 1 shows the integrated system of the Framework:

- The system is supported by education on *why* we need to achieve the goals and *how* to achieve them.
- Data informs decision-making and monitors progress.
- The 30-year *Statewide Waste and Resource Recovery Infrastructure Plan* (state infrastructure plan), one metropolitan and six 10-year regional implementation plans provide the roadmap for investment, procurement, markets and organics recovery.
- Sustainability Victoria (SV) has developed strategies to provide direction for these four areas through the *Victorian Organics Resource Recovery Strategy* (state organics strategy), the *Victorian Market Development Strategy for Recovered Resources*, the *Victorian Waste Education Strategy* (waste education strategy), the investment facilitation service and procurement support.

Figure 1 Achieving the state infrastructure plan goals



Source: Sustainability Victoria, 2015

Waste is an essential service

An essential service can be defined as a service that is recognised as a basic right for the community. Any failure to deliver this service results in risks to the community.

Victoria's waste and resource recovery system provides the essential services to manage Victoria's waste. If these streams are not managed properly they can cause a range of issues including odours, dust, noise, generation of leachate which can contaminate groundwater, soil contamination and the generation of greenhouse gases which impact the community and environment.

Statewide Waste and Resource Recovery Infrastructure Plan, Sustainability Victoria, 2015

Goulburn Valley residents identify waste as an essential service and widely believe that waste management services should be in the top three essential services priorities for local and state governments.

GVWRRG Community Engagement Survey, Wallis, 2015

1.3 Scope of the plan

The EP Act details the scope of the GV implementation plan and how it is developed. It must be integrated with the state infrastructure plan, developed by SV that commenced on 12 June 2015. See Appendix 1 for details of the requirements.

The state infrastructure plan provides the road map for investment in the *state's* waste and resource recovery system. The GV implementation plan identifies what needs to happen in the *region* to make sure we have the right infrastructure in the right place at the right time.

The GV implementation plan must include:

- A description and analysis of waste and resource recovery infrastructure in our region.
- A description of how the long term directions in the state infrastructure plan will be implemented to meet local and regional infrastructure needs in our region.
- A schedule of existing and required waste and resource recovery infrastructure in our region.
- Any matters required by the *Ministerial Guideline: Making, amending and integrating the Statewide Waste and Resource Recovery Infrastructure Plan and Regional Implementation Plans* (Ministerial Guideline).

Figure 2 shows the wide range of activities that occur in the statewide waste and resource recovery system. The scope of the GV implementation plan is to identify the infrastructure needed to manage waste materials after entering the system, shown in the yellow section.

Other relevant legislation, including the *Victorian Planning and Environment Act 1987* and the *Transport Integration Act 2009* have been considered in the preparation of this plan.



Image: Tour of Recycled Plastic Technology's Moama recycled pipe manufacturing site

The Goulburn Valley Waste and Resource Recovery Group

The GVWRRG was created under 2014 amendments to the EP Act and replaced the former Goulburn Valley Waste Management Group that was established in 1997.

We are responsible for planning the future needs of waste and resource recovery infrastructure in the region, aligned to Victorian Government policy. We work with six councils, the Shire of Campaspe, City of Greater Shepparton and the shires of Mitchell, Moira, Murrindindi and Strathbogje, to plan for waste and resource recovery infrastructure and services and to facilitate appropriate joint council procurement.

We work with government environment agencies, councils, industry, business and communities to provide best practice advice on waste and resource recovery systems, facilities and services. We have a long history since 1997 of successful government funding partnering to deliver waste and resource recovery projects across the region.

We have a long history of successful government funding partnering to deliver waste and resource recovery projects across the region.

Figure 2 Waste and resource recovery system



Source: *Statewide Waste and Resource Recovery Infrastructure Plan*, Sustainability Victoria, 2015



Image: Timber bins for fruit processing

1.4 How the plan was developed

The GVWRRG is responsible for preparing the GV implementation plan, in collaboration with SV, the Environment Protection Authority Victoria (EPA) and all other waste and resource recovery groups (WRRGs).

The WRRGs and SV worked together to integrate the priorities and directions of the regional implementation plans and the state infrastructure plan to resolve any differences in the plans. Neighbouring WRRGs worked collaboratively, to the extent practicable, to ensure the plans are consistent and align with one another. See Appendix 2 for details of the collaboration, alignment and integration process and outcomes.

To achieve full and effective integration, council strategies will need to align with regional strategies (see Action 6).

Working in collaboration will establish a system across the state that maximises recovery, minimises impacts to the community and environment and is as efficient and cost effective as possible.

Developing the GV implementation plan includes meeting all requirements of the EP Act and the Ministerial Guideline.

Figure 3 shows the overall process for preparing the GV implementation plan. Underpinning this approach is evidence-based analysis and assessment, principles of transparency and fairness, and engagement with stakeholders and the community.

For more detail on statutory requirements, the scope and processes for preparing the plan, please see Appendix 1.

1.5 Governance structure

A governance structure was developed as one of the first steps in the development of the GV implementation plan. It included processes to manage actual or perceived conflict of interest and to make and implement decisions to develop the GV implementation plan. Details of the structure as well as the roles and responsibilities of each group are included in Appendix 2.

Figure 3 Process for preparing the Goulburn Valley Waste and Resource Recovery Implementation Plan



1.6 Consultation and community engagement

Stakeholder consultation and community engagement have occurred throughout the development of the GV implementation plan based on the International Association for Public Participation principles and Public Participation Spectrum¹² to ensure the broadest participation possible. The GV implementation plan included a consultation and engagement plan. This defined four distinct phases, moving from 'informing', at the lower end of public participation on the spectrum, to 'collaboration and seeking approval' at the higher levels of the spectrum, shown in Table 1.

The consultation process also ensured the principles of environmental justice of equity and participation were incorporated. For the GV implementation plan, this meant the community was involved in determining the waste and resource recovery priorities and had opportunities to participate in the long term planning to establish a safe, integrated waste and resource recovery system.

A community survey undertaken in November 2015 aimed to understand Goulburn Valley residents' attitudes and behaviours to waste and resource recovery¹³ to ensure they could be

addressed in the development of the GV implementation plan. The 2015 survey built on a survey conducted in 2013, and repeated a number of questions for comparison (these results have been included in the relevant sections of the GV implementation plan).

1.6.1 Consultation activities for the draft implementation plan

Councils, industry, business and the community all create waste and participate in the waste and resource recovery system in different ways. A range of opportunities was offered for councils, industry, business and the community to participate and provide feedback.

The primary tool was a multi-purpose open house which provided multiple opportunities for engagement. The open house format provided an informal setting for people to watch a two and a half minute video and view printed information including a summary document and maps explaining the draft GV implementation plan, consider the frequently asked questions, talk to GVWRRG staff and council representatives and provide comments or fill in a survey.

Table 1 Consultation and engagement IAP2 activities to develop the Goulburn Valley Waste and Resource Recovery Implementation Plan

Phase	1	2	3	4
IAP2 spectrum	Inform / consult	Consult	Involve	Collaborate / approve
Activities	<ul style="list-style-type: none"> state infrastructure plan launch registration of interest in the development of the GV implementation plan 	<ul style="list-style-type: none"> industry and council consultation to assess current waste generated, infrastructure and capacity need market sounding process community engagement survey meetings with reprocessors meeting with a waste generator 	<ul style="list-style-type: none"> public consultation on draft plan targeted to all stakeholders range of opportunities review submissions and amend plan 	<ul style="list-style-type: none"> alignment with state infrastructure plan integration with other regional implementation plans finalise draft plan Ministerial approval

¹² <https://www.iap2.org.au/resources/public-participation-spectrum>

¹³ Six hundred and fifty residents answered question on waste behaviours, waste as an essential service, role and performance of councils, the future of waste services and facilities, economic development/regional development/investment attraction, environmental justice and social licence to operate.

Community interest in participating

When presented with an open-ended question regarding waste and resource recovery in the Goulburn Valley, nine out of ten community members came up with at least some sort of change or development that they would like to see in 10 years' time. This is a remarkably high figure, indicating that the issue of kerbside collections, resource recovery and landfills is one that affects almost everyone in the Goulburn Valley community.

Nearly 70% of residents are interested in providing feedback on policies that are important to them, by email or community survey, particularly broad long term policies like the implementation plan.

GVWRRG Community Engagement Survey, Wallis, 2015

- 27 online surveys were completed
- presenting at a joint WRRG consultation event held in Melbourne targeting statewide and national industry stakeholders.

Appendix 3 summarises the response to the comments from the consultation.

1.7 How was the plan integrated with the other plans?

The EP Act and the Ministerial Guidelines establish processes to ensure that each regional implementation plan is aligned to the priorities and directions of the state infrastructure plan and the all regional implementation plans.

The first step following the consultation process was for the draft implementation plans to be submitted to SV to ensure strategies, directions, actions and data were aligned to the state infrastructure plan, EPA reviewed it to identify any objection to any particular proposed scheduled landfill and Department of Environment, Land, Water and Planning (DELWP) to ensure each plan was consistent with other government policies.

The final step in the integration process was for all the WRRGs to ensure that all seven regional plans were integrated with one another and with the state infrastructure plan.

1.8 How was the plan approved?

The Minister for Energy, Environment and Climate Change reviewed and approved the plan following the integration phase.

1.9 Who will use the plan?

Councils, government, industry, business and the community involved in waste and resource recovery will use the GV implementation plan to inform their decision making. It will be of value to local, state and Commonwealth governments in their own planning and land use decisions. EPA will use the plan and infrastructure schedules when considering works approvals for landfills and resource recovery facilities.

The EP Act specifically requires that:

- Councils must perform waste management functions which are consistent with the regional implementation plans.
- Any person involved in the generation, management or transport of waste within a waste and resource recovery region must not do anything in relation to that waste that is inconsistent with the relevant regional implementation plan.

A four-page summary, enlarged A1 maps from the plan showing infrastructure locations and the short video were all designed for maximum access and engagement without it being necessary to read the entire plan.

As well as participating on-the-spot, all of these resources, including a template letter and survey, were available online to review or complete later.

The consultation process resulted in the following outcomes:

- individual meetings with 14 reprocessors classified as a regional or state hub and one waste generator
- six open houses were held across the region attracting nearly 70 visitors from the community, industry, councils, state government and other WRRGs
- staff discussed aspects of the draft implementation plan with open house visitors documenting their comments for analysis, and providing immediate feedback where possible
- 15 open house participant comments and discussions documented
- 14 written submissions were received



2 What do we want to achieve?

We want to ensure we have the right waste and resource recovery infrastructure to meet the region's needs for at least the next 10 years. We will do this by supporting councils, industry, business and the community to:

- reduce their reliance on landfills
- maximise resource recovery
- achieve best practice standards so that communities and the environment are protected
- make well informed evidence based decisions.

2.1 What does success look like?

The region has the right mix of infrastructure to manage its waste and recover valuable resources, providing economic, social and environmental benefits to the community.

Informed planning	Targeted information and guidance informs evidence based planning and investment decisions.
Resource recovery	Valuable resources are recovered and consolidated through an integrated planning and infrastructure approach.
Residual waste	Residual waste facilities are managed to provide economic, social, public health and environmental community benefits including cost efficiency, improved amenity, less community and environmental impacts and environmental protection.

2.2 Strategic objectives

There are five strategic objectives for the GV implementation plan that are based on the principles of the EP Act and aligned to the strategic directions of the state infrastructure plan:

1. Maximise diversion of recoverable materials from landfills.
2. Support increased resource recovery.
3. Achieve quantities for reprocessing.
4. Manage waste and material streams.
5. Maximise economic outcomes in the delivery of a region-wide network of waste and resource recovery infrastructure.

2.3 What are the regional priorities?

We have divided our priorities into needs and opportunities. *Needs* occur where there is either no existing infrastructure or insufficient infrastructure to recover and reprocess materials types. These include:

- e-waste
- tyres
- textiles
- food and garden organics
- sorting infrastructure to recover industrial waste.

Opportunities occur where there is existing infrastructure with capacity to recover or process more. These include:

- wood and timber
- plastics
- aggregates, masonry and soil.

The needs and opportunities were established through research and data analysis followed by conducting a market sounding process to confirm and refine the needs and opportunities. They have been identified as priority materials to inform the actions.



Sustainable resource recovery requires a positive business case, a market for the recovered goods and materials and improved outcomes for the community, environment and public health.

Images: Baled cardboard, baled plastic and crushed glass at a materials recovery facility



3 Actions to achieve regional and statewide objectives

Table 2 shows the six statewide strategic directions and the regional plan's five objectives, outcomes and 13 actions. Table 3 lists the action plan to achieve the objectives. Actions in the action plan will be included in the GVVRRG business plans that will list key performance indicators and measures.

Table 2 State infrastructure plan strategic directions and the region's objectives, outcomes and priorities

	1	2	3	4	5	6
State infrastructure plan strategic directions	<p>To maximise the diversion of recoverable materials from landfills</p> <p>Resource recovery will be undertaken by local government and industry where it is economically viable and where it will result in better community, environment and public health outcomes.</p>	<p>To support increased resource recovery</p> <p>Planning of new landfill airspace, including the scheduling of new landfill sites, will be based on:</p> <ul style="list-style-type: none"> the volumes of residual waste streams remaining after all material that can be recovered viably have been extracted a demonstrated need for additional airspace. 	<p>To achieve quantities for reprocessing</p> <p>Consolidation and aggregation of material streams, around a hubs and spokes network, will be undertaken if:</p> <ul style="list-style-type: none"> there is a market for the feedstock there is a viable business case potential community, environment and public health impacts are minimised. 	<p>To manage waste and material streams</p> <p>Suitably located and zoned land will be made available for the mix of infrastructure required.</p>	<p>To maximise economic outcomes, provide cost effective service delivery and reduce community, environment and public health impact</p> <p>Decisions to determine resource recovery and waste management options will be based on evidence.</p>	<p>To facilitate a cost effective statewide network of waste and resource recovery infrastructure</p> <p>Integrated statewide planning and decision making will be capable of addressing local, regional and state needs.</p>
Regional strategic objectives <i>What we want to do differently</i>	<p>To maximise diversion of recoverable materials from landfills</p> <p>Resource recovery will be undertaken by councils and industry where it is economically viable and where it will result in better community, environment and public health outcomes.</p>	<p>To support increased resource recovery</p> <p>Planning of new landfill airspace will be based on:</p> <ul style="list-style-type: none"> the volumes of residual waste streams remaining after all materials that can be recovered viably have been extracted a demonstrated need for additional airspace. 	<p>To achieve quantities for reprocessing</p> <p>Consolidation and aggregation of material streams around hubs will be undertaken if:</p> <ul style="list-style-type: none"> the impacts of such actions are understood and they address a strategic opportunity potential community, environment and public health impacts are minimised. 	<p>To manage waste and material streams</p> <p>Suitably located and zoned land will be made available for the mix of required infrastructure.</p>	<p>To maximise economic outcomes in the delivery of a region-wide network of waste and resource recovery infrastructure</p> <p>Decision making frameworks that determine resource recovery and waste management options that are evidence based and use appropriate assessment criteria.</p> <p>Integrated planning and decision making will be capable of addressing local, regional and state needs.</p>	

<p>Regional 10 year outcomes <i>What will be different in 10 years</i></p>	<p>Resource recovery is prioritised where it is economically viable and where it improves community, environment and public health outcomes.</p>	<p>Greater emphasis is placed on regional airspace needs and availability.</p>	<p>Industry is actively engaged to identify options for waste and resource recovery where appropriate.</p>	<p>Appropriate planning controls applied to minimise incompatible development within close proximity of waste and resource recovery facilities. Active encouragement of complementary land uses and innovative processes that can support the waste and resource recovery industry through feedstock generation, consumption or product development.</p>	<p>Targeted information and guidance informs evidence based planning and investment opportunities. Procurement processes for waste services demonstrate consistency and integrity. Equitable access to facilities and services is prioritised.</p>
<p>Regional actions</p>	<ol style="list-style-type: none"> 1. Increase diversion of industrial waste from landfills. 2. Facilitate the increased recovery of regional and state priority materials. 3. Work with councils and industry to investigate viable options to increase the recovery of household and commercial food and garden organics. 	<ol style="list-style-type: none"> 4. Improve market engagement techniques and lead a sound analysis of viable opportunities to maximise resource recovery. 5. Build capacity of landfill operators to minimise impacts to the community and environment posed by the management of residual waste. 	<ol style="list-style-type: none"> 6. Support councils to develop waste and resource recovery plans and improve practices for resource recovery facilities. 7. Facilitate partnerships with industry (service providers and waste generators), councils and state government for collection, processing and transport efficiencies. 	<ol style="list-style-type: none"> 8. Support community and business actively participating in decision making processes. 9. Work with councils and industry to better integrate waste and resource recovery management with land use planning. 10. Facilitate work between councils and the EPA to develop appropriate risk-based approaches for rehabilitation of closed landfills. 	<ol style="list-style-type: none"> 11. Research local and regional economic development influences in order to achieve appropriate procurement outcomes. 12. Consult with industry and councils to inform infrastructure and market development needs and priorities. 13. Implement data collection and reporting methods that enhance and support waste and resource recovery decision making.

3.1 GVWRRG values

- GVWRRG will implement the plan based on its values, which are to:
- facilitate the development of partnerships to achieve shared objectives
 - lead a culture of continuous improvement and professionalism
 - be responsive and equitable in our dealings and communication
 - provide high quality information, facilitation and advice.

Economic development
The overwhelming majority of Goulburn Valley residents (99%) believe generating more local employment in the region is either very important (90%) or important (9%). The top three waste management proposals to drive employment in the Goulburn Valley were:

- innovative technology to reduce landfill and increase recycling (supported by 88% of residents)
- local waste processing plants (84% support)
- establishing a local resource recovery centre (83% support).

GVWRRG Community Engagement Survey, Wallis, 2015

3.2 Action plan

Table 3 Action plan

ACTIONS		ALIGNMENT		IMPLEMENTATION			
Number	Description	Objective	Regional strategic directions	State strategic directions	Stakeholders	Time-frame	
1.	Increase diversion of industrial waste from landfills	1.1 To investigate the viability of pre-sort infrastructure at landfill hubs of state importance in the region			GVWRRG, industry, councils, SV	2016-17	
		1.2 To investigate funding opportunities to support suitable infrastructure for increased industrial waste recovery such as landfill pre-sort	1, 3	1, 3	GVWRRG, industry, councils, SV	2017-18	
		1.3 To investigate funding opportunities to support waste audits and increased industrial waste recovery at source			GVWRRG, industry, councils, SV	2018-19	
2.	Facilitate the increased recovery of regional and state priority materials	2.1 To investigate opportunities for regional priority materials including					
		<ul style="list-style-type: none"> wood and timber – assess options to utilise existing capacity and/or seek new reprocessing methods as appropriate plastics – assess options to utilise existing capacity and/or seek new reprocessing methods as appropriate aggregates, masonry and soil – assess options to utilise existing capacity and/or seek new reprocessing methods as appropriate textiles – assess options to aggregate and/or reprocess textiles tyres and stockpiles – assess options to reprocess and/or aggregate tyres to comply with regulations e-waste – design a regional network of collection and aggregation points for at least six sites to prepare the region for the introduction of e-waste ban 	1, 3	1, 3	GVWRRG, industry, councils, SV	2017-18	
		2.2 To investigate reprocessing options for other priority materials in the <i>Victorian Market Development Strategy for Recovered Resources</i>			GVWRRG, industry, councils, SV	2019-20	
							2019-20
							2018-19
							2019-20
							2018-19

ACTIONS			ALIGNMENT		IMPLEMENTATION	
Number	Description	Objective	Regional strategic directions	Statewide strategic directions	Stakeholders	Time-frame
3.	Work with councils and industry to investigate viable options to increase the recovery of household and garden organics	3.1 To support councils to consider and expand organics recovery			Councils, GVVRRG, SV	2016-17
		3.2 To identify C&I organic waste streams and assess opportunities to aggregate and/or consolidate organics to support investment	1, 3	1, 3	Councils, GVVRRG, SV, industry	2016-19
		3.3 To support councils and industry to identify new or expanded capacity for food and garden organics of at least 5,000 tonnes			Councils, industry GVVRRG, SV	2017-18
		3.4 To support the local delivery of the state organics strategy			GVWRRG, industry, councils, SV	2019-20
4.	Improve market engagement techniques and lead a sound analysis of viable opportunities to maximise resource recovery	4.1 To undertake early engagement with industry stakeholders to obtain accurate registrations of processing capacity			GVWRRG, SV, councils, industry, WRRGs	2018-19
		4.2 To undertake a robust evaluation of submissions to the market engagement process to meet the region's growing capacity needs	1,3,5	1,3,5,6	GVWRRG, SV, councils, industry, WRRGs	2019-20
5.	Build capacity of landfill operators to minimise impacts to the community and environment posed by the management of residual waste	5.1 To investigate accessible and appropriate handling and disposal options for asbestos waste management in the region			EPA, councils, GVVRRG, industry	2016-18
		5.2 To work with municipal emergency management officers, landfill operators and state authorities to develop mechanisms to appropriately manage waste during and after emergency and biosecurity events	5	5	Councils, GVVRRG, EPA, Emergency Management Victoria, industry	2018-19
6.	Support councils to develop waste and resource recovery plans and improved practices for waste and resource recovery facilities	6.1 To support councils to meet emerging demands for waste and resource recovery infrastructure and services in areas of high population growth			Councils, SV, GVVRRG	2016-18
		6.2 To investigate priority upgrades at facilities to support improved practices	3	3	Councils, GVVRRG	2016-17
		6.3 To identify funding opportunities to support the prioritised facility upgrades and improved practices			GVWRRG, councils, SV	2017-18
		6.4 To assist councils with waste and resource recovery capacity building			Councils, GVVRRG	2018-19

ACTIONS			ALIGNMENT		IMPLEMENTATION	
Number	Description	Objective	Regional strategic directions	Statewide strategic directions	Stakeholders	Time-frame
7.	Facilitate partnerships with industry (service providers and waste generators) councils and state government for collection, processing and transport efficiencies	7.1 To review past collaborative procurement processes			GVWRRG, councils, industry	2016-17
		7.2 To identify procurement options to maximise waste and resource recovery			GVWRRG, councils, industry	2016-17
		7.3 To gain a greater understanding of material flows across the region and potential impacts	1,3	1,3	GVWRRG, councils, industry, SV	2017-18
		7.4 To facilitate training opportunities to support improved procurement practices			GVWRRG, councils, industry, SV	2017 -19
		7.5 To support research and demonstration of innovative technologies and materials handling			GVWRRG, councils, industry, SV	2017-20
8.	Support community and business actively participating in decision making processes	8.1 To build awareness and understanding of the waste and resource recovery network among all stakeholders			GVWRRG, councils, industry, community	2016-17
		8.2 To support the local delivery of the Victorian Community and Business Education Strategy			GVWRRG, councils, industry, community	2016-18
		8.3 To assess options for greater participation in waste management and resource recovery planning and decision making	4, 5	4, 6	GVWRRG, councils, industry	2018-19
		8.4 To support the local implementation of resource recovery education and engagement			GVWRRG, councils, industry, community	2018-19
		8.5 To support relationships and partnerships to influence best practice litter prevention and product stewardship initiatives			GVWRRG, councils, industry, community, VLAAs, KVBs, Parks Victoria	2019-20
9.	Work with councils and industry to better integrate waste and resource recovery management with land use planning	9.1 To meet with councils to facilitate a process where WRRGs play a role in new and expanded waste and resource recovery infrastructure applications and multi-unit/mixed-use developments			GVWRRG, councils, SV, DELWP, EPA	2016-17
		9.2 To meet with councils and industry to discuss management of site buffers for existing and future facilities with a focus on state and regional hubs of importance	4	4	GVWRRG, councils, SV, DELWP, industry	2017-18
		9.3 To support industry and councils to identify possible sites for new resource recovery infrastructure			Industry, councils, GVWRRG	2018-19

ACTIONS		ALIGNMENT		IMPLEMENTATION		
Number	Description	Objective	Regional strategic directions	Statewide strategic directions	Stakeholders	Time-frame
10.	Facilitate work between councils and the EPA to develop appropriate risk-based approaches for rehabilitation of closed landfills	10.1 To support workshops, working groups and development of guidelines for closed landfills			EPA, councils, WRRGs	2016-17
		10.2 To facilitate work between councils and EPA to build capacity of duty holders to develop a risk assessment for closed landfills	4, 5	4, 5	WRRGs, EPA, councils	2017-18
		10.3 To facilitate work between councils and EPA to assist with the development and implementation of strategies for closed landfills			Councils, GVVRRRG, EPA	2018-20
11.	Research local and regional economic development influences in order to achieve appropriate procurement outcomes	11.1 To undertake an economic benefits assessment of waste and resource recovery in the region	3, 4, 5	3, 4, 5	GVVRRRG, industry, councils	2016-17
		11.2 To implement recommendations from the economic benefits assessment to achieve optimal procurement outcomes			GVVRRRG, industry, councils, SV	2016-17
12.	Consult with industry and councils to inform infrastructure and market development needs and priorities	12.1 To initiate discussions with, and provide linkages between, waste generators and available service and facility providers			GVVRRRG, councils, industry	2016-17
		12.2 To lead a regional strategy review of council RRCs in consideration of all costs and benefits	1, 3, 5	1, 3, 5	GVVRRRG, councils	2017-18
		12.3 To facilitate alternate solutions where councils seek to reduce their role as default providers of waste and resource recovery facilities			Councils, GVVRRRG, industry	2018-19
13.	Implement data collection and reporting methods that enhance and support waste and resource recovery decision making	13.1 To investigate regional data collection systems that are aligned with the statewide data collection system			WRRGs, SV, councils	2016-17
		13.2 To identify funding opportunities to purchase software/hardware, train operators and integrate systems	5	5	GVVRRRG, councils, SV	2017-18
		13.3 To work with councils and industry to implement the data collection system			GVVRRRG, councils, SV, WRRGs, EPA, DELWP	2018-19

Note: Some actions in this plan are similar to those in the regional implementation plans for other waste and resource recovery regions. Where appropriate GVVRRRG will work with other WRRGs to determine opportunities to work together on the common actions.

1 Victorian Litter Action Alliance
2 Keep Victoria Beautiful



4 The state of waste in the Goulburn Valley region

4.1 Overview of the region

The Goulburn Valley Waste and Resource Recovery Region (GV region) is located in the central north of Victoria and has a total area of over 21,000 square kilometres. Figure 4 shows that it is spread across six council areas ranging from the urban fringe abutting metropolitan Melbourne to rural areas bordering the Murray River and southern New South Wales. It is incredibly diverse, ranging from the rapidly growing residential fringes of Melbourne to regional centres and more rural areas.

The councils in the region are:

- Campaspe Shire
- City of Greater Shepparton
- Mitchell Shire
- Moira Shire
- Murrindindi Shire
- Strathbogie Shire.

Waste generation

While population growth is a major driver of how much waste is generated, there are many other factors contributing to how much and what waste is generated, such as economic conditions, manufacturing and community behaviour.

4.1.1 Population and demographics

The region includes key population centres such as Alexandra, Cobram, Echuca, Wallan and Shepparton. The total population from the 2011 Census was over 185,000 with Greater Shepparton home to the largest population of nearly 62,000 residents and Strathbogie the smallest with just under 10,000 residents. Table 4 shows the projected population to 2031 based on 2011 Census data.

Table 4 Municipality population 2011 and projected 2016-31

Council	2011	2016	2021	2026	2031	Increase 2016-31	
Campaspe Shire	36,869	36,955	37,705	38,660	39,585	2,716	7%
Greater Shepparton	61,766	64,803	69,016	73,343	77,974	16,208	26%
Mitchell Shire	35,068	40,732	51,590	67,864	86,038	50,970	145%
Moira Shire	28,406	29,155	29,944	30,791	31,665	3,259	11%
Murrindindi Shire	13,324	13,713	14,372	15,127	16,161	2,837	21%
Strathbogie Shire	9,601	9,938	10,308	10,699	11,108	1,507	16%
Total	185,034	195,296	212,935	236,484	262,531	77,497	42%

Source: Department of Environment, Land, Water and Planning (2014) Victoria in the Future – Population and Household Projections

Figure 4 Municipalities in the Goulburn Valley Waste and Resource Recovery Region



Source: Sustainability Victoria



Image: Local demonstrating use of new household organics bin infrastructure

The total regional population is forecast to increase by 42% to over 262,000 between 2011 and 2031, with the most significant increase of 145% in the Mitchell Shire, located on Melbourne's growth fringe, followed by Greater Shepparton at 26% for the period. In terms of age, around 20% of the population is aged under 15 years and just over 17% are aged 65 years or over¹⁴.

Mitchell, the region's fastest growing municipality

Mitchell Shire is predicted to experience the highest:

- non-metropolitan, and second highest overall population change, between 2011 and 2031 in Victoria
- regional annual growth rate of 4.6%, almost double the next closest shire in Victoria
- proportion of 0-19 year olds of all Victorian councils.

It is also predicted to be second behind City of Greater Geelong, in absolute population growth, with 51,000 additional people.

Mitchell Shire and Greater Shepparton's age structure are significantly younger, with high proportions of children and young adults compared to the other shires. In contrast, just over 25% of Strathbogie Shire's residents are over 65 years, compared to 17% for the region, and is forecast to increase to nearly 35% by 2031¹⁴.

4.1.2 Regional profile

The Goulburn Valley produces around 25% of the value of Victoria's agricultural production¹⁵. Industries important to the region include dairy, viticulture, fruit growing and other agriculture, as well as nature-based tourism. There are large areas of irrigated dairy farming, vegetable production and broadacre cropping, which contribute to the large number of food and dairy processing manufacturers and supporting businesses in the region¹⁶.

4.1.3 Land use and major industries

Figure 5 shows that land use in the Goulburn Valley region is dominated by agricultural production (81%)¹⁷. Strathbogie Shire has the highest proportion of agricultural land (98.4%). Mitchell Shire has the highest share of residential land (8.8%). Almost half (42.9%) of Murrindindi Shire's land is parkland due to a number of State Forests in the region¹⁷.

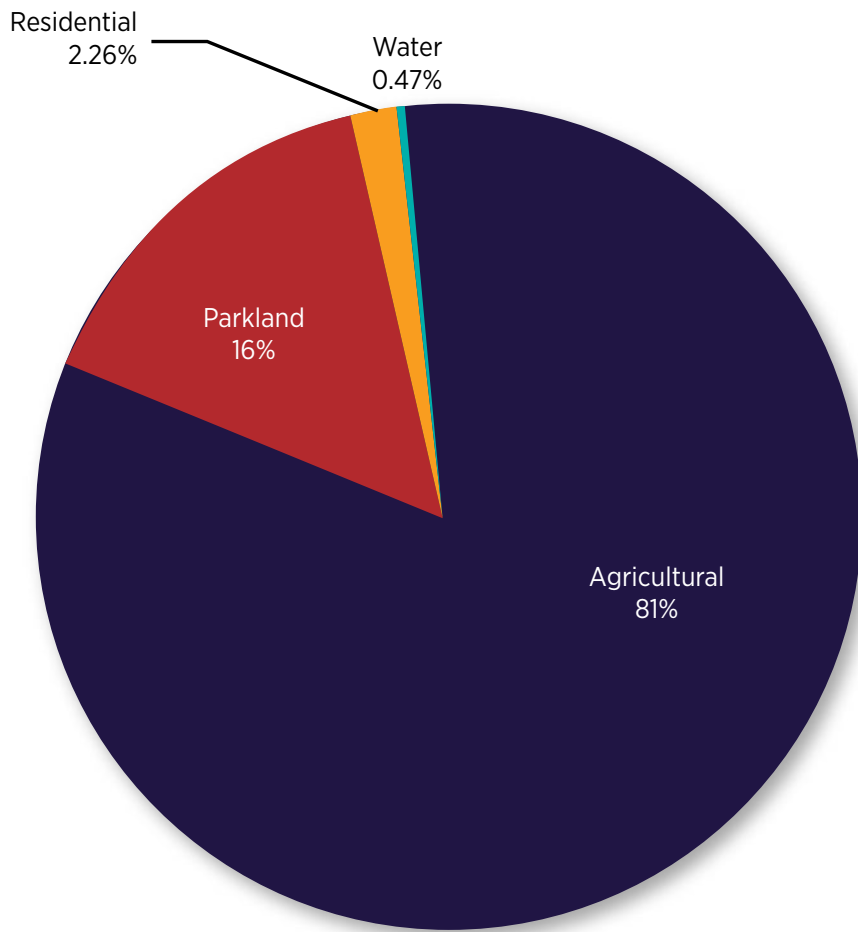
¹⁴ Demographic and economic profile of the Goulburn Valley region, prepared by .id, unpublished, 2015

¹⁵ Regional Development Victoria 2015 in Goulburn Valley Infrastructure capacity and needs assessment, Blue Environment, unpublished, 2015

¹⁶ Goulburn Valley Infrastructure capacity and needs assessment, Blue Environment, unpublished, 2015

¹⁷ Demographic and economic profile of the Goulburn Valley region, prepared by .id, unpublished, 2015

Figure 5 Goulburn Valley region land use distribution, 2011



Source: *Demographic and economic profile of the Goulburn Valley region*, .id, 2015

Note: The remaining 0.27% of land use is made up commercial 0.11%, industrial 0.10%, education 0.4%, transport 0.1%

The Gross Regional Product (GRP) of the Goulburn Valley region was \$7.4 billion in 2014, or 11.7% of the total regional Victorian GRP of \$63.8b. The Goulburn Valley’s GRP has increased by approximately \$400 million since 2011, with an annual growth rate of 1.8%, double the regional Victorian average of 0.9%¹⁸.

In 2014 there were 19,257 local businesses in the Goulburn Valley, down slightly from 19,752 in 2011 (Table 5). In 2014, nearly one third (29%) of the businesses in the region were in the agricultural, forestry and fishing industries and 16% were in the construction industry, together accounting for nearly half (45%) of all businesses¹⁸. This reflects key features of the region with food production in the north and rapid residential expansion on Melbourne’s fringe in the south.

The total value of agricultural produce grown in the region is \$1.87 billion. In Greater Shepparton, fruit is the main produce compared to livestock and grain crops in Campaspe and Moira Shires¹⁸.

Just under a third of all businesses are located in Greater Shepparton. Together, Greater Shepparton and Campaspe Shire are home to 50% of the region’s agricultural businesses. Mitchell Shire has a very high number of construction businesses, driven by the residential growth occurring in the area¹⁸.

¹⁸ *Demographic and economic profile of the Goulburn Valley region*, prepared by .id, unpublished, 2015

Table 5 Number of businesses by industry in the region, 2011 and 2014

Industry	2011	% of total	2014	% of total
Agriculture, forestry and fishing	5,847	30%	5,647	29%
Construction	3,255	16%	3,094	16%
Retail trade	1,232	6%	1,131	6%
Transport, postal and warehousing	1,186	6%	1,135	6%
Rental, hiring and real estate services	1,551	8%	1,548	8%
Professional, scientific and technical services	1,038	5%	1,061	6%
Subtotal and % of total businesses	14,109	71%	13,616	71%
Total businesses	19,752		19,257	

Source: *Demographic and economic profile of the Goulburn Valley region*, prepared by .id, unpublished, 2015

The top five industries in employment terms in the region are agriculture, forestry and fishing (10.2%), manufacturing (12.6%), construction (9.0%), retail trade (11.1%) and healthcare and social assistance (12.1%)¹⁹.

Major employers in the region are focussed on food product manufacturing and supporting industries¹⁹.

Relationship between population demographics, land use and the waste sector

The structure and growth rates of the population in the region impacts on both waste generation rates and demand for waste and resource recovery infrastructure.

The rapid residential development in Mitchell Shire creates:

- construction waste to be recovered or landfilled
- packaging waste as people move into their new homes
- ongoing demand for RRCs for non-kerbside collected materials
- increased demand for kerbside collection services.

The types of industries in the region also impact on waste generation and demand for waste and resource recovery infrastructure. Opportunities include:

- greater recovery of agricultural plastics
- working with food manufacturers and wholesalers to recover food waste, including from out of date and out of specification foods, and recyclable packaging. There are currently significant flows into the region from across the state
- establishing industrial waste sorting facilities to increase recovery.

4.2 Data sources, limitations and handling

Please see Appendix 4 for a list of major data sources, major data assumptions and definitions, infrastructure categories for data collection and Appendix 5 for the types and characteristics of infrastructure that supports the waste and resource recovery system.

This GV implementation plan is based on all best available current data, but there are limitations in the availability and quality of the data.

The three main data sources for the GV implementation plan are:

- Sustainability Victoria's Regional Waste and Resource Recovery Database (RWRRD) 2013-14 modelling that includes several data sets.
- *Survey and analysis of regional reprocessors and material recovery facility operators: Goulburn Valley Waste and Resource Recovery Group regional report* conducted by Sustainable Resource Use for Sustainability Victoria, unpublished, 2015.
- *Goulburn Valley Infrastructure capacity and needs assessment*, Blue Environment, unpublished, 2015.

GVWRRG collected the data from councils and industry for resource recovery centres (RRCs) and landfills and SV collected reprocessor data. SV is the custodian of all of the data. SV's RWRRD records statewide information on waste and material streams sourced from EPA landfill levy records, surveys of reprocessors and other statewide information. Data on the waste and material streams managed in the Goulburn Valley region was extracted from the RWRRD and relies on the reliability and validity of the source data.

A key limitation of the data extrapolated from the RWRRD for the Goulburn Valley region is that it is based on 2013-14 data.

¹⁹ *Demographic and economic profile of the Goulburn Valley region*, prepared by .id, unpublished, 2015

Table 6 Council household organics collection start dates

Council	Collection start date	Comments
Moira Shire	8 December 2014	Introduced food and garden collection
Strathbogie Shire	1 July 2015	Introduced food and garden collection
Greater Shepparton	1 November 2015	Changed from opt-out garden collection to compulsory food and garden collection
Mitchell Shire	2017-18	Currently assessing implementation options

It does not include the current recovery of food and garden organics and data from existing reprocessors identified through the market sounding. Table 6 shows the start dates and details of kerbside organics collections for three of the six regional councils that would not be included in the 2013-14 data. The *Goulburn Valley Infrastructure capacity and needs assessment*²⁰ data also does not include actual recovery of food and garden organics as it was conducted in 2015.

Additional data limitations:

- Councils are required to report annually through the Local Government Performance Reporting Framework, which provides a long term data set but at times can be variable.
- SV also produces the *Victorian Recycling Industry Annual Survey* that relies on reprocessors voluntarily submitting data on their activities.
- Where limited regional data was available state data was considered.
- Time lags in data collection, analysis and release.
- SV estimates that data was available for 91% of reprocessors in the region (collected through the regional reprocessor survey and from other existing sources). However, the quantity of materials managed by the remaining 9% is unknown.

It is expected that the quantity and quality of data will be greatly improved through the Waste Data Governance Framework to be delivered by SV. These improvements will be evident in the three to five year review of the GV implementation plan.

4.2.1 Reprocessor data

There were 20 reprocessors identified by the 2015 SV Survey of Reprocessors²¹ and additional reprocessors responded to the market sounding and consultation processes. This resulted in 22 known reprocessors operating in the region that have been included in the Infrastructure Schedule (Section 8.1).

It is acknowledged that additional unidentified reprocessors may exist in the region but did not respond to the market sounding and did not come forward in the consultation process

despite GVWRRG's best efforts to engage the entire sector.

4.2.2 Data rounding

Due to modelling, aggregated data and the need to maintain commercial-in-confidence, data is rounded:

- under 10,000 to the closest 1000
- under 1000 to the closest 100
- under 100 to 100.

4.2.3 Data collection and handling

SV's RWRRD provides data collection methodology for all of the WRRGs to achieve consistency in data presentation for all regional implementation plans.

A range of processes were established to ensure data protection that included:

- Achieving confidentiality of commercially sensitive information through signed agreements between GVWRRG and councils or SV and reprocessors.
- Protection of personal information through compiling data based on material categories and not business categories and consolidating data to protect exposing confidential data. This was stored in the RWRRD in an internal secure folder that could only be accessed by authorised individuals.
- Obtaining consent for disclosure of information in surveys, and consultation with councils and reprocessors by GVWRRG or Sustainable Resource Use, who conducted the reprocessor survey on behalf of SV.

4.3 Waste generated and managed in the region

Materials or wastes *generated* in the region refers to materials or waste originating within the region. Some of this is recovered for recycling and some is landfilled. But not all of the recycling and landfilling occurs in the region as some materials are transported out of the region to be *managed*.

Materials or waste *managed* in the region refers to materials or wastes that have passed through or been managed at a waste and

20 Conducted by Blue Environment

21 Survey and analysis of regional reprocessors and material recovery facility operators: Goulburn Valley Waste and Resource Recovery Group regional report by Sustainable Resource Use for Sustainability Victoria, 2015

resource recovery facility in the region including RRCs, materials recovery facilities (MRFs), reprocessors or landfills. They may have been generated in another region or be reprocessed or disposed of outside the region.

Therefore it is important to note that the amount generated in the region is not the same as the amount managed in the region due to flows in and out of the region.

The data presented is the best available data acknowledging it is difficult to accurately measure generation data due to the multitude of generation points and the complex ways materials enter and move within the waste and resource recovery system. GVWRRG is committed to working with SV, other WRRGs, the community and industry to increase our ability to improve the collection of generation data so we can better understand the waste and resource recovery system in the region.

This section presents the available data on total waste generation in the region and the quantities recovered and landfilled.

The bulk of the discussion on materials managed is in Section 5 but it is considered in Sections 4.3.4 Waste disposed to landfill and 4.3.5 Waste flows into and out of the region.

4.3.1 Waste generated in the Goulburn Valley region

It is estimated that in 2013-14 around 387,000 tonnes of waste and recovered materials were generated in the region. About 255,000 tonnes (66%) was recovered and around 132,000 tonnes (34%) was landfilled²².

4.3.2 Source sector of materials generated

Table 7 shows the estimated tonnes of materials generated, recovered and landfilled for each of the three sectors based on state data. Construction and demolition (C&D) has the highest recovery rate at 81% followed by 67% for commercial and industrial (C&I) and 42% for municipal solid waste (MSW). This highlights the challenge to remove organics and other recyclables from household garbage bins to recover this valuable material and divert it from landfill. The C&I sector also provides opportunities to increase the recovery rate, particularly with food waste and commingled recyclables.

4.3.3 Material stream summary

Table 8 shows the estimated breakdown for the region, based on state data, of the materials recovered, landfilled and generated in 2013-14.

Organic material generated is estimated to be over 75,000 tonnes with about 29,000 tonnes recovered. It is anticipated the household food and garden organics recovery from kerbside collections will increase by an additional 5,000 tonnes in 2018-19.

The region has significant food processing facilities generating food waste. Section 5 details the waste managed in the region which provides greater details on the materials managed but further research is required to identify C&I organic waste streams and identify opportunities to aggregate and/or consolidate organics to gain a greater understanding of the organics generated in the region (see Action 3).

Table 7 Sector breakdown of material generated in the region, tonnes, 2013-14

	Generated	Recovered	Landfilled	Recovery rate
MSW	96,000	40,000	57,000	42%
C&I	145,000	97,000	47,000	67%
C&D	146,000	118,000	28,000	81%
Total	387,000	255,000	132,000	66%

Source: Victorian Regional Waste and Resource Recovery Database v3; waste and resource recovery data provided by Sustainability Victoria

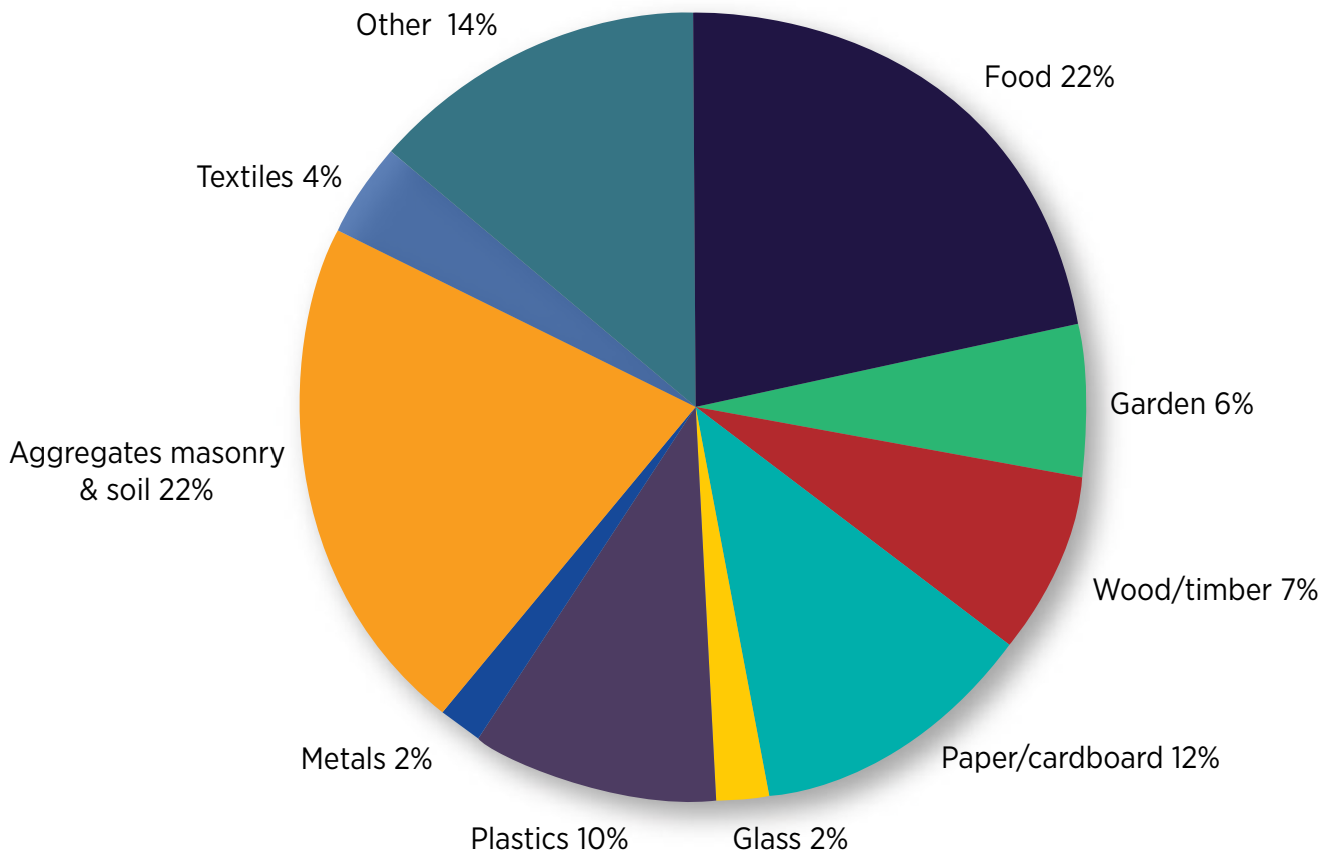
Table 8 Waste and material streams generated, tonnes, 2013-14

Material category		Generated	Recovered	Landfilled
Organics	Food	30,900	2,400	28,500
	Garden	20,100	11,900	8,200
	Wood/timber	13,500	3,900	9,600
	Other	11,000	10,800	200
Paper/ cardboard		61,300	46,000	15,300
Glass		8,000	5,400	2,600
Plastics		18,400	5,000	13,400
Rubber (including tyres)		900	900	n/a
Metals		53,400	51,200	2,200
Aggregates, masonry and soil		146,300	118,000	28,300
Textiles		5,100	100	5,000
Other		18,200	0	18,200
TOTAL		387,100	255,600	131,500

Source: Victoria Regional Waste and Resource Recovery Database (RWRRD) v3; waste and resource recovery data provided by Sustainability Victoria

²² Victorian Regional Waste and Resource Recovery Database v3; waste and resource recovery data provided by Sustainability Victoria

Figure 6 Indicative composition of materials from MSW, C&I and C&D sectors in Goulburn Valley landfills, 2013-14



Source: Victorian Regional Waste and Resource Recovery Database v3; waste and resource recovery data provided by Sustainability Victoria

4.3.4 Waste disposed to landfill

Of the estimated 387,000 tonnes of waste generated in the region in 2013-14, it is estimated around 132,000 tonnes (or 34%) of material generated were landfilled. In addition over 30,000 tonnes of materials from other regions flow into the region's landfills bringing the total managed at landfills in the region to about 162,000 tonnes.

Figure 6 shows the indicative composition of materials landfilled with aggregates, masonry and soil, and food the two largest material categories (each 22%). Together food and garden material categories are estimated to make up 28% and, when wood/timber is added, this increases to a total of over a third (35%) of all materials landfilled. Other recyclable material categories were paper/cardboard (12%) and plastics (10%). This indicates that nearly 60% of materials landfilled are potentially recyclable.

Table 9 Estimated current annual material flows into and out of the Goulburn Valley region

Material type		Description of movement of material
Recovery	Commingled recyclables	Inflows: From household kerbside collections including paper/cardboard, plastics and metals from the Loddon Mallee region which are managed in a facility in the region. Outflows: Between 11,000 and 21,000 tonnes to the Metropolitan region.
	Paper/cardboard	Outflows: Between 6,000 and 11,000 tonnes to the Metropolitan region.
Reprocessing	Organics	Inflows: Between 8,000 and 16,000 tonnes, predominantly from the North East and Metropolitan regions and possibly other areas in Victoria, are managed in facilities in the region.
	Plastics	Inflows: Between 2,000 and 3,000 tonnes from the Metropolitan region, NSW and possibly other areas in Victoria are managed in facilities in the region. Outflows: Approximately 1,000 to the Metropolitan region.
	Glass	Outflows: To the Metropolitan region for reprocessing.
Disposal	Landfill	Inflows: Approximately 30,000 tonnes of putrescible waste from Loddon Mallee and North East regions are managed in facilities in the region.

Source: *Survey and analysis of regional reprocessors and material recovery facility operators: Goulburn Valley Waste and Resource Recovery Group regional report*, Sustainable Resource Use for Sustainability Victoria, unpublished, 2015

4.3.5 Waste flows into and out of the region

The state infrastructure plan identified the need to further assess the quantities and impacts for Victoria of the movement of material streams across the border of New South Wales (NSW) and Victoria. This includes materials entering and leaving Victoria. Approximately 50,000 tonnes of materials, predominantly residual waste, are transported from various locations within Victoria to landfills in NSW. This is likely to be influenced by lower landfill gate fees in regional NSW and/or longer distances to transport to appropriate landfills in Victoria. There was also evidence that some materials entered Victoria from NSW for reprocessing. While these tonnes may not be significant to the overall Victorian infrastructure system, they do impact on the Goulburn Valley region and other regions along the NSW–Victoria border.

In order to try and understand these impacts for the Goulburn Valley region, GVWRRG undertook research to identify additional information about tonnes of materials flowing into and out of the region. It is estimated that about 52,000 tonnes flow into and 30,000 tonnes flow out of the region. Due to commercial confidentiality we can only provide general

information about these flows to ensure we do not identify individual reprocessors. Table 9 summarises the material flows into and out of the region.

There is limited data available regarding cross regional reprocessing waste flows, as it relies on voluntary sharing and some reprocessors were reluctant due to commercial concerns. There is no e-waste processing in the region and there is limited information available on flows of e-waste out of the region (see Action 2).

Material flow data from council kerbside contracts, to locations outside the Goulburn Valley region, are shown in Table 10. These contracts will expire during the period of the GV implementation plan providing some opportunities to establish new resource recovery facilities in the region. The contracts could be aligned through joint procurements resulting in significant procurement and administration savings for councils. Joint procurements may offer larger aggregated quantities of materials to MRFs and reprocessors that could result in cost savings for service delivery. Aggregation of materials offers opportunities for sustainable resource recovery within the region which would lead to economic growth and increased employment in the region.

Table 10 Major infrastructure located in other regions servicing Goulburn Valley

Infrastructure type	Location	Material streams managed	Contracted until	Extension option
MRF	Wangaratta	Household recyclables	1 July 2016	+ 3 years
MRF	Melbourne	Household recyclables	30 June 2024 1 November 2023	+ 1 year + 1.9 year
Landfill ¹	Benalla	Household residual waste	30 June 2024	+ 1 year

¹ Commenced in 2015

There are also a number of reprocessors on the NSW border, shown in Table 11, that accept timber, organics and plastics for reprocessing from the Goulburn Valley region but there is limited data for these material flows.

Table 11 Infrastructure located on the NSW border that accepts material for reprocessing from the Goulburn Valley region

Infrastructure	Location	Material streams managed
D&M Metals ¹	Corowa	Metals
Double B Metals ¹	Moama	Metals
Drums Go Round ²	Moama	Plastics
Newtecpoly ²	Moama	Plastics
Nullarbor Reclaimed Timber ²	Moama	Organics – timber
The Green Pipe ²	Moama	Plastics

Sources:

¹ Local information

² *Survey and analysis of regional reprocessors and material recovery facility operators: Goulburn Valley Waste and Resource Recovery Group regional report*, Sustainable Resource Use for Sustainability Victoria, unpublished, 2015

In summary, while there is confidence in the exact amount of material leaving and entering the Goulburn Valley region in the council data due to tracing through council contracts, it is difficult to quantify commercial quantities as some businesses and reprocessors were reluctant to share commercially sensitive data.

This reluctance is possibly because it is the first time a state government, council and industry long term statewide waste and resource recovery planning approach has been attempted. Establishing new, and building on existing, relationships with the C&I and C&D sectors is a priority for GVWRRG (see Action 13), as this will improve the confidence of reprocessors to provide data that will underpin long term waste and resource recovery planning.

As discussed, the flows of materials are influenced by cost and availability of facilities. While there may be benefits when sustainable resource recovery occurs within the region there are also benefits if materials leave the region to be reprocessed if they would otherwise have been landfilled in the region. This increases overall recovery and also reduces the need for landfill airspace thereby contributing to an integrated statewide system with some interstate connections.



Image: Household kerbside recycling bin

4.4 Future projections of waste generated

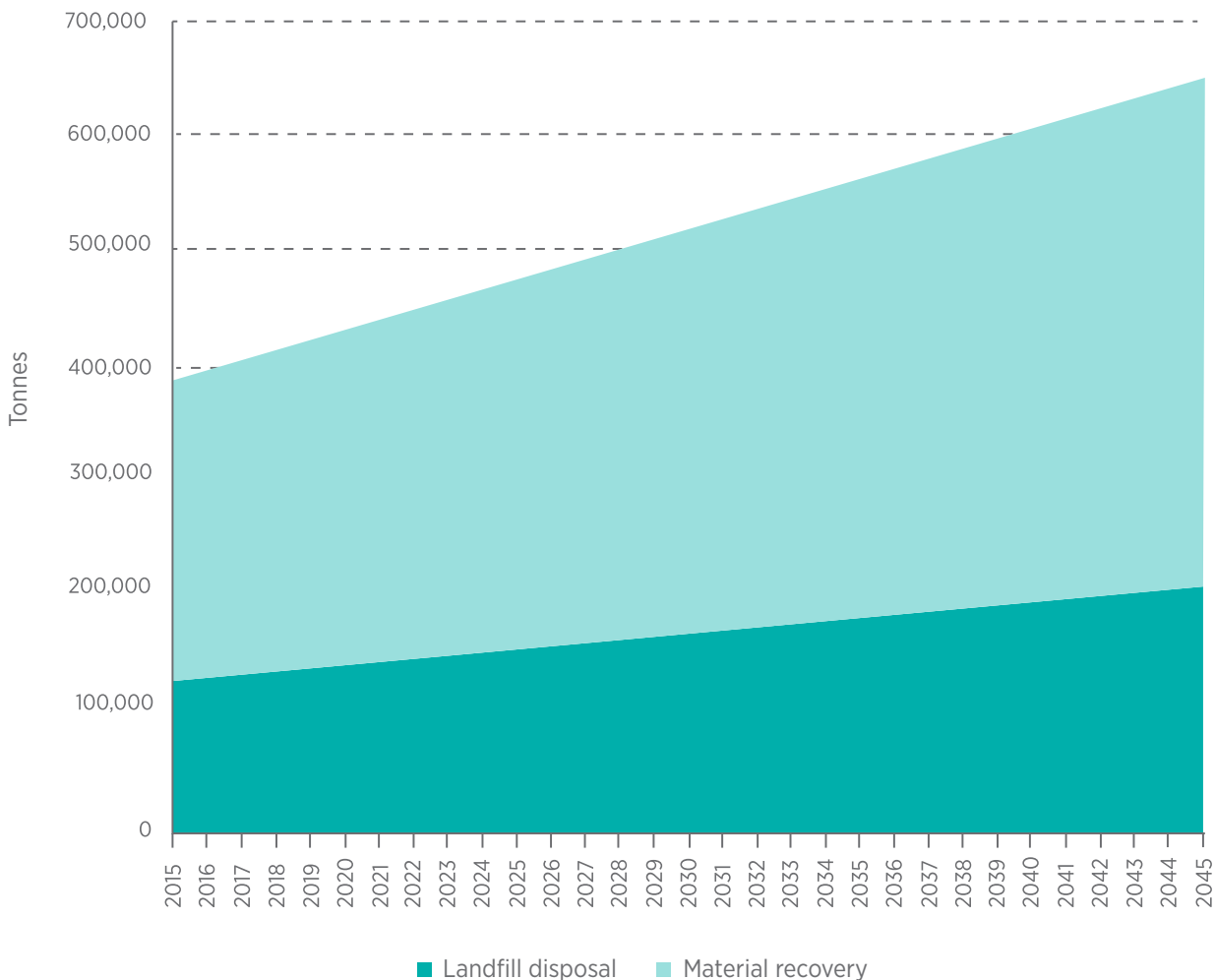
Assuming 2015 recycling rates continue, and based on the expected population increases, by 2025, waste generated in the region is projected to increase by 20% to 464,000 tonnes. By 2044-45, the 30-year time frame of the state infrastructure plan, waste generated is expected to increase by nearly 65% to 635,000 tonnes, as shown in Figure 7.

Therefore, under business as usual, overall waste generation will increase in the next 30 years, with the recovery of materials projected to increase at a higher rate than landfilling. This trend is consistent with statewide trends identified by SV and highlights the Goulburn Valley region's waste challenges. Our detailed analysis preparing the GV implementation plan has

established that our region will not require additional landfill capacity within the next 10 years. Our strategic objective to reduce the amount of waste landfilled, aims to reduce unprocessed materials going to landfill to extend the life of the landfills and minimise any potential environmental or health impacts.

The introduction of household food and garden organics kerbside collections will impact on the business as usual modelling by increasing recovery of these materials and reducing the amount of materials landfilled, which would alter the modelled trend. As the region moves away from business as usual and achieves the plan's objectives to reduce waste to landfill and increase recovery it will also alter the modelled trend.

Figure 7 Projected tonnes of waste to be generated in the Goulburn Valley region to 2045

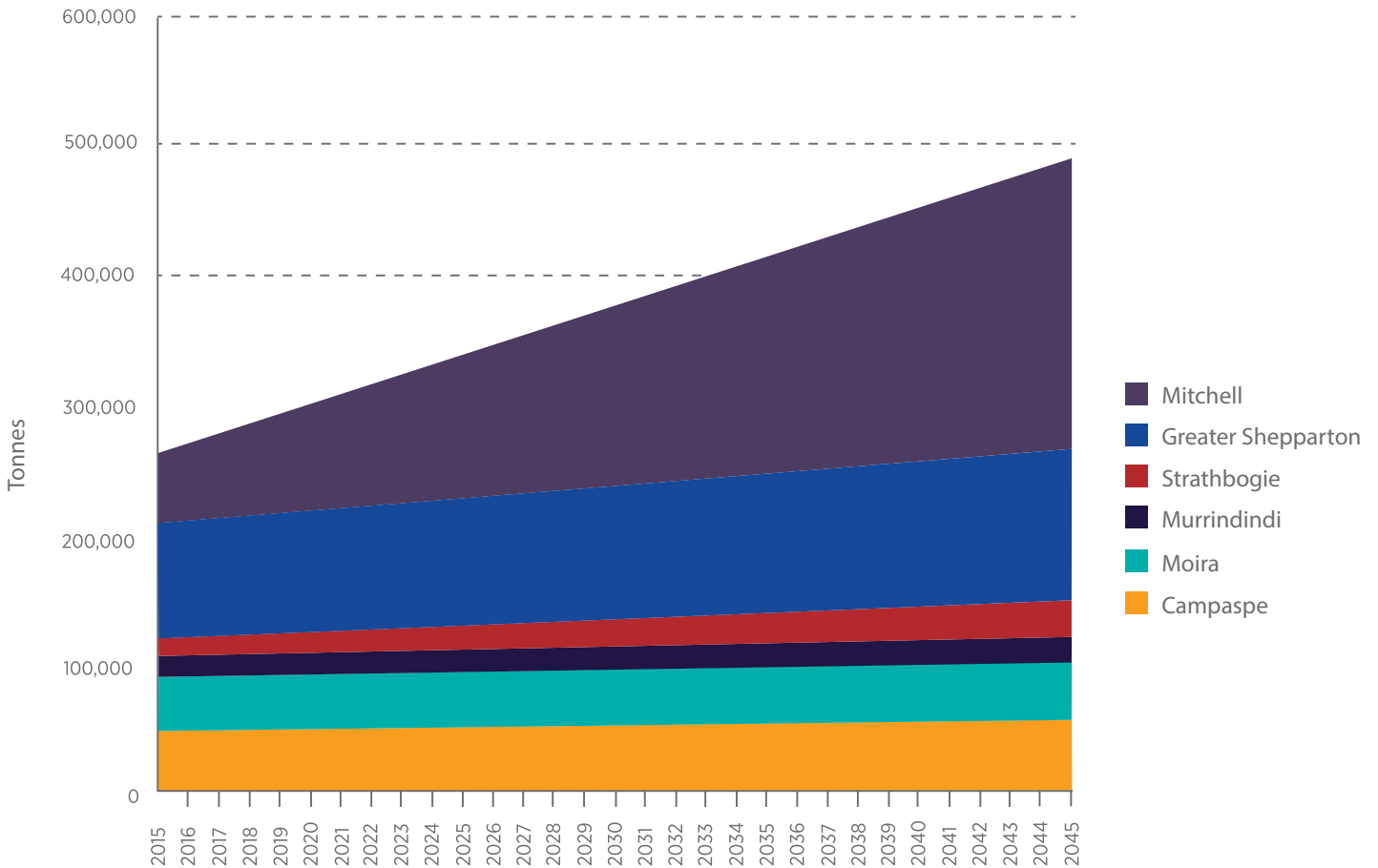


Source: *Goulburn Valley Infrastructure capacity and needs assessment*, Blue Environment, unpublished, 2015

4.4.1 Projected tonnes recovered by council

Figure 8 shows the projected tonnes of materials recovered by councils to 2045. The impact of the rapid growth in housing and population in Mitchell Shire is evident with its contribution increasing significantly while other councils remain relatively stable. This highlights the need for additional infrastructure to increase resource recovery and manage residual waste generated in the Mitchell Shire. Campaspe Shire and Strathbogie Shire's flat trend highlights the opportunity to increase recovery of food and garden waste to increase overall recovery.

Figure 8 Projected total recovered tonnes by council to 2045



Source: Goulburn Valley Infrastructure capacity and needs assessment, Blue Environment, unpublished, 2015, based on RWRRD data



5 The waste and resource recovery system in the Goulburn Valley region

This section outlines the existing infrastructure in the region that manages landfilled or reprocessed materials and identifies the Goulburn Valley region's future needs and opportunities.

It is estimated that over 290,000 tonnes of materials were managed through facilities in the region including RRCs, MRFs, reprocessors or landfills²³. As discussed in Section 4.3.5 Waste flows into and out of the region, 52,000 tonnes originated from other regions.

As discussed in Section 2.3, the region's infrastructure needs and opportunities were established through research and data analysis, which was followed by conducting a market sounding process (Section 7) to confirm and refine the needs and opportunities.

The region's priorities have been divided into *needs* and *opportunities*.

Needs occur where there is either no existing infrastructure or insufficient infrastructure to recover and reprocess material types. The regional needs include:

- Food and garden organics – The needs analysis and regional reprocessor survey indicated that the region has limited remaining capacity to process the projected increase in generation of food and garden organics. An additional 5,000 tonnes per annum of capacity to process food and garden material is required in the short term due to the phased introduction of council food and garden organics collections.
- E-waste – The impending ban on e-waste disposal to landfill in Victoria will drive increased recovery of this material at regional level. This presents a short term need for reprocessing and/or aggregation points to manage this material appropriately.

- Tyres – The region currently lacks capacity to process end-of-life tyres and is home to a significant legacy stockpile of tyres. The introduction of stronger regulation to manage end-of-life tyres in Victoria presents a need for new infrastructure to process and/or aggregate this material.
- Textiles – Landfill data suggests around 4% of material disposed to landfill in the region is textiles (Figure 6). Given the plan has a strong focus on improved resource recovery, this data suggests reprocessing options for textile waste is needed.
- Mixed industrial waste – Analysis of landfill data indicates that a significant amount of waste presented to landfill in the region is mixed industrial waste, which includes valuable materials such as plastics, paper/cardboard and metals. There is a need to increase recovery of this material, through both sorting infrastructure and improved source separation.

Opportunities occur where there is existing infrastructure with capacity to recover or process more. A detailed survey of 20 reprocessors in the region indicates there is considerable available capacity to reprocess additional quantities of:

- wood and timber
- plastics
- aggregates, masonry and soil.

Material flows in and out of the region are also discussed.

Appendix 5 lists the types of infrastructure that support the waste and resource recovery system in the Goulburn Valley region.

²³ Victorian Regional Waste and Resource Recovery Database v3; waste and resource recovery data provided by Sustainability Victoria

Table 12 Summary of infrastructure types in the region, 2013-14

Infrastructure type		Number of facilities managing material categories ¹	Tonnes per year				
			Currently managed	Installed capacity	Under-utilised capacity	Projected tonnes 2024-2025 (BAU recovery rates)	
Resource recovery	RRC stand alone ²	39	50,000				
	RRC co-located at landfill ²	1					
	MRF	1					
Reprocessing	Organics	Food	4	42,000	45,000	3,000	50,000
		Garden					
		Wood/timber	12	30,000	48,000	18,000	36,000
		Other					
	Plastic	5	3,000	7,000	4,000	4,000	
Aggregates, masonry and soil	3	4,000	14,000	10,000	5,000		
Disposal landfill	Licensed	5	162,000				

Note:

¹ Some reprocessors manage multiple materials.

² Specific capacity is not fixed and is scaled up and down as demand requires.

Sources:

1. Victorian Regional Waste and Resource Recovery Database v3; waste and resource recovery data provided by Sustainability Victoria
2. *Goulburn Valley infrastructure capacity and needs assessment*, Blue Environment, 2015
3. *Survey and analysis of regional reprocessors and material recovery facility operators: Goulburn Valley Waste and Resource Recovery Group regional report* by Sustainable Resource Use for Sustainability Victoria, 2015

The data used for this section is drawn from several sources including:

- Victorian Regional Waste and Resource Recovery Database v3; waste and resource recovery data provided by Sustainability Victoria
- *Goulburn Valley infrastructure capacity and needs assessment*, Blue Environment, 2015
- *Survey and analysis of regional reprocessors and material recovery facility operators: Goulburn Valley Waste and Resource Recovery Group regional report* by Sustainable Resource Use for Sustainability Victoria, 2015
- Market Sounding for Waste and Resource Recovery Infrastructure conducted jointly by GVWRRG, the North East WRRG and Loddon Mallee WRRG in 2015
- Verbal information provided by waste and resource recovery operators.

Due to commercial sensitivity, the exact source of information for specific types of infrastructure may not be included in each section.

5.1 Summary of regional infrastructure

The region has five licensed landfills, 40 RRCs, one MRF and 22 reprocessing facilities managing a diverse range of materials. Of the reprocessing facilities, over half reprocess organics, eight reprocess plastics and four reprocess aggregates, masonry and soil.

Table 12 shows the types of infrastructure in the region including estimates of the materials managed in 2013-14, installed capacity, under-utilised capacity and projected tonnes in 2024-2025. This reinforces the need to establish additional food and garden organics reprocessing facilities in the region in the next few years as more of these materials are collected through kerbside collections.

5.2 Collection systems

A waste collection system involves services to pick up waste where it is generated and transport it to waste and resource recovery facilities for aggregating/consolidating, reprocessing or disposal. These services are provided through councils to households. Private commercial operators also provide collection services. Collection services play an important role in protecting public health and the environment.

5.2.1 Municipal kerbside collections

Council kerbside collections provide an essential community service through the regular removal of waste materials from households. These services include the collection of commingled recyclables, garden and food organics and residual waste. Some councils provide a service to small and medium businesses.

In 2012-13²⁴, nearly 80,000 kerbside residual waste services were provided in the region through council contracts with private providers paid for by residents through waste services charges. Nearly 7% (5,300) were provided to non-residential (business) customers, with higher rates of non-residential service in Moira, Campaspe and Murrindindi Shires. Similar figures were reported for the recycling service to businesses.

Kerbside collections provide a secure supply of feedstock for reprocessors. Efficiency, transport and environmental performance has improved through technological advances such as global positioning guidance and tracking systems, cameras, improved emission standards and low entry and high visibility collection vehicles. Ongoing household education programs, including council website information, contributes to increased recycling and reduced contamination.

5.2.1.1 Analysis of future needs

Increasing the quantity of recovered materials could be achieved through:

- Ongoing assessment of extensions to collection routes, where feasible, for new residential developments.
- Considering extending the kerbside collection to non-residential customers where appropriate.
- Analysing opportunities when councils renew kerbside contracts such as:
 - > offering households a larger 360 litre commingled recyclables bin
 - > investigating the feasibility of a smaller residual waste bin
 - > assessing optimal collection frequencies for organics and residual waste.
- Expanding the universal food and garden organics collection service where feasible (see Action 3).

Increasing the quality of recovered materials could be achieved through:

- Councils adopting the Australian Standard for Mobile Waste Containers (AS4123) at the time of kerbside contract renewal to create uniformity in bin lid and body colours to support standard education and messaging for the appropriate use of bins.
- Implementing region-wide education campaigns supported by ongoing localised household engagement programs (see Action 8).

5.2.2 Private sector collections

Private sector collection services for C&I and C&D waste generators are privately arranged and funded. 'Skip' bins are typically used, provided by a private contractor to collect and remove bulk waste from commercial premises. Source segregation in this sector is growing, with cardboard, shrink wrap and plaster-only skips available, along with typical residual mixed waste skip bins.

The types of collections include:

- 'mini-skips' to householders for weekend clean-ups or building and renovation
- mixed waste for farms (due to the isolation from council services and facilities)
- larger sized bulk bins for larger manufacturers and food processors
- larger sized bulk bins for transporting aggregated waste from council RRCs.

5.2.2.1 Analysis of future needs

It is well recognised that more can be done to maximise resource recovery from businesses generating waste and private collectors.

Statewide and regional data indicate that a significant volume of private sector waste, particularly mixed C&I waste, is disposed directly to landfill without any sorting or resource recovery. In the Goulburn Valley region, around 75,000 tonnes or 57% (Table 7) of waste to landfill comes from industrial sectors (C&I and C&D waste), suggesting a significant opportunity for increased resource recovery of this material. Depending on the source, mixed industrial waste often contains valuable materials such as plastics, paper/cardboard and metals.

Currently the region has limited infrastructure for receipt of mixed industrial waste, particularly construction waste. Only limited sorting of selected loads of mixed industrial waste currently takes place. Commercial-in-confidence issues can limit partnerships and information sharing with private

²⁴ Victorian Local Government Annual Survey Sustainability Victoria, 2015

industry. Effective engagement with the industrial sector is a priority, however this is resource intensive.

Technology for sorting mixed industrial waste is readily available, ranging from highly automated MRFs, to manual separation of material streams. Such facilities can be co-located at landfills to pre-sort material and remove valuable materials prior to disposal; such approaches can reduce exposure to landfill gate fees and preserve valuable landfill airspace and are thus attractive options for the region. However, recovery of industrial waste can only occur where there is a positive business case and where suitable markets for recovered materials exist.

The implementation plan aims to maximise recycling from residential and commercial collections through supporting the investigation of the viability of pre-sort infrastructure at landfills in the region (see Action 1).

Further maximising recycling from residential and commercial collections will be addressed through:

- Supporting residents and businesses to reduce materials entering the waste stream through reusing materials onsite such as composting in agricultural businesses and then maximising recycling (see Action 8).
- Engaging businesses and the community through implementing the waste education strategy actions (see Action 8).
- Promoting opportunities for technical exhibition and trial of new equipment that enables greater material handling and processing of industrial waste (see Action 7).
- Working to ensure that appropriate data systems and reporting provide the evidence to support future opportunities for investment in industrial waste sorting (see Action 13).

5.2.3 Hard waste collections

Household kerbside hard waste collections previously provided by councils across the region were discontinued due to cost, amenity and occupational health and safety issues. Residents are able to access the RRC network and commercial service providers.

5.2.4 Residential multi-unit and mixed-use development collections

In our region, the predominant forms of mixed-use or residential multi-unit developments (MUDs) are retirement living and semi-permanent holiday parks. Mitchell Shire is located on Melbourne's rapidly growing northern fringe with an increasing number of MUDs.

Challenges for these properties, similar to MUDs and mixed-use developments in metropolitan Melbourne, include lower resource recovery rates and higher contamination rates.

Poorly designed collection areas and infrastructure impact on amenity and are costly to address through retrofitting. Intervention early in the planning and design phases is critical.

5.2.4.1 Analysis of future needs

Support the provision of waste and resource recovery services in MUDs and mixed-use developments (see Action 9) through:

- Ensuring developers have access to appropriate best practice facility design and operational standards for services for MUDs and mixed-use development.
- Increasing coordination and consistency of waste and recycling collection services to properties.
- Building the capacity of householders and property industry stakeholders to develop, use and support waste and resource recovery systems.
- Exploring and implementing retrofitting options to make resource recovery easier.

5.2.5 Litter and illegal dumping

Litter and illegal dumping poses a significant problem for communities in terms of environmental and amenity impacts, clean up and collection costs. Litter also has a negative impact on local communities' feelings of safety and wellbeing²⁵.

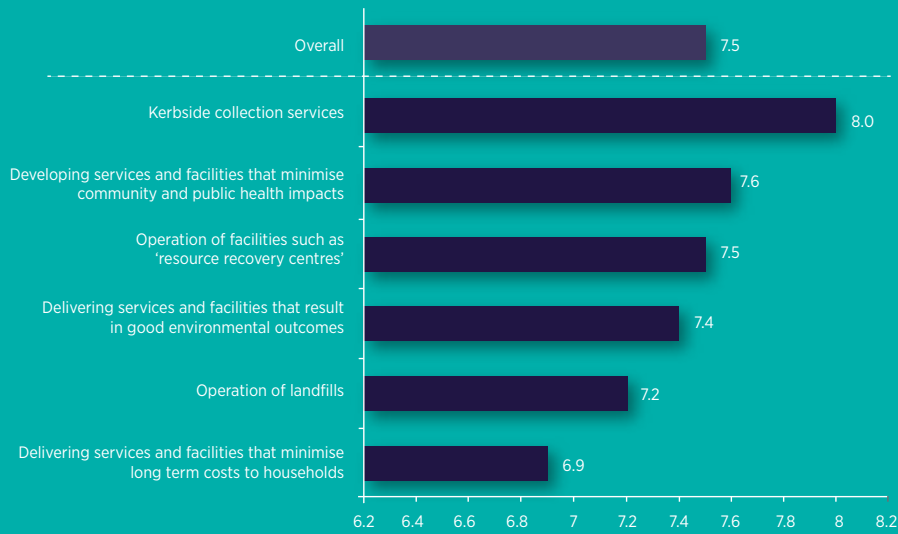
Litter and illegal dumping is managed through a wide range of infrastructure, such as public bins and public place recycling, education and enforcement actions across state government and councils. The waste education strategy identifies regional litter plans as a key mechanism to identify and prioritise regional litter issues and develop targeted, measurable and evidence based litter prevention activities.

5.2.5.1 Analysis of future needs

GVWRRG will play a role in supporting SV, the Victorian Litter Action Alliance (VLAA) and councils to facilitate the development and implementation of best practice litter prevention programs based on VLAA's 8-step model (see Action 8).

²⁵ Gladwell, M. 2000 & Kelling, G. 1982

Community satisfaction with waste management services²⁶



The Goulburn Valley community have an overall high level of satisfaction with waste management services, particularly with kerbside collections. The figure shows the satisfaction ratings for specific services.

Source: *GVWRRG Community Engagement Survey*, Wallis, 2015

5.3 Resource recovery infrastructure

5.3.1 Resource recovery centres

The primary purpose of a RRC is to aggregate, consolidate, and/or sort reusable and recyclable materials prior to transport to another facility for recovery or management. It may include a resale centre. They may be designed to receive specific material streams such as metals or organics or to receive multiple streams such as those from households including residual waste.

Councils own and operate RRCs for residents to take items not accepted in the household kerbside collections, or where an area is not serviced by household kerbside collections. Some privately owned RRCs collect and sort specific materials such as scrap steel, non-ferrous metals and paper/cardboard for households and businesses. Map 1 (page 35) shows the location of RRCs in the region.

Some councils in the region provide vouchers for residents to drop off set quantities of materials for free. Some RRCs charge a minimal fee. Sorting of recyclable materials is encouraged at all RRCs.

There is a well-developed geographical network of 40 council and privately owned RRCs that accept a range of materials for disposal or recycling. A vast majority of properties are within a radius of 25 kilometres of a RRC. Table 13 shows the number of RRCs in each municipality.

Depending on the nature of the site and the availability of options, some RRCs are limited to accepting household waste. Others accept larger quantities of commercial waste. Further details of

²⁶ *GVWRRG Community engagement survey*, Wallis, 2015

Table 13 Goulburn Valley resource recovery centres by municipality

Municipality	Council owned	Privately owned
Campaspe Shire	8	
Greater Shepparton	3	4
Mitchell Shire	4	
Moira Shire	9	
Murrindindi Shire	5	
Strathbogie Shire	7	
Total	36	4

materials managed by specific RRCs can be found in Table 24 Existing resource recovery infrastructure in Section 8.1

It is estimated that nearly 50,000 tonnes of materials are managed at council owned and privately owned RRCs in the region each year. The RRCs are supported by retailers who offer a take back or trade in of items, such as mattresses and televisions, either through a promotion or as part of product stewardship initiatives. A privately owned RRC in Shepparton achieves transport efficiencies through consolidating MSW, commercial recyclables and residual waste at its facility for bulk haul in larger trucks to reprocessors and landfill. The efficiencies increase the options for marketing and disposal that may otherwise be limited.

Strathbogie Shire have drop off facilities which have not been considered as all material is transported to the closest RRC for recovery and disposal.

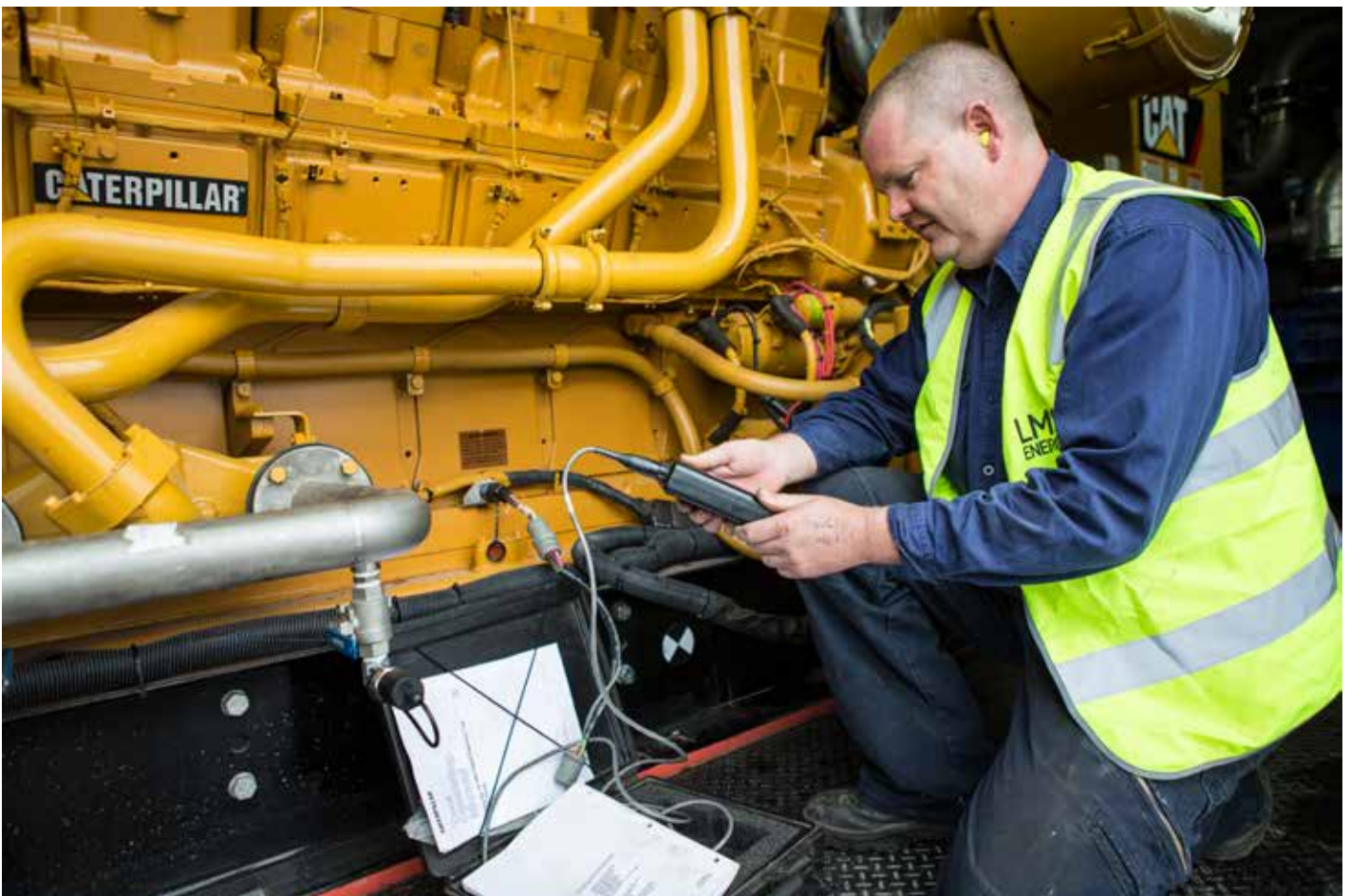


Image: Operating a methane gas capture system at a landfill

Mitchell Shire responding to a rapidly growing population

Mitchell Shire is located on Melbourne's rapidly growing northern fringe. Its waste and resource recovery infrastructure is under pressure to meet the demands from residential developments and increased population.

There are three locations that require relocation or redevelopment and council is currently considering its options that include:

- expanded capacity at Wallan RRC
- relocating Seymour RRC to rehabilitate the former Seymour landfill
- relocating Broadford RRC.

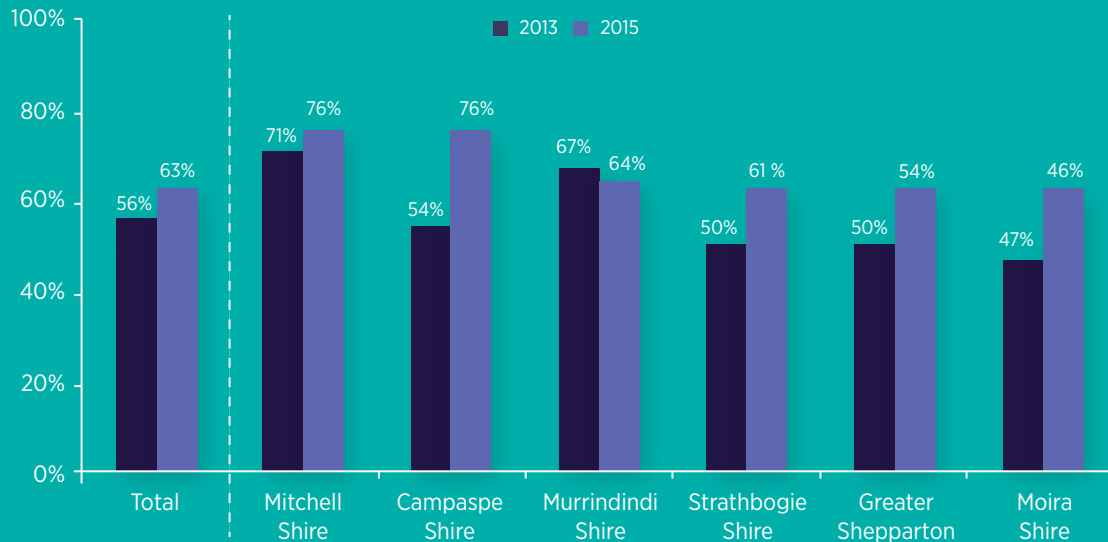
Image: Excavator at the Mitchell landfill site



Community knowledge of local resource recovery centres

Nearly 80% of residents knew the location of their nearest RRC (compared to 56% who knew where the nearest landfill was) and 63% had used it in the last 12 months, up from 56% in 2013. The figure compares the use of RRCs in 2013 and 2015.

Resident resource recovery centre use in past 12 months, 2013 and 2015



5.3.1.1 Analysis of future needs

Overall the analysis found RRCs are likely to have sufficient capacity to meet growth in demand over the next 10 years. However RRCs will require some equipment upgrades, increased collection frequency of skips and storage to manage additional recovered materials.

Notwithstanding this, due to high population growth and emerging demand, Mitchell Shire is currently planning how to best meet the projected population growth and urban development. Council is currently assessing its options for upgrades (see Action 6).

The Victorian Government's commitment to ban e-waste from landfill will see additional amounts of electronic equipment recovered for recycling, with the region's RRCs likely to play a significant role. An exception would be waste that is covered under the National Television and Computer Recycling Scheme which would be collected at drop off points.

The increase in the amount of e-waste to RRCs may require support to meet the Australian Standard AS5377 Collection, storage, transport and treatment of end-of-life electrical and electronic equipment.

It would also require ensuring reasonable access of all communities to e-waste drop off facilities (see Action 2).

Additional future needs include:

- reviewing RRC cost benefits (see Action 12)
- identifying alternative solutions if councils seek to reduce their role as a default provider of waste and resource recovery (see Action 12)
- assisting councils to identify priority upgrades (see Action 6)
- improving the regional data collection system (see Action 13)
- assisting councils to meet the demands of areas of high population growth (Action 6).

5.3.2 Materials recovery facility

Materials recovered from the waste stream are received and sorted prior to transport to another facility for recovery and management. At a MRF materials may undergo mechanical treatment for sorting by characteristics such as weight, size, magnetism and optical density and may include cleaning and compression. Materials may be received as mixed streams such as commingled recyclables from households and businesses or single streams such as metals.

The majority of household kerbside recyclables from the region are transported to MRFs in metropolitan Melbourne. Councils may consider opportunities within the region when tendering for future contracts which creates an opportunity for a MRF to provide additional capacity to manage the current tonnes of recyclables flowing out of the region. The Ellwaste MRF (shown on Map 1) located in Echuca is the only MRF in the region and presently has considerable underutilised capacity. Only materials from household kerbside collections are sorted at the MRF.

However large amounts of waste are generated from the C&I sector that has low recovery rates. There is an opportunity to increase recovery of C&I waste either through C&I businesses separating valuable materials onsite for collection, or through establishing a MRF capable of sorting C&I waste, and located to either the source or end point, to increase the viability of recovery.

5.3.2.1 Analysis of future needs

- The viability of the existing or any future MRF within the region to sort and process recyclables depends on:
 - the timing of council tenders for waste services contracts
 - how well such facilities compete with large-scale Melbourne facilities on transport and market economics.
- Recovery of industrial waste would improve recovery outcomes in the region. This would allow for further sorting, segregation and reprocessing of materials that are currently disposed at landfills as part of the mixed waste stream, and for increased employment and economic growth.
- Pre-sorting at landfills would recover additional recyclable materials from all sectors (see Action 1).

5.4 Reprocessing infrastructure

Map 2 shows the number and location of reprocessors in the region. There are a number of material streams that are not reprocessed in the region and the existing capacity for reprocessing some materials is limited. For some materials, local management solutions may not be feasible, for example due to lack of local markets, or the need for specialised treatment technologies. However there is potential to establish or expand reprocessing for some materials in the region.

The SV reprocessor survey noted that apart from organic

Reprocessing is changing the physical structure and properties of a waste material that would otherwise have been sent to landfill to add financial value to the processed material. Without reprocessing, the beneficial use of waste materials would be lost.

A **reprocessor** is the facility where these changes occur.

A survey of reprocessors conducted by Sustainability Victoria conservatively estimated that the total value of resources recovered in Goulburn Valley in 2013-14 was over \$8 million, however only \$3.2 million (or 40%) of those resources stayed in the region.

material, which is generally reprocessed locally, only 14% of recycle stays within the region; 68% is sent to Melbourne and 16% is sent interstate or directly exported.

Data sources for the reprocessing infrastructure

Unless otherwise referenced, the data sources for this section are the:

- *Survey and analysis of regional reprocessors and material recovery facility operators: Goulburn Valley Waste and Resource Recovery Group regional report* conducted by Sustainable Resource Use for Sustainability Victoria, 2015.
- *Goulburn Valley Infrastructure capacity and needs assessment*, Blue Environment, 2015.

5.4.1 Current reprocessing capacity

There are 22 reprocessors in the region. Table 12 in Section 5.1 shows the tonnes currently managed for material categories against installed capacity, under-utilised capacity (as reported by reprocessors) and projected tonnes in 2024-2025. Existing facilities processing food and garden organics are operating at close to current capacity. With demand likely to grow substantially in the short term, there is a need for additional reprocessing capacity for food and garden organics.

Reprocessors of other materials appear to be operating with under-utilised capacity, indicating room for reprocessing of additional materials expected from projected population growth.

Table 14 lists the identified reprocessors in the region. There is no throughput or reprocessing capacity data available for some of the reprocessors listed. However they have still been identified in Table 14 and are included in the existing resource recovery schedule (see Section 8.1).

Map 2 Location of reprocessors in the Goulburn Valley region

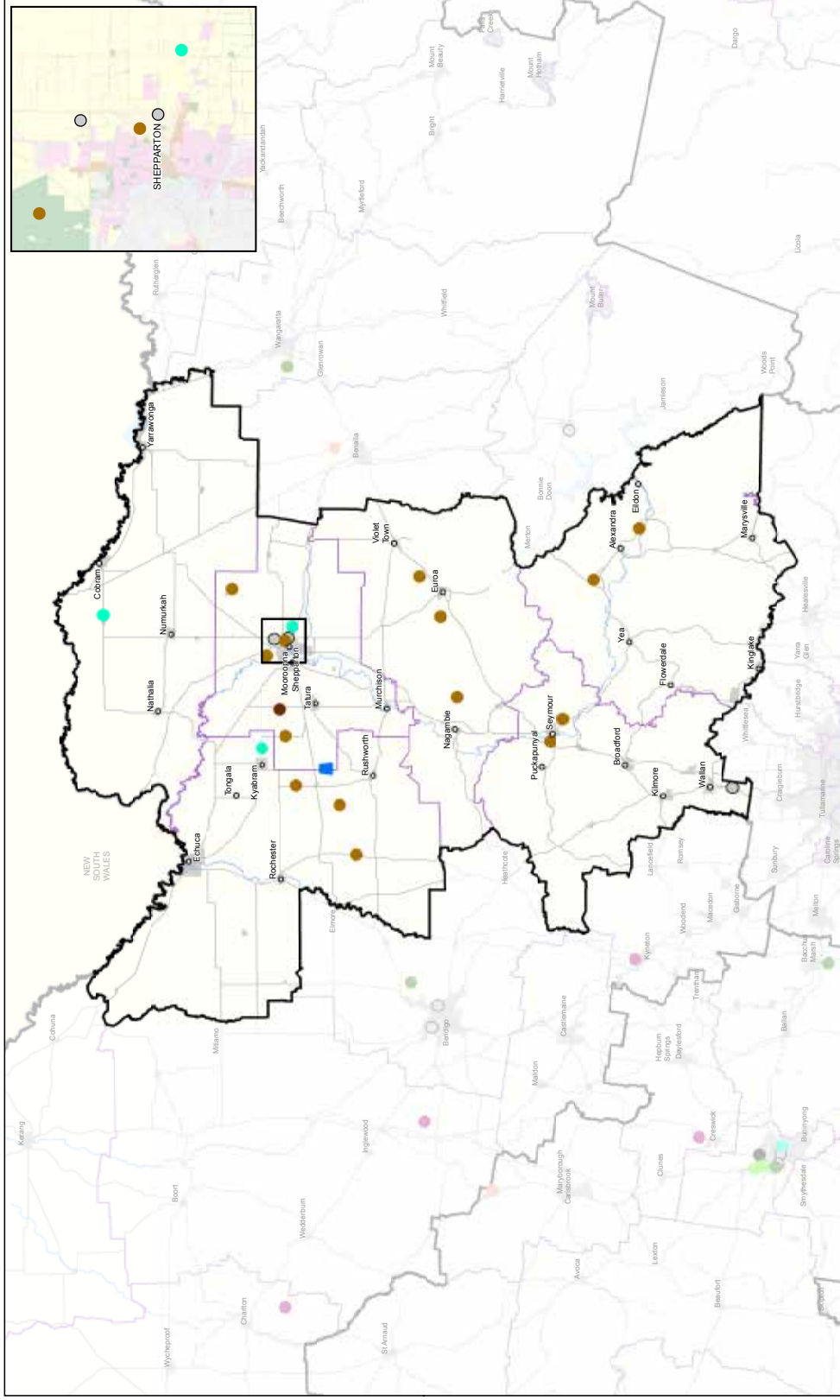


Table 14 Goulburn Valley reproprocessors

Municipality	Number	Facility	Material category recovered/reprocessed
Campaspe Shire	4	Biomix	Organics
		Carl Brown	Organics
		Resource Resolution	Organics
		Waranga Green Energy ¹	Organics
Greater Shepparton	9	Aussie Drum Furniture	Metals, plastics, organics
		Brendan O'Keefe Demolition & Recycling	Aggregates, masonry and soils, plastics, metal and organics
		Crowbar Demolitions	Metal, aggregates, masonry and soils and organics
		Environmentally Stable ²	Organics
		Gardners Ag Services	Organics
		Pental Soaps	Organics
		Recycled Plastic Pipe Manufacturers	Plastics
		Western Composting Technology	Organics
		Elite Manufacturing ²	Plastics
Mitchell Shire	3	Eco Logs	Organics
		Seymour Shavings & Sawdust Supplies	Organics
		Beveridge Scoria ²	Aggregates, masonry and soil
Moira Shire	1	Plastic Forest	Plastics
Murrindindi Shire	2	Goulburn River Trout	Organics
		Blow it Mulch and Mega Mulch ²	Organics
Strathbogie Shire	3	Enviro 2100	Organics
		Humus Composting	Organics
		Costa Mushroom ²	Organics

Disclaimer: Every effort was made to identify and contact all reproprocessors but this does not guarantee that all reproprocessors were identified

¹ Waranga Green Energy due to be operational in 2017

² No pre-existing data from these sites has been included

Organics technologies

Some advanced waste treatment technologies that provide an alternative to landfilling operate in Victoria but are not common. The technologies can contribute to regional innovation and economic development, provide improved environmental outcomes, produce value-added products and improve resource efficiency. They can also potentially be high-risk, capital-intensive ventures that may not deliver on expected outcomes.

The increasing costs of waste disposal, pressures to improve sustainable outcomes and the goal to minimise new landfills drive opportunities for new technologies to increase and maximise resource recovery which can include generating energy from waste or creating useful by-products.

Many technologies focus on organics as a feedstock due to its value to generate energy from waste or for recycled organics products. Organics can be recovered through source separated collection systems or extracted from mixed MSW and C&I wastes. The types of organics and how they are refined for processing will influence both the processing technologies and the value of outputs. Biological and thermal treatment are suitable technologies for organics processing including:

- Biological processing and feedstocks:
 - Aerobic composting/stabilisation such as garden, food and other wet organics.
 - Anaerobic digestion such as food and wet organics. Organics loads are extracted from source separated organics or derived organics rich fraction from mixed waste.
 - Anaerobic fermentation such as stretchy and sugary organics and potentially woody organics.
- Thermal processing and feedstocks:
 - Heat treatment.
 - Pyrolysis/gasification: predominately dry woody organics from source separated collections, derived organics rich fraction or residual from other organics recovery.
 - Combustion technologies: mixed waste, derived organic/calorific fraction from mixed waste, woody organics from other organics recovery operations.
 - Refuse derived fuel manufacture: derived organic/calorific fraction from mixed waste or woody organics from other organics recovery operations.

5.4.2 Organics reprocessing infrastructure

There are 18 organics reprocessing facilities in the Goulburn Valley region managing over 70,000 tonnes of material in 2013-14 (see Table 14). Food and garden organics make up nearly 60% and wood/timber and other organic materials over 40% of the total organics reprocessed.

The SV reprocessor survey did not capture cross regional flows from some of the reprocessors and, as highlighted, not all reprocessors participated in the survey. The survey identified that cross regional flows of organics occurs in and out of the region.

Food and garden organics in landfill can have a potentially high contribution to greenhouse gas emissions which result in increased methane levels in the atmosphere, contributing to climate change and posing significant risks to land, water and air contamination.

Significant steps have been made in the region to recover organics from the MSW stream to eliminate it from landfill. With the addition of services that commenced between 2014 and 2016, approximately 50% of households in the region are now serviced by household food and garden organics collections. Three councils

provide food and garden organics collections and another one has an opt-in garden organics collection in specific areas. It is anticipated these services will significantly reduce the amount of organics sent to landfill in the next two to three years.

The increased recovery of organics creates opportunities for organics reprocessing technologies. The market sounding process highlighted proposed technologies, including an anaerobic digestion facility and an existing facility upgrading to in-vessel composting, to reprocess organics from within and outside the region. These proposed technologies would provide reprocessing options from industrial food processing facilities which have been identified as a priority for the region. The group will play a role in facilitating cross sector partnerships to best examine potential infrastructure solutions (see Action 3).

The state organics strategy analysed barriers and opportunities in organics recovery and determined appropriate government actions for the next five years. GVWRRG will implement locally relevant actions of the state organics strategy in an effort to maximise the recovery for organics (see Action 3).

5.4.2.1 Analysis of future needs

The region has significant organics reprocessing infrastructure with a total installed capacity of around 93,000 tonnes a year and one organics reprocessing facility responded to market sounding proposing to expand capacity (see Table 22 in Section 7.3).

However, the analysis undertaken by Blue Environment using the regional reprocessing data indicates that around 93% of the capacity to process food and garden organics is already being utilised. The introduction of council collections for food and garden organics will recover more of this material for reprocessing and this current lack of available capacity suggests a short term need for new or expanded food and garden organics reprocessing infrastructure in the region.

It is estimated the introduction of new food and garden organics collections across three councils in the region will recover an additional 5,000 tonnes in 2018-19. It is likely that in coming years the three remaining councils (one of which has an existing opt in garden collection) will also consider introducing a kerbside food and garden organics collections service for residents which would have the potential to recover more than 15,000 tonnes in 2024-25. While further data collection and modelling is still required, it is apparent that between 5,000–10,000 tonnes of additional processing capacity is required in the short term.

Establishing any new food and garden organics facilities in the region should consider a business case that incorporates C&I organics and kerbside organics to achieve economies of scale. To ensure a strong business case for investment, C&I organic waste streams may be used to augment kerbside organics to gain economies of scale. Additional research is required to work with industry to identify C&I organic waste streams across the region as well as opportunities for aggregation and/or consolidation to support business and industry investment in organics reprocessing facilities (see Action 3). An analysis of options is also required to ensure the best solution for the region (see Action 3).

The regional data and market sounding process point to significant available reprocessing capacity for recovered organics timber and wood and other. The regional reprocessor survey indicates that the current infrastructure has capacity to process an additional 18,000 tonnes a year, which represents an opportunity for increased resource recovery. Recovering additional timber from mixed industrial waste, through additional sorting infrastructure and improved source separation is a priority for the region (see Actions 1 and 2).

All council RRCs in the region are currently receiving timber and garden organics that is chipped onsite, but the resulting mulch is often contaminated. Upgrades at council RRCs are needed to improve separation of timber and wood, reduce contamination and improve leachate control.

Opportunities for organics reprocessing are being explored with stakeholders to co-locate EfW technologies with water authority infrastructure. These plants are already located with established buffer distances and often with available land (see Actions 3 and 7).

Reprocessing should be undertaken in accordance with the relevant best practice standards. In the case of composting this requires compliance with the Australian Standard for Compost, Soil Conditioner and Mulches (AS 4454-2012), which has been established in the region and has resulted in strong gains in organics recovery.

5.4.3 Plastics reprocessing infrastructure

Based on the reprocessor survey it is estimated around 3,000 tonnes of plastics were managed in the Goulburn Valley region in 2013-14. Of this, around 67% was managed within the region, with the remaining 33% reprocessed outside the region²⁷.

There are nine facilities in the region that manage plastics: five reprocessors specialising in particular plastics, three private RRCs and one MRF.

5.4.3.1 Analysis of future needs

The regional data and market sounding process point to significant available reprocessing capacity for recovered plastics. The regional reprocessor survey indicates that the current infrastructure has capacity to process an additional 4,000 tonnes a year.

Moira Shire's expanded polystyrene recovery saves money and reduces landfill

Moira Shire Council purchased a custom built mobile expanded polystyrene machine with \$45,000 funding from the Victorian government. The machine, designed to overcome electricity constraints at rural RRCs, runs on single-phase electricity and is powered by a small on board diesel generator that has a reduced start up current demand. The project has been so successful that the council purchased a second unit after about 18 months with the landfill savings. Recovering the material also extends landfill airspace.

27 Survey and analysis of regional reprocessors and material recovery facility operators: Goulburn Valley Waste and Resource Recovery Group regional report conducted by Sustainable Resource Use for Sustainability Victoria, 2015.

Many of the existing plastics reprocessors in the region have been successful because of their market niche. There are opportunities to grow the sector by targeting specific types of plastics, such as silage wrap, baling twine, irrigation pipe, mattress foam and other hard plastics and plastic films, particularly from the C&I and agricultural sectors (see Action 2).

5.4.4 Aggregates, masonry and soil reprocessing infrastructure

Around 4,000 tonnes of aggregate materials were managed in the region in 2013-14. There are four facilities in the region, including an additional facility that responded to market sounding, that currently reprocess or recover aggregates.

5.4.4.1 Analysis of future needs

Research and data analysis identified opportunities for additional reprocessing capacity of aggregates, masonry and soils. The market sounding process validated opportunities to increase concrete, brick and asphalt reprocessing in the region. The reprocessor survey indicates that the current infrastructure has capacity to process an additional 10,000 tonnes of aggregates, masonry and soils a year. Opportunities include mobile crushing equipment to process stockpiled materials onsite and establishing an industrial MRF that accepts C&D materials (see Action 2).

5.4.5 Paper and cardboard reprocessing

There is no paper and cardboard reprocessing infrastructure in the region. It is however, estimated that approximately 2,000 tonnes, sourced mainly from C&I sectors, of paper and cardboard were managed in the region in 2013-14 by privately owned RRCs. Paper and cardboard is compacted and transported to reprocessors outside of the region. Based on landfill composition data (Figure 6) it is estimated that approximately 12% of material landfilled is paper and cardboard. There is an opportunity to further improve aggregation of materials to increase resource recovery.

5.4.6 Glass reprocessing

There is no reprocessing of glass in the region. Like paper and cardboard, glass is received at the MRF and a privately owned RRC and transported to Melbourne for reprocessing. The cost versus benefit of smaller scale glass crushing needs to be evaluated, as there may be opportunities for viable products to use this material as pipe bedding and in road base. Further investigation of local reprocessing options for glass are required.

5.4.7 Metals reprocessing

There are no metal reprocessors in the region. Metals are collected and aggregated across the region for transport to

reprocessing facilities outside of the region by four facilities. It is however estimated that 3,000 tonnes of metals were aggregated across the region in 2013-14. Based on landfill composition data (Figure 6) it is estimated that approximately 2% of material landfilled is metals. There is an opportunity to further improve aggregation of materials to increase resource recovery.

5.4.8 Tyres²⁸ reprocessing infrastructure

In Victoria, the landfilling of whole tyres is banned, requiring alternative management of this considerable resource. Over 90,000 tonnes of end-of-life tyres and rubber waste were generated in Victoria in 2013-14 and 12% of end-of-life tyres were recycled, 77% were exported and 11% were stockpiled or disposed without record.

While tonnages reported in the region are modest, the data limitations suggest significant under-reporting of waste tyres. The Victorian Government is taking action to reduce the fire risk from tyre stockpiles by imposing stricter rules, enforceable by EPA, on how tyres are stored. Tyre Stewardship Australia has been established by the tyre industry to administer a national tyre product stewardship scheme that was launched in January 2014.

5.4.8.1 Analysis of future needs

The waste material streams generated (Table 8) from state data suggest that around 100 tonnes a year of tyres are generated in the region. There is an opportunity to establish tyre reprocessing in the region which was reflected in the market sounding process. The possibility of reprocessing tyres is supported by:

- considerable volumes exported, suggesting an opportunity for increased redirection
- a significant transport sector in the Goulburn Valley region
- the fact that the region is home to a priority stockpile in the Moira Shire
- pre-existing interest in the establishment of small scale pyrolysis plants.

GVWRRG will work to support SV and complement the EPA regulatory framework by:

- promoting greater local recovery of tyres
- promoting demand for tyre derived products
- notifying illegitimate stockpiling activity
- helping to address priority legacy stockpiles
- assessing options for the local use of tyre-derived fuel to replace fossil fuels and non-fuel, tyre derived products
- supporting councils in assessing end-of-life tyre reprocessing proposals (see Action 2).

²⁸ Investment factsheet: End-of-life tyres, Sustainability Victoria, November 2015

Image: Trommel at a composting facility





Image: Cardboard cage at an industrial facility

5.4.9 Textiles²⁹ reprocessing infrastructure

While Victoria generated 129,000 tonnes of textile waste in 2013-14, around 3,000 tonnes were recovered, representing a recovery rate of just 2%.

Goulburn Valley region's textile waste includes discarded clothing, end-of-life furniture and manufacturing offcuts. While reported tonnages are modest, data limitations suggest significant under-reported quantities of textile waste exist in the regional waste stream.

5.4.9.1 Analysis of future needs

The data for the waste material streams generated in the region (Table 8) suggests that around 5000 tonnes of textiles are landfilled in the region a year. There is an opportunity to establish textile reprocessing in the region, which was identified through the data and validated in the market sounding process.

GVWRRG will lead regional investigation into the scope for viable recovery of mattresses along with greater usage and coordination of charity bins and other means of textiles collection (see Action 2).

Regional investment opportunities may include:

- reprocessing of high calorific value, woven textiles as a refuse derived fuel
- technologies that reduce combined textiles to their constituent fabrics
- reprocessing of mattresses.

5.4.10 E-waste

E-waste is one of the fastest growing waste streams in Victoria and includes items such as televisions, computers, mobile phones, kitchen appliances and white goods³⁰. Larger e-waste items such as whitegoods are collected by scrap metal traders and computers and TVs have been collected through the National Television and Computer Recycling Scheme at registered collection points. Material is transported to Melbourne for reprocessing.

There is currently minimal collection of smaller e-waste products such as kitchen appliances, hairdryers and DVD players in the region.

5.4.10.1 Analysis of future needs

The Victorian government has made a commitment to ban e-waste from landfill and the region must therefore ensure that there are suitable avenues to divert the material to resource recovery. Given the introduction of the ban is imminent, future management of e-waste has been identified as a regional priority in the implementation plan (see Action 2).

Additional infrastructure, storage and solutions to divert banned materials from landfill will need to be considered. GVWRRG is working with the rest of state government on the design of the ban.

5.5 Product stewardship initiatives

Product stewardship is an approach to manage the impacts of different products and materials. It acknowledges that those involved in producing, selling, using and disposing of products

²⁹ Investment factsheet: Textile waste, Sustainability Victoria, November 2015

³⁰ <http://www.delwp.vic.gov.au/environment-and-wildlife/e-waste>, accessed 25 October 2016

have a shared responsibility to ensure that those products or materials are managed in a way that reduces their impact, throughout their lifecycle, on the environment and on human health and safety³¹.

Product stewardship is one of the guiding principles in the EP Act where it is defined as:

- Producers and users of goods and services have a shared responsibility with government to manage the environmental impacts throughout the life cycle of the goods and services, including the ultimate disposal of any wastes.
- Product stewardship is a preferred waste policy instrument because it can be an effective and efficient way of correcting market failure. It requires those who benefit from production and consumption to bear the costs of environmental management, so reducing the burden on governments and the community.

In Victoria, SV has led a number of product stewardship programs for products including computers (ByteBack), batteries (BatteryBack), paint (PaintBack) and compact fluorescent lights (FlashBack). These programs have been important, not only for diverting these products from landfill, but also for helping shape future programs. For example, the ByteBack scheme was an important input into the design of the national television and computer recycling scheme³².

Product stewardship is usually most efficient and effective when implemented nationally, because most companies affected by product stewardship operate nationally. To date, only a small number of schemes have been introduced nationally, but this is set to change.

There are a number of additional products that communities and governments want to see diverted from landfill to alternative pathways, such as recycling. For example, products that contain hazardous or valuable materials may be considered a priority for management using product stewardship.

Victoria has worked collaboratively with other governments to harness opportunities under the National Waste Policy and, in particular, the *Product Stewardship Act 2011*.

The market sounding process highlighted tyres and e-waste as priorities for the region's needs, both subject to product stewardship schemes. Both schemes are relatively new and opportunities to increase recovery of these materials have been identified as needs in this plan.

GVWRRG shares the concerns of communities and governments of hazardous and valuable materials deposited in landfills and will work with councils, the community and state government to recover more of these materials (see Actions 2, 6 and 7).

5.6 Energy from waste

EfW technologies include gasification, pyrolysis and anaerobic digestion. These technologies recover resources, generate energy from waste, produce fuel alternatives and reduce greenhouse gas emissions from landfills.

The EfW technologies suited to MSW treatment require large amounts of waste to justify the large capital outlay involved. Annual waste throughputs in excess of 100,000 tonnes are required to warrant capital investment of over \$30 million for many systems. Small-scale technologies targeted to particular waste streams with high calorific value (e.g. anaerobic digesters treating wet organics, energy generation from combustion/gasification of dry organics) may suit the region. Both large and small-scale technologies are likely to be more feasible when considered on a regional scale, where access to sufficient feedstock allows economies of scale to be achieved.

In view of meeting Victoria's Renewable Energy Target and the potential to create new jobs in the region, GVWRRG will assess the potential that EfW has in addressing the region's increase in organic materials (see Actions 4 and 7). Opportunities exist to co-locate EfW technologies with water treatment plants. As stated in 5.4.2, these plants are already located with established buffer distances and often with available land (see Actions 3 and 7). Opportunities are currently being explored.

5.6.1.1 Analysis of future needs

Four companies proposing new EfW infrastructure responded to the market sounding process. Of these, only one, Waranga Green Energy Pty Ltd, has secured the approvals for the facility.

Waranga Green Energy plans to establish an anaerobic digester at Stanhope to process food waste from the C&I waste stream and generate biogas for the neighbouring piggery which is consistent with Action 3. The facility has been included in the Infrastructure Schedule.

Energy from waste

The terms 'energy recovery from waste', 'waste to energy' or 'energy from waste' can be used interchangeably to describe a number of treatment processes and technologies used to generate a useable form of energy from waste materials. Examples of useable forms of energy include electricity, heat and transport fuels.

³¹ www.environment.gov.au/protection/national-waste-policy/product-stewardship, accessed 9 August 2016

³² www.epa.vic.gov.au/your-environment/waste/product-stewardship, accessed 9 August 2016

New technology and land use planning

- 81% of Goulburn Valley residents support new waste and resource recovery technology
- 93% believed council should be planning to set aside land for future innovation and development opportunities.

GVWRRG Community Engagement Survey, Wallis, 2015



Image above: Kialla closed landfill

5.7 Landfill infrastructure

Landfills are engineered waste disposal facilities that receive and contain waste in the ground. They are part of Victoria's waste and resource recovery infrastructure system and play a central role in safely and effectively managing waste materials. While the government and the GV implementation plan's aim is to increase recovery so that only materials that cannot be viably recovered are disposed of to landfill, they will continue to play a necessary role in Goulburn Valley's regional infrastructure network for at least the short to medium term. Looking to the long term, there will still be a need for some landfill capacity to safely dispose of treated, residual material.

To prevent negative impacts on the environment and the community, existing and new landfill design, construction, operation and rehabilitation must comply with the *Best Practice Environmental Management (Siting, Design, Operation and Rehabilitation of Landfills) 2015* (Landfill BPEM). Schedule A of the Landfill BPEM, deals with areas where landfill sites must not be established or extended into.

For landfills receiving putrescible material that decomposes, best practice rehabilitation and aftercare can extend to 30 years or more after a landfill stops receiving waste.

Some landfills, including Cosgrove in the Goulburn Valley region, capture gas to produce energy. Food and garden organics have a potentially high contribution to greenhouse gas emissions if not managed properly. The region has taken many steps to divert MSW food and garden organics from landfill and will continue to work with councils to consider and expand organics recovery (see Action 3).

5.7.1 Existing landfills

There are five licensed landfills in the region with four owned by councils. Ellwaste privately owns Patho, the largest landfill in the region. Patho and Cosgrove are licensed to receive prescribed industrial Category C waste which includes soils that pose a low hazard, or only exhibit offensive aesthetic properties. Table 15 lists the landfills in each council and Map 3 shows the specific location.

Patho and Cosgrove landfills are listed in the state infrastructure plan as hubs of state importance (see Section 5.8). This reinforces the role they play in the region and the focus on regional landfills.

A new landfill, Cosgrove 3, adjacent to the existing Cosgrove landfill site, with a total airspace of around 3,000,000 m³ is planned to be operational in 2018-19. Cosgrove is centrally located and close to larger population centres and businesses in the region. It will provide a significant increase in airspace for the region and an alternative option for contingency planning.

Table 15 Goulburn Valley licensed landfills in each council

Municipality	Landfill name	Number of landfills
Campaspe Shire	Patho	1 ¹
Greater Shepparton	Cosgrove	1
Mitchell Shire	Mitchell	1
Moira Shire	Moira	1
Murrindindi Shire	Murrindindi	1
Strathbogie Shire		0
Total		5

¹ Privately owned

5.7.1.1 Analysis of future needs

Landfills are part of Victoria's waste and resource recovery infrastructure system. The *Waste Management Policy (Siting, Design and Management of Landfills)* (Landfill WMP) requires that the development and use of landfills is minimised, but it is a role of this plan to ensure sufficient landfill airspace to meet the requirements of the GV region for the disposal of residual waste.

Many factors impact on how much landfill airspace will be required to meet the region's needs. A key factor is the implementation plan's objective to increase recovery so that only materials that cannot be viably recovered are disposed of to landfill. With changes in technologies and improved markets for goods made from recovered materials, many of the materials currently going to landfills may be recovered in future.

To achieve this the GVWRRG undertook a process in accordance with the Ministerial Guideline to assess and determine the region's landfill airspace needs. As part of this process the GVWRRG has committed to undertake regular future reviews of the implementation plan in accordance with the EP Act and relevant guidelines.

5.7.1.2 Landfill needs assessment

To determine landfill airspace needs the GVWRRG considered:

- Projected tonnages of residual waste likely to need landfilling in the next 30 years taking into consideration:
 - regional population and catchment growth
 - business as usual recovery rates as worst case scenario
 - potential impact of recovery initiatives that could divert material from landfills
 - knowledge of the region
 - information from the waste and resource recovery industry
 - future of other existing landfills.

- Information from the owners and operators of individual existing landfill sites including:
 - compaction rates
 - the amount of daily cover
 - site survey results, where available
 - future plans
 - airspace availability
 - land use planning and EPA works approval status of the available airspace.
- Tonnes currently going to individual landfills including:
 - landfill levy and council sourced data
 - specific factors that may have influenced the data collection year
 - tonnages expected to be landfilled under contracts and duration of these contracts
 - flows to or from other regions or interstate.
- Contingency requirements including:
 - natural disasters
 - unexpected closure of facilities including those that may be located in another region and provide a service (landfill or recovery) to the region.
- The management, accuracy and verification of information provided by third parties and impact of data gaps on the assessment. If data was unavailable, a conservative approach was taken.

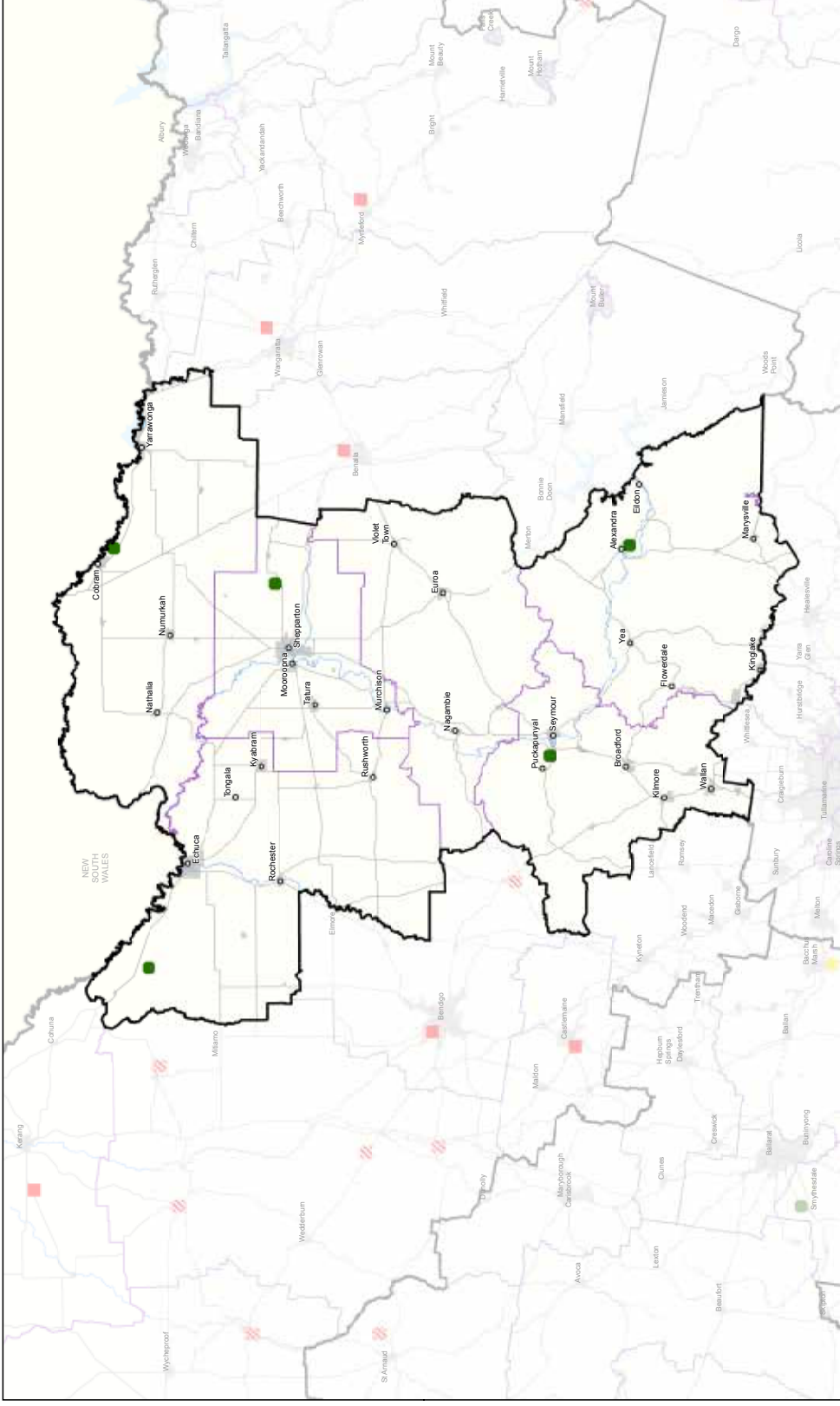
5.7.1.3 Findings of the landfill needs assessment

The detailed analysis in developing the GV implementation plan indicates that no additional landfills will be required for the region for the next 10 years and is unlikely for the 30-year outlook of the plan. Figure 9 shows the regional landfill airspace against the annual disposal rate and highlights the diminishing availability of airspace at each of the five landfills in the region over the next 10 years.

This assessment informs the Infrastructure Schedule (Part B) – Proposed Sequence of filling table. Section 50BB(c)(iv) of the EP Act sets out a required minimum timeframe for a landfill scheduling table of 10 years. While this plan is for a 10-year period, the Schedule provides an indication of the extent to which the existing landfills may contribute to meeting the needs of the region for a 30-year period. This is to provide clarity to operators, decision makers and the community. The Schedule is subject to review.

As part of developing the GV implementation plan we were required to consult with other WRRGs about flows into our region. It is anticipated that the Loddon Mallee region will require additional landfill airspace in seven years. Consequently the Loddon Mallee WRRG conducted a Landfill Schedule Application process to meet the landfill needs for its region for at least the next 10 years. The Patho Landfill in the Goulburn Valley region participated in that process and has capacity to accept the additional waste from Loddon Mallee in seven years without impacting on the availability of landfill airspace for the Goulburn Valley, which is reflected in the modelling.

Map 3 Landfill locations in the Goulburn Valley region



Paper Size A3
 0 4.5 9 18 27 36
 Kilometres
 Map Projection Lambert Conformal Conic
 Horizontal datum CGA 1994
 GDA 1984 to NAD 84
 Vertical datum CGA 1984
 GDA 1984 to NAD 84

LEGEND
 ■ Permeable & Solid Inert
 ● Townships
 ◻ Region Boundary
 ◻ LGA & Alpine Resort Area
 ◻ Municipalities
 ◻ Major Water Areas
 — Major Watercourses
 — Township Boundaries

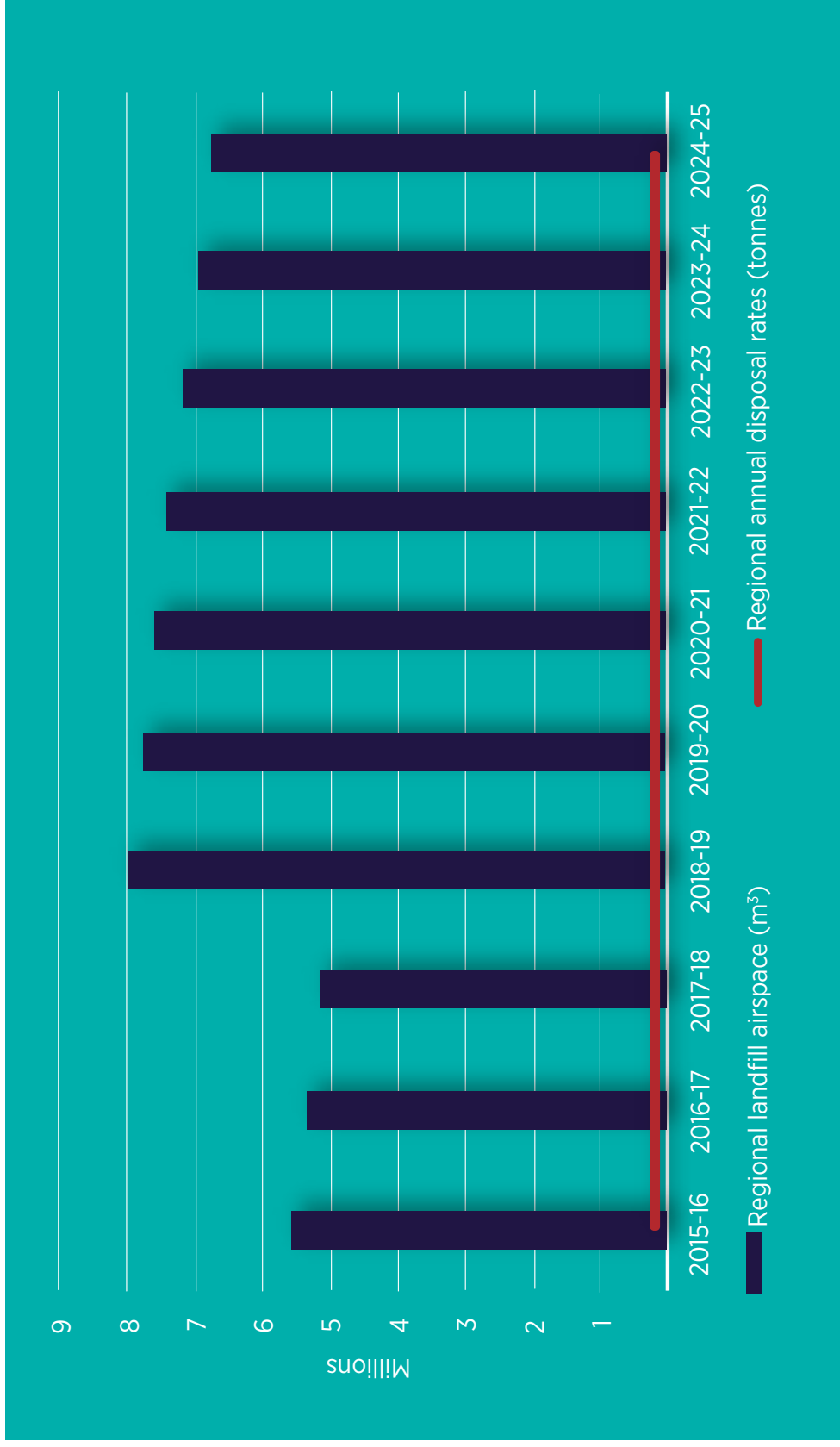
Regional Waste & Resource Recovery Implementation Plan
 Goulburn Valley Waste & Resource Recovery Group
 Existing Landfills

Job Number 31-33625
 Revision F
 Date 08 Nov 2016

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Figure 9 Landfill airspace availability (m³) and projected annual tonnes disposed in the Goulburn Valley region, 2015-25



Notes:

- All figures in m³.
- All airspace usage is approximate and takes into consideration airspace used by cover material.
- Cosgrove includes both the existing Cosgrove 2 landfill and Cosgrove 3 that is planned to be operational in 2018-19.
- The modelling does not take into account the impact of any natural disasters that produce large quantities of waste in very short timeframes and impact on airspace availability.

5.7.1.4 Review process

It is planned the schedule will be reviewed in three to five years. This will ensure that any gap in the availability of landfill airspace to meet the needs of the region will be identified and addressed with adequate time to:

- determine the most appropriate solution(s)
- schedule new infrastructure in accordance with the statewide process (if required)
- allow sufficient time for planning and construction.

Other factors which could trigger an earlier review or change to the schedule include:

- A direction from the Minister for Energy, Environment and Climate Change.
- Unexpected closure or filling of a landfill resulting in an immediate need.
- A request from another region to manage residual waste in one of the landfills in the region.
- A scheduled landfill not receiving approvals for scheduled expansions.
- A natural disaster that resulted in large quantities of materials that needed to be landfilled.

In addition there will be a high level contingency review undertaken by WRRGs across the state every 12 months that will include consideration of the impact of emergency events.

5.7.2 Asbestos disposed in landfills

Asbestos is a Prescribed Industrial Waste (PIW) which are hazardous wastes and outside the scope of this plan. Hazardous wastes are wastes that pose significant environmental and/or human health risks if not managed or disposed of safely. Under Victoria's current hazardous waste management framework, many hazardous wastes are 'prescribed' through Victoria's *Environment Protection (Industrial Waste Resource) Regulations*.

The Victorian Government is committed to the protection of human health and the environment from the possible harms of hazardous wastes. A review of Victoria's hazardous waste management framework has commenced and will consider the infrastructure needs to appropriately manage these waste streams. This includes considering the potential to include hazardous waste in the scope of the state infrastructure plan and regional implementation plans.

While currently outside the scope of this plan, given that asbestos is a waste stream that is relevant to so many people and entities in the region, GVVRRG has included a short analysis of its current status.

Asbestos is a silicate mineral made up of tiny fibres that form a dust when disturbed. Asbestos fibres breathed into the lungs

can cause a range of health problems including lung cancer and mesothelioma. Asbestos was previously used extensively in building products in Australia. All use, import or manufacture of asbestos was banned completely in Australia by 2003. Managing asbestos safely is a major regional and statewide priority. Table 16 shows the types of asbestos accepted by landfills in the region.

5.7.2.1. Analysis of future needs

The relative scarcity of disposal locations for domestic asbestos is further compounded as each of the three available disposal locations within the region have some conditions upon the receipt of asbestos:

- Alexandra: domestic quantities of asbestos from within the Murrindindi Shire only.
- Shepparton: no public access to the Cosgrove landfill.
- Patho: domestic and commercial quantities of asbestos from within the Campaspe Shire only.

In many instances the distance from population centres within the region to an unrestricted disposal site is more than 100 kilometres.

The Domestic Asbestos Working Party on behalf of the Association of Victorian Regional Waste Management Groups, with representation from EPA, WorkSafe Victoria, SV, Department of Health Victoria, Municipal Association of Victoria, Gippsland Asbestos Related Diseases Support Incorporated, WRRGs and the Gippsland Trades and Labour Council developed the *2011 Managing domestic non-friable asbestos at resource recovery centres guidelines*. They were for facilities receiving non-friable asbestos from domestic sources and subsequent transfer to a licensed landfill for disposal.

GVWRRG supports greater availability of responsible and accessible disposal options for asbestos-bearing material through appropriate infrastructure, education and training, as well as councils obtaining appropriate insurance coverage.

Establishing receive facilities (see Action 5) is intended to provide greater coverage and opportunity for the public to appropriately dispose of asbestos. Providing such facilities should reduce the level of inappropriate disposal, such as illegal dumping and concealment of asbestos materials in domestic waste. This should in turn reduce the risk to the community and to landfill or transfer station staff.

Appropriate safe work practices are required to be developed at RRCs to ensure that asbestos waste is managed, transported and disposed of in a manner that protects employees, customers, community and the environment from harm.

The illegal dumping of asbestos is a significant issue and represents a substantial annual cost to councils.

Table 16 Types of asbestos accepted by landfills in the Goulburn Valley Region

Type of asbestos accepted	Location of landfill	Additional info
Domestic	Alexandra Shepparton	Refers to generally small quantities of asbestos that a householder doing a do-it-yourself job may encounter, such as bathroom renovation where asbestos sheeting is present. The asbestos needs to be packaged correctly ¹ and may be transported in a householder's own vehicle to a licensed landfill for disposal without transport certificates or a permitted vehicle.
Commercial and domestic	Patho Wangaratta (north east WRRG region)	The landfill is able to receive asbestos from both domestic (as above) and commercial sources (as below).
Commercial		The landfill can only accept asbestos from commercial/industrial sources in a permitted vehicle with transport certificates. These may be small or large quantities from a commercial source or a domestic premises where a contractor has been engaged to undertake the removal work.

¹The disposal of waste asbestos, whether from a workplace or household, is controlled by EPA Victoria (<http://www.epa.vic.gov.au/your-environment/waste/asbestos>)

Councils have specific responsibilities in emergencies, such as bush fires, that are outlined in municipal emergency management plans (MEMPs). Councils should have a public health emergency management sub-plan that manages issues that could arise in the event of an asbestos related emergency.

Following an asbestos-related emergency, councils are the lead agency for all domestic or non-workplace locations. In addition to management of post incident issues onsite, councils may also need to distribute information to residents and handle public health enquiries.

Council involvement in an asbestos incident may include:

- Assessing the structural safety of the building.
- Assessing the affected site to determine whether an offsite public health risk/nuisance exists, or is likely to exist, under the *Health Act 1958*.
- Providing advice/enforcement for clean up of the site and safe disposal of materials.
- Distributing public health information to address community concerns.

When receiving construction waste at RRCs, councils are required to comply with the WorkSafe industry standard *Recycling Construction and Demolition Material – Guidance on Complying with the Occupational Health and Safety (Asbestos) Regulations 2003*.

5.7.3 Closed landfills

Closed landfills are those landfills that have received waste in the past, but do not any longer. Prior to the 1970s there was no overarching environmental protection legislation or regulatory framework to control the types of materials disposed at landfills, or standards for the design and operation of landfills. The result is that there are landfills across metropolitan and rural areas that have accepted materials that are potentially hazardous to the environment and human health, and were not constructed to today's best practice standards.

EPA data indicates there are over 100 active landfills in Victoria, in both council and private ownership, and at least 245 closed landfills, with the majority closing at least 10 years ago. GVVRRG has identified 38 closed landfills in the region that have closed within the last 30 years.

It is important that closed landfills in the region are identified and any potential impacts to the community, public health and the environment are managed and reduced. The potential of adverse impacts depends on a range of factors including the size of the landfill and types of waste accepted, the geology and natural features of the site and how the landfill was constructed and rehabilitated on closure.

The requirements for the rehabilitation depends on the risk of adverse impacts. Smaller landfills pose significantly lower risks to the environment and surrounding community and therefore rehabilitation, monitoring and maintenance are less stringent than for larger landfills that pose a greater risk. With the trend towards larger landfills the rehabilitation requirements have changed in recent years, with current operational landfills needing to undergo far more stringent guidelines when being rehabilitated.

5.7.3.1 Analysis of future needs

The responsibility for the management and rehabilitation of closed landfill sites lies with the entity known as the 'duty holder' of the site. In most situations this is the current landholder. The EPA manages and regulates this process. Further information on landfill requirements, from planning through to rehabilitation, can be found on the EPA's website. Specific related documents include the landfill BPEM and the *Landfills exempt from licensing 2014 guidelines* and the *Closed landfill guidelines, 2012*.

Many of the 38 closed landfill sites in the region were small landfills servicing the local area and closed some time ago. In most cases they pose a small risk to the community, environment and public health. GVVRRG proposes to assist the rehabilitation process for these closed landfills by facilitating work between councils and the EPA to develop risk-based assessments to take into account the local context. This may effectively reduce environmental and human health risks of these landfills more efficiently than current approaches that are aimed at landfills more broadly (see Action 10).

5.8 Waste and resource recovery hubs

5.8.1 What is a hub

The concept of hubs and spokes is a simple one – hubs are locations where materials are managed, with supporting spokes that enable materials to be transported to the hub. Together they form a system that supports the aggregation of materials within a network for efficient resource recovery and management of waste and material streams. The initial identification of a hub is the starting point to inform a discussion of its future.

Through identifying hubs we are seeking to achieve:

- consolidation of material streams to achieve tonnages that attract industry investment
- an integrated system that maximises resource recovery
- optimal economic, community, environment and public health outcomes.

During the implementation phase the future of hubs in the region will be explored, including consideration of appropriate planning controls.

The state infrastructure plan outlines the cascading criteria for hubs of state, regional and local importance (Table 17). The criteria help determine at what level(s) to carry out the appropriate planning and indicate where the impact would be if activities occurring at existing hubs were to change. These criteria are not definitive and should be applied as a 'best fit'. An individual hub does not need to meet all criteria or functions. This approach highlights the importance of local and regional planning to achieve an integrated statewide waste and resource recovery system.

5.8.2 Role the region plays in the overall statewide waste and resource recovery infrastructure system

The region's existing waste and resource recovery network includes five landfills, 40 RRCs (36 council owned and four privately owned), 22 reprocessors and one MRF.

The state infrastructure plan identified three existing hubs of state importance to the state waste and resource recovery system. Maps 4, 5 and 6 show the locations of the hubs of state, regional and local importance.

5.8.3 Strategic review of the Goulburn Valley region's hubs

Table 18 presents the results of the strategic analysis of the Goulburn Valley region's hubs. It lists the name of the hub and whether it is of state, regional or local importance as well as the individual challenges and opportunities for the hub. It also identifies any actions included in the Action plan to address the challenges and opportunities.



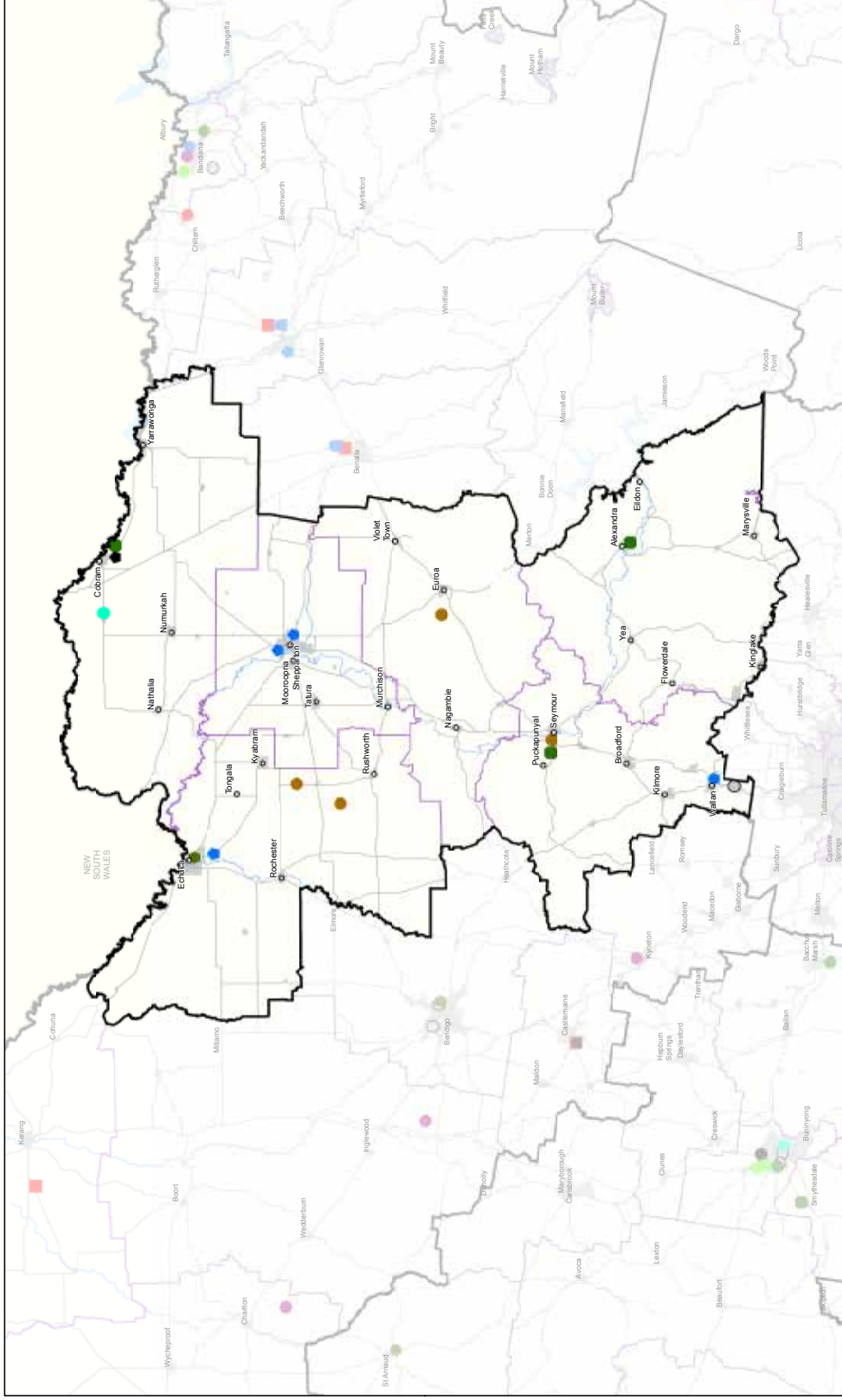
Image: Sorting material for recycling

Table 17 Cascading criteria for waste and resource recovery hubs

Level	Criteria
State importance	<p>The hub manages or processes a significant proportion of one or more material streams for the state.</p> <p>The type of materials managed or reprocessed at the hub are of economic value to the state's economy or pose a significant risk to economic, community, environment and public health outcomes if not recovered.</p> <p>It is an existing hub with established spokes for one or more materials. It is an integral component of the supply and/or processing chain across multiple regions or the state. If the functionality of the hub was compromised, it would put pressure on the viability of upstream or downstream industries.</p> <p>The hub has access to generators, markets, ports or transport infrastructure.</p> <p>The hub is in a location compatible with waste management and resource recovery activities and has capacity for future waste management and resource recovery activities.</p>
Regional importance	<p>The hub manages or processes a significant proportion of one or more material streams for the waste and resource recovery region or adjacent regions.</p> <p>The type of materials managed or reprocessed at the site are of economic value to the region or adjacent regions or pose a significant risk to economic, community, environment and public health outcomes if not recovered.</p> <p>It is an existing hub with established spokes for one or more materials. If the functionality of the site was compromised it would put pressure on the viability of upstream and downstream industries within the region.</p> <p>The hub is in a location compatible with waste management and resource recovery activities and has capacity for future waste management and resource recovery activities.</p> <p>The hub enables aggregation or consolidation of material streams from within the region or adjacent regions prior to transport to a regional hub for reprocessing or disposal.</p> <p>The hub may facilitate some reprocessing within the region or in the close proximity.</p>
Local importance	<p>The hub manages or processes a significant proportion of one or more material streams for the local community.</p> <p>The hub is an integral component of the local infrastructure. If the functionality was compromised it would reduce the ability of the local community to manage its waste streams and recover resources.</p> <p>The hub enables aggregation or consolidation of material streams at the local level prior to transport to a regional or state hub for reprocessing or disposal.</p> <p>The type of materials managed or reprocessed at the site might be of economic value to the local community or pose a significant risk to economic, community, environment and public health outcomes if not recovered.</p>

Source: *Statewide Waste and Resource Recovery Infrastructure Plan 2015-44*, Sustainability Victoria, 2015

Map 5 Hubs of regional importance



Regional Waste & Resource Recovery Implementation Plan
 Goulburn Valley Waste & Resource Recovery Group

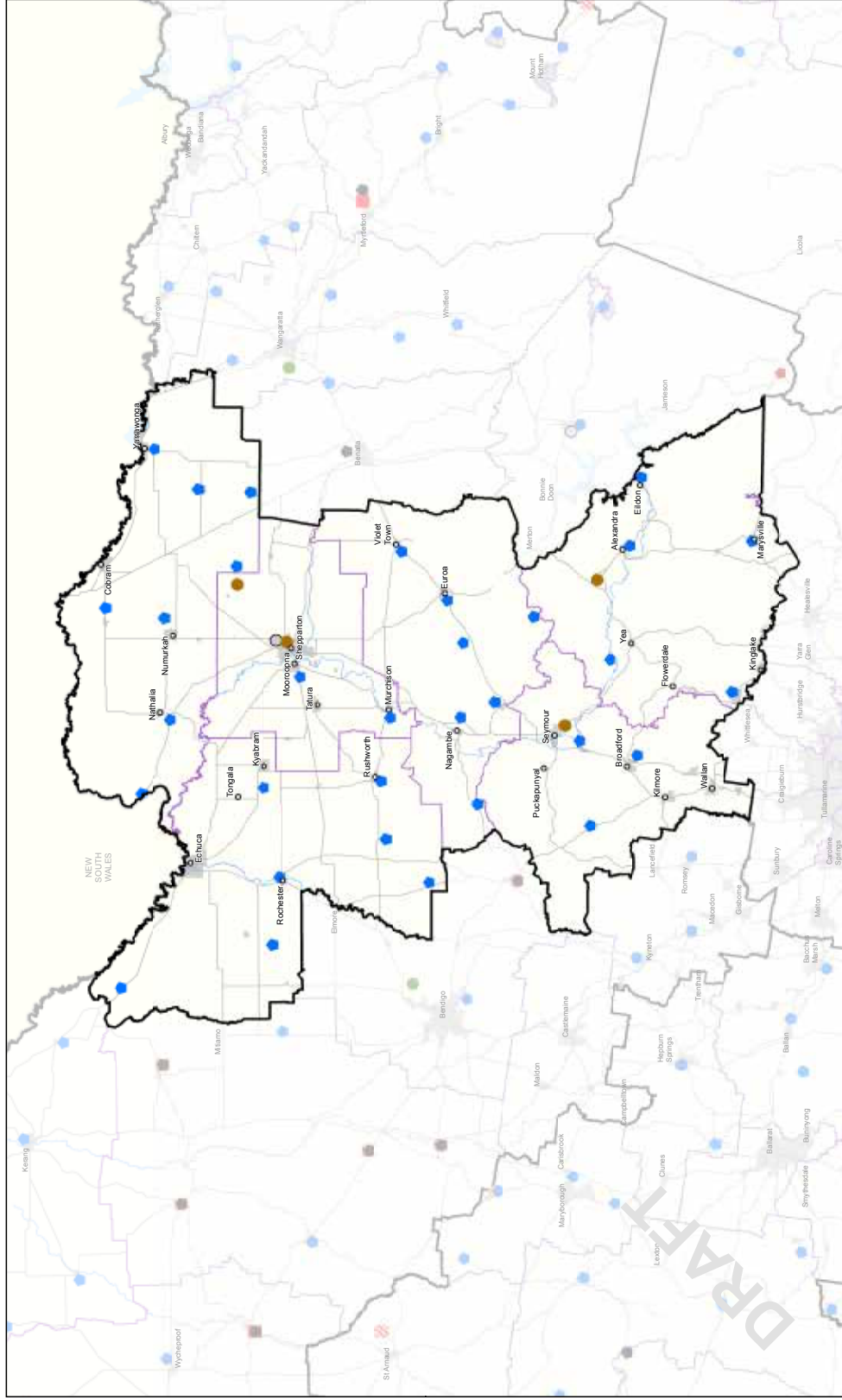


Job Number 31-33625
 Revision F
 Date 08 Nov 2016

Hubs of Regional Importance

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Map 6 Hubs of local importance



Regional Waste & Resource Recovery Implementation Plan
Goulburn Valley Waste & Resource Recovery Group

GHD **VICTORIA**

Hubs of Local Importance

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An ideal hub

An ideal hub has appropriate buffers between the waste and resource recovery facilities and incompatible uses to support the activities undertaken at that location. It has well established feeder-spokes and good access to transport networks. It is co-located or in close proximity to complementary activities that provide feedstocks or markets for the products and services, or share and utilise the same buffers. It is [economically] viable, minimises community, environment and public health impacts and contributes to the local and state economy.

Statewide Waste and Resource Recovery Infrastructure Plan, 2015

Image: Cobram landfill



Table 18 Strategic analysis of hubs

Hub of importance	Challenges and opportunities	Action plan number (if applicable)
STATE		
Cosgrove Landfill Cosgrove	Cosgrove 2 will reach capacity in 2019-20. Cosgrove 3 is planned to be operational by 2018-19. Any significant delays could impact landfill airspace availability in Cosgrove 2 requiring contingencies to be considered. Future upgrades to sort building and construction, concrete, timber and organics for recovery prior to disposal.	1
Patho Landfill Patho	Landfill airspace modelling could be impacted with potential cross regional flows. Opportunity for pre-sorting to increase recovery.	1
Western Composting Technology Shepparton	Growing uptake of food and garden organics kerbside collection from within and outside the region, with limited facilities available across the state to accept food waste. Opportunities for expansion.	3
REGIONAL		
Alexandra Landfill Alexandra	Leachate management issues. New leachate pond operational in 2016-17.	
Biomix Stanhope	Upgrades to in-vessel pasteurisation and open windrow maturation.	3
Beveridge Scoria Recycling Beveridge	Considering opportunities for additional reprocessing.	2, 3
Cobram Landfill and RRC Cobram	Landfill and RRC co-located. Future upgrades to recover plastics, timber, concrete, metals, commingled recyclables and organics.	2, 3
Echuca RRC Echuca	Additional land purchased to create site buffer with sale yards co-located and opportunities for expansion. Proposed development of education centre and future upgrades to improve environmental performance.	
Ellwaste MRF Echuca	The only MRF in the region. Accepts materials from the GV and other regions. Opportunity to increase throughput.	2
Enviro 2100 Euroa	Opportunities for expansion.	3
Foott Waste and Recycling Shepparton	Opportunities for expansion.	2
Mitchell Landfill Hilldene	Major projected population growth will increase demand. Landfill feasibility review completed in 2016. Seymour RRC possibly co-located onsite.	
Plastic Forests Pty Ltd Strathmerton	Power limitations at the site. Accepts waste from within and outside the region. Niche market for plastic film, often not otherwise recovered. Opportunities for expansion.	2
Resource Resolution Girgarre		

Hub of importance	Challenges and opportunities	Action plan number (if applicable)
Seymour Shavings and Sawdust Supplies Seymour	Opportunities for expansion.	2
Shepparton RRC Shepparton	Future upgrades to increase recovery of concrete, brick, bitumen and organics. Reviewing redevelopment options. Significant recovery, reprocessing and resale operations carried out onsite. Only permanent 'Detox Your Home' household hazardous waste drop off site in the region.	2, 3
Wallan RRC Wallan	Wallan is located in the urban growth boundary experiencing major population growth. Future upgrades would increase resource recovery volumes.	2
LOCAL hub of importance		
Alexandra RRC Alexandra	Future upgrades to recover metals, plastics, e-waste, organics, aggregates masonry and soil and batteries.	2, 3
Ardmona RRC Ardmona		
Avenel RRC	Potential security issues due to remoteness. Future upgrades to increase recovery of mattresses, waste oil, e-waste and resale items. Services rural areas with no kerbside collection.	2
Barmah RRC Barmah	Increased waste in summer from tourists, which can result in illegal dumping.	
Blow it Mulch and Mega Mulch Yark	Obtaining appropriate approvals.	3
Broadford RRC Broadford	Remotely located with no mains power or water onsite. Requires relocation to council owned land in Industrial Lane Broadford.	2
Colbinabbin RRC Colbinabbin	Site recently fenced which creates opportunities for additional services. Optional kerbside collection in rural areas.	
Crowbar Demolitions Shepparton	Opportunities for expansion.	2
Eco Logs Seymour	Opportunities for expansion.	2
Eildon RRC Eildon	Challenges with site topography. Future upgrades to recover metals, plastics, e-waste, organics, aggregates, masonry, soil and batteries.	2, 3
Euroa RRC Euroa	Potential security issues due to remoteness of site. Future upgrades to increase recycling of mattresses and e-waste. Services rural areas with no kerbside collection.	2
Gardners Ag Services Katandra		
Graytown RRC Graytown	Potential security issues due to remoteness of site and potential for illegal dumping. Servicing rural areas without a kerbside collection.	
Gunbower RRC Gunbower	Optional kerbside collection for rural areas.	

Hub of importance	Challenges and opportunities	Action plan number (if applicable)
Kinglake RRC Kinglake West	Future upgrades to recover metals, plastics, e-waste, organics, aggregates masonry and soil, batteries and high quality materials for direct resale.	2, 3
Lockington RRC Lockington		
Longwood RRC Longwood	Servicing surrounding rural areas without a kerbside collection. Additional kerbside collections have been recently introduced so currently reviewing hours of operation.	
Marysville RRC Marysville	Very low site utilisation. Future upgrades to recover metals, plastics, e-waste and batteries.	2
Mt Scobie RRC Kyabram		
Murchison RRC Murchison	Native vegetation on site and cultural heritage considerations.	
Nagambie RRC Nagambie	Potential security issues due to remoteness of site. Services rural areas with no kerbside collection. Future upgrades to increase recovery of mattresses and e-waste.	2
Nathalia RRC Nathalia	Future upgrades to recover plastics, timber, concrete, metals, commingled recyclables and organics.	2, 3
Numurkah RRC Numurkah	Future upgrades to recover plastics, timber, concrete, metals, commingled recyclables and organics.	2, 3
Pental Products Shepparton		
Pyalong RRC Pyalong	Potential security issues due to remoteness. Very low site utilisation. Viability of site to be assessed as part of the Landfill Operation RRC Feasibility Review.	
Rochester RRC Rochester		
Ruffy RRC Ruffy	Potential security issues due to remoteness of site. Servicing rural areas without a collection. Currently reviewing hours of operation.	
Rushworth RRC Rushworth		
Seymour RRC Seymour	RRC requires relocation due to pending rehabilitation of former landfill. Site to be relocated (possibly co-located at Mitchell Landfill).	2
St James RRC St James		
Strathmerton RRC Strathmerton	Increased waste in summer from tourism.	
Toolleen RRC Toolleen	No kerbside service with options currently being considered.	
Tungamah RRC Tungamah		
Violet Town RRC Violet Town	Services rural areas not serviced by a kerbside collection. Native vegetation considerations.	

Hub of importance	Challenges and opportunities	Action plan number (if applicable)
Yabba RRC Yabba	Buffer exists within the boundary of the site.	
Yarrowonga RRC Yarrowonga	Increased waste during summer from tourism. Future upgrades to recover plastics, timber, concrete, metals, commingled recyclables and organics.	2, 3
Yea RRC Yea	Services rural areas that do not have a kerbside service. Future upgrades to recover metals, plastics, e-waste, organics, aggregates masonry and soil and batteries.	2



Image: Public place recycling station



Image: Echuca Resource Recovery Centre

5.9 Risks and contingency planning

WRRGs are required to factor contingency requirements into the assessment of landfill and resource recovery needs.

Planning for, and allocating, contingency allowances ensure that sufficient landfill or reprocessing capacity is available if an adverse or emergency event occurs.

In the last decade, a wide range of natural disasters and other events of differing scales have occurred in the region highlighting the critical need for this work.

This planning also needs to consider the non-delivery of new waste and resource recovery infrastructure and when existing waste and resource recovery infrastructure is not available.

Events requiring contingency consideration can include:

- Inadequate planning by landfill operators to develop existing sites and landfill cells to ensure an ongoing cycle of planning, construction and approval of airspace to meet contractual and industry demands.
- Delays in the development of a proposed waste and resource recovery facility against expected timeframes or abandonment of such developments entirely, for example due to insufficient funds.
- Failure of existing reprocessors to obtain required planning and works approvals for expansion.
- An adverse environmental event, within or near the Goulburn Valley region that may:
 - disrupt collection systems or access to resource

- recovery centres, such as a flood
 - produce large quantities of waste requiring immediate disposal or recovery at short notice.
- An adverse event that closes a landfill in the short term requiring alternative disposal options for the period. Examples include police operations, onsite fires, onsite accidents or prolonged rain events or periods of extreme fire weather.
- The closure of significant waste and resource recovery infrastructure, for example through emergency event, market or business failure.
- Failure of industry to operate as intended and/or contracted. This can inadvertently result in potential stockpiling of source materials or end products that may ultimately mean the products will need to be managed. This would be exacerbated by any market failures for one or more end products which could occur due to price fluctuations, products not meeting updated specifications or standards, changes in costs to bring products to market, changes in perception of products and competition.
- A biosecurity event (animal disease) that would require specific transport, treatment and disposal protocols has the potential to increase the amount of materials landfilled and use available landfill airspace at a faster rate than expected.
- A biosecurity event (plant, pest, disease and weed) that would require limitations on the movement of raw organics into and within the region or onsite treatment processes. Such an event could also result in significant economic and reputational damage to high value industries if not managed appropriately and in an integrated way.

- Immediate system/infrastructure failure if one element of the chain is disrupted without notice including:
 - > service contractor goes into administration
 - > key transport route is unavailable
 - > service disruption due to dispute.
- Planned and existing facilities may be impacted by changing community attitudes and/or a failure to establish a social licence to operate, reducing the capacity to operate, expand or be established.
- Climate change will place additional pressure on the waste and resource recovery system with more extreme weather events. For example:
 - > Heat waves may restrict opening hours of facilities, reduce the functionality of facilities or impact on collection systems.
 - > Floods or fires may directly impact the operation of facilities or increase the amount of materials to be landfilled and use up available land space at a faster rate than expected.

5.9.1 Resource recovery infrastructure

The development of new resource recovery infrastructure will progressively reduce the reliance on landfills. Strategic risks could arise from:

- failure of new infrastructure to be delivered
- failure of processes or technologies to be approved and/or constructed to the timelines of the infrastructure schedule
- lost opportunities if markets cannot be stimulated and supported by demonstrations in technology advances
- lost opportunities through inability of planning and regulatory authorities to provide approval pathways and operating conditions for new technologies
- financial or technical failure of new resource recovery technology.

The mid-term (three to five years) review of the infrastructure schedule and the five-year state infrastructure plan review (which is a legislative requirement) will mitigate these risks. The review will include an assessment of council commitment, availability of alternative waste treatment and EfW technology. The review will assess the procurement and planning approvals processes to gauge the likelihood of delivery of new infrastructure as planned.

GVWRRG will build upon the learnings of the inaugural 2015 market sounding process and undertake early engagement with councils and industry. This will enable us to obtain wider acceptance and awareness of the purpose of market sounding and the need to obtain accurate data (see Action 4).

With respect to biosecurity related risks, GVWRRG will further assess the movement of unpasteurised materials into and within the region. The assessment would include how compost facilities could be used as a tool for dealing with outbreaks of animal or plant diseases.

While the waste and resource recovery framework seeks to limit reliance on landfills, contingency landfill airspace capacity and management of residuals from more advanced processing technologies, will still be a necessity.



Image: Greater Shepparton City Council staff member deconstructing e-waste

5.9.2 Landfill infrastructure

The GV implementation plan is required to sequence the filling of available airspace. The likely closure dates of existing landfills (Table 27 in Section 8.2) are based on void space available for landfill disposal.

Early closure of landfills within and near to the region, during the planning period, along with advances in transport efficiencies, may result in increased patronage and reliance on the Patho and Cosgrove Landfills and consideration of Wollert Landfill in the metropolitan region for the southern councils in the region.

Both the Patho and Cosgrove landfills currently experience inflows from the Loddon Mallee and North East regions. Given the relative wealth of available airspace at these facilities, these flows do not materially impact on airspace availability within the planning period. Patho and Cosgrove landfills will be considered as contingency options in the event neighbouring regions have landfills that close temporarily or prematurely due to regulatory, amenity, safety or political reasons.

There is an increased risk posed by a reliance on fewer, larger landfills. The deactivation of a large landfill site due to an emergency event, remediation works or the inability to gain timely approval for cell development, would result in significant disruption to the residual disposal system.

5.9.3 Emergency events

Emergency events can create an immediate need to safely landfill large quantities of waste.

Occupational health and safety of community, staff and contractors are paramount; natural disasters create many hazards, some of which are unforeseen. The working environment in the aftermath of an emergency event is a dynamic situation and waste management and resource recovery is only one aspect of natural disaster management and recovery.

Depending on the scale of an emergency event, there are multiple landfill sites within the region that can accept most material at EPA's discretion. In most instances this will ensure disposal requirements can be managed at short notice, hence avoiding the environmental and public health impacts that would otherwise be likely to eventuate.

There are operational challenges to providing contingency airspace in case of an emergency event. Sites with readily available airspace scheduled to accept the type of waste produced by an event may not be readily able to receive the waste at short notice. Practicalities of procurement processes and site issues such as traffic management can generally be accommodated to enable a timely solution.

A particular issue however, in the aftermath of fires and severe windstorms, is the management of asbestos waste. Current disposal options are few and those that are available have various restrictions which limit availability to the higher population centres within the region (discussed in Section 5.7.2).

The requirement to observe hygiene requirements for handling and transporting asbestos bearing wastes could slow the management of a clean up effort and could cause significant delays in the demolition and removal of debris.

In Victoria, State Emergency Plans are prepared by the Victoria State Emergency Service. Councils develop MEMPs and have designated municipal recovery managers (MRM).

Efficient waste and resource recovery management is one vital aspect of a successful recovery from a natural disaster. Efficient delivery is underpinned by being part of the overall relief and recovery response. It is vital that waste and resource recovery management forms part of each councils emergency management planning. It is the responsibility of the council waste management officer, in conjunction with the MRM, to ensure this occurs.

Action 5 addresses the need to develop greater coordination and integration of waste and resource recovery contingency planning through establishing a group comprising EPA and regional municipal emergency recovery officer networks. A key task is to further investigate the pre-event preparation for waste and resource recovery in emergencies and the process of decision making during such events. We will continue to work with SV and the other WRRGs, possibly through an annual statewide contingency planning workshop, to address contingency planning.

5.9.4 Goulburn Valley risks and contingencies

As part of developing the implementation plan major risks and mitigation strategies have been identified through:

- A statewide risk and contingency workshop.
- Consultation with councils around risks associated with council owned/operated infrastructure.

Mitigation strategies have only been developed for the 10-year planning period. Risk rankings are based on risks at the time of writing the plan. Risks are likely to change as mitigation strategies are implemented over time and circumstances change. The risk register is shown in Table 19.

Table 19 Goulburn Valley implementation plan risk register

Risk	Level of risk (L,M,H)	Cause(s)	Potential impact	Contingency/mitigation measures/s
Emergency events	H	Natural disasters - flood, fire, chemical spills, and biosecurity challenges.	Increase in waste sent to landfill reduces the landfill airspace for the short term disposal of waste following an event. The utilisation of this airspace can impact on capacity availability in the region beyond the event.	<ul style="list-style-type: none"> • State Emergency Plans, prepared by the Victoria State Emergency Service, could consider potential waste needs and agreed options for management and be informed by statewide annual contingency planning process. • MEMPs should include local responses for waste management and disposal options as they are updated. • Following emergency events, changes to the projected fill rate of utilised landfills should be monitored and inform discussions with operator changes to timing of applications for approvals and annual contingency planning, as relevant.
Infrastructure delivery issues	H	Delays in new or expanded infrastructure becoming available. Delays in planning and/or approvals, construction or non-compliance to regulations.	Delays may increase costs, compromise compliance, reduce recovery rates and damage reputation.	<ul style="list-style-type: none"> • Facility operators commence planning, procuring and construction with adequate time allowances. • Regular (at least annual) monitoring of the progress of infrastructure planning and delivery (including individual landfill cells) to identify potential timing risks to be addressed. • Investigate/establish alternative scenarios within and/or in neighbouring regions.
Market failure	H	Market price fluctuations, products not meeting updated specifications or standards, changes in costs to bring products to market, changes in perception of products, competition and transport costs. Markets may fail to develop as expected.	Short term stockpiling to changes in the acceptance of materials, resulting in disposal to landfill and higher costs. The demand for many products from organic materials is still developing – and there is a risk that products may not meet needs or expectations.	<ul style="list-style-type: none"> • The <i>Victorian Market Development Strategy for Recovered Resources</i> outlines the statewide approach. • Work with industry and state government to develop local markets. • Monitor use of new technologies

Risk	Level of risk (L,M,H)	Cause(s)	Potenital impact	Contingency/Mitigation measures/s
Inadequate social licence to operate	H	Planned or existing facilities are impacted by changing community attitudes and inadequate social licence to operate. This can occur due to encroachment of sensitive uses into buffers.	Reduces capacity to operate, expand or establish. Impacted communities, changes in operations that don't meet regulatory requirements and changes in expectations.	<ul style="list-style-type: none"> Operators undertake effective community engagement at key facilities and in other facilities during periods of change. Adequate buffers appropriately reflected in local planning schemes to maintain required distances and reduce impacts on community.
Adaptiveness of infrastructure and services to climate change	M	Climate change will place additional pressure on the waste and resource recovery system.	Increase in extreme weather events, such as heat waves that may restrict opening hours of facilities, reduce the functionality of facilities or impact on collection systems.	<ul style="list-style-type: none"> Potential impacts on the system to be understood and managed.

5.10 Environmental and financial performance of infrastructure

There are many factors influencing the performance of waste and resource recovery infrastructure. These factors change over time and with infrastructure type, size and location. An analysis was undertaken for Victoria in 2015, which used published reports and communications with industry to identify key factors that influence the environmental and financial performance of infrastructure. This report and other relevant information have been used to inform a regional assessment to assist planning and decision making, shown in Table 20. Action plan actions have been listed where relevant.

Table 20 Environmental and financial performance of infrastructure in the region

Infrastructure category	Environmental and financial performance in the region	Opportunities
RRCs	<p>Councils operate RRCs from a service focus rather than a profit motive.</p> <p>Council RRCs classified as regional hub sites (4 sites) are able to operate on a marginally profitable or cost neutral basis given scale whereas the balance of RRCs classified as local hubs (32 sites) do not recover the cost of operation.</p> <p>Four privately owned RRCs operate in the region.</p> <p>Environmental and social value needs consideration to better inform cost benefit analysis.</p>	<p>Opportunity to support voluntary rationalisation of infrastructure by councils where economies of scale are low, operations are challenging and the cost per tonne of waste managed is rising or high (see Action 12).</p> <p>Support advances in materials handling and logistics to unlock transport efficiencies (see Actions 6 and 7).</p>

Infrastructure category	Environmental and financial performance in the region	Opportunities
RRCs	<p>Recycling markets are cyclical and financial returns on recyclables can fluctuate significantly.</p> <p>End markets for recyclables are not as strong in regional centres compared to larger centres such as Melbourne.</p> <p>Where recyclables need to be transported large distances for their end use the cost of handling and transport can be greater than the market value. It is often cheaper to dispose of recyclable materials to landfill than to transport to recycle or reuse so collection systems may not be established.</p>	
MRF	<p>The MRF generally has relatively stable demand and pricing for commodities and mature markets.</p> <p>Products from greater than 150 km radius likely to require bulk haulage solution.</p>	Opportunity to increase recovery.
In-vessel processing of organics	<p>Higher levels of process control afford many advantages for batch traceability and monitoring, leading to enhanced compliance and track record and reputational advantage.</p> <p>Being licensed to take commercial and household food affords a market advantage given the lack of options to undertake this processing.</p> <p>Able to accept more volatile materials and is fully appropriate for disposing of abattoir waste or other high risk materials. These higher risk materials attract a premium for disposal which can fund the increased operating costs.</p> <p>Financial performance is undermined by a lack of certainty and direction in the regulation of lower technology solutions.</p> <p>Quality (contamination rate) of delivered materials can increase processing costs.</p>	<p>Pursue greater household organics recovery and work to boost commercial food recovery (see Action 3).</p> <p>Assist EPA to establish greater clarity of direction for organics processing.</p> <p>Investigate the use of in-vessel composting as a tool for dealing with biosecurity outbreaks.</p> <p>Increase the quality and quantity of kerbside organics collected for processing (see Action 3).</p> <p>Ensure regional capacity is available when needed to meet growing regional need (see Action 3).</p>

Infrastructure category	Environmental and financial performance in the region	Opportunities
Open windrow processing of organics	<p>On farm composting at smaller scale occurs mostly without regulation and with varying management techniques.</p> <p>Windrow composting is more likely to suffer from odour and runoff problems.</p> <p>Limitations on amounts of food and other wet organics impact business model, but process remains popular given lower cost of establishment and technology.</p> <p>Larger scale operator experiences difficulty in obtaining approval to expand to intended capacity due to lack of certainty and direction in the regulation.</p> <p>Varying quality of end product means that market opportunities can be limited.</p>	<p>Assist EPA to establish greater clarity of direction for organics processing.</p> <p>Encourage operators to pursue better practice standards and obtain relevant approvals.</p>
Wood/timber processing	<p>Low margin material markets, competing with cheap virgin materials or product imports (sometimes leading to material stockpiling).</p>	<p>Increased capture of up to 7% by weight in domestic and C&I residual stream.</p> <p>Ensure regional capacity is available when needed to meet growing regional need (see Action 2).</p> <p>Potential for alternate end uses such as refuse derived fuels or animal bedding.</p>
Paper/cardboard	<p>Whilst relatively stable in comparison to other commodities, market price fluctuations can result in material stockpiling and/or export.</p> <p>Well-developed collection systems for commercial and kerbside sources.</p> <p>Leakage of paper and cardboard to landfill is lost opportunity.</p>	<p>Increased capture of up to 12% by weight in domestic and C&I residual stream.</p>
Plastics	<p>Costs of processing infrastructure and transport for often low value materials.</p> <p>The region is noteworthy for the depth of its plastics reprocessing sector.</p>	<p>Increased capture of up to 10% by weight in domestic and C&I residual stream going to landfill.</p> <p>Work with reprocessors and councils to identify services and facilities that will enable greater recovery of plastics (see Action 2).</p>
Metals	<p>Market price fluctuations resulting in material stockpiling and/or export.</p>	

Infrastructure category	Environmental and financial performance in the region	Opportunities
Aggregate, masonry and soils	Low margin material markets, competing with cheap virgin materials or product imports (sometimes leading to material stockpiling).	Recycled materials in pavement construction are endorsed by agencies including VicRoads, however are not widely used in many councils. Investigate opportunities to increase reprocessing (see Action 2).
Energy from waste (including pyrolysis, gasification and anaerobic digestion)	Regulatory gaps prolong approval times and costs. Sourcing the large capital necessary for investment in infrastructure and equipment. The ability to attract sufficient material volumes to reach viable economies of scale.	Work to boost commercial food recovery. Maintain communication with market sounding respondents to assess future opportunities (see Action 4). Assess potential to develop small-scale technologies targeted to particular waste streams with high calorific value (see Action 7).
Existing landfills	In 2013 EPA undertook an assessment of the financial and environmental sustainability of rural landfills in Victoria ¹ . Of the five landfills operating within the region, the results of the assessment indicated that: <ul style="list-style-type: none"> • continued operation with the opportunity of expansion of the landfill, is the most appropriate option (1 site) • continued operation of the landfill is the most appropriate option (2 sites) • an alternate option to the current landfill may be appropriate (1 site). Increased compliance costs due to higher landfill design.	Support efforts for accurate and consistent whole-of-life costing of landfilling including provision for landfill assurance. Investigate opportunities to pre-sort materials prior to landfilling (see Action 1). There is an opportunity to strategically review the waste delivery model (e.g. privatise infrastructure) as part of rationalisation of infrastructure (see Action 12).
Closed landfills	These sites can pose risks that are a legacy of being sited and built to the standards that were accepted as good practice at that time, but were less stringent than the standards that have applied since 2010. EPA is responsible for overseeing landfill owners' compliance and has implemented a better practice risk-based regulation model. However, localised risks to the environment and surrounding community amenity can be better managed, particularly at older sites. The Victorian Auditor-General commented on improvements needed to address these risks, which the EPA and councils are currently undertaking ² . Increased compliance cost due to the higher post closure standards.	There is an opportunity to work with landfill duty holders to support greater understanding of the complexity and costs associated with addressing these issues. Also an opportunity to work with the EPA to propose new ways to implement its risk-based approach to better suit the region's needs, and to clarify roles and responsibilities associated with closed landfills (see Action 10). Assist councils to address the recommendations of the Victorian Auditor-General's report.

¹ Rural Landfill Risk Assessment Project Report, URS Australia, in association with Fox-Lane Consulting, June 2013

² Managing Landfills, Victorian Auditor-General's Report, 2014

It is estimated the Goulburn Valley region will experience the following economic benefits as a result of implementing the plan:

- Investment in resource recovery infrastructure of \$20–\$30 million is required over the next 10 years (under business as usual) that would support 175 full time equivalent (FTE) construction jobs.
- Currently the waste and resource recovery sector supports 800 (125 landfill and 675 resource recovery) FTE jobs in the region.
- By 2025 this is expected to increase to 975 (150 landfill and 825 resource recovery) FTE jobs.
- The current value of recovered materials in the region is estimated at \$29 million per annum.
- By 2025 the value of recovered materials in the region is forecast to increase to \$35 million per annum.
- The economic output associated with the waste and resource recovery sector is estimated at \$44 million of which \$34 million is value-added output.

Source: *Goulburn Valley Waste and Resource Recovery Group Economic Analysis*, Essential Economics and Blue Environment, unpublished, 2016

5.10.1 Climate change

The Victorian Government is committed to positioning Victoria as a national and international leader in climate change action and is implementing a range of policy initiatives to deliver on this commitment, including:

- the new *Climate Change Act 2017*, which legislates long-term target of net zero greenhouse gas emissions by 2050. This gives effect to the majority of the commitments set out in the Victorian Government Response to the 2015 Independent Review of the *Climate Change Act 2010*
- Victoria's Climate Change Framework, which sets out our vision for Victoria in 2050 and the steps required across government and key sectors of the economy to commence the transition
- Victoria's Climate Change Adaptation Plan 2017-2020. This plan sets out the priorities for the next four years for the Victorian Government to better understand and manage current impacts, and to prepare for the long-term risks of climate change

- TAKE2, which is Victoria's climate change pledge program for State Government, local government, businesses, community groups, educational institutions and individuals. This provides an opportunity to make a public commitment to reduce emissions and build capacity between now and 2020
- committing to Victorian renewable energy targets of 25% by 2020 and 40% by 2025, supported by a competitive reverse auction scheme.

Asserting climate change action as a core component of public sector business is essential to delivering these climate change policy objectives.

This requires all Victorian Government agencies and portfolio entities to understand the impacts of climate change on their assets and service delivery and contribute to reducing emissions.

The impacts of climate change on Victoria's waste sector are varied and may include issues such as changes in the timing, form and amount of precipitation as well as potential increases in extreme weather events such as bushfires, flood and drought.

These impacts can affect waste infrastructure, remediation and containment strategies as well as local water quality.

WRRGs have a number of opportunities to contribute towards action on climate change including:

- incorporating climate-resilience into the design and management of waste infrastructure
- contributing to TAKE2 by taking measures to reduce emissions from operations and facilities, landfills and reprocessing of materials such as organics
- assisting the development of markets for reprocessed materials such as organics to compost or energy
- reviewing potential risks and current assumptions about remediation and containment methods in light of climate change impacts
- putting in place contingency plans to handle surges in treatment and disposal of waste generated from climate-related events (such as bushfires and floods)
- contributing to improvements in soil quality through the provision of compost
- contributing to Victoria's renewable energy targets through use of EfW technologies
- engagement with the community to increase their understanding of the challenges and opportunities presented by climate change of the waste sector, and how they can help.

5.10.2 Greenhouse gas emissions and waste and resource recovery operations

Greenhouse gas emissions associated with the management of waste and resource recovery occur in different parts of the waste and resource recovery system. A major source is from the breakdown of organic materials causing the generation of methane gas. Cosgrove landfill captures the gas off the landfill to power the generation plant which then feeds power into the electricity grid. The transport of residual waste and materials for recovery and the energy used to process materials also generate emissions.

Image: Sorting plastics for recycling



As discussed, the Victorian Government is currently consulting on its Climate Change Framework, and this will consider waste and resource recovery and emissions, transport emissions and government responsibilities in planning and delivering services.

It is estimated the Goulburn Valley region will experience the following environmental benefits as a result of implementing the plan:

Over the next 10 years existing levels of recovery will result in:

- Greenhouse gas emission reductions (from recycling and reduced landfill emissions) of 161,200-165,800 tonnes CO₂-e/yr.
- Garden and food organics recovery related reduced emissions by 7,000-11,000 tonnes CO₂-e/yr.
- Energy savings of over 2.2 million GJ/year.
- Water savings of over 2.2 GL/year.

In economic terms these environmental benefits will yield per annum savings of:

- \$1.2 million in greenhouse gas emission costs
- \$120 million in energy consumption costs
- \$11 million in water consumption.

These estimated outcomes are linked to Actions 7, 11 and 12.

Source: *Goulburn Valley Waste and Resource Recovery Group Economic Analysis*, Essential Economics and Blue Environment, unpublished, 2016



6 Land use planning and the transport network

6.1 Land use planning

A key function of the *Planning and Environment Act 1987* (Vic) is to minimise the risk of any potential adverse environmental, health and safety impacts. The Act establishes a framework (the *State Planning Policy Framework*) for planning the use, development and protection of land in Victoria to meet the present and long term interests of all Victorians.

All planning schemes in the State of Victoria include reference to waste and resource recovery infrastructure at clause 19.03-5 of the State Planning Policy Framework. This requires planning decision makers to consider (amongst other things) any relevant regional waste management plan when preparing planning scheme amendments and assessing planning permit applications.

Aligning the GV implementation plan with relevant local planning schemes is critical to achieve the objectives of the framework. To facilitate this alignment GVWRRG must:

1. Inform councils

Advise councils in the Goulburn Valley region that the GV implementation plan (and its infrastructure schedule) is the plan referred to in clause 19.03-5 of the planning scheme and that councils should give it due consideration when exercising its planning functions to ensure consistent decision making.

2. Support councils and proponents seeking planning approvals

Work with relevant councils and proponents to facilitate planning approvals, where required, to implement new or expanded infrastructure.

3. Facilitate effective buffers

Work with councils in relation to issues of encroachment of sensitive uses into buffers surrounding existing and new infrastructure.

These activities are consistent with Action 9.

6.1.1 Link with land use planning and waste and resource recovery infrastructure

Planning for waste and resource recovery infrastructure is inherently linked with land use planning. As the population grows we need to secure more housing, essential community infrastructure and services including waste and resource recovery facilities and transport.

A key challenge for land use planning is to balance these competing needs and interests so that we achieve an overall community benefit by developing land in a fair, orderly, economic and sustainable way.

The state infrastructure plan summarises the land use planning challenge as, *“making suitably zoned land available for waste and resource recovery activities for the lifetime of industry investment. This requires planning to ensure there is well located land available with appropriate buffers and other mechanisms in place to protect sites from encroachment by incompatible land uses and the amenity of the surrounding community”*.

Aligning siting requirements with both environmental and land use planning requirements is necessary to ensure the right sites are selected for essential waste and recovery infrastructure.

In order to attract initial investment and to maximise any economic gains arising from this investment, it is critical that a site can remain commercially viable and socially accepted by adjoining communities for its operating life.

Land use planning and environmental approvals, where appropriate, now require ongoing community engagement as part of the conditions of planning permits and licence approvals.

As with other essential services, it is important that sufficient land is available in suitable locations with appropriate approvals for the waste and resource recovery facilities that will be needed in the Goulburn Valley region over the next 10 years. Waste and resource recovery facility owners and operators need to

implement best practices to minimise their offsite impacts.

In June 2016, EPA released the *Assessing planning proposals near landfills – draft guideline* to provide information and advice for planning and responsible authorities to assess planning permit applications and planning scheme amendments that would lead to development near an operating or closed landfill.

The draft guidelines state, “*The Landfill BPEM provides guidance on buffers for operating and closed landfills. EPA requires landfills to comply with the Landfill BPEM, which is an incorporated document under the Landfill WMP. EPA does not regulate sensitive land uses within landfill buffers. It is the planning system that determines all permitted land use and development, including within landfill buffers. Buffers are protected by implementing appropriate planning policies and controls, including through zones and overlays, and making appropriate decisions on individual planning permit applications.*”

6.1.2 Analysis of future needs

GVWRRG will work with council and industry to better integrate waste and resource recovery with land use planning. This will include:

- A process where WRRGs play a role in new and expanded waste and resource recovery infrastructure applications.
- Discussion of site buffers for existing and future facilities with a focus on state and regional hubs of importance.
- Support for industry and councils to identify possible sites for new resource recovery infrastructure.

Achieving the GV implementation plan’s objectives relies on integrating waste and resource recovery infrastructure planning and land use planning. This will require further work between GVWRRG and councils (see Action 9).

6.2 Transport

As noted in the state infrastructure plan, many areas of regional Victoria are reliant on reprocessing facilities in Melbourne under a ‘hubs-and-spokes’ waste network. This involves transporting materials regularly, sometimes over long distances, with subsequent impacts on energy resources (mostly using non-renewable fossil fuels), road networks, health, safety and the environment. Transport of organic waste through Goulburn Valley’s peak agricultural areas also raises potential biosecurity risks for food production. Where feasible, local solutions can reduce the environmental footprint of waste management and recycling, and reduce attendant risks³³.

Transport features of the region include:

- The region is well serviced by a network of highways and major designated roads that include the Hume Freeway, Northern, Midland, Goulburn Valley and Maroondah Highways.

- State and regional hubs exhibit good road access but access to many local hubs is variable.
- The main existing and planned infrastructure in Mitchell Shire has convenient access to the Wallan RRC and the Mitchell Shire landfill via the Hume Freeway.
- There is close proximity to Melbourne, if needed, for the Mitchell Shire in the southern part of the region.
- In the Murrindindi Shire the heavy truck movements over the Black Spur are considerations for access to markets along that route.
- The occurrence of fog in the Murray Valley and mountainous areas in the south of the region have some impact on the safety in kerbside collections.
- Cosgrove landfill is located near the Dookie-Shepparton rail line and presents a potential option for transporting waste, but this is unlikely to be considered within the planning period. Given the projected life of landfilling in the area, this may become an option that is worthy of assessment in the future.
- A number of major upgrades to transport infrastructure are planned or underway across the Goulburn Valley region (e.g. Shepparton Bypass, Kilmore-Wallan Bypass and Echuca Moama Second Bridge Crossing) which will improve efficiency of movement and reduce costs for operators transporting waste and reprocessing materials and could leverage greater investment in the sector³⁴.

Map 7 presents the transport routes for the region.

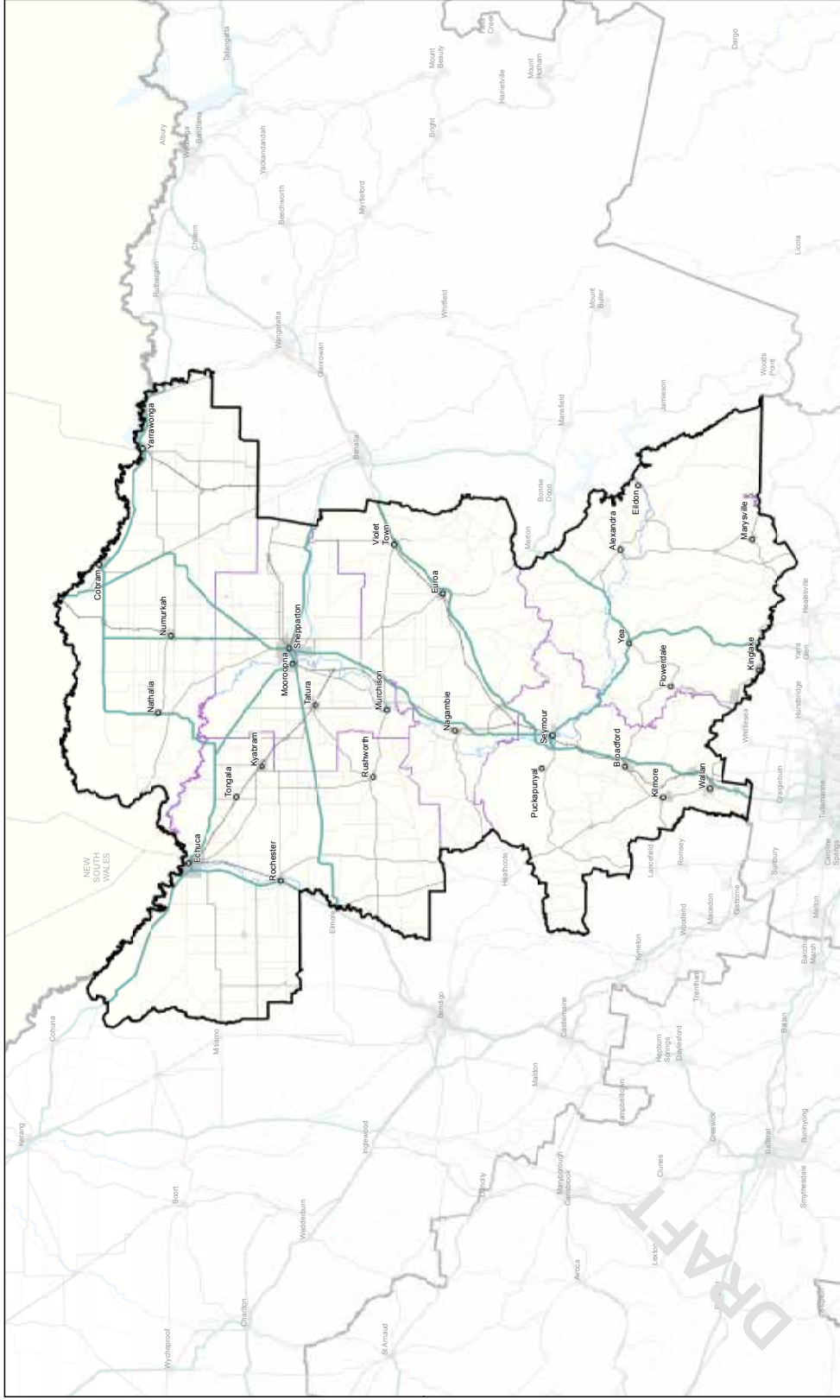
6.2.1 Analysis of future needs

The siting of waste and resource recovery infrastructure in close proximity to end markets provides employment opportunities and can offer opportunities for the co-location of alternative resource recovery facilities with other sectors, such as water and waste infrastructure. Minimising transport distances and costs, which are often a high proportion of overall costs, can increase the viability of a facility and result in financial, greenhouse and other benefits (see Action 7).

³³ Goulburn Valley Infrastructure capacity and needs assessment, Blue Environment, 2015

³⁴ Goulburn Valley Waste and Resource Recovery Group Economic Analysis, Essential Economics and Blue Environment, unpublished, 2016

Map 7 Transport routes in the Goulburn Valley region



Paper Size A3
 0 4.5 9 13 27 36
 Kilometres

LEGEND
 ○ Township
 □ Region Boundary
 □ Major Road
 □ Major Water Area
 □ Township Boundaries

Map Projection: Lambert Conformal Conic
 Horizontal Datum: GDA 1984
 Grid: GDA 1984, VICCRD24

Regional Waste & Resource Recovery Implementation Plan
Goulburn Valley Waste & Resource Recovery Group

Job Number 31-33625
Revision D
Date 24 Feb 2016

Transport Routes

GHD VICTORIA

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Transport impacts from the movement of waste and material streams

Sustainability Victoria with support from the former Victorian Government Department of Transport Planning and Local Infrastructure, analysed congestion impacts from the movement of residual waste, commingled recyclables and garden organics collected via municipal kerbside services to their first destination points. The data was gathered directly from local governments via surveys.

This analysis indicates that the cost to the Victorian economy of increased congestion caused by the movement of these streams is around \$2.5 million annually. This cost takes into consideration the cost to other road users for their lost time while in traffic and the cost of operating vehicles for a longer period of time due to traffic congestion. When viewed in consideration of all other vehicles on the road in Victoria, this constitutes less than 0.2% of the overall congestion costs in Victoria and less than 0.005% of the total distance travelled by freight vehicles in Victoria each year.

This analysis will be used to inform a more comprehensive analysis including developing the methodology to capture additional impacts to congestion and movements of other waste streams besides MSW. At the time of publishing [the statewide infrastructure plan], the data available on movement of wastes was not sufficiently comprehensive or robust to analyse all material streams. Data was available on the movement of materials collected via kerbside services to their first destination point, usually to a transfer station, resource recovery facility or landfill as these movements are managed through local government contracts. However, data on materials collected from the C&I and C&D sectors is limited. These are generally managed through contracts directly between generators and service providers and the data is not available to Sustainability Victoria.

Statewide Waste and Resource Recovery Infrastructure Plan, Section 2.4.2

Image: Sorted plastic for recycling





7 Market sounding for waste and resource recovery infrastructure

GVWRRG, the North East WRRG and Loddon Mallee WRRG, ran a joint resource recovery infrastructure market sounding process. This process engaged private and council waste and resource recovery facility operators to identify new or expanding facilities to meet the region's growing needs. This process also sought to identify any facilities not listed on the infrastructure schedule. The WRRGs sought submissions from facilities that embraced technological advancements, along with those that utilise existing technologies.

The market sounding process was looking for submissions that included information on collection, consolidation, aggregation, sorting, separation, treatment and reprocessing of waste and material streams, and on perceived challenges and constraints to expansion. It aimed to demonstrate the potential for developing good working relationships within the region.

The process utilised broad stakeholder engagement to maximise participation, and to identify previously unknown facilities in the region.

As discussed in Section 5.7.1, the detailed analysis in developing the GV implementation plan indicated that no additional landfills will be required for the region in the next 10 years, and is unlikely for the 30-year outlook of the GV implementation plan.

Therefore GVWRRG was not required to undertake a separate Landfill Application Process.

Market sounding assisted in determining the appropriate infrastructure to manage the region's waste and resource recovery over the next 10 years.

7.1 Relationship between the market sounding process and the infrastructure schedule

The market sounding process directly informed the development of the resource recovery infrastructure component of the schedule.

Any organisation seeking to have its new and/or expanding resource recovery infrastructure included in the schedules of the North East, Goulburn Valley or Loddon Mallee regional implementation plans, were required to make a submission.

It is not a prerequisite for resource recovery infrastructure to be on the infrastructure schedule to be considered for EPA approvals. However, the EPA may refuse to consider an application for a works approval or an application for the issue or amendment of a licence in relation to a waste management facility, if the operations of the facility could be inconsistent with the state infrastructure plan or a relevant regional implementation plan (EP Act s. 50C(1)).

The EP Act also prescribes that a council must perform its waste management functions consistently with the regional implementation plans applying to the council's municipal district (s. 50BH).

7.2 Information provided

The market sounding process provided the identified infrastructure needs and opportunities shown in Table 21, information on current waste and resource recovery data, projected volumes and composition and capacity gaps.

Submissions that passed the assessment process (detailed in section 7.3.1) are listed, subject to agreement by the respondent, in the existing infrastructure schedule or the future resource recovery infrastructure requirements and options.

Table 21 The Goulburn Valley region's needs and opportunities

Needs and opportunities	
Industrial waste	C&I and C&D waste is currently deposited in regional landfills with significant recoverable materials being landfilled. There is potential for sorting, segregation and reprocessing of valuable materials that form part of the mixed waste stream from industrial sources.
Food organics	Food waste is generated from domestic and industrial sources in the region. While some food organics are reprocessed, the amount recovered is expected to significantly increase in the short to medium term. Additional reprocessing capacity for food organics has been identified in the short term.
Garden organics	Garden organics reprocessing is well established in the region but is approaching capacity. Additional reprocessing capacity for garden organics is likely to be needed in the medium term.
Wood and timber	Some timber and wood waste is processed in the region and as such there are opportunities to increase the amount recovered.
Plastics	There are opportunities to increase reprocessing of plastics in the region, particularly plastics sourced from industrial and agricultural sectors.
Aggregates, masonry and soil	There are opportunities to increase processing of concrete, brick and asphalt in the region.
Electronic waste (e-waste)	Considerable volumes of e-waste are generated in the region and future disposal to landfill is likely to be banned under new Victorian Government policy. There is opportunity to establish e-waste processing capacity in the region.
Tyres	Tyre stockpiles have been identified in the region, in addition to the consistent loads currently being generated. An opportunity to establish a tyre reprocessing facility in the region has been identified.
Textiles	The majority of textiles are landfilled in the region. Reprocessing opportunities have been identified in the region to increase diversion efforts.

7.3 Market sounding outcomes

The market sounding process and the development of regional implementation plans that include infrastructure schedules is a first for Victoria. The effort that respondents invested in drafting and submitting their responses is acknowledged.

Forty-five submissions across the three regions were received. However despite broad stakeholder engagement a small number of current, and possible prospective facility owners, did not make a submission. Some businesses noted their concerns about the protection of commercially sensitive information (this provides learnings for reviews and development of future plans) and did not submit. Additional barriers could be attributed to apathy, resourcing/workload issues (especially for small companies), computer literacy issues or the lack of a need to provide a submission. Some organisations that have no intention of expanding or changing service provision, did not make a submission, particularly where the facilities were already listed on the schedule.

Overall there was a strong response to solutions for the Goulburn Valley region's needs and the state infrastructure plan's strategic directions to maximise resource recovery opportunities and reduce waste to landfill. A very positive outcome of the process was the commitment of industry, councils and stakeholders to work together with GVVRRG to plan for and manage the region's future needs.

7.3.1 Evaluation process

Facilities were grouped by:

- new operators
- expanding operators
- current operators not listed in the existing infrastructure schedule.

A strict probity and assessment process was developed for evaluating submissions in line with legislative requirements and guidelines. An expert panel assessed the market sounding submissions against the following criteria:

- ability to meet an identified regional waste and resource recovery opportunity or need
- use of technology that is proven, internationally or locally
- land use planning requirements
- regulatory requirements
- consideration of community concerns and impacts.

7.3.2 Outcomes

Of the 31 submissions received for the Goulburn Valley region, one was non-compliant. Table 22 provides details and outcomes for the 30 compliant submissions received.

Table 22 Number of submissions received and outcomes

Number	Infrastructure type	Outcomes
Goulburn Valley region		
17	Expanded existing infrastructure	<ul style="list-style-type: none"> • Sixteen existing expanded infrastructure will be listed in the Future resource recovery infrastructure requirements and options (Table 26). • Echuca RRC was ineligible to be listed in the schedule as it did not actually include infrastructure expansion (see Table 18 Strategic analysis of hubs).
5	New infrastructure	<ul style="list-style-type: none"> • One submission will be listed on the Existing resource recovery infrastructure (Table 24). • Four submissions will be included in the Future resource recovery infrastructure requirements and options (Table 27) noting that one was in the early stages of planning and the other three, although more advanced, were not adequately advanced to be included in the Infrastructure schedule.
3	Existing facilities	<ul style="list-style-type: none"> • Three submissions included in the Existing resource recovery infrastructure (Table 24).
Goulburn Valley, North East and Loddon Mallee region		
5	New infrastructure	<ul style="list-style-type: none"> • Not included as insufficient information provided due to infancy of the proposals.

7.4 Possible technologies identified for the region

Four submissions proposed technological solutions for specific waste materials that were of interest to the three WRRGs. Only one in the GV region, Waranga Green Energy for anaerobic digestion, has approvals and is included in the infrastructure schedule.

The other three submissions were general in nature without identified sites, and are not listed in the infrastructure schedule. The

three WRRGs remain interested in any ideas that are advanced and address the needs identified by the WRRGs.

GVWRRG will ensure that successive market sounding processes enable evaluation of proposals that exhibit greater reliance on developing technologies. Furthermore we will need to ensure greater integration with councils, major generators, reprocessors and technology providers (see Action 4).



Image: Compost being applied under vines at Monichino's winery near Katunga.



8 Infrastructure schedules

The EP Act requires the GV implementation plan to include a schedule of the existing and required waste and resource recovery infrastructure within the region. This enables strategic planning to identify gaps in the existing infrastructure, meet the strategic objectives for the region and plan for future needs.

GVWRRG has worked with its neighbouring WRRGs, North East and Loddon Mallee, to ensure consistency and alignment with the infrastructure schedules across the state.

To the knowledge of GVWRRG, all relevant existing facilities have been included on this schedule. Please note that inclusion of an existing facility in this schedule should not in any way be construed as a warranty or representation as to the quality, compliance, effectiveness or suitability of the facilities included. While GVWRRG has made every effort to compile this information accurately and completely, the list of facilities included, information and comments in the 'other considerations' section are not exhaustive, and are provided to generally facilitate the achievement of the objectives of the EP Act. Further information about individual facilities should be sought from the EPA or (where appropriate) owners or operators of facilities.

In the case that future resource recovery infrastructure listed on the schedule no longer presents a preferred option for the region, the schedule will be amended.

The schedule is split into parts:

[Part A Resource recovery infrastructure](#)

Part A lists where the resource recovery infrastructure is currently located, the timeframe in which additional infrastructure may be required and the general type, location and other requirements of the new infrastructure.

It will play an important role in planning where land should be made available to expand current resource recovery activities and establish new facilities. Early and appropriate land use planning minimises any impacts of these activities on the environment, public health and amenity of the surrounding community.

[Part B Landfill infrastructure](#)

Part B lists current landfill infrastructure, including the likely date of closure and proposed sequencing of filling.

This schedule is restricted to landfill capacity in the Goulburn Valley region, but its development considered waste flows that may enter the region from other areas of the state.

GVWRRG will work with councils to ensure appropriate buffers are defined, allowing for sound planning decisions to be made for land development in the vicinity of any landfills listed in the schedule.

Figure 10 (page 83) presents the infrastructure scheduling process.

Aligning the schedules with planning schemes

Aligning the GV implementation plan with relevant local planning schemes is critical to achieve the objectives of the framework. As discussed in section 6.1 Land use planning, to facilitate this alignment GVWRRG must:

1. Inform councils

Advise councils in the Goulburn Valley region that the GV implementation plan (and its infrastructure schedule) is the plan referred to in clause 19.03-5 of the planning scheme and that councils should give it due consideration when exercising its planning functions to ensure consistent decision making.

2. Support councils and proponents seeking planning approvals

Work with relevant councils and proponents to facilitate planning approvals, where required, to implement new or expanded infrastructure.

3. Facilitate effective buffers

Work with councils in relation to issues of encroachment of sensitive uses into buffers surrounding existing and new infrastructure.

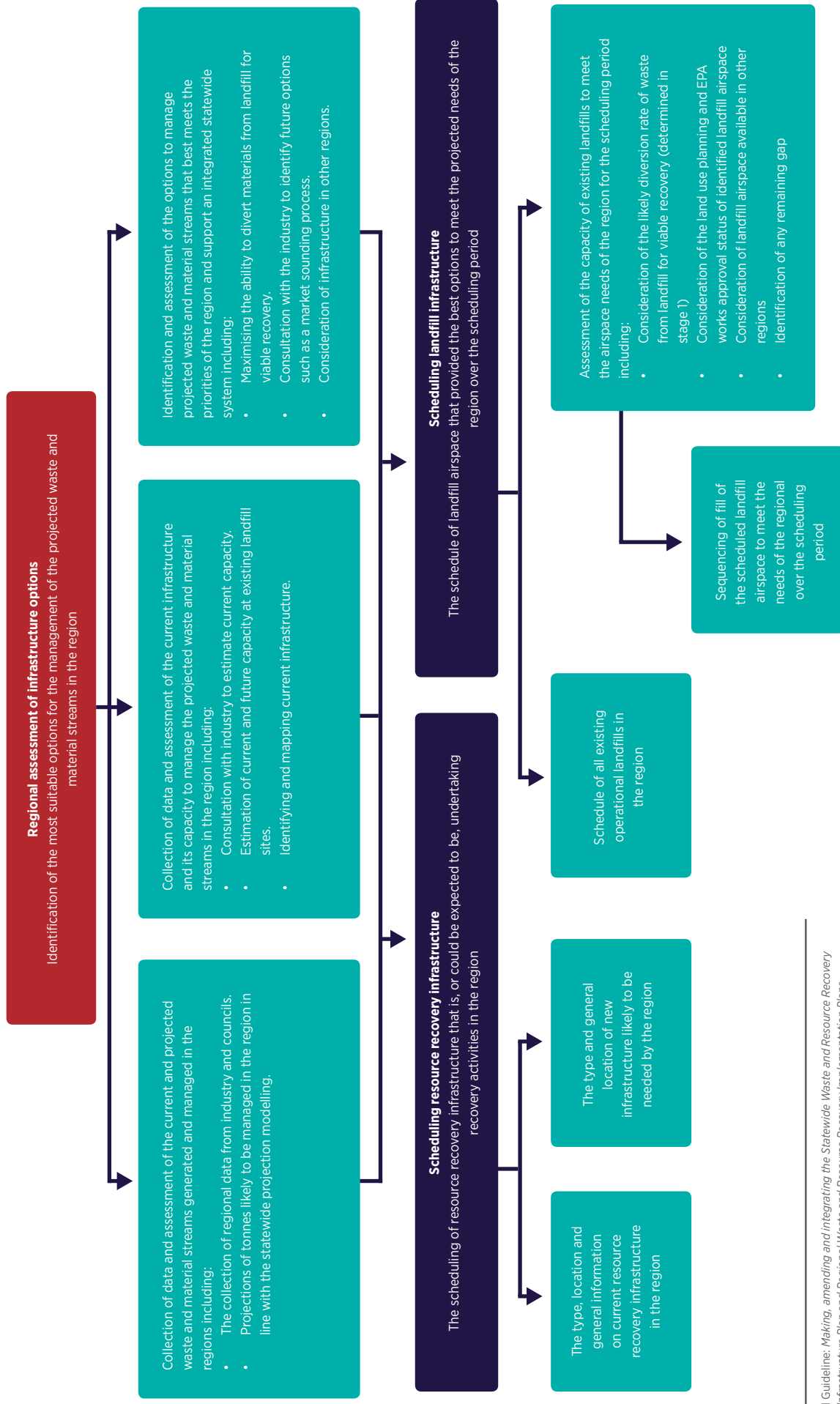
These activities are consistent with Action 9.

To assist with the alignment of the GV implementation plan with the local planning schemes the infrastructure types identified in the plan have been aligned with the Victorian Planning Provision definitions and clauses. This is shown in Table 23.



Image: Family doing the right thing and placing their rubbish in the bin

Figure 10 Infrastructure scheduling process^{1,2}



1 Guideline: Making, amending and Integrating the Statewide Waste and Resource Recovery Infrastructure Plan and Regional Waste and Resource Recovery Implementation Plans
2 Supporting Guideline: Statewide infrastructure scheduling process (SV 2015)

Table 23 Land use planning and waste planning framework infrastructure categorisation

State infrastructure plan and regional implementation plan infrastructure type		Victorian Planning Provision (VPP)	
		Definitions (Clause 74)	Clause 52.10
Reprocessing infrastructure – other reprocessors		Industry – materials recycling Land used to collect, dismantle, treat, process, store, recycle , or sell, used or surplus materials.	Advanced resource recovery technology facility Commercial and industrial materials recycling Construction and demolition materials recycling Used metals treatment or processing Used paper and cardboard treatment or processing Used plastics treatment or processing Other resource recovery or recycling operations Composting and other organics materials recycling
	Reprocessing infrastructure – organics reprocessing facility		
Reprocessing infrastructure – energy from waste facility		Renewable energy facility Land used to generate energy using resources that can be rapidly replaced by an ongoing natural process. Renewable energy resources include the sun, wind, the ocean, water flows, organic matter and the earth's heat. It includes any building or other structure or thing used in or in connection with the generation of energy by a renewable resource. It does not include a renewable energy facility principally used to supply energy for an existing use of the land.	Combustion, treatment or bio-reaction of waste to produce energy
Resource recovery infrastructure – RRC/TS		Industry – transfer station Land use to collect, consolidate, temporarily store, sort or recover refuse or use materials before transfer for disposal or use elsewhere.	Refuse and used material storage, sorting and recovery in a transfer station: <ul style="list-style-type: none"> accepting organic wastes other.
Resource recovery infrastructure – MRF			
Disposal infrastructure – landfill		Industry – refuse disposal Land used to dispose of refuse, by landfill, incineration or other means.	Sanitary and garbage disposal in landfill
Disposal infrastructure – incinerator*			

Notes:

Clause 74 of the VPP lists terms used in relation to the use of land. All waste and resource recovery activities are nested under the headline use of 'Industry'.

Clause 52.10 lists uses with amenity impacts, some of which are relevant to the waste and resource recovery activities.

* Disposal Infrastructure – incinerator: this infrastructure type was not considered in the development of this regional plan or this schedule.

8.1 Part A Resource recovery and consolidation infrastructure

All existing resource recovery infrastructure in the region that is currently operational or has all the appropriate planning and regulatory approvals has been included in the schedule. Infrastructure types in this region are:

- RRCs
- MRFs
- reprocessors.

The Resource Recovery Infrastructure Schedule includes:

- Table 24 Existing resource recovery infrastructure
- Table 25 Indication of potential need for new infrastructure capacity
- Table 26 Current need for new infrastructure capacity
- Table 27 Future resource recovery infrastructure requirements and options.

Abbreviations used in these tables:

- MSW – municipal solid waste
- SIW – solid industrial waste
- TBA – to be announced.

Council abbreviations in the Goulburn Valley region used in the tables

Council	Abbreviation used in tables
Campaspe Shire Council	Campaspe (S)
Greater Shepparton City Council	Greater Shepparton (C)
Mitchell Shire Council	Mitchell (S)
Moira Shire Council	Moira (S)
Murrindindi Shire Council	Murrindindi (S)
Strathbogie Shire Council	Strathbogie (S)

8.1.1 Existing resource recovery infrastructure

Table 24 Existing resource recovery infrastructure

Site name	Facility owner	GIS location	Address	Local government area	Materials accepted*	Other considerations
Resource recovery RRC/TS, stand alone						
Alexandra Resource Recovery Centre	Murrindindi (S)	145 43°18.53E 37 12'30.36S	Mt Pleasant Rd Alexandra	Murrindindi (S)	<ul style="list-style-type: none"> • household recyclables and residual waste • household and commercial garden and food organics • construction and demolition aggregates, masonry and soils • commercial paper and cardboard • household and commercial waste timber • <i>drumMUSTER</i> collection point 	Upgrades to increase recovery

Site name	Facility owner	GIS location	Address	Local government area	Materials accepted*	Other considerations
Ardmona Resource Recovery Centre	Greater Shepparton (C)	145 18'46.02E 36 24'13.12S	770 Turnbull Road Ardmona	Greater Shepparton (C)	<ul style="list-style-type: none"> household recyclables and residual waste construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber <i>drumMUSTER</i> collection point 	
Avenel Resource Recovery Centre	Strathbogie (S)	145 14'30.62E 36 52'44.19S	145 Monea Rd Avenel	Strathbogie (S)	<ul style="list-style-type: none"> household recyclables and residual waste commercial paper and cardboard household and commercial waste timber 	Upgrades to increase recovery
Barmah Resource Recovery Centre	Moira (S)	144 57'48.85E 36 00'24.59S	Cnr Moira Lakes Rd and Racecourse Rd Barmah	Moira (S)	<ul style="list-style-type: none"> household recyclables and residual waste commercial paper and cardboard household and commercial waste timber 	
Broadford Resource Recovery Centre	Mitchell (S)	145 04'26.19E 37 13'21.91S	Mia Mia Rd Broadford	Mitchell (S)	<ul style="list-style-type: none"> household recyclables and residual waste construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber 	Relocation of existing site
Colbinabbin Resource Recovery Centre	Campaspe (S)	144 48'03.66E 36 35'48.71S	Cemetery Rd Colbinabbin	Campaspe (S)	<ul style="list-style-type: none"> household recyclables and residual waste construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber 	
Echuca Resource Recovery Centre	Campaspe (S)	144 46'23.03E 36 11'37.50S	510 McKenzie Rd Echuca	Campaspe (S)	<ul style="list-style-type: none"> household recyclables and residual waste construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber <i>drumMUSTER</i> collection point 	Upgrades to improve environmental performance
Eildon Resource Recovery Centre	Murrindindi (S)	145 55'53.26E 37 14'03.67S	100 Jerusalem Creek Rd Eildon	Murrindindi (S)	<ul style="list-style-type: none"> household recyclables and residual waste household and commercial garden and food organics construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber 	Upgrades to increase recovery

Site name	Facility owner	GIS location	Address	Local government area	Materials accepted*	Other considerations
Euroa Resource Recovery Centre	Strathbogie (S)	145 33'04.34E 36 45'40.86S	46 Euroa Tip Rd Euroa	Strathbogie (S)	<ul style="list-style-type: none"> household recyclables and residual waste commercial paper and cardboard household and commercial waste timber <i>drumMUSTER</i> collection point 	Upgrades to increase recovery
Graytown Resource Recovery Centre	Strathbogie (S)	144 55'52.23E 36 50'14.37S	1487 Costerfield Road Graytown	Strathbogie (S)	<ul style="list-style-type: none"> household recyclables and residual waste household kerbside recyclables 	
Gunbower Resource Recovery Centre	Campaspe (S)	144 22'37.60E 35 57'38.52S	Murray Valley Hwy Gunbower	Campaspe (S)	<ul style="list-style-type: none"> household recyclables and residual waste construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber 	
Kinglake Resource Recovery Centre	Murrindindi (S)	145 16'29.80E 37 27'39.54S	205 Watsons Rd Kinglake West	Murrindindi (S)	<ul style="list-style-type: none"> household recyclables and residual waste household and commercial garden and food organics construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber <i>drumMUSTER</i> collection point 	Upgrades to increase recovery
Lockington Resource Recovery Centre	Campaspe (S)	144 30'23.86E 36 20'7.65S	Cnr Keane Rd and O'Donnell Rd Lockington	Campaspe (S)	<ul style="list-style-type: none"> household recyclables and residual waste construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber 	
Longwood Resource Recovery Centre	Strathbogie (S)	145 25'02.78E 36 48'07.76S	85 Maxfield St Longwood	Strathbogie (S)	<ul style="list-style-type: none"> household recyclables and residual waste household kerbside recyclables 	
Marysville Resource Recovery Centre	Murrindindi (S)	145 44'20.97E 37 30'25.71S	Sunds Mill Crt Marysville	Murrindindi (S)	<ul style="list-style-type: none"> household recyclables and residual waste household and commercial garden and food organics construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber 	Upgrades to increase recovery

Site name	Facility owner	GIS location	Address	Local government area	Materials accepted*	Other considerations
Mt Scobie Resource Recovery Centre (also known as Kyabram)	Campaspe (S)	144 58'51.81E 36 18'44.67S	Cnr Curr Rd and Everard Rd Kyabram	Campaspe (S)	<ul style="list-style-type: none"> household recyclables and residual waste construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber <i>drumMUSTER</i> collection point 	
Murchison Resource Recovery Centre	Greater Shepparton (C)	145 11'31.19E 36 37'24.25S	15 Cassidy Rd Murchison	Greater Shepparton (C)	<ul style="list-style-type: none"> household recyclables and residual waste commercial paper and cardboard household and commercial waste timber <i>drumMUSTER</i> collection point 	
Nagambie Resource Recovery Centre	Strathbogie (S)	145 11'42.87E 36 47'41.95S	McDonald's Rd Nagambie	Strathbogie (S)	<ul style="list-style-type: none"> household recyclables and residual waste commercial paper and cardboard household and commercial waste timber <i>drumMUSTER</i> collection point 	Upgrades to increase recovery
Nathalia Resource Recovery Centre	Moira (S)	145 11'10.01E 36 04'52.97S	Cnr Barmah-Shepparton Rd and Balls Rd Nathalia	Moira (S)	<ul style="list-style-type: none"> household recyclables and residual waste commercial paper and cardboard household and commercial waste timber <i>drumMUSTER</i> collection point 	Upgrades to increase recovery
Numurkah Resource Recovery Centre	Moira (S)	145 29'29.38E 36 03'52.95S	Naring Rd Numurkah	Moira (S)	<ul style="list-style-type: none"> household recyclables and residual waste commercial paper and cardboard household and commercial waste timber <i>drumMUSTER</i> collection point 	Upgrades to increase recovery
Pyalong Resource Recovery Centre	Mitchell (S)	144 51'53.17E 37 06'51.68S	Ladderhill Rd Pyalong	Mitchell (S)	<ul style="list-style-type: none"> household recyclables and residual waste commercial paper and cardboard household and commercial waste timber <i>drumMUSTER</i> collection point 	
Rochester Resource Recovery Centre	Campaspe (S)	144 42'36.93E 36 21'04.92S	139 High St Rochester	Campaspe (S)	<ul style="list-style-type: none"> household recyclables and residual waste construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber <i>drumMUSTER</i> collection point 	

Site name	Facility owner	GIS location	Address	Local government area	Materials accepted*	Other considerations
Ruffy Resource Recovery Centre	Strathbogie (S)	145 28'36.52E 36 56'22.23S	Redgate Lane/ Longwood Ruffy Rd Ruffy	Strathbogie (S)	<ul style="list-style-type: none"> household recyclables and residual waste household kerbside recyclables 	
Rushworth Resource Recovery Centre	Campaspe (S)	145 00'01.07E 36 36'2.44S	Nine Mile Rd Rushworth	Campaspe (S)	<ul style="list-style-type: none"> household recyclables and residual waste construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber 	
Seymour Resource Recovery Centre	Mitchell (S)	145 09'14.62E 37 03'07.64S	Hume and Hovel Rd Seymour	Mitchell (S)	<ul style="list-style-type: none"> household recyclables and residual waste construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber <i>drumMUSTER</i> collection point 	Relocation of existing site
Shepparton Resource Recovery Centre	Greater Shepparton (C)	145 23'18.04E 36 20'57.70S	125 Wanganui Rd Shepparton	Greater Shepparton (C)	<ul style="list-style-type: none"> household recyclables and residual waste construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber household chemical collection permanent drop off site <i>drumMUSTER</i> collection point 	Upgrades to increase recovery
St James Resource Recovery Centre	Moira (S)	145 52'30.67E 36 16'39.09S	Kelly's Rd St James	Moira (S)	<ul style="list-style-type: none"> household recyclables and residual waste commercial paper and cardboard household and commercial waste timber 	
Strathmerton Resource Recovery Centre	Moira (S)	145 31'20.80E 35 55'28.94S	Murray Valley Hwy Strathmerton	Moira (S)	<ul style="list-style-type: none"> household recyclables and residual waste commercial paper and cardboard household and commercial waste timber 	
Tooleen Resource Recovery Centre	Campaspe (S)	144 41'06.52E 36 43'18.64S	Cornella Tooleen Rd Tooleen	Campaspe (S)	<ul style="list-style-type: none"> household recyclables and residual waste construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber 	
Tungamah Resource Recovery Centre	Moira (S)	145 52'57.14E 36 08'55.66S	Tungamah Rd Tungamah	Moira (S)	<ul style="list-style-type: none"> household recyclables and residual waste commercial paper and cardboard household and commercial waste timber 	

Site name	Facility owner	GIS location	Address	Local government area	Materials accepted*	Other considerations
Violet Town Resource Recovery Centre	Strathbogie (S)	145 41'56.21E 36 38'54.96S	190 McDiarmids Rd Violet Town	Strathbogie (S)	<ul style="list-style-type: none"> household recyclables and residual waste commercial paper and cardboard household and commercial waste timber <i>drumMUSTER</i> collection point 	
Wallan Resource Recovery Centre	Mitchell (S)	144 59'58.05E 37 25'0.34S	4-5 Freeway Drive Wallan	Mitchell (S)	<ul style="list-style-type: none"> household recyclables and residual waste construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber <i>drumMUSTER</i> collection point 	Expansion to increase recovery
Yabba Resource Recovery Centre	Moira (S)	145 38'59.79E 36 14'39.85S	Yabba South Rd Yabba	Moira (S)	<ul style="list-style-type: none"> household recyclables and residual waste commercial paper and cardboard household and commercial waste timber 	
Yarrowonga Resource Recovery Centre	Moira (S)	146 00'08.64E 36 02'20.02S	Channel Rd Yarrowonga	Moira (S)	<ul style="list-style-type: none"> household recyclables and residual waste construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber <i>drumMUSTER</i> collection point 	Upgrades to increase recovery
Yea Resource Recovery Centre	Murrindindi (S)	145 22'27.00E 37 09'30.0S	617 Ghin Ghin Rd Yea	Murrindindi (S)	<ul style="list-style-type: none"> household recyclables and residual waste household and commercial garden and food organics construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber <i>drumMUSTER</i> collection point 	Upgrades to increase recovery
Foott Waste and Recycling	Foott Waste and Recycling	145 26'7.10E 36 23'16.46S	10 Carroll Rd Shepparton	Greater Shepparton (C)	Paper and cardboard, plasterboard/cement sheeting and plastics	
Future Metals	Future Metals	145 25'48.56E 36 22'38.32S	121-135 Old Dookie Road Shepparton	Greater Shepparton (C)	Metals	
Transpacific Industries	Transpacific Waste Management Pty Ltd	145 25'26.82E 36 22'07.31S	73 Old Dookie Road Shepparton	Greater Shepparton (C)	Paper, cardboard and plastic	

Site name	Facility owner	GIS location	Address	Local government area	Materials accepted*	Other considerations
Wheelie Waste	Wheelie Waste	145 27'38.99E 36 21'50.333S	415 New Dookie Road Lemnos	Greater Shepparton (C)	Household kerbside recyclables and residual waste Commercial recyclables and residual waste	
Resource recovery RRC/TS, co-located at landfill						
Cobram Resource Recovery Centre	Moira (S)	145 41'59.45E 35 57'10.60S	Pye Rd Cobram	Moira (S)	<ul style="list-style-type: none"> household recyclables and residual waste construction and demolition aggregates, masonry and soils commercial paper and cardboard household and commercial waste timber <i>drumMUSTER</i> collection point 	Upgrades to increase recovery
Resource recovery MRF						
Eilwaste MRF	Elliott Holdings (Aust) Pty Ltd	144 45'44.02E 36 08'51.17S	11 Reliance Crt Echuca	Campaspe (S)	Commingled recyclables	
Reprocessor organics, food						
Environmentally Stable	Environmentally Stable	145 08'1.16E 36 22'17.55S	113 Morrissey Street Merrigum	Greater Shepparton (C)	Organics – food waste	Relocation of existing site
Resource Resolution	Resource Resolution	144 55'28.42E 36 30'15.19S	15 Curr Road Girgarre	Campaspe (S)	Organics – food waste	
Reprocessor organics, garden						
Biomix	Biomix	144 55'28.42E 36 30'15.19S	980 Two Tree Road Stanhope	Campaspe (S)	Organics – garden, other, food waste, straw, biosolids and manure	Upgrades to increase recovery
Blow it Mulch and Mega Mulch	Aztec Industries Pty Ltd	145 36'47.79E 37 07'33.25S	6309 Maroondah Hwy Yark	Murrindindi (S)	Organics – garden and timber	
Reprocessor organics, organics						
Carl Brown	Carl Brown	144 46'25.63E 36 32'41.57S	3196 Heathcote Rochester Rd Colbinabbin	Campaspe (S)	Organics – manure	

Site name	Facility owner	GIS location	Address	Local government area	Materials accepted*	Other considerations
Costa Mushrooms	Costa Mushrooms	145 15'10.62E 36 47'30.40S	347 Zanelli Road Nagambie	Strathbogie (S)	Organics	
Enviro 2100	Enviro 2100	145 29'52.94E 36 45'3.34S	578 Drysdale Road Euroa	Strathbogie (S)	Organics – garden, other, biosolids, food waste and dead animals	
Gardners Ag Services	Supreme Soils	145 34'41.96E 36 14'22.01S	800 Katandra Main Road Katandra	Greater Shepparton (C)	Organics – manure and straw	
Humus Composting	Wadref Humified Compost Pty Ltd	145 37'13.10E 36 41'57.28S	Lot 2 Lomers Rd Euroa	Strathbogie (S)	Organics – manure	
Western Composting Technology	Western Composting Technology Pty Ltd	145 22'36.83E 36 19'31.22S	165 Daldy Rd Shepparton	Greater Shepparton (C)	Organics – garden and food waste	
Reprocessor organics, wood/timber						
Eco Logs	Eco Logs	145 10'14.17E 37 03'9.85S	13-15 Darcy St Seymour	Mitchell (S)	Organics – sawdust	
Goulburn River Trout	Goulburn River Trout	145 46'17.84E 37 14'11.83S	1680 Goulburn Valley Highway Alexandra	Murrindindi (S)	Organics – timber	
Seymour Shavings and Sawdust Supplies	Seymour Shavings and Sawdust Supplies	145 09'25.10E 37 01'30.40S	135 Delatite Rd Seymour	Mitchell (S)	Organics – timber, other, manure	
Reprocessor organics, other						
Pental Soaps	Pental Soaps	145 25'23.58E 36 22'9.54S	48 Drummond Road Shepparton	Greater Shepparton (C)	Organics – other	

Site name	Facility owner	GIS location	Address	Local government area	Materials accepted*	Other considerations
Reprocessor plastics						
Elite Manufacturing	Elite Manufacturing	145 27°57.14E 36 23°14.77S	35 Swainston Road Shepparton East	Greater Shepparton (C)	Plastics	
Plastic Forests Pty Ltd	Plastic Forests Pty Ltd	145 29°51.73E 35 55°29.14S	4990 Murray Valley Highway Strathmerton	Moira (S)	Plastics – LDPE, HDPE and polypropylene	
RPM Pipe	Recycled Plastic Pipe Manufacturers	145 05°48.21E 36 18°49.73S	280 Kyabram Road Lancaster	Greater Shepparton (C)	Plastics – HDPE and polypropylene	
Reprocessor aggregates, masonry and soil						
Beveridge Scoria	Beveridge Scoria	144 58°38.71E 37 28°3.78S	61 Minton Street Beveridge	Mitchell (S)	Aggregates, masonry and soil and metal	
Brendan O'Keefe Demolition and Recycling	Brendan O'Keefe demolition and recycling	145 25°51.27E 36 22°38.20S	Corner Doyles and Old Dookie Road Shepparton	Greater Shepparton (C)	Aggregates, masonry and soil, plastic, organics – timber and metal	
Crowbar Demolitions	Keith McCrae	145 25°38.85E 36 20°35.82S	225 Grahamvale Rd Shepparton	Greater Shepparton (C)	Concrete, bricks, organics – timber and metal	
Reprocessor other						
Aussie Drum Furniture	Aussie Drum Furniture	145 12°52.48E 36 21°26.19S	730 Manley Road Gillieston	Greater Shepparton (C)	Ferrous steel, plastic – HDPE and organics – timber	
Energy from waste, anaerobic digester						
Waranga Green Energy	Waranga Green Energy Pty Ltd	145 0°25.47E 36 28°16.27S	223 Hill Road Stanhope	Campaspe (S)	C&I organics	New infrastructure 2017

8.1.2 Future resource recovery infrastructure needs

Table 25 indicates the potential need for new infrastructure capacity based on business as usual modelling³⁵ of infrastructure capacity and needs. It indicates a future infrastructure need for only two material streams, with only food and garden organics in 2018-19 within the 10-year planning period of the plan. It is very difficult to determine the potential need for new infrastructure given competition for feedstock and the impact of regulatory limitations placed upon establishment or expansion of facilities.

One existing garden and food organics reprocessing facility operator indicated in the market sounding process they are considering expansion options which would help meet the region's need.

Table 25 Indication of potential need for new infrastructure capacity

Facility type	Year current installed capacity could potentially be exceeded						
	2016-17	2017-18	2018-19	2019-20	2020-30	2030-40	2040-45
Reprocessing organics food and garden							
Reprocessing organics wood/timber and other							

The market sounding highlighted that reprocessing infrastructure for industrial waste, e-waste, tyres and textiles does not currently exist in the region and that there is an existing need to establish new infrastructure capacity as shown in Table 26.

Table 26 Current need for new infrastructure capacity

Facility type	Current need for new infrastructure capacity						
	2016-20	2021-25	2026-30	2031-35	2036-40	2041-45	
Reprocessing Industrial waste							
e-waste							
Tyres							
Textiles							

³⁵ Goulburn Valley infrastructure capacity and needs assessment, Blue Environment, 2015

Table 27 lists the proposed infrastructure plans identified in the market sounding process to expand existing facilities and build new facilities that would deliver additional reprocessing capacity in the region.

Table 27 Future resource recovery infrastructure requirements and options

Who	Infrastructure type	Category	General location	Material streams to be managed	Likely start date	Reason for need	Other requirements
Existing facility with changed or expanding infrastructure							
Campaspe (S)	RRC/TS, stand alone	MSW	Echuca		2017	Improve environmental performance and reduce environmental risks to the community	
Greater Shepparton (C)	RRC/TS, stand alone	MSW SIW	Shepparton	Concrete, brick, bitumen and organics	2017	Significant site upgrade to enable higher recovery rates	Additional permits are required but have not been obtained
Mitchell (S)	RRC/TS, stand alone	MSW SIW	Wallan East	Commingled recyclables, metal, e-waste, plastics, waste oil, batteries, mattresses and tyres	TBA	To cater for increased demand from residential growth	Expansion
Moira (S)	RRC/TS, stand alone	MSW SIW	Nathalia	Plastics, timber, concrete, metals, commingled recyclables and organics	TBA	Maximising resource recovery	
Moira (S)	RRC/TS, stand alone	MSW SIW	Numurkah	Plastics, timber, concrete, metals, commingled recyclables and organics	TBA	Maximising resource recovery	
Moira (S)	RRC/TS, stand alone	MSW SIW	Yarrawonga	Plastics, timber, concrete, metals, commingled recyclables and organics	TBA	Maximising resource recovery	
Murrindindi (S)	RRC/TS, stand alone	MSW SIW	Marysville	Metals, plastics, e-waste and batteries	2019	Site upgrade to better meet the needs of the community	Additional permits are required but have not been obtained
Murrindindi (S)	RRC/TS, stand alone	MSW SIW	Alexandra	Metals, plastics, e-waste, organics, aggregates masonry, soil and batteries	2018	Maximising resource recovery	Additional permits are required but have not been obtained
Murrindindi (S)	RRC/TS, stand alone	MSW SIW	Kinglake	Metals, plastics, e-waste, organics, aggregates masonry, soil and batteries	2020	Site upgrade to better meet the needs of the community	Additional permits are required but have not been obtained

Who	Infrastructure type	Category	General location	Material streams to be managed	Likely start date	Reason for need	Other requirements
Existing facility with changed or expanding infrastructure							
Murrumbidgee (S)	RRC/TS, stand alone	MSW	Yea	Metals, plastics, e-waste, organics, aggregates masonry, soil and batteries	2019	Site upgrade to better meet the needs of the community	Additional permits are required but have not been obtained
Murrumbidgee (S)	RRC/TS, stand alone	MSW SIW	Eildon	Metals, plastics, e-waste, organics, aggregates masonry, soil and batteries	2019	Site upgrade to better meet the needs of the community	Additional permits are required but have not been obtained
Strathbogie (S)	RRC/TS, stand alone	MSW SIW	Euroa	E-waste and mattresses	TBA	Site upgrade to better meet the needs of the community	Additional permits are required but have not been obtained
Strathbogie (S)	RRC/TS, stand alone	MSW SIW	Nagambie	E-waste and mattresses	TBA	Site upgrade to better meet the needs of the community	Additional permits are required but have not been obtained
Strathbogie (S)	RRC/TS, stand alone	MSW SIW	Avenel	E-waste, mattresses and waste oil	TBA	Site upgrade to better meet the needs of the community	Additional permits are required but have not been obtained
Moira (S)	RRC/TS, co-located	MSW SIW	Cobram	Plastics, timber, concrete, metals, commingled recyclables and organics	TBA	Maximising resource recovery	
Biomix	Reprocessor organics, garden	MSW SIW	Stanhope	Garden waste and food organics	2016	To accommodate planned inflows from municipal and commercial contracts	
New infrastructure							
Greater Shepparton (C)	RRC, co-located at landfill	MSW SIW	Cosgrove	Building and construction, concrete, timber and organics, industrial waste	2017	Establishment of infrastructure to pre-sort selected loads prior to landfill	Additional permits are required but have not yet been obtained
Mitchell (S)	RRC/TS, stand alone	MSW SIW	Broadford	Commingled recyclables, metal, e-waste, plastics, waste oil, batteries, mattresses and tyres	>2021	Access and limitations of existing site restricts its ability to meet community expectations and growth	Relocation of existing site Additional permits are required but have not yet been obtained
Mitchell (S)	RRC/TS, co-located	MSW SIW	Seymour	Commingled recyclables, metal, e-waste, plastics, waste oil, batteries, mattresses and tyres	2017	Necessary due to imminent rehabilitation of former Seymour landfill at current site	Relocation of existing site Additional permits are required but have not yet been obtained
Mitchell (S)	Reprocessor organics, garden	MSW SIW	Mitchell Shire – southern	Garden waste and food organics	2018	Processing solution for planned kerbside collection	Site yet to be secured Additional permits are required but have not yet been obtained

Note: It is expected that all infrastructure technologies considered in this schedule will not be inconsistent with those detailed in the state infrastructure plan.

8.2 Part B Landfill infrastructure schedule

Part B of the Schedule is restricted to landfill infrastructure and includes:

- operating licensed landfills
- landfills that have closed in the last 30 years.

The purpose of this schedule is to identify options for future landfill capacity in the region.

The EP Act requires the waste and resource recovery portfolio to minimise the development and use of landfills, while providing sufficient landfill airspace need for the disposal of residual waste. The purpose of scheduling landfill infrastructure is to:

- Ensure that each region has an adequate amount of landfill capacity, to ensure the safe and sanitary disposal of wastes that are not recovered, for at least the next 10 years.
- Minimise the development and use of landfills for the management of waste in Victoria as per section 9(3) of the Landfills WMP.
- Propose the sequence for the filling of available landfill sites for at least the next 10 years.
- Provide estimations of the intended or likely closure date for the landfills that are listed in the schedule.
- Report on the rehabilitation status for closed landfills within the Goulburn Valley region that have been closed in the last 30 years to drive effective rehabilitation and to ensure that the public are informed of landfills that require more active management.
- Ensure that future landfill capacity needs are planned for to enable appropriate buffers to be known and defined, allowing for sound planning decisions to be made for land development in the vicinity of any new landfills that are listed in the schedule.

Unlike resource recovery infrastructure, if a proposed landfill operator is to obtain approval from the EPA to commence works, its site must be listed on the relevant regional implementation plan infrastructure schedule otherwise approval cannot be granted from the EPA. However, there is no identified need for new landfill infrastructure in the Goulburn

Valley region for at least the next ten years.

If a landfill site, prior to being issued a works approval, planning permit and licence, is found, through the infrastructure scheduling process (Part B) to no longer be the most suitable option to service the needs identified by GVVRRG, then it can be removed from the schedule and suitable alternatives scheduled if new infrastructure is still required. This review will be undertaken as part of the mid term review (three to five years) of this plan.

The Landfill Infrastructure Schedule includes:

- Table 28 Existing landfills
- Table 29 Proposed sequence of the filling of available landfill sites
- Table 30 Rehabilitation status of closed landfills.

8.2.1 Existing landfills

Table 28 lists the existing landfills and details.

Table 28 Existing landfills

Landfill name	EPA licence number	Location LGA	GIS coordinates	Facility owner	Waste types able to be accepted under current licence	Likely closure date	Additional considerations
Alexandra Landfill	12039	Mt Pleasant Rd Alexandra, Murrindindi (S)	145 43'18.62E 37 12'40.57S	Murrindindi Shire Council	asbestos (domestic) putrescible solid inert waste tyres (shredded)	2040	Previous licence ES31673
Cobram Landfill	15500	Pye Rd Cobram, Moira (S)	145 42'3.51E 35 57'6.40S	Moira Shire Council	putrescible solid inert waste tyres (shredded)	>2045	Previous licence ES69514 Co-located with Cobram RRC
Cosgrove Landfill	12099	Cnr Quarry Rd & Cosgrove-Lemnos Rd Cosgrove, Greater Shepparton (C)	145 35'52.14E 36 20'48.11S	Greater Shepparton City Council	asbestos (domestic) putrescible solid inert waste tyres (shredded) contaminated soil (Cat C) foundry sands containing PIW	>2045	Previous licence ES35898
Mitchell Landfill	74231	Seymour-Tooborac Rd Hilldene, Mitchell (S)	145 04'45.07E 37 01'09.42S	Mitchell Shire Council	putrescible solid inert waste tyres (shredded)	2030	Previous licence ES58410
Patho Landfill	11908	Davis Rd Patho, Campaspe (S)	144 26'27.53E 36 02'17.93S	Elliott Holdings Pty Ltd	putrescible solid inert waste tyres (shredded), asbestos (all forms)	>2045	Previous licence ES24721

Notes:

*Likely closure dates reflect the year in which the site is likely to cease receiving waste. They are estimated based on modelled tonnage projections and airspace available and may include potential void space at quarry-based landfill sites as identified by owners and operators. These timeframes will depend on commercial decisions of site operators and the site achieving the appropriate approvals. A listing in this table does not indicate that all available space will be sequenced or approved.

#Landfills exempt from licensing are landfills operated by a council, serve less than 5,000 people but more than 500 people, which are the exemption categories specified in the Environment Protection (Scheduled Premises and Exemptions) Regulations 2007 (Vic). They can accept a range of wastes including putrescible and solid inert as per the *Waste Management Policy (Siting, Design and Management of Landfills) 2004* and the EP Act. There are no landfills exempt from licensing in the region.

- Landfills included in the above table are existing operational facilities in the region at the time of publication.
- Licensed sites can only accept wastes listed as per current EPA licence.

- For the avoidance of doubt, private landfills which are privately owned and will only receive wastes that consist of substances owned by the owner of the site (before the substances became wastes) referred to in section 50C(3) of the EP Act are not included in the above table. Any need for a works approval for these sites will be assessed by the EPA without reference to this implementation plan, in accordance with section 50C(3) of the EP Act.

8.2.2 Potential new or expanded landfills

A new landfill, Cosgrove 3, is planned to be operational by 2018-19 at Cosgrove (adjacent to the existing Cosgrove landfill site) with an expected total airspace of around 3,000,000 m³. With the operation of Cosgrove 3, the region's landfill needs will be met with the existing landfills and no additional landfills will be required for the region for the next 10 years, or for the 30-year outlook of the GV implementation plan.

Please note that subject to limited exceptions, under section 50C(2) of the EP Act, EPA must refuse to consider an application for a works approval in relation to a new- landfill if the landfill is not provided for in this table. Table 29 shows the proposed sequence for the filling of available landfill sites for the next 30 years. This table should be read in conjunction with the description of the landfill needs assessment outlined in section 5.7.1.1.

Table 29 Proposed sequence of the filling of available landfill sites¹

Landfill	Years																														Likely closure date			
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45				
Alexandra landfill, 12039																																		2040
Cobram landfill, 15500																																		>2045
Cosgrove landfill, 12099																																		>2045
Mitchell landfill, 74231																																		2030
Patho landfill, 11908																																		>2045

Key:

- Has all appropriate approvals including EPA works approval and land use planning approval where relevant
- Land use planning approved (still requires EPA works approval)
- Airspace available subject to receiving appropriate approvals

¹As referred to in section 50C (2) of the EP Act
Notes:

- The landfill airspace detailed in the above table has been classified according to its land use planning and works approval status at the time of preparation of this implementation plan. Only sites with landfill airspace with the appropriate approvals are permitted (and, where applicable, licensed) to receive waste. Inclusion of airspace still requiring either land use planning or EPA approvals is based on an assessment of the need and suitability in line with the statewide process. Where further approvals are required, the appropriate processes to achieve such approvals, must be undertaken and inclusion in the above table does not guarantee the granting of these approvals.
- Licensed landfills are sequenced to indicate their potential to accept the wastes allowed under their current EPA licence over the 10-year sequencing period.
- Landfills exempt from licensing are sequenced to indicate their potential to accept wastes as per the *Waste Management Policy (Siting, Design and Management of Landfills) 2004* and the EP Act over the 10-year sequencing period. There are no landfills exempt from licensing in the region.
- Sites exempt from licensing are those which are occupied by a municipal council, serve less than 5,000 people and accept a range of wastes including putrescible and solid inert as per *Waste Management Policy (Siting, Design and Management of Landfills) 2004*, the **Environment Protection (Scheduled Premises and Exemptions) Regulations 2007 (Vic)** and the EP Act.
- Sites which are exempt from a requirement to obtain a works approval under the **Environment Protection (Scheduled Premises and Exemptions) Regulations 2007 (Vic)** and the **EP Act** are those which are occupied by a municipal council and which serve less than 500 people. **Those sites are not included in the above table.**
- For the avoidance of doubt, private (own waste) landfills which are privately owned and will only receive wastes that consist of substances owned by the owner of the site (before the substances became wastes) referred to in section 50C(3) of the EP Act are not included in the above table. These sites are not approved to accept waste from external sources. Any need for a works approval for these sites will be assessed by the EPA without reference to this implementation plan, in accordance with section 50C(3) of the EP Act.
- Likely closure dates reflect the year in which the site is likely to cease receiving waste. They are estimated based on modelled tonnage projections and airspace available and may include potential void space at quarry-based landfill sites as identified by owners and operators.
- Additional airspace may be sequenced in the future, if an assessment of airspace requirements in the region identifies a need in line with the statewide scheduling process. A listing in the above table does not guarantee the airspace will be scheduled in the future.
- When landfills close they must go through a decommissioning phase which includes working with the EPA to establish a long term rehabilitation plan. During this time they will cease to accept waste, but may continue to receive clean fill and soils to undertake appropriate capping and contouring. The actual time required for this process may vary from site to site.
- Sequencing in this table has been done pursuant to the requirements of section 50BB (c)(iv) of the EP Act.
- Cosgrove modelling includes Cosgrove 2 and Cosgrove 3, to be operational in 2018-19.

8.2.3 Closed landfills

GVWRRG is required to develop a program for the rehabilitation of landfill sites. An important function of this part of the schedule is to identify landfills that have yet to undertake the appropriate rehabilitation and aftercare activities. The responsibility of rehabilitation is generally the responsibility of the owner, in many cases councils.

Closed landfills must meet the requirements of the EPA *Closed Landfill Guidelines* (December 2012). GVWRRG and the councils have considered the guidelines as part of developing the GV implementation plan and the landfill infrastructure schedule.

GVWRRG expects the operators of all closed landfills to meet their EPA obligations and to communicate effectively with adjoining communities on the progress of rehabilitation and possible future uses of the site.

Please note: The schedule of closed landfills is a list based on the best of GVWRRG's knowledge and all of the information provided in developing the plan and consultation with duty holders.

Table 30 lists details of the 38 landfills in the region that have been closed during the past 30 years. Most are owned by councils. Included in this table is the rehabilitation status for each site where it is known (see key below table).

Note that landfills that are yet to be rehabilitated will be considered under Action 10 of this plan. This involves facilitating work between council and the EPA to identify if there are more localised risk-based approaches to rehabilitation of closed landfills.

Table 30 Rehabilitation status of closed landfills

Landfill name	GIS Location	Local government area	Duty holder	Wastes previously received	Date landfilling ceased ¹	Rehabilitation status	Current infrastructure onsite
Alexandra	145 43'18.53E 37 12'30.36S	Murrindindi (S)	Murrindindi (S)	putrescible solid inert waste	1997	Rehabilitation completed	RRC
Avenel	145 14'30.62E 36 52'44.19S	Strathbogie (S)	Strathbogie (S)	putrescible solid inert waste	1998	Rehabilitation completed	RRC
Barmah	144 57'48.85E 36 00'24.59S	Moira (S)	Moira (S)	putrescible solid inert waste	1995	Rehabilitation completed	RRC
Broadford East	145 3'58.14E 37 11'9.19S	Mitchell (S)	Private landholder	not known	1999	Rehabilitation completed	None
Broadford South	145 04'26.19E 37 13'21.91S	Mitchell (S)	Mitchell (S)	putrescible solid inert waste	Prior to 1996	Not available	RRC and pound
Coomboona	145 17'42.55E 36 15'11.07S	Greater Shepparton (C)	Private landholder	fruit processing	Not available	Not available	None
Cosgrove 1	145 35'54.539E 36 20'54.655S	Greater Shepparton (C)	Greater Shepparton (C)	putrescible solid inert waste	1998	Ongoing monitoring and maintenance	None
Dookie	145 39' 55.25E 36 18' 49.37S	Greater Shepparton (C)	Greater Shepparton (C)	putrescible solid inert waste	1997	Not available	None
Echuca	144 46'19.15E 36 11'28S	Campaspe (S)	Campaspe (S)	putrescible solid inert waste asbestos	2006	Ongoing monitoring and maintenance	None
Eildon	145 55'53.26E 37 14'03.67S	Murrindindi (S)	Murrindindi (S)	putrescible solid inert waste	1997	Rehabilitation completed	RRC
Euroa	145 33'5.32E 36 45'37.82S	Strathbogie (S)	Strathbogie (S)	putrescible solid inert waste	1998	Rehabilitation completed	RRC
Flowerdale	145 19'37.00E 37 19'42.07S	Murrindindi (S)	Murrindindi (S)	putrescible solid inert waste	1991	Not available	None
Gunbower	144 22'37.60E 35 57'38.52S	Campaspe (S)	Campaspe (S)	putrescible solid inert waste	1999	Rehabilitation completed	RRC
Kialla	145 22'42.76E 36 24'02.93S	Greater Shepparton (C)	Greater Shepparton (C)	putrescible solid inert waste	1989	Rehabilitation completed	None
Kialla East	145 28'51.487E 36 26'26.975S	Greater Shepparton (C)	Private land holder	fruit processing	Not available	Not available	None

Landfill name	GIS Location	Local government area	Duty holder	Wastes previously received	Date landfilling ceased ¹	Rehabilitation status	Current infrastructure onsite
Kilmore	144 58'9.21E 37 17'2.71S	Mitchell (S)	Mitchell (S)	putrescible solid inert waste	2005	Ongoing monitoring and maintenance	None
Kinglake	145 16'29.80E 37 27'39.54S	Murrindindi (S)	Murrindindi (S)	putrescible solid inert waste	1991	Not available	RRC
Kyabram	145 02'5.58E 36 17'59.96S	Campaspe (S)	Campaspe (S)	putrescible solid inert waste	2004	Ongoing monitoring and maintenance	None
Lockington	144 30'23.86E 36 20'07.65S	Campaspe (S)	Campaspe (S)	putrescible solid inert waste	2010	Ongoing monitoring and maintenance	RRC
Mooroopna	145 22'52.71E 36 23'9.37S	Greater Shepparton (C)	Greater Shepparton (C)	putrescible solid inert waste	Not available	Rehabilitation completed	None
Murchison	145 11'31.19E 36 37'24.25S	Greater Shepparton (C)	Greater Shepparton (C)	putrescible solid inert waste	2012	Rehabilitation completed	RRC
Nagambie	145 11'42.87E 36 47'41.95S	Strathbogie (S)	Strathbogie (S)	putrescible solid inert waste	1998	Rehabilitation completed	RRC
Nathalia	145 11'10.01E 36 04'52.97S	Moira (S)	Moira (S)	putrescible solid inert waste	1995	Rehabilitation completed	RRC
North Shepparton	145 22'9.447E 36 21'2.524S	Greater Shepparton (C)	Private landholder	putrescible solid inert waste	1985	Not available	None
Numurkah	145 29'29.38E 36 03'52.95S	Moira (S)	Moira (S)	putrescible solid inert waste	1995	Ongoing monitoring and maintenance	RRC
Pyalong	144 51'53.17E 37 06'51.53S	Mitchell (S)	Mitchell (S)	putrescible solid inert waste	1999	Rehabilitation completed	RRC
Rushworth	145 00'01.07E 36 36'2.44S	Campaspe (S)	Campaspe (S)	putrescible solid inert waste	2005	Rehabilitation completed	RRC
Seymour	145 09'14.62E 37 03'07.64S	Mitchell (S)	Mitchell (S)	putrescible solid inert waste	2008	Rehabilitation commenced	RRC
St James	145 52'30.67E 36 16'39.09S	Moira (S)	Moira (S)	putrescible solid inert waste	1995	Rehabilitation completed	RRC
Stanhope	144 53'36.55E 36 27'23.27S	Campaspe (S)	Campaspe (S)	putrescible solid inert waste	1999	Rehabilitation completed	None
Strathmerton	145 31'20.80E 35 55'28.94S	Moira (S)	Moira (S)	putrescible solid inert waste	1995	Rehabilitation completed	RRC

Landfill name	GIS Location	Local government area	Duty holder	Wastes previously received	Date landfilling ceased ¹	Rehabilitation status	Current infrastructure onsite
Tennyson	144 30'15.80E 36 18'53.13S	Campaspe (S)	Campaspe (S)	putrescible solid inert waste	Not available	Rehabilitation completed	None
Tongala	144 55'59.55E 36 15'26.28S	Campaspe (S)	Campaspe (S)	putrescible solid inert waste	1999	Rehabilitation completed	None
Tungamah	145 52'57.14E 36 08'55.66S	Moira (S)	Moira (S)	putrescible solid inert waste	1995	Rehabilitation completed	RRC
Violet Town	145 33'5.321E 36 38'54.96S	Strathbogie (S)	Strathbogie (S)	putrescible solid inert waste	2010	Rehabilitation commenced	RRC
Yabba	145 38'59.79E 36 14'39.85S	Moira (S)	Moira (S)	putrescible solid inert waste	1995	Rehabilitation completed	RRC
Yarrowonga	146 00'09.34E 36 02'25.21S	Moira (S)	Moira (S)	putrescible solid inert waste	2000	Rehabilitation commenced	RRC
Yea	145 22'27.00E 37 09'30.05S	Murrindindi (S)	Murrindindi (S)	putrescible solid inert waste	1991	Not available	RRC

¹ Note that the date landfilling ceased are estimates for some sites, determined with the best available information

Key to closed landfill abbreviations

Status criteria	Explanation	Explanation of rehabilitation status
Yet to commence rehabilitation	Yet to begin process of rehabilitation	
Rehabilitation commenced	Working to design a rehabilitation plan and undertake rehabilitation activities appropriate to each site	
Rehabilitation completed	Rehabilitation appropriate to the site and regulation relevant at the time of closure has been completed. No further rehabilitation activities planned or required	
Ongoing monitoring and maintenance	Landfills that are undergoing a range of activities including: <ul style="list-style-type: none"> • monitoring of groundwater, surface water, landfill gas, leachate and cap settlement • landfill cap maintenance to prevent erosion, restore depressions, seal cracks, restore vegetation • leachate control systems (if applicable) • landfill gas-extraction system (if applicable) 	

Image: Shepparton Resource Recovery Centre



References

- Best practice environmental management (Siting, design, operation and rehabilitation of landfills)* publication number 788.3, EPA Victoria, 2015
- Closed landfill guidelines*, Publication number 1490, EPA Victoria, 2012
- Demographic and economic profile of the Goulburn Valley region*, unpublished, .id, 2015
- Designing, constructing and operating composting facilities*, Publication 1588, EPA Victoria, 2015
- Draft Metropolitan Waste and Resource Recovery Implementation Plan*, Metropolitan Waste and Resource Recovery Group, 2015
- Environment Protection Act 1970*
- Goulburn Valley Infrastructure capacity and needs assessment*, Blue Environment, unpublished, 2015
- Goulburn Valley Waste and Resource Recovery Group Economic Analysis*, Essential Economics and Blue Environment, unpublished, 2016
- GVWRRG Community Engagement Survey, Wallis*, unpublished, 2015
- GVWRRG council landfill survey report*, unpublished, 2015
- Landfills exempt from licensing*, Publication number 1563, EPA Victoria, 2014
- Managing Landfills*, Victorian Auditor-General's Report, 2014
- Ministerial Guideline: Making, amending and integrating the Statewide Waste and Resource Recovery Infrastructure Plan and Regional Waste and Resource Recovery Implementation Plans*, Victorian Government, 2014
- Rural Landfill Risk Assessment Project Report*, URS Australia, in association with Fox-Lane Consulting, unpublished, June 2013
- Statewide Waste and Resource Recovery Infrastructure Plan*, Sustainability Victoria, 2015
- Survey and analysis of regional reprocessors and material recovery facility operators: Goulburn Valley Waste and Resource Recovery Group regional report*, Sustainable Resource Use for Sustainability Victoria, unpublished, 2015
- Victorian Waste Education Strategy*, Sustainability Victoria, 2016
- Victorian Market Development Strategy for Recovered Resources*, Sustainability Victoria, 2016
- Victorian Organics Resource Recovery Strategy*, Sustainability Victoria, 2015
- Victorian Regional Waste and Resource Recovery Database v3; waste and resource recovery data provided by Sustainability Victoria
- Waste Management Policy (Siting, Design and Management of Landfills)*, EPA Victoria, 2004

Abbreviations

Term	Explanation
C&D	construction and demolition
C&I	commercial and industrial
DELWP	Department of Environment, Land, Water and Planning
EfW	energy from waste
EPA	Environment Protection Authority Victoria
EP Act	<i>Environment Protection Act 1970</i>
Framework	Victorian Waste and Resource Recovery Infrastructure Planning Framework
FTE	full time equivalent
GV implementation plan	Goulburn Valley Waste and Resource Recovery Implementation Plan
GV region	Goulburn Valley Waste and Resource Recovery Region
GVWRRG	Goulburn Valley Waste and Resource Recovery Group
GRP	Gross Regional Product
Landfill BPEM	<i>Best Practice Environmental Management (Siting, Design, Operation and Rehabilitation of Landfills) 2010 updated</i>
Landfill WMP	<i>Waste Management Policy (Siting, Design and Management of Landfills)</i>
MEMP	municipal emergency management plan
Ministerial Guideline	<i>Ministerial Guideline: Making, amending and integrating the Statewide Waste and Resource Recovery Infrastructure Plan and Regional Implementation Plans</i>
MRF	materials recovery facility
MRM	municipal recovery managers
MSW	municipal solid waste
RRCs	resource recovery centres
RWRRD	Sustainability Victoria's Regional Waste and Resource Recovery Database
SIW	solid industrial waste
state infrastructure plan	<i>Statewide Waste and Resource Recovery Infrastructure Plan</i>
state organics strategy	<i>Victorian Organics Resource Recovery Strategy</i>
SV	Sustainability Victoria
TI Act	<i>Transport Integration Act 2010</i>
waste education strategy	<i>Victorian Waste Education Strategy</i>
WRRGs	waste and resource recovery groups

Terms and definitions

Term	Explanation
Aerobic composting	The controlled biological decomposition of organic materials under aerobic (in the presence of oxygen) conditions, accomplished in open or enclosed windrows or piles.
Airspace	The remaining capacity of a landfill.
Anaerobic composting	The controlled biological decomposition of organic materials under anaerobic (in the absence of oxygen) conditions, accomplished in enclosed vessels producing combustible methane gas and compost.
Anaerobic digestion (AD)	Biological breakdown by microorganisms of organic matter, in the absence of oxygen, into biogas (a mixture of carbon dioxide and methane) and digestate (a nutrient-rich residue).
Asbestos	<p>A term for a group of six naturally occurring mineral fibres belonging to two groups:</p> <ul style="list-style-type: none"> • Serpentine Group – comprised of only chrysotile (white asbestos) • Amphibole Group – comprised of anthophyllite, amosite (brown asbestos or grey asbestos), crocidolite (blue asbestos), tremolite, and actinolite. <p>Asbestos containing materials (ACMs) can be categorised as friable and non-friable. Non-friable asbestos, where it is mixed with other materials like cement, is the type most commonly found in our built environment. Friable asbestos is more likely to become airborne.</p> <p>Both friable and non-friable asbestos pose a significant health risk to all workers and others if the materials are not properly maintained or removed carefully.</p> <p>The risk of exposure from the built environment is broad, with the potential to impact the entire Australian community.</p>
Avoidance	The first step in the waste hierarchy. Indicates practices whereby waste generation is circumvented.
Beneficiation	An optical sorting process used to separate different colours of container glass to produce cullet for reprocessing and mixed fines.
Biogas or syngas	A gas generated by breaking down organic matter in the absence of oxygen, such as occurs in landfills. Biogas is typically comprised of 60% methane and 40% carbon dioxide, and can be used as an energy source.
Biomass	Biological material that is not fossilised, including forest and mill residues, agricultural crops and waste, wood and wood waste, animal waste, livestock operation residues, aquatic plants, fast growing trees and plants.
Biosolids	Biosolids are considered to be organic solids derived from sewage treatment processes that are in a state that they can be managed to sustainably utilise their nutrient, soil conditioning, energy, or other value (achieve minimum EPA standards for classification as T3 and C2 biosolids). The solids that do not meet these criteria are defined as sewage sludge.
BPEM (Landfill)	<i>Best Practice Environmental Management – siting, design, operation and rehabilitation of landfills.</i>
Buffer zone	<p>Buffer zones, or separation distances, aim to minimise the offsite impacts of sensitive land uses arising from unintended, industry generated odour and dust emissions.</p> <p>A buffer zone is an area of land outside the operating area of a facility that is set aside to maintain an adequate distance between the facility and sensitive land uses (such as residential development) so those uses are not adversely affected by noise, odour or dust. The land may or may not be owned by the facility owner.</p>
Category C contaminated soil	Refer to prescribed waste and prescribed industrial waste (PIW).

Term	Explanation
Clean fill	Material that has no harmful effects on the environment. This material is a natural soil material and does not contain any chemicals or other materials such as concrete rubble. Also called fill material.
Closed landfill	Landfills which have ceased to receive waste. During the decommissioning phase they may continue to receive clean fill and soils to undertake the appropriate capping and contouring. If it was a licensed landfill, it should have received a post closure pollution abatement notice (PAN) from the EPA. If exempt from licensing, there should be reassurance that the closure process has commenced or is in place.
Collection system	System for collecting materials from the kerbside, including bin type and collection frequency.
Commercial and industrial (C&I) waste	Solid inert waste generated from trade, commercial and industrial activities including the government sector. It includes waste from offices, manufacturing, factories, schools, universities, state and government operations and small to medium enterprises e.g. food waste.
Commingled recyclables	Materials combined generally for the purposes of collection, mainly through municipal collection services. Includes plastic bottles, other plastics, paper, glass and metal containers. Commingled recyclable materials require sorting after collection before they can be reprocessed. Can also be called commingled materials.
Composting	The process whereby organic materials are microbiologically transformed under controlled aerobic conditions to create a pasteurised and stabilised organic product for application to land.
Construction and demolition (C&D) waste	Solid inert waste generated from residential and commercial construction and demolition activities e.g. bricks and concrete.
Cullet	Sorted glass feedstock resulting from the beneficiation process of mixed container glass. Generally consists of sorted streams of amber, flint and green glass of particle size greater than 5-10 mm depending on the capacity of the beneficiation plant.
Current capacity of infrastructure	Estimation of the installed capacity of an existing facility or infrastructure type
Daily cover	The layer of compressed soil or earth which is laid on top of a day's deposition of waste on an operational landfill site. The cover helps prevent interaction between waste and air, reducing odours and creating a firm base for vehicles to work on.
Delamination	The process of splitting a composite material into its component parts e.g. laminated glass.
Department of Environment, Land, Water and Planning (DELWP)	A Victorian government department providing policy planning, preparation of legislative amendments, leadership coordination and oversight of the environment portfolio.
Digestate	A nutrient-rich residue remaining after the anaerobic digestion of a biodegradable feedstock.
Drop off centre/site	A facility where households can drop off selected materials and household items for recycling and reuse. Also called drop off facilities.
Duty holder	Any person who has a duty or obligation under the <i>Environment Protection Act 1970</i> . For the purposes of this plan, the above definition, used by the EPA, is relevant. Note - under section 67B of the EP Act, EPA may require duty holders to provide financial assurance as a condition of a licence or works approval.
E-waste	E-waste comprises of electronic equipment with a plug or battery that requires a current to operate and that has reached end of life. It includes televisions, computers, monitors and whitegoods such as fridges and washing machines.

Term	Explanation
Energy from waste (EfW)	The terms 'energy recovery from waste', 'waste to energy' or 'energy from waste' can be used interchangeably to describe a number of treatment processes and technologies used to generate a usable form of energy from waste materials. Examples of usable forms of energy include electricity, heat and transport fuels.
EP Act	<i>Environment Protection Act 1970.</i>
Environment Protection Authority Victoria (EPA)	Established under the auspices of the Environment Protection Act 1970, EPA's role is to be an effective environmental regulator and an influential authority on environmental impacts.
Environmental justice	The principles of environmental justice are based on the concepts of equity and participation. The principles require that environmental benefits and impacts should be distributed proportionately and affected communities should be able to participate in decision making.
Existing operating landfill	Landfills currently accepting waste for disposal or have recently ceased to accept waste but are yet to receive a post closure PAN from the EPA.
Feedstock	Raw material used to manufacture products. Material varies depending on what is being produced.
Fill material	See clean fill.
Fines (glass)	Unsorted sub 5-10 mm glass material left over from the glass beneficiation process. It can contain contamination including plastics and small pieces of metals. These fines can be further processed to produce a glass sand product which has a number of uses.
Food organics	Food waste from households or industry, including food processing waste, out-of-date or off-specification food, meat, fruit and vegetable scraps. Excludes liquid wastes.
Garden organics	Organics derived from garden sources e.g. grass clippings, tree prunings. Also known as green organics.
Gasification	Thermal technology that converts material into combustible gases by partial oxidation under the application of heat, leaving an inert residue.
Generated material/waste	Refers to materials or waste originating from the region.
Green organics/ waste	Referred to as garden organics.
Greenhouse gases	Gases, including carbon dioxide and methane, that trap heat in the earth's atmosphere, affecting weather and climate patterns.
Hard waste	The term applied to household garbage that is not usually accepted in kerbside garbage bins by local councils e.g. old fridges and mattresses.
Hazardous waste	See prescribed waste and prescribed industrial waste (PIW).
Hubs	A facility or group of facilities that manage or recover waste or material streams. For larger hubs the concentration of facilities enable sufficient waste derived feedstock to support viable reprocessing and best practice management options. The location of hubs will vary for individual material streams.
Illegal dumping	Illegal dumping is the deliberate and unauthorised dumping, tipping or burying of waste on land that is not licensed or fit to accept that waste.
Incinerator	For the purpose of this document, a site that facilitates the disposal of waste streams through incineration without producing another useful end product or capturing value from the waste material.
Inert waste	Inert waste is neither chemically nor biologically reactive and will not decompose. Includes glass, sand and concrete.

Term	Explanation
In-vessel composting	Composting technology involving the use of a fully enclosed chamber or vessel in which the composting process is controlled by regulating the rate of mechanical aeration. Aeration assists in heat removal, temperature control and oxygenation of the mass. Aeration is provided to the chamber by a blower fan which can work in a positive (blowing) and/or negative (sucking) mode. Rate of aeration can be controlled with temperature, oxygen or carbon dioxide feedback signals.
Kerbside waste/ collection	Waste collected by local councils from residential properties, including garbage, commingled recyclables and garden organics, but excluding hard waste.
Landfill	Discharge or deposit of solid wastes onto land that cannot be practically removed from the waste stream.
Landfill available airspace	Refer to airspace.
Landfill capping	An impermeable geo-membrane and/or clay materials with, possibly a further layer of soil, placed over the capping. Capping allows greenhouse gases to be captured and creates a 'dry tomb' protecting groundwater. (Once a landfill cell is filled, the waste matter must be covered with landfill capping.)
Landfill levy	A levy applied at differential rates to municipal, industrial and prescribed wastes disposed of at licensed landfills in Victoria. Landfill levies are used solely for the purposes of environment protection and fostering environmentally sustainable use of resources and best practice in waste management. They fund the activities of WRRGs, SV and EPA, helping to establish waste management infrastructure, industry waste reduction programs, education programs, regulatory controls and enforcement regimes. Levies also provide an incentive to minimise the generation of waste, sending a signal to industry that the government supports efforts to develop alternatives to disposal to landfill.
Landfill likely closure dates	An estimate of the likely year of closure of the landfill based on consideration of modelling tonnage projections and land available under current EPA works approval, planning and permit requirements and potential void space that may eventuate at a quarry-based landfill site as identified by owners and operators.
Landfill tonnages	Tonnes landfilled derived from landfill levy data supplied by EPA. Does not include prescribed industrial waste (PIW). There has been no allowance for daily cover which must be considered when comparing figures with those earlier drafts of the Statewide Waste and Resource Recovery Infrastructure Plan (state infrastructure plan). Previously landfill figures were adjusted to remove a 15% allowance for daily cover.
Leachate	Contaminated water that has percolated through or drained from a landfill.
Litter	Any small, medium or large item placed inappropriately.
LG ARG	Local Government Advisory Reference Group: A sub group of the local government waste forum established to advise, assist and inform the forum.
LG Waste Forum	Local Government Waste Forum established as per section 49B of the EP Act which requires each WRRG to establish a forum consisting of representatives of the councils in the region.
Local Litter Measurement Toolkit (LLMT)	The Local Litter Measurement Toolkit has been designed for local government and land managers to: <ul style="list-style-type: none"> • Increase access to best practice techniques, data and analysis to inform management of litter and illegal dumping. • More efficiently evaluate litter and illegal dumping programs and interventions at a local scale. • Conduct cost-benefit analyses to improve local litter prevention projects. • Prepare business cases to bid for funding for initiatives to reduce litter and illegal dumping, maximise recycling, improve or introduce infrastructure and enforcement.

Term	Explanation
Managed materials/waste	Materials or waste managed in the region refers to materials or wastes that have passed through or been managed at a waste and resource recovery facility in the region including, RRC/TS, MRFs, reprocessors or landfills. They may have been generated in another region and or they ultimately be reprocessed or disposed of outside the region.
Materials or wastes generated in the region	See Generated material/waste.
Materials or wastes managed in the region	Refer to Managed materials/waste.
Materials recovery facility (MRF)	A centre for the receipt, sorting and transfer of materials recovered from the waste stream prior to transport to another facility for recovery and management. At a MRF materials may undergo mechanical treatment for sorting by characteristics such as weight, size, magnetism and optical density and may include cleaning and compression. Materials may be received as mixed streams such as commingled recyclables from households and businesses or single streams such as metals.
Materials processed	Materials processed in the region or facility refers to the materials that have been sorted, consolidated or processed at resource recovery centres, transfer stations, drop off centres and/or MRFs in the region.
Materials recovered	Materials recovered from the region refers to materials diverted from landfill for use or reprocessing irrespective of where the recovery or reprocessing takes place. Materials recovered in the region refers to materials recovered for reprocessing or use through facilities in the region.
Materials reprocessed	Materials reprocessed in the region refers to the materials that have passed through reprocessing facilities in the region. Materials reprocessed in a particular facility refers to the materials that are directly reprocessed in the individual facility.
Mechanical biological treatment (MBT) plant	MBT plants combine mechanical sorting (such as in a MRF) with biological treatment of organic waste to process residual organic waste. This could include technology such as anaerobic digestion to stabilise the material and generate heat and power. Material remaining after further treatment (often referred to as 'digestate') can be added to compost or used as fuel in a thermal waste-to-energy facility.
Municipal solid waste (MSW)	Solid waste generated from municipal and residential activities, and including waste collected by, or on behalf of, a municipal council. In this document, MSW does not refer to waste delivered to municipal disposal sites by commercial operators or waste from municipal demolition projects.
Open windrow composting operation	A type of outdoor composting process where organic materials are piled into windrows and are turned for aeration.
Optical sorting	Technologies used to sort glass by colour type, and plastics by polymer type.
Organic material	Plant or animal matter, e.g. grass clippings, tree prunings and food waste, originating from domestic or industrial sources.
Pollution abatement notice (PAN)	Pollution abatement notices are issued under section 31A of the <i>Environment Protection Act 1970</i> . They aim to prevent further occurrence of pollution or the potential environmental risk through installation of risk controls and changes to onsite processes and practices.
Prescribed waste and prescribed industrial waste (PIW)	These wastes are defined in the <i>Environment Protection (Industrial Waste Resource) Regulations 2009</i> . EPA closely regulates these wastes because of their potential adverse impacts on human health and the environment. Prescribed wastes carry special handling, storage, transport and often licensing requirements, and attract substantially higher disposal levies than non-prescribed solid wastes. Also known as hazardous waste.

Term	Explanation
Private (own waste) landfills	Landfills privately owned by an entity that generate and deposit waste exclusively from a single source (arising from their own onsite activities).
Process derived fuels	Also called process engineered fuel (PEF) or refuse derived fuel (RDF), is a fuel produced after basic processing in a MRF or MBT to increase the calorific value and remove recyclable materials and contaminants of municipal solid waste, commercial and industrial waste and construction and demolition waste.
Processing facilities	Facilities which either receive materials directly from collection systems or from recovery facilities for further sorting and/or processing to provide material for use in the generation of new products.
Product stewardship	A concept of shared responsibility by all sectors involved in the manufacture, distribution, use and disposal of products, which seeks to ensure value is recovered from products at the end of life.
Public place recycling	Recycling facilities found in public areas, such as parks, reserves, transport hubs, shopping centres and sport and entertainment venues, that allow the community to recycle when away from home.
Putrescible waste	Waste that readily decomposes, including food waste and organic waste from gardens.
Pyrolysis	Thermal breakdown of waste in the absence of air, to produce char, pyrolysis oil and syngas e.g. the conversion of wood into charcoal.
Recover / recovery / resource recovery	The process of recovering resources from waste for reuse or reprocessing. This includes collection, sorting and aggregation of materials.
Recyclable materials	Waste and materials which can be recycled. Collection of recyclable materials can be done separately to provide feedstocks for viable recovery.
Recyclables	While this term strictly applies to all materials that can be recycled, in this document the term is generally used to refer to the recyclable containers and paper/cardboard component of kerbside waste e.g. it excludes food and garden organics.
Recyclate	Raw materials that can be recycled that are sent to and processed in a recovery facility.
Recycle / recycling	To convert waste into a reusable material. In common practice the term is used to cover a wide range of activities, including collection, sorting, reprocessing and reuse.
Refuse derived fuels	Refer to Process derived fuels.
Reprocess / reprocessing	To put a material that has been used through an industrial process to change it so that it can be used again.
Reprocessor / reprocessing facility / reprocessing infrastructure	Facility that uses an industrial process to change the physical structure and properties of a waste material so it can be used again. This can include facilities that dismantle products, such as tyres, e-waste and mattresses, and energy from waste facilities that use materials to generate energy.
Resale centre / shop	A centre/shop that enables the sale and subsequent reuse of good quality, saleable products and materials that were disposed of by their previous owner.
Residual waste	Residual material that remains after any source separation or reprocessing activities of recyclable materials or garden organics. Waste that is left over after suitable materials have been recovered for reuse and recycling. This generally means the environmental or economic costs of further separating and cleaning the waste are greater than any potential benefit of doing so.

Term	Explanation
Resource recovery centre (RRC)	A facility established to receive and/or recover reusable and recyclable materials that would otherwise be destined for disposal. Can be combined with a transfer station and may include resale centres.
Resource recovery infrastructure	Facility that receives and manages materials to enable them to be reused or reprocessed. This includes drop off points, resale centres, resource recovery centres, transfer stations and materials recovery facilities.
Reuse	Recovering value from a discarded resource without processing or remanufacture e.g. garments sold though opportunity shops are, strictly speaking, a form of reuse, rather than recycling.
Scrap metal	Metals recovered from all sectors (households, building and business) and can be further categorised into ferrous and non-ferrous metals.
Sectors / industry sectors	Groupings of industries used to generalise patterns in waste generation and disposal e.g. construction and demolition, food services including food retail and food manufacturing, small to medium enterprises.
Separation distance	Refer to buffer zone.
Shredder floc	Residue directly arising from large scale shredding operations to recover metals. Shredded material includes, but is not limited to, end-of-life vehicles, white goods, machineries, drums and corrugated material.
Social licence to operate	The concept of a 'social licence to operate' has evolved from broader concepts of 'corporate social responsibility' and is based on the idea that a business not only needs appropriate government or regulatory approval but also a 'social licence'. The social licence is the acceptance that is continually granted to industry and facility operators by the local community or other stakeholders to operate.
Solid industrial waste (SIW)	Solid waste generated from commercial, industrial or trade activities, including waste from factories, offices, schools, universities, state and federal government operations and commercial construction and demolition work. Excludes MSW, wastes that are prescribed under the <i>Environment Protection Act 1970</i> and quarantine wastes.
Solid waste	Non-hazardous, non-prescribed, solid waste materials, ranging from municipal garbage to industrial waste.
Source separation	The practice of segregating materials into discrete material streams prior to collection by, or delivery to, processing facilities.
Spokes	The sequence of activities that move materials from waste generators to (and from) hubs e.g. collection, transport and sorting. The length of the spoke, and hence the location of the hub, for a particular material stream is influenced by the impact of transport on the margin of return for that particular material stream.
Stockpiling	Storage of materials.
Sustainability Victoria (SV)	Statutory authority established in October 2005 under the <i>Sustainability Victoria Act 2005</i> with the key objective of 'facilitating and promoting environmental sustainability in the use of resources'. SV works across the areas of energy, waste and water with communities, industries and government applying the best ideas and encouraging action to enable change in environmental practices.
Transfer station	A facility allowing the drop off and consolidation of garbage and a wide range of recyclable materials. Can be combined with a resource recovery centre and may include resale centres. Does not undertake processing activities.
Treatment	A specific activity, process or handling of an item/material (often involved with reprocessing to remove contamination and the like).

Term	Explanation
Vermiculture	Worm farming, to reprocess food and garden organics into liquid fertiliser.
Waste	Any discarded, rejected, unwanted, surplus or abandoned matter, including where intended for recycling, reprocessing, recovery, purification or sale. Anything that is no longer valued by its owner for use or sale and which is, or will be, discarded. In this document, the term 'solid waste' refers to non-hazardous, non-prescribed, solid waste materials ranging from municipal garbage to industrial waste.
Waste and resource recovery group (WRRG)	Statutory authorities established under the Environment Protection Act 1970 responsible for preparing the regional waste and resource recovery implementation plan for their region.
Waste and Resource Recovery Planning Framework	The planning framework as defined in the 2014 amendments to the Environment Protection Act 1970 and including: <ul style="list-style-type: none"> • The Statewide Waste and Resource Recovery Infrastructure Plan (state infrastructure plan). • The seven regional waste and resource recovery implementation plans (regional implementation plans). • Relevant Ministerial Guidelines made under section 50CA of the EP Act. • The process for integration of the state infrastructure plan and regional implementation plans.
Waste hierarchy	A concept promoting waste avoidance ahead of recycling and disposal. Recognised as promoting management of waste in the order of preference: avoidance, reduce, reuse, recycle and disposal.
Waste management industry	Applies to those involved in managing waste e.g. collectors, sorters, processors and landfill operators.
Waste minimisation	The concept of, and strategies for, waste generation to be kept to a minimum level in order to reduce the requirement for waste collection, handling and disposal to landfill. Also referred to as waste avoidance.
Waste to energy	Refer to Energy from waste.

Appendices

Appendix 1 Requirements of the *Environment Protection Act 1970*

Division 2AD – Regional waste and resource recovery implementation plans

50B Preparation of draft Regional Waste and Resource Recovery Implementation Plans

- (1) Each Waste and Resource Recovery Group must prepare a Regional Waste and Resource Recovery Implementation plan for its waste and resource recovery region.
- (2) Subject to subsection (3), each Waste and Resource Recovery Group must submit a draft Regional Waste and Resource Recovery Implementation Plan to Sustainability Victoria and to the Authority within 12 months after the State-Wide Waste and Resource Recovery Infrastructure Plan takes effect.
- (3) A draft Regional Waste and Resource Recovery Implementation Plan must be submitted by the Metropolitan Waste and Resource Recovery Group within 3 months after the date on which the first State-Wide Waste and Resource Recovery Infrastructure Plan takes effect.
- (4) The Authority must make any comments within 60 days after receiving a draft Regional Waste and Resource Recovery Implementation Plan.

50BA Objective of Regional Waste and Resource Recovery Implementation Plans

The objective of a Regional Waste and Resource Recovery Implementation Plan is to set out how the waste and resource recovery infrastructure needs of a waste and resource recovery region will be met over at least a 10 year period.

50BB Content of Regional Waste and Resource Recovery Implementation Plans

- (1) A Regional Waste and Resource Recovery Implementation Plan must include—
 - (a) A description and analysis of waste and resource recovery infrastructure within its waste and resource recovery region, including a consideration of—
 - (i) environmental and financial performance; and
 - (ii) current infrastructure and anticipated opportunities for providing infrastructure across the waste and resource recovery region; and
 - (iii) the waste and resource recovery infrastructure needs, priorities and preferred locations for the waste and resource recovery region; and
 - (iv) regional transport and land use planning; and
 - (b) A description of how the long term directions in the State-Wide Waste and Resource Recovery Infrastructure Plan will be implemented to give effect to local and regional infrastructure needs within the waste and resource recovery region; and
 - (c) A schedule of existing and required waste and resource recovery infrastructure within the waste and resource recovery region including—
 - (i) the type, general location and other requirements of new waste and resource recovery infrastructure, other than landfills; and
 - (ii) the timeframe for when new waste and resource recovery infrastructure is needed; and
 - (iii) an identification of steps required to align the schedule with local planning schemes; and
 - (iv) the proposed sequence for the filling of available landfill sites for at least the next 10 years; and
 - (v) a program for replacing and rehabilitating landfill sites; and
 - (vi) the intended or likely date of closure of each landfill site; and
 - (vii) options for future landfill capacity and resource recovery infrastructure; and
 - (d) any matters required by guidelines made under section 50CA.
- (2) Subject to subsection (3), a Regional Waste and Resource Recovery Implementation Plan must be consistent with any policy and any government policies.
- (3) If a Regional Waste and Resource Recovery Implementation Plan is inconsistent with a policy, the policy prevails to the extent of the inconsistency.

50BC Consultation during preparation of Regional Waste and Resource Recovery Implementation Plans

Before submitting a draft Regional Waste and Resource Recovery Implementation Plan to Sustainability Victoria and to the Authority under section 50B, a Waste and Resource Recovery Group must consult with—

- (a) the Secretary of the Department of Environment and Primary Industries; and
- (b) the Chairman; and
- (c) the Chairperson of Sustainability Victoria; and
- (d) the Chairperson of each Waste and Resource Recovery Group; and
- (e) the chairperson of the Urban Renewal Authority Victoria; and
- (f) the chief executive of each council within its waste and resource recovery region.

50BD Further preparation of Regional Waste and Resource Recovery Implementation Plans

(1) On the submission of a draft Regional Waste and Resource Recovery Implementation Plan under section 50B, each Waste and Resource Recovery Group and Sustainability Victoria must work together to integrate the priorities and directions of the Regional Waste and Resource Recovery Implementation Plan and the State-Wide Waste and Resource Recovery Infrastructure Plan and to resolve any differences in the Plans.

(2) Each Waste and Resource Recovery Group and Sustainability Victoria are jointly responsible for integrating the Plans for a period of up to 6 months.

(3) Sustainability Victoria and each Waste and Resource Recovery Group must—

- (a) take into account any comments made by the Authority under section 50B(4); and
- (b) amend the schedule of existing and required waste and resource recovery infrastructure within the draft Regional Waste and Resource Recovery Implementation Plan if the Authority objects to the inclusion of a proposed landfill on the ground that it is unlikely to meet the requirements of a relevant policy.

(4) The integration process in subsections (1) to (3) must comply with any guidelines issued under section 50CA.

(5) A Waste and Resource Recovery Group must submit a draft Regional Waste and Resource Recovery Implementation Plan to the Minister for approval—

- (a) no later than 6 months after submitting a draft to Sustainability Victoria and the Authority under section 50B; and
- (b) not before either the Authority has provided its comments under section 50B(4) or the 60 days in which the Authority may comment on the Plan have expired.

(6) On receiving a draft Regional Waste and Resource Recovery Implementation Plan under subsection (5) the Minister must—

- (a) approve the Plan; or
- (b) approve the Plan with amendments; or
- (c) return the Plan to the relevant Waste and Resource Recovery Group for amendment.

(7) If the Minister returns the Regional Waste and Resource Recovery Implementation Plan to a Waste and Resource Recovery Group under subsection (6)(c), the Minister must give directions as to the amendments required to be made to the draft Plan.

(8) A Waste and Resource Recovery Group must comply with a direction of the Minister under subsection (7) within 30 days or a longer period specified by the Minister.

50BE Publication of approval of Regional Waste and Resource Recovery Implementation Plans

(1) The Minister must cause to be published in the Government Gazette a notice of approval of a Regional Waste and Resource Recovery Implementation Plan.

(2) The notice of approval must be published—

- (a) in the next general edition of the Government Gazette; or
 - (b) in a special edition of the Government Gazette within 10 working days after the approval of the Plan.
- (3) A Regional Waste and Resource Recovery Implementation Plan takes effect on—

- (a) the date on which the notice of approval is published in the Government Gazette; or
- (b) a later date specified in the notice.
- (4) A Regional Waste and Resource Recovery Implementation Plan remains in force until it is replaced by another Regional Waste and Resource Recovery Implementation Plan.

50BF Publication of Regional Waste and Resource Recovery Implementation Plans

- (1) A Waste and Resource Recovery Group must publish a copy of its Regional Waste and Resource Recovery Implementation Plan on its Internet site within 7 days of a notice of approval of the Plan being published in the Government Gazette.
- (2) Sustainability Victoria must publish a copy of a Regional Waste and Resource Recovery Implementation Plan on its Internet site within 7 days of a notice of approval of the Plan being published in the Government Gazette.
- (3) A Waste and Resource Recovery Group and Sustainability Victoria must each publish on its Internet site a revised copy of a Regional Waste and Resource Recovery Implementation Plan within 7 days of a notice of approval of an amendment or variation to the Plan being published in the Government Gazette.

50BG Amendment of Regional Waste and Resource Recovery Implementation Plans

- (1) A Waste and Resource Recovery Group may prepare draft amendments to its Regional Waste and Resource Recovery Implementation Plan at any time, including any schedule of existing and required waste and resource recovery infrastructure within the Plan.
- (2) The Minister may at any time direct a Waste and Resource Recovery Group to prepare draft amendments to its Regional Waste and Resource Recovery Implementation Plan within a specified period of time.
- (3) The Minister may at any time make a variation to a Regional Waste and Resource Recovery Implementation Plan that is declaratory, machinery or administrative in nature.
- (4) Sections 50BC, 50BD and 50BE apply to an amendment of a Regional Waste and Resource Recovery Implementation Plan under subsections (1) and (2) as if the amendment were a draft Regional Waste and Resource Recovery Implementation Plan.
- (5) Sections 50BD(6) to (8) and 50BE apply to a variation of a Regional Waste and Resource Recovery Implementation Plan under subsection (3) as if the variation were a draft Regional Waste and Resource Recovery Implementation Plan.

50BH Consistency with Regional Waste and Resource Recovery Implementation Plans

- (1) A council must perform its waste management functions consistently with the Regional Waste and Resource Recovery Implementation Plan applying to the council's municipal district.
- (2) If a council disposes of waste in a waste and resource recovery region other than the waste and resource recovery region in which the council's municipal district is located, the disposal of the waste must be consistent with the Regional Waste and Resource Recovery Implementation Plan applying to the other waste and resource recovery region.
- (3) Any person involved in the generation, management or transport of waste within a waste and resource recovery region must not do anything in relation to the waste that is inconsistent with the relevant Regional Waste and Resource Recovery Implementation Plan while the waste is in that region.

Appendix 2 Collaboration, alignment and integration process and outcomes

The EP Act and the Ministerial Guidelines establish processes for consultation and collaboration during the plan’s development to achieve a coordinated approach to planning for Victoria’s waste and resource recovery system. This appendix outlines the collaboration process over the two years including:

- developing the plan
- alignment with the state infrastructure plan
- integration with the other six regional plans.

1. Collaboration during the development of the plan

Figure 11 shows the governance structure to develop the plan to ensure those with accountability could make timely decisions, establish how project risks would be managed and the appropriate direction and resources were secured.

The Board (depicted in green) is the Project Control Group which is the decision making body. The GV Implementation Plan Working Group (depicted in purple) was established to assist and guide preparation of the plan. It is made up of GVWRRG staff, representatives selected to provide expert advice across all aspects of the plan drawn from three regional councils, EPA and SV. The working group has no approval or decision-making authority. The Market Sounding Project Working Group (depicted in blue) developed and worked to a probity plan, procurement project plan and evaluation plan. Councils were consulted at appropriate times through the Goulburn Valley Waste Forum (depicted in orange). The Statewide Regional Implementation Plan Working Group (depicted in teal) was established to provide advice and collaboration opportunities to WRRGs and portfolio partners to achieve consistency in developing the regional plans and met monthly.

Figure 11 Goulburn Valley Waste and Resource Recovery Implementation Plan governance structure

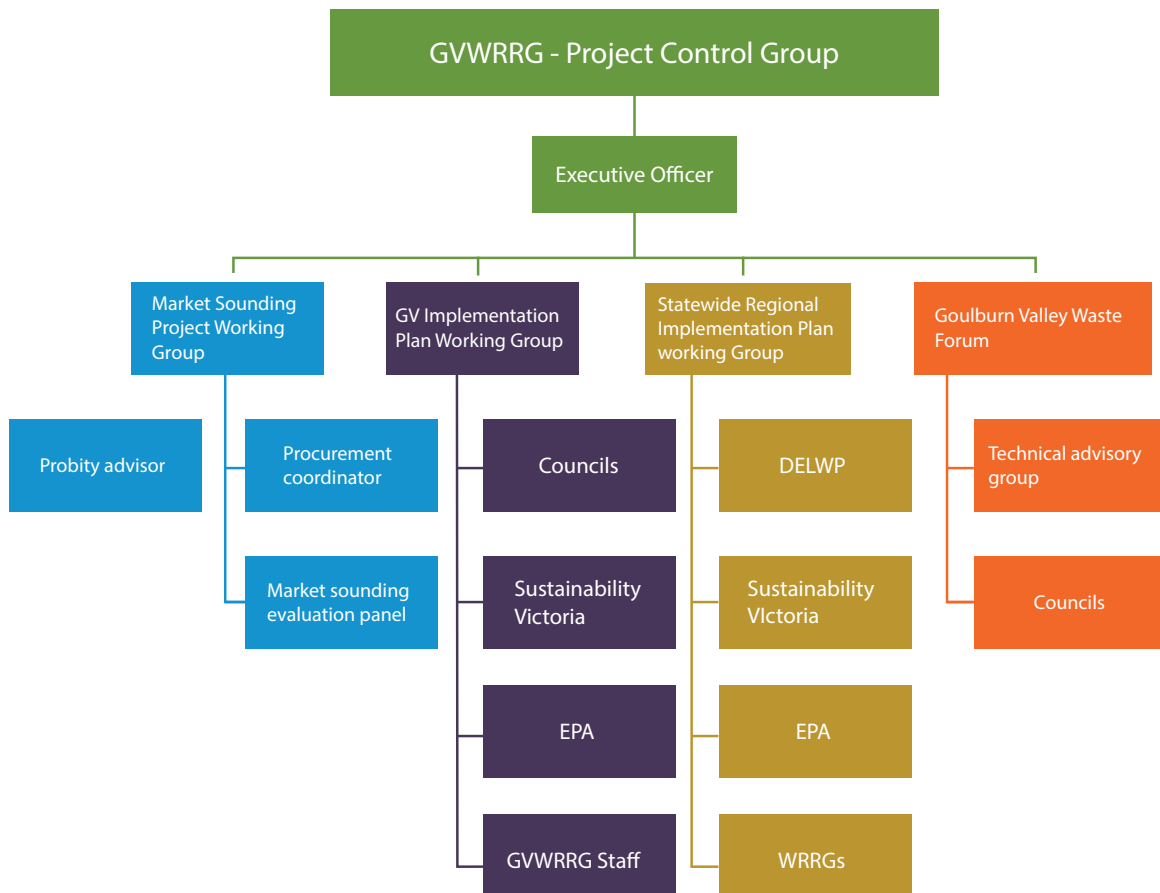


Table 31 lists the roles and responsibilities of the groups involved in developing the GV implementation plan

Table 31 Roles and responsibilities of groups involved in developing the Goulburn Valley Waste and Resource Recovery Implementation Plan

Group	Established	Role
Goulburn Valley Waste and Resource Recovery Group Board	To consider strategy, governance and risk management. The Board establish and monitor governance arrangements for GVWRRG ensuring the preparation and approval of strategic plans, annual reports, key procedures and policies.	Project Control Group.
Market Sounding Project Working Group	To undertake the collaborative market sounding process.	To develop and review the market sounding documentation prior to release including: <ul style="list-style-type: none"> • Project Plan • Probity Plan • Evaluation Plan.
GV Implementation Plan Working Group	To inform the development of the GV implementation plan which aligns with the long term strategic directions of the state infrastructure plan.	To provide expert advice and guidance to support the planning and development of the GV implementation plan.
Statewide Regional Implementation Plan Working Group	To support the WRRGs to develop their plans.	Provides a forum to: <ul style="list-style-type: none"> • identify and discuss common issues, barriers and opportunities related to the development of the regional implementation plans • facilitate cross regional collaboration to understand alternative management options as required in the legislation and guidelines • share information about developing the plans between the WRRGs, SV, EPA and DELWP • develop consistency and alignment between the regional implementation plans and the state infrastructure plan.
Local Government Waste Forum	Under Section 49B of the EP Act each region must establish a Local Government Waste Forum consisting of representatives of the councils in the region.	The Forum provides: <ul style="list-style-type: none"> • high-level strategic advice to the Board on matters and issues affecting the role of councils in waste management and resource recovery • a conduit for consultation between GVWRRG and the councils to encourage information sharing on best practice, trends and technologies and facilitate waste management and resource recovery initiatives.

Figure 11 and Table 31 also highlight a range of collaborative processes. This included:

- The GV Implementation Plan Working Group of representatives from councils in the region, SV and EPA.
- Participation in the Statewide Regional Implementation Plan Working Group of representatives from the portfolio and other WRRGs to discuss progress and issues to ensure consistency in developing the plans. This included data sharing.
- Consulting with and seeking feedback from the Local Government Waste Forum throughout the development of the plan.

These formal structures were supported by GVWRRG's ongoing engagement with SV and the EPA throughout the development of the plan.

Table 32 lists collaboration activities with the portfolio and stakeholders during this phase.

Table 32 Key collaboration activities during the development of the Goulburn Valley Waste and Resource Recovery Implementation Plan

Collaboration	Outcomes	Stakeholders
Risk and contingency workshops to develop a risk and contingency plan	<p>The workshops were used to identify the major risks to be addressed through infrastructure solutions and establish contingencies to manage the risks. This was achieved through a two-stage process:</p> <ul style="list-style-type: none"> attending a statewide risk and contingency workshop holding a regional risk and contingency workshop in September 2015 using the Victorian Managed Insurance Authority risk management guide. <p>Twenty-four participants from across council operations, councillors and portfolio partners identified and worked on three potential regional risks:</p> <ul style="list-style-type: none"> If a key piece of current waste and resource recovery infrastructure in the region was deactivated, reaches capacity or is required to meet an urgent need for recovery or disposal following an emergency event. To facilitate recovery of key material streams in the region for new and expanding infrastructure. Failure of end markets. 	WRRGs, SV, EPA and DELWP
Data sharing	<p>Data used to develop the plan relied on data sharing between SV, EPA, GVWRRG, councils, reprocessors and other WRRGs.</p> <p>GVWRRG obtained data from the councils.</p> <p>(Section 4.2)</p>	WRRGs, SV and EPA
Map development	Joint procurement of maps to ensure consistency.	WRRGs
Market sounding process with the North East and Loddon Mallee WRRGs	<p>A joint market sounding was conducted with North East and Loddon Mallee WRRGs to ensure a consistent approach when engaging with the waste and resource recovery sector.</p> <p>(Section 7)</p>	Loddon Mallee and North East WRRGs
Public consultation 16 May - 17 June 2016	<p>Public consultation with councils, industry, business and the community was undertaken for 4 weeks.</p> <p>(Section 1.9)</p>	Councils, community, business, industry, SV, EPA, WRRGs and DELWP

As well as consulting councils, industry, business and the community, Section 50BC of the EP Act specifies the organisations that each WRRG must consult with prior to submitting the GV implementation plan to SV and EPA. In accordance with this requirement GVWRRG consulted with the:

- Secretary of DELWP
- Chairperson of EPA
- Chairperson of SV
- Chairperson of each WRRG
- Chairperson of Places Victoria
- Chief executive officer of each council in the region.

A legal compliance review of the draft Goulburn Valley Waste and Resource Recovery Implementation Plan was conducted prior to consultation. A follow up legal review was conducted post consultation.

2. Alignment with the state infrastructure plan

As required, GVVRRG submitted the draft GV implementation plan to EPA and SV by 11 June 2016, 12 months after the state infrastructure plan took effect.

SV was responsible to ensure the strategies, directions, actions and data in the GV draft implementation plan are aligned to the state infrastructure plan and regional plans.

EPA was responsible to identify any objection to any particular proposed scheduled landfill.

3. Integration with other regional plans

The EP Act and the Ministerial Guidelines establish requirements to ensure all of the regional implementation plans are integrated with each other and the state infrastructure plan.

'Integration' as referred to in the EP Act, is a process that ensures consistency between plans before finalisation. Integration is to ensure that the strategies, actions, directions and data identified in all plans are complementary and in alignment with one another, prior to submitting the final draft implementation plans to the Minister for approval.

DELWP was tasked by the Minister with reviewing regional implementation plans during the formal integration phase to ensure alignment with such policies.

A formal integration meeting was held with WRRGs, SV, EPA and DELWP to address final alignment issues, including cross regional flows and contingency measures.

Outcomes

As a result of the collaborative approach, the following outcomes were achieved:

- Efficiencies in the engagement with the waste and resource recovery sector.
- Comprehensive data set using the same methodology, represented consistently in the regional plans and which will also be reflected in the statewide plan.
- Consistent terminology used throughout the plans.
- Infrastructure schedules that are consistent across the state.
- Consistent response to statewide policy.
- Cross regional flows and opportunities considered.
- Commitment to annual contingency planning across the state.
- Commonality of priority actions, including statewide priorities.

Appendix 3 Summary of the response to comments

Councils, industry, business and the community all create waste and participate in the waste and resource recovery system in different ways. Our consultation process included a range of opportunities for all of these stakeholders to participate and provide feedback.

The four key phases of the consultation were based on the Victorian Auditor General's Office *Public participation in decision-making: better practice guide* (2015) for consultation and community engagement. The guide used the International Association for Public Participation's *Public Participation Spectrum* that includes levels of increasing public engagement. Section 1.6 Consultation and community engagement provides more details on the activities within these phases.

This appendix summarises the consultation feedback and how it was addressed in the final plan. The general support for the plan was welcomed as evidence that overall the plan addressed the region's waste and resource recovery infrastructure needs for the next 10 years. The constructive feedback has improved the final plan.

Consultation process

The draft GV implementation plan was open for comment between 16 May and 17 June 2016 (including a one week extension from 10 June 2016).

A range of engagement opportunities were offered for councils, industry, business and the community to participate and provide feedback. This included:

- Six open house sessions for councils, industry, business and the community held across the region at Shepparton, Yarrawonga, Euroa, Broadford, Yea and Echuca.
- Information provided at the open houses included:
 - > a two and a half minute video
 - > a 4-page summary document
 - > A1 maps showing infrastructure locations
 - > frequently asked questions
 - > an online survey
 - > a letter template for feedback.
- All of the information available at the open houses was also available on the GVVRRG website.
- One presentation at a joint WRRG consultation event held in Melbourne targeting statewide and national industry stakeholders.

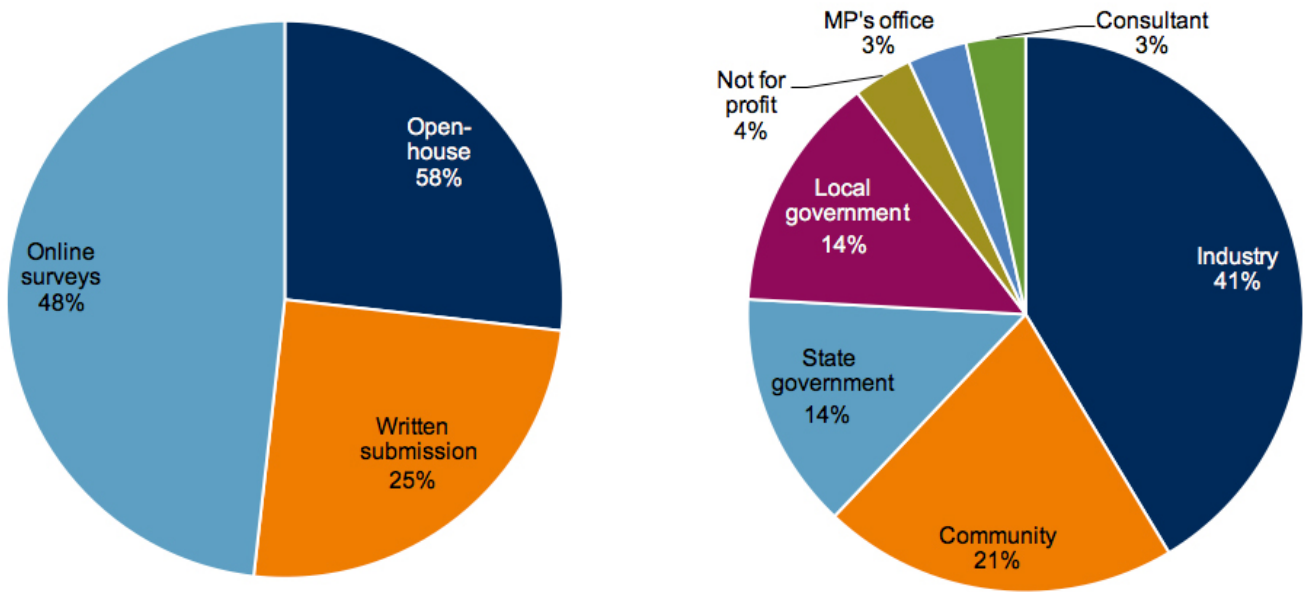
Stakeholders from all sectors – councils, industry, business and the community – participated in the consultation as shown in Figure 12.

A total of 56 responses were received or noted during the public consultation. Figure 12 shows the breakdown of the source which was:

- 15 open house participant comments and discussions were documented and included
- 14 written submissions
- 27 online surveys.

Over 40% of the 15 open house and 14 written submissions were from industry. Note that responses to the online survey were anonymous so a breakdown of the stakeholder groups is not available.

Figure 12 Breakdown of submission source and stakeholders



Responses

Careful analysis of the 56 responses resulted in the classification of 143 specific comments on the plan, after excluding corrections, comments of support, matters outside the scope of the plan and other general information. The 143 comments were categorised into 14 key themes.

Submitters of the 14 written submissions included contact details and were provided individual letters outlining how their comments were addressed. Responses to most of the feedback from the open house sessions were provided at the time with some follow ups undertaken. Due to the nature of the anonymous online surveys individual feedback was not possible.

The following items have been addressed but have not been included in the summary in Table 33:

- Factual corrections were all amended in the plan.
- A suggestion to change a facility's hub classification has been referred to SV.
- A request for a facility to be included in the Resource Recovery Infrastructure Schedule, which it was.
- A number of policy issues outside the scope of the plan that have been referred to the relevant government organisation.
- Supportive statements, comments that did not require a response, 'no' responses to survey question statements about the structure of the open house sessions and design suggestions for the plan.

Key themes

The 143 specific comments from 56 submissions have been organised into 14 key themes. Table 33 shows a summary of the issues and responses for each key theme. They are organised from the highest to the lowest number of comments for each theme.

Table 33 Feedback and responses to the key themes

Feedback	Response	Number of responses
1.Objectives and actions		
<p>Concerns the plan lacked:</p> <ul style="list-style-type: none"> • measurement • targets • responsibility/ accountability • realistic actions. <p>It was queried if it was within GVWRRG's direct control to deliver the actions as currently written in the draft plan.</p> <p>Support:</p> <ul style="list-style-type: none"> • for economic viability of resource recovery • to incorporate environmental and social benefits into the objectives • to ensure they were understandable to the community • to consider overseas success. 	<p>The implementation plan:</p> <ul style="list-style-type: none"> • Is a strategic plan that will be translated into measurable targets and detailed activities in the rolling four-year GVWRRG business plan and the regional litter plan (to be developed). • Actions will be prioritised with the available budget over the life of the implementation plan. <p>The plan is based on sustainable resource recovery that requires a positive business case, a market for recovered goods and materials and improved outcomes for the community, environment and public health (therefore environmental and social benefits). Within this context it is important to note the market determines what is economically viable.</p> <p>The objectives and actions have been reviewed to ensure they are as clear as possible and that GVWRRG is allocated responsibility only for those outcomes within its control. In other cases it will work to support other stakeholders appropriately.</p> <p>Evidence based solutions, from Victoria, nationally and internationally, will be sought throughout the 10-year life of the plan.</p> <p>GVWRRG will support industry and council through the delivery of Actions 1, 2 and 3 to maximise the diversion of recoverable materials from landfill. Action 7 supports research and demonstration of innovative technologies and materials handling.</p> <p>Objective 3 highlights the changing role for GVWRRG to work closely with planning authorities to ensure suitably located and zoned land is available for the mix of infrastructure required.</p>	24
2. Material streams		
<p>There was strong support to reduce waste to landfill and increase recycling and to minimise waste through repairing, reusing and recycling.</p> <p>Materials of particular interest were organics and e-waste and those with current low recovery rates such as C&I waste, timber, tyres, farm chemicals and bulky materials such as expanded polystyrene.</p> <p>There was strong support to reprocess materials in the region where economically viable and to use reprocessed products, such as organics, in the region. Providing organics collections in fast growing Mitchell Shire was seen as a priority.</p> <p>There was support to increase product stewardship schemes noting that it was a federal responsibility and that a focus should be reducing landfilling of hazardous materials such as batteries.</p>	<p>The 2015 market sounding process highlighted that the needs of the region included:</p> <ul style="list-style-type: none"> • sorting, segregation and reprocessing of mixed industrial waste and reprocessing facilities for e-waste, tyres and textiles • additional capacity for food and garden organics reprocessing • opportunities to increase the reprocessing of wood and timber, plastics and aggregates, masonry and soils in the region. <p>Actions 1, 2 and 3 identify priority materials in the region to increase recovery and achieve quantities for reprocessing. Table 27 Future resource recovery infrastructure requirements and options for the region and includes new infrastructure for organics reprocessing for Mitchell Shire.</p> <p>A new section on product stewardship has been included in the final plan and Action 8 was amended.</p>	21

Feedback	Response	Number of responses
3. Community education, engagement and capacity building		
<p>There was strong demand for targeted educational and community engagement initiatives to reduce waste and increase recovery.</p> <p>Suggestions were made for priority educational projects, plastic bag free towns/region and to continue the educational waste tours.</p> <p>It was suggested councils be supported to develop the necessary skills to manage EPA licensed facilities.</p>	<p>The Victorian Waste Education Strategy released post consultation (in August 2016) requires each WRRG, with SV's support, to develop a regional litter and illegal dumping plan. GVWRRG's 2014 litter directions paper will be reviewed and provide the basis for the strategy.</p> <p>Action 8 was amended to support delivery of local projects and Keep Victoria Beautiful has been included as a partner. Action 6 has been amended to include capacity building.</p> <p>The Victorian Government is currently investigating plastic bag free options and will lead on any actions.</p>	16
4. Infrastructure		
<p>Concerns were expressed:</p> <ul style="list-style-type: none"> • about landfill modelling • if all closed landfills and their level of risk have been identified • if all current reprocessors have been identified • about details of which sites are open to the public • about clarity of hub definition. <p>Site options were suggested for any new landfills and a potential resource recovery site.</p> <p>Suggestions to consider integrating product stewardship collection schemes into RRC upgrades (internal or externally funded).</p> <p>Suggestions to consider how to best service the community with local access to resource recovery infrastructure and how to create 'regional centres of excellence' to recycle a range of materials including e-waste.</p>	<p>All of the data used for modelling is the best available at the time. The plan will be reviewed in three to five years. More detail has been included in Section 5.7.1 about the Landfill needs assessment process. New landfills were not an identified priority for the regional plan.</p> <p>Closed landfills have been identified to best of GVWRRG's knowledge. Action 10 in the plan identifies a risk-based approach for rehabilitation of closed landfills.</p> <p>All current reprocessors have been identified to the best of GVWRRG's knowledge but it is also acknowledged that other facilities exist, particularly for niche materials. GVWRRG encourages any facilities in the region not included on the schedule to make contact. GVWRRG will maintain contact with the operator of the potential reprocessor site. GVWRRG encourages the community to visit the appropriate council or company website for further information on the wastes and material streams accepted at individual facilities.</p> <p>The hub definition is listed in Section 5.8 of plan and was developed by SV for the state infrastructure plan.</p> <p>A new section on product stewardship has been included in the final plan and Action 8 was amended to include product stewardship.</p> <p>Regarding RRCs and upgrades:</p> <ul style="list-style-type: none"> • Actions 1, 2 and 3 support the diversion of recoverable materials from landfill. • Action 7 was amended to promote partnerships across local, state and industry. It also identifies procurement options to maximise resource recovery and support research and demonstration of innovative technologies and materials handling. There are no facilities to reprocess e-waste in the region and this was identified as a need. • Drop off centres were considered. 	13

Feedback	Response	Number of responses
5. Litter and illegal dumping		
<p>There was support for:</p> <ul style="list-style-type: none"> a greater focus on taking action against litter and illegal dumping to be included in the plan a plastic bag ban a focus on other litter priorities, such as cigarette butts consideration of a container deposit scheme collecting consistent data using Local Litter Measurement Tool. <p>It was suggested that the cost of waste disposal leads to illegal dumping.</p>	<p>The Victorian Waste Education Strategy requires each WRRG, supported by SV, to develop a regional litter and illegal dumping plan that would consider using the Local Litter Measurement Tool. The region will align any litter and illegal dumping projects with the waste education strategy to inform and engage people's behaviours.</p> <p>Keep Victoria Beautiful and the Victorian Litter Action Alliance have been included as partners in Action 8. Action 8.4 is to support partnerships to influence best practice litter prevention.</p> <p>The Victorian Government is considering a plastic bag ban.</p> <p>The information we have shows that a container deposit scheme would increase costs to Victorians well beyond the benefit to the environment. Victoria has relatively low litter levels.</p>	12
6. Cost and funding		
<p>Feedback on the cost and funding to implement the plan included:</p> <ul style="list-style-type: none"> The cost of implementing the plan overall and to specific stakeholders was not included. Would funding be made available to implement the plan, specifically for new and upgraded infrastructure and the rehabilitation of closed landfills. How councils will be assisted to align with the plan. Have the costs and benefits of implementing the plan been analysed. A funded strategy to address camper and visitor litter on the Murray is needed. <p>It was also commented that the plan does not consider pricing as an incentive to encourage beneficial use as an incentive to industry.</p>	<p>Actions will be prioritised and priority projects will be funded in GVWRRG's business plan as funding is available.</p> <p>Action 6 supports the review of council waste strategies to align with the plan. A cost benefit analysis of waste and resource recovery in the region has been conducted with the results incorporated into the final plan.</p> <p>Parks Victoria has been included as a stakeholder in Action 8.</p> <p>The allocation of state government funds is outside the scope of the plan.</p>	12
7. Procurement and end markets		
<p>There was support to encourage councils and the community to increase recycled content product purchasing to support end markets. Industry expressed concern at the amount of time some tenders took to finalise.</p> <p>Concern that long term council contracts 'lock up' materials and therefore 'lock out' opportunities for innovation and new technology that rely on feedstock.</p>	<p>Action 7 supports the review of past collaborative procurement processes and identification of procurement options to maximise waste and resource recovery.</p> <p>Organics reprocessed into compost are currently used in and outside the region.</p> <p>There are no facilities to reprocess e-waste in the region and this is identified as a need.</p> <p>Action 13 seeks to collect data to support waste and resource recovery decision making and to achieve regional data collection systems that are aligned with the statewide data collection system.</p>	12

Feedback	Response	Number of responses
<p>Support for reprocessing more materials, such as e-waste, in the region that can be sold in the region.</p> <p>There were questions about the level of market intelligence, options and the correct drivers to achieve best resource use.</p>		
8. Environmental impacts		
<p>A number of concerns about the environmental impacts of the waste and resource recovery system were raised:</p> <ul style="list-style-type: none"> • Inefficient waste and resource recovery facilities, long transport distances, landfills with poor or no gas capture all result in negative greenhouse gas emission impacts. • A focus on EfW facilities could divert government investment from proven renewable technologies. • The proximity of landfills to rivers. <p>There was support for:</p> <ul style="list-style-type: none"> • best practice landfills • monitoring of methane generation from closed landfills. 	<p>The plan is focused on best practice solutions to avoid negative environmental and greenhouse gas emission outcomes. These are addressed in Actions 5, 7, 10 and 12.</p> <p>GVWRRG can support but not control external or commercial funding decisions.</p> <p>EPA has regulatory requirements for existing and closed landfills to prevent negative environmental and public health outcomes.</p> <p>Action 10 highlights a risk-based approach for rehabilitation of closed landfills.</p>	9
9. Technology		
<p>There was strong support for more information and investigation of new technologies, particularly EfW, to reduce waste to landfill, generate electricity and achieve a net reduction in carbon dioxide. There was also support for the processing of other products.</p> <p>A concern was expressed there was a lack of incentives for innovative technology.</p>	<p>Section 5 has been updated to include innovative options for organics infrastructure and investigations to co-locate EfW facilities with water authorities.</p> <p>One EfW facility, due to be operational in the short term, responded to the market sounding process and has been included in the infrastructure schedule. Additional innovative proposals were also submitted but were not included as they were in their infancy. GVWRRG is committed to continue seeking innovative solutions throughout the implementation process. Action 7 supports research and demonstration of innovative technologies and materials handling.</p> <p>The allocation of state government funds is outside the scope of the plan.</p>	8
10. Data		
<p>There was strong support for accurate data to understand material flows and the cost of implementation was emphasised. Suggestions included:</p> <ul style="list-style-type: none"> • conduct business audits • increase data for specific material streams • measure litter and illegal dumping using the Local Litter Measurement Tool • consider integrated data software. 	<p>Action 13 seeks to collect data to support waste and resource recovery decision making and to achieve regional data collection systems that are aligned with the statewide data collection system. It has been amended to include industry.</p> <p>GVWRRG is currently piloting software with councils noting the need for regional and statewide consistency.</p> <p>Funding would be required to undertake business audits.</p> <p>Since the release of the consultation draft, GVWRRG received the Economic Benefits Assessment and the results have been included in the final plan.</p>	5

Feedback	Response	Number of responses
11. Waste flows		
<p>There was a suggestion to consider landfills outside the region for contingencies for southern councils.</p> <p>A number of issues were raised about cross border flows and the impacts of any legislative changes.</p>	<p>Section 5 includes a landfill outside the region for contingencies.</p> <p>Action 7 was amended to include cross border flows and Section 4.3.5 expanded to include key infrastructure outside the region.</p>	5
12. Planning and legislation		
<p>The importance of adequate buffers for existing and future facilities, particularly in areas of population growth, was highlighted.</p> <p>A suggestion was made to streamline the EPA permit process.</p>	<p>Action 9 addresses planning and management of site buffers for existing and future facilities.</p> <p>EPA is an independent regulator and GVVRRG can assist with best practice support.</p>	3
13. Partnerships		
<p>There was a suggestion to increase partnership opportunities to increase recovery through <i>drumMUSTER</i>.</p> <p>There was support to develop a reuse and repair program through community groups.</p>	<p>A section on product stewardship has been included in the final plan and Action 8 was amended to include product stewardship.</p> <p>Partnerships with community groups for a reuse and repair program is consistent with Action 8.</p>	2
14. Policy		
<p>There was support for a national approach to manage many material streams.</p>	<p>A new section on product stewardship has been included in the final plan and Action 8 was amended to include product stewardship.</p>	1

Appendix 4 Data sources, assumptions and definitions

Major data sources

Data source	Description
Australian Bureau of Statistics (ABS) population data	ABS Catalogue Number 3101.0 - Australian Demographic Statistics, September 2014
<i>Demographic and economic profile of the Goulburn Valley region .id</i> , 2015.	Regional summary taking into account demographic, economic and town profiles.
EPA landfill levy returns	Unpublished information provided by EPA on a confidential basis.
<i>GVWRRG Community Engagement Survey Wallis</i> , 2015.	Findings from a survey of Goulburn Valley residents on environmental attitudes and behaviours. Based on an 18 minute survey using a Computer-Assisted Telephone Interview (CATI) methodology.
<i>Goulburn Valley Infrastructure capacity and needs assessment</i> , Blue Environment, 2015.	Investigation into the current and future capacity, needs and priorities of waste and resource recovery infrastructure in the Goulburn Valley region.
<i>Rural Landfill Risk Assessment</i> URS and Fox Lane Consulting 2013.	Presentation of data that will inform how rural Victorian licensed landfills can move to a position of long term environmental and financial sustainability.
<i>Survey and analysis of regional reprocessors and material recovery facility operators Sustainability Victoria</i> 2015.	Data on the activity of reprocessors and material recovery facilities in regional Victoria.
Victorian landfill audits	SV's disposal-based waste survey, 2009. A visual waste audit of eight metropolitan landfills, one regional landfill and one transfer station, covering 2003 separate inbound loads.
<i>Victorian Local Government Annual Survey</i>	Annual data on materials collected through council kerbside collection systems and published by SV. All councils in Victoria participate. The survey provides trending data on recyclables, organics, residual waste, hard waste and litter. The state infrastructure plan uses survey data from the financial year 2011-12, which is available on the SV website at www.sustainability.vic.gov.au
<i>Victorian Recycling Industry Annual Survey</i>	Annual data collection measuring tonnages of materials diverted from landfill by major reprocessors in Victoria. This is used to measure progress against Victorian waste reduction targets, and trends in the recovery of waste materials. The survey is voluntary and although the return rate is relatively constant, contributors can vary from year to year. VRIAS is available on the SV website at www.sustainability.vic.gov.au
Victorian Regional Waste and Resource Recovery Database v3.	SV's purpose-built database for data storage, analysis and projection to assist development of regional implementation plans and alignment with the state infrastructure plan.

Major data assumptions and definitions

Landfill tonnages	Tonnes landfilled are derived from landfill levy data supplied by EPA and do not include prescribed industrial waste. There has been no allowance for daily cover which must be considered when comparing figures with those in earlier drafts of the state infrastructure plan. Previously landfill figures were adjusted to remove a 15% allowance for daily cover.
Existing operating landfill	Landfills that are accepting waste for disposal or have recently ceased to accept waste but are yet to receive their post closure pollution abatement notice (PC PAN) from the EPA.

Landfill available airspace	Calculating landfill airspace is based on information from waste and resource recovery region landfill owners, councils and EPA. It reflects the estimated amount of airspace void and the amount of works approved airspace.
Closed landfill	Landfill that is no longer accepting waste. In the case of licensed landfills it should have received its PC PAN from the EPA. If it is exempt from licensing then there should be reassurance that closure processes have commenced or are in place.
Landfill likely closure dates	An estimate of the likely year of closure of the landfill based on consideration of modelled tonnage projections and land available under current EPA works approval, planning and permit requirements and potential void space that may eventuate at quarry based landfill sites as identified by owners and operators. A closure date of beyond 30 years should be represented as >30 years.
Rounding of data	As a general rule, all of the data is rounded to the nearest thousand. This may result in minor discrepancies between totals and line items. Graphs, charts and modelling were generated using non-rounded data. Any exceptions are referenced.
Generation tonnages	This is the sum of the state landfill tonnes and state tonnes reprocessed using VRIAS data. Because this modelling uses landfill data, generation tonnages will differ from those in previous drafts of the state infrastructure plan due to no allowance being made for daily cover.
Recovered tonnages	Unless stated, these are tonnes of materials entering reprocessing facilities. This is not a direct measure of how much was reprocessed as there is no data on tonnes stockpiled or landfilled by reprocessors. For this reason, quantities are referred to as recovered, rather than reprocessed.
Current capacity of infrastructure	An estimate of the installed capacity of an existing facility or infrastructure type.

Infrastructure categories for data collection

Infrastructure type	
Resource recovery	drop off
	RRC/TS, stand alone
	co-located at landfill
	MRF
Reprocessor organics	food
	garden
	wood/timber
	organics
	other
Reprocessor paper cardboard	
Reprocessor glass	
Reprocessor plastics	
Reprocessor rubber including tyres	
Reprocessor metals	
Reprocessor aggregate, masonry and soils	
Reprocessor textiles	
Reprocessors other	
Disposal landfill	licensed
	exempt from licensing

Appendix 5 Infrastructure

Types of infrastructure that support the waste and resource recovery system

Type	Characteristics
Collection infrastructure: Infrastructure to collect and transfer waste materials at the point of generation	
Kerbside bins and collection	<ul style="list-style-type: none"> • Collections from households of residual waste, garden organics and commingled recyclables; hard waste collections; and kerbside collection from businesses and other commercial premises. • Includes services provided by local governments and their service and commercial providers.
Skip bin	<ul style="list-style-type: none"> • Large bin provided by a private contractor to collect and remove bulk waste from households, businesses, schools, commercial premises and hospitals.
Tip truck	<ul style="list-style-type: none"> • Truck used to remove large amounts of mainly commercial and industrial waste.
Resource recovery infrastructure: Infrastructure to facilitate recovery of materials and resources	
Drop off centres and charity bins	<ul style="list-style-type: none"> • Recovers selected materials and goods mainly dropped off by householders for recycling and reuse. • May include aggregation for transport to a resource recovery centre or transfer station.
Resource recovery centres/transfer stations (RRC/TS)	<ul style="list-style-type: none"> • Receives, sorts and/or consolidates a range of material streams (depending on the facility) including hard, organic and residual waste and commingled recyclables for transport for materials recovery, processing or disposal to landfill. • Accepts materials from all sectors and can be publicly or privately owned and operated. • May include a resale centre.
Materials recovery facility (MRF)	<ul style="list-style-type: none"> • Sorting, consolidation and transfer. • Receives and sorts household and business commingled recyclables. • Compacts and bales, or consolidates materials and sends to reprocessing facilities. • May include a resale centre.
Reprocessing infrastructure: Infrastructure to recover materials and resources	
Organics reprocessing facility	<ul style="list-style-type: none"> • A facility that biologically reprocesses organic matter, yielding a variety of products including stabilised organic residues for use as a soil additive, heat and renewable energy. • Includes both windrow and in-vessel technologies.
Waste to energy facility	<p>A facility that uses waste or refuse derived fuels as a feedstock to produce a useful end product with market value such as heat and electricity.</p> <p>Technologies can include anaerobic digestion and heat processing such as pyrolysis and gasification.</p>
Other reprocessors	<p>A facility that changes the physical structure and properties of a waste material that would otherwise be sent to landfill adding financial value to the processed material. Without reprocessing, the beneficial use of the material would be lost.</p>
Disposal infrastructure: Infrastructure established as the final repository of waste materials	
Landfill	<ul style="list-style-type: none"> • A site for the disposal of waste into the ground. • May include a RRC/TS or resale shop.
Incinerator	<ul style="list-style-type: none"> • Disposal by burning. • A site that disposes of waste by burning it, without producing a useful end product.

*Back cover image:
Man loading metals for recycling*



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