Gippsland Waste and Resource Recovery Implementation Plan

June 2017

Gippsland
Waste and Resource Recovery Group

VICTORIA
State Government

Conflicts of Interest

Potential conflicts of interest of the Gippsland Waste and Resource Recovery Group (GWRRG) Board of Management have been considered and managed throughout the development and adoption of this publication.

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Approvals and Referencing

All figures published have been approved by data owners and all data sets have been appropriately referenced.

Presented data and associated information is based on best available statistics as at 2016.

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Chair's Foreword

The Gippsland Waste and Resource Recovery Group (GWRRG) is pleased to present the Gippsland Waste and Resource Recovery Implementation Plan (Gippsland Implementation Plan). The Plan proposes ways to better manage waste and resource recovery for Gippsland over the next 10 years and beyond.

It is well recognised that reliance on landfill as a primary solution to our waste is short sighted. From an environmental, economic and social perspective, our community cannot continue to dispose of material that has residual value. We cannot continue to set aside valuable land for an indeterminable time to facilitate disposal of material that could and should be reused.

The opportunity to create new local jobs through resource recovery is potentially substantial, particularly in areas such as the Latrobe Valley where heavy industry is well supported with land, infrastructure, logistics and services. The closure of Hazelwood power station may provide resource recovery opportunities, particularly steel, aggregates and masonry. The closure may also present economic and job creation opportunities through development of energy generation capacity through establishment of Waste to Energy facilities in the region.

In concert with the State Waste and Resource Recovery Infrastructure Plan (State Infrastructure Plan) and the other Regional Implementation Plans, the Gippsland Implementation Plan's aims are threefold: to maximise the diversion of recoverable material from landfill, increase resource recovery through diversion and improve the viability of commercial enterprise by improved consolidation and aggregation of materials for reprocessing.

Due to Gippsland's topography and settlement characteristics, achieving these goals is not simple. Gippsland is defined by mountains to the north, Bass Straight to the south, Melbourne to the west and it is linear in nature. It comprises many small communities with more than 40% of its residents living in towns of less than 1000 people. Rather than an obvious principal population centre, its main towns could be described as "a string of pearls", located along the Princes Highway, its primary transport corridor. While much of the region is sparsely populated, Gippsland's western portion is subject to some of Victoria's highest population growth and its tourist centres attract substantial temporary population increases at peak times. These areas require tailored solutions.

The Gippsland Implementation Plan proposes Priority Actions around the following key themes:

- Achieving greater material recovery with maximum value return through development of appropriate, well-sited infrastructure
- Driving innovative services and infrastructure provision;
- Building greater responsibility and accountability;
- Facilitating continuous improvement and enhanced performance;
- Planning to reduce undesirable impacts; and
- Improving the value of available information to support industry development.

The GWRRG Board of Management thanks and acknowledges the organisations and individuals who have contributed to the development of the Gippsland Implementation Plan.

Chair - Richard A. Ellis

Executive Summary

The Gippsland region faces a number of challenges in the next decade and beyond to enhance its waste and resource recovery activities. The region already performs well in a range of areas, including high levels of recycling, effective municipal-run waste and resource recovery services and wide-ranging private sector businesses.

This Plan focuses on increasing resource recovery in Gippsland, which brings with it significant opportunities for new jobs and investment in the region. Resource recovery employs 9.2 full time workers for every 10,000 tonnes of waste, compared to 2.8 workers if that waste goes to landfill.[1] Through providing a clear direction for the region, this Plan aims to align efforts of state government, local government and the waste and resource recovery sector to increase resource recovery and create these economic opportunities.

In a large and diverse area such as Gippsland, there is capacity to improve service delivery, facilities and performance. This will drive better outcomes for resource recovery, protecting public health and the region's environment and create jobs.

This Gippsland Waste and Resource Recovery Implementation Plan (Gippsland Implementation Plan) outlines actions aimed at improving the waste and resource recovery system in Gippsland and reducing dependence on landfills.

The GWRRG is one of seven groups across Victoria, established under the State's Environment Protection Act 1970 (EP Act), to undertake regional waste planning for all solid waste streams.

The Group is required by legislation to develop a Regional Waste and Resource Recovery Implementation Plan that will integrate with other Implementation Plans across the state to better manage waste and resource recovery activity. A core objective of this strategic work is to increase recovery and reuse of materials which, in addition to the economic opportunities, would reduce dependence on landfills, while protecting public health and the region's environment.

Gippsland extends from Melbourne's south eastern boundary to the most easterly point of Victoria and is 41,600 square kilometres in area. The current population of 271,000 is expected to grow to more than 333,000 people over the next 15 years. Significant changes are expected in the demographic profile, due to an ageing population and rapid growth in parts of the region, influencing the provision of waste and resource recovery services to the Gippsland community. The Gippsland Implementation Plan also recognises the challenges created by climate change and the critical need to mitigate and manage resultant impacts.

Gippsland currently manages 735,200 tonnes of waste each year. Of this material, around 136,200 tonnes go to landfill and 599,000 tonnes are recovered and reprocessed. Apart from garden organics, paper and cardboard and aggregates (including concrete and masonry), much of the recovered material (including glass, plastic, rubber, metals and e-waste) is transported to Melbourne for reprocessing.

Gippsland's location, adjacent to one of the key growth areas of Melbourne, as well as the region's projected growth, presents opportunities for economic development and job creation through increased resource recovery activities. The Gippsland Implementation Plan recognises that viable resource recovery requires a positive business case and a sustained market for recovered products. To achieve this, it is important to establish sufficient economies of scale that will support viable material recovery.

1 *The Australian Recycling Sector*, Access Economics, Department of Sustainability, Environment, Water, Population and Communities, January 2012

The Latrobe Valley is particularly well placed, through its proximity to Melbourne, its access to transport infrastructure and its defined industrial zonings, to grasp opportunities associated with highly engineered and environmentally responsible resource recovery innovations. It also provides an opportunity to ease the congestion experienced to the west of Melbourne by managing waste and resource recovery activities at a regional level.

These activities could also assist the Latrobe Valley as it transitions away from its substantial carbon energy based economy, finding new opportunities through jobs in resource recovery and possibly even renewable energy projects.

The closure of the Hazelwood power station in March 2017 may present opportunities to develop energy generation capacity through expansion of Waste to Energy facilities in the region. The plan has not assessed such development opportunities. In addition, comprising substantial amounts of aggregate, masonry and steel, Hazelwood power station potentially presents a significant resource recovery opportunity as this large-scale industrial structure is decommissioned. The Plan has not explicitly assessed the impact the closure may have on the region's landfill capacity, however, the Prescribed Industrial Waste (PIW) contained within the power station will require a tailored response following final assessment. The GWRRG will work with the operator, the EPA and other relevant stakeholders to support the management of materials generated through the demolition.

The Plan identifies a significant opportunity to utilise the Latrobe Valley's substantial industrial capability and capacity, and establish additional resource recovery and reprocessing in the Latrobe Valley with material sourced, not only regionally, but from Melbourne's expanding eastern suburbs. This has the potential to attract economic development and create jobs locally as well as reducing traffic congestion in and around Melbourne. An economic growth zone that covers Latrobe City, Wellington and Baw Baw Shires will support new and expanding businesses to establish or grow in the Latrobe Valley.

The Plan supports material aggregation, where possible, to develop sufficient economies of scale for viable recovery both within and external to the region, thereby fostering a more viable statewide recovery system.

The role of landfills will diminish over the period of this Plan although they are expected to remain necessary over its life span. A process of data collation and site specific modelling clearly demonstrates that Gippsland's current landfills, operated in line with planned extensions, will provide adequate capacity for at least the next 10 years. As such, the Plan proposes extensions to existing facilities within planned landfill development areas rather than development of any new landfill sites within the region. A review is scheduled for 2019 to update this assessment.

The Gippsland Implementation Plan has been developed in collaboration with the region's six municipal councils, Sustainability Victoria, the Department of Environment, Land, Water and Planning, the Environment Protection Authority Victoria, and members of the community, industry and business. It is one of seven such Implementation Plans being developed across Victoria. Each of these Plans will align with the Statewide Waste and Resource Recovery Infrastructure Plan (State Infrastructure Plan) to present a comprehensive and synergistic approach to managing Victoria's waste.

This Plan has six Priority Action areas that support and align with the Goals and Strategic Objectives of the State Infrastructure Plan. The Priority Action areas for Gippsland are:

1. Achieving greater material recovery through development of appropriate, well-sited infrastructure

Continue to reduce reliance on landfill by actively planning and promoting the transition to greater resource recovery by developing infrastructure to maximise the value of materials collected.

2. Driving innovative services and infrastructure provision

Stimulate the introduction of innovative waste and resource recovery services, and infrastructure by driving collaboration between local government, the waste industry and community to meet the diverse needs of Gippsland.

3. Building greater responsibility and accountability

Drive greater responsibility and accountability for resource recovery within Gippsland communities and the business sector by increasing understanding and knowledge of the waste and resource recovery system.

4. Facilitating continuous improvement and enhanced performance

Assist the waste industry and local government to continuously improve the performance of Gippsland's waste and resource recovery infrastructure and systems through improved compliance and efficiency to deliver better public health outcomes.

5. Planning to reduce undesirable impacts

Coordinate proactive planning to reduce impacts of events or failure of infrastructure that have the potential to impact on public health, cause environmental damage, or disrupt the delivery of waste and resource recovery infrastructure and services.

6. Improving the value of available information to support industry development

Enhance the quantity, accuracy, consistency and transparency of information available for decision makers involved in Gippsland's waste and resource recovery system.

Priority Actions for Gippsland

The Priority Actions proposed in the Gippsland Implementation Plan are intended to improve the way Gippsland manages its waste and resource recovery activity in the next ten years. These actions are designed to deliver the objectives of this Plan and realise the identified priorities, especially opportunities in waste and resource recovery for the region. The Plan supports the diminishing reliance on landfill with an increased emphasis on resource recovery.

In Gippsland, this is driven by economics; specifically, the high and increasing cost landfills impose on local communities. Each Priority Action has been developed to help achieve one of the four goals identified in the State Infrastructure Plan. These actions are also informed by other strategies developed by Sustainability Victoria to support the implementation of the State Infrastructure Plan. These include the Victorian Organics Resource Recovery Strategy, the Victorian Market Development Strategy for Recovered Resources and the Victorian Waste Education Strategy. Other relevant initiatives have also been considered such as the Investment Facilitation Framework, the Collaborative Procurement Framework and the Waste Data Governance Framework.

While each of these actions are recognised as important, success will require state government agencies, local governments, industry and the community to work together.

Table 1: Priority Actions

Areas of Focus Priority Action	Activity	
Achieving greater material recovery through development of appropriate, well-sited infrastructure. 1. Continue to reduce reliance on landfill by actively planning and promoting the transition to greater resource recovery by developing infrastructure to maximise the value of materials collected.	**Work with each local government authority to determine priority infrastructure for Gippsland.** • Decide, in association with the five Gippsland municipalities currently managing landfills, agreed future options for landfill operations and other infrastructure needs, and investigate and implement agreed future options. • Work with local government, government authorities and the waste industry to identify priority infrastructure for the region that supports recovery of materials identified in the statewide Organics and Resource Recovery Market Strategies.	
	Support effective land use planning decisions and appropriate facility locations. • Develop a spatial Geographic Information System (GIS) based map to assess the current waste and resource recovery system in Gippsland to support effective land use planning and investment decision making. This will identify opportunities and the most appropriate locations for new waste and resource recovery infrastructure and systems as well as identifying methods to protect essential existing infrastructure. • In development of this map, investigate opportunities for co-locating infrastructure in association with Gippsland's water authorities. • The GWRRG will work with councils to ensure that the assessment tool is embedded in the land use planning decision making processes within Gippsland local government and the Local Planning Scheme.	
	Assess Gippsland's waste and resource recovery transport efficiency. • Identify major transport tasks and related material flows within, and to and from Gippsland, with a view to supporting opportunities in the waste and resource recovery sector (for example, optimal load and back loading opportunities). • Lead the development of new waste and resource recovery infrastructure that improves transport efficiency.	

	State Strategic Direction	Timeframe	Participating Organisations
	1, 2, 3, 5	2017-2018	• GWRRG • Local Government • Neighbouring WRRGs • Private operators • DELWP • EPA • Water Authorities
	1, 2, 3, 5	2017	• GWRRG • Local Government • Neighbouring WRRGs • Private operators • DELWP • EPA • Water Authorities
	1, 2, 3, 5	2017	• GWRRG • Local Government • Neighbouring WRRGs • Private operators • DELWP • EPA • Water Authorities

Table 1: Priority Actions (cont.)

Areas of Focus Priority Action	Activity	
Driving innovative services and infrastructure provision. **2.** Stimulate the introduction of innovative waste and resource recovery services and infrastructure, by driving collaboration between local government, the waste industry and community to meet the diverse needs of Gippsland.	**Attract greater private sector investment and social enterprise involvement in the development and operation of resource recovery activity in Gippsland by identifying, progressing and supporting viable initiatives.** • In line with Sustainability Victoria's Collaborative Procurement Framework, scope key areas where a shared approach could benefit provision of local government services to their respective communities. • Lead the second stage of the Gippsland Collaborative Waste Investment Initiative in partnership with Gippsland councils to facilitate and promote engaged collaboration with other identified regional and cross regional partner organisations. • Facilitate partnerships between government authorities, local government and the waste industry to support the upgrades of waste and resource infrastructure or asset renewal, including consolidation or relocation where appropriate.	
	Improve local resource recovery by identifying innovative and viable recycling initiatives to improve the convenience, scope and consistency of recycling. • Participate in and support the statewide research on innovation in resource recovery and identify where new infrastructure can be developed or existing infrastructure and/or underutilised workforce can be leveraged. • Utilise the Waste and Resource Recovery Assessment Map to analyse high priority activity clusters (geographical/material or sector based) with common waste and resource recovery challenges and assist them in finding solutions. • Assess market stability and benchmark key technology options suitable in the Gippsland context, invite private sector responses and develop business plans to implement high priority initiatives. • Identify and support co-funding or other opportunities to implement improvements and innovation with identified partners.	

	State Strategic Direction	Timeframe	Participating Organisations
	1, 3, 4, 5	2017-2021	• GWRRG • Gippsland Local Government • Sustainability Victoria • Water and other government authorities • Neighbouring Waste and Resource Recovery Groups • Private operators • Private equity • Universities • Social enterprise
	1, 3, 4, 5	2017-2019	• GWRRG • Gippsland Local Government • Sustainability Victoria • Water and other government authorities • Neighbouring Waste and Resource Recovery Groups • Private operators • Private equity • Universities • Social enterprise

Table 1: Priority Actions (cont.)

Areas of Focus Priority Action	Activity	
Building greater responsibility and accountability. **3.** Drive greater responsibility and accountability for resource recovery within Gippsland communities and business sector by increasing the understanding and knowledge of the waste and resource recovery system.	**In alignment with the Victorian Waste Education Strategy, develop and implement best practice approaches to engender behavioural change as it relates to waste and resource recovery.** • Implement the Victorian Waste Education Strategy in the Gippsland region, focussing on locally important issues. • Undertake a situation assessment of the litter and illegal dumping across the region in line with the Victorian Litter Report Card and Local Litter Measurement Toolkit (LLMT)[2] to understand the magnitude of the issue, the related impact and costs to land managers, local government and other affected stakeholders and to benchmark behaviour change.	
Facilitating continuous improvement and enhanced performance. **4.** Assist the waste industry and local government to continuously improve the performance of Gippsland's waste and resource recovery infrastructure and systems through compliance and efficiency to deliver better public health outcomes.	**Lead improvements in the management of waste facilities.** • Determine continuous improvement actions that would benefit waste and resource recovery infrastructure in collaboration with local government, the waste industry, Environment Protection Authority (EPA) Victoria and other relevant regulatory agencies. • Benchmark activities to monitor and evaluate performance and encourage improvements. • Publish a Biennial 'State of Waste' Report for Gippsland to communicate successes and challenges in meeting key performance measures set for the region, and promote positive activities of the waste sector that support the community.	

2 The Local Litter Measurement Toolkit (LLMT) has been designed for local government and land managers to:

- 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; and
- Prepare business cases to bid for funding for initiatives to reduce litter and illegal dumping, maximise recycling, improve or introduce infrastructure and enforcement.

http://www.litter.vic.gov.au/litter-prevention-toolkits/local-litter-measurement-toolkit

	State Strategic Direction	Timeframe	Participating Organisations
	5, 6	2017; on-going implementation	• GWRRG • Local Government • Waste Industry • Education for Sustainability partner organisations • Business • Gippsland schools • Community • Sustainability Victoria • DELWP
	1, 3, 5	2017-2021	• GWRRG • Local Government • EPA • Sustainability Victoria

Table 1: Priority Actions (cont.)

Areas of Focus Priority Action	Activity	

Planning to reduce undesirable impacts
 	
5. Coordinate proactive planning to reduce impacts of events or failure of infrastructure that have the potential to impact on public health, cause environmental damage or disrupt the delivery of waste and resource recovery infrastructure and services.
	Identify the key risks to waste management assets arising from unexpected events, natural disasters and emergencies and ensure appropriate contingency measures are in place.
	
	• Coordinate the documentation of risks to waste and resource recovery infrastructure, including:
	  • Emergency events/natural disasters/pandemics
	  • Unplanned events, such as market failure
	• Work with local government, relevant government authorities and Emergency Management Victoria to identify appropriate mitigation responses or plans.	

	Support Gippsland councils and the EPA to identify the region's closed landfills, build on past risk assessments and assist in development of priorities at a regional scale. • Facilitate the development of a consistent methodology to assess the risk of closed landfill sites in Gippsland. • Facilitate an agreed management approach for closed landfills.	
Improving value of available information to support industry development **6.** Enhance the quantity, accuracy, consistency and transparency of information available for decision makers involved in Gippsland's waste and resource recovery system.	**Improve collection of waste data and reporting.** • Implement agreed waste and resource recovery data sets, and collection and reporting methodology, consistent with the state's Waste Data Governance Framework, in conjunction with the waste industry, local government, and state government agencies. • Ensure regular input to the data collection system. • Undertake detailed data analysis and modelling, based on accurate and contemporary data, to identify opportunities for improvement and provide a foundation for the priority actions in this Plan. • Develop routine data reporting protocols for public availability.	
	Develop an understanding of the material composition of waste generated by the construction (C&D) and business (C&I) sectors. • Investigate the composition of materials discarded by business and industry, thus supporting improvements in material efficiency, waste management and resource recovery.	

	State Strategic Direction	Timeframe	Participating Organisations
	5, 6	2017; on-going monitoring and execution to 2020	• GWRRG • Local Government • Sustainability Victoria • Water and relevant other Government Authorities including environmental and public health • Emergency Management Victoria • Waste Industry
	5, 6	2017; on-going monitoring and execution to 2021	• GWRRG • Local Government • Sustainability Victoria • Water and relevant other Government Authorities including environmental and public health • Emergency Management Victoria
	5, 6	2017-2021	• GWRRG • Waste industry • Local Government • State Government • Sustainability Victoria
	5, 6	2018-2020	• GWRRG • Waste industry • Local Government • State Government • Sustainability Victoria

Section 1:

About the Gippsland Waste and Resource Recovery Implementation Plan

1. About the Gippsland Waste and Resource Recovery Implementation Plan

As a requirement of Victoria's Environment Protection Act 1970 (the EP Act), the GWRRG has developed a Waste and Resource Recovery Implementation Plan - the Gippsland Implementation Plan - to help achieve a more viable resource recovery system within the region that leads to increased economic development opportunities and jobs while reducing reliance on landfill. The Plan outlines how the long term directions of the Statewide Waste and Resource Recovery Infrastructure Plan (State Infrastructure Plan) will be achieved in Gippsland.

The objective of the Plan is to identify Gippsland's waste and resource recovery infrastructure needs and priorities over the next ten years in order to deliver an efficient, effective and high quality service that minimises environmental and public health impacts and maximises the value returned from the materials recovered.

1.1. Purpose of the Plan

The Gippsland Implementation Plan has been developed to complement, and integrate with, the State Infrastructure Plan forming a key component of the Victorian Waste and Resource Recovery Planning Framework (the Framework).

The Plan presents the strategic direction for Gippsland's waste and resource recovery system, identifying its needs and priorities. It addresses issues specific to Gippsland while also aligning with other Regional Plans and the State Infrastructure Plan to establish an efficient statewide system.

1.2. What Will the Plan Deliver?

The Gippsland Implementation Plan provides the direction required to improve waste and resource recovery within Gippsland by proposing Priority Actions to achieve the goals and long term strategic directions of the State Infrastructure Plan. The Plan will form a component of the state's overall waste and resource recovery system through integration with the State Infrastructure Plan.

In Gippsland, the Plan is focussed on providing an evidence base for confident investment in waste and resource recovery infrastructure and services that deliver tangible benefit to our community. This would be achieved through job creation, diversification of our industry and energy generation, and reduced impacts on our valuable natural environment.

1.2.1. State Goals

The State Infrastructure Plan provides Victoria with a 30-year vision and roadmap to guide future planning for waste and resource recovery infrastructure, and forms the basis for an integrated system that:

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

The State Infrastructure Plan has four goals as outlined below.

Goal 1:

Landfills will only be used for receiving and treating waste streams from which all materials that can be viably recovered have been extracted.

Goal 2:

Materials are made available to the resource recovery market through aggregation and consolidation of volumes to create viability in recovering valuable resources from waste.

Goal 3:

Waste and resource recovery facilities including landfills are established and managed over their lifetime to provide best economic, community, environment and public health outcomes for local communities and the state, and ensure their impacts are not disproportionately felt across communities.

Goal 4:

Targeted information provides the evidence base to inform integrated state waste and resource recovery infrastructure planning and investment at the state, regional and local levels by industry, local government, waste and resource recovery groups, government agencies and the broader community.

The GWRRG has adopted the statewide strategic directions for the Gippsland Implementation Plan as follows:

- to maximise the diversion of recoverable materials from landfills;
- to support increased resource recovery;
- to achieve quantities for reprocessing;
- to manage waste and material streams;
- to maximise economic outcomes, provide cost effective service delivery and reduce community, environment and public health impacts; and
- to facilitate a cost-effective state network of waste and resource recovery infrastructure.

Figure 1 shows the relationship between these state goals, state strategic directions and the Priority Actions of the Gippsland Implementation Plan.

Figure 1a: Strategic Direction for Waste and Resource Recovery in Gippsland

State Vision

Victoria has an integrated 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 households, industry and governments

State Purpose

To provide strategic direction for the management of waste and resource recovery infrastructure to achieve an integrated system that effectively manages the expected mix and volumes of waste, reflects the principles of environmental justice to ensure the impacts on the community, environment and public health are not disproportionately felt, supports a viable resource recovery industry and reduces the amount of valuable material going to landfill.

State Goals

Goal 1

Landfills will only be for receiving and treating waste streams from which all materials that can be viably recovered have been extracted.

Goal 2

Materials are made available to the resource recovery market through aggregation and consolidation of volumes to create viability in recovering valuable resources from waste.

Goal 3

Waste and resource recovery facilities including landfills are established and managed over their lifetime to provide best economic, community, environment and public health outcomes for local communities and the state and ensure their impacts are not disproportionately felt across communities.

Goal 4

Targeted information provides the evidence base to inform integrated state waste and resource recovery infrastructure planning and investment at the state, regional and local levels by industry, local government, waste and resource recovery groups, government agencies and the broader community.

Figure 1b: Strategic Direction for Waste and Resource Recovery in Gippsland

State Infrastructure Plan Strategic Directions		
1	**To maximise the diversion of recoverable materials from landfills.** 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.	Goal 1 Goal 2 Goal 3
2	**To support increased resource recovery.** Planning of new landfill airspace, including the scheduling of new landfill sites, will be based on: • the volumes of residual waste streams remaining after all materials that can be recovered viably have been extracted. • a demonstrated need for additional airspace.	Goal 1 Goal 2 Goal 3 Goal 4
3	**To achieve quantities for reprocessing.** Consolidation and aggregation of material streams, around a hubs and spokes network, will be undertaken if: › there is a market for the feedstock › there is a viable business case › potential community, environment and public health impacts are minimised.	Goal 1 Goal 2 Goal 3
4	**To manage waste and material streams.** Suitably located and zoned land will be made available for the mix of infrastructure required.	Goal 1 Goal 2 Goal 3 Goal 4
5	**To maximise economic outcomes, provide cost effective service delivery and reduce community, environment and public health impacts.** Decisions to determine resource recovery and waste management options will be based on evidence.	Goal 3 Goal 4
6	**To facilitate a cost effective statewide network of waste and resource recovery infrastructure.** Integrated statewide planning and decision making will be capable of addressing local, regional and state needs.	Goal 3 Goal 4

Goal 1
Goal 2
Goal 3
Goal 4

Coloured circles indicate which Strategic Directions and which Gippsland Priority Actions support each of the State Goals.

Gippsland Priority Actions		
Achieving greater material recovery through development of appropriate, well sited infrastructure.	Continue to reduce reliance on landfill by actively planning and promoting the transition to greater resource recovery by developing infrastructure to maximise the value of materials collected. Links to Strategic Directions: 1, 2, 3, 5.	
Driving Innovative Services and Infrastructure Provision.	Stimulate the introduction of innovative waste and resource recovery services and infrastructure, by driving collaboration between local government, the waste industry and community to meet the diverse needs of Gippsland. Links to Strategic Directions: 1, 3, 4, 5.	
Building Greater Responsibility and Accountability.	Drive greater responsibility and accountability for resource recovery within Gippsland communities and business sector by increasing the understanding and knowledge of the waste and resource recovery system. Links to Strategic Directions: 5, 6.	
Facilitate Continuous Improvement and Enhanced Performance.	Assist the waste industry and local government to continuously improve the performance of Gippsland's waste and resource recovery infrastructure and systems through compliance and efficiency to deliver better public health outcomes. Links to Strategic Directions: 1, 3, 5.	
Planning to Reduce Undesirable Impacts.	Coordinate proactive planning to reduce impacts of events or failure of infrastructure that have the potential to impact on public health, cause environmental damage or disrupt the delivery of waste and resource recovery infrastructure and services. Links to Strategic Directions: 5, 6.	
Improving Value of Available Information to support industry development.	Enhance the quantity, accuracy, consistency and transparency of information available for decision makers involved in Gippsland's waste and resource recovery system. Links to Strategic Directions: 5, 6.	

1.3. Legislative and Policy Context

1.3.1. Relevant Acts of Parliament (Legislation)

In 2014, the Environment Protection Act (EP Act) was amended to establish the Victorian Waste and Resource Recovery Infrastructure Planning Framework (the Framework).

As amended, the EP Act provides the legislative underpinning for the Regional Waste and Resource Recovery Implementation Plans (Regional Implementation Plans).

The Framework and the Regional Implementation Plans are primarily governed by the EP Act. However, regard should also be given to other relevant legislation as appropriate, including the Planning and Environment Act 1987 (Vic) and the Transport Integration Act 2010 (Vic).

1.3.2. Victorian Infrastructure Framework

The Framework provides the structure for strategic planning for waste and resource recovery that integrates state, regional and local planning. The objectives of the Framework are to:

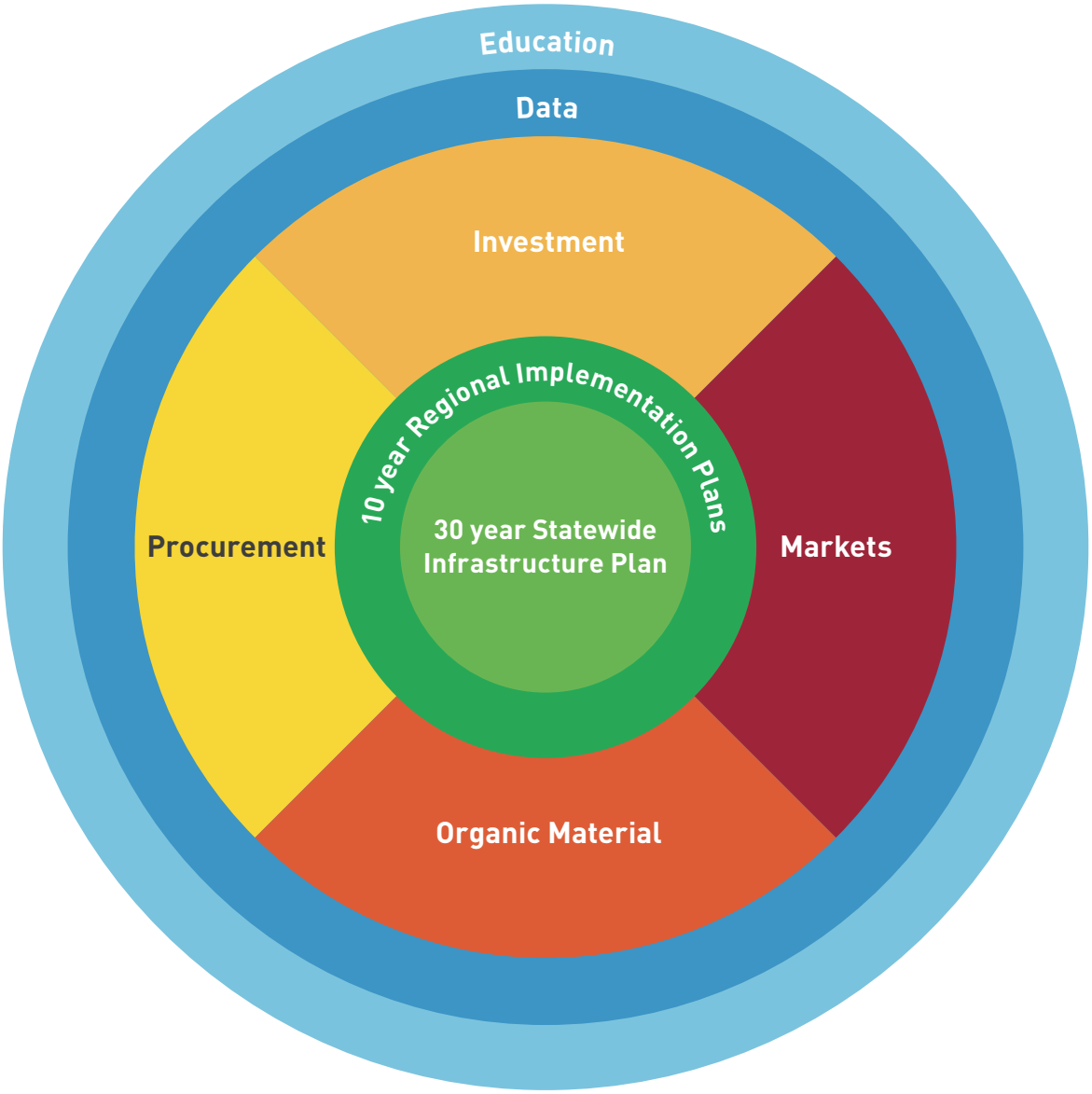
- ensure long term strategic planning for waste and resource recovery infrastructure at state and regional level;
- facilitate the integration of state directions for the management of waste and resource recovery infrastructure and regional infrastructure needs;
- enable waste and resource recovery planning to be:
    - effectively integrated with land use and development planning and policy
    - effectively integrated with transport planning and policy
- ensure Sustainability Victoria (SV) and the Waste and Resource Recovery Groups (WRRGs) work together to integrate the Statewide Waste and Resource Recovery Infrastructure Plan and Regional Implementation Plans; and
- enable waste and resource recovery infrastructure planning decisions at the appropriate level of the Framework.

The Framework, shown in Figure 2, provides for the preparation, integration and implementation of the State Infrastructure Plan by Sustainability Victoria based on the seven Regional Implementation Plans.

Strategic documents to drive the Framework include:

- Victorian Waste and Resource Recovery Infrastructure Investment Prospectus, October 2015;
- Victorian Organics Resource Recovery Strategy, September 2015;
- Collaborative Procurement Guidelines for Waste and Resource Recovery Groups, 2015;
- Waste Data Governance Framework, 2015;
- Victorian Waste Education Strategy, August 2016; and
- Victorian Market Development Strategy for Recovered Resources, May 2016.

Figure 2: The Victorian Waste and Resource Recovery Infrastructure Planning Framework



The Gippsland Regional Growth Plan recognises the important role efficient waste management plays in supporting sustainable growth. The Growth Plan" …supports an ongoing, coordinated approach to managing solid waste through a network of landfill and recovery centres that are accessible for domestic and industrial users. Local strategic planning should support and facilitate the development of waste facilities including appropriate amenity buffers to secure their operations in the long term." [3]

In addition, Plan Melbourne, the metropolitan planning strategy, has been considered in the development of this Implementation Plan where relevant. Specifically, the GWRRG supports Direction 5.8 - Plan for better waste management and resource recovery.[4]

3 Gippsland Regional Growth Plan, May 2014, Victorian Government
4 Plan Melbourne, 2014

The government has committed to restoring Victoria's position as a leader in climate change action and is taking a range of actions to deliver on this commitment, including:

- Delivering the comprehensive whole of government response to the independent review of the Climate Change Act 2010;
- Preparing a Climate Change Framework to 2050;
- Developing the state's second Climate Change Adaptation Plan;
- Committing to a long term emissions reduction target of net zero emissions by 2050, coupled with a renewable energy target of 25% by 2020 and 40% by 2025.

Climate change will affect Victoria's waste and resource recovery industry in various ways. Impacts may include issues such as changes in the timing, form and amount of rainfall as well as potential increases in extreme events such as droughts and floods. These can affect waste infrastructure and the way in which we deliver these services. They will also provide challenges in the methods used for remediation, landfill gas attenuation and protection of local water quality.

The second Victorian Climate Change Adaptation Plan will set out climate change adaptation actions across the state for the next four years from 2017. This policy agenda for climate change action fits within the broader, long term and transformational vision of the state's Climate Change Framework to 2050.

The seven Waste and Resource Recovery Groups have an opportunity to contribute towards action on climate change, and support the waste and resource recovery sector's contribution to action:

- committing to TAKE2 - Victoria's climate change pledge, by taking measures to reduce Victoria's greenhouse gas emissions from operations and facilities, landfills and reprocessing of materials that contribute to climate change if managed in certain ways;
- the incorporation of climate-resilient considerations into the design and management of waste infrastructure;
- assisting the delivery of markets for reprocessed materials, i.e. organics to compost or energy;
- reviewing the risk factors and current assumptions about remediation and containment methods, considering climate change impacts and mitigating these risks where practicable;
- consideration of current waste management capacity, including interim capacity, to handle surges in treatment and disposal of waste generated from climate events (floods, bushfires etc.);
- contribution to improvements in soil quality through the provision of compost;
- contribution to renewable energy targets using Waste to Energy technologies as well as the use of renewable fuels in undertaking waste and resource recovery services; and
- continued engagement to increase the community's adaptive capacity and resilience to climate change impacts.

1.3.3. The Role of the Gippsland Waste and Resource Recovery Group (Governance Arrangements)

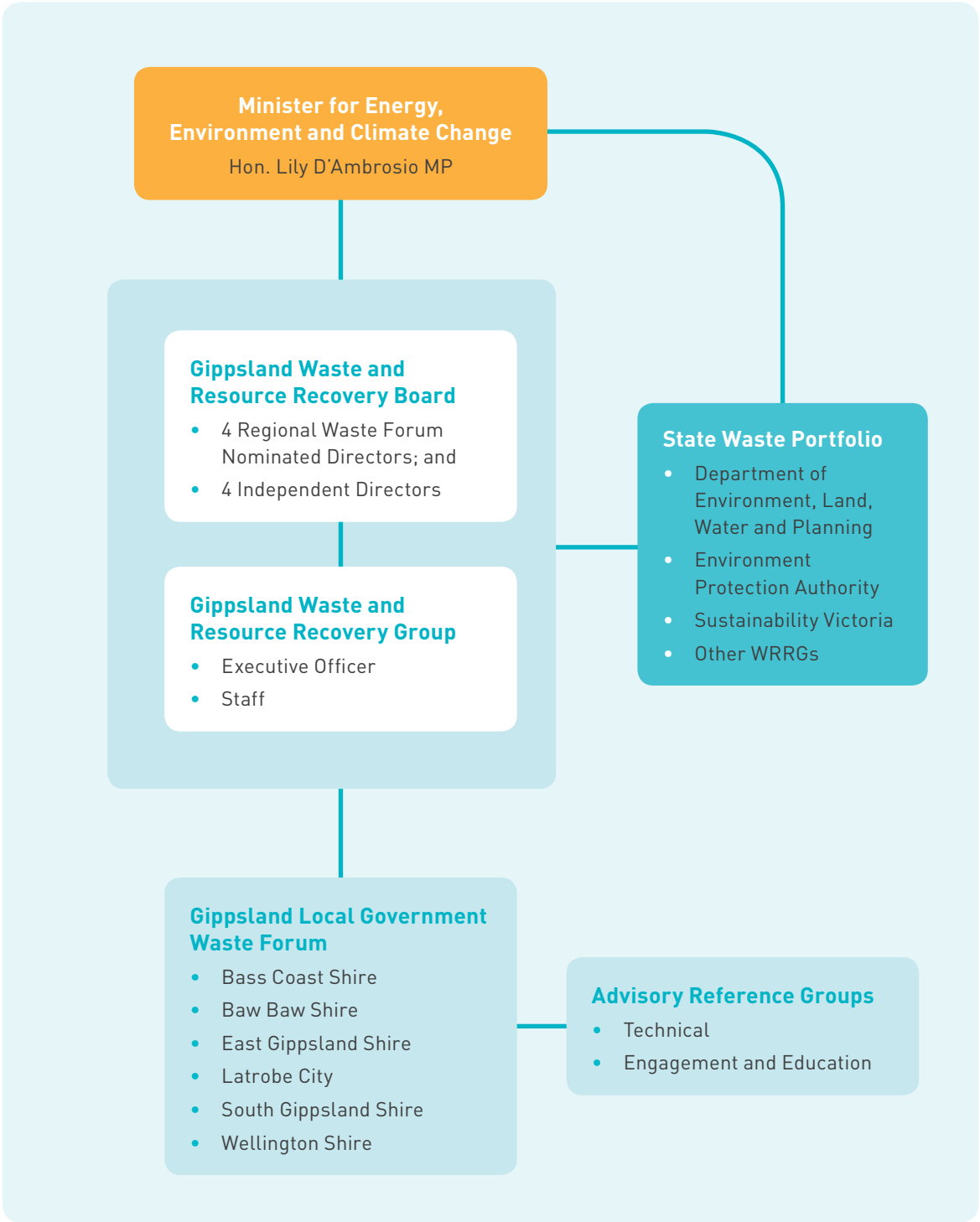
In April 2014, the Victorian Government undertook a review of waste management arrangements in the state, resulting in seven Waste and Resource Recovery Groups being established under new legislation. These groups were strengthened through clearer statutory powers to undertake regional waste planning for all solid waste streams (Municipal Solid Waste /Commercial & Industrial /Construction & Demolition) and to facilitate joint procurement in partnership with local government.

The GWRRG is one of these seven groups established as Statutory Bodies under the EP Act 1970, amended in 2014 (Section 49C). The objective of a Waste and Resource Recovery Group is specified in Section 49G of the EP Act.

Section 50BA of the EP Act outlines the objective of a Regional 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".

The Gippsland Governance structure is outlined in Figure 3.

Figure 3: Governance Structure



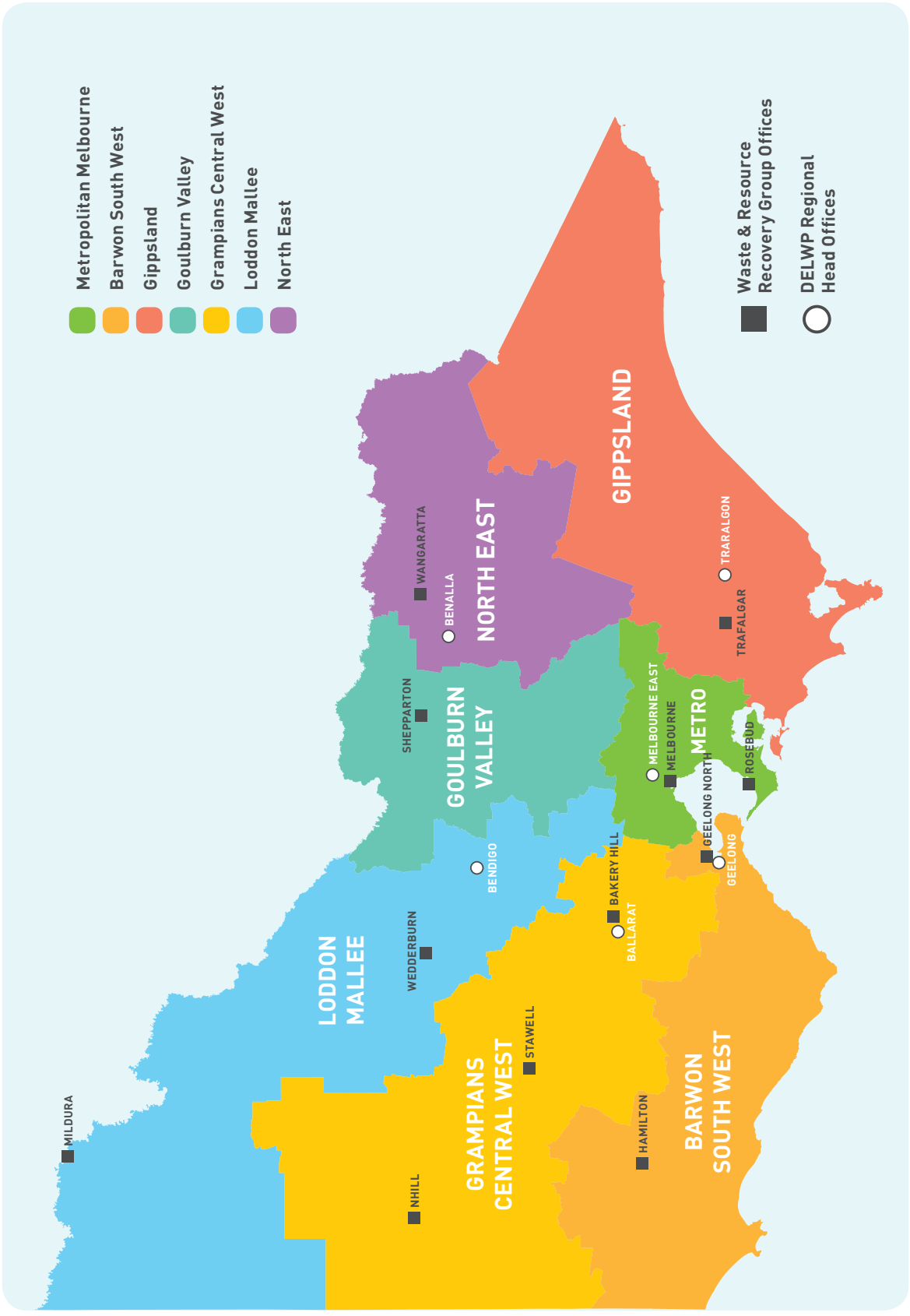


Figure 4: Waste and Resource Recovery Regions in Victoria

1.3.4. Who Will Use the Plan?

The final Gippsland Implementation Plan will be used to inform decision making by Gippsland councils, industry, individuals and the community as they pursue improvements to resource recovery and waste management in the region.

The Plan will guide the work of the GWRRG over the next ten years. Some actions in this Plan align with those in the Implementation Plans for other waste and resource recovery regions. Where appropriate, the GWRRG will work with the other Waste and Resource Recovery Groups to determine if a joint approach may provide opportunities for better outcomes.

1.4. How the Plan Was Developed (Methodology)

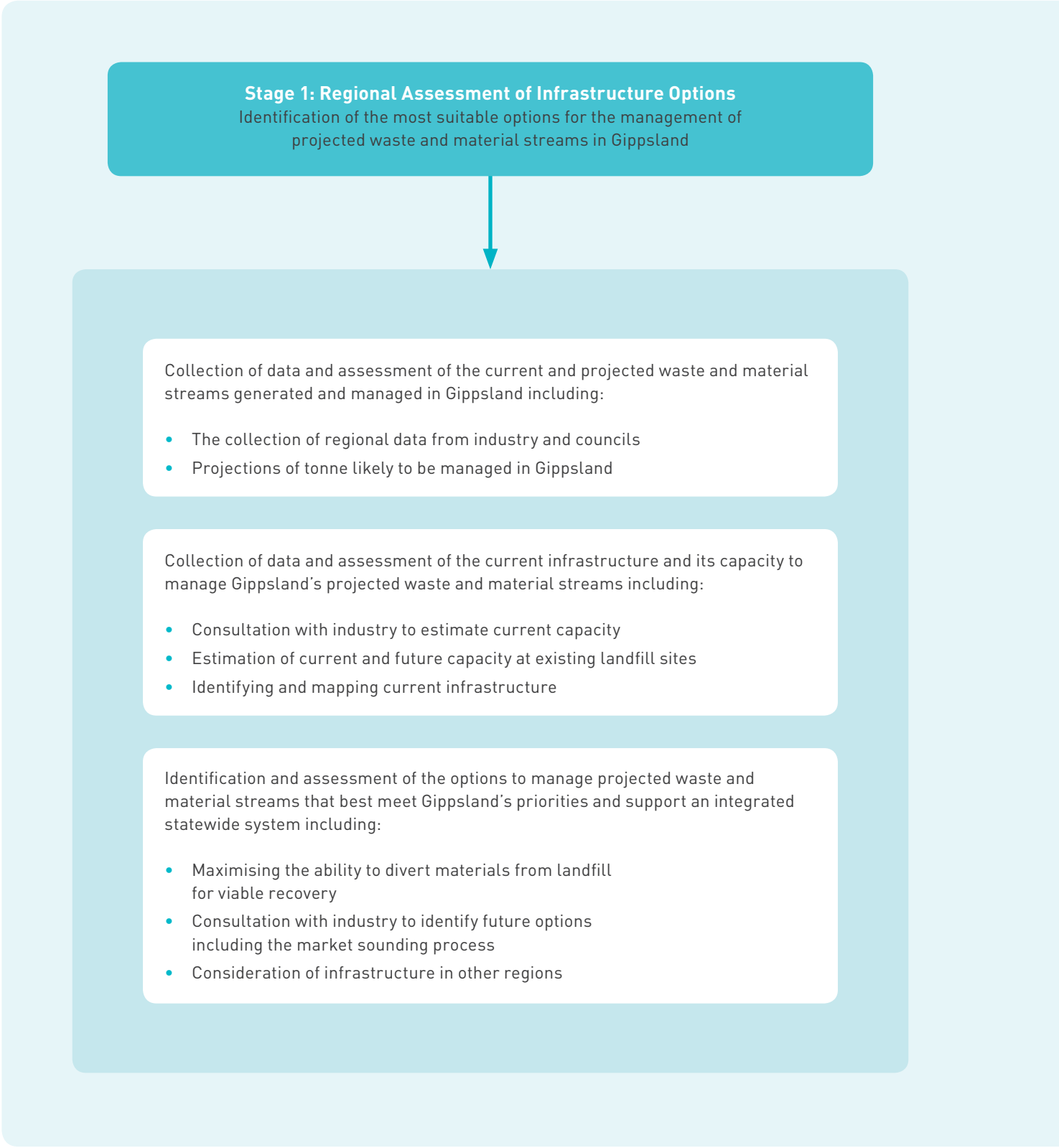
The Gippsland Implementation Plan was developed in three main stages. The overall methodology for development of the Implementation Plan is depicted in Figure 5.

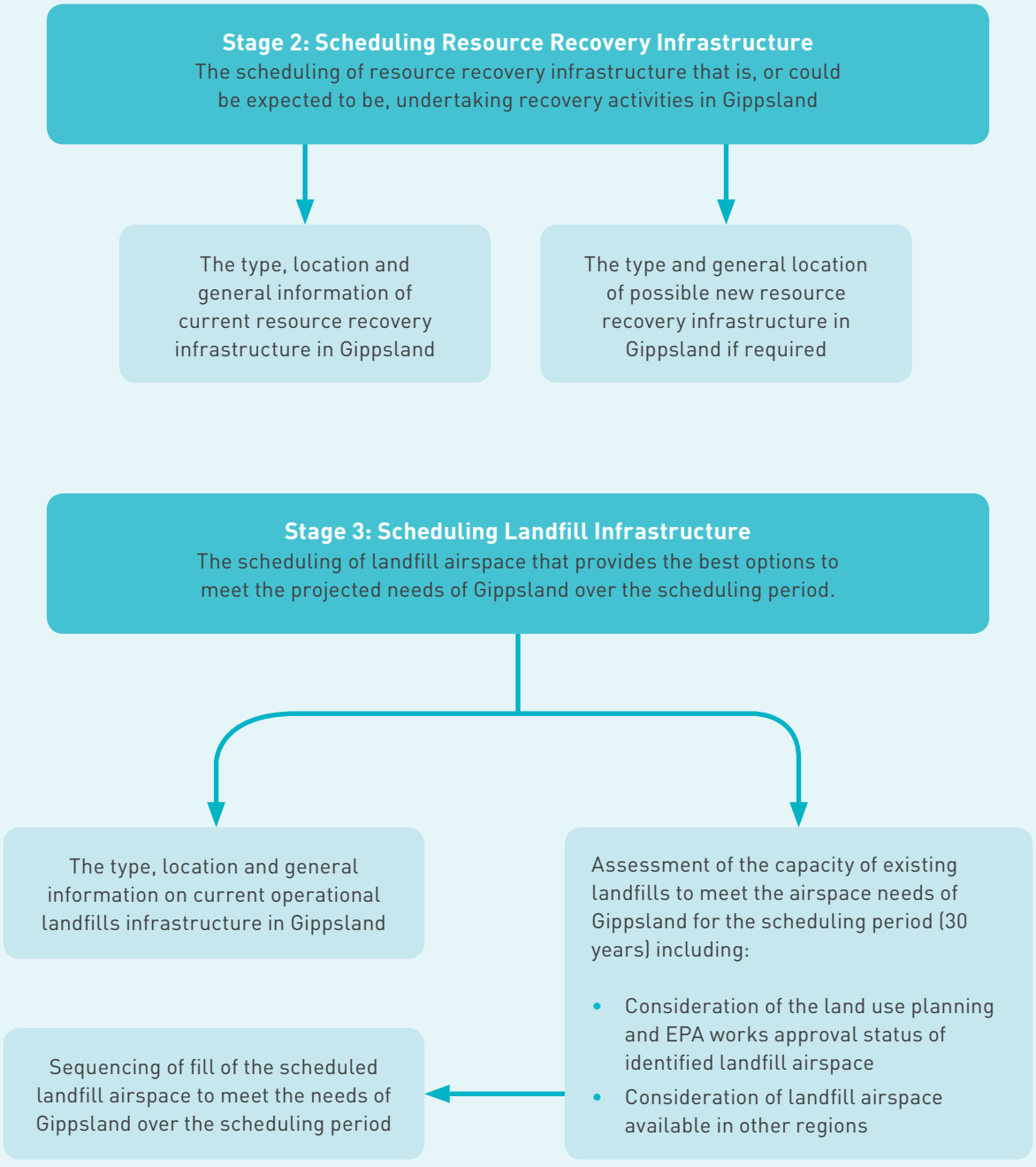
Figure 5: Process for Preparing the Gippsland Implementation Plan

STAGE 1 Understanding Gippsland	Population Growth
	Spatial Locations
	Settlement Patterns
	Facilities & Services Provided
	Challenges & Opportunities
	Engagement with Stakeholders & Community (Discovery)
STAGE 2 Analysing Gippsland's Capacity and Need	Performance Assessment
	Cost & Benefit
	Barriers & Enablers
	Options Analysis & Prioritisation
	Develop Current & Future Infrastructure Schedules
	Stakeholder & Community Engagement (Consultation Draft)
STAGE 3 Consideration of consultation findings, integrating with the State Infrastructure Plan and Regional Plans followed by submission to the Minister for Energy, Environment and Climate Change.	

The first stage involved acquiring an expanded understanding of Gippsland's waste and resource recovery system as well as the challenges and opportunities inherent in improving the way facilities and services are currently provided. These considerations are driven by Gippsland's population and settlement patterns. In Gippsland, there is a contrast between significant population growth in the western part of the region and a matrix of medium sized towns, surrounded by dispersed and relatively isolated communities with low population density in much of the remainder of the region.

Figure 6: Infrastructure Scheduling Process




Stage 2: Scheduling Resource Recovery Infrastructure
The scheduling of resource recovery infrastructure that is, or could be expected to be, undertaking recovery activities in Gippsland
The type, location and general information of current resource recovery infrastructure in Gippsland
The type and general location of possible new resource recovery infrastructure in Gippsland if required
Stage 3: Scheduling Landfill Infrastructure
The scheduling of landfill airspace that provides the best options to meet the projected needs of Gippsland over the scheduling period.
The type, location and general information on current operational landfills infrastructure in Gippsland
Assessment of the capacity of existing landfills to meet the airspace needs of Gippsland for the scheduling period (30 years) including:
Consideration of the land use planning and EPA works approval status of identified landfill airspace
Consideration of landfill airspace available in other regions
Sequencing of fill of the scheduled landfill airspace to meet the needs of Gippsland over the scheduling period

This first stage of development was supported by an engagement process that commenced in 2014. Early feedback was collected and stakeholder connections were established following the restructure of the GWRRG resulting from changes to the EPA Act. Targeted meetings were convened with relevant representatives of Gippsland's six councils in the areas of Planning, Economic Development, Waste, Environment and Procurement. Meetings were also held with government authorities and state government agencies.

A 'discovery phase' followed with community and industry consultations conducted in January and February 2016. More than 230 people took part in face-to-face sessions in 12 locations across the region. In addition, there were 18 written responses and two email responses.

The second stage was underpinned by a suite of projects and collaborations undertaken over the past few years by the GWRRG and its predecessor organisation, the Gippsland Regional Waste Management Group. Key components of this work included:

- development of a full cost calculator for the region's licensed landfills with detailed recommendations to improve future budgeting and operational performance;
- risk assessments of each licensed landfill including the development of auditor verified monitoring plans;
- risk assessments of 23 of the region's closed landfills;
- financial modelling and benchmarking the performance of Gippsland's transfer stations to better understand costs and functionality;
- support and facilitation of the Gippsland Collaborative Waste Investment Initiative seeking proposals from the private sector to improve Municipal Solid Waste recovery and reprocessing;
- a trial program to recover food and garden organics from 2,400 households in two Gippsland townships undertaken over six months; and
- the ResourceSmart Schools pilot program, which typifies the challenges of engaging with a diverse group of stakeholders and the limitations of taking a 'one size fits all' approach in Gippsland.

Additional work has been undertaken by the GWRRG and councils to assess how well the Gippsland waste and resource recovery system is operating, what are the limiting factors inhibiting improved performance and what priority actions will deliver a better result.

An assessment of current waste and resource recovery infrastructure and landfill capacity was undertaken to develop an understanding of the existing system. To identify opportunities to supplement and increase Gippsland resource recovery and material reprocessing capability, an examination of private sector interest via a market sounding process was implemented.

A key component of this work was the preparation of Infrastructure Schedules to describe current facilities and identify infrastructure required in the future. The process to develop these Schedules is depicted in Figure 6 and outlined in more detail in Section 3.1.5.1.

Using the information developed, a consultation draft was developed and a statutory public consultation process undertaken over six weeks in August and September 2016.

Following the statutory public consultation round, the third stage was an integration process to assist in aligning the Plan with the State Infrastructure Plan and other Regional Implementation Plans.

1.5. Review of the Gippsland Implementation Plan in 2019

The GWRRG intends to undertake a review of components of the Gippsland Implementation Plan in 2019 to:

- assess the impact of the Plan on the resource recovery market; and
- consider any changed circumstances, including changes to legislation, government policy and technology.

As part of this review, the GWRRG will work in collaboration with adjoining regions. Upon the review's completion, the Plan will be updated as necessary and in accordance with statutory requirements.

The GWRRG has committed to repeating the landfill needs assessment in 2019. This will ensure that any gaps in the availability of landfill airspace to meet the needs of the region will be identified and addressed. This will be undertaken with adequate time to determine the most appropriate solution/s, schedule new infrastructure in accordance with the statewide process (if required) and allow sufficient time for planning and construction.

Factors that 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; and
- A scheduled landfill not receiving approvals for scheduled expansions.

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

1.6. How the Plan Will be Measured

The development of the Gippsland Implementation Plan has created a baseline for measuring the performance of Gippsland's waste and resource recovery infrastructure and services. It allows key performance indicators to be developed by the GWRRG to monitor the progress of the delivery of the Priority Actions and the various activities that support these actions.

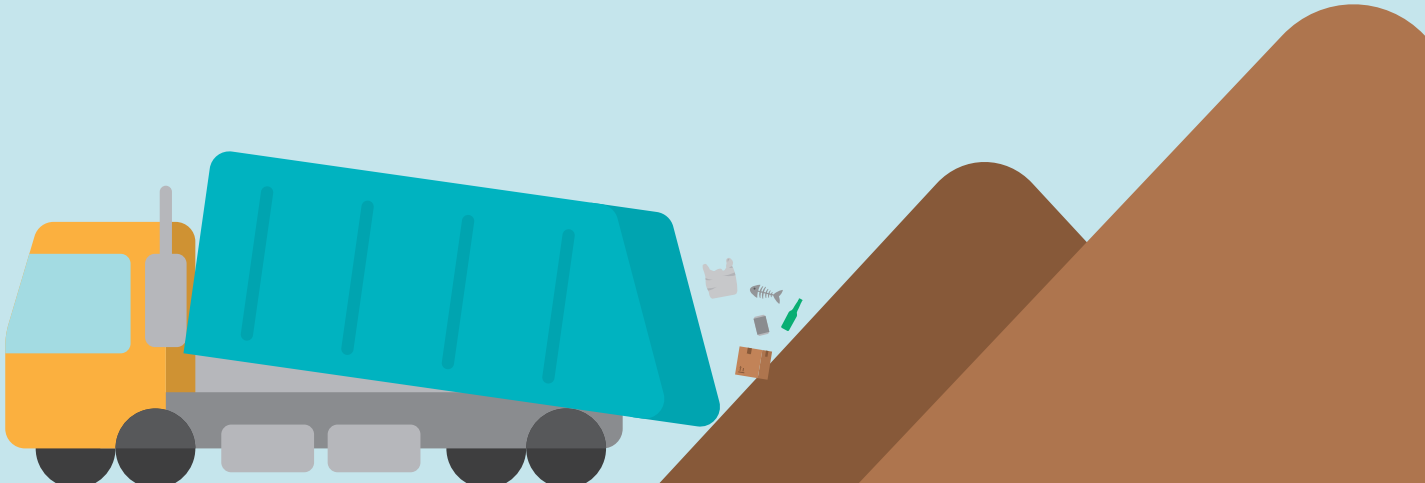
The GWRRG Business Plan will be used to outline the activities to be delivered over a four-year planning period, with a report on progress communicated through the Annual Report.

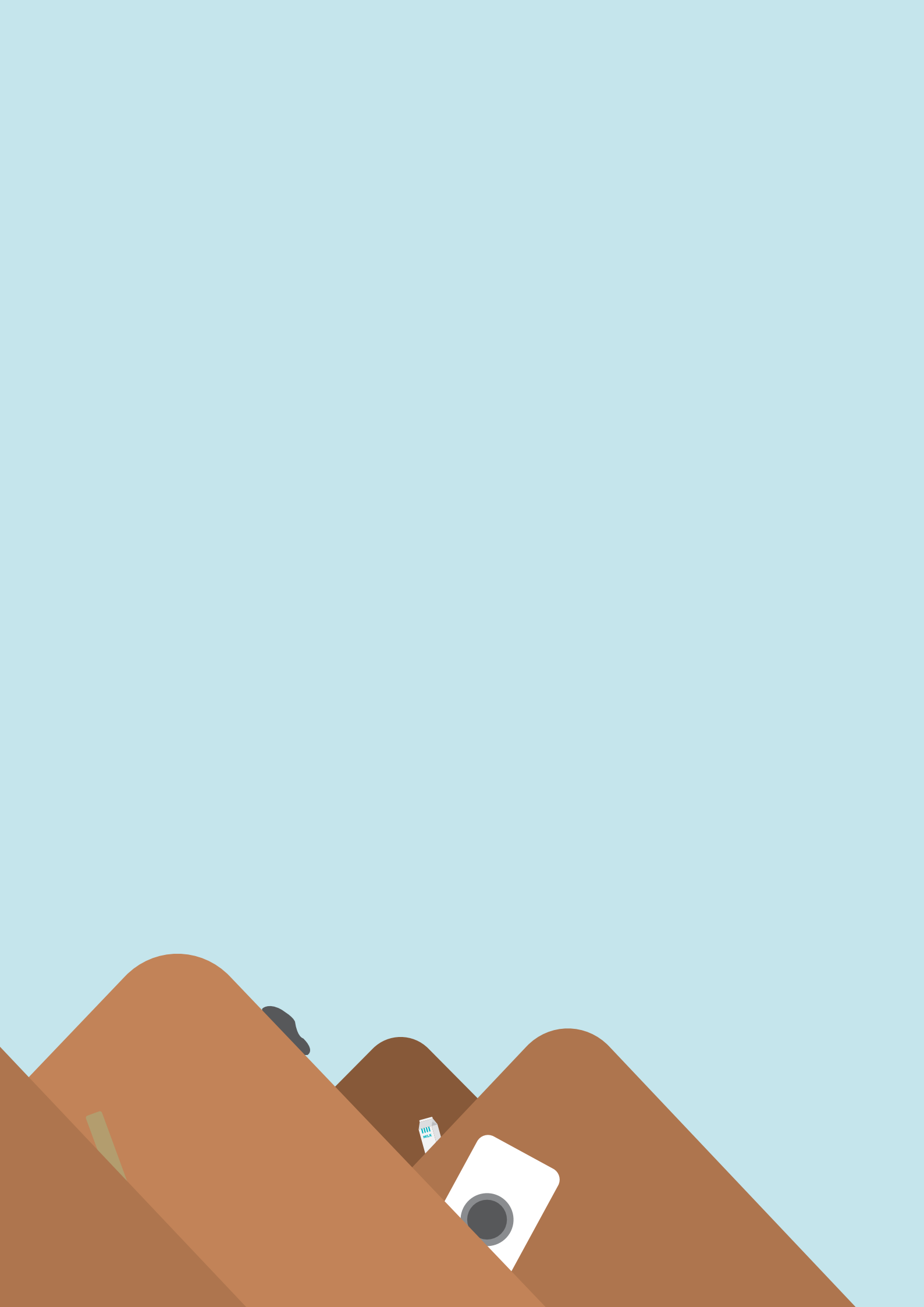
The Gippsland 'State of Waste' Report will be used to report, on a biennial basis, the progress of the waste and resource recovery industry and the community in responding to the Priority Actions in the Plan. It will also track progress towards achieving the long term strategic directions and 30 year goals contained within the State Infrastructure Plan.

Based on the above, a comprehensive and consistent monitoring and evaluation program will be developed in collaboration with the other Regional Groups and Sustainability Victoria.

Section 2:

Waste in Gippsland

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2. Waste in Gippsland

2.1. A Snapshot of our Region

Gippsland, in Victoria's southeast, is 41,600 square kilometres in area. While the region contains the second and fourth fastest growing regional municipalities in the state, Baw Baw and Bass Coast Shires respectively, much of Gippsland is sparsely populated.[5] For example, the population density of East Gippsland Shire is only 2.1 persons per square kilometre.[6] The current (2016) population of Gippsland is 271,182 and by 2031, it is expected that 333,327 people will call Gippsland home.[7]

Overall population growth is considerable, particularly in the western peri-urban areas of Gippsland, driven by proximity to Melbourne's south eastern growth corridor. This growth is generating sustained pressure on infrastructure and the provision of services.

Gippsland's settlement characteristics are such that "around 40% of the region's population lives in towns and settlements of less than 1,000 people. These towns are dispersed throughout the region including the high plains, historic gold mining areas and in agricultural areas, giving the region a strong series of towns with local amenity, community character and tourist destinations. The dispersal of these small towns also presents a range of challenges with respect to the delivery of, and/or access to services…."[8]

The region currently provides approximately 85% of Victoria's electricity supply, 97% of its natural gas, 60% of the state's water supply and 42% of its fishing catch. Major employment sectors include energy production, tourism, manufacturing, hospitality, health and human services, forestry and food production. Australian Paper's Maryvale Mill, situated in the Latrobe Valley, is the largest paper manufacturing facility in the southern hemisphere and the only manufacturer of fine office paper in Australia. A recently constructed paper de-inking plant on the site provides significant capacity for reprocessing of paper products into a new high quality product.[9]

Significant tourism activity accentuates the pressure on waste and resource recovery infrastructure and services in many parts of Gippsland. Tourism Victoria indicates that in 2014, there were 1,583,000 overnight visitors to the Greater Gippsland Region (which excludes Phillip Island), resulting in 4.7 million visitor nights. In addition, there were 845,000 visitors to Phillip Island resulting in more than 2.5 million visitor nights. During this period, there were 3.53 million day trips to Gippsland.[10] [11] While the implications of this population influx on Gippsland's waste and resource recovery system are difficult to fully assess and accurate annualised equivalent population numbers are not available, anecdotal evidence indicates that the impact is significant.

National parks, publicly owned forests and native freehold forests make up 67% of Gippsland's landmass.[12] With Victoria recognised "as one of the most fire-prone areas in the world",[13] this substantive forest coverage results in the Gippsland community being frequently exposed to fire events. At the other extreme, a combination of the region's geography and generous rainfall result in flood events being reasonably common. Anticipated climate change impacts are expected to increase the frequency and possibly the severity of these events into the future.

5 Victoria in Future, 2015
6 ABS Website
7 Victoria in Future*, 2015*
8 Gippsland Regional Pla*n,* 2015-2020, p.19
9 Gippsland Regional Plan, Summary, 2014
10 Gippsland Market Profile: Year ending December 2014, Tourism Victoria
11 Phillip Island Market Profile; Year ending December 2014, Tourism Victoria
12 Gippsland Regional Plan, Summary, 2014
13 State Bushfire Plan, Emergency Management Victoria, 2014

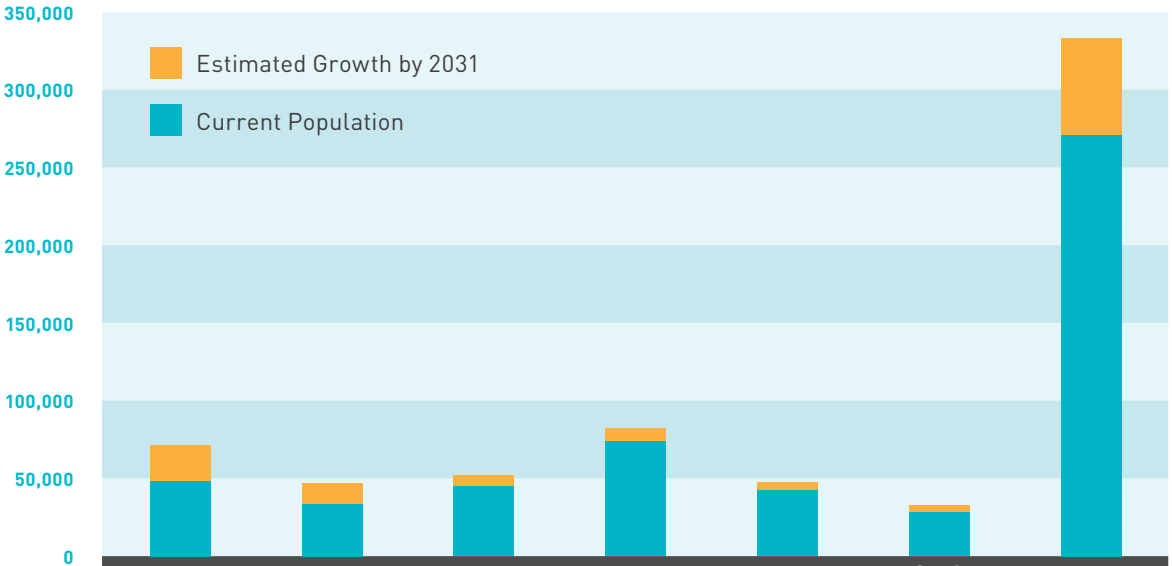
Gippsland consists of six municipalities.

Table 2: Gippsland's Local Government Areas

Local Government Area	Key Centres
Baw Baw Shire	Warragul, Drouin, Trafalgar
Bass Coast Shire	Wonthaggi, Inverloch, Cowes
East Gippsland Shire	Bairnsdale, Lakes Entrance, Orbost
Latrobe City	Traralgon, Moe, Morwell, Churchill
South Gippsland Shire	Leongatha, Foster, Mirboo North, Korumburra
Wellington Shire	Sale, Maffra, Rosedale, Yarram

Population growth is expected to be significant over the next 15 years, particularly in the western part of the region. This is shown in Figure 7 below.

Figure 7: Gippsland Population Growth Predictions[14]



	Baw Baw Shire	Bass Coast Shire	East Gippsland Shire	Latrobe City	Wellington Shire	South Gippsland Shire	Gippsland
	22,867	13,291	7,631	8,552	5,165	4,652	62,145
	48,378	33,581	44,611	73,903	42,467	28,112	271,182
TOTAL	71,245	46,872	52,242	82,455	47,632	32,764	333,327

14 Information derived from the Gippsland Regional Plan, 2015-2020

2.2 Our Waste

Sustainability Victoria modelling indicates there were 11,719,000 tonnes of waste generated in Victoria in 2013-14, with 73% generated by metropolitan Melbourne and 27% across regional Victoria. Gippsland generates 3.8% of the waste generated in Victoria. Facilities of statewide significance established in Gippsland manage large amounts of garden organics, and paper and cardboard material which are transported into the region for reprocessing.

The information presented in the following tables is based on quantities and types of materials recorded at the point of receival for consolidation followed by reprocessing or disposal.

2.2.1. Where Does Our Waste Come From?

The point where waste is created is important in understanding the most appropriate and effective time and ways to intervene. Analysis of data from various sectors will help focus efforts to minimise the total waste generated and identify opportunities to better reuse or recycle particular material streams. For example, manufacturers may make decisions regarding packaging options that later impact, adversely or positively, on the amount of waste created in our communities.

Furthermore, the life cycle assessment of goods[15] can lead to innovative ways to either avoid producing waste or ensure the components can be reused or recycled rather than disposed.

More information and engagement with business and the community are required to fully understand where waste is generated in Gippsland and outside of the region.

Waste practitioners define the three main sources of waste as:

- Building waste (known as Construction and Demolition or C&D) generated from residential and commercial Construction and Demolition;
- Business waste (known as Commercial and Industrial or C&I) generated from trade, Commercial and Industrial activity; and
- Household and council waste (known as Municipal Solid Waste or MSW), generated by residential and municipal activity.[16]

The GWRRG is committed to working with Sustainability Victoria, other Waste and Resource Recovery Groups, the community and industry to improve the collection of data to better understand Gippsland's waste and resource recovery system and the characteristics of the materials collected by this system.

All waste data presented in this Plan has been gathered from sources provided in Table 25, located in Appendix 1.

15 Assessment of the processes by which goods are produced, consumed and discarded.
16 Complete definitions for each are provided in the Glossary.

In particular, the six key sources were fundamental in the Plan's development and projection modelling, include:

- Landfill Levy Data, EPA Victoria;
- Whole-of-life assessments for Gippsland landfill and transfer stations, Gippsland Regional Waste Management Group;
- Victorian Landfill Audits, 2009, Sustainability Victoria;
- Survey of Reprocessors in Gippsland, Sustainable Resource Use (SRU), 2015;
- Victorian Local Government Annual Survey (VLGAS), Sustainability Victoria; and
- Victorian Recycling Industries Annual Survey (VRIAS), Sustainability Victoria.

2.2.2. Waste Generated in Gippsland

Waste generated in Gippsland is any waste material produced that originated from Gippsland. It includes material that originated in Gippsland but is reprocessed in other regions.

The sources of waste materials generated in the Gippsland are listed below in Table 3 below.

Table 3: Waste Generated in Gippsland (2013-2014 data)

Waste Generated in Gippsland			
Source	**Recovered (t)**	**Landfilled (t)**	**Generated (t)**
Municipal	123,400	73,000	196,400
Commercial & Industrial (C&I)	165,400	59,700	225,100
Construction & Demolition (C&D)	25,000	3,500	28,500
TOTAL	**313,800**	**136,200**	**450,000**

- Tonnes rounded to the nearest 100.
- Modelled raw data from the Sustainability Victoria, SRU Survey and analysis of regional reprocessors, material recovery facility operators Gippsland Waste and Resource Recovery regional report (June 2015) and GWRRG Transport and Logistics Modelling Project (2016) landfill and transfer station quantities.
- Tonnes landfilled are derived from landfill levy data supplied by EPA and do not include Prescribed Industrial Waste (PIW). 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.

2.2.3. Waste managed in Gippsland

Waste managed in Gippsland is all waste material that has passed through or been managed at a waste and resource recovery facility located in Gippsland, including RRC/TS, MRFs, reprocessors or landfills.

The waste managed in Gippsland includes:

- material generated in Gippsland that is recovered or disposed in Gippsland facilities or flows into other regions for reprocessing or disposal; and
- material generated in another region that flows into Gippsland for further reprocessing or disposal.

The waste managed in Gippsland facilities is the material recovered/reprocessed or landfilled in Gippsland, regardless of where it is generated. For example, the GWRRG data indicates that of the total waste managed in Gippsland each year, approximately 60% is garden organics, which includes flows into the region. This is collected and reprocessed through the combined operations of Pinegro, and the Gippsland Water Soil and Organics Recycling Facility (SORF) as well as other smaller operators.

The annual quantities of waste managed in Gippsland is summarised by source in Table 4.

Table 4: Waste Managed in Gippsland (2013-2014 data)

Waste Managed in Gippsland			
Source	**Recovered/ Reprocessed (t)**	**Landfilled (t)**	**Managed (t)**
Municipal	278,700	72,900	351,600
Commercial & Industrial (C&I)	297,700	3,500	301,200
Construction & Demolition (C&D)	22,600	59,800	82,400
TOTAL	**599,000**	**136,200**	**735,200**

- Tonnes rounded to the nearest 100.
- Modelled raw data from Sustainability Victoria, SRU Survey and analysis of regional reprocessors, material recovery facility operators Gippsland Waste and Resource Recovery regional report (June 2015) and GWRRG Transport and Logistics Modelling Project (2016) landfill and transfer station quantities.
- Tonnes landfilled are derived from landfill levy data supplied by EPA and do not include Prescribed Industrial Waste (PIW). 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.
- Gippsland landfills receive 3.4% of the waste materials disposed to landfill in Victoria.

There are limitations in characterising specific material types deposited to landfills in the region due to a lack of waste audits at Gippsland landfills. Therefore, landfill audit data collected by Sustainability Victoria in 2009 has been used to provide an indicative representative material breakdown.

Table 5 provides a detailed material category breakdown representation of the waste managed in Gippsland.

Table 5: Waste managed in Gippsland details by Material Categories (2013-2014 data)

Material Category		Recovered/ Reprocessed (tonnes)	Landfilled (tonnes)	Managed (tonnes)
Organics	Food	10,400	29,500	39,900
	Garden Organics	133,600	8,600	142,200
	Wood/Timber	53,300	9,900	63,200
	Combined Organics	150,500	200	150,700
	Total Organics	347,800	48,200	396,000
Paper/ Cardboard		50,000 - 160,000	15,800	65,800 - 175,800
Glass		100	2,700	2,800
Plastic		100	13,900	14,000
Rubber (incl. tyres)		10,500	0	10,500
Metals		2,300	2,300	4,600
Aggregates, Masonry & Soil		23,900	29,400	53,300
Textiles		Unknown	5,100	5,100
Hazardous	E-waste	400	Unknown	400
	(excluding. E-waste)	100	Unknown	100
	Total Hazardous	500	Unknown	500
Other (mixed materials)		142,500	18,800	161,300

- Landfill material percentages breakdown is based on state averaged data from SV 2009 landfill audit and Sustainability Victoria's Regional Waste and Resource Recovery Database (RWRRD)
- Modelled raw data from the Sustainability Victoria, SRU Survey and analysis of regional reprocessors, material recovery facility operators Gippsland Waste and Resource Recovery regional report (June 2015) and GWRRG Transport and Logistics Modelling Project (2016) landfill and transfer station quantities.
- Tonnes landfilled are derived from landfill levy data supplied by EPA and do not include Prescribed Industrial Waste (PIW). 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.

Table 6 provides a breakdown by service type of the amount of material disposed to landfill by each source sector in Gippsland per annum. It should be noted that waste materials generated by the Construction and Demolition (C&D) sector are frequently collected in the same vehicles servicing the Commercial and Industrial (C&I) sector. Hence, the load is mixed. When this load is presented at transfer stations and landfills, it is generally recorded as coming from the C&I sector. This explains in part the large disparity in the amounts received at landfill by these different sectors.

Table 6: Waste to Landfill by Service Type (2013 – 2014 data)

Source	Service Type			Direct to Landfill	Total Landfilled	Source %
	Transfer Trailer (TT)	Transfer Station (TS)	Collections			
	(Tonnes)	(Tonnes)	(Tonnes)	(Tonnes)	(Tonnes)	%
Municipal (MSW)	300	17,200	52,500	2,900	**72,900**	54%
Commercial & Industrial (C&I)	0	500	0	59,200	**59,700**	44%
Construction & Demolition (C&D)	0	100	0	3,500	**3,600**	3%
TOTAL	**300**	**17,800**	**52,500**	**65,600**	**136,200**	**100%**

- Tonnes rounded to the nearest 100.
- GWRRG Transport & Logistics Modelling Project (2016) landfill and transfer station quantities
- Tonnes landfilled are derived from landfill levy data supplied by EPA and do not include Prescribed Industrial Waste (PIW). 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.

2.2.4. What Does Our Waste Consist of and Where Does it Go?

The State Infrastructure Plan has a key focus on improving the recovery of valuable resources from waste. These materials are broken into the following categories:

- organics;
- aggregates, masonry and soil;
- glass;
- hazardous materials;
- metals;
- paper and cardboard;
- plastic;
- rubber including tyres;
- textiles; and
- other which includes discarded goods of multiple material types.

More detail of materials managed in Gippsland is provided in the following sections.

2.2.4.1. Organics

The Victorian Organics Resource Recovery Strategy provides a strategic approach to improving management of organic materials. This strategy is driven by the desire to remove a large proportion of currently landfilled organic waste that generates greenhouse gases, thereby contributing to climate change.

However, the significant volumes available do provide opportunities to increase organics recovery for beneficial uses such as soil conditioners or for energy production.

Organic materials can be divided into the following sub-categories:

- Food;
- Garden organics;
- Wood and timber;
- Bio-solids and manures; and
- Combinations of the above.

Food

Food organics make up a high proportion of waste generated in households, and from hospitality and food manufacturing sectors[17].

Studies conducted estimate that on average, each Gippsland household discards around 172 kilograms of food per annum into the garbage bin, with the total amount sent to landfill amounting to approximately 17,000 tonnes per annum[18]. There are considerable quantities also generated in supermarkets, commercial kitchens, restaurants and cafes across the region, although specific information on this is not currently available. It is assumed, however, that much of this material also goes to landfill.

Notable exceptions are food organics accepted at the Gippsland Water Soil and Organics Recycling Facility (SORF) at Dutson Downs, which are blended with garden organics and bio-solids to make compost. At Mallacoota, food organics are turned into compost following a successful domestic food organics collection project undertaken in that community in 2011. East Gippsland Water's Sewerage Treatment Facility at Bairnsdale has been trialling the recovery of energy from food organics using anaerobic digestion technology.

Pre-consumer waste (material managed by food manufacturers, wholesalers and whole food retailers) is also relatively unknown in quantity. There is little evidence that large quantities of this material go to landfill, apart from a periodic disposal of 'off-spec' and out-of-date packaged material. Hence, it is assumed that much of this material would, where suitable, be provided as fodder for livestock or ploughed back into the soil as 'green manure'.

Diverting food organics from households is taking place in various regions across Victoria and Australia through development of a combined Food Organics and Garden organics (FOGO) system as part of the kerbside collection service. The FOGO system separates kitchen food organics from residual waste so this material can be included with garden organics in the organics bin.

Most FOGO is then reprocessed into compost and soil conditioner. Diversification in treatment methods and an increase in the capacity for infrastructure to reprocess food organics is likely to be required to support greater material recovery. One Gippsland council, Bass Coast Shire, has committed to introducing the FOGO system from September 2017.

17 Waste flows in the Victorian Commercial and Industrial sector, Final Report for SV, 2013
18 GWRRG data – Household Waste Audits 2009 - 2011

Garden Organics

This material consists of branches, pruning offcuts and grass clippings. Councils and commercial businesses in the region provide services to collect and manage garden organics. Garden organics are delivered to drop-off facilities dedicated to reprocessing this material or to transfer stations where the garden organics are segregated and reprocessed. There are also significant volumes of garden organics collected through commercial gardening services.

Four of the six Gippsland councils currently offer kerbside collection of garden organics from households on a fortnightly basis. The capture of this material has driven a change to the way in which garden organics are valued and used. In Gippsland, composting and mulching of this material is the predominant management technique.

Often this material is mixed with other organic materials such as manures, bio-solids and unwanted food to manufacture composts and soil conditioners.

More than 100,000 tonnes of garden organics from inside and outside the region are reprocessed in Gippsland per year[19].

To maintain and build market confidence, expand clientele and ensure ongoing demand, it is fundamentally important that the resulting products are fit for purpose and meet strict quality control requirements.

Wood and Timber

Wood and timber are largely generated by the building and business sectors with smaller proportions from households.

Often raw timber is included with garden organics and composted or mulched, although some is used in domestic fireplaces or industrial furnaces. Despite this, raw timber is still observed entering landfills or being stockpiled.

Managing timber products that are mixed with other materials is considerably more difficult. Glues, penetrating chemical treatments (such as preservatives including chromium, copper and arsenic (CCA) used in treated pine) or coatings such as paint or plastic laminates mixed with or attached to timber products, limit the reuse or recycling options.

De-constructing and reprocessing these materials for re-use or recovery is an opportunity in Gippsland. More research could identify recovery options other than landfill disposal.

Bio-Solids and Manures

Water authorities typically manage bio-solids, while manures and effluent from farms are generally managed at the point of generation by the agricultural industry. In some cases, both manures and bio-solids are used as feedstock for composting operations.

Combined Organics

There are many instances where the organics materials listed above are combined as a feedstock to produce marketable end products.

Compost, potting mixes and mulches are all produced and sold within the region. Gippsland reprocessing businesses produce more than 130,000 tonnes of compost and soil conditioners per year for local and national markets.

19 GWRRG Data.

As well as material from Gippsland, feedstock for the region's organics reprocessing companies is generated in Melbourne and transported into the area for reprocessing.

2.2.4.2. Aggregates, Masonry and Soil

Aggregates, masonry and soil are largely generated in the building sector during demolition and construction works.

Materials such as concrete, bricks and tiles are heavy - in most cases landfill charges are based on weight so much of this material is segregated and recycled to reduce disposal costs. This has driven development of local businesses specifically for reprocessing of building debris.

Some existing quarry operators have expanded operations to crush this material, which is blended with quarry products such as a road base for re-use. Better quality product is more valuable, so material is graded to meet established standards for re-use, or it is sometimes blended with virgin material.

Generally, natural clean soils are used as 'clean fill'. To keep transport costs to a minimum, they are usually deposited close to the construction area.

Some soils are used in landfills as daily cover to suppress the odour of putrescible waste, prevent attraction of vermin and to minimise litter. This practice can reduce or delay leachate production. Daily cover generally takes up 15% to 30% of the airspace (volume) consumed in landfill operations.

Clay soils are sought-after for construction of low permeability landfill basal liners that contain the waste and protect the environment. Clay is also used for capping over landfills, which restricts water flow into the deposited waste.

2.2.4.3. Glass

Glass products removed from the waste stream are mainly bottles and jars. In Gippsland, collection is predominantly through the kerbside collection system in the commingled recyclables bin.
Material Recovery Facilities (MRF) separate glass into brown (amber), clear and green. All glass from Gippsland is sent to the metropolitan region for reprocessing.

In theory, glass can be recycled indefinitely. In reality, however, there are barriers to achieving this outcome including fragment size when broken and contamination during collection.

Glass fragments can be difficult to reprocess as glass products, and solutions for its re-use, need to be developed and marketed.

Glass can be a contaminated by other similar products such as Pyrex, windscreen (laminated) glass and ceramic material during the reprocessing stages. However, when commingled with other materials during collection, glass can contaminate other materials such as paper, increasing the difficulty of reprocessing the paper into a higher value product.

The dispersed settlement pattern in Gippsland often results in glass being transported large distances from collection point to reprocessor. For instance, glass collected in Mallacoota in far east Gippsland travels more than 500 kilometres to be reprocessed.

Glass can also be used as an additive to construction material such as road base and concrete products (i.e. a blend with aggregates and masonry) or as a sand replacement for water filtration.

2.2.4.4. Hazardous

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. It will consider the infrastructure needs to appropriately manage these waste streams, including the potential to integrate this information into the State Infrastructure Plan and Regional Implementation Plans.

Much of this material is described as Prescribed Industrial Waste (PIW), which is not within the scope of this Plan and is subject to regulations set by EPA Victoria. An example is the presence of asbestos used extensively in the construction of heavy industrial infrastructure in the Latrobe Valley. As these facilities are progressively decommissioned and demolished, appropriate large disposal sites will be required. While some companies have established on-site licensed landfills within their operational area, there are other facilities with no such allowance.

Some waste materials that require specialist handling and treatment are generated domestically and while not prescribed waste, require management. Therefore, systems and infrastructure for proper management are important. Listed below are some of these materials.

Asbestos

Asbestos is a natural product used extensively in industry and building products since the 1940s, with usage more extensive in the 1960s, 70s and early 80s. The use of crocidolite (blue) asbestos was banned in 1967, while the use of amosite (brown) asbestos continued in the construction industry until the mid-1980s. It was finally banned from building products in 1989, though it remained in gaskets and brake linings until 31 December 2003 and cannot be imported, used or recycled.

Asbestos is generally categorised as friable (loose fibres) or non-friable (bound in the products). Friable asbestos was commonly used as pipe lagging in industrial facilities, including power generation. Non-friable asbestos is more commonly found in the domestic setting and was widely used for building products such as cement sheet used for roof sheeting and wall cladding, as backing for linoleum floor covering and in gaskets and automotive brake linings.

Regardless of its source, asbestos has well known adverse health effects for human lung function and should be managed by professional services and disposed of at an appropriate location. Gippsland has several specific facilities for asbestos product disposal, though the material must meet certain requirements to be accepted.

Asbestos materials have been used extensively in Gippsland. This has been largely due to the establishment of heavy industry in the Latrobe Valley and the need to construct affordable housing for those working for the rapidly expanding power generation and forestry industry in the 1960s through to the early 1980s. Asbestos sheet was also a popular building product used in the construction of holiday homes and fishing huts established along the Gippsland coast. Much of this infrastructure, domestic and industrial, is nearing the end of its useful life and will require responsible handling and disposal to protect public health and the environment.

Currently asbestos removed by the householder can be disposed of at the Hyland Highway Landfill in the Latrobe City, the Kilmany Landfill in the Wellington Shire, the Koonwarra Landfill in the South Gippsland

Shire, the Grantville Landfill in the Bass Coast Shire and the Bairnsdale Landfill in the East Gippsland Shire. The public is advised that disposal must be arranged with the respective council.

Asbestos removed by licensed commercial asbestos removalists can be disposed of at the Gippsland Water facility at Dutson Downs by appointment.

Synthetic Mineral Fibre (SMF), including materials such as glass fibre, mineral wool and ceramic fibre, is the collective term for man-made mineral fibre (MMMF). These materials are used due to their excellent insulation properties in, for example, manufacture of insulation batts. This material should be handled and disposed of in the same way as asbestos.

Electronic Waste (e-waste)

E-waste is the collective term for the growing stock of electronic or electrical waste created by industry, business and the community. It can be defined as any device or appliance with an electrical cord or battery. A fridge or freezer, televisions, mobile phones and computer equipment, toasters, hairdryers and battery-powered tools are just a few examples of e-waste.

These materials are generally stable under normal conditions. When sent to landfill, however, they break down and some of the elements can leach into the water within the landfill. Often due to acidic conditions, heavy metals are absorbed into the water, making it very difficult to treat. This material is toxic to the environment if allowed to escape.

Dismantling of certain types of e-waste also poses a health risk to people and the environment. However, there are many valuable materials contained within e-waste that are finite resources and should be recovered.

E-waste is collected at all transfer stations in Gippsland. Some infrastructure, such as shipping containers, is established to support the National Television and Computer Recycling Scheme[20] at some sites. This scheme is regulated by the Commonwealth Government and compels companies importing computers and televisions to make provision for their disposal at the end of their useful life. A national network of collection points has been established for these companies to meet legislated targets and for the communities across Australia to have access to the service.

In Gippsland, approximately 400 tonnes of discarded computers and televisions are collected annually through the National Television and Computer Recycling Scheme. However, many appliances and white goods are stockpiled in the open or hardstand areas awaiting recycling as scrap metal. Due to commingling with other scrap steel, it is difficult to ascertain the current extent of e-waste capture.

While mobile phone recycling in Gippsland is well developed and strongly led by industry, the quantity of discarded mobile phones managed by this system is also unknown.

A recent (2016) commitment by the state government to ban e-waste from landfill will significantly change how this material is managed. Methods of achieving this aim are under consideration and will require planning and consultative activities.

20 The National Television and Computer Recycling Scheme was established in 2011 to provide Australian householders and small business with access to industry-funded collection and recycling services for televisions and computers. https://www.environment.gov.au/protection/national-waste-policy/television-and-computer-recycling-scheme

Paint, Oils, Batteries, Fluorescent Lights, Gas Bottles and Household Chemicals

Paint, motor oils, automotive (wet-cell) and household (dry-cell) batteries, fluorescent lamps (tubes and compact fittings) and household chemicals all require special handling and disposal.

Generally, these materials are catered for at the network of transfer stations throughout Gippsland or through scheduled collection events located around the region. However, it is likely that disposal in the garbage bin is still prevalent.

Disposing of industrial and commercial quantities can also be catered for but these services are generally less accessible in more remote areas of the region.

The disposal of gas bottles, oil and automotive batteries is well supported at most transfer stations. Three permanent facilities, located in Morwell, Wonthaggi and Bairnsdale, accept paint, fluorescent lamps and dry cell batteries. Some retailers are offering take-back options that can be more accessible than transfer stations.

2.2.4.5. Metals

Metals have long been extracted from the waste stream and recycled into new products. As a commodity traded on the world market, the value of metals fluctuates extensively which affects the level of recycling activity.

Private sector steel recyclers endeavour to separate the various metals to maximise economic return. For example, scrap metal[21] is currently trading on the world market at a very low value. Due to a higher value per tonne, it is likely that any particular metals such as aluminium and copper are being extracted separately.

A downturn in the value of metals is affecting the steel recyclers, generally small businesses, trading scrap in Gippsland. Where possible, material is being stockpiled until the value increases.

In some cases, businesses may cease operating and possibly recommence trading when the commodity price can once again generate a commercial return.

Low commodity prices, such as those currently being experienced, may result in increased dumping of items such as car bodies as motor vehicle owners have fewer disposal options.

2.2.4.6. Paper and Cardboard

Renewable and recyclable products, paper and cardboard have been manufactured in Gippsland since the late 1930s.

Paper recycling is undertaken through the collection of the material from households and businesses.

Contamination in the paper and cardboard stream limits the amount of material suitable for recycling. The most common contaminants are plastic, food and glass. Many of these contaminants can be avoided with correct use of the collection services offered.

Australian Paper (Nippon Paper) based at Maryvale in the Latrobe Valley recently commissioned a paper de-inking plant capable of reprocessing 80,000[22] tonnes of recovered paper per annum.

Paper waste, that is not of a high enough quality for re-manufacturing, can also be reprocessed through composting, vermiculture (worm farming) or other thermal based technologies.

21 Scrap metal includes a mix of iron, steel, copper, aluminium, lead etc.
22 http://www.australianpaper.com.au/ - Australian Paper website.

2.2.4.7. Plastic

The use of plastic is extensive and includes wrapping for storage, preservation and transport of goods, manufacture of items that require rigid casing or structure and as a surface treatment in automotive, industrial and household products.

The comparatively limited capture of these plastic goods offers a strong case for increased recycling or re-use efforts.

Recovery of many plastics used for a relatively short time by households, such as plastic packaging, is well catered for. For many years, plastics with codes from 1 to 7 (the industry code often shown on the product in a raised triangular arrow) have been accepted in the kerbside collection services and segregated at Material Recovery Facilities within Victoria. The exceptions are plastic film and polystyrene (expanded foam).

With varying degrees of success, recovery of used silage wrap plastics generated in the agricultural sector has been undertaken in Gippsland over the past 15 years. It is estimated that more than 4,000 tonnes of silage wrap plastics are used by the agricultural industry in Gippsland each year.

There is limited plastic manufacturing in Gippsland, with no post-consumer plastics reprocessing in the region.

2.2.4.8. Rubber Including Tyres

Tyres are currently banned from landfill unless shredded to a fraction (2.5cm x 2.5cm) of their original size. While some tyres are disposed of at transfer stations within the region, the majority are managed reasonably efficiently through extensive retail chain arrangements with tyre recyclers, where old tyres are collected as new tyres are fitted. A disposal charge is passed on to the purchaser of the new tyres to facilitate this service.

There is little data available regarding disposal historically, particularly in farming communities. Often tyres have been reused to shore up dam or irrigation channel walls or used to fill holes in farm paddocks. The impact of these practices is still to be evaluated.

Rubber conveyor belts are used extensively in power generation to transport coal and overburden. These belts wear and require replacement over time, however quantities are unknown.

2.2.4.9. Textiles

Textiles can be synthetic (man-made such as nylon and polyester) or natural (such as wool, leather, silk or cotton) and are often a blend of both synthetic and natural materials.

In general, textiles enter the waste stream as used clothes, bedding and upholstery. Used clothes are largely collected through donation to charity organisations where they are graded, and either re-sold locally or sent overseas to other markets. Some textiles are sold for rags.

It is difficult to ascertain the volumes of textiles entering landfill as they are often integrated into the discarded product (e.g. a mattress or a sofa).

2.2.4.10. Other

The 'Other' category is used to group discarded goods consisting of multiple material types. Many goods are complex in the way they have been manufactured and the variety of materials used contributes to the difficulty and expense of reclaiming material into a useful reusable form.

There are examples of recovery or 'disassembly' in Gippsland. For example, mattresses and furniture often contain textiles, wood, plastic and metal, motor vehicles are made from a variety of metals and plastic and textiles, and appliances such as microwaves, ovens and washing machines are made of metals, glass and plastic. A variety of techniques is used to remove the material of greatest value with metal recovery usually driving the recycling processes.

The title 'Other' is also used to characterise commingled recyclables (plastic, glass, steel, aluminium, paper and cardboard). The increased efficiency of collection and transport of materials to another location for further segregation has enabled better recycling of commingled materials by households and businesses.

2.3. What Are We Recycling?

Recovering material for a useful purpose, either in its current form (re-use) or when reprocessed (recycling), is recognised as critically important to the effective management of waste in Gippsland and is a core focus of this Implementation Plan.

Recycling in Gippsland is substantial and takes place across the region but in some areas the costs are comparatively higher and accessibility is limited.

Despite these challenges, the waste industry, and particularly local government in Gippsland, has made significant efforts to cater for recycling of discarded or unwanted materials.

Gippsland also receives recyclable material from outside the region. Having a large composting facility and a paper manufacturer in Gippsland has enabled a flow into the region of garden organics and discarded paper and cardboard.

Gippsland has the following material streams, with Table 7 also providing an indication of their source and potential end products.

Table 7: Material Streams

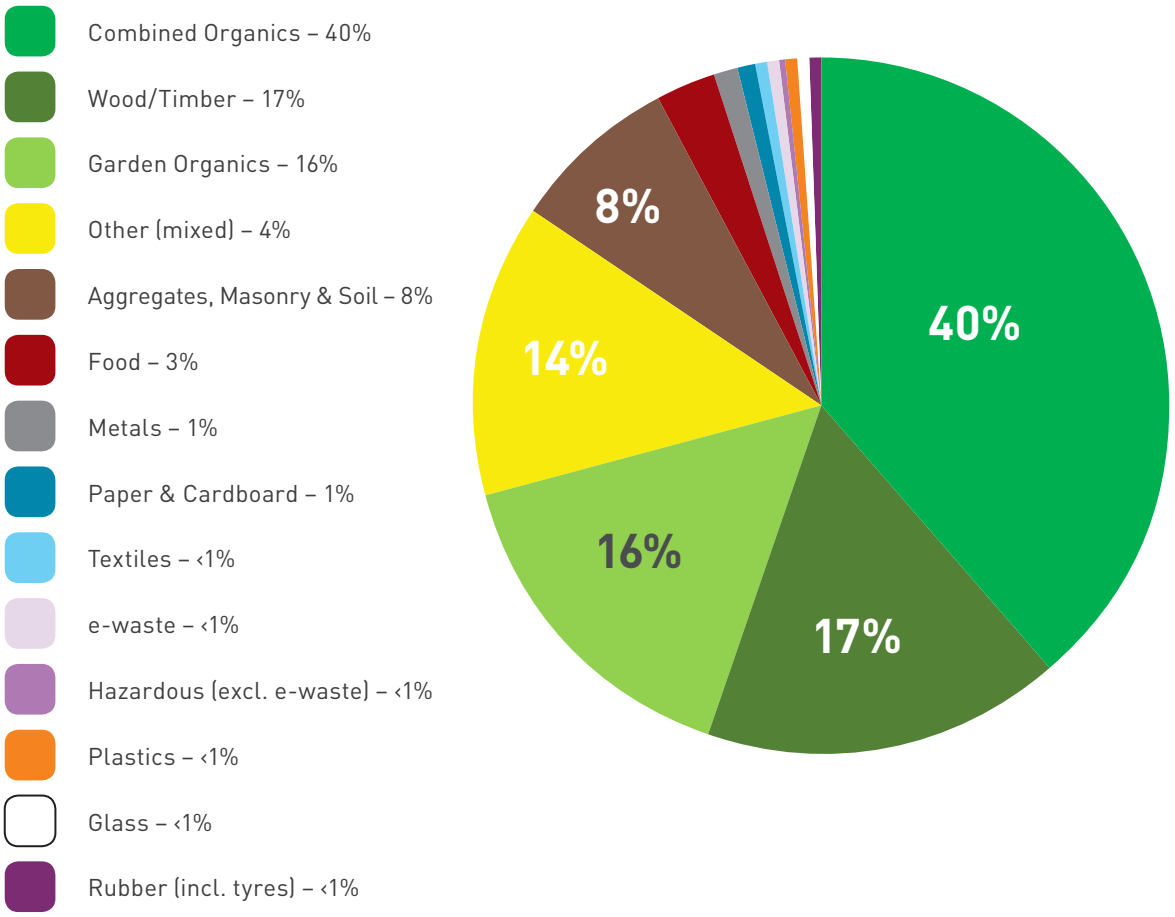
Material Category	Source	Product
Organics		
Food	Business and households from post production and post-consumer	Compost, fodder for livestock
Garden Organics	Business and households through collection and drop-off services	Compost, mulch and soil conditioners
Wood & Timber	Business and households through collection and drop-off services	Mulches, potting mixes and soil conditioners as well as small scale energy production
Bio-Solids & Manures	Businesses (water authorities) through collection	Compost and soil conditioners as well as small scale energy production

Material Category	Source	Product
Aggregates, Masonry & Soil		
Concrete	Building sector and households through drop-off facilities and collection	Crushed concrete as a crushed rock substitute
Bricks and Tiles	Building sector and households through drop-off facilities and collection	Crushed concrete as a crushed rock substitute
Asphalt	Building sector through drop-off facilities and collection	Crushed asphalt as a crushed rock substitute
Soil	Building sector manage this on an 'as needs' basis	Clean-fill, daily cover at landfill, some construction
Glass		
Bottles & Jars	Households through collection and drop-off facilities	Glass products
Automotive Windscreens	Businesses	Glass products
Hazardous		
e-waste	Households and businesses through collection and drop-off	Reclaimed materials such as metals, plastics and glass
Paint	Households and businesses through collection and drop-off	Reclaimed chemicals and solvents
Oil	Households and businesses through collection and drop-off	Reclaimed oil
Batteries (automotive & dry cell)	Households and businesses through collection and drop-off	Reclaimed elements metals and chemicals
Fluorescent Lamps	Households and businesses through collection and drop-off	Reclaimed chemicals metals and glass
Gas Bottles	Households and businesses through collection and drop-off	Metals
Household & Agricultural Chemicals	Households and businesses through collection and drop-off	Chemicals and plastics/metal containers
Metals		
Scrap metal – including Iron, Steel, Copper, Aluminium, Lead etc.	Households and businesses through collection and drop-off	Metal products

Material Category	Source	Product
Paper & Cardboard		
Paper, Cardboard, Liquid Paper Board	Households and businesses through collection and drop-off	Paper and cardboard products, some composting
Plastic		
Plastics ranging in rigidity used for packaging (Codes 1-7)	Households and businesses through collection and drop-off	Plastic products including new packaging and goods such as furniture and clothing
Rubber		
Tyres	Households and businesses through collection and drop-off	Rubber crumb for playground soft fall matting
Textiles		
Clothing, Linen & Upholstery	Households and businesses through collection and drop-off	Clothes & rags
Other		
Mattresses	Households and businesses through collection and drop-off	Textiles, timber & steel
Comingled Recyclables	Households and businesses through collection and drop-off	Plastic, glass, steel, aluminium, paper and cardboard

Figure 8 provides detail on the known material successfully recovered within Gippsland. It is important to note that the significant flows of paper and cardboard, and garden organics into Gippsland substantially influence the results.

Figure 8: Material Recovered by Category in Gippsland



- Data from Sustainability Victoria, SRU Survey and analysis of regional reprocessors and material recovery facility operators (June 2015) and GWRRG landfill and transfer station quantities.
- 'Other' consists of mixed material items including commingled recyclables and mattresses

2.4. What is Going to Landfill?

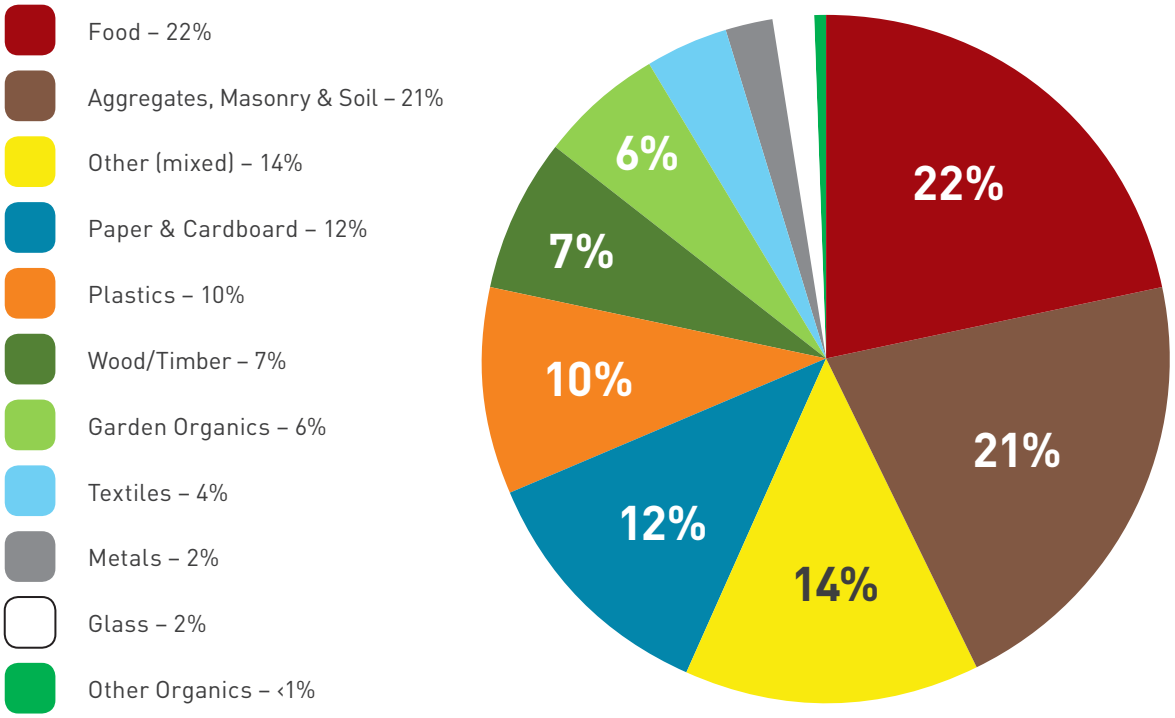
It is estimated that across Victoria around 450,000 wheelie bins of recyclable material end up in landfill each week rather than being recovered.[23]

It is estimated that Gippsland currently landfills approximately 136,200 tonnes of material per annum. There are opportunities to improve recovery of material currently sent to landfill, through Waste to Energy (WtE) solutions, improved source separation techniques and centralised segregation initiatives.

Figure 9 indicates the percentage of the total tonnage by material type based on the 2009 landfill survey by SV. Material percentages are based on state averaged data from Sustainability Victoria 2009 landfill audits. These figures should be viewed as indicative only as this data is limited in providing actual characterisation of the materials sent to Gippsland landfills, due to age of the survey and changes in landfill charges over the past seven years. 'Other' consists of mixed material items, including furniture and mattresses.

23 Sustainability Victoria website, *Get it Right on Bin Night*

Figure 9: Material Landfilled by Category



2.5 What Material Moves Out of and Into Gippsland?

There is a significant interdependence between Gippsland and the Metropolitan Waste and Resource Recovery region. Material generated and recovered in Gippsland is being transported to Melbourne for reprocessing and some material generated and recovered in Melbourne is being transported to Gippsland for reprocessing.

Much of Gippsland-generated material is collected and transported by the private sector. As a consequence, specific data on quantities is commonly inaccessible to the GWRRG.

Inflows

Gippsland has significant capacity for reprocessing of garden organic material and paper/cardboard. Therefore, garden organics and paper and cardboard flow into Gippsland primarily from Melbourne. These materials from the metropolitan region create sufficient economies of scale to enable sustainable business activity focussed on the recovery of organics, paper and cardboard, while creating jobs and contributing to the regional economy.

Outflows

Material types that flow out of Gippsland include glass, plastic, rubber, metals, e-waste, and mixed and commingled material as well as a small amount of paper and cardboard. While specific amounts are unknown, some residual waste is also transported into the metropolitan region for disposal to landfills. Material Flows are shown in Table 8.

Table 8: Material Flows into and out of the Gippsland region

Resource Recovery Material Category	Material Flows into Gippsland		Material Flows Out of the Region		Notes
	Tonnes	Source	Tonnes	Destination	
Food	#		#		
Garden Organics	✓	Metro	#		
Wood/Timber	#		#		
Combined Organics	✓	Metro	#		
Organics Total	✓	Metro	#		Large quantities of paper/cardboard are reprocessed in the Gippsland region
Paper/Cardboard	✓	Metro	700	Metro	Large quantities of paper/cardboard are reprocessed in the Gippsland region
Glass	#		100	Metro	Quantities of glass flow into MRFs in the Metropolitan region as commingled recyclables for sorting prior to forwarding on to reprocessors
Plastic	#		100	Metro	Quantities of plastic flow into MRFs in the Metropolitan region as commingled recyclables for sorting prior to forwarding on to reprocessors
Rubber incl. Tyres	#		500	Metro	Private operators collect significant unknown quantities of tyres
Metals	#		2,300	Metro	Private operators collect significant unknown quantities of metals
Aggregates, Masonry & Soil	#		#		
Textiles	#		*	Metro	Unknown quantities of textiles are sent to reprocessors from charity organisations in the Gippsland region
e-waste	#		400	Metro	
Excluding e-waste	#		100	Metro	
Hazardous Total	#		500	Metro	
Other			26,200	Metro	Includes commingled recyclables and mattresses from council contracts
Total Resource Recovery Flow	✓		30,400		
Residual Waste to Landfill Flows	•		✓	**Metro**	Unknown quantities moved out of the region by commercial waste operators

- Data from Sustainability Victoria, SRU Survey and analysis of regional reprocessors and material recovery facility operators (June 2015) and GWRRG landfill and transfer station quantities.
- Tonnes rounded to the nearest 100
- ✓Indicates quantities not listed due to commercial in confidence.
- #Quantities unknown or not recorded.
- • Residual waste data from reprocessors is not available. However, these waste quantities are included in the statewide landfill totals.
- *May also include unknown quantities of materials from charity organisations or commercial businesses.

2.6. How Was This Information Obtained? (Data Sources and Limitations)

Limitations exist with the current sources of data. Further work needs to be undertaken to achieve more precise estimations of the volume and characteristics of waste and material streams recovered, reprocessed and landfilled within Gippsland as part of the execution of the Gippsland Implementation Plan and its related Priority Actions.

The main data sources used for this Plan are provided in Table 25, located in Appendix 1. As mentioned earlier, the six key sources fundamental to the Plan's development and projection modelling include:

- Landfill Levy Data, EPA Victoria;
- Whole-of-life assessments for Gippsland landfill and transfer stations, Gippsland Regional Waste Management Group;
- Victorian Landfill Audits, 2009, Sustainability Victoria;
- Survey of Reprocessors in Gippsland, Sustainable Resource Use (SRU), 2015;
- Victorian Local Government Annual Survey (VLGAS), Sustainability Victoria; and
- Victorian Recycling Industries Annual Survey, Sustainability Victoria.

Much of the information and data contained within this Plan relies on survey information provided to the GWRRG, Sustainability Victoria or their agents by Gippsland councils as well as recyclers and reprocessors within and outside of the region. Information regarding waste deposited into landfill in Gippsland has been provided by EPA Victoria. This information has been scrutinised and determined suitable for the development of this Plan.

Assumptions are required when analysing and interpreting data in this Plan, hence there will be instances where further work is required to gain a better understanding of the material type, volume and source.

In addition, application of the Privacy and Data Protection Act 2014 means that some information is not able to be published within this Plan due to its commercial sensitivity. Therefore, where possible, data and information not currently publicly available has been aggregated in this Plan.

Sustainability Victoria's Waste Data Governance Framework provides a consistent and coordinated approach to a standardised collection, storage and sharing of waste and resource recovery data across Victoria. This will drive a more consistent, systematic evidence-based approach to waste and resource recovery programs into the future, including the Implementation Plans. Future efforts to improve data capture, monitoring and reporting in Gippsland will be aligned with this broader framework.

Section 3:

Gippsland's Waste and Resource Recovery System Strategic Assessment

3. Gippsland's Waste and Resource Recovery System Strategic Assessment

3.1. Waste and Resource Recovery Infrastructure and Services

Gippsland's waste and resource recovery system is enabled by a range of infrastructure and services as outlined in Table 9 and further particulars about this infrastructure is provided in Table 10.

Table 9: Types of Infrastructure Supporting the Waste and Resource Recovery System

Type	Characteristics
Collection Infrastructure: Infrastructure to Collect and Transfer Waste Materials	
Kerbside bins and collection	• 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 government and commercial providers.
Industrial skip or hook bin	• Large bin provided by a commercial provider to collect and remove bulk waste from households, businesses, schools, commercial premises and hospitals.
Collection vehicle	• Truck used to collect and transport waste from waste generation locations.
Resource Recovery Infrastructure: Infrastructure to Facilitate Recovery of Materials	
Drop-off centres and collection centres	• Recovers selected materials and goods mainly dropped off by householders for recycling and reuse (for example, charity bins, drumMUSTER and Planet Ark facilities). • Could include aggregation for transport to a trailer, resource recovery centre or transfer station.
Resource recovery centres/ transfer stations (RRC/TS)	• 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, reprocessing or disposal to landfill. • Accepts materials from all sectors and can be publicly or privately owned and operated. • Could incorporate a resale centre to intercept and therefore reduce volumes to landfill.

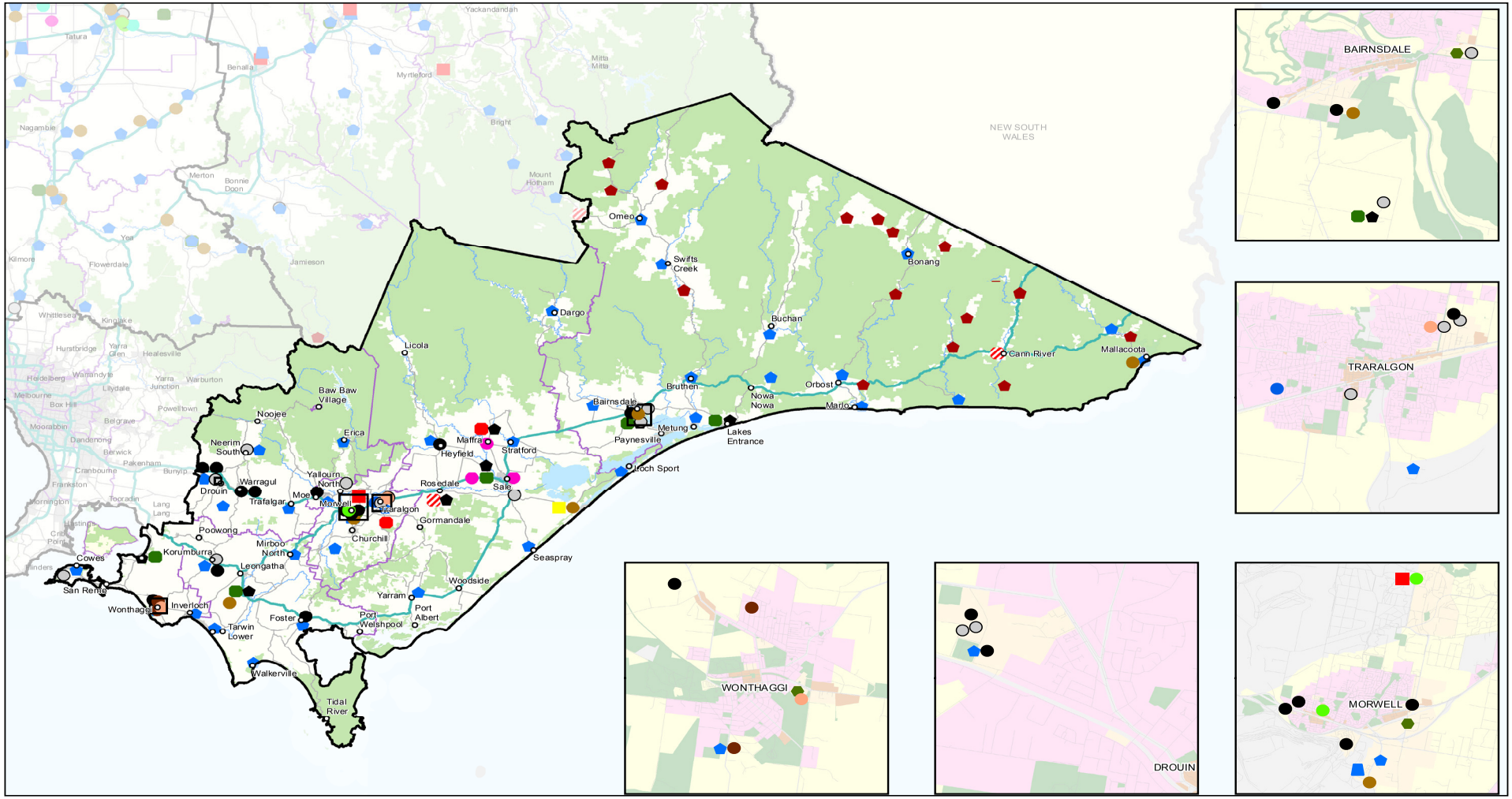
Type	Characteristics
Resource Recovery Infrastructure: Infrastructure to Facilitate Recovery of Materials	
Materials Recovery Facility (MRF)	• Sorting, consolidation and transfer. • Receives and sorts household and business commingled recyclables. • Compacts and bales, or consolidates materials and sends to reprocessing facilities. • Could include warehouse style sorting facilities such as those run by charitable organisations. • Could include a resale centre to intercept and therefore reduce volumes to landfill.
Reprocessing Infrastructure: Infrastructure to Recover Materials and Resources	
Organic reprocessing facility	• A facility that biologically reprocesses organic matter, yielding a variety of products including heat, renewable energy and stabilised organic residues for use as a soil additive. • Includes both windrow and in-vessel composting technologies, and anaerobic digestion.
Other reprocessors	• 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 reprocessed material. Without reprocessing, the beneficial use of the material would be lost. For example, plastic film, silage wrap, metals and concrete.
Waste to Energy (WtE) Facility	• A facility that uses waste or refuse derived fuels (RDF) or process engineered fuel (PEF) as a feedstock to produce a useful end product with market value such as heat and electricity. • Technologies can include anaerobic digestion and thermal processing such as pyrolysis and gasification or high temperature incineration.
Disposal Infrastructure: Infrastructure Established as the Final Repository of Waste Materials	
Landfill	• Infrastructure to receive and dispose of waste that is unable to be recycled or reprocessed viably. • Requires significant investment and ongoing environmental management, not only during its active life but also its rehabilitation. Limits the subsequent use of the land. • Could include a resource recovery centre, transfer station or resale shop.

Table 10: Summary of Infrastructure Types in the Region

Facility Type	Facility Function	Facility Description	Total	Waste Managed[a] (tonnes p.a)	Capacity[a] (tonnes p.a)
Resource Recovery	Drop off	Drop Off Facility	4	198,600	210,000
		Community Skip Bin	2		
		Transfer Trailer	14		
	Resource Recovery Centre*/ Transfer Station	Stand alone	68		
		Co-located at Landfill	7		
	Materials Recovery Facility	Municipal	3		
Reprocessing	Aggregates, masonry, soil		13	392,400	850,000
	Organics	Wood / Timber	2		
		Combined organics	5		
	Paper / Cardboard		1		
Energy from Waste	Waste to Energy	Anaerobic Digester	1	8,000	16,000
		Other	2		
Disposal	Landfill: Licenced	Putrescible	7	136,200	160,000
		PIW/Asbestos	5		
	Landfill: Exempt from Licence	Putrescible	2		
	Closed Landfills		**Refer to Section 3.1.5.4.**		
Total			**136**		

- *Resource Recovery Centres include local commercial waste and metal collection businesses that sort and consolidate waste for reprocessing
- Data rounded to the nearest 100 tonnes
- [a]Modelled raw data from tonnes landfilled are derived from landfill levy data supplied by EPA, Sustainability Victoria, SRU Survey and analysis of regional reprocessors, material recovery facility operators Gippsland Waste and Resource Recovery regional report (June 2015) and GWRRG Transport and Logistics Modelling Project (2016) landfill and transfer station quantities.

Figure 10: Locations of Existing Infrastructure in Gippsland



Paper Size A3

0 5 10 20 30 40

Kilometres

Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA 1994
Grid: GDA 1994 VICGRID94

N

LEGEND

- EfW (Energy for Waste), other
- Landfill, Licensed
- Landfill, Asbestos
- Landfill, Unlicensed
- Putrescible & Solid Inert Landfill
- Putrescible Landfill
- Reprocessing - (Multiple Materials)
- Reprocessing - Aggregates, Masonary & Soil
- Reprocessing - Metals
- Reprocessing - Organics
- Reprocessing - Organics - Wood/Timber
- Reprocessing - Other
- Reprocessing - Paper & Cardboard
- Reprocessing - Rubber
- Resource Recovery - Drop Off
- Resource Recovery - MRF (Municipal Solid Waste)
- Resource Recovery RRC/TS, co-located at landfill
- Resource Recovery RRC/TS, stand alone
- Township
- Region Boundary
- Principal Freight Network
- LGA & Alpine Resort Area Boundaries
- Major Roads
- Major Water Areas
- Major Watercourses
- Township Boundaries
- Parks and Reserves

GHD VICTORIA

Regional Waste & Resource Recovery Implementation Plan
Gippsland Waste & Resource Recovery Group

Job Number 31-33625
Revision E
Date 19 Apr 2016

Existing Infrastructure

G:\31\33625\GIS\Maps\Working\31_33625_ResourceRecoveryGroup_A3L_BulkMapper.mxd [KBM: 3]

Data source: DELWP, VicMap, 2015; Infrastructure, SV, 2015; Created by: mjahanshahi

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3.1.1. Collections Systems

Gippsland's waste and resource recovery collection system is made up of a range of components managed by local government, government authorities and private enterprise. Unlike other essential services, such as handling of sewerage, management of solid waste is reliant on a road-based collection system using haulage vehicles of varying size. This means solid waste collection is energy and labour intensive with impacts on the region's carbon footprint. The key elements of Gippsland's collection system are outlined below.

3.1.1.1. Municipal Kerbside Collection

Of the material collected by councils at kerbside in Gippsland, the average diversion from landfill is 46%.[24] Each of Gippsland's municipalities offer kerbside collection of waste materials, in either a three-bin or two-bin configuration. The Baw Baw Shire, the East Gippsland Shire, the South Gippsland Shire and the Latrobe City all provide a three-bin service, one for general garbage, one for commingled recyclables and one for garden organics.

Table 11 presents the details of the three-bin kerbside system operated by four of Gippsland's councils.

Table 11: Three-Bin System Details

Council	Lid*	Bin Capacity	Material Stream	Collection Frequency
Baw Baw Shire East Gippsland Shire South Gippsland Shire Latrobe City		120 litre Garbage Bin Service	Residual waste	Weekly
		240 litre Recycling Service	Comingled recyclable containers, paper and cardboard, plastics, glass	Fortnightly
		240 litre Garden organics Service	Grass clippings and pruning	Fortnightly

- * Lid colours are consistent with the Australian Standard, AS4123.7-2006. Not all Gippsland councils comply with this standard.

Table 12 presents details of the two-bin kerbside system provided by the Wellington Shire and the Bass Coast Shire councils.

Table 12: Two-Bin System Details

Council	Lid*	Bin Capacity	Material Stream	Collection Frequency
Wellington Shire Bass Coast Shire		120 litre Garbage Bin Service	Residual waste	Weekly
		240 litre Recycling Service	Comingled recyclable containers, paper and cardboard, plastics, glass	Fortnightly

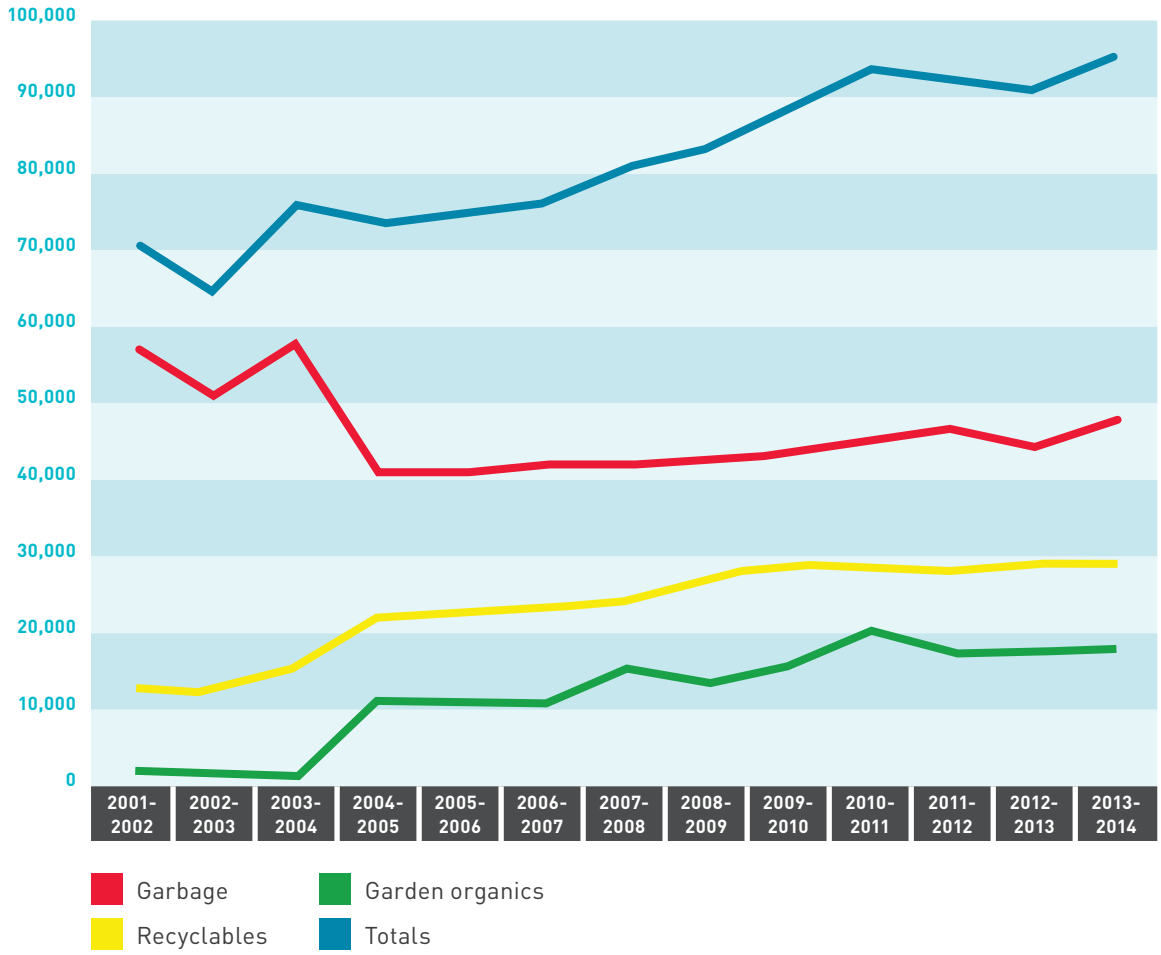
- * Lid colours are consistent with the Australian Standard, AS4123.7-2006. Not all Gippsland councils comply with this standard.

24 *Victorian Local Government Annual Waste Services Report 2013-14*, Sustainability Victoria.

The Bass Coast Shire has committed to the introduction of a three-bin system, incorporating a Food Organics Garden Organics (FOGO) bin from late in 2017. All Gippsland councils have indicated interest in transitioning to the FOGO system.

Figure 11 shows that although waste generation in Gippsland increased, an improvement in material recovery rates between 2001-2002 and 2010-2011, particularly for garden organics, has meant a greater portion of the materials collected at kerbside has been recycled.

Figure 11: Kerbside Collection Streams, Gippsland (2013-14)



3.1.1.2. Commercial collections

Collection services for Construction & Demolition (C&D) and Commercial & Industrial (C&I) waste generators are privately arranged and subject to market forces. Increases in disposal costs mean that many commercial waste businesses are choosing to diversify the services they offer or are segregating recoverable material prior to taking residual waste to landfill.

Commercial collections use industrial bins or other types of specialised collection infrastructure to collect and remove bulk waste from households, businesses, schools and commercial premises.

Gippsland is well serviced by regular and one-off waste collection services with many of these businesses providing broad category waste collection. In addition, specialist service providers offer material-specific collections for organics, paper and cardboard, concrete and aggregates, vehicle tyres, e-waste and metals.

3.1.1.3. Municipal Hard Waste Services

Hard waste collections are focussed on collecting bulky waste items unable to be accommodated by normal kerbside collection. These include permitted building wastes, white goods, furniture and appliances that meet defined criteria.

Changes to Occupational Health and Safety (OH&S) requirements have seen services in Gippsland modified significantly since 2003, with increased mechanical lifting and reduced riding on vehicles. The Gippsland councils, excluding the East Gippsland Shire, provide their community with a bulk hard waste kerbside collection service option.

Generally, this service is targeted at people unable to transport material without assistance due to age, lack of suitable transport or otherwise limited capacity. Some councils offer an incentive to self-haul material through the provision of vouchers or no-charge drop off events at their transfer station facilities. All councils offering a hard waste service, except for the Wellington Shire, currently implement an at-call / user pays service model for kerbside hard waste collection.

Further detail of the region's hard waste services is provided in Table 13.

Table 13: Hard Waste Collection Details, Gippsland

Municipality	Drop Off at Facility	Kerbside Pick-up
Baw Baw Shire	1 voucher provided upon request	At call, scheduled bi-annually, with charge plus 1 at call on demand, annually, no charge
Bass Coast Shire		At call, on demand, with charge
Latrobe City	2 coupons provided per rate notice	At call, on demand in exchange for two coupons, annually
South Gippsland Shire		At call, on demand, with charge
Wellington Shire		Scheduled annually, no charge

With an ageing population and higher density living in some areas, the need for services that collect bulky unwanted materials is likely to increase. In the case of useable furniture and serviceable whitegoods, the private and not for profit (charity) sector is providing some services. The extent of this service is currently unknown to the GWRRG. Anecdotally, there is a growing number of appliance and furniture retailers who are removing old appliances and mattresses on delivery of new ones.

There is an opportunity for the private and not for profit sectors to play a greater role in providing a more responsive and tailored service to the Gippsland community.

3.1.2. Resource Recovery Facilities

A network of drop-off centres, resource recovery centres/transfer stations (RRC/TS) and Material Recovery Facilities (MRF) operates across Gippsland to assist in the consolidation of waste and the recovery of recyclable material.

In general, the operations at these facilities have improved dramatically in recent times. The sites are generally recognised as orderly, safe and able to address issues of traffic management, dust, noise and odour.

3.1.2.1. Drop-Off Centres

Gippsland is serviced by a widespread network of drop-off centres that deal with recovered material and in some cases, residual waste.

In Gippsland, 20 drop-off facilities are operated by councils. These play a particular role in the region's remote communities, largely in East Gippsland which has 14 recyclables and residual waste collection trailers and two skips.

The region is serviced by numerous charity collection bins and opportunity shops, often run by charitable organisations, allowing for large scale re-use of textiles, clothing, furniture and other goods.

3.1.2.2. Resource Recovery Centres/Transfer Stations

Gippsland has 75 resource recovery centres (RRC), also commonly known as transfer stations (TS), that identify and secure re-useable and recyclable materials. RCC/TS provide a service to residents and business owners/operators who may not have access to a collection service from their property or who need to dispose of large bulky materials not serviced by other means.

Municipal RRC/TS

There are a 45 council-run RRC/TS in Gippsland with a current average recovery rate of more than 67%[25]. The objective of these facilities is to segregate as much material as possible to minimise disposal to landfill. The average cost per tonne to operate transfer stations is $127[26] which is less than the average cost per tonne to operate a landfill in Gippsland.

The current Gippsland network is generally established and positioned based on historic use of the sites as landfills. Therefore, many facilities are not situated in the most convenient and accessible locations for the communities they serve. In addition, there are examples of facilities that, due to geographical proximity, are competing with other facilities for the same customer base resulting in substantial inefficiency.

Significant public investment has been injected into establishing Gippsland's network of transfer stations. It would be difficult to argue that there would be adequate return on investment to warrant relocation of infrastructure into new and improved locations. However, encroachment by conflicting land uses or end of lease situations could present opportunities to consolidate or, in some cases, decommission existing sites and establish them in more appropriate locations.

In collaboration with local government, the GWRRG proposes to lead a strategic assessment of Gippsland's RRC/TS network to identify opportunities to improve overall efficiency and ensure future investment into the system has the best opportunity to maximise return.

25 GWRRG Transfer Station Cost Assessment, 2015
26 GWRRG Transfer Station Cost Assessment, 2015

Private RRC/TS (Construction and Demolition)

The GWRRG has identified 21 private RRC/TS that focus on collecting and sorting specific materials from the Construction and Demolition sector such as scrap steel and non-ferrous metals.

There are also facilities that segregate a wider range of materials generated by building and demolition activities.

Private RRC/TS (Commercial and Industrial)

There are nine private RRC/TS that focus on collecting and sorting specific materials from the Commercial and Industrial sector such as paper and cardboard. The GWRRG has identified four paper collection facilities operating in Gippsland.

3.1.2.3. Material Recovery Facilities

Material recovery facilities (MRFs) receive, sort and transfer material recovered from waste streams. These range from highly mechanised to labour-intensive manual sorting with materials sorted by type and treated, including cleaning and compression.

Aside from the large number of facilities that sort and transfer metals, paper and cardboard, there are two MRFs in Gippsland that reprocess commingled recyclables (2016) - Dasma (Morwell) and Tambo Waste (Bairnsdale). These facilities receive kerbside commingled recycling and separate the material through a mixture of mechanical and manual sorting of waste streams. The range of material types recovered include glass (brown, green, clear), aluminium, steel, plastic (seven types) and paper and cardboard.

In comparison to metropolitan-based MRFs, the Gippsland companies reprocess relatively small volumes. Consequently, the economies of scale enjoyed by competing metropolitan-based facilities have, through competitive tenders, resulted in large portions of the region's recyclable materials being sent directly to Melbourne. Currently, the Bass Coast, Baw Baw, South Gippsland and Wellington Shires send commingled recyclables into the metropolitan region.

However, material recovery is increasingly being recognised by the private sector as a potentially rewarding business opportunity, with tangible flow-on prospects to create jobs and new investment. The existence of good infrastructure in Gippsland presents a significant opportunity for economic development, investment and job creation for the region, particularly if joint procurement to generate improved economies of scale can be achieved.

For example, there are currently no 'Dirty' MRFs in operation in Gippsland[27].

3.1.3. Reprocessors

Gippsland is home to 21 reprocessing facilities that value-add to materials and create new products. Gippsland reprocessors handle around 400,400 tonnes of material annually, accepting two thirds of feedstock from within the region and a third from Melbourne.[28] A significant amount of material is consolidated and transported to metropolitan-based reprocessors or exported to overseas markets.

These reprocessors are identified according to specific material types, including aggregates, paper and cardboard and organics. Further details are provided below and where references are made to specific businesses, information provided has been derived from public sources including company websites and is not commercially sensitive.

27 A 'Dirty' Material Recovery Facility receives unsorted materials for segregation into materials streams, often this can be from Commercial & Industrial, Construction & Demolition or Municipal sources.
28 Regional Survey of Reprocessors and MRFs, Sustainability Victoria, June 2015

3.1.3.1. Organics Reprocessors

The reprocessing of organics in Gippsland has been highly successful for many years with seven identified organics reprocessors located in the region. Gippsland has established itself as a net importer of organic materials and due to improving performance, enjoys growing market demand.

Organics reprocessing in Gippsland is relatively mature, however, with the rapid residential development in Melbourne's South East, some metropolitan reprocessors are looking to establish new facilities within Gippsland. Significant opportunity exists to utilise this material for new Waste to Energy initiatives as outlined in Section 3.1.4, providing the means for local job creation.

Demand for a high quality, market driven product has resulted in the success of organics reprocessors such as Pinegro, with a site in Morwell, and Gippsland Water at Dutson Downs, through a partnership with commercial operator Gibsons Groundspread. In addition, there is some small-scale activity in capturing wood and timber for re-use as a building product.

Gippsland Water Soil and Organic Recycling Facility

Located on an 8,500 hectare site at Dutson Downs near Longford, the Soil and Organic Recycling Facility (SORF) is an EPA licensed waste treatment and recycling facility. The SORF accepts and treats EPA prescribed and non-prescribed waste, most of which is used in compost production. Waste accepted and reprocessed includes tannery waste, commercial grease trap content, milk and food wastes, poultry mortalities and manure, and garden organics. The compost produced is distributed by the Gippsland-based company Gibsons Groundspread under the brand REVIVE Recycled Compost.[29] The process employs a mixture of in-vessel composting and open windrow composting techniques.

Markets for the product are often on the doorstep of the SORF, such as intensive farming within the Macalister Irrigation District (MID). There is also the ability to backload product into the western agricultural areas of Gippsland and beyond.

There is significant space at Dutson Downs for maturation of compost material should there be a need to stockpile the material for any length of time. The SORF is licensed to take food not suitable for consumption, which means it can respond to customers requiring management of this material.

Pinegro

With one of its five Australian sites located on Monash Way, Morwell, Pinegro receives and reprocesses a variety of organic material into potting mixes, soil conditioners, soil blends and mulches for domestic and commercial markets.[30] Pinegro also manages material at the Australian Paper Maryvale Mill site.

The company has traditionally used an open windrow composting process, although in recent years, has introduced a Mobile Aerated Floor™ (MAF) technique to more closely manage the aeration of the material.

Pinegro has had a long association with Australian Paper and receives a number of waste streams from this plant for composting. Its Morwell facility accepts garden organics collected from the Baw Baw Shire, the Latrobe City and the South Gippsland Shire.

Buffers to the licensed facility in Morwell are adequate, with heavy industrial neighbours surrounding the site. The facility is also close to the potting mix bagging operation within Morwell and has good access to major transport infrastructure. Pinegro has well established markets for its products.

Pinegro has expressed interest in expanding the site's capacity to accept discarded food collected through kerbside services (FOGO).

29 Gippsland Water website
30 Pinegro website

3.1.3.2. Paper and Cardboard Reprocessors

Australian Paper Recycled Paper Plant

Australian Paper operates a wastepaper recycling plant at its Maryvale Mill, north of Morwell. The only paper and cardboard reprocessor in Gippsland, the recycling facility started operation in 2015 and has capacity to reprocess approximately 80,000 tonnes of externally sourced waste paper each year.

This activity is part of the largest integrated pulp and paper operation in Australia. Zoned Industrial 2, the 344 hectare site has significant buffers from conflicting land uses and can expand within the site if the need arises. A dedicated rail line and good road transport infrastructure are available. As well as generating Waste to Energy created on site, large-scale electricity and natural gas are provided to the site with on-site wastewater treatment and connections to the Gippsland Water Factory.

The facility sources virgin organic material from surrounding forests and plantations, managed predominantly by Hancock Victoria Plantations (HVP). Substantial amounts of post-consumer (recycled) paper and cardboard are also received by Australian Paper, enabling production of high quality recycled products.

The company is a major source of material for Pinegro's reprocessing activities and provides a key input in the form of lime for incorporation into soil conditioners produced by Gibsons Groundspread.

3.1.3.3. Aggregates, Masonry and Soil Reprocessors

Higher gate fees at local landfills have triggered a decrease in the amount of concrete, bricks and rubble being sent to landfill, resulting in the increase in operations receiving and reprocessing this material into a crushed rock substitute.

The reprocessing of aggregates and masonry in Gippsland occurs in localised facilities of varying size. In addition, there are also mobile crushing plant services provided by the demolition industry that are available as need arises.

The quality of the product is variable and this affects its saleability. Operations in Gippsland are taking two approaches to reprocessing and providing material to the market:

- A product made entirely from recycled material to substitute a crushed rock quarry product; or
- A product blended from virgin quarry product and a crushed concrete and masonry material.

While demand for this material exists, there are limitations in securing feedstock and meeting this demand. The weight of the material means transport costs are uneconomical beyond a certain distance and availability of the recycled product for recycling is not always consistent. Using alternative disposal methods, including illegal dumping on private land, means that the material often fails to enter the re-use market.

Effective control of this activity in Gippsland is challenging due to the dispersed nature of settlement and limited resources available for enforcement. Consequently, accessing feedstock volumes sufficient to achieve economies of scale and compete with comparable quarry products is proving difficult.

However, there is little evidence to suggest that large amounts of this material are being sent to landfill.

Gippsland Concrete Recycling

Gippsland Concrete Recycling, located on Rocla Road, Traralgon, receives and reprocesses concrete, bricks and aggregate, producing a variety of pavement material and aggregates.[31] The company has a product comparable with a VicRoads Class 3 crushed rock.

The facility is on Industrial zoned land, adjoining complementary industry and excellent transport infrastructure. There is ample capacity to further expand the operation.

3.1.4. Waste to Energy (WtE)

Waste to Energy (WtE) in Gippsland is not extensive and is generally part of a closed system approach to managing the waste stream of a particular process.

For example, at Australian Paper's Maryvale Mill, black liquor, a waste product from the paper manufacturing process, generates renewable energy to reduce gas and electricity use. An on-site power plant generates a maximum of 55 MW of power using a combination of black liquor and other re-use materials, meeting half of Maryvale's total energy needs. Australian Paper Maryvale is Victoria's largest generator of base load renewable energy.

In addition, East Gippsland Water has recommissioned an anaerobic digestion unit reprocessing bio-solids and some food organics at its Bairnsdale Waste Water Treatment Facility. This operation is planned to offset some of the water treatment plant's energy needs in the near future.

The Victorian Government is supportive of WtE and is investigating ways to support development of initiatives. This is part of a broader move towards diversifying energy generation models that will support new jobs and reinforce Victoria's climate change pledge initiative to reach net zero emissions by 2050.

The outcomes from the market sounding process, issued to industry as the Gippsland Collaborative Waste Investment Initiative, indicted a high level of interest by industry to establish WtE infrastructure within Gippsland when underpinned by an offer of residual Municipal Solid Waste (approximately 70,000 tonnes per annum) by the collective Gippsland councils.

Technologies assessed by the GWRRG in the market sounding process included mass-burn combustion, pyrolysis, gasification and anaerobic digestion. These are supported through front-end processes of varying sophistication, actively removing materials that may be detrimental to the process and support higher order recovery options.

Gippsland is well placed to support WtE initiatives and the heavy industry located in the heart of the Latrobe Valley lends itself to facilities of this nature. In addition, due to increasing cost of disposal to landfill in Gippsland and changes to technologies enabling commercial returns with smaller volumes, WtE alternatives are generally becoming more viable.

The closure of Hazelwood power station may provide added impetus for the establishment of additional Waste to Energy facilities in Gippsland to partially replace the capacity of this major electricity generator.

3.1.5. Disposal Facilities (Landfills)

Gippsland is serviced by 14 landfills, seven are council-owned facilities, licensed under EPA legislation while two smaller council-owned facilities are exempt from licensing. Landfills exempt from licensing relate to an historical arrangement where the EPA provided approvals for facilities that met a range of criteria and serviced a population of less than 5,000 people. In addition, the region has five privately operated landfills.

31 Gippsland Concrete Recycling website

A landfill lifecycle includes the following six phases: siting, design, construction, operation, rehabilitation and aftercare. The life of a landfill, from initial planning to aftercare, can be as long as 60-80 years.

These elements are critically important to the overall performance of the facility and all involve close regulation by EPA Victoria. Each phase requires investment by the operator, yet only the operational stage generates funds to meet the total costs of landfill management.

Waste management policy (EPA) has progressively strengthened requirements on operators of landfills. The introduction in 2001 of Best Practice Environmental Management (BPEM) requirements and life-cycle Financials Assurances (bank guarantee) requirements in 2002 marked a change to the way landfills were operated, making provision for future monitoring and management.

In 2004, the Waste Management Policy (Siting, Design and Management of Landfills) was gazetted seeking to protect people and the environment, including local amenity, from the inherent risks posed by the disposal of waste to landfill. The policy provides a framework to drive more efficient use of resources throughout the whole life-cycle of goods and services. The policy also recognised that landfills will be required for the foreseeable future to recover wastes that cannot currently be recycled or reused. Future landfill development should therefore be minimised, taking into account the policy principles.

In 2010, landfill licensing was fundamentally revised with a focus on long term outcomes and a correspondingly greater role for environmental auditors. This significantly strengthened the role and power of the EPA with quality assurance mechanisms, independent auditing and third party verification being required of landfill developers.

While it is recognised that there have been significant improvements made, the Victorian Auditor-General Office (VAGO) Report, Managing Landfills (2014) recommended more comprehensive regulation and increased environmental management standards.[32]

The initiatives put in place since 2001 have been instrumental in reducing the impacts of landfill on the Gippsland environment and the general amenity issues potentially caused by these facilities.

3.1.5.1. Landfills Needs Assessment and Review

Landfills are part of Victoria's waste and resource recovery infrastructure system. The EPA document Waste Management Policy (Siting, Design and Management of Landfills)[33] requires that the development and use of landfills be minimised. However, it is a role of this Plan to ensure sufficient landfill airspace to meet the requirements of Gippsland 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 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 GWRRG undertook a process in accordance with the document Guideline: Making, amending and integrating the Statewide Waste and Resource Recovery Infrastructure Plan and Regional Waste and Resource Recovery Implementation Plans[34] and Outline of Process: Statewide Waste and Resource Recovery Infrastructure Scheduling[35] which assessed and determined the region's landfill airspace needs. As part of this process, the GWRRG has committed to undertaking regular future reviews of the Plan in accordance with the EP Act and relevant guidelines.

32 Victorian Auditor-General's Report, Managing Landfills, 2014
33 EPA, 2004
34 DEPI, 2014
35 Sustainability Victoria, 2015

The landfill airspace needs were determined through consideration of;

1. Projected tonnages of residual waste likely to need landfilling in the next 30 years taking into consideration:
   a. Regional population and catchment growth;
   b. Business as usual (BAU) recovery rates as worst case scenario;
   c. Information from the waste and resource recovery industry and other businesses in the region; and
   d. Future of other existing landfills (including consideration of capacity need to compensate for landfills planned for closure).

2. Information from the owners and operators of individual existing landfill sites including:
   a. Site survey results, where available;
   b. Future site development plans;
   c. Airspace availability (e.g. quarry void space) and airspace consumption performance; and
   d. Land use planning and EPA works approval status of the available airspace.

3. Waste currently deposited (in tonnes) to individual landfills including:
   a. Landfill levy and council sourced data;
   b. Specific factors that may have influenced the data;
   c. Tonnages expected to be landfilled; and
   d. Flows to or from other regions.

4. Contingency planning considerations including:
   a. Natural disasters; and
   b. Unexpected closure of facilities including those that may be in another region and provide a service (landfill or recovery) to the region.

5. The management, accuracy and verification of information provided by third parties and impact of any data gaps or assumptions on the assessment[36].

In contrast to other waste and resource recovery businesses, landfills cannot be scheduled until there is a demonstrated community need. This Plan is required to ensure that there is adequate capacity within the Gippsland region to accommodate the projected waste generated in Gippsland over a minimum of 10 years. The GWRRG is also required to work with adjoining regions that may require capacity within Gippsland. To date, there have been no requests from other Victorian Waste and Resource Recovery Groups seeking new landfill capacity in Gippsland to service their regions.

In terms of the regional need for Gippsland, assessment of current landfills, operated in line with planned extensions, shows that there is adequate capacity for at least the coming 10 years. This assumes a 'business as usual' approach and that applications for works approval are successful and timely. Three occurrences will require the GWRRG to re-evaluate this scenario:

1. Any of the Gippsland councils currently operating landfills in the region decide to cease their landfill operations, or
2. Any of the requests for extensions are denied by EPA Victoria, or
3. Modifications to the collection services, or introduction of new recycling infrastructure reduce the demand for landfill airspace.

36 The potential of increased landfill diversion and resource recovery rates were not included in the assumptions to allow conservative projections during the development of the Plan.

The GWRRG has committed to repeating the landfill needs assessment in 2019. 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); and 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.

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

This assessment informs Table 23 in the Infrastructure Schedule (Part B). Section 50BB(c)(iv) of the EP Act sets out a required minimum timeframe for a landfill scheduling table of 10 years. Whilst 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 in 2019.

3.1.5.2. Operating Landfills

All putrescible landfills currently operating in Gippsland are owned and operated by the relevant local government authority. Of the Gippsland facilities, Hyland Highway Landfill near Traralgon and Bairnsdale Landfill are recognised as regionally significant as they service regional catchments.

Two landfills currently servicing Gippsland will require works approval applications should they wish to extend their current operations to use the planned capacity of the sites. They are:

- Hyland Highway landfill, Loy Yang (Latrobe City Council), and;
- Kilmany Landfill, Kilmany (Wellington Shire Council).

Initially, there is a need to determine the commitment of councils to continue operation of landfills. Current indications are that this is the case. Should this change, the GWRRG is required to undertake a process of identifying suitable sites and enabling an Expression of Interest process for the development of alternative landfill airspace.

As new initiatives come on-line, the GWRRG will re-evaluate the need for future landfill airspace. A review of the Gippsland Implementation Plan is scheduled for 2019 and will include a reassessment of future landfill requirements. Gippsland will work collaboratively with the Metropolitan Waste and Resource Recovery Group during this time to ensure that opportunities for each region are maximised.

3.1.5.3. Potential Future Landfills

Several landfills in Gippsland are calculated to reach current approved capacity within 15 years. The GWRRG will look to operators extending existing facilities within the already approved licensed area, rather than developing new landfill sites.

Therefore, the efforts to encourage greater diversion through viable resource recovery will be given priority. Completion of the market sounding process and further assessment of possible resource recovery initiatives, such as food organics and Alternative Waste Treatment (AWT), are required to support credible predictions on future diversion of wastes from Gippsland landfills.

The Metropolitan Implementation Plan acknowledges there is a short to medium term challenge to accommodate waste in the landfills operating in the south eastern suburbs. While there is ample capacity in other landfills in the metropolitan region, this would affect the transport network.

Private sector interest exists in the establishment of landfills in Gippsland, largely to receive material generated in the south eastern suburbs of Melbourne. These initiatives have strong opposition from local communities, demonstrated by petitions to Parliament, public meetings and local media commentary.

As Melbourne's eastern growth corridor expands, there are opportunities for Gippsland councils to work with metropolitan councils to support cross regional resource recovery solutions, providing positive outcomes for Gippsland and Melbourne.

For this reason, it will be important for the GWRRG to work closely with the Metropolitan Waste and Resource Recovery Group over the coming three years, in line with the Metropolitan Group's review of its plan in 2019.

A focus on environmental justice is critical during this stage. The need for landfill airspace in Gippsland is relatively modest and in some instances future needs could be met by accessing metropolitan-based landfills that may have capacity to accept more material. Both the Bass Coast and Baw Baw Shire councils could look at options to consolidate their residual waste for bulk transport into larger Melbourne landfills with substantially lower gate fees.

Should a process be developed to establish a new landfill in the region to meet internal or external needs, it will be vital to ensure local communities are involved in the decision making process with suitable mechanisms to voice their opinion on how they are potentially impacted.

3.1.5.4. Closed Landfills

Landfills have the potential to impact the environment and communities long after they have stopped receiving waste.

Managing any issues that may impact on public health is paramount. For this reason, it is important for those responsible for the operation of landfills to rehabilitate and manage them to minimise adverse impacts. Monitoring is necessary to ensure a rapid and appropriate response if an issue arises.

Over the past 30 years, more than 60 landfills have closed in Gippsland. This has been attributed to four factors:

1. Reaching capacity;
2. Undergoing consolidation due to the amalgamation of local municipalities in the mid-1990s;
3. Not being economically viable due to the low operational throughput, hence a consolidation of waste to a larger facility; and
4. Not being able to meet the regulatory requirements, either economically or due to the environmental setting.

In total, there are 120 closed landfills in a state of rehabilitation or aftercare across Gippsland. The duty holder is accountable for these activities.

Nine of these have Post-Closure Pollution Abatement Notices (PC PAN) and 23 still require PC PANs.[37] There are a number of very small landfills that are either in the aftercare phase and some in a state of transition between closure and rehabilitation.

The EPA recently increased compliance standards for the PC PANS which require each closed landfill "...to be managed so there are no unacceptable risks to the environment".[38]

The State Infrastructure Plan advises:
"That landfill sites continue to pose environmental risks for a significant period of time after waste acceptance has ceased. Possible risks include:

- Contamination of groundwater, stormwater or surface waters with leachate, a liquid formed by rainwater and decomposing waste.
- Migration of landfill gas, formed during the decomposition of waste, into the surrounding ground and atmosphere, causing odours.
- Inappropriate or incomplete capping, leading to infiltration of rainwater that creates large volumes of leachate.
- Insufficient assessment of risk due to a lack of appropriate ongoing aftercare management, maintenance, monitoring and reporting."

To reduce these risks, EPA requires the occupier of a site to undertake ongoing aftercare until the site no longer poses a risk to human health or the environment. The period of time for aftercare management (from when a site is closed) is a minimum of:

- "10 years for sites exempt from licensing
- 30 years for licensed sites."

The GWRRG will work with the EPA and duty holders to facilitate an agreed approach to managing the risk of closed landfills to protect the environment and public health at a financial cost no greater than necessary.

In mitigating possible environmental and public health risks to meet the principle of intergenerational equity[39], both financial costs and environmental impact should not be passed on to future generations. In collaboration with EPA Victoria and Gippsland councils, the GWRRG is committed to facilitating the prioritisation of closed site rehabilitation using a risk-based approach.

Table 24 in section 6.5.1 provides information on the rehabilitation status of Gippsland's identified closed landfills.

3.1.5.5. Private Landfills

Three power generation companies operate private landfills to manage the waste from electricity production, principally ash from the combustion of brown coal. These are located within the mine works area of the Loy Yang, Hazelwood and Yallourn operations.

Australian Paper operates a privately owned licensed landfill facility for waste generated on-site. The company has been actively decreasing reliance on its landfill with the waste deposited in the facility being significantly reduced over the past 10 years. Further research is underway with a view to removing the need for landfill on-site within the next seven years.

37 Statewide Waste and Resource Recovery Infrastructure Plan, 2015
38 EPA website
39 Inter-generational equity principles aim to ensure that health and diversity of the environment is maintained and enhanced for the benefit of current and future generations

Gippsland Water operates a private landfill at its facility located at Dutson Downs. This facility is of regional significance because it provides a disposal option for commercially collected asbestos and synthetic mineral fibre (SMF), deposited in a mono-cell, a cell dedicated to one type of material. There is also infrastructure to accept Naturally Occurring Radioactive Material (NORMS), a by-product of oil drilling and exploration.

3.1.6. Service Providers External to Gippsland

Approximately 37,200 tonnes of Gippsland's recovered materials are processed outside the region, primarily though facilities located in the metropolitan region.

Metals, glass, plastics (rigid and flexible), rubber (tyres) and large portion of the commingled recyclables (including paper and cardboard, steel, aluminium, plastics and glass) rely on reprocessing in the metropolitan region, due to an absence or lack of capacity within Gippsland.

Of the material that has been identified in this Plan, 7% of recovered materials in Gippsland is sent to metropolitan-based reprocessors. The residual waste from these processes is believed to be disposed of in metropolitan-based landfills or those in other regions.

Other small amounts of residual waste generated in Gippsland are also making their way into metropolitan-based landfills in the south east and western parts of the metropolitan region. This is estimated to be approximately 10% to 15%[40] of the total waste currently sent to Gippsland landfills.

3.2. Environmental and Financial Performance of Infrastructure

A wide range of factors impact on the performance of waste and resource recovery infrastructure. Financial performance can be significantly influenced by market economics, policy settings, economies of scale, and the community's willingness and ability to pay. Environmental factors include management of emissions, maintaining public amenity, ability to resource post closure landfill rehabilitation and obtaining a social licence to operate.[41]

The following is an extract from Impacts of Economic and Environmental Factors on the Performance of Waste and Resource Recovery Infrastructure in Victoria,[42] which outlines identified financial/economic factors and environmental factors across Victoria.

"Market Economics – The functioning of the WRR (Waste and Resource Recovery) market has considerable impact on the performance of WRR infrastructure. Traditional high volume, low value commodity streams typify the industry and have led to marginal business models that are exposed to changes in market conditions.

Policy Settings – Current and future policy and regulatory settings impact performance of WRR infrastructure. In Victoria, the policy and regulatory framework has many elements and covers the activities of local government and private industry. The landfill levy remains the key instrument aimed at driving resource recovery. The current levy supports reprocessing infrastructure for heavy materials (such as concrete, brick and masonry) mainly around urban areas but is not yet high enough to drive reprocessing of residual waste.

Industry Trends – Performance of WRR infrastructure such as material recovery facilities for commingled waste benefits from strong community support for recycling at household level. In addition, global trends in technology ranging from truck bodies and compaction rates to complex infrastructure for sorting material streams improves efficiency, benefits recovery rates and saleability of end products.

40 Based on long term data trends from Gippsland councils over the past 15 years
41 Draft Metropolitan Waste and Resource Recovery Implementation Plan, 2015
42 Impacts of Economic and Environmental Factors on the Performance of Waste and Resource Recovery Infrastructure in Victoria – June 2015, p. 1.

Management of Emissions and Amenity Issues – The key environmental factor impacting the performance of WRR infrastructure in Victoria is the management of discharges and the associated amenity impacts on the local community.

Compliance and Monitoring – In light of the ongoing issues with emissions and amenity impacts outlined above, a key factor improving the performance of WRR infrastructure is the current compliance and monitoring framework. High risk infrastructure such as landfills and organics reprocessing facilities must now be managed in accordance with key guidelines such as the Landfill BPEM (Best Practice Environmental Management) and the Composting Guidelines.

Legacy Issues /Post Closure Rehabilitation of Landfill Sites – A key factor/risk that is impacting the current and future financial and environmental performance of landfill facilities relates to legacy issues from closed or capped landfill cells and the overall rehabilitation of landfill sites."

Table 14 provides a summary of the environmental and financial performance of Gippsland infrastructure.

Table 14: Infrastructure Environmental and Financial Performance

Infrastructure Category/ Material/ Technology	Environmental and Financial Performance in the Region	Opportunities
Resource Recovery Centre (RRC) / Waste Transfer Station (TS)	**Opportunity addressed through Priority Action: 1, 2, 6**	
	In Gippsland, councils' RRC operation is not driven by financial profitability, rather it has a community service focus. RRCs classified as regional hub sites (7) operate on a marginally profitable or cost neutral basis due to their scale. However, RRCs classified as local hubs (38), are unable to recover the cost of operation. RRC/TS are often not conveniently located and sometimes require substantial effort to access. This means people may take the 'easy option' of disposing recyclable items in kerbside collection bins or dumping. Outcomes are often driven by the timing and conditions of contracts, especially those of a long term nature, which may preclude alternatives such as the introduction of a new technology. Adequate buffer distances are not provided in some instances. There is bulk haulage of materials to reprocessors located in Melbourne and distance can be an issue.	Rationalisation of infrastructure by councils where: • economies of scale are low; • operations are not well located; and • the cost per tonne of waste management is rising or high. Improve viability and marketability of recyclable materials through reduced contamination. Implementation of advances in materials handling and transport efficiencies. Research and development (R&D), and introduction of new technologies that will make better use of material streams. Improved marketing of recycled materials and products (e.g. plastic furniture, compost etc.). Improved use of existing transport (i.e. trains, back loading) and consolidation of materials to provide more efficient transport.

Infrastructure Category/ Material/ Technology	Environmental and Financial Performance in the Region	Opportunities
Materials Recovery Facility (MRF)	**Opportunity addressed through Priority Action: 1, 2, 4, 6**	
	Gippsland MRFs are privately owned and recover commingled recyclables (sorting and separating). The MRFs with long term contracts generally have relatively mature markets, stable demand and steady pricing for commodities. There is bulk haulage of materials to reprocessors located in Melbourne and distance can be an issue.	Collaborative procurement option for processing of kerbside commingled recyclables to achieve greater economies of scale. Research and development of technology options to improve efficiency in processing and transport. Exploring alternative markets within and outside the state.
In Vessel Composting of Organics	**Opportunity addressed through Priority Action: 2, 3, 4, 6**	
	Higher levels of process control afford many advantages for batch traceability and monitoring leading to enhanced compliance and reputational advantages. Currently only SORF facility is utilising in-vessel composting. Contamination of feedstock can increase the reprocessing costs.	Collaborative procurement option for reprocessing of kerbside food organics and garden organics collection to achieve greater economies of scale. Increased feedstock through kerbside food organics collection. Increased feedstock through improved commercial collections. Improved marketability of end product through improved quality standards tailored to different potential markets. Improved viability and marketability of recyclable materials through reduced contamination.

Table 14: Infrastructure Environmental and Financial Performance (cont.)

Infrastructure Category/ Material/ Technology	Environmental and Financial Performance in the Region	Opportunities
Open Windrow Composting of Organics	**Opportunity addressed through Priority Action: 1, 2, 4, 6**	
	Pinegro, which has a site in Morwell, produces some 3.5 million bags of retail landscape products each year. Access to feedstock is becoming increasingly competitive, especially with a reliance by some of the smaller operators on garden organics material from Melbourne. On-farm composting on a smaller scale occurs, many without regulation and with varying management techniques. Windrow composting is more likely to suffer from odour and runoff problems. Limitations on the amounts of food and other wet organics that can be reprocessed impact the business model. However, this process remains popular given lower cost of establishment and technology. Varying quality of end product means that market opportunities can be limited.	Potential location for composting operations seeking to move from areas where encroachment is occurring and larger buffers required. Collaborative procurement option for reprocessing of kerbside food organics and garden organics collection to achieve greater economies of scale. Increased feedstock through kerbside food organics collection. Increased feedstock through improved commercial collections. Improved marketability of end product through improved quality standards tailored to different potential markets. Improved viability and marketability of recyclable materials through reduced contamination.
Wood / Timber Reprocessing	**Opportunity addressed through Priority Action: 1, 2, 4, 6**	
	Low margin material markets, competing with cheap virgin materials or product imports (sometimes leading to material stockpiling). In Gippsland, material is often stockpiled at remote locations as timber products are reprocessed close to source. This often leaves stockpiles of bark and timber by-products some distance from potential markets.	Increased capture within residual stream from all waste sectors. Potential for alternate end uses e.g. refuse derived fuels, soil conditioners or animal bedding. Possible aggregation of material in sub-regional areas to achieve more efficient transport.

Infrastructure Category/ Material/ Technology	Environmental and Financial Performance in the Region	Opportunities
Alternative Waste Technologies (AWTs) such as Mechanical Biological Treatment	**Opportunity addressed through Priority Action: 1, 2, 3, 6**	
	Limited instances in the region to evaluate. Australian Paper has successfully produced up to 55kW from paper and pulping process. Likely to be greater interest if feedstock in excess of that generated in the region can be secured to enable return on investment (i.e. >20 years). However, desired annual throughput and costs only just comparable with landfill gate fees in Gippsland.	Supplementary energy for manufacturing businesses. Possible co-location in heavy industrial zones. Collaborative procurement option for councils and private industry to stimulate economic development and investment.
Waste to Energy (including pyrolysis, gasification and anaerobic digestion)	**Opportunity addressed through Priority Action: 1, 2, 3, 6**	
	Regulatory gaps prolong approval times and costs. Sourcing of large capital necessary for investment in infrastructure and equipment. The ability to attract sufficient material volumes to reach viable economies of scale will determine the financial success of these ventures.	Supplementary energy for manufacturing businesses. Possible co-location in heavy industrial zones. Collaborative procurement option for councils and private industry to stimulate economic development and investment.
Existing landfills	**Opportunity addressed through Priority Action: 1, 4, 5, 6**	
	Smaller facilities have ceased operation, making way for more centralised facilities that have been fully engineered to meet regulatory requirements. Larger, specific plants as well as improved infrastructure such as sealed roadways, weighbridges and leachate treatment have led to improved performance and monitoring of active sites. Greater economies of scale have been achieved, which has gone some way to reducing the impact of increased compliance costs resulting from complex landfill design requirements and regulatory environment. Adequate buffer distances are not provided in some instances.	Possible sharing of landfill infrastructure between councils where economic benefit can be achieved for all parties. More frequent assessment of airspace consumption to monitor operational performance. Expansion of selected sites to facilitate regional centralisation at a greater scale. Collaborative procurement option for councils to consolidate design, construction, operation, auditing, environmental monitoring and reporting, rehabilitation and aftercare of existing landfills on a regional scale.

Table 14: Infrastructure Environmental and Financial Performance (cont.)

Infrastructure Category/ Material	Environmental and Financial Performance in the Region	Opportunities
Closed landfills	**Opportunity addressed through Priority Action: 5**	
	These sites can pose potential risks that are a legacy of being sited and built to the standards that were accepted as good practice at the time of their construction. However, they fall short of the stringent standards that have applied since 2001. Many closed landfill sites in Gippsland have been rehabilitated upon closure to minimise any environmental, amenity and health risks and any future financial cost. Some existing facilities in Gippsland will require further remediation work to meet regulatory standards. There will be further investment required to achieve fully compliant closed landfill facilities over the coming years. Adequate buffer distances are not provided in some instances.	Collaborative procurement option for duty holders to assess closed facilities on a regional scale to prioritise action. Collaborative procurement option for councils to undertake design, auditing and rehabilitation, monitoring and reporting on a regional scale.
Paper/Cardboard	**Opportunity addressed through Priority Action: 1, 2, 3, 4, 6**	
	While relatively stable in comparison to other commodities, market price fluctuations can result in material stockpiling and/or export. Well-developed collection systems for commercial and kerbside sources. Disposal of paper and cardboard to landfill is a lost opportunity to reprocess this material into new products.	Increased capture within residual stream from all waste sectors. Possible aggregation of material in sub-regional areas to achieve more efficient transport.
Glass	**Opportunity addressed through Priority Action: 1, 2, 3, 4, 6**	
	It is currently understood that glass collected in Gippsland is transported out of the region for reprocessing.	Potential for sand replacement in some products within the region. Research and development on product options to improve marketability and target applications with greater return.

Infrastructure Category/ Material	Environmental and Financial Performance in the Region	Opportunities
Plastics	**Opportunity addressed through Priority Action: 1, 2, 3, 4, 6**	
	Costs of reprocessing infrastructure and transport high for often low value materials. It is believed that all recovered plastics are transported to Melbourne for reprocessing.	Increased capture in MSW and C&I residual streams. Collaborative procurement option for collection of agricultural plastics to achieve greater economies of scale. Establishment of reprocessing capacity within the region.
Rubber (incl. tyres)	**Opportunity addressed through Priority Action: 1, 2, 3, 4, 6**	
	Quantity of tyres used / stored on farm is unknown but believed to be significant. Large-scale use of tyres has historically occurred in irrigation canals servicing the Macalister Irrigation District. These are being uncovered as an upgrade of the system takes place. Cost of disposal at transfer stations is perceived as expensive and varies across the region.	Possible aggregation of tyres to enable reprocessing or recycling options or Waste to Energy options.
Metals	**Opportunity addressed through Priority Action: 1, 2, 3, 4, 6**	
	Market price fluctuations resulting in material stockpiling. Numerous small collection centres across the region to service the diverse population, i.e. many scrap metal operators.	Collaborative procurement option for collection of metals to achieve greater economies of scale in areas further from reprocessing locations (e.g. far east Gippsland).
Aggregate, masonry and soils	**Opportunity addressed through Priority Action: 2, 3, 4, 6**	
	Low margin material markets, competing with plentiful virgin materials. Cost of reprocessing concrete is high. Market acceptance is unpredictable. Adequate buffer distances are not provided in some instances.	Greater use of recycled material in construction projects. Research and development of product options to improve marketability and target applications with greater return.

Table 14: Infrastructure Environmental and Financial Performance (cont.)

Infrastructure Category/ Material	Environmental and Financial Performance in the Region	Opportunities
Textiles (including mattresses)	**Opportunity addressed through Priority Action: 1, 2, 3, 4, 6**	
	Most councils reprocess mattresses on site. Clothing and furnishings widely re-used through charity organisations.	Collaborative procurement option for collection of mattresses to achieve greater economies of scale. Possible collaboration with not for profit sector to enhance transport and processing options.

3.3. Waste and Resource Recovery Hubs

Victoria's waste management and resource recovery activities are located across the state in a network of what the State Infrastructure Plan defines as 'hubs and spokes'. The Gippsland Implementation Plan defines a hub as "a facility or group of facilities that manage or recover waste or material streams" [43] and divides hubs into three levels according to criteria presented below.[44] The Plan defines a 'spoke' as "the sequence of activities that move materials from waste generators to (and from) hubs"[45].

Together they form a system that supports the aggregation of materials within a network for efficient resource recovery and management of waste materials. The initial identification of a hub is intended to inform a discussion of its future. Over the implementation phase of this Plan, the future of hubs in the region will be explored, including alignment with local planning schemes as appropriate.

There is significant potential for economic development opportunities associated with development of resource recovery hubs in Gippsland as the need for aggregation and consolidation of recyclable materials grows. The western end of the region, which is relatively close to the expanding metropolitan area, is in a good position to take advantage of these opportunities.

A hierarchy of hubs is outlined in Table 15.

43 *State Waste and Resource Recovery Infrastructure Plan*, 2015
44 *Draft Metropolitan Waste and Resource Recovery Implementation Plan*, 2015
45 *State Waste and Resource Recovery Infrastructure Plan*, 2015

Table 15: Waste and Resource Recovery Hub Criteria

Level	Criteria
State Importance	• The hub manages or processes a significant proportion of one or more material streams for the state. • 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. • 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. • The hub has access to generators, markets, ports or transport infrastructure. • 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.
Regional Importance	• The hub manages or processes a significant proportion of one or more material streams for the waste and resource recovery region or adjacent regions. • 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. • 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. • 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. • 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. • The hub may facilitate some reprocessing within the region or in the close proximity.
Local importance	• The hub manages or processes a significant proportion of one or more material streams for the local community. • 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. • 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. • 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.

The locations of Hubs of State and Regional significance is shown in Figure 12 with further detail provided in Table 16.

Figure 12: Locations of State and Regionally Significant Hubs in Gippsland

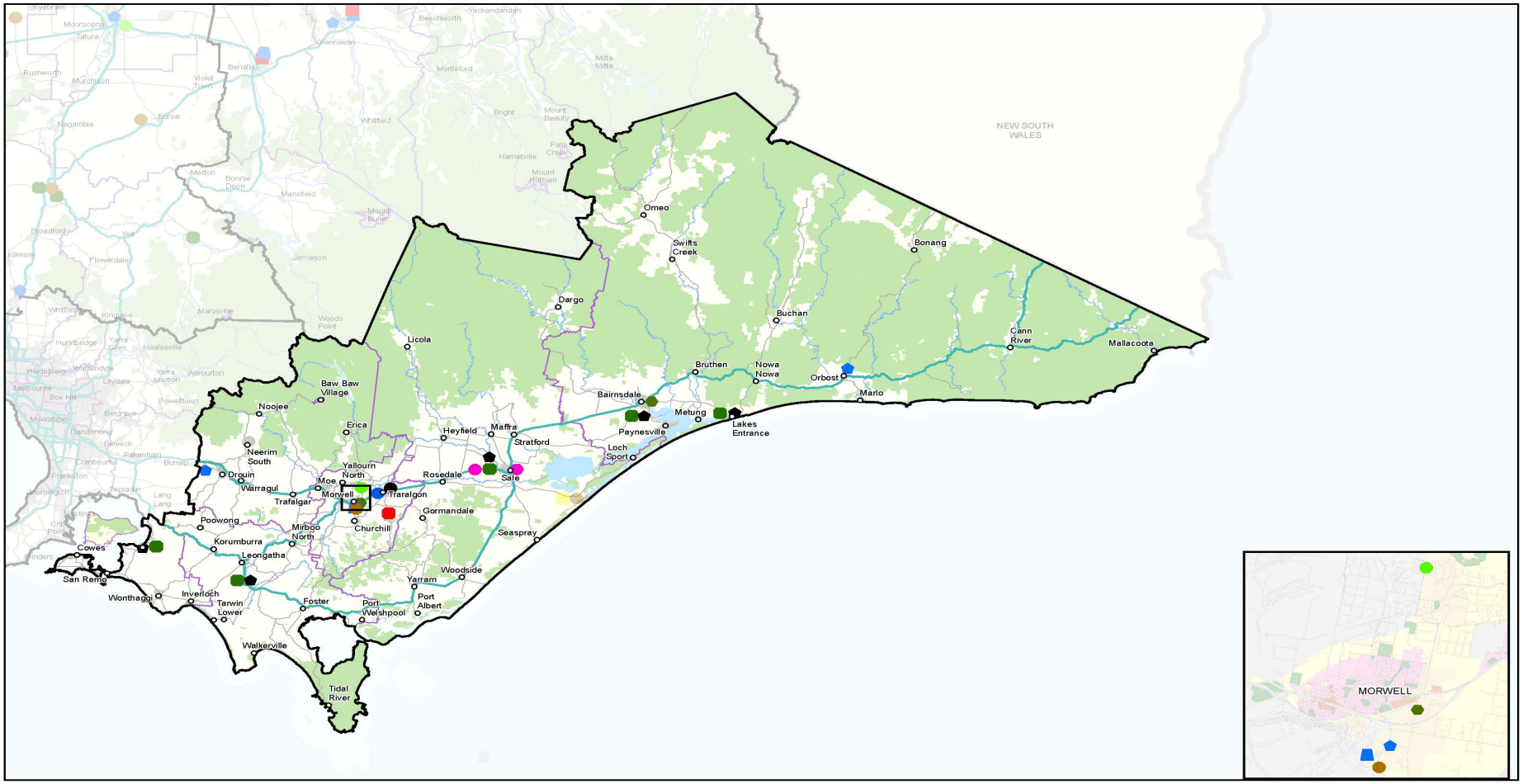


Table 16: Waste and Resource Recovery Hubs in Gippsland

Hub		Significance				
Site	Category	Type	State	Regional	Local	
Grantville	Disposal	Landfill Licenced		•		
Grantville	Resource Recovery	RRC/TS, Co-located at landfill		•		
Wonthaggi	Resource Recovery	RRC/TS standalone		•		
Inverloch	Resource Recovery	RRC/TS standalone			•	
Cowes Recycling Facility	Resource Recovery	RRC/TS standalone			•	
Wonthaggi Recyclers	Resource Recovery	MRF			•	
Bass Coast Metal Recyclers	Resource Recovery	RRC/TS standalone				
Wheel-A-Waste Pty Ltd	Resource Recovery	RRC/TS standalone			•	
Bass Coast Rubbish Removal & Bin Hire	Resource Recovery	RRC/TS standalone			•	
Donmix Concrete	Reprocessor	Aggregates, Masonry & Soil			•	

	Constraints	Needs & Opportunities
	The site is zoned PUZ1 – Public Use – Service and Utility under the Bass Coast Shire Council's (BCSC) Planning Scheme. The following land use zones surround the site: • Land to the southwest of the site is zoned FZ – Farming and SUZ – Special Use; • Land to the south of the site is zoned PCRZ - Public Conservation and Resource; • Land to the east is zoned TZ – Township (comprising the township of Adams Estate); and • Land to the north and northwest is zoned FZ – Farming. The site and land to the south is subject to a Wildfire Management Overlay and requires a permit for certain building works, however, operation and construction of public utilities is excluded from this permit requirement. BCSC owns the land on which the existing landfill operates. The Grantville landfill forms part of the Grantville Gravel Reserve that is managed by the BCSC as a Committee of Management under the Crown Lands Reserve Act 1978. The reserve occupies an area of about 100 ha. Two gravel quarries are located within the reserve located either side of a prominent north westerly flowing creek which bisects the reserve into northern and southern portions (NC, 2011).	
		Facility upgrade including waste sorting area. Resale shed.
	Location. Upgrade tied to Operational Contract.	Facility upgrade to Best Practice including resale shop. An alternate location in the industrial zone. Centralising the facility to better service the shire population location and density.
	Limited size of site.	Council resolved that the site is to be closed 1 September 2017.
	Insufficient capacity to operate as a transfer station.	No planned upgrades. Replace with a new Transfer Station on Phillip Island (Expression of Interest for development of a site is planned for 2017).
	Insufficient capacity and old MRF plant.	

Table 16: Waste and Resource Recovery Hubs in Gippsland (cont.)

Hub		Significance				
Site	Category	Type	State	Regional	Local	
Lardner	Resource Recovery	RRC/TS standalone		•		
Trafalgar	Resource Recovery	RRC/TS standalone			•	
Neerim South	Resource Recovery	RRC/TS standalone			•	
Erica	Resource Recovery	RRC/TS standalone			•	
Drouin Waste Recyclers	Resource Recovery	RRC/TS standalone		•		
Drouin Concrete Recyclers	Reprocessor	Aggregates, Masonry & Soil			•	
Neerim South Quarry	Reprocessor	Aggregates, Masonry & Soil			•	
Sort Worx	Resource Recovery	RRC/TS standalone			•	

	Constraints	Needs & Opportunities
	The location of the site is 10-15 minutes from the population base of the shire. The size of the site is restrictive for introduction of improved infrastructure for recovery. The roads leading into Lardner are council controlled sealed rural roads. Facility is zoned FZ (Farming). Surrounding land use is FZ.	Review the location of the facility and potential for relocation into the industrial area to the east of Warragul. Facility upgrade to Best Practice. Transfer Station Infrastructure Strategy to be developed. Future vision is for source separation infrastructure and mechanical compaction of bins.
	The location of the site is small and narrow. No capacity for expansion or stockpiling. Facility is zoned FZ (Farming). Surrounding land use is FZ. The roads leading into this site are VicRoads controlled roads and council controlled local sealed roads. The site is in the Uralla Nature reserve and has rehabilitation vegetation conditions.	Review the location of the facility and potential for relocation into the industrial area to the east of Trafalgar. Facility upgrade to Best Practice. Transfer Station Infrastructure Strategy to be developed. Future vision is for source separation infrastructure and mechanical compaction of bins.
	The current location of the site is small and narrow. No capacity for expansion or stockpiling. Facility is located in, and surrounded by, Farming zones FZ. It is within 480m of the General Residential Zone GRZ1. Future development will be subject to land availability and planning amendment conditions.	Facility upgrade to Best Practice. Transfer Station Infrastructure Strategy to be developed. Future vision is for source separation infrastructure and mechanical compaction of bins.
	The facility is zoned Public Use and the surrounding land is zoned Housing and Agriculture. The Roads leading into Erica are VicRoads controlled roads.	Facility upgrade to Best Practice. Transfer station Infrastructure Strategy to be developed. Future vision is for source separation infrastructure and mechanical compaction of bins.
	The facility is zoned Industrial IN1Z and surrounding land is Public Use - Cemetery/Crematorium PUZ5, Industrial IN1Z and Low Density Residential zone LDRZ. The roads leading into this site are VicRoads controlled roads and council controlled local sealed roads.	
	The facility is zoned Industrial IN1Z and surrounding land is Public Use - Cemetery/Crematorium PUZ5, Industrial IN1Z, Farming FZ and Low Density Residential zone (LDRZ). The roads leading into this site are VicRoads controlled roads and council controlled local sealed roads.	
	Facility located in, and surrounded by, Farm zoning FZ. Future planning may be subject to planning conditions and amendments. The roads leading into this site are VicRoads controlled roads and council controlled local sealed roads.	Adjacent to the Transfer Station.
	The facility is zoned Industrial IN1Z and surrounded by Industrial IN1Z and General Residential GRZ1.	Potential replacement of Trafalgar TS.

Table 16: Waste and Resource Recovery Hubs in Gippsland (cont.)

Hub		Significance				
Site	Category	Type	State	Regional	Local	
Baw Baw Shire Depot	Reprocessor	Hazardous			•	
Drouin Waste Recyclers	Reprocessor	Aggregates, Masonry & Soil			•	
Gippsland Metal Recyclers	Resource Recovery	RRC/TS standalone			•	
K.B. Auto Salvage & Recycling	Resource Recovery	RRC/TS standalone			•	
Drouin Concrete Recyclers	Reprocessor	Aggregates, Masonry & Soil			•	
A1 Concrete Recycling	Reprocessor	Aggregates, Masonry & Soil			•	
B & H Scrap Removals	Resource Recovery	RRC/TS standalone			•	
Maple Ridge Scrap	Resource Recovery	RRC/TS standalone			•	
Saferoads	Reprocessor	Aggregates, Masonry & Soil			•	
Bemm River	Resource Recovery	RRC/TS standalone			•	
Genoa	Resource Recovery	RRC/TS standalone			•	
Mallacoota	Resource Recovery	RRC/TS standalone			•	
Orbost	Resource Recovery	RRC/TS standalone			•	
Bonang	Resource Recovery	RRC/TS standalone			•	
Wairewa	Resource Recovery	RRC/TS standalone			•	
Newmerella	Resource Recovery	RRC/TS standalone			•	

	Constraints	Needs & Opportunities
	Located in a Mixed-Use zone MUZ and surrounded by general residential GRZ1 and urban growth zones UGZ, the depot is predominately in a residential area of Warragul. The mixed-use zone allows the operation of the facility. However, transition into heavier uses is prohibited. Future development will be subject to planning conditions. The roads leading into this site are controlled by VicRoads and council controlled local sealed roads.	Current need is for an undercover facility.
	The facility is zoned Industrial IN1Z and surrounding land is Public Use - Cemetery/Crematorium PUZ5, Industrial IN1Z and Low Density Residential zone (LDRZ). The roads leading into this site are VicRoads controlled roads and council controlled local sealed roads.	
	This facility is zoned Public Conservation & Resource and is surrounded by Farming and Public Park and Recreation zones. The facility is located outside the buffer but in close proximity to the urban settlement.	Site upgrades.
		Site upgrades.
		No planned upgrades.
	Within Farming zone, this site is surrounded by Farming and Public Conservation & Resource zones. Future planning will be subject to planning conditions.	No planned upgrades.
		No planned upgrades.
	This facility is zoned Public Conservation & Resource. It is surrounded by Public Conservation & Resource and Farming zones.	Site upgrades.
	Site closure.	

Table 16: Waste and Resource Recovery Hubs in Gippsland (cont.)

Hub		Significance				
Site	Category	Type	State	Regional	Local	
Marlo	Resource Recovery	RRC/TS standalone			•	
Buchan	Resource Recovery	RRC/TS standalone			•	
Metung	Resource Recovery	RRC/TS standalone			•	
Bruthen	Resource Recovery	RRC/TS standalone			•	
Swifts Creek	Resource Recovery	RRC/TS standalone			•	
Omeo	Resource Recovery	RRC/TS standalone			•	
Lindenow	Resource Recovery	RRC/TS standalone			•	
Bairnsdale	Resource Recovery	RRC/TS, Co-located at landfill		•		
Lakes Entrance	Resource Recovery	RRC/TS, Co-located at landfill		•		
Anglers Rest	Resource Recovery	Drop Off Transfer Trailers			•	
Brodribb River	Resource Recovery	Drop Off Transfer Trailers			•	
Buldah	Resource Recovery	Drop Off Transfer Trailers			•	
Chandlers Creek	Resource Recovery	Drop Off Transfer Trailers			•	
Club Terrace	Resource Recovery	Drop Off Transfer Trailers			•	

	Constraints	Needs & Opportunities
	This facility is zoned Public Park and Recreation. Surrounding land is zoned Low Density Residential, Farming and Public Conservation Resource land. The transfer station is adjacent to the urban boundary. Future development could be constrained by low density residential encroachment. Identified for closure under the East Gippsland Shire's Waste Facilities and Disposal Strategy 2014.	Site upgrades.
	This facility is zoned Public Use - Local Government and is surrounded by Public Park & Recreation and Farming zones. There are dwellings within 500m buffer. The zoning allows for dwellings to be located within this distance.	Site upgrades.
	Surrounded by Farming zone but future development could be constrained by rural residential encroachment.	Site upgrades.
	Within rural residential area and surrounded by Rural Living, Low Density Residential and Public Use - Cemetery zones. Future planning will be subject to planning conditions.	Site upgrades.
	Within Farming zone, this site is surrounded by Farming and Public Conservation & Resource zones. Future planning will be subject to planning conditions.	Site upgrades.
	Within Industrial zone. Future planning will be subject to planning conditions.	Site upgrades.
	Facility is located within, and surrounded by, Farming zones and adjacent to land subject to an Environmental Significance Overlay.	Site upgrades.
	The zoning is Farming and there is an Environmental Significance Overlay. Permits are required for buildings and works.	No planned upgrades.
	This facility is zoned Farming and is surrounded by Farming, Rural Living and General Residential zones. The area is covered by Environmental Significance, Vegetation Protection and Erosion Management Overlays. Residential development has been permitted within the 500m buffer. Future planning will be subject to planning conditions.	Upgrade and design new Transfer Station to best practice.
	This facility is surrounded by Farming zoned land.	Upgrade trailer to include recyclables.
	This facility is surrounded by Farming zoned land.	Change of service provision - rural kerbside collection.
	Service identified to be removed – same location as Chandlers Creek	
		Upgrade trailer to include recyclables.
		Upgrade trailer to include recyclables.

Table 16: Waste and Resource Recovery Hubs in Gippsland (cont.)

Hub		Significance				
Site	Category	Type	State	Regional	Local	
Combienbar	Resource Recovery	Drop Off Transfer Trailers			•	
Deddick	Resource Recovery	Drop Off Transfer Trailers			•	
Dellicknora	Resource Recovery	Drop Off Transfer Trailers			•	
Ensay	Resource Recovery	Drop Off Transfer Trailers			•	
Gipsy Point	Resource Recovery	Drop Off Transfer Trailers			•	
Glen Wills	Resource Recovery	Drop Off Transfer Trailers			•	
Goongerah	Resource Recovery	Drop Off Transfer Trailers			•	
Tamboon / Furnell	Resource Recovery	Drop Off Transfer Trailers			•	
Tubbut	Resource Recovery	Drop Off Transfer Trailers			•	
Tambo Waste	Resource Recovery	MRF		•		
Mallacoota Water Treatment Plant	Reprocessor	Organics			•	
Whelans Quarry Sandpit	Reprocessor	Aggregates, Masonry & Soil			•	
Paul Volk Contracting	Reprocessor	Aggregates, Masonry & Soil			•	
Bairnsdale Scrap Metal	Resource Recovery	RRC/TS standalone			•	
East Gippsland Scrap Metal Recyclers & Bargain Centre	Resource Recovery	RRC/TS standalone			•	
Bin Skips Waste & Recycling	Resource Recovery	RRC/TS standalone			•	
East Gippsland Water	Reprocessor	Combined organics			•	

	Constraints	Needs & Opportunities
		Upgrade trailer to include recyclables.
	The facility is surrounded by Public Conservation & Resource and Public Use - Other zones.	Upgrade trailer to include recyclables.
	This facility is surrounded by Farming zoned land.	Upgrade trailer to include recyclables.
	This facility is surrounded by Farming zoned land.	Trailers to be replaced by rural kerbside collection service.
	The facility is surrounded by Public Conservation & Resource, Rural Living and Township zones.	New rural kerbside to be introduced by July 2016.
	Within a Farming zone, this site is surrounded by Farming Public Conservation & Resource zones.	Upgrade trailer to include recyclables.
	Within a Farming zone. This site is surrounded by Farming and Public Conservation & Resource zones.	Upgrade trailer to include recyclables.
	Service identified to be removed	
	This facility is surrounded by Public Conservation & Resource and Farming zones.	Upgrade trailer to include recyclables.
	Within Industrial zone and surrounded by Industrial, General Residential and Public Park and Recreation zoned land.	Upgrade facilities to provide for paper and cardboard recycling and sort separation of C&I, C&D wastes.
	This facility is surrounded by Public Conservation & Resource and Public Use - Service and Utility zones.	
	Within a Farming zone and surrounded by Farming zoned land.	
		Increase throughput capacity.

Table 16: Waste and Resource Recovery Hubs in Gippsland (cont.)

Hub		Significance				
Site	Category	Type	State	Regional	Local	
Hyland Highway	Disposal	Landfill - Licenced		•		
Morwell	Resource Recovery	RRC/TS standalone		•		
Moe	Resource Recovery	RRC/TS standalone			•	
Traralgon	Resource Recovery	RRC/TS standalone			•	
Yinnar	Resource Recovery	RRC/TS standalone			•	
Dasma Environmental Solutions	Resource Recovery	MRF		•		
Gippsland Concrete Recyclers	Reprocessor	Aggregates, Masonry & Soil			•	
Pinegro	Reprocessor	Organics		•		

	Constraints	Needs & Opportunities
	This facility is within Special Use Zone (coal) and adjacent to Farming zones. Future planning will be subject to planning conditions. There are no identified freight routes at this stage, but should the facility be expanded, the strength of the immediate access road may be suspect. There are no transport alternatives.	No planned upgrades.
	This facility is within an Industrial zone and adjacent to Farming, Road and Industrial zones. The land is subject to Land Subject to Inundation, Floodway, State Resource and a Design and Development Schedule 1 Overlays. The land is adjacent to the Lurgi site where the Lurgi Master Plan 2006 is applied.	Access roads are all in good condition. It may be feasible to establish a rail spur to the site. No planned upgrades.
	This facility is within Special Use Zone (coal) and adjacent to Farming zone, the land is subject to the Environmental Significance Overlay, Schedule 1 (urban buffer). Future development will be subject to planning conditions. The Moe Structure Plan identifies future residential encroachment towards the site to within approximately 600m. The road accessing this site from the west is in good condition but in a higher density residential area. Part of access from Princes Freeway is not suitable for heavy vehicles.	The site is adjacent the train line. No planned upgrades.
	This facility is within Special Use Zone (coal) and adjacent to Farming and Residential Land zones. The site has a Public Acquisition Overlay for the future Traralgon Bypass and an Environmental Significance Overlay, Schedule 1 (urban coal buffer). The potential Traralgon Freeway Bypass may impact access. The road is not adequate for significant heavy vehicle traffic.	No planned upgrades.
	This facility is within Public Use - Service & Utility) and surrounded by Public Conservation and Resource Zone. Site has a State Resource Overlay. The closest dwelling is approximately 500m away. There are no transport alternatives. The road is not adequate for significant heavy vehicle traffic.	Need for an additional 30M^3 skip bin location, upgrade road surfaces, office/amenities.
	This facility is located in, and surrounded by, Industrial zoning. Current planning encourages protection of this area from residential encroachment.	This facility is located beside a major road and is close to Princes Freeway and rail line. Potential future access to the site by a rail spur requires a road crossing of Tramway Road. No planned upgrades.
	Located in, and surrounded by Industrial zoning. Future planning will be subject to planning conditions. Amendment C87 proposes to introduce a new Structure Plan that will identify adjacent land for long term residential.	Railway is nearby, but a spur to the site is not practical. Access roads are all in good condition for industrial use.
	This facility is within an Industrial zone and adjacent to the Special Use Zone Schedule 1, Road and Industrial zones. The land is within the Floodway and Land Subject to Inundation Overlays.	Access roads are all in good condition for industrial use. There appears to be a decommissioned rail spur to this site.

Table 16: Waste and Resource Recovery Hubs in Gippsland (cont.)

Hub		Significance				
Site	Category	Type	State	Regional	Local	
Nippon Paper (Australian Paper)	Reprocessor	Paper/Cardboard		•		
TRP Morwell Pty Ltd	Reprocessor	Rubber		•		
Gippsland Renewable Energy	Waste to Energy	Waste to Energy		•		
Depot - Latrobe 1					•	
Sims Metal Management	Reprocessor	Metal		•		
Koonwarra	Disposal	Landfill - Licenced		•		
Koonwarra	Resource Recovery	RRC/TS, Co-located at landfill		•		
Foster	Resource Recovery	RRC/TS standalone			•	
Korumburra	Resource Recovery	RRC/TS standalone			•	
Mirboo North	Resource Recovery	RRC/TS standalone			•	

	Constraints	Needs & Opportunities
	This facility is within an Industrial zone. The land is surrounded by Special Use, Public Conservation & Resource, Farming, Rural Living and Industrial zones. The property is affected by multiple significant overlays. As part of Amendment C87, an odour buffer is proposed around the facility. Formal controls will be put in place as part of a future amendment. The Australian Paper Mill is required under this provision to provide a 5km default buffer. This is to prevent further encroachment towards the Australian Paper Mill. There are a significant number of sensitive uses within the default 5km buffer including approximately 4000 dwellings and a number of schools. The adjusted buffer, while significantly smaller and is the proposed extent, still includes 219 dwellings within the buffer. Access from the Princes Freeway is partially through existing and future residential areas.	There is alternate arterial road access to the site, as well as a rail spur.
	The facility has yet to be established. All roads are residential although in good condition considering their purpose. Not suitable for heavy vehicles or an increase in traffic volumes.	
	This facility is within an Industrial zone and adjacent to the Special Use Zone Schedule 1, Road and Industrial zones. The land is within the Floodway and Land Subject to Inundation Overlays.	Access roads are all in good condition for industrial use. There appears to be a decommissioned rail spur to this site.
	This facility is within an Industrial zone and adjacent to a Farming and General Residential zones. Land is subject to an Environmental Significance Overlay (Urban buffer). Future planning will be subject to planning conditions. The access road is not adequate for significant heavy vehicle traffic	
	This facility is located in, and surrounded by, Industrial zoning. The site is in close proximity to Residential and Farming zones and identified in the proposed structure plan as part of Amendment for protected from residential encroachment.	Access roads are all in good condition for industrial use.
	This facility is within Farming and surrounded by Farming and Public Use – Service & Utility zones.	Future Black Spur upgrade / Koonwarra South Gippsland Highway. On Leongatha heavy vehicle route and existing VicRoads B-Double routes.
	This facility is within Farming and surrounded by Farming and Public Use – Service & Utility zones.	Future Black Spur upgrade / Koonwarra South Gippsland Highway. On Leongatha heavy vehicle route and existing VicRoads B-Double routes.
	This facility is within Public Use - Service & Utility and surrounded by Farming and Public Park & Recreation zones.	Good access to the South Gippsland Highway and existing VicRoads B-Double routes.
	This facility is within Public Use - Service & Utility and surrounded by Public Park & Recreation and Public Conservation & Resource zones. Houses are situated within the buffer limits.	Good access to the South Gippsland Highway.
	This facility is within Public Use - Service & Utility and surrounded by Public Park & Recreation and Public Conservation & Resource zones. The access road to the site is unsealed and runs through residential area. Strzelecki Highway requires overtaking lanes.	Main roads are Strzelecki Highway and South Gippsland Highway and on existing VicRoads B-double routes.

Table 16: Waste and Resource Recovery Hubs in Gippsland (cont.)

Hub		Significance				
Site	Category	Type	State	Regional	Local	
Venus Bay	Resource Recovery	RRC/TS standalone			•	
Walkerville	Resource Recovery	RRC/TS standalone			•	
Aussie Compost Company	Reprocessor	Organics			•	
Dargo	Resource Recovery	RRC/TS standalone			•	
Heyfield	Resource Recovery	RRC/TS standalone			•	
Kilmany	Disposal	Landfill - Licenced		•		
Kilmany	Resource Recovery	RRC/TS, Co-located at landfill		•		
Loch Sport	Resource Recovery	RRC/TS standalone			•	
Maffra	Disposal	Licenced			•	
Maffra	Resource Recovery	RRC/TS, Co-located at landfill			•	
Rosedale	Disposal	Unlicensed			•	
Rosedale	Resource Recovery	RRC/TS, Co-located at landfill			•	

	Constraints	Needs & Opportunities
	This facility is within Public Use - Service & Utility and surrounded by Township, Low Residential Development and Public Conservation & Resource zones. There are houses situated within the buffer limits. Future planning may be subject to planning conditions.	The main road is Inverloch - Venus Bay Road and existing VicRoads B-Double routes.
	This facility is within Public Use - Service & Utility and surrounded by farming and Public Conservation & Resource zones.	The main road Fish Creek - Walkerville Road and existing VicRoads B-Double routes.
	This facility is zoned Farming and surrounded by the same zoned land. Should probably be in the Public Use zone.	Land owned by Wellington Shire No planned upgrades.
	This facility is zoned Public Use - Local Government and is surrounded by Public Conservation & Resource, Road and Farming zones. An Environment Significance Overlay and Landfill buffer applies to the site. Amendment C72 to the Planning Scheme was implemented in 2014. As part of this amendment land was rezoned to Residential use and Low Density Residential. There are houses situated within the landfill buffer.	No planned upgrades.
	This facility is zoned Public Use - Local Government and is surrounded by Farming zone. An Environmental Significance Overlay applies.	No planned upgrades.
	This facility is zoned Public Use - Local Government and is surrounded by Farming zone. An Environmental Significance Overlay applies constituting a buffer for landfill.	No planned upgrades.
	This facility is zoned Public Use - Local Government and surrounded by Public Park & Recreation, Industrial and Road zones. The facility is subject to an Environment Significance Overlay - Coastal and Gippsland Lakes Environs. There are houses situated within the Landfill buffer. The Primary School is closest at ~585m.	No planned upgrades.
	This facility is zoned Public Use - Local Government and surrounded by Farming zone. There are houses within the Landfill buffer.	No planned upgrades.
	This facility is zoned Public Use - Local Government and surrounded by Farming zone. There are houses within the Landfill buffer.	No planned upgrades.
	This facility is zoned Public Use - Local Government and is surrounded by Farming and Public Conservation & Resource zone). It is subject to the Environment Significance Overlay and Landfill buffer. Amendment C86 - Implementation Rosedale Structure Plan, October 2015, has rezoned land to the Rural Living zone. There are houses within the Landfill buffer.	No planned upgrades.
	This facility is zoned Public Use - Local Government and is surrounded by Farming and Public Conservation & Resource zone. It is subject to the Environment Significance Overlay and Landfill buffer. Amendment C86 - Implementation Rosedale Structure Plan, October 2015, has rezoned land to the Rural Living zone. There are houses within the Landfill buffer.	No planned upgrades.

Table 16: Waste and Resource Recovery Hubs in Gippsland (cont.)

Hub		Significance				
Site	Category	Type	State	Regional	Local	
Seaspray	Resource Recovery	RRC/TS standalone			•	
Stratford	Resource Recovery	RRC/TS standalone			•	
Yarram	Resource Recovery	RRC/TS standalone			•	
Gippsland Water - Dutson Downs Soil and Organic Recycling Facility	Reprocessor	Organics	•			
Towards Zero depot	Reprocessor	Recycling skips, Steel, P&C. HH		•		

	Constraints	Needs & Opportunities
	The facility is zoned Public Use - Local Government and is surrounded by Public Park and Recreation and Farming zones. The land is subject to an Inundation Overlay and Flood Overlay. The adjacent property is subject to the Environment Significance Overlay, Coastal and Gippsland Lakes Environs. There are houses situated within the Landfill buffer.	No planned upgrades.
	This facility is zoned Public Use - Local Government. It is surrounded by Farming, Rural Living and General Residential, Public Use - Transport zones. On the other side of the railway are Public Park & Recreation and Industrial zones.	No planned upgrades.
	This facility is zoned Public Conversation & Resource and surrounded by a Farming zone (Yarram Golf Course), Public Use, Public Park & Recreation and Public Use zones. Rural Living Zone 2 is ~290m from the facility. The land is zoned Public Conversation and Resource which is not appropriate for a Transfer Station. A planning scheme amendment needs to be undertaken to correct this.	No planned upgrades.
	This facility is zoned Public Use - Service and Utility and is surrounded by Farming, Public Conservation & Resources and Commonwealth Land zones.	No planned upgrades.
	The facility is zoned Industrial IN1Z and surrounding land is Industrial IN1Z.	No planned upgrades.

3.4 Land Use Planning and the Transport Network

3.4.1. Land Use Planning

Land use planning is fundamentally about balancing competing needs, a function that becomes increasingly challenging as population increases. Providing for well-sited and appropriately buffered waste and resource recovery infrastructure is and must continue to be an important role for Gippsland's land use planners and developers.

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 preserve the amenity of the surrounding community".[46]

The Gippsland Regional Growth Plan identifies the following relevant strategies for future land use:

- Support the provision of adequate facilities to manage the region's solid waste;
- Give priority to development proposals that maximise the use of existing infrastructure and minimise the need for new infrastructure[47].

The successful development and operation of resource recovery and waste facilities are highly dependent on a suitable location. This will allow businesses to operate viably, with long term certainty and in compliance with regulations without unduly affecting local communities, public safety and the environment.

For instance, the Gippsland Logistics Precinct (GLP) in Morwell is a 75 hectare site of greenfield, Industrial zoned land with direct rail connection to the Melbourne-Bairnsdale rail line. Within two hours of Melbourne and with ready access to rail, the Princes Highway and surrounding industrial activity, the GLP offers significant potential for major resource recovery and reprocessing operations.

In close proximity to the GLP is the Morwell Heavy Industry Park, 26.3 hectares of vacant, Industrial 2 zoned land, catering for industry activity requiring large buffers from sensitive uses.

Siting of future infrastructure in Gippsland needs to be wholly consistent with the provisions of the Planning Scheme. To support better outcomes in this regard, the GWRRG will develop a GIS-based referral tool to assist prospective developers in identifying the most appropriate location for waste and resource recovery infrastructure. This will support existing operators in facilitating the protection of essential infrastructure where appropriate.

This approach will also enable the GWRRG to work closely with Gippsland councils proactively during strategic planning phases, such as Planning Scheme amendments, enabling appropriate land use planning policies to be employed to address potential land use conflicts.

It is acknowledged that the effectiveness of planning tools such as overlays and buffers is greater than relying on conditions in a planning permit as an outcome of the statutory planning process.

It is critical for successful integration of waste and resource recovery activities into our communities that this work maintains consistency with the Gippsland Regional Growth Plan and responds to the population and industry growth forecasts in Gippsland and at the interfaces with metropolitan Melbourne.

46 State Waste and Resource Recovery Infrastructure Plan, 2015
47 Gippsland Regional Growth Plan, 2014, p. 60

3.4.1.1. Planning Scheme Requirements

All land use planning schemes in the State of Victoria include reference to waste and resource recovery infrastructure in clause 19.03-5 of the State Planning Policy Framework. This requires planning decision makers to consider, among other things, any relevant Regional Waste Management Plan. Planning decision makers are required to have regard for clause 19.03-5 when preparing planning scheme amendments and determining planning permit applications.

Clause 19.03-5 provides a link between this Plan and Local Planning Schemes from a policy perspective. This clause states that the land use planning decision making process must take into consideration relevant Waste Management Plans, including the Gippsland Implementation Plan following its gazettal. However, achieving the objectives of the Plan and aligning it with individual planning schemes will require further steps, including engagement between Victoria's seven Waste and Resource Recovery Groups and the constituent local government.[48]

Outline of how waste and resource recovery infrastructure is categorised in the Victorian Planning Provision (VPP) is detailed in Section 6.1 Table 19.

48 *Development Workbook - Regional Implementation Plans*, 2015

3.4.2. Gippsland's Transport Network

While the Princes Highway and Melbourne to Bairnsdale railway provide Gippsland with a strong east-west transport spine, the region's topography and diverse settlement characteristics often create challenging transport issues away from this spine.

The Gippsland Freight Strategy, 2013 identifies that "within Gippsland, the Principal Freight Network has four major elements:

- Princes Freeway/Highway (Melbourne to NSW border).
- South Gippsland Freeway/Highway (Melbourne to Leongatha).
- Melbourne to Bairnsdale rail line.
- Intermodal terminals at Morwell and Bairnsdale."

Figure 13 presents Gippsland's principal freight transport network.

Figure 13: Gippsland's Freight Transport Network[49]

The Gippsland Freight Strategy identifies access to and from Melbourne as a growing challenge due to single points of access and growing congestion. "Having a single point of access into Melbourne is likely to become even more critical in the coming years. The growing population of Melbourne's south eastern suburbs will stretch the capacity of the existing road and rail network, and increase travel time for freight movements originating from Gippsland."[50]

49 *Gippsland Freight Strategy*, 2013
50 *Gippsland Freight Strategy*, 2013

Most waste and resource recovery facilities located in Gippsland are accessible through an efficient road network.

Major road infrastructure projects such as duplication of sections of the Princes Highway and other highways will improve the flow of collected materials and reprocessed product to market. These efficiencies are critical to improving the viability of resource recovery endeavours where the cost to transport and reprocessing currently exceeds the value of the end product.

The movement of recovered resources or residual waste may be further improved through using systems such as baling and/or shredding to increase payload density or walking floor trailers to haul greater volumes more efficiently. These initiatives could be realised through collaborative procurement or regional partnerships.

3.4.2.1. Transport Integration Act 2010

The Transport Integration Act 2010 (TI Act) is recognised as a key piece of relevant legislation for waste and resource recovery sector in seeking to integrate decision making through its objectives and principles listed below:[51]

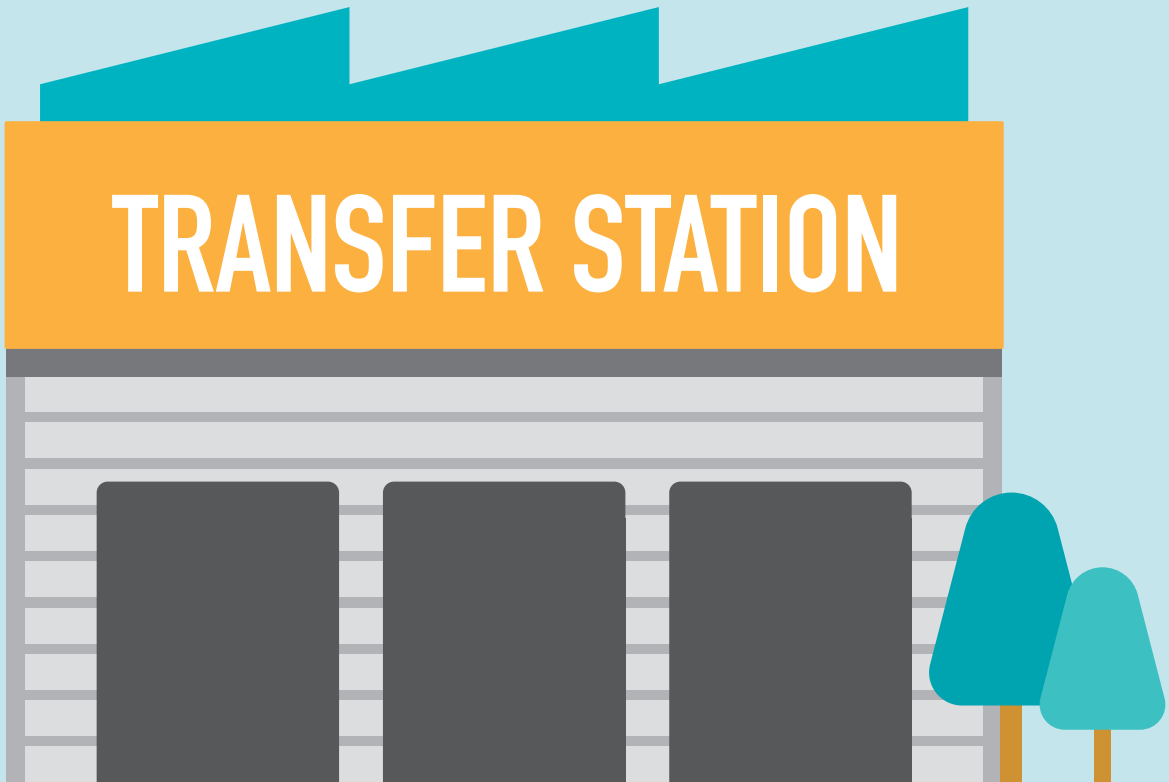
- Integrated decision making;
- Triple bottom line assessment;
- Equity between people;
- Transport system user perspective;
- Precautionary principle;
- Stakeholder engagement and community participation; and
- Transparency.

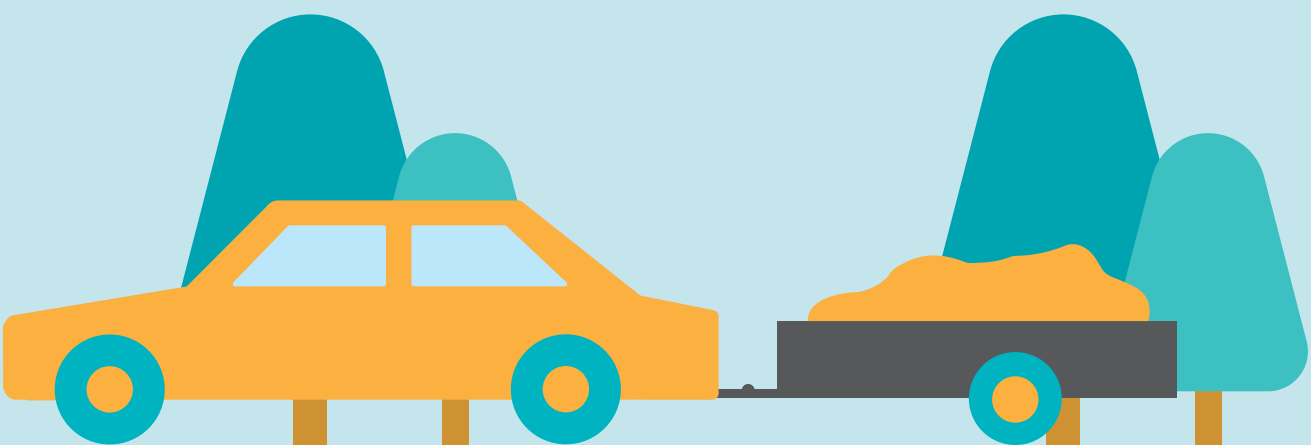
The Gippsland transport network is recognised as being intrinsically linked to the economic prosperity, efficient and effective access and amenity experienced by the community. Application of the requirements of the TI Act have been considered during the development of this Plan and will be further addressed in development of the proposed Gippsland Waste and Resource Recovery Assessment Map.

51 Development Workbook - Regional Implementation Plans, 2015

Section 4:

Gippsland's Infrastructure Gaps and Opportunities





4. Gippsland's Infrastructure Gaps and Opportunities

Gippsland's waste and resource recovery system is extensive and its operation and location of infrastructure is reflective of the region's settlement patterns.

This section identifies gaps and opportunities in the system. Priority Actions to address these gaps are outlined and discussed in Section 5: Initiatives to Meet Future Needs.

Fundamentally, the system is stable and operates reasonably effectively. However, the Gippsland Implementation Plan addresses the following gaps and opportunities:

- Improvements to the long term planning (beyond 10 years) and coordination of existing and future waste and resource recovery infrastructure to ensure it meets the needs of the Gippsland community while evaluating options to supplement this capacity and enhance process and transport efficiencies (Priority Action 1).
- Addressing infrastructure gaps and service inefficiencies that are limiting the extent to which the material can be economically diverted from waste flows in the Municipal, Construction and Demolition (C&D) and Commercial and Industrial (C&I) sectors through greater cooperation and collaboration (Priority Action 2);
- Increasing the community's knowledge and understanding of waste and resource recovery services and infrastructure to improve resource recovery and reduce littering through education (Priority Action 3);
- Assessment and monitoring of the efficiency and effectiveness of existing waste and resource recovery infrastructure to enhance the viability and community acceptance within the region through transparency and continuous improvement (Priority Action 4);
- Building a more resilient and responsive waste and resource recovery industry through improved assessment and management of risks (Priority Action 5); and
- Working more closely with industry to build the evidence base to attract investment and better understand the infrastructure requirements and opportunities for feasible resource recovery systems and services (Priority Action 6).

4.1. What are the Predictions for Gippsland Resource Recovery and Waste Management? (Future Trends)

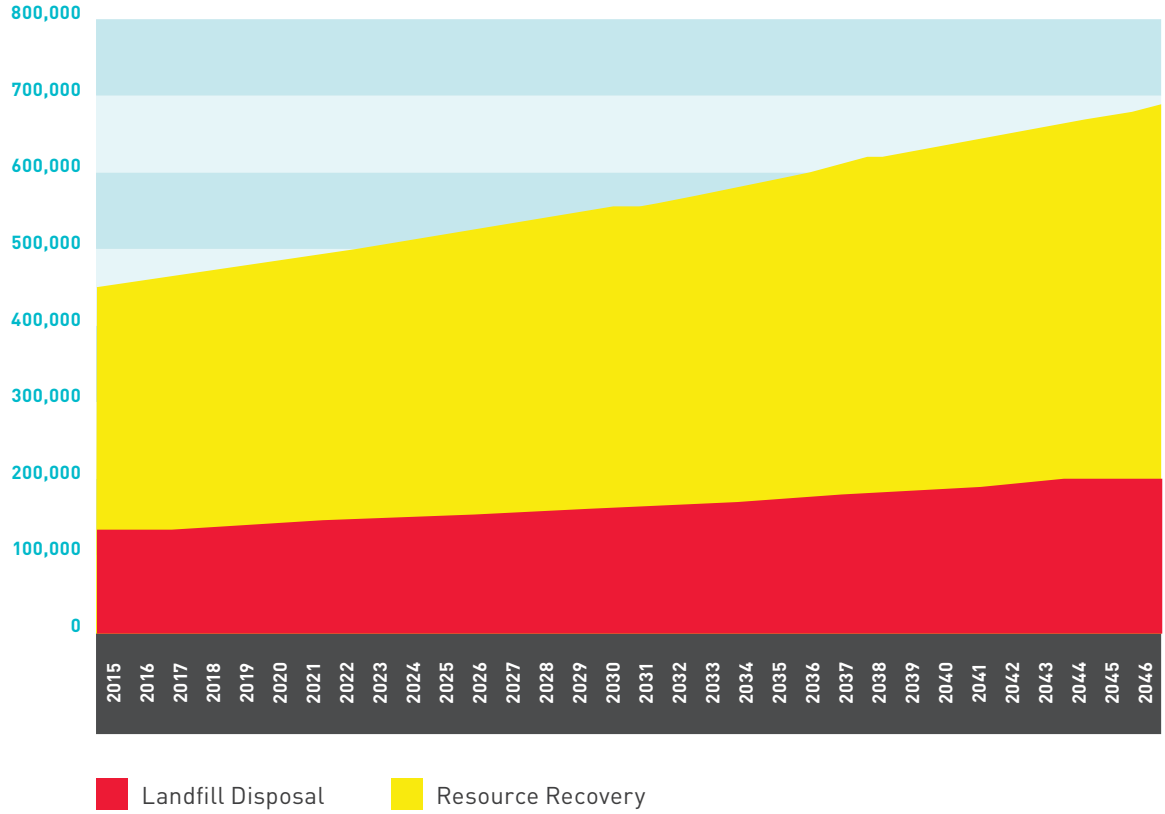
It is estimated that the population of Gippsland will grow by more than 60,000 people in the next 15 years,[52] an increase of more than 20%. Under a business as usual approach (BAU), it is assumed that waste generation in Gippsland would also increase by 20%.

4.1.1 Future Projections of Waste Generation in Gippsland

With business as usual recovery rates and the expected population increases, waste generated in the region is projected to increase by 16% to 521,700 tonnes by 2025. By 2044-45 (the 30-year timeframe of the State Infrastructure Plan), waste generated is expected to increase by nearly 52% to 682,000 tonnes, as shown in Figure 14.

52 *Gippsland Regional Plan*, 2015-2020, p.18

Figure 14: Projections of Gippsland's Waste Generation



Therefore, under BAU modelling, 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 Sustainability Victoria and highlights the Gippsland region's waste and resource recovery infrastructure challenges.

However, our detailed analysis preparing the Gippsland Implementation Plan has determined that our region will not require additional landfill capacity within the next 10 years. Our strategic objective to reduce the amount of waste and unprocessed materials going to landfill will extend the life of the existing landfills as well as minimising potential environmental or public health impacts.

The introduction of food and garden organics kerbside collections will impact on the BAU modelling by increasing the recovery of these materials and reducing the amount of materials landfilled, altering the modelled trend.

Table 17 provides information on the current and projected annual throughput of waste and resource recovery infrastructure in Gippsland. The information is broken down into infrastructure types. Waste tonnes shown are the quantities handled for each facility type each year. Some waste will be recorded at the resource recovery facility, and then at either a landfill or reprocessor.

Table 17: Projections of Waste Managed in Gippsland by Infrastructure Type

Infrastructure Type	Projected Waste Managed (2013-2014 BAU tonnes p.a)			Facility Capacity (tonnes p.a)
Year	2013/14	2025	2045	
Predicted Population increase		11.6%	42.8%	
Resource Recovery	198,600	221,600	283,600	273,000
Reprocessing	400,400	446,900	571,900	989,000
Disposal landfill, licenced	134,900	150,600	192,700	160,000
Disposal landfill, exempt from licencing	1,300	1,400	Projected closure with the Plan period	

- *% increases based on Gippsland region predicted population growth figures in Australian Bureau of Statistics, Australian Demographic Statistics, December Quarter 2013.
- Data rounded to the nearest 100 tonnes.
- @Modelled raw data from Sustainability Victoria, SRU Survey and analysis of regional reprocessors, Material Recovery Facility operators Gippsland Waste and Resource Recovery regional report (June 2015) and GWRRG Transport and Logistics Modelling Project (2016) landfill and transfer station quantities.
- Tonnes landfilled are derived from landfill levy data supplied by EPA and do not include Prescribed Industrial Waste (PIW). 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.

This high level analysis indicates that the capacity of the infrastructure serving the community is adequate. However, as detailed further in this section there is significant opportunity to achieve greater efficiency and effectiveness and ultimately improved performance and greater integration of waste and resource recovery operations and services.

The following outlines key opportunities for Gippsland's waste and resource recovery infrastructure over the next ten years and beyond.

4.2. Municipal Collection Systems

4.2.1. Collaborative Procurement of Collection Services

Currently, the Gippsland councils procure their kerbside/ hard waste collection services and associated treatment operations independently. Although, through collaboration, the features of the services are converging across Gippsland (i.e. bin type and frequency are identical), there remains an inconsistent and overly complex process of procuring these services.

Harmonisation of specifications, economies of scale and consistency in approach are likely to be welcomed by industry and bring about economic benefits that cannot be viably provided to one or even two councils alone. This will also allow the expansion of more affordable services into areas currently not serviced due to economic unviability. Furthermore, the increased volumes offered are likely to positively impact the treatment infrastructure scale and efficiency, creating new economic development and job creation opportunities.

4.2.2 Organics Collection and Diversion from Landfill

Organic material presents a range of opportunities for reprocessing. Composted mulch applied in agriculture has a range of benefits, including sequestering of carbon in soil, improving soil fertility and assisting with water retention. In addition, energy can be produced from organic material through a range of processes, including anaerobic digestion, pyrolysis and gasification.

In 2011, a successful trial was undertaken by the then Gippsland Regional Waste Management Group (GRWMG) to divert food and garden organics from landfill, focussing on the Gippsland townships of Mallacoota (500 households) and Churchill (1900 households). Outcomes from this trial and examples from other regions indicate a reduction of approximately 35 to 40% in volumes of garbage can be expected. Therefore, an opportunity exists across Gippsland to significantly reduce the amount of organic material sent to landfill through the recovery of food organics. It is estimated each Gippsland household discards around 172 kilograms of food to landfill a year, resulting in a regional total of approximately 17,000 tonnes.

Gippsland councils recognise the benefits of diverting food organics from landfill and are interested in a combined Food Organics and Garden organics (FOGO) kerbside collection service. The preferred model is the introduction of a service providing a weekly FOGO collection and a fortnightly recycling and garbage collection. Bass Coast Shire Council will introduce this system from September 2017.

Gippsland is recognised as a region with significant capacity to reprocess organics. Given an expected, substantive increase in demand for reprocessing of food organics in Gippsland and other regions, there is likely to be a requirement for additional facilities of this type.

This would also present an opportunity to locate a facility closer to material sources in the western part of the region, resulting in significant transportation efficiency gains.

While Gippsland already has systems in place to recover organic material from the waste stream, including food, the infrastructure is predominantly limited to raw timber and garden organics.

4.2.3. Commingled Recyclables

Much of the commingled recyclables collected at kerbside is transported to material recovery facilities based in metropolitan Melbourne. Similarly, collaborative procurement provides opportunities to increase value of the material collected within the region and possibly attract flows from other regions, fostering further opportunity to manufacture innovative new products and create jobs.

4.3. Commercial Collection Systems

4.3.1. Increased Resource Recovery Through Collaboration

Across Gippsland, there are a significant number of businesses producing waste for collection by private waste and resource recovery businesses.

Generally, waste is managed separately by each business whereby it engages a waste collection company to manage the materials generated. In many instances, due to the limited quantities and commingling of material types, it is sent directly to landfill. This waste often contains recyclable material that could be recovered if volumes could support a viable collection service.

During the process of consultation for the development of the Gippsland Implementation Plan, a range of businesses expressed a desire to remove particular material from the waste stream. Despite this interest, barriers such as obtaining a sufficient critical mass of feedstock to support processing are preventing this from happening.

By encouraging these businesses to work collaboratively, existing barriers could be largely overcome, enabling recovery and reuse of substantial amounts of recoverable materials currently going to landfill.

Material steams identified during the development of this Plan include:

- Food;
- Plastics (such as used silage wrap and expanded foam (polystyrene); and
- Timber.

An opportunity exists to work with businesses of all sizes to identify activity clusters focussed on separating materials at source or co-locating infrastructure that reprocesses materials able to be segregated.

Opportunities range in scale and complexity with the possibilities of employing new highly technical solutions or to establish more localised initiatives using social ventures and not for profit enterprises. This also provides an impetus for existing waste businesses to expand and diversify their services to better meet the needs of customers.

4.4. Resource Recovery Infrastructure

4.4.1. Transfer Station and Resource Recovery Centre Locations and Accessibility

A common decision to replace landfill with transfer stations, using the same landfill site, has resulted in the current network of transfer stations in Gippsland often being developed opportunistically, rather than based on convenience, accessibility and appropriate land use planning. There are repeated instances where one transfer station is competing with another within the same catchment area, reducing the viability of each.

In the effort to contain operating costs, a subsequent decision is often reached to share labour across multiple sites, resulting in confusion about operating hours and poor accessibility for customers. This is recognised as one possible trigger for illegal dumping, especially in the more isolated parts of Gippsland.

Consistent with the method of procuring collection services, Gippsland councils independently engage contractors to manage these facilities on their behalf or operate them with their own personnel, plant and equipment.

Therefore, there is a need to improve the consistency in the services provided by these facilities and standardise the operations resulting in:

- improved use of sites;
- the ability to disseminate consistent information regionally;
- use of economies of scale to:
  - procure supporting services such as mulching of garden organics or crushing of concrete; and
  - improve the saleability of materials, such as scrap metals or paper and cardboard, sold into the market.

While the assessment undertaken during the development of the Gippsland Implementation Plan indicates that the capacity of Gippsland transfer stations is adequate to meet the current needs of their communities over the next 20 years, this does not mean the facilities will address the changing needs of the communities over this time. In fact, the changing expectations of communities and needs of business will require significant investment in our current transfer station stock.

The large number of facilities in Gippsland means that the cost to achieve a realistic return on investment at each transfer station is unfeasible. An opportunity exists to introduce more affordable infrastructure through joint procurement involving multiple Gippsland councils. This would not only enhance existing facilities but, where possible, establish new resource recovery facilities with leading practice standards in optimum locations. This would be particularly beneficial in Gippsland's western municipalities experiencing high population growth.

4.4.2. Large Scale Waste Sorting Capacity

A possibility identified during the development of the Gippsland Implementation Plan is to introduce infrastructure to divert recoverable material from municipal, Construction and Demolition and Commercial and Industrial sectors. While specific data on the characteristics of the material collected in the Commercial and Industrial sectors is limited, it is believed that this could substantially reduce material sent to landfill.

The establishment of a large capacity waste sorting facility would provide the means to more expediently separate the non-degradable materials from the degradable materials via manual or mechanical processes. This type of infrastructure could be a precursor for Waste to Energy and mechanical biological treatment facilities.

By being located within the region, improved accessibility could encourage greater private sector involvement in diversion of material from landfill.

Respondents to the market sounding identified the Latrobe Valley as a potential location to host a facility of this type due to its central location, presence of supporting infrastructure and the availability of suitable land.

These types of initiatives could support efforts to reposition the Latrobe Valley's economy following large industry closures and support jobs in future industries.

4.5. Reprocessing Infrastructure

The region has sizeable capacity to reprocess two key material streams, namely organics, and paper and cardboard. Many other recovered material streams are currently managed in metropolitan based resource recovery facilities. However, this provides an opportunity to enhance reprocessing facilities in Gippsland.

Organics reprocessing through a diversity of techniques at variety of scales has been identified with some initiatives known to be explored.

An opportunity exists to maximise the value of timber waste currently sent to landfill or processed into a low value product such as mulch or firewood.

Much of the plastic film and polystyrene is either landfilled (burned in the case of silage wrap) or sent long distances to be reprocessed may provide small scale opportunities for local processing.

Industry has also expressed interest in the reprocessing of used tyres to produce alternative fuels.

4.6. Waste to Energy

Gippsland has an extensive energy generation and transmission infrastructure. Continuing to harness these assets provides a significant opportunity for the region to progress towards an economy with reduced reliance on high carbon emission industry.

The Collaborative Waste Investment Initiative process, which is outlined in further detail below, established that there is private sector interest in establishing Waste to Energy facilities in the region. These options are well supported through appropriately zoned and serviced industrial areas located in the Latrobe Valley.

Further work is being undertaken to understand the opportunities for using organic materials not sent to landfill through the Australian Biomass for Bioenergy Assessment (ABBA). ABBA identifies biomass waste streams at the source which are available for recovery into value-add products. This involves updating an interactive map with detailed information about biomass resources across Australia to attract investment in the renewable energy sector, particularly for bioenergy. The investigation will seek data from operations that produce:

- Agricultural and forestry residues;
- Animal slurries and waste;
- Food manufacturing waste;
- Food retail waste (post-consumer);
- Forestry and sawmill residues;
- Paper and cardboard waste;
- Waste-water biosolids; and
- Other organic manufacturing waste.

4.7. Adequate Landfill Management

4.7.1. Reducing Reliance on Landfill

While it is expected that the use of landfills will be required in the short and medium term as a management tool for materials that cannot be viably recovered, the significance of landfills should be substantially reduced in the coming 15 years. In Gippsland, this change is being driven by the increasing cost of landfill to the community without delivering a corresponding net benefit, making it progressively less viable and desirable as a waste management option.

It is expected that Gippsland's future waste and resource recovery system will include the following attributes:

- Reduced volumes of organics sent to landfill by diverting to composting or anaerobic digestion (this will be supported by improved collection systems or mechanical segregation);
- Reduced volumes of e-waste being landfilled through improved collection infrastructure and new opportunities to dismantle and segregate high value components through social ventures;
- Greater segregation of plastics and local reprocessing (there is currently no plastics reprocessing in Gippsland);
- More accessible domestic asbestos disposal services (addressing the limited number of licenced facilities in the region);
- Increased use of recycled glass in civil construction and possible use in water industry, possibly as a filtering agent or as trench base as a replacement for sand;
- Possible transition to small scale, co-located Waste to Energy (WtE) facilities for power production; and
- More recycling of paper and cardboard products.

4.7.2. Operating Landfills

Based on a projected need for landfill airspace in line with population increases, and the current and expected future capacity of the landfills operating within the region, there is sufficient capacity to meet the disposal needs of Gippsland for at least the next ten years. This would be achieved by using existing landfill airspace and implementing planned extensions to landfills operating in Gippsland.

Should current landfills not be extended for any reason, the GWRRG will be required to re-evaluate the situation taking into consideration:

- the ability to re-direct the material to another landfill capable of receiving the waste in the short term (contingency planning);
- the impact of any new or enhanced recovery processes that reduce residual waste quantities and have come online since the release of this Plan; and
- opportunities that may come from collaborating with the Metropolitan Waste and Resource Recovery Group.

The revision of the Landfill Schedule will occur only after considering viable resource recovery options and other alternative arrangements that may include transporting residual waste outside of the region.

The Group will take a two-pronged approach as follows:

1. Work to maximise the opportunities for diversion of materials from landfill through viable recovery (and in consideration of new scientific solutions), including exploring possible collaboration opportunities with Metropolitan Waste and Resource Recovery Group.
2. Work with councils on strategies for the management of their residual MSW including:
    - determining the position of individual councils on continued landfill development and ownership;
    - completion of the Gippsland Waste and Resource Recovery Assessment Map; and
    - identification of options presented through the Gippsland Collaborative Waste Investment Initiative and undertaking recommendations from this work.

The GWRRG will review landfill capacity within the next three years (before December 2019) and if a need is identified, an Expression of Interest will be undertaken.

These activities will be brought forward if another region requests Gippsland to address a specific need for landfill airspace. Currently, the Metropolitan Group has not made this request. However, this may change following future reviews of metropolitan landfill capacity.

4.7.3. Viability of Smaller Landfills

Although more than 30 Gippsland landfills have been closed over the past 15 years, there remains some smaller landfills in Gippsland receiving approximately 2,000 tonnes of waste per annum or less. These landfills include those servicing the townships of Rosedale and Maffra in the Wellington Shire and Cann River in the East Gippsland Shire. The future need for these facilities is being investigated by the relevant municipalities.

It is important to recognise that a smaller landfill imposes a proportionally higher cost to the community it serves relative to larger landfills. This is generally due to fixed operational costs being spread across fewer people. This means less waste and an inability to create sufficient critical mass to be efficient in terms of construction, operation and rehabilitation.

The GWRRG will support these councils in determining the longer-term viability of these landfills and any changes to existing infrastructure that may be required.

4.7.4. Rehabilitation of Closed Landfills

Rehabilitation of landfills is a key step in mitigating potential environmental and public health risks posed by closed landfills. Many landfills in Gippsland have already been rehabilitated although a significant number are still in a state of flux between a closed and rehabilitated status.

The rehabilitation of closed landfills has increased in complexity and cost in line with other changes to the construction and quality assurance requirements for landfills. In the case of the publicly owned facilities, there has been limited or no provision for this rehabilitation by former municipalities prior to amalgamation of councils in the mid-1990s.

The GWRRG will work with Gippsland councils and the EPA to facilitate a prioritised approach to rehabilitating closed former landfills in the region using a risk based approach. The Group expects the duty holders of all closed landfills to meet their EPA Victoria obligations and to communicate effectively with adjoining communities on the progress of rehabilitation and possible future uses of the site.

4.8. Technologies Proposed in Responses to the Market Sounding

Gippsland's six councils jointly control approximately 70,000 tonnes of Municipal Solid Waste (MSW) each year which ends up in the region's five landfills. A further 65,000 to 70,000 tonnes of Commercial and Industrial (C&I) and Construction and Demolition (C&D) waste is also accepted into these facilities. This material is controlled by the market, hence aggregating to underpin reliable, long term investment is more difficult due to the many individual and varying commercial arrangements.

The GWRRG has identified that the aggregated MSW stream has the greatest potential for leveraging more immediate resource recovery improvements and investment, due to its readiness for attracting private sector investment over an agreed period. Factors include:

- Information about quantities and constituent materials of MSW is well documented and can be readily quantified;
- The Gippsland councils, due to their control over this waste, are well positioned to make a long term commitment that material would be available to support private sector proposals; and
- The Gippsland councils have worked collaboratively with the GWRRG and its predecessor organisation to determine the whole of life costs of each licenced landfill in Gippsland to better evaluate the economic benefit of alternative options.

Gippsland councils collaborated in a process to investigate the potential for private sector investment in medium to large-scale infrastructure that could deal with the region's consolidated residual waste.

Known as the Gippsland Collaborative Waste Investment Initiative, this process was supported by the GWRRG in its legislative role to encourage efficient procurement of waste and resource recovery infrastructure and services. This process forms the 'market sounding' for the Gippsland Implementation Plan. The Collaborative Waste Investment Initiative was released on 9 July 2015 and advertised broadly to industry through local, and national print media, the Waste Management Association of Australia (WMAA) and through Invest Victoria local and international contacts.

The need identified in the region is for infrastructure that can recover or treat residual waste and divert this material from landfill, whether collected directly from households, transfer stations/resource recovery centres or through a combination of commercial collections.

The objective of the Gippsland Collaborative Waste Investment Initiative was to test the market for investment in infrastructure that can use waste managed by councils in an economically productive

manner, complementing the existing waste and resource recovery systems for Gippsland. Proponents were encouraged to, where necessary, supplement the MSW feedstocks with other material streams such as the C&I wastes currently being sent to landfill or specific material streams that are generated in the C&I or the C&D sectors that can be captured to support the economic viability of their resource recovery infrastructure proposal.

An industry briefing session was held in Morwell on 3rd August 2015 to provide interested respondents an opportunity to clarify the intent of the initiative and understand the regional opportunities as well as providing a chance for them to ask questions.

The process resulted in 15 conforming responses and identified a broad range of infrastructure options available that could meet the specific investment and waste management outcomes as well as utilising other waste materials such as tyres, timber and food organics generated in the C&I or C&D sectors. Responses to the process indicated there are new private sector infrastructure investment opportunities in Gippsland that can use waste in an economically productive manner and complement or expand the existing waste and resource recovery infrastructure and systems already established.

Such investment could:

- increase employment and economic development opportunities;
- reduce carbon emissions;
- improve diversion of materials currently deposited in landfill from the municipal stream and attract other sectors to participate; and
- integrate into existing local waste management and resource recovery systems.

The Evaluation Report found that "The responses …demonstrated that collaboration with the private sector, through a range of public/private partnership models, is potentially viable and should be pursued to secure the Gippsland region's infrastructure needs for the next 20 years and beyond."

While it is not possible to disclose the exact nature nor the proponents of the proposals received during the Gippsland Collaborative Waste Investment Initiative, a generic description of the infrastructure technologies received and evaluated in the process are listed in Table 18.

The nature of these technologies and the larger population growth forecast for the western part of the region will influence the locations for this type of infrastructure. Complementary land use planning, excellent transport connections and existing available workforce within the Latrobe Valley area means it is likely to provide an ideal location.

Furthermore, the prospect of enticing material to flow into the region from the south eastern suburbs of Melbourne would further support the economic scale required by facilities of this type. Opportunities to re-orient the flow of material in an easterly direction would mitigate further traffic congestion in and around Melbourne.

If implemented in optimal locations, there is potential to significantly reduce the waste sent to Gippsland landfills.

New infrastructure identified through the market sounding process and deemed appropriate for development in the Gippsland region is listed in Table 21. In receiving a positive response to attract private sector investment in the region and reducing the reliance on landfill facilities, Gippsland councils have proposed to progress the second stage of the Gippsland Collaborative Waste Investment initiative seeking detailed proposals in 2017 as outlined in Priority Action 2.

Table 18: Alternate Waste Treatment Infrastructure Technologies

Facility Category	Type	Functional Description
Mechanical Biological Treatment (MBT)	Overview	A mechanical biological treatment (MBT) facility involves a biological treatment process for the biodegradable waste stream. The biodegradable waste is separated by a mechanical sorting process.
	Aerobic	**Process** Aerobic MBT facilities involve the decomposition of the biodegradable waste stream in an aerobic environment to produce stabilised organic matter. This is typically known as composting. Enclosed (or in-vessel) composting of residual waste typically involves an intensive enclosed phase followed by open-air maturation of 8 to 12 weeks. **Products** The reduced volume of stabilised product can be landfilled, used as a low value soil amendment product or sold as RDF (provided the moisture content is sufficiently low through bio-drying).
	Anaerobic	**Process** Anaerobic MBT facilities involve the decomposition of the biodegradable waste fraction in an anaerobic environment to produce stabilised organic matter and biogas. The decomposition occurs in an anaerobic digester. **Dry and wet states** The biodegradable waste stream can be reprocessed in a dry or wet state. For the wet state, water or a wet organic waste is added prior to reprocessing. **Products** The products of anaerobic digesters are biogas (mainly methane and CO2) which can be used as a fuel for energy generation and digestate that can be used as landfill cover, for agricultural applications, or as a soil conditioner after refinement.

Facility Category	Type	Functional Description
Mechanical Heat Treatment (MHT)	Autoclaving	**Process** Autoclaving of residual waste is a form of 'mechanical heat treatment' (MHT) that uses thermal treatment in conjunction with mechanical processing. Waste may initially be screened for the removal of any large items, and possibly shredded. The unsorted waste is sealed in an autoclave that is a large, enclosed vessel. Steam is injected at pressure to sterilise the waste, to reduce the volume of waste by about 60% and to reduce the moisture content. The biodegradable waste, including food and garden organics, paper and card is broken down into a floc. **Products** Metals and possibly plastics are extracted for recycling. There is a residue or 'reject fraction' that needs to be landfilled. The floc may be further reprocessed on site anaerobically and/or aerobically to recover energy and/or produce a soil improver. Alternatively, the floc may be incorporated into a RDF. Unrecovered waste is sent to landfill or for energy recovery.
	Refuse-derived fuel production facility (RDF)	**Process** A facility whose primary purpose is to reprocess residual waste (MSW, C&I, C&D, PIW) to separate recyclables and manufacture a process engineered or refuse derived fuel (RDF). The facility does not normally recover energy from the waste or fuel on site. **Products** Fuel products may be solid, liquid or gaseous. Unrecovered materials are sent to landfill.
Waste to Energy facilities (WtE)	General	A facility that converts waste into heat and/or electricity for which there is an economically viable end use. Technologies can include, but are not limited to, mass burn combustion, pyrolysis, gasification and plasma gasification. A combination of these processes is sometimes used.
	Combustion	**Process** Mass burn combustion occurs where the oxygen concentration exceeds the combustion requirements. The waste requires little or no preparation before combustion. During combustion, the organic component is oxidised into CO2 and water. **Products** The ash (or slag) is either landfilled or sorted by grain size for recovery as aggregate. The ferrous metals are recovered magnetically and recycled.

Table 18: Alternate Waste Treatment Infrastructure Technologies (cont.)

Facility Category	Type	Functional Description
Waste to Energy facilities (WtE)	Pyrolysis	**Process** Pyrolysis involves the thermal decomposition of organic materials in the absence of oxygen. Pre-treatment typically involves sorting of recyclables and must include screening to ensure a consistent feedstock. The process produces syngas, liquid and char. **Products** Syngas can be used as an industrial feedstock to produce biofuels, synthetic fuels or to produce hydrogen, or simply as a fuel (replacing fossil fuels) to create steam or electricity. The liquid fraction can be converted to a gaseous fuel or a synthetic oil fuel (pyrolysis oil). The char can be reprocessed into inert building materials.
	Gasification	**Process** Gasification involves the thermal decomposition of organic materials into combustible gases by partial oxidation under the application of heat. As with pyrolysis, pre-treatment typically involves sorting of recyclables and must include screening to ensure a consistent feedstock. The process produces a combustible synthesis gas (syngas) and an inert residue. **Products - Syngas** Syngas can be used as an industrial feedstock to produce biofuels, synthetic fuels or to produce hydrogen, or simply as a fuel (replacing fossil fuels) to create steam or electricity. **Products – Inert residue** The inert residue can be reprocessed into inert building materials.

Facility Category	Type	Functional Description
Dirty MRF	Not Applicable	A facility that accepts a residual waste stream and separate out the non-degradable materials from the degradable materials via a manual/mechanical process The non-degradable materials can be further sorted into recyclables and a refuse derived fuel (RDF) which consists of the dry calorific fractions. **Products - RDF** RDF materials usually include plastics, timber, paper and cardboard, rubber and textiles. **Products – Recyclables** The sorted recyclable materials may undergo further reprocessing required to meet technical specifications established by end markets. **Unrecovered waste** The unrecovered waste is sent to a disposal facility such as a landfill.

4.9. Supporting a Sustainable Waste and Resource Recovery Industry in Gippsland

While population growth is a key factor in the western part of the region, much of Gippsland consists of medium-sized towns, surrounded by small and often isolated communities with an ageing population. Developing waste and resource recovery solutions that consider a low critical mass and substantial transport challenges is an increasingly important issue that needs to be addressed. Placing a stronger emphasis on good waste and resource recovery management will bring about more accountability from communities. This will require work in the following areas:

1. Developing a greater appreciation of the transport required to mobilise materials within and beyond Gippsland to effectively and efficiently recover greater quantities of the materials for recycling and recovery;
2. Expanding our thinking to develop locally-based solutions that interact more readily within townships and districts, driving innovation and knowledge sharing to foster a social conscience connected to the waste that is generated by local communities; and
3. Identifying the opportunities to encourage economic development and create jobs linked to resource recovery.

4.9.1. Delivering New Facilities

It is important that the development of new facilities that reduce the need for landfills gain acceptance from the communities in which they operate, referred to as 'social license to operate'. A social license to operate is an essential part of operating within our democratic controls, as without sufficient support it is unlikely that decision makers will readily grant operational approvals.

Technologies, such as anaerobic digestion and gasification as well as the various composting techniques being employed successfully in other countries, need to be explained to communities to develop trust and confidence in the systems employed. This will allow the facilities, not only to gain social license to operate, but also increase the viability of these technologies when the benefits of separating the materials at source are well understood.

This can be further supported by appropriate land use planning, including the ability to establish appropriate buffers. Proponents wishing to establish these types of facilities in Gippsland will be required to navigate the already robust approvals process administered by the EPA and the local planning authority (usually the municipal council).

Additionally, it is necessary to assess where and when, from the regional perspective, best to place infrastructure. Alternatively, it may be necessary to consider the removal or replacement of redundant or excessively costly infrastructure. This will ensure maximum return on investment, optimal operational and financial efficiency of facilities, and effective functioning of the waste and resource recovery system as a whole.

4.9.2. Supporting Environmental Justice

Operators also have an obligation to be good neighbours. A social licence to operate will only be granted when industry addresses the impacts on their local neighbourhood amenity such as noise, dust, odour and traffic issues. Inclusive and thorough engagement should also work towards meeting the environmental justice requirements listed in the State Infrastructure Plan as follows:

"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.

"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 decisions and long term planning to establish a safe, integrated waste and resource recovery system."[53]

A focus on continuous improvement by the industry will give communities greater confidence in new and existing operations and provide the transparency communities are demanding.

4.9.3. Being Prepared for the Impacts of Climate Change and Unforeseen Events

Impacts from climate change will continue to affect Gippsland, already one of the most fire prone regions in Australia. Effective relationships and proactive planning with state agencies, local government and private industry will work towards achieving a greater understanding of the risks and the impact of emergencies on the operation of waste and resource recovery facilities. Improved understanding will assist the waste and resource recovery industry to be better prepared for adverse threats.

4.9.4. Reducing the Impact of Littering and Illegal Dumping

The challenges to infrastructure and services due to seasonal tourist activity are also likely to grow. This means that improvements to the performance of the current waste industry and the introduction of new services and infrastructure in more accessible locations will be required to protect the local environment and enhance the experience for residents and tourists alike.

53 Statewide Waste and Resource Recovery Infrastructure Plan, p.14

Littering and illegal dumping continue to be significant issues. Land managers will need to form a cohesive and collaborative approach to managing this highly visible issue through education, appropriate infrastructure and measured enforcement.

4.9.5. Evidence-Based Decision Making

A reliable evidence-base will give the state government and private industry the confidence to invest in Gippsland. It is proposed that a comprehensive suite of data collection initiatives will need to be undertaken on a cyclic basis to provide the foundation for improved knowledge of the changing nature of the materials generated and managed. Modelling by the GWRRG proposes to assist the private sector in identifying areas to invest and innovate.

4.10. Risks and Contingency Planning

The EP Act requires each of the Waste and Resource Recovery Groups to identify current and future risks and appropriate contingencies when assessing landfill and waste recovery needs. This Plan also outlines the contingencies in place in the region for a range of other circumstances.

Planning for and allocating resources to address emergency or unexpected situations are important to effectively manage risks.

Therefore, a risk-based approach was used to identify the potential scenarios for which contingency measures may be required, some of which are shared across the state. Some contingency (or mitigation) measures are similar across the state, whilst others are unique to the Gippsland region.

These high level state risks include:

Emergency Events

Emergency events include, but are not limited to, natural disasters such as flood, fire, chemical spills and biosecurity challenges.

Emergency events can affect the waste system and services at a sub-regional, regional or even state wide level. Additional landfill airspace for the short-term disposal of waste following an event is typically required and the utilisation of this airspace can impact on capacity availability in the region beyond the event.

To address these risks, the GWRRG can support local government in ensuring that these risks and their impact on the waste management infrastructure and services in the region are referenced in the Municipal Emergency Management Plans as relevant. As a contingency measure, GWRRG will monitor changes to landfill sequencing as a result of such events and take action as appropriate.

Immediate System/Infrastructure Failure

The waste system on which the region depends on can fail if one element of the chain is disrupted without notice. This could include:

- Service contractor goes into administration;
- Key transport route is unavailable;
- Service disruption due to dispute; and
- Landfill or key facility closure due to fire or other event.

As a contingency measure, alternative arrangements for key waste management activities should be identified and reflected in service contracts. While councils (or businesses where relevant) establish contracts, Regional Groups can work with councils at tendering stage and support inclusion of relevant clauses in tender documents and contracts where appropriate. Furthermore, as its core function, the GWRRG will ensure that adequate capacity and availability of landfill is considered as part of the region's Infrastructure Schedule development and its regular reviews. Furthermore, the GWRRG will consider potential contingency measures when scheduling and undertaking an annual contingency plan review.

Infrastructure Delivery Issues

The region's waste management system may rely on significant new or expanded infrastructure becoming available at key points in time. Delays in planning and/or approvals, construction or non-compliance to regulations may result in infrastructure not being available when required.

While facility operators are responsible, where appropriate, the GWRRG may support operators to commence planning in adequate timeframes and liaise with EPA as needed. The GWRRG may also inform other Regional Groups which may be impacted by delays. Regular (at least annual) monitoring of the progress of infrastructure planning and delivery (including individual landfill cells) can assist with identifying potential timing risks to be addressed. Where appropriate, the GWRRG may liaise with operators regarding progress of planning infrastructure to inform annual contingency planning.

Inadequate Social License to Operate

Planned or existing facilities are impacted by changing community attitudes and inadequate social license to operate, reducing capacity to operate, expand or establish. This can occur due to encroachment of sensitive uses into buffers resulting in impacted communities, changes in operations that do not meet regulatory requirements, changes in expectations etc.

While operators are responsible for establishing and maintaining a social licence for facilities, local government and planning authorities play a critical role in preserving and maintaining buffers. GWRRG can work with local government to support the use of available planning tools to protect buffers (such as those being identified through the Local Buffer Support Program).

Market Failure

Markets for end products from recovered materials can fail for a range of reasons, including market price fluctuations, products not meeting updated specifications or standards, changes in costs to bring products to market, changes in perception of products or increased competition. Similarly, markets may fail to develop as expected. The impact of market failure can vary from short-term stockpiling to changes in the acceptance of materials, resulting in disposal to landfill and higher costs.

While the GWRRG's contingency role in this regard is limited, it may support the uptake of recovered materials within the region.

Adaptiveness of Infrastructure and Services to Climate Change

Climate change will place additional pressure on the waste and resource recovery system with more extreme weather events, such as heat waves that may restrict opening hours of facilities, reduce the functionality of facilities or impact on collection systems.

It is important that the potential impacts on the system are understood and managed. The GWRRG can play a role in working with local government, government and industry to identify risks and support the region's adaptability where appropriate.

Table 27 in the Appendix 1 provides further details on Gippsland's identified risks, how these risks might be caused and expected consequences of each. The table also outlines what contingencies are in place to manage each identified risk with an estimation of the potential significance of the risk.

Large Industrial Infrastructure Closure and Decommissioning

The closure of the Hazelwood power station underscores the need to plan for the decommissioning and demolition of large industrial infrastructure and the possible impacts to existing waste and resource recovery infrastructure or conversely opportunities for development of new improved or expanded resource recovery infrastructure capacity. It is important that an assessment of feasible disposal options available to the operators of large industrial sites are identified and where possible options to more adequately manage materials able to be recovered quantified to determine the best management approach. Generally, the material found in these facilities is inert and therefore the urgency to develop appropriate solutions is not as time critical as managing putrescible waste materials. Attention will be directed to the appropriate handling and disposal of the significant quantities of Prescribed Industrial Waste (PIW) contained within these industrial facilities. The Victorian Government is currently reviewing the management framework for hazardous wastes, including those categorised as PIW and will consider the infrastructure needs to appropriately manage these waste streams.

Section 5:

Initiatives to Meet Future Needs (Achieving Regional and State Needs)

5. Initiatives to Meet Future Needs (Achieving Regional and State Needs)

5.1. Achieving Greater Material Recovery Through Development of Appropriate, Well Sited Infrastructure (Priority Action 1)

It is critical that the Gippsland Implementation Plan ensures the right infrastructure is in the right place at the right time. The sections below explain how the GWRRG, in association with local government and the private sector, will investigate and deliver infrastructure solutions that meet the region's future waste and resource recovery needs.

5.1.1 Future Infrastructure Development

Landfills will be required to accept wastes that cannot be viably recovered, however, the supply of available airspace should not unduly affect the current economics that have enabled a successful resource recovery sector in Gippsland and Victoria.

Using existing landfill airspace and implementing planned extensions to landfills operating in Gippsland, the region has enough landfill airspace available to accommodate the projected waste for at least the coming 10-year period.

Currently, the landfills accommodating most household and business waste generated in Gippsland are owned and managed by Gippsland councils. In comparison to the large landfills servicing the metropolitan area, these landfills are relatively small. The economic viability of small landfills, combined with increasing development, operation and rehabilitation costs, is likely to result in decreasing viability of these facilities over time.

While it is recognised that some of these higher costs are unavoidable due to Gippsland's inherent demographic characteristics, there needs to be a planned transition to more effective and affordable methods of managing waste. The GWRRG will work in close collaboration with Gippsland councils and the waste industry to prioritise the development of future waste and resource recovery infrastructure to support this transition.

Deliverable: Gippsland Future Infrastructure Development	
Proposed Activity	**Objective (Why)**
• Decide, in association with the five Gippsland municipalities currently managing landfills, agreed future options for landfill operations and other infrastructure needs, and investigate and implement agreed future options. • Work with local government, government authorities and the waste industry to identify priority infrastructure for the region that supports recovery of materials identified in the Statewide Organics and Resource Recovery Market Strategies.	To transition to more efficient use of existing landfills and greater resource recovery.

5.1.2. Support Effective Land Use Planning Decisions and Appropriate Facility Locations

Ensuring that waste and resource recovery infrastructure is sited in the most appropriate location and is sufficiently protected against impacts from conflicting land use, is critically important to deliver an efficient and effective waste and resource recovery system to service Gippsland into the future.

To this effect and in collaboration with local government, the GWRRG will lead the development of an assessment tool to depict the current integrated waste resource recovery system within Gippsland. This tool will guide the development of appropriate infrastructure and inform the Local Planning Policy Framework. It will also support improved evidence-based decision making and serve as an essential tool to ensure that existing and future facilities are appropriately located and protected to maximise return on investment and minimise impacts on the community, environment and public health.

Using a Geographic Information System (GIS), a Gippsland Waste and Resource Recovery Assessment Map will provide the means to work with industry and the community to:

- identify suitable locations for potential new waste and resource recovery infrastructure;
- Identify key supporting infrastructure that improves the efficiency of waste and resource recovery activities;
- Provide the evidence to increase investment certainty; and
- Map the generation of waste material types and business activities spatially to identify opportunities to co-locate complementary services or industry.

It is proposed that the Map will be used to inform the process to determine infrastructure priorities for Gippsland, focussing on recovery of priority materials as identified in the Victorian Organics Resource Recovery Strategy and Market Development Strategy for Recovered Resources. It will identify the most appropriate locations for recovery infrastructure and landfill development should the need arise. In identifying appropriate locations, discussions will be undertaken with each of Gippsland's water authorities to determine the viability of co-locating infrastructure, such as Waste to Energy facilities. This initiative will assist in achieving a sufficiently stable business setting to support market development and ensure that facilities can be operated and managed to minimise impacts on the community, environment and public health.

The Map will also assist in defining and protecting key waste and resource recovery infrastructure that is essential to the proper management of waste in the region.

The GWRRG will work with councils to ensure that the Map is a key reference in the land use planning decision making processes within Gippsland local government. This will also assist with identifying what essential infrastructure in the region is at risk of encroachment by sensitive uses.

Deliverable: Gippsland Waste and Resource Recovery Assessment Map	
Proposed Activity	**Objective (Why)**
• Develop a spatial Geographic Information System (GIS) based map to assess the current waste and resource recovery system in Gippsland to support effective land use planning and investment decision making. This will identify opportunities and the most appropriate locations for new waste and resource recovery infrastructure and systems as well as identifying methods to protect essential existing infrastructure. • In development of this map, investigate opportunities for co-locating infrastructure in association with Gippsland's water authorities. • The GWRRG will work with councils to ensure that the assessment tool is embedded in the land use planning decision making processes within Gippsland local government and the Local Planning Scheme.	To identify and support the most appropriate locations for new waste and resource recovery infrastructure and systems as well as identifying methods to protect essential existing infrastructure.

5.1.3. Transport efficiency assessment

The reliance on Melbourne's reprocessing industry is expected to grow. Efficient and reliable transport solutions are critical to maximise the value of the material. Efficiency gains, such as back loading opportunities, can provide other economic opportunities for the Gippsland community. The Gippsland Waste and Resource Recovery Assessment Map will improve understanding of the movement of waste into and out of Gippsland, and inform key transport industry stakeholders of opportunities and challenges in line with the objectives of the Transport Integration Act 2010. An assessment of the waste and resource recovery transport efficiency in Gippsland proposes to:

- Identify the major transport tasks and related material flows in Gippsland;
- Assess efficiency (i.e. optimal load and back loading opportunities); and
- Identify supporting infrastructure needs and upgrades.

This initiative will support efforts to identify and increase cross-regional material aggregation to achieve economies of scale sufficient for increased material recovery.

Deliverable: Transport Efficiency Assessment	
Proposed Activity	**Objective (Why)**
• Identify major transport tasks and related material flows within, and to and from Gippsland, with a view to supporting opportunities in the waste and resource recovery sector (for example, optimal load and back loading opportunities). • Lead the development of new waste and resource recovery infrastructure that improves transport efficiency.	To identify opportunities to more efficiently integrate the movement of waste or recovered resources within and beyond Gippsland and support new initiatives that rely on effective transport infrastructure.

5.2. Driving Innovative Services and Infrastructure Provision (Priority Action 2)

There is an increasing interest by the private sector in waste and resource recovery proposals based on innovation and technological development as demonstrated through the Gippsland Collaborative Waste Investment Initiative, used as the market sounding approach for this Plan. This is the first step towards identifying viable initiatives that promise to deliver reduced reliance on landfills and mitigate environmental, public health and amenity impacts. However, private sector investment requires stability and transparency, and will require agreements and partnerships allowing a return on that investment.

5.2.1. Gippsland Collaborative Procurement

In many cases, securing a minimum amount of material is critical to supporting the introduction of a new technology. In Gippsland, the quantity of waste material may not be available but opportunities may exist to work with regional and cross-regional partners to secure the required volume to support such ventures. This could provide added benefit to the region through increased economic development and job creation.

Waste and resource recovery infrastructure is expensive and often specialised. Hence, it is recognised as advantageous to investigate opportunities for increased collaboration, including joint procurement, with the objective of gaining efficiencies and/or economies of scale while maintaining or improving service delivery.

Sustainability Victoria is leading the Collaborative Procurement Framework and the associated Collaborative Procurement Service, designed to encourage best practice collaborative procurement for waste and resource recovery services and infrastructure. In Gippsland, there are expected to be many opportunities to use this framework for the benefit of councils and their communities.

A focus of the Gippsland Implementation Plan is the recovery of organic material as identified in the Statewide Organics and Resource Recovery Market Strategies. There may be opportunities under a collaborative procurement framework to establish Waste to Energy facilities in the region to divert organic material away from landfill.

This is further supported by the Investment Facilitation Framework, aimed at attracting and facilitating investment in Victoria's waste and resource recovery infrastructure, as identified in the State Infrastructure Plan.

Deliverable: Gippsland Collaborative Procurement	
Proposed Activity	**Objective (Why)**
• In line with Sustainability Victoria's Collaborative Procurement Framework, scope key areas where a shared approach could benefit Gippsland councils in providing services to their respective communities. • Facilitate partnerships between local government authorities and the waste industry to support the upgrades of waste and resource infrastructure, or asset renewal, including consolidation or relocation where appropriate. • Lead the second stage of the Gippsland Collaborative Waste Investment Initiative in partnership with Gippsland councils to facilitate and promote engaged collaboration with other identified regional and cross regional partner organisations.	To target the most appropriate way the GWRRG can bring benefit to Gippsland councils and community through a joint procurement role. To attract greater private sector investment and social enterprise in the development and operation of resource recovery activity in Gippsland by identifying, progressing and supporting viable initiatives.

5.2.2. Innovative and Viable Recycling Initiatives

While large facilities might be appropriate in more urbanised cities and towns, a one size fits all approach is not appropriate for all situations in Gippsland. Identification and encouragement of local solutions for Gippsland's isolated communities is recognised as being just as important in achieving improved waste and resource recovery in these locations. Exploring common issues and investigating opportunities to engage Gippsland's social enterprise sector and community groups in delivering cost efficient solutions are recognised as having potential for better outcomes in some communities.

Offering convenient solutions, providing a consistent approach and presenting accessible recycling opportunities are recognised as ways to significantly reduce the barriers to increased recycling in public places and at home. Similarly, working with the business community to improve the convenience and viability of recycling could deliver substantive increases in material recovery.

The GWRRG will work to stimulate the introduction of innovative waste and resource recovery solutions, reflecting the diverse needs of Gippsland communities. It will do this through various initiatives that identify how to best assist in facilitating collaborative procurement involving Gippsland councils. The GWRRG will also lead the second stage of the Gippsland Collaborative Waste Investment Initiative and investigate initiatives to advance the convenience, scope and consistency of recycling.

Deliverable: Investigation of Innovative and Viable Recycling Initiatives	
Proposed Activity	**Objective (Why)**
• Participate in and support the statewide research on innovation in resource recovery and identify where new infrastructure can be developed or existing infrastructure and/or underutilised workforce can be leveraged. • Utilise the Waste and Resource Recovery Assessment Map to analyse high priority activity clusters (geographical/material or sector based) with common waste and resource recovery challenges and assist them in finding solutions. • Assess market stability and benchmark key technology options suitable in the Gippsland context, invite private sector responses and develop business plans to implement high priority initiatives. • Identify and support co-funding or other opportunities to implement improvements and innovation with identified partners.	To improve the convenience, scope and consistency of recycling locally

5.3. Building greater responsibility and accountability (Priority Action 3)

Knowledge sharing through education and engagement is recognised as being critical to supporting behaviour change in the community and fostering Gippsland's resource recovery efforts as well as reducing littering and illegal dumping.

5.3.1. Waste education for Gippsland

The community needs to understand what can be recycled and, just as importantly, what happens to a recycled product. An understanding of the waste management system, through targeted education and social marketing strategies, would encourage a more responsive community reaction at household and business levels.

The GWRRG would also help to promote the waste industry's activities and initiate a social licence to operate.

Engaging school-age children - the future leaders of the community - is critical to delivering substantive long-term behaviour change. The GWRRG has achieved considerable success with its school programs and continuing this work is a high priority.

Deliverable: Gippsland Waste Education	
Proposed Activity	**Objective (Why)**
• Implement the Victorian Waste Education Strategy in the Gippsland region, focussing on locally important issues.	To engender behavioural change through targeted and intensive knowledge sharing and education.

5.3.2. Regional Litter Initiative for Gippsland

Litter and illegal dumping of waste are often confronting. While Victoria is the least littered state[54] in Australia, there is more we can do to prevent littering. Anecdotally, the instances of littering in Gippsland are more frequent in comparison to other regions.

The drivers for littering and illegal dumping are not always clear. Often much of the material is recyclable and could be taken to a nearby local transfer station at no charge. In other cases, fees associated with disposal or a perceived lack of convenience could lead to individuals deciding it is easier to dump the material.

Whatever the reason, there is a lack of consistent data to assess the magnitude of this issue. Furthermore, a lack of understanding of the most effective techniques in reducing littering and illegal dumping is limiting a coordinated and more appropriate approach to dealing with this issue.

The GWRRG will work with identified partner organisations to undertake a situation assessment of the litter and illegal dumping across the region to understand the magnitude of this issue, including related impact and costs to land managers, local government and other affected stakeholders. The GWRRG will track behaviour change through benchmarking to promote, reinforce and engage the community to work together on viable solutions.

Based on this assessment, the GWRRG proposes to implement initiatives for dealing with litter and illegal dumping. This would be done in collaboration with identified partner organisations.

Deliverable: Regional Litter Initiative for Gippsland	
Proposed Activity	**Objective (Why)**
• Undertake a situation assessment of the litter and illegal dumping across the region in line with the Victorian Litter Report Card and Local Litter Measurement Toolkit (LLMT) to understand the magnitude of the issue, the related impact and costs to land managers, local government and other affected stakeholders and to benchmark behaviour change.	To better understand the magnitude of littering and illegal dumping in Gippsland and work with key stakeholders and the community to deliver a coordinated response.

54 Media Release – Minister Energy, Environment and Climate Change, August 2016

5.4. Facilitating Continuous Improvement and Enhanced Performance (Priority Action 4)

As the complexity of the goods produced and consumed increases, the waste industry responds with increasingly sophisticated waste management and resource recovery solutions. The activities of the waste sector are often scrutinised when they affect the amenity of communities living near waste and resource recovery facilities. As an industry, it is important to recognise that a focus on continual improvement builds community confidence in the sector's ability to manage facilities well, within regulatory parameters and in line with reasonable community expectations.

A high level of transparency and a genuine desire to be a 'good neighbour' will increase the credibility of the sector.

5.4.1. Lead Improvements in the Management of Waste Facilities

The GWRRG recognises that working in collaboration with the sector to promote achievements and to share the challenges faced, provides the industry with an opportunity to develop a trusting relationship with the community and business.

Benchmarking and developing agreed targets to enable monitoring and evaluation are key in assessing performance. The GWRRG proposes to prepare and publish a biennial 'State of Waste Report' to present information on the progress to help drive improvements in Gippsland's waste and resource recovery system.

Deliverable: Lead Improvements in the Management of Waste Facilities	
Proposed Activity	**Objective (Why)**
• Determine continuous improvement actions that would benefit waste and resource recovery infrastructure in collaboration with government, the waste industry, EPA Victoria and other regulatory agencies. • Benchmark activities to monitor and evaluate performance and encourage improvements.	To lead a culture of continuous improvement in the waste sector in Gippsland.
Deliverable: Biennial Gippsland 'State of Waste' Report	
Proposed Activity	**Objective (Why)**
• Publish a Biennial 'State of Waste' Report for Gippsland to communicate successes and challenges in meeting key performance measures set for the region, and promote the positive activities of the waste sector that support the community.	To be accountable for the work undertaken in improving the management of waste in Gippsland.

5.5. Planning to Reduce Undesirable Impacts (Priority Action 5)

Gippsland's current waste and resource recovery system is adequate to manage the usual mix and throughput of waste materials generated in the region. However, emergency or unexpected events, together with events that are expected but not fully planned for, have been identified as particular risks to the Gippsland community.

During the aftermath of the Black Saturday fires in 2009, the clean-up efforts were among the first activities to be undertaken once the emergency had ceased. Waste service providers perform an important role in facilitating this process in an orderly manner. Given that more frequent events of this type can be expected due to the changing climate, a more comprehensive understanding of the measures in place to proactively plan for these events in Gippsland is required.

Gippsland's waste and resource recovery infrastructure is required to accommodate waste resulting from emergency events, which can impact on the available space and short-term capacity of facilities, or reduce access to facilities for extended periods of time.

If not planned for, the waste generated by emergency events and the impact that their management can have on the region's infrastructure can lead to undesirable public health or environmental issues. In some cases, the nature of the waste material requires specific management techniques, which may disrupt the day-to-day operations due to occupational health and safety concerns.

Other impacts to the waste system may be:

- temporary closure due to plant failure;
- regulatory action if licence conditions are breached; or
- failure of the market for particular products or commodities that facilities rely upon to enable economic viability.

The potential implications of these events need to be fully understood and formally recognised by Gippsland's community and agency leaders if negative impacts are to be effectively mitigated.

Where the region's waste and resource recovery sector is influenced by global events such as fluctuations in the price of crude oil or economic downturns, it can be difficult for local industry to influence these changes. However, the GWRRG will work with the region's industry to encourage the adoption of leading practice in its processes to improve efficiencies and reduce the chances of plant failures or regulatory enforcement, and help ensure that the region's resource recovery facilities remain competitive in the world market.

5.5.1. Ensure Appropriate Contingency Measures are in Place for Waste Management Assets

The GWRRG has established that the region's Municipal Emergency Management Plans should identify key waste and resource recovery infrastructure as assets available early in the recovery phase. To support this, the GWRRG believes contingencies for unplanned events need to be put in place to ensure that the severity or duration of the disruption to the region's waste and resource recovery system and any associated health and environmental impacts are minimised (if they cannot be avoided altogether).

Contingencies for other unplanned events must also be put in place. Again, proactively planning for such events is required to ensure that the severity or duration of the disruption is minimised (if it cannot be avoided altogether).

Deliverable: Identify the key risks to waste management assets arising from unexpected events, natural disasters and emergencies and ensure appropriate contingency measures are in place	
Proposed Activity	**Objective (Why)**
• Coordinate the documentation of risks to waste and resource recovery infrastructure. • Work with local government, relevant authorities and Emergency Management Victoria to identify appropriate mitigation response or plan.	To acknowledge the role and importance of waste infrastructure during emergencies and ensure these risks and appropriate contingency measures are formally recognised within the existing Emergency Management Framework. To assist all facilities to strive for leading practice thus mitigating operational issues and building contingency planning in to business decisions.

5.5.2. Closed Landfills Prioritisation

More than 30 landfills in Gippsland have closed in the past 15 years with many more landfills closing prior to this time. In some cases, appropriate rehabilitation works or monitoring are still to be undertaken. Many of these old landfills serviced very small communities and represent a low risk. However, it is important to assess these sites to ensure the risk to the environment and public health is as low as reasonably practicable.

In 2014, the Victorian Auditor General's Office recommended improved management of closed landfills in Victoria. In mitigating possible environmental and public health risks and in meeting the principle of intergenerational equity, these costs should not be passed on to future generations that have not benefitted from their operation.

The GWRRG believes that a collaborative and coordinated approach to addressing Gippsland's closed landfills will provide consistency and cost effectiveness. The GWRRG will work with local government and EPA to develop a consistent methodology to assess the risk and facilitate an agreed management approach for closed landfill sites in Gippsland, including the application of any appropriate land use planning tools.

Deliverable: Support Gippsland councils and the EPA to identify the region's closed landfills, build on past risk assessments and assist in development of priorities at a regional scale	
Proposed Activity	**Objective (Why)**
• Facilitate the development of a consistent methodology to assess the risk of closed landfill sites in Gippsland. • Facilitate an agreed management approach for closed landfills.	To ensure the impact of closed landfills to our environment and public health is as low as reasonably practicable.

5.6. Improving Value of Available Information to Support Industry Development and Protect Public Health (Priority Action 6)

Quality data and information are the foundation for evidence-based decision making and essential to the delivery of a better waste and resource recovery network for Gippsland.

The current characteristics of Municipal Solid Waste generated in Gippsland are well known through successive waste audits.

By comparison, the composition of materials generated in the business and building sectors (C&D and C&I) is not well understood. These gaps include knowledge of material flows from private companies, flows into and out of the region to adjoining regions and Melbourne, and quantity and types of materials being transported.

5.6.1. Gippsland Waste and Resource Recovery Data Collection and Reporting

Further information about material flows is necessary to improve the identification of opportunities and removal of barriers. It could also enable better connections across the state so that combined volumes can be identified to meet market demand, increase viability of innovative technologies or improve material recovery.

The GWRRG recognises a need to build trusted relationships so that information can be shared for planning purposes through timely and well targeted waste and resource recovery data collection and reporting.

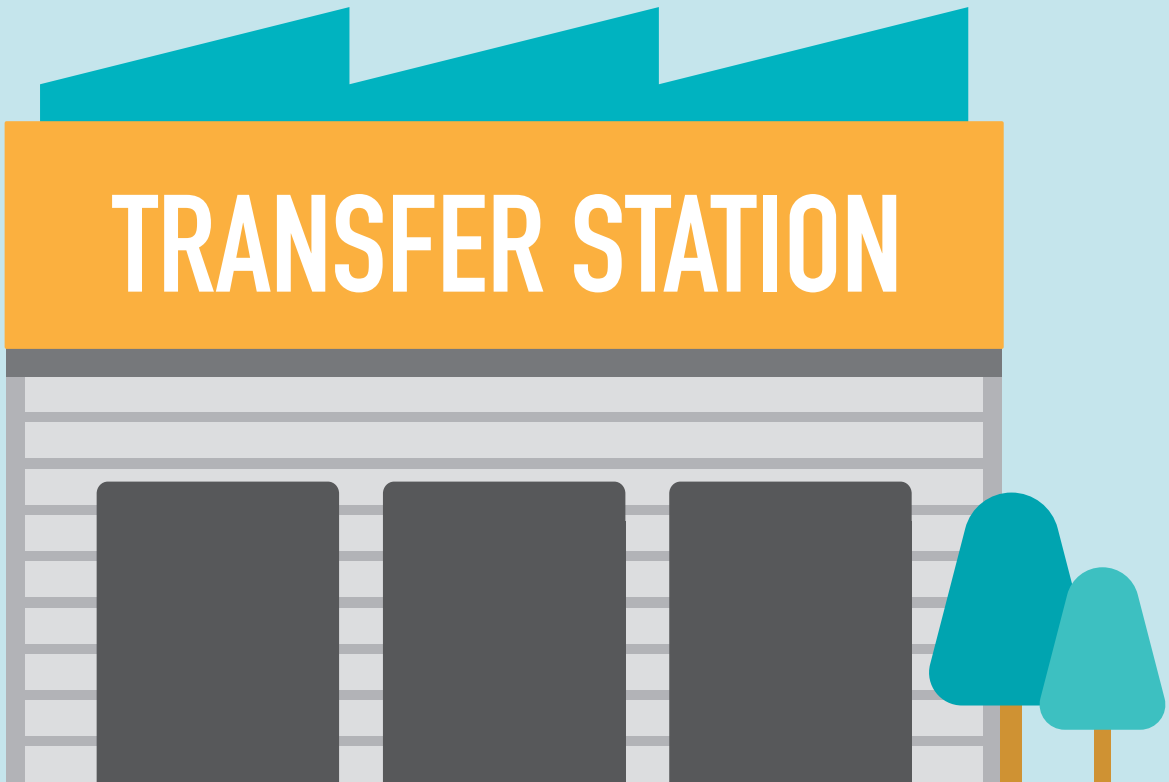
The aim is to better inform all elements of the waste and resource recovery sector in Gippsland with a view to making existing industry more viable, encouraging new investment and developing technological solutions. It is also expected to improve waste and resource recovery within the region.

Deliverable: Gippsland Waste and Resource Recovery Data Collection and Reporting	
Proposed Activity	**Objective (Why)**
• Implement agreed waste and resource recovery data sets and collection and reporting methodology, consistent with the State's Waste Data Governance Framework, in conjunction with the waste industry, local government, and state government agencies. • Ensure regular input to the data collection system. • Undertake detailed data analysis and modelling, based on accurate and contemporary data, to better understand and identify opportunities for improvement and provide a foundation for the Priority Actions in this Plan. • Develop routine data reporting protocols for public availability.	To better understand and identify opportunities for improvement and provide a foundation for the strategic planning and investment in Gippsland.

Deliverable: Waste Composition Investigation	
Proposed Activity	**Objective (Why)**
• Investigate the composition of materials discarded by business and industry, thus supporting improvements in material efficiency, waste management and resource recovery.	To enable development of strategies for improved waste and resource recovery based on measured material composition (or characteristics) of waste streams.

Section 6:

Infrastructure Schedule



6. Infrastructure Schedule

As a requirement of the EP Act, the Gippsland Implementation Plan must include an Infrastructure Schedule that outlines existing waste and resource infrastructure within the region and provides detail on what will be required to effectively manage Gippsland's future waste needs. The purpose of the Schedule is to facilitate planning to identify and address gaps in infrastructure based on current status, future needs, and constraints and opportunities. In developing this Schedule, the region has worked with the other Waste and Resource Recovery Groups, ensuring consistency and alignment with the Infrastructure Schedules across the state.

A key requirement of the Infrastructure Schedule is to facilitate decision making that prioritises resource recovery over landfilling.

To the knowledge of the GWRRG, all relevant facilities currently in existence have been included in the Schedule. It is important to note that inclusion of a facility should not in any way be interpreted as a warranty or representation as to its quality, compliance, effectiveness or suitability.

While the GWRRG has made every effort to ensure the information contained in the Infrastructure Schedule is accurate and complete, the list of facilities included, as well as information and comments in the 'other considerations' section, should not be taken as exhaustive and are provided to fulfil 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.

The Schedule consists of two parts:

Part A:

Resource recovery and consolidation infrastructure identifies where existing resource recovery infrastructure in the region is currently located and the timeframe, general location and other requirements of any further resource recovery infrastructure needed.

The information contained in Part A of the Infrastructure Schedule is aimed at informing future planning, including land use planning to designate where land should be made available for expansion of current resource recovery activities and establishment of new facilities. This is to ensure appropriate land use planning to minimise the impact of these activities on the environment, public health and amenity of the surrounding community.

Part B:

Landfill Infrastructure Schedule has the primary purpose of ensuring there is adequate landfill capacity planned to ensure the safe and sanitary disposal of non-recoverable residual wastes for at least the next 10 years. While Part B of this Schedule only includes landfill capacity in Gippsland, it has been developed in consideration of waste flows that may enter the region from other areas of the state. The landfill component of the Infrastructure Schedule is also designed so appropriate buffers can be defined, allowing for sound planning decisions on land development near any new landfills listed in the Schedule.
It should be noted that listing a site or general location in this Schedule does not guarantee the location or site will be developed. Relevant planning and regulatory approvals need to be granted before the infrastructure can be developed.

Future reviews of this Plan may identify that the need and/or location of future resource recovery and landfill infrastructure listed in the Schedule no longer presents the preferred option for the region. If this is the case, the Schedule will be amended.

6.1. Aligning the Infrastructure Schedule with Planning Schemes

Aligning the Gippsland Implementation Plan with relevant local planning schemes is important to achieve the objectives of the Victorian Waste and Resource Recovery Infrastructure Framework as it relates to landfills and waste and resource recovery infrastructure. Table 19 below outlines how waste and resource recovery infrastructure is categorised in the Victorian Planning Provision (VPP).

Furthermore, the proposed development of the Gippsland Waste and Resource Recovery Assessment Map will allow the GWRRG to:

1. Inform Local Government

Advise local government in Gippsland that the Gippsland Implementation Plan (and its Infrastructure Schedule) is the Plan referred to in clause 19.03-5 of the Planning Scheme and that due consideration when exercising its planning functions. Further, providing options for Gippsland councils to work collaboratively with the GWRRG to achieve the intent of this Plan, including protecting existing facilities and providing for future facilities, in the Local Planning Policy Framework and Municipal Strategic Statement.

2. Facilitate Planning Approvals

Work with relevant local government and proponents to facilitate planning approvals, providing context and advice on how proposals achieve consistency with this Plan and its objectives.

3. Facilitate Effective Buffers

Work with local government to identify what essential infrastructure in the region is at risk of encroachment by sensitive uses. Where appropriate, work with local government to implement and manage buffers for existing infrastructure. This work will be informed by the recent work undertaken by the Metropolitan Waste and Resource Recovery Group through the Local Government Buffer Support Program.

The GWRRG will also consider any further policy development as it relates to land use planning following the state government's response to the EPA Inquiry and other waste related land use initiatives such as Major Hazard Facilities report.

Table 19: Land Use Planning and Waste Planning Framework Infrastructure Categorisation

SWRRIP and Regional 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
Reprocessing Infrastructure Organic reprocessing facility		Composting and other organics materials recycling
Reprocessing Infrastructure Waste to Energy 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

SWRRIP and Regional Plan Infrastructure Type	Victorian Planning Provision (VPP)	
	Definitions (Clause 74)	Clause 52.10
Resource Recovery Infrastructure Resource Recovery Centres/ Transfer Stations (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: • Accepting organic wastes • Other
Resource Recovery Infrastructure Materials Recovery Facility (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		

Part A: Resource recovery and consolidation infrastructure

6.2. Existing resource recovery infrastructure

Details of Gippsland's existing resource recovery infrastructure is provided in Table 20. Resource recovery refers to a process that results in either matter or energy being obtained from waste. Reprocessing describes the process of changing the physical structure and properties of a waste material, resulting in a new product of value being created. If not reprocessed, these materials would be sent to landfill.

Table 20: Existing Resource Recovery Infrastructure (read over both pages)

Site Name	Address	Local Government Area	Facility owner/ Lessee	
Resource Recovery Drop Off				
Baw Baw Depot	188 Normanby Street, Warragul	Baw Baw	Baw Baw Shire	
Anglers Rest TRAILER	Callaghan-McNamara Road, Anglers Rest	East Gippsland	East Gippsland Shire	
Brodribb River TRAILER	Sandy Flat Road, Brodribb	East Gippsland	East Gippsland Shire	
Buldah TRAILER	Buldah Road, Buldah	East Gippsland	East Gippsland Shire	
Chandlers Creek TRAILER	Chandlers Creek	East Gippsland	East Gippsland Shire	
Club Terrace TRAILER	School Road, Club Terrace	East Gippsland	East Gippsland Shire	
Combienbar TRAILER	Combienbar Road, Combienbar	East Gippsland	East Gippsland Shire	
Deddick TRAILER	McKillops Road, Deddick	East Gippsland	East Gippsland Shire	
Dellicknora TRAILER	McKillops Road, Dellicknora	East Gippsland	East Gippsland Shire	
Ensay TRAILER	Doctors Flat Road, Ensay	East Gippsland	East Gippsland Shire	
Gipsy Point TRAILER	Gipsy Point	East Gippsland	East Gippsland Shire	
Glen Wills TRAILER	Omeo Highway, Glen Wills	East Gippsland	East Gippsland Shire	
Goongerah TRAILER	Bonang Highway, Goongerah	East Gippsland	East Gippsland Shire	
Tamboon/Furnell TRAILER	Tamboon Road, Tamboon	East Gippsland	East Gippsland Shire	
Tubbut TRAILER	McKillops Road, Tubbut	East Gippsland	East Gippsland Shire	
Benambra Skip	97 Tip Road, Benambra	East Gippsland	East Gippsland Shire	
Bendoc Skip	Clarkeville Road, Bendoc	East Gippsland	East Gippsland Shire	
Pinegro Moe	31 Walhalla Road Moe	Latrobe City	Pinegro	
Pinegro Traralgon	29-35 Rocla Road Traralgon	Latrobe City	Pinegro	
Towards Zero	1 Wellington Park Way, Sale	Wellington	Towards Zero	

	"GIS Location Latitude"	"GIS Location Longitude"	Waste Sources accepted	Materials accepted
	Resource Recovery Drop Off			
	-38.154492	145.941705	Municipal	Chem Collect
	-36.993161	147.474107	Municipal and C&I	Residual waste
	-37.707933	148.563474	Municipal and C&I	Residual waste
	-37.335037	149.206256	Municipal and C&I	Residual waste
	-37.336772	149.206801	Municipal and C&I	Commingled recyclables, Residual waste
	-37.551624	148.935370	Municipal and C&I	Residual waste
	-37.438168	148.988117	Municipal and C&I	Residual waste
	-37.073342	148.465597	Municipal and C&I	Residual waste
	-37.120873	148.660764	Municipal and C&I	Residual waste
	-37.367449	147.793477	Municipal and C&I	Residual waste
	-37.484124	149.680790	Municipal and C&I	Residual waste
	-36.887033	147.461333	Municipal and C&I	Residual waste
	-37.357928	148.684166	Municipal and C&I	Residual waste
	-37.692039	149.160208	Municipal and C&I	Residual waste
	-37.073956	148.596658	Municipal and C&I	Residual waste
	-36.965257	147.687049	Municipal and C&I	Residual waste
	-37.168929	148.881945	Municipal and C&I	E-waste, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses
	-38.160177	146.260376	Municipal C&D and C&I	Garden organics/Wood/Timber
	-38.182567	146.567244	Municipal C&D and C&I	Garden organics/Wood/Timber
	-38.099337	147.096218	Municipal and C&I	Commingled recyclables`

Table 20: Existing Resource Recovery Infrastructure (read over both pages)

Site Name	Address	Local Government Area	Facility owner/ Lessee	
Resource Recovery RRC/TS, Stand Alone				
Cowes Recycling Facility	Dunsmore Road, Cowes	Bass Coast	Bass Coast Shire	
Inverloch	Old Ford Road, Inverloch	Bass Coast	Wonthaggi Recyclers	
Wonthaggi	180 Cameron Street, Wonthaggi	Bass Coast	Wonthaggi Recyclers	
Drouin Waste Recyclers	81 Weerong Road, Drouin	Baw Baw	Drouin Waste Recyclers	
Erica	Mathesons Road, Erica	Baw Baw	Baw Baw Shire	
Lardner	Simpson Road, Lardner	Baw Baw	Baw Baw Shire	
Mt Baw Baw	Mt Baw Baw Tourist Road	Baw Baw	Mount Baw Baw Alpine Resort Management Board	
Neerim South	Neerim East Road, Neerim South	Baw Baw	Baw Baw Shire	
Trafalgar	Giles Road, Trafalgar	Baw Baw	Baw Baw Shire	
Bemm River	2044 Syndenham Parade, Bemm River	East Gippsland	East Gippsland Shire	
Bonang	16 Maling Road, Bonang	East Gippsland	East Gippsland Shire	
Bruthen	107 - 117 Great Alpine Road, Bruthen	East Gippsland	East Gippsland Shire	
Buchan	2337 Bruthen - Buchan Road, Buchan	East Gippsland	East Gippsland Shire	
Genoa	Princes Highway, Genoa	East Gippsland	East Gippsland Shire	
Lindenow	Snobbs Road, Lindenow	East Gippsland	East Gippsland Shire	

	"GIS Location Latitude"	"GIS Location Longitude"	Waste Sources accepted	Materials accepted
	Resource Recovery RRC/TS, Stand Alone			
	-38.45705	145.24819	Municipal C&D and C&I	E-waste, Motor oil, Automotive batteries, Dry cell batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard
	-38.63122	145.751292	Municipal C&D and C&I	E-waste, Fluoro tubes, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, Tyres
	-38.621983	145.58244	Municipal C&D and C&I	E-waste, Fluoro tubes, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, Tyres
	-38.122448	145.83346	Municipal C&D and C&I	Concrete, brick & tiles, E-waste, Automotive batteries, Metals, Combined organics, Residual waste, Paper & cardboard, Silage wrap
	-37.971961	146.371268	Municipal	E-waste, Fluoro tubes, Motor oil, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, Tyres
	-38.220544	145.864021	Municipal	E-waste, Fluoro tubes, Motor oil, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, drumMuster, Tyres
	-37.847104	146.245269	Municipal and C&I	Commingled recyclables, Residual waste
	-38.00739	145.963851	Municipal	E-waste, Fluoro tubes, Motor oil, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, drumMuster, Tyres
	-38.228236	146.143388	Municipal	E-waste, Fluoro tubes, Motor oil, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, drumMuster, Tyres
	-37.751764	148.969301	Municipal C&D and C&I	E-waste, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses
	-37.201878	148.726927	Municipal C&D and C&I	E-waste, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses
	-37.697864	147.836478	Municipal C&D and C&I	E-waste, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses
	-37.544522	148.148001	Municipal C&D and C&I	E-waste, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses, Tyres
	-37.478899	149.583393	Municipal C&D and C&I	E-waste, Automotive batteries, Metals, Commingled recyclables, Residual waste,
	-37.814954	147.425117	Municipal C&D and C&I	E-waste, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses, drumMuster

Table 20: Existing Resource Recovery Infrastructure (read over both pages)

Site Name	Address	Local Government Area	Facility owner/ Lessee	
Resource Recovery RRC/TS, Stand Alone				
Mallacoota	Betka Road, Mallacoota	East Gippsland	East Gippsland Shire	
Marlo	99 Marlo Tip Road, Marlo	East Gippsland	East Gippsland Shire	
Metung	130 Rosherville Road, Metung	East Gippsland	East Gippsland Shire	
Newmerella	215 Corringle Road, Newmerella	East Gippsland	East Gippsland Shire	
Omeo	18 Margetts Street, Omeo	East Gippsland	East Gippsland Shire	
Orbost	Bonang Road, Orbost	East Gippsland	East Gippsland Shire	
Swifts Creek	237 Cassilis Road, Swifts Creek	East Gippsland	East Gippsland Shire	
Wairewa	Boundary Road, Wairewa	East Gippsland	East Gippsland Shire	
Moe	Haunted Hill Road, Hernes Oak	Latrobe City	Latrobe Waste & Recycling	
Morwell	Porters Road, Hazelwood North	Latrobe City	Latrobe Waste & Recycling	
Traralgon	Liddiard Road, Traralgon	Latrobe City	Latrobe Waste & Recycling	
Yinnar	Whitelaws Track, Yinnar South	Latrobe City	Latrobe Waste & Recycling	
Foster	South Gippsland Highway, Foster	South Gippsland	Dasma Environmental Solutions	
Korumburra	Silkstone Road, Korumburra	South Gippsland	Dasma Environmental Solutions	

	"GIS Location Latitude"	"GIS Location Longitude"	Waste Sources accepted	Materials accepted
	Resource Recovery RRC/TS, Stand Alone			
	-37.572423	149.745938	Municipal C&D and C&I	Concrete, brick & tiles, Clean fill, E-waste, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, Tyres
	-37.790137	148.561590	Municipal C&D and C&I	E-waste, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses
	-37.852133	147.861536	Municipal C&D and C&I	E-waste, Motor oil, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard
	-37.754817	148.423226	Municipal C&D and C&I	E-waste, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses
	-37.100543	147.603573	Municipal C&D and C&I	E-waste, Motor oil, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses, drumMuster
	-37.672272	148.472983	Municipal C&D and C&I	E-waste, Motor oil, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, drumMuster, Tyres
	-37.269118	147.696939	Municipal C&D and C&I	E-waste, Motor oil, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard
	-37.690504	148.172573	Municipal C&D and C&I	E-waste, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses
	-38.201088	146.309603	Municipal C&D and C&I	Clean fill, Plasterboard, Glass, E-waste, Motor oil, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, Tyres
	-38.254212	146.426395	Municipal C&D and C&I	Chem Collect, Clean fill, Plasterboard, Glass, E-waste, Fluoro tubes, Motor oil, Automotive batteries, Dry cell batteries, Paint, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, drumMuster, Silage wrap, Tyres
	-38.222746	146.554063	Municipal C&D and C&I	Clean fill, Plasterboard, Glass, E-waste, Motor oil, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, Tyres
	-38.377715	146.343027	Municipal C&D and C&I	Clean fill, Glass, E-waste, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, Tyres
	-38.6521	146.219392	Municipal C&D and C&I	Clean fill, Glass, E-waste, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, Tyres
	-38.447625	145.833978	Municipal C&D and C&I	Concrete, brick & tiles, E-waste, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, drumMuster, Silage wrap, Tyres

Table 20: Existing Resource Recovery Infrastructure (read over both pages)

Site Name	Address	Local Government Area	Facility owner/ Lessee	
Resource Recovery RRC/TS, Stand Alone				
Mirboo North	Railway Road, Mirboo North	South Gippsland	Dasma Environmental Solutions	
Venus Bay	Corner Canterbury Road & 3 Beach Road, Venus Bay	South Gippsland	Dasma Environmental Solutions	
Walkerville	Fish Creek Road -Walkerville Road, Walkerville	South Gippsland	Dasma Environmental Solutions	
Dargo	Kings Road, Dargo	Wellington	Towards Zero	
Heyfield	Rifle Range Road, Heyfield	Wellington	Towards Zero	
Loch Sport	Progress Road, Loch Sport	Wellington	Towards Zero	
Seaspray	Tip Road, Seaspray	Wellington	Towards Zero	
Stratford	Wyndham Street, Stratford	Wellington	Towards Zero	
Yarram	Hyland Highway, Yarram	Wellington	Towards Zero	
Bass Coast Metal Recyclers	Wonthaggi	Bass Coast	Bass Coast Metal Recyclers	
Bass Coast Rubbish Removal & Bin Hire	11 Pine Grove Wonthaggi	Bass Coast	Bass Coast Rubbish Removal & Bin Hire	
Wheel-A-Waste Pty Ltd	38 Fuller Road North Wonthaggi	Bass Coast	Wheel-A-Waste Pty Ltd	
B & H Scrap Removals	Warragul	Baw Baw	B & H Scrap Removals	
Drouin Waste Recyclers	8 Weerong Road, Drouin	Baw Baw	Drouin Waste Recyclers	
Gippsland Metal Recyclers	7 Cadby Court, Warragul 3820	Baw Baw	Gippsland Metal Recyclers	

	"GIS Location Latitude"	"GIS Location Longitude"	Waste Sources accepted	Materials accepted
	Resource Recovery RRC/TS, Stand Alone			
	-38.402207	146.171474	Municipal C&D and C&I	Concrete, brick & tiles, E-waste, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Paper & cardboard, drumMuster, Silage wrap, Tyres
	-38.696967	145.808548	Municipal C&D and C&I	Concrete, brick & tiles, E-waste, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Paper & cardboard, drumMuster, Silage wrap, Tyres
	-38.818034	146.001743	Municipal C&D and C&I	Concrete, brick & tiles, E-waste, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Paper & cardboard, drumMuster, Silage wrap, Tyres
	-37.456218	147.241525	Municipal C&D and C&I	Motor oil, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses, Tyres
	-37.961417	146.741264	Municipal C&D and C&I	E-waste, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Tyres
	-38.064742	147.552742	Municipal C&D and C&I	E-waste, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Tyres
	-38.365518	147.191445	Municipal C&D and C&I	E-waste, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Tyres
	-37.959918	147.090904	Municipal C&D and C&I	E-waste, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Tyres
	-38.54132	146.702445	Municipal C&D and C&I	E-waste, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, drumMuster, Tyres
			C&D	Metal
	-38.621855	145.586237	C&D	Mixed Building waste
	-38.587388	145.590823	C&D	Mixed Building waste
	-38.164814	145.941123	C&D	Metal
	-38.116549	145.831578	C&D	Metal
	-38.162708	145.940597	C&D	Metal

Table 20: Existing Resource Recovery Infrastructure (read over both pages)

Site Name	Address	Local Government Area	Facility owner/ Lessee	
Resource Recovery RRC/TS, Stand Alone				
K.B. Auto Salvage & Recycling	30 Weerong Road Drouin 3818	Baw Baw	K.B. Auto Salvage & Recycling	
Maple Ridge Scrap	2B Olympic Street, Warragul	Baw Baw	Maple Ridge Scrap	
Sort Worx	Contour Road, Trafalgar	Baw Baw	Sort Worx	
Bairnsdale Scrap Metal	14 Kyle Street, Bairnsdale	East Gippsland	Bairnsdale Scrap Metal	
Bin Skips Waste & Recycling	Bairnsdale	East Gippsland		
East Gippsland Scrap Metal Recyclers & Bargain Centre	29 Lawless Street, Bairnsdale	East Gippsland	East Gippsland Scrap Metal Recyclers & Bargain Centre	
Doc Shop	66 Eastern Rd Traralgon	Latrobe City	Doc Shop	
Don Thornley Metal Merchant		Latrobe City	Don Thornley Metal Merchant	
Industrial Metal Recyclers	Lot 4J Southern Court (Off Hazelwood Drive), Morwell	Latrobe City	Industrial metal Recyclers	
Latrobe Valley Recyclers	55 Madden Street, Morwell	Latrobe City	Transpacific Industries	
Lifeline Gippsland	Cnr Church & Fleming Streets, Morwell	Latrobe City	Lifeline Gippsland	
LVE	547 Princes St Morwell	Latrobe City	LVE	
Madden Street Scrap & Recycling	55 Madden St, Morwell	Latrobe City	Madden Street Scrap & Recycling	
Moe Recyclers	116 Moore Street, Moe	Latrobe City	Moe Recyclers	
Sims Metal Management	70 - 74 Eastern Road, Traralgon	Latrobe City	Sims Metal Management	
Sledge Hammer Scrap Metal	48-50 Commercial Road, Morwell	Latrobe City	Sledge Hammer Scrap Metal	
B&H Scrap Metal Removals	Leongatha	South Gippsland	B&H Scrap Metal Removals	
Fast Scrap Metals	Poowong	South Gippsland	Fast Scrap Metals	
Jackson Maria C	Ameys Track, Foster	South Gippsland	Jackson Maria C	
Loch Scrap Metal Pty Ltd	3 Adkins Street, Korumburra	South Gippsland	Loch Scrap Metal Pty Ltd	

	"GIS Location Latitude"	"GIS Location Longitude"	Waste Sources accepted	Materials accepted
	Resource Recovery RRC/TS, Stand Alone			
	-38.118986	145.831721	C&D	Metal
	-38.164814	145.941123	C&D	Metal
	-38.204605	146.158754	Municipal C&D and C&I	Mixed Materials, residual waste
	-37.843572	147.611273	C&D	Metal
			Municipal C&D and C&I	Mixed Materials
	-37.841714	147.587345	C&D	Metal
	-38.181396	146.56528	Municipal and C&I	Paper/Cardboard, E-waste/Textiles
			C&D	Metal
	-38.247854	146.410624	C&D	Metal
	-38.2308	146.388554	C&D	Metal
	-38.234243	146.399671	Municipal and C&I	Paper/Cardboard, Textiles
	-38.231432	146.440407	Municipal and C&I	Paper/Cardboard
	-38.2308	146.388554	C&D	Metal
	-38.16457	146.262997	C&D	Metal
	-38.180395	146.5655	C&D	Metal
	-38.23376	146.382577	C&D	Metal
			C&D	Metal
			C&D	Metal
	-38.63992	146.222733	C&D	Metal
	-38.427264	145.809139	C&D	Metal

Table 20: Existing Resource Recovery Infrastructure (read over both pages)

Site Name	Address	Local Government Area	Facility owner/ Lessee	
Resource Recovery RRC/TS, Stand Alone				
Heyfield Scrap Metal Merchants	Firebrace Road, Heyfield	Wellington	Heyfield Scrap Metal Merchants	
Maffra Waste Disposal	6 McMahon Drive, Maffra	Wellington	Maffra Waste Disposal	
Maffra Waste Disposal	6 McMahon Drive, Maffra	Wellington	Maffra Waste Disposal	
Maffra Waste Disposal	6 McMahon Drive, Maffra	Wellington	Maffra Waste Disposal	
Resource Recovery RRC/TS, Co-Located at Landfill				
Grantville	1685 Bass Highway, Grantville	Bass Coast	Ace Contractors	
Bairnsdale	200 Johnstons Road Forge Creek	East Gippsland	East Gippsland Shire	
Lakes Entrance	Thorpes Lane, Lakes Entrance	East Gippsland	East Gippsland Shire	
Koonwarra	Koonwarra-Inverloch Road, Koonwarra	South Gippsland	Dasma Environmental Solutions	
Kilmany	Velore Road, Kilmany	Wellington	Towards Zero	
Maffra	Sellings Road, Maffra	Wellington	Towards Zero	
Rosedale	Merton Vale Road, Rosedale	Wellington	Towards Zero	
Resource Recovery MRF				
Tambo Waste	66 McMillan Street, Bairnsdale	East Gippsland	Tambo Waste – Bairnsdale	
Dasma Environmental Solutions	Tramway Road, Morwell	Latrobe City	Dasma – Morwell	

	"GIS Location Latitude"	"GIS Location Longitude"	Waste Sources accepted	Materials accepted
	Resource Recovery RRC/TS, Stand Alone			
	-37.976796	146.780465	C&D	Metal
	-37.971153	146.979569	C&D	Metal
	-37.971153	146.979569	Municipal and C&I	Paper/Cardboard
	-37.971153	146.979569	Municipal C&D and C&I	Mixed Materials, Residual waste
Resource Recovery RRC/TS, Co-Located at Landfill				
	-38.420809	145.51953	Municipal C&D and C&I	E-waste, Fluoro tubes, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Mattresses, Paper & cardboard, drumMuster, Tyres, Residual waste
	-37.87967	147.626012	Municipal C&D and C&I	Concrete, brick & tiles, Clean fill, E-waste, Fluoro tubes, Motor oil, Automotive batteries, Dry cell batteries, Paint, Metals, Combined organics, Commingled recyclables, Residual waste, Paper & cardboard, Tyres
	-37.858294	148.006782	Municipal C&D and C&I	Concrete, brick & tiles, Clean fill, E-waste, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, drumMuster, Tyres
	-38.558186	145.922177	Municipal C&D and C&I	Concrete, brick & tiles, Clean fill, E-waste, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, drumMuster, Silage wrap, Tyres, Clothing
	-38.103092	146.920064	Municipal C&D and C&I	Concrete, brick & tiles, E-waste, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, drumMuster, Tyres, Clothing
	-37.912559	146.986143	Municipal C&D and C&I	Concrete, brick & tiles, E-waste, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, drumMuster, Tyres
	-38.185982	146.813461	Municipal C&D and C&I	Concrete, brick & tiles, E-waste, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Tyres
	Resource Recovery MRF			
	-37.823865	147.655721	Municipal and C&I	Commingled recyclables
	-38.239204	146.438518	Municipal	Concrete/Commingled recyclables

Table 20: Existing Resource Recovery Infrastructure (read over both pages)

Site Name	Address	Local Government Area	Facility owner/ Lessee	
Reprocessor Aggregates, Masonry and Soils				
A1 Concrete Recycling	50 Parinda Road, Drouin	Baw Baw	A1 Concrete Recycling	
Drouin Concrete Recyclers	Parinda Road, Drouin	Baw Baw	Drouin Concrete Recyclers	
Neerim South Quarry	11 Sheffield Road, Neerim South.	Baw Baw	Neerim South Quarry & Concrete Recycling	
Donmix Concrete	793 Back Beach Road, Ventnor	Bass Coast	Donmix Concrete	
Paul Volk Contracting	McMillan Street, Bairnsdale	East Gippsland	Paul Volk Contracting	
Whelans Quarry Sandpit	Johnston's Road, Forge Creek	East Gippsland	Whelans Quarry Sandpit	
G & J Crosby Contractors Pty Ltd	Yard 2 Dodd Court, Traralgon	Latrobe City	G & J Crosby Contractors Pty Ltd	
Gippsland Concrete Recyclers	24-44 Rocla Road, Traralgon	Latrobe City	Gippsland Concrete Recyclers (Matthews Quarries/Latrobe Valley Concrete)	
Kennedy Quarry	Boola Road, Yallourn North	Latrobe City	Kennedy Haulage	
Traralgon Concrete products	14- 28 Dunbar Road, Traralgon	Latrobe City	Traralgon Concrete products	
EcoProjects Australia	PO Box 215 Korumburra	South Gippsland	EcoProjects Australia	
Kilmany TS	Velore Road, Kilmany	Wellington	Wellington Shire Council	
Rob Hicks	Sale	Wellington	Rob Hicks	
Reprocessor Organics, Wood/Timber				
Building Bitz	5 Loughran Drive, Wonthaggi	Bass Coast	Building Bitz	
G & J Crosby Contractors Pty Ltd	Yard 2 Dodd Court, Traralgon	Latrobe City	G & J Crosby Contractors Pty Ltd	
Reprocessor Organics, Combined Organics				
Mallacoota Water Treatment Plant	Watertrust Road, Mallacoota	East Gippsland	John Andersen	
Gary Ryan	57-79 Rocla Rd Traralgon	Latrobe City	Gary Ryan	
Pinegro	Monash Way, Morwell	Latrobe City	Pinegro – Morwell	

	"GIS Location Latitude"	"GIS Location Longitude"	Waste Sources accepted	Materials accepted
	Reprocessor Aggregates, Masonry and Soils			
	-38.120513	145.830814	C&D	Concrete
	-38.120201	145.83098	C&D	Concrete
	-38.005801	145.963551	C&D	Concrete, Bricks and Tiles
	-38.501623	145.182121	C&D	Concrete, Bricks and Tiles
	-37.823383	147.65864	C&D	Concrete
	-37.874684	147.630147	C&D	Concrete
	-38.183964	146.562656	C&D	Concrete, Bricks and Tiles
	-38.182158	146.56747	C&D	Aggregates, Masonry & Soil
	-38.128839	146.386388	C&D	Concrete, Bricks and Tiles
	-38.182158	146.56747	C&D	Aggregates, Masonry & Soil
			C&D	Aggregates, Masonry & Soil
	-38.103092	146.920064	C&D	Aggregates, Masonry & Soil
			C&D	Concrete
	Reprocessor Organics, Wood/Timber			
	-38.609776	145.604647	C&D	Wood/Timber
	-38.183964	146.562656	C&D	Wood/Timber
	Reprocessor Organics, Combined Organics			
	-37.5681285	149.7371293	Municipal and C&I	Food, Garden organics, Wood/Timber
	-38.181151	146.567549	Municipal and C&I	Bark/Sawdust, Wood/Timber
	-38.2442225	146.4096645	Municipal and C&I	Garden organics, Wood/Timber

Table 20: Existing Resource Recovery Infrastructure (read over both pages)

Site Name	Address	Local Government Area	Facility owner/ Lessee	
Reprocessor Organics, Combined Organics				
Aussie Compost Company	307 Koonwarra-Pound Creek Road, Pound Creek	South Gippsland	Aussie Compost Company	
Gippsland Water - Soil and Organic Recycling Facility	1954 Longford-Loch Sport Road, Dutson Downs	Wellington	Gippsland Water (Soil and Organic Recycling Facility)	
Reprocessor Paper Cardboard				
Nippon Paper (Australian Paper)	Morwell-Maryvale Road, Maryvale	Latrobe City	Nippon Paper (Australian Paper)	
WtE (Waste to Energy), Anaerobic Digester				
East Gippsland Water	Holloway St, Bairnsdale	East Gippsland	East Gippsland Water	
WtE (Waste to Energy), Other				
Nippon Paper (Australian Paper)	Morwell-Maryvale Road, Maryvale	Latrobe City	Nippon Paper (Australian Paper)	

*Further information on the wastes and material streams accepted at the facility can be found at the appropriates council or company website.

	"GIS Location Latitude"	"GIS Location Longitude"	Waste Sources accepted	Materials accepted
	Reprocessor Organics, Combined Organics			
	-38.6053608	145.8120627	Municipal and C&I	Garden organics and manures
	-38.209116	147.2931423	Municipal and C&I	Food, Garden organics, Wood/Timber
	Reprocessor Paper Cardboard			
	-38.179826	146.441327	Municipal and C&I	Paper/Cardboard
	WtE (Waste to Energy), Anaerobic Digester			
	-37.843311	147.616376	Municipal and C&I	Biosolids, Garden organics, Wood/Timber
	WtE (Waste to Energy), Other			
	-38.179826	146.441327	C&I	Processing plant waste (Black Liquor) into fuel

6.3. Future Resource Recovery Infrastructure

Some gaps in infrastructure are currently limiting the extent to which material can be diverted particularly from waste flows in the Municipal Solid Waste (MSW), Construction and Demolition (C&D) and Commercial and Industrial (C&I) sectors. Furthermore, the diversification and attraction of additional waste and resource recovery infrastructure to the region will support efforts to more efficiently and effectively segregate, aggregate, transport, reprocess and treat materials, producing marketable products in a bid to transition to greater resource recovery. Table 21 outlines future resource recovery infrastructure requirements and options.

Table 21: Future Resource Recovery Infrastructure Requirements and Options

Infrastructure type	General location	Waste Sources accepted	Materials accepted	
New resource recovery infrastructure				
Resource Recovery Centres/Transfer Stations	Greenfield site or expansion of existing infrastructure capability	Municipal, C&I and C&D	Chem Collect, Clean fill, Plasterboard, Glass, E-waste, Fluoro tubes, Motor oil, Automotive batteries, Dry cell batteries, Paint, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, drumMuster, Silage wrap, Tyres	
Large scale waste (Municipal, C&I and C&D) sorting facility	Greenfield site or co-located on current waste and resource recovery site/s		Residual waste, Concrete, brick & tiles, Combined organics, Metals, Plastics, Timber	
Reprocessor Organics		Municipal, C&I and C&D	Combined organics, Timber	
Reprocessor Plastics	Greenfield site or co-located on current waste and resource recovery site/s	Municipal, C&I and C&D	Flexible Plastics, Expanded Polystyrene and mixed plastics.	
Reprocessor Rubber	Greenfield site or co-located on current waste and resource recovery site/s	Municipal and C&I	Tyres, Conveyor Belt	
Waste to Energy	Greenfield site or co-location with energy user	Municipal and C&D	Combined organics, Timber, Residual waste	
Existing resource recovery infrastructure				
Resource Recovery drop off	Anglers Rest	Municipal and C&I	Residual waste	
Resource Recovery drop off	Brodribb River	Municipal and C&I	Residual waste	
Resource Recovery drop off	Club Terrace	Municipal and C&I	Residual waste	

	Reason for need	Timeframe (likely start date)	Other requirements (e.g. Planning approvals required)
	New resource recovery infrastructure		
	Reduce Municipal, C&I and C&D waste currently landfilled. Provide more efficient, appropriately sited infrastructure that is convenient.	2 – 3 years	Planning and possible Works Approvals required
	Reduce C&I and C&D waste currently landfilled. Provide options for re-manufacturing, investment and job creation. Possible front end process prior to Waste to Energy options.	3 -5 years	Planning and possible Works Approvals required
	Alternative options to existing reprocessors in Gippsland to maximise organics recovery.	3 years	Planning and Works Approvals required
	Support re-manufacturing of plastic goods, initiate economic development and job creation.	2 – 3 years	Planning and Works Approvals required
	Recovery of tyres to produce alternate fuels or for remanufacturing rubber products.	5 years	Planning and possible Works Approvals required
	Transition to renewable energy production, initiate economic development and job creation.	5 years	Planning and Works Approvals required
	Existing resource recovery infrastructure		
	Collection of recyclables through trailer upgrades.	2016	
	Improved service by replacing trailers with a rural kerbside collection	2017	
	Collection of recyclables through trailer upgrades.	2016	

Table 21: Future Resource Recovery Infrastructure Requirements and Options (read over both pages)

Infrastructure type	General location	Waste Sources accepted	Materials accepted	
Existing resource recovery infrastructure				
Resource Recovery drop off	Combienbar	Municipal and C&I	Residual waste	
Resource Recovery drop off	Deddick	Municipal and C&I	Residual waste	
Resource Recovery drop off	Dellicknora	Municipal and C&I	Residual waste	
Resource Recovery drop off	Ensay	Municipal and C&I	Residual waste	
Resource Recovery drop off	Gipsy Point	Municipal and C&I	Residual waste	
Resource Recovery drop off	Glen Wills	Municipal and C&I	Residual waste	
Resource Recovery drop off	Goongerah	Municipal and C&I	Residual waste	
Resource Recovery drop off	Tubbut	Municipal and C&I	Residual waste	
Resource Recovery RRC/TS, stand alone	Wonthaggi	Municipal, C&I and C&D	E-waste, Fluoro tubes, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, Tyres	
Resource Recovery RRC/TS, stand alone	Phillip Island	Municipal, C&I and C&D	E-waste, Fluoro tubes, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, Tyres	
Resource Recovery RRC/TS, stand alone	Erica	Municipal only	E-waste, Fluoro tubes, Motor oil, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, Tyres	
Resource Recovery RRC/TS, stand alone	Lardner	Municipal only	E-waste, Fluoro tubes, Motor oil, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, drumMuster, Tyres	
Resource Recovery RRC/TS, stand alone	Neerim South	Municipal only	E-waste, Fluoro tubes, Motor oil, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, drumMuster Tyres	

	Reason for need	Timeframe (likely start date)	Other requirements (e.g. Planning approvals required)
	Existing resource recovery infrastructure		
	Collection of recyclables through trailer upgrades.	2016	
	Collection of recyclables through trailer upgrades.	2016	
	Collection of recyclables through trailer upgrades.	2017	
	Improved service by community drop off bins with a rural kerbside collection	2017	
	Improved service by replacing trailers with a rural kerbside collection	2016	
	Collection of recyclables through trailer upgrades.	2016	
	Collection of recyclables through trailer upgrades.	2016	
	Collection of recyclables through trailer upgrades.	2016	
	Assess facility operations to improve resource recovery efficiency.	2017/2018	Upgrades are tied to the current contract.
	Resource Recovery Centre/Transfer Station to replace limited capacity of the Cowes Recycling Bank	Expression of Interest planned for 2017	Site selection and associated planning permits
	Upgrade facilities to improve resource recovery.	2017-2022	Baw Baw Shire Long Term Infrastructure Plan.
	Assess facility operations to improve resource recovery efficiency.	2017-2022	Baw Baw Shire Long Term Infrastructure Plan.
	Assess facility operations to improve resource recovery efficiency.	2017-2022	Baw Baw Shire Long Term Infrastructure Plan.

Table 21: Future Resource Recovery Infrastructure Requirements and Options (read over both pages)

Infrastructure type	General location	Waste Sources accepted	Materials accepted	
Existing resource recovery infrastructure				
Resource Recovery RRC/TS, stand alone	Trafalgar	Municipal only	E-waste, Fluoro tubes, Motor oil, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, drumMuster, Tyres	
Resource Recovery RRC/TS, stand alone	Bemm River	Municipal, C&I and C&D	E-waste, Automotive batteries, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses	
Resource Recovery RRC/TS, stand alone	Bruthen	Municipal, C&I and C&D	E-waste, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses	
Resource Recovery RRC/TS, stand alone	Buchan	Municipal, C&I and C&D	E-waste, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses, Tyres	
Resource Recovery RRC/TS, stand alone	Genoa	Municipal, C&I and C&D	E-waste, Automotive batteries, Metals, Commingled recyclables, Residual waste.	
Resource Recovery RRC/TS, stand alone	Lindenow	Municipal, C&I and C&D	E-waste, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses, drumMuster	
Resource Recovery RRC/TS, stand alone	Metung	Municipal, C&I and C&D	E-waste, Motor oil, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard	
Resource Recovery RRC/TS, stand alone	Omeo	Municipal, C&I and C&D	E-waste, Motor oil, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses, drumMuster	
Resource Recovery RRC/TS, stand alone	Swifts Creek	Municipal, C&I and C&D	E-waste, Motor oil, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard	
Resource Recovery RRC/TS, stand alone	Wairewa	Municipal, C&I and C&D	E-waste, Automotive batteries, Metals, Commingled recyclables, Residual waste, Mattresses	
Resource Recovery RRC/TS, stand alone	Yinnar	Municipal, C&I and C&D	Clean fill, Glass, E-waste, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, Tyres	
Resource Recovery RRC/TS, collocated at landfill	Grantville	Municipal, C&I and C&D	E-waste, Fluoro tubes, Motor oil, Automotive batteries, Metals, Combined organics, Commingled recyclables Mattresses, Paper & cardboard, drumMuster, Tyres, Residual waste	

	Reason for need	Timeframe (likely start date)	Other requirements (e.g. Planning approvals required)
	Existing resource recovery infrastructure		
	Assess facility operations to improve resource recovery efficiency.	2017-2022	Baw Baw Shire Long Term Infrastructure Plan.
	Upgrade facilities to improve resource recovery.	2017	
	Upgrade facilities to improve resource recovery.	2017	
	Upgrade facilities to improve resource recovery.	2018	
	Upgrade facilities to improve resource recovery.	2016	
	Upgrade facilities to improve resource recovery.	2017	
	Upgrade facilities to improve resource recovery.	2018	
	Upgrade facilities to improve resource recovery.	2016	
	Upgrade facilities to improve resource recovery.	2018	
	Upgrade facilities to improve resource recovery.	2016	
	Upgrade facilities to improve resource recovery.	2017	
	Upgrade facilities to improve resource recovery.	2017-2022	

Table 21: Future Resource Recovery Infrastructure Requirements and Options (read over both pages)

Infrastructure type	General location	Waste Sources accepted	Materials accepted	
Existing resource recovery infrastructure				
Resource Recovery RRC/ TS, co-located at landfill	Bairnsdale	Municipal, C&I and C&D	Concrete, brick & tiles, Clean fill, E-waste, Fluoro tubes, Motor oil, Automotive batteries, Dry cell batteries, Paint, Metals, Combined organics, Commingled recyclables, Residual waste, Mattresses, Paper & cardboard, Tyres	
Resource Recovery RRC/ TS, co-located at landfill	Lakes Entrance	Municipal, C&I and C&D	Concrete, brick & tiles, Clean fill, E-waste, Fluoro tubes, Motor oil, Automotive batteries, Dry cell batteries, Paint, Metals, Combined organics, Commingled recyclables, Residual waste, Tyres	
Reprocessor Organics, other	Gippsland Renewable Energy	Municipal, C&I and C&D	Combined organics and Timber	

*Further information on the wastes and material streams accepted at the facility can be found at the appropriate council or company website. It is expected that all infrastructure technologies considered in this Schedule will not be inconsistent with those detailed in the SWRRIP.

	Reason for need	Timeframe (likely start date)	Other requirements (e.g. Planning approvals required)
	Existing resource recovery infrastructure		
	Upgrade facilities to improve resource recovery.	2017	
	Design and construction of best practice transfer station in preparation for closure of the Landfill	2018	
	Move into full production - timber and wood waste pelletisation		

Part B: Landfill Infrastructure Schedule

6.4. Existing Landfills

Landfills are part of Victoria's waste and resource recovery infrastructure system. The Waste Management Policy (Siting, Design and Management of Landfills) requires that the development and use of landfills be minimised, however, it is a role of this Implementation Plan to ensure sufficient landfill airspace to meet the requirements of Gippsland 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 Gippsland 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 these materials currently going to landfills may be recovered in the future.

To achieve this, the GWRRG undertook a process in accordance with the Ministerial Guideline 'Guideline: Making, amending and integrating the Statewide Waste and Resource Recovery Plan and Regional Waste and Resource Recovery Implementation Plans' and the Outline of Process: Statewide Waste and Resource Recovery Infrastructure Scheduling[55] to assess and determine the region's landfill airspace needs. As part of this process, the GWRRG has committed to undertaking regular future reviews of this Plan in accordance with the EP Act and relevant guidelines.

The landfill needs assessment process is detailed in section 4.7 Adequate landfill management. Findings of the landfill needs assessment informs the Infrastructure Schedule (Part B) – Proposed Sequence of Filling of Available Landfill Sites Table 23. 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 will provide clarity to operators, decision makers and the community. The Schedule is subject to review.

Table 22 lists the landfills currently in operation in Gippsland. Closure dates are estimates only based on best available data.

Table 22: Gippsland's Existing Landfills

Landfill name	Address & LGA	GIS Coordinates		Owner Operator	
		Latitude	Longitude		
Licenced Landfills					
Lakes Entrance	Thorpes Lane, Lakes Entrance, East Gippsland SC	-37.859532	148.016224	East Gippsland SC	
Bairnsdale	200 Johnstons Road Forge Creek, East Gippsland SC	-37.87967	147.626012	East Gippsland SC	
Grantville	1685 Bass Highway, Grantville, Bass Coast SC	-38.420809	145.51953	Bass Coast SC Ace Contractors	

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	EPA Licence Number	Waste Types Accepted	*Likely Closure Date Year	Additional Considerations
	Licenced Landfills			
	74237	Putrescible, Solid Inert, Tyres shredded into pieces < 250 mm	2018	Works approval valid for current final cell
	74237	Putrescible, Solid Inert, Tyres shredded into pieces < 250 mm, Asbestos (of domestic origin and all forms), Contaminated Soil (Cat C),	2048	Planning Permit valid for entire site. Works approval valid for Stage 1 (Cells 1-12) Expansion into Stage 2 (post 2048) of site development
	12129	Putrescible, Solid Inert, Tyres shredded into pieces < 250 mm, Asbestos of domestic origin, Ceramic-based fibre similar to Asbestos	2027	Site in PUZ zone (allows for Landfill use). Development encompasses 10 cells. Works approval valid for current operating Cell 7

Table 22: Gippsland's Existing Landfills (read over both pages)

Landfill name	Address & LGA	GIS Coordinates		Owner Operator	
		Latitude	Longitude		
Licenced Landfills					
Koonwarra	Koonwarra-Inverloch Road, Koonwarra, South Gippsland SC	-38.447625	145.833978	South Gippsland SC	
Hyland Highway	Hyland Highway, Calignee South, Latrobe City Council	-38.278483	146.559248	Latrobe City Council	
Maffra	Sellings Road, Maffra, Wellington SC	-37.912559	146.986143	Wellington SC Towards Zero	
Kilmany	Velore Road, Kilmany, Wellington SC	-38.103092	146.920064	Wellington SC Towards Zero	
Gippsland Water PIW	Wellington	-38.209116	147.2931423	Gippsland Water	
Unlicenced Landfills					
Cann River	Old Coast Road, Cann River, East Gippsland SC	-37.569549	149.123579	East Gippsland SC	
Rosedale	Merton Vale Road, Rosedale, Wellington SC	-38.185982	146.813461	Wellington SC Towards Zero	

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 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 licencing 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 Waste Management Policy (Siting, Design and Management of Landfills) 2004 and the EP Act.

	EPA Licence Number	Waste Types Accepted	*Likely closure date Year	Additional Considerations
	Licenced Landfills			
	24873	Putrescible, Solid Inert, Tyres shredded into pieces < 250 mm, Asbestos (of domestic origin and all forms), Contaminated Soil (Cat C)	2052	Planning Permit valid for stages 1 & 2. Works approval valid for stage 1 Commercial asbestos or Cat C soils not accepted. Expansion of current approved site into Stage 2 of development
	25565	Putrescible, Solid Inert, Asbestos of domestic origin, Tyres shredded into pieces < 250 mm	2029	Planning Permit valid for entire site (10 cells) and expires 2033. Works approval valid to cell 7 Synthetic mineral fibre and Commercial asbestos not accepted. Expansion of current approved site into cells 8 to 10 of development
	74211	Putrescible, Solid Inert,	2025	Site in PUZ zone (allows for landfill use).
	74211	Putrescible, Solid Inert, Asbestos (of domestic origin), Tyres shredded into pieces < 250 mm	2044	Site in PUZ zone (allows for landfill use). Expansion of current approved site into Stages 2 to 5 of development
	74253	PIW (Asbestos of all forms and NORM's[a])	2035	Only site accepting commercial asbestos quantities between metropolitan region and this facility Expansion of existing site
	Unlicenced Landfills			
	Unlicensed	Putrescible, Solid Inert	2020	Site in PCR zone (Public Conservation & Reserve)
	Unlicenced	Putrescible, Solid Inert	2025	Site in PUZ zone (allows for landfill use).

- 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 the current EPA licence.
- Approvals status refers to land use planning approvals and EPA works approvals relevant to the site at the time of preparation of this Schedule.

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.

[a] Naturally Occurring Radioactive Material

Table 23 contains the proposed sequence for the filling of available landfill sites for a 30-year period.

While a 30-year timeframe is depicted, the life of this Plan is limited to 10 years. In addition, closure dates are estimates only and may be affected by unforeseen circumstances.

In developing the Schedule, a detailed analysis of the region's landfill capacity was undertaken consisting of the following key tasks:

- Collation of information obtained from the five councils that own/operate landfills in Gippsland relating to tonnes of material currently being sent to landfill.
- Modelling of information:
  - using municipality specific population estimates for the years 2011, 2014 and 2031[56] averaged for each council over the total period;
  - incorporating an assumption that per capita material generation would remain constant; and
  - accounting for changes in material flows resulting from planned facility closure within the 10-year period of the Plan that would see additional waste being directed to remaining landfills.
- The results of this analysis were then provided to the owner/operators and endorsement received.

Subject to limited exceptions, under section 50C(2) of the EP Act, EPA Victoria 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.

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Table 23: Proposed Sequence of the Filling of Available Landfill Sites*

Landfill and EPA licence number		Year														
		17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Lakes Entrance	74237															
Cann River	Unlicensed															
Bairnsdale	74237															
Grantville,	12129															
Koonwarra	24873															
Hyland Highway	25565															
Rosedale	Unlicensed															
Maffra	74211															
Kilmany	74211															
Dutson Downs	74253															

Has all appropriate approvals including EPA works approval and land use planning approval where relevant

Land use planning approved (still requires EPA works approval)

Notes:

- This table should be read in conjunction with the description of the landfill needs assessment outlined in Section 3.1.5.1 Landfill needs assessment and review.
- 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 having 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 ten-year sequencing period.
- Landfills exempt from licensing are sequenced to indicate their potential to accept wastes as per Waste Management Policy (Siting, Design and Management of Landfills) 2004 and the EP Act over the ten-year sequencing period.
- 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 that 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.

	Year																Likely closure date
	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	
																	2018
																	2020
																	2048
																	2027
																	2052
																	2029
																	2027
																	>2047
																	2044
																	2035

- 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 on the above table does not guarantee that the airspace will be scheduled in the future.
- When landfills close, they must go through a decommissioning phase which includes working with 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.

*As referred to in section 50C (2) of the EP Act

6.5. Closed landfills

6.5.1. Rehabilitation of closed landfills in Gippsland

Table 24 provides information relating to identified closed landfills within Gippsland including the organisation responsible for management of each closed facility. Waste and Resource Recovery Groups are not accountable for closed landfill infrastructure. The GWRRG will facilitate work between local councils and the EPA to implement a risk-based approach to the rehabilitation of closed landfills.

Table 24: Rehabilitation Status of Closed Landfills

Landfill Name and Address	Latitude	Longitude	Municipality	Licence Reference	Duty Holder	
Dudley Cnr Bass Hwy and Loch-Wonthaggi Roads	-38.577804	145.573379	Bass Coast SC	Unlicensed	Bass Coast SC	
Grantville Bass Highway (Old Landfill in current premises)	-38.421083	145.522521	Bass Coast SC	ES172	Bass Coast SC	
Inverloch Old Ford Road	-38.63122	145.751292	Bass Coast SC	HS1023	Bass Coast SC	
Lang Lang Scout Drive (off South Gippsland Highway)	-38.337125	145.613168	Bass Coast SC	HS918	Bass Coast SC	
Rhyll Cowes-Rhyll Road	-38.464681	145.274368	Bass Coast SC	ES52	Bass Coast SC	
Wonthaggi 180 Cameron Street	-38.621983	145.58244	Bass Coast SC	No Details	Bass Coast SC	
Darnum Pedder Street	-38.185881	146.009792	Baw Baw SC	LS139	Baw Baw SC	
Drouin Parinda Road	-38.11988	145.829969	Baw Baw SC	No Details	Baw Baw SC	
Erica 12 Mathiesons Road	-37.983633	146.37133	Baw Baw SC	No Details	Baw Baw SC	
Glen Cromie (Rokeby) Main Neerim Road	-38.072656	145.903971	Baw Baw SC	Unlicensed	Baw Baw SC	
Jindivick Quarry Road	-38.040326	145.912068	Baw Baw SC	1/S7	Baw Baw SC	
Lardner Simpson Road	-38.222875	145.863837	Baw Baw SC	ES104	Baw Baw SC	
Mt Baw Baw Mt Baw Baw Tourist Road	-37.846141	146.245715	Baw Baw SC	LS265	Mount Baw Baw Alpine Resort Management Board	
Neerim North Neerim North-Noojee Road	-37.914612	145.990555	Baw Baw SC	LS121	Baw Baw SC	
Rawson	Unknown	Unknown	Baw Baw SC	Unlicensed	Baw Baw SC	
Thorpdale McDonalds Track	Unknown	Unknown	Baw Baw SC	Unlicensed	Baw Baw SC	
Trafalgar Giles Road	-38.228269	146.143527	Baw Baw SC	LS119	Baw Baw SC	
Trafalgar North Bayleys Road	Unknown	Unknown	Baw Baw SC	Unlicensed	Baw Baw SC	
Willow Grove	Unknown	Unknown	Baw Baw SC	3/S7	Baw Baw SC	
Anglers Rest Callaghan-McNamara Road	-36.993161	147.474107	East Gippsland SC	Unlicensed	East Gippsland SC	

	Waste Types Received	Year Closed	Rehabilitation Status	Current Infrastructure on Site
	Unknown	No Details	Yet to commence rehabilitation*	Bushland in Farm Zone (FZ)
	MSW, C&I, C&D, Asbestos	1998	Rehabilitation completed	Transfer Station, Mulched Organics stockpiles
	MSW and C&I	No Details	Rehabilitation completed	Transfer Station
	Uncontrolled	No Details	Rehabilitation commenced (PC PAN in place)#	Bushland
	MSW, C&I, C&D	1998	Rehabilitation completed	Reserve
	MSW, C&I, C&D	1998	Rehabilitation commenced (PC PAN in place)	Transfer Station
	MSW, C&I, C&D	1991	Rehabilitation completed	Grassland Reserve
	MSW, C&I, C&D	mid 1980s	Rehabilitation completed	Concrete Reprocessor
	Uncontrolled	No Details	Yet to commence rehabilitation*	Transfer Station Fire Brigade and Depot
	MSW, C&I, C&D	mid 1980s	Rehabilitation completed	Farmland
	MSW, C&I, C&D	No Details	Rehabilitation completed	Farmland
	MSW, C&I, C&D, Asbestos	2001	Rehabilitation completed	Farmland
	MSW and C&I	1990s	Yet to commence rehabilitation*	Transfer Station
	MSW, C&I, C&D	mid 1980s	Rehabilitation completed	Bushland
	Uncontrolled	No Details	Yet to commence rehabilitation*	Unknown
	Uncontrolled	No Details	Yet to commence rehabilitation*	Unknown
	MSW, C&I, C&D, Asbestos, LLCS, Shredded Tyres	2011	Rehabilitation commenced (PC PAN in place)	Uralla Nature Reserve
	Uncontrolled	No Details	Yet to commence rehabilitation*	Unknown
	Uncontrolled	No Details	Yet to commence rehabilitation*	Unknown
	Uncontrolled	No Details	Rehabilitation commenced (PC PAN in place)#	Drop Off Trailer

Table 24: Rehabilitation Status of Closed Landfills (read over both pages)

Landfill Name and Address	Latitude	Longitude	Municipality	Licence Reference	Duty Holder	
Bairnsdale Bosworth Road	-37.839767	147.618002	East Gippsland SC	LS52327	East Gippsland SC	
Bemm River 2044 Sydenham Parade	-37.751764	148.969301	East Gippsland SC	Unlicensed	East Gippsland SC	
Benambra Lake Omeo Road	-36.965366	147.686901	East Gippsland SC	(17/S7)	East Gippsland SC	
Bendoc Clarkeville Road	-37.165868	148.884051	East Gippsland SC	(18/S8)	East Gippsland SC	
Bennett's Brook (Swan Reach) Next to 2329 Princes Highway	-37.8244	147.888733	East Gippsland SC	Unlicensed	East Gippsland SC	
Bete Belong Buchan-Orbost Road (0.8km past Reeves Road RHS)	-37.680118	148.353045	East Gippsland SC	Unlicensed	East Gippsland SC	
Bonang 16 Maling Road	-37.201261	148.728099	East Gippsland SC	(18/S10)	East Gippsland SC	
Brodribb River Sandy Flat Road	-37.707933	148.563474	East Gippsland SC	Unlicensed	East Gippsland SC	
Bruthen 107 - 117 Great Alpine Road	-37.696286	147.836435	East Gippsland SC	LS243	East Gippsland SC	
Buchan 2337 Bruthen - Buchan Road	-37.544522	148.148001	East Gippsland SC	(16/S10)	East Gippsland SC	
Cabbage Tree On property owned by Mr J Ingram (1986)	Unknown	Unknown	East Gippsland SC	Unlicensed	East Gippsland SC	
Calulu Hodgestate Road	-37.776238	147.511895	East Gippsland SC	(15/S2 and 3429/b)	East Gippsland SC	
Cape Conran Cabbage Tree-Cape Conran Road near Cape Conran Road	-37.798884	148.733015	East Gippsland SC	Unlicensed	East Gippsland SC	
Chandlers Creek	Unknown	Unknown	East Gippsland SC	No Details	East Gippsland SC	
Club Terrace	Unknown	Unknown	East Gippsland SC	No Details	East Gippsland SC	
Club Terrace	Unknown	Unknown	East Gippsland SC	Unlicensed	East Gippsland SC	
Club Terrace School Road	-37.551624	148.935370	East Gippsland SC	(18/S7)	East Gippsland SC	
Combienbar Combienbar Road	-37.438168	148.988117	East Gippsland SC	Unlicensed	East Gippsland SC	
Deddick McKillops Road	-37.073342	148.465597	East Gippsland SC	(18/S11)	East Gippsland SC	
Dellicknora Dellicknora Road	-37.120873	148.660764	East Gippsland SC	Unlicensed	East Gippsland SC	
Eagle Point Cnr Eagle Point Road and Forge Creek Road (Cnr Barkhill and Eagle Point Roads)	-37.899398	147.657471	East Gippsland SC	LS195	East Gippsland SC	
Ensay Doctors Flat Road	-37.367449	147.793477	East Gippsland SC	(17/S4)	East Gippsland SC	
Gelantipy Bald Hills Road	-37.148967	148.241564	East Gippsland SC	Unlicensed	East Gippsland SC	
Genoa Princes Highway	-37.459335	149.59789	East Gippsland SC	Unlicensed	East Gippsland SC	
Glen Wills Omeo Highway	-36.887033	147.461333	East Gippsland SC	Unlicensed	East Gippsland SC	

	Waste Types Received	Year Closed	Rehabilitation Status	Current Infrastructure on Site
	MSW, C&I, C&D, Asbestos, LLCS, Scallop Shells	2003	Rehabilitation commenced (PC PAN in place)	Under rehabilitation
	Uncontrolled	1999	Rehabilitation commenced (PC PAN in place)#	Transfer Station
	MSW, C&I, C&D, Asbestos	2014	Rehabilitation completed	Drop Off Skip
	MSW, C&I, C&D, Asbestos	2014	Rehabilitation completed	Drop Off Skip
	Uncontrolled	No Details	Rehabilitation completed	Bushland
	Uncontrolled	2003	Rehabilitation commenced (PC PAN in place)#	Bushland
	MSW, C&I, C&D, Asbestos	2015	Rehabilitation completed	Transfer Station
	Uncontrolled	1990	Rehabilitation completed	Drop Off Trailer
	Uncontrolled	Early 1990s	Rehabilitation completed	Transfer Station
	Uncontrolled	2004 approx.	Rehabilitation completed	Transfer Station
	Uncontrolled	1992	Yet to commence rehabilitation*	Unknown
	Uncontrolled	1996/97	Rehabilitation completed	Bushland
	Uncontrolled	No Details	Rehabilitation completed	Bushland
	Uncontrolled	No Details	Yet to commence rehabilitation*	Unknown
	Uncontrolled	No Details	Yet to commence rehabilitation*	Unknown
	Uncontrolled	No Details	Yet to commence rehabilitation*	Unknown
	Uncontrolled	1997 approx.	Rehabilitation completed	Drop Off Trailer
	Uncontrolled	Early 1990s	Rehabilitation completed	Bushland
	Uncontrolled	1999	Rehabilitation completed	Drop Off Trailer
	MSW, C&I, C&D	2003	Rehabilitation completed	Drop Off Trailer
	MSW, C&I, C&D, Fish waste	2001	Rehabilitation completed	Farm Land
	Uncontrolled	2004	Rehabilitation completed	Drop Off Trailer
	Uncontrolled	2014	Rehabilitation completed	Bushland
	Uncontrolled	Circa 1998	Rehabilitation completed	Transfer Station
	Uncontrolled	No Details	Rehabilitation completed	Drop Off Trailer

Table 24: Rehabilitation Status of Closed Landfills (read over both pages)

Landfill Name and Address	Latitude	Longitude	Municipality	Licence Reference	Duty Holder	
Goongerah Bonang Highway	-37.357928	148.684166	East Gippsland SC	Unlicensed	East Gippsland SC	
Gypsy Point	Unknown	Unknown	East Gippsland SC	Unlicensed	East Gippsland SC	
Lindenow South 90 Snobbs Lane	-37.815085	147.424724	East Gippsland SC	Unlicensed	East Gippsland SC	
Mallacoota Betka Road	-37.574493	149.747235	East Gippsland SC	LS55	East Gippsland SC	
Marlo Tip Road	-37.790137	148.561590	East Gippsland SC	Unlicensed	East Gippsland SC	
Marlo Marlo - Conran Road and Snowy River Estuary	-37.788511	148.592561	East Gippsland SC	Unlicensed	East Gippsland SC	
Marlo Marlo-Conran Road	-37.796281	148.564679	East Gippsland SC	Unlicensed	East Gippsland SC	
Metung 130 Rosherville Road	-37.852133	147.861536	East Gippsland SC	LS116	East Gippsland SC	
Newmerella Corringle Road	-37.75546	148.425718	East Gippsland SC	Unlicensed	East Gippsland SC	
Noorinbee Monaro Highway (opposite 503 Monaro Highway	-37.528107	149.173717	East Gippsland SC	Unlicensed	East Gippsland SC	
Nowa Nowa Long Hill Road	-37.742994	148.069235	East Gippsland SC	(93/3429B)	East Gippsland SC	
Omeo 18 Margetts Street	-37.100543	147.603573	East Gippsland SC	HS732	East Gippsland SC	
Orbost Bonang Highway	-37.672349	148.473359	East Gippsland SC	LS56, (18/S1)	East Gippsland SC	
Paynesville 60 Slip Rd	-37.911868	147.726929	East Gippsland SC	No Details	East Gippsland SC	
Raymond Island Eleventh parade (opposite 76)	-37.920549	147.738385	East Gippsland SC	(15/S2, 3429B)	East Gippsland SC	
Seldom Seen	Unknown	Unknown	East Gippsland SC	Unlicensed	East Gippsland SC	
Suggan Buggan	Unknown	Unknown	East Gippsland SC	Unlicensed	East Gippsland SC	
Suggan Buggan Suggan Buggan Road	-36.971146	148.322333	East Gippsland SC	Unlicensed	East Gippsland SC	
Suggan Buggan Snowy River Road	-36.934824	148.3526	East Gippsland SC	Unlicensed	East Gippsland SC	
Swifts Creek 237 Cassilis Road	-37.269118	147.696939	East Gippsland SC	HS 732 (17/S3, 17/S6)	East Gippsland SC	
Tamboon Tamboon Road	-37.740747	149.149809	East Gippsland SC	Unlicensed	East Gippsland SC	
Tubbut McKillops Road	-37.073956	148.596658	East Gippsland SC	Unlicensed	East Gippsland SC	
Wairewa Carl Smith Road	-37.690504	148.172573	East Gippsland SC	Unlicensed	East Gippsland SC	
Woodglen Cnr Rathjens and Lindenow Glenandale Roads	-37.76721	147.384333	East Gippsland SC	Unlicensed	East Gippsland SC	
Wulgulmerang Off Bakers Rd in Goodwins Hills area	-37.048356	148.272595	East Gippsland SC	Unlicensed	East Gippsland SC	

	Waste Types Received	Year Closed	Rehabilitation Status	Current Infrastructure on Site
	Uncontrolled	No Details	Rehabilitation completed	Drop Off Trailer
	Uncontrolled	No Details	Yet to commence rehabilitation*	Unknown
	Uncontrolled	Circa 1995	Rehabilitation completed	Transfer Station
	MSW, C&I, C&D, Fish waste	2014	Rehabilitation completed	Transfer Station
	Uncontrolled	Circa 2002	Rehabilitation completed	Transfer Station
	Uncontrolled	1998	Rehabilitation completed	Bushland
	Uncontrolled	No Details	Yet to commence rehabilitation*	Marlo Racecourse
	MSW, C&I, C&D, Asbestos, LLCS, Scallop Shells, Interceptor waste	2003	Rehabilitation completed	Transfer Station
	Uncontrolled	1994	Rehabilitation completed	Transfer Station
	Uncontrolled	1977	Rehabilitation completed	Bushland
	Uncontrolled	2001	Rehabilitation completed	Bushland
	Uncontrolled	2004	Rehabilitation completed	Transfer Station
	MSW, C&I, C&D, Asbestos, LLCS	2015	Rehabilitation commenced (PC PAN in place)#	Transfer Station
	Uncontrolled	No Details	Rehabilitation completed	Grassland
	Uncontrolled	1997	Rehabilitation completed	Bushland
	Uncontrolled	No Details	Yet to commence rehabilitation*	Unknown
	Uncontrolled	No Details	Yet to commence rehabilitation*	Unknown
	Uncontrolled	No Details	Rehabilitation completed	Bushland
	Uncontrolled	No Details	Rehabilitation completed	Bushland
	Uncontrolled	2006	Rehabilitation completed	Transfer Station
	Uncontrolled	Circa 1980	Rehabilitation completed	Bushland
	Uncontrolled	2007	Rehabilitation completed	Drop Off Trailer
	MSW and C&I	2009	Rehabilitation completed	Transfer Station
	Uncontrolled	1989	Rehabilitation completed	Farm Land
	MSW and C&I	2012	Yet to commence rehabilitation*	Bushland

Table 24: Rehabilitation Status of Closed Landfills (read over both pages)

Landfill Name and Address	Latitude	Longitude	Municipality	Licence Reference	Duty Holder	
Boolarra Foster Road	-38.387	146.273507	Latrobe CC	LS222	Latrobe CC	
Glengarry Riggalls Road (between Bickertons Road and Glengarry North Roads	Unknown	Unknown	Latrobe CC	Unlicensed	Latrobe CC	
Maryvale 405 Latrobe Road Adjacent to Yallourn Open Cut	-38.20223	146.40136	Latrobe CC	LS49	Latrobe CC	
Moe (Hearns Oak) Haunted Hills Road	-38.201069	146.309738	Latrobe CC	LX36	Latrobe CC	
Morwell Morwell-Maryvale Road	-38.200502	146.426141	Latrobe CC	LS185	Latrobe CC	
Toongabbie Glengarry North Road	-38.063402	146.588413	Latrobe CC	Unlicensed	Latrobe CC	
Traralgon Liddiard Road	-38.222746	146.554063	Latrobe CC	LS9	Latrobe CC	
Yallourn North Yallourn Works Area	Unknown	Unknown	Latrobe CC	LS62/ LS000018/1 LX36	Formerly SEC	
Yallourn North Mill Road	-38.153126	146.34958	Latrobe CC	LS118	Latrobe CC	
Yallourn North Moe-Glengarry Road (Latrobe River Road)	-38.164643	146.361017	Latrobe CC	No Details	Yet to be Identified	
Yinnar Whitelaws Track	-38.377715	146.343027	Latrobe CC	LS50	Latrobe CC	
Foster South Gippsland Highway	-38.6521	146.219392	South Gippsland SC	HS1028	South Gippsland SC	
Koonwarra (Ash Pit) Koonwarra- Inverloch Road	-38.56238	145.919818	South Gippsland SC	LS237	South Gippsland SC	
Koonwarra (Old site) Roughheads Road	-38.557361	145.922256	South Gippsland SC	ES388	South Gippsland SC	
Korumburra Silkstone Road	-38.447625	145.833978	South Gippsland SC	EM39311	South Gippsland SC	
Mirboo North Railway Road	-38.402207	146.171474	South Gippsland SC	LS132	South Gippsland SC	
Sandy Point Waratah Road	-38.82626	146.134145	South Gippsland SC	24/S2	South Gippsland SC	
Venus Bay Corner Canterbury Road & No 3 Beach Road	-38.696967	145.808548	South Gippsland SC	Unlicensed	South Gippsland SC	
Walkerville Fish Creek Road -Walkerville Road	-38.818034	146.001743	South Gippsland SC	23/S1	South Gippsland SC	
Welshpool Telegraph Road	-38.682166	146.4626	South Gippsland SC	HS1029	South Gippsland SC	
Alberton West Cnr Gelliondale and Forest Lodge Roads	-38.593522	146.577569	Wellington SC	Unlicensed	Wellington SC	
Boisdale Boisdale Reserve	-37.886809	146.9886502	Wellington SC	LS159	Wellington SC	

	Waste Types Received	Year Closed	Rehabilitation Status	Current Infrastructure on Site
	Uncontrolled	1970	Rehabilitation commenced (PC PAN in place)#	Bushland
	Unknown	No Details	Yet to commence rehabilitation*	Farmland
	Uncontrolled	Pre 1982	Rehabilitation completed	Grassland
	MSW, C&I, C&D, Asbestos, LLCS	2006	Rehabilitation commenced (PC PAN in place)	Transfer Station
	MSW, C&I, C&D, Asbestos, LLCS	2008	Rehabilitation commenced (PC PAN in place)	Council Reserve Grassland
	Unknown	No Details	Rehabilitation completed	Bushland
	MSW, C&I, C&D, Asbestos, LLCS	1997	Rehabilitation completed	Transfer Station
	Unknown	No Details	Yet to commence rehabilitation*	Unknown
	MSW, C&I, C&D, Asbestos, LLCS	1998	Rehabilitation completed	Bushland
	Unknown	No Details	Yet to commence rehabilitation*	Bushland
	Uncontrolled	1991	Rehabilitation commenced (PC PAN in place)#	Transfer Station
	MSW, C&I, C&D, Scallop processing residue, Asbestos, LLCS, Shredded Tyres, Inert Industrial from ESSO.	2002	Rehabilitation completed	Transfer Station
	Fly Ash, Boiler Ash	2004	Rehabilitation completed	Reserve
	MSW, C&I, C&D, Asbestos, Shredded Tyres	2007	Rehabilitation completed	Grassland Reserve
	Uncontrolled	1980s	Rehabilitation commenced (PC PAN in place)#	Transfer Station
	Uncontrolled	No Details	Rehabilitation commenced (PC PAN in place)#	Transfer Station
	Uncontrolled	No Details	Rehabilitation completed	Grassland
	Uncontrolled	No Details	Rehabilitation completed	Transfer Station
	Uncontrolled	No Details	Rehabilitation completed	Transfer station
	Uncontrolled	No Details	Yet to commence rehabilitation*	Bushland
	Uncontrolled	1999	Rehabilitation completed	Bushland
	Uncontrolled	1994	Yet to commence rehabilitation*	Farm Land

Table 24: Rehabilitation Status of Closed Landfills (read over both pages)

Landfill Name and Address	Latitude	Longitude	Municipality	Licence Reference	Duty Holder	
Boisdale Boisdale Newry(Maffra) Road and Lochs Road	-37.882059	146.958391	Wellington SC	Unlicensed	Wellington SC	
Briagolong Maffra Briagolong Road	Unknown	Unknown	Wellington SC	No Details	Wellington SC	
Cowwarr McEwan Road	-38.026662	146.692157	Wellington SC	9/S3	Wellington SC	
Dargo Kings Road	-37.456218	147.241525	Wellington SC	LS197	Wellington SC	
Dargo 8256 Dargo Road	-37.471898	147.240187	Wellington SC	No Details	Wellington SC	
Gormandale Hyland Highway north of Gormandale	-38.300639	146.705835	Wellington SC	Unlicensed	Wellington SC	
Heyfield (cnr Rifle Range Road and Heyfield Seaton Road)	-37.96278	146.741005	Wellington SC	LS67	Wellington SC	
Licola Tamboritha Road (adjacent to the National Park)	-37.60507	146.640232	Wellington SC	Unlicensed	Wellington SC	
Loch Sport Progress Road	-38.064742	147.552742	Wellington SC	LS245	Wellington SC	
Longford Garrett's Road	-38.228286	147.168126	Wellington SC	LS95/ LS000008/4	Formerly ESSO Aust P/L	
Longford 12 Punt Lane Longford	-38.162686	147.098474	Wellington SC	EI503	Private Land Owner	
Longford 407 Longford – Loch Sport Road	-38.186252	147.272973	Wellington SC	No Details	Private Land Owner	
Longford 746 Longford-Loch Sport Road	-38.180115	147.163445	Wellington SC	LS183	Wellington SC	
Longford (Dutson Downs) 1954 Longford – Loch Sport Road	-38.163074	147.102234	Wellington SC	ES344/ ES000004/2 ES344/7	Gippsland Water. Formerly Latrobe Valley Water & Sewerage Board	
Maffra Maffra Stratford Road	Unknown	Unknown	Wellington SC	No Details	Wellington SC	
Mann's Beach Mann's Beach Road	-38.640679	146.752219	Wellington SC	LS260	Wellington SC	
Port Albert Yarram-Port Albert Road	-38.650267	146.668673	Wellington SC	20/S3	Wellington SC	
Rosedale Merton Vale Road	-38.185982	146.813461	Wellington SC	LS51463	Wellington SC	
Rosedale Mill Lane	Unknown	Unknown	Wellington SC	Unlicensed	Yet to be Identified	
Rosedale 164 Willung Road	-38.169358	146.785714	Wellington SC	No Details	Wellington SC	
Sale Stephensons Park, Lacey Street	-38.118921	147.077104	Wellington SC	No Details	Wellington SC	
Sale Short Street	-38.09646	147.061451	Wellington SC	No Details	Wellington SC	
Sale Pearson and Reeve Streets (88)	-38.104688	147.061207	Wellington SC	No Details	Wellington SC	
Seaspray Tip Road	-38.365518	147.191445	Wellington SC	Unlicensed	Wellington SC	

	Waste Types Received	Year Closed	Rehabilitation Status	Current Infrastructure on Site
	Uncontrolled	No Details	Yet to commence rehabilitation*	Bushland
	Uncontrolled	No Details	Yet to commence rehabilitation*	Unknown
	Uncontrolled	2002	Rehabilitation completed	Council Reserve
	Uncontrolled	1999	Rehabilitation completed	Transfer Station
	Uncontrolled	No Details	Yet to commence rehabilitation*	Bushland in Farm Zone (FZ)
	Uncontrolled	No Details	Yet to commence rehabilitation*	Bushland
	Uncontrolled	2000	Rehabilitation completed	Transfer Station
	Uncontrolled	2000	Rehabilitation completed	Bushland
	Uncontrolled	2003	Rehabilitation completed	Transfer Station
	Unknown	No Details	Yet to commence rehabilitation*	Unknown
	Unknown	No Details	Yet to commence rehabilitation*	Quarry
	Unknown	No Details	Yet to commence rehabilitation*	Quarry
	MSW, C&I, C&D, LLCS	No Details	Rehabilitation commenced (PC PAN in place)	Bushland
	PIW	No Details	Yet to commence rehabilitation*	Soil Organics Recycling Facility (SORF)
	Unknown	No Details	Yet to commence rehabilitation*	Road Reserve
	Uncontrolled	1999	Rehabilitation completed	Bushland
	Uncontrolled	1999	Rehabilitation completed	Bushland
	Uncontrolled	No Details	Yet to commence rehabilitation*	Bushland
	Unknown	No Details	Yet to commence rehabilitation*	Unknown
	Uncontrolled	No Details	Yet to commence rehabilitation*	Crown Land
	Unknown	No Details	Yet to commence rehabilitation*	Parkland
	Unknown	No Details	Yet to commence rehabilitation*	Parkland
	Unknown	No Details	Yet to commence rehabilitation*	Parkland
	Uncontrolled	Early 1990s	Rehabilitation completed	Transfer Station

Table 24: Rehabilitation Status of Closed Landfills (read over both pages)

Landfill Name and Address	Latitude	Longitude	Municipality	Licence Reference	Duty Holder	
Stratford Wyndham Street	-37.959918	147.090904	Wellington SC	LS79	Wellington SC	
Tinamba Tinamba-Glenmaggie Road	-37.938592	146.821774	Wellington SC	Unlicensed	Wellington SC	
Woodside	Unknown	Unknown	Wellington SC	Unlicensed	Wellington SC	
Yarram Hyland Highway (Yarram Traralgon Road)	-38.54132	146.702445	Wellington SC	HS619	Wellington SC	

General Table Definitions:

- Unknown – Details have yet to be identified from site inspections, audits or investigations.
- No Details – Available records do not provide this information.
- Uncontrolled – No supervision of the site.

Rehabilitation Definitions:

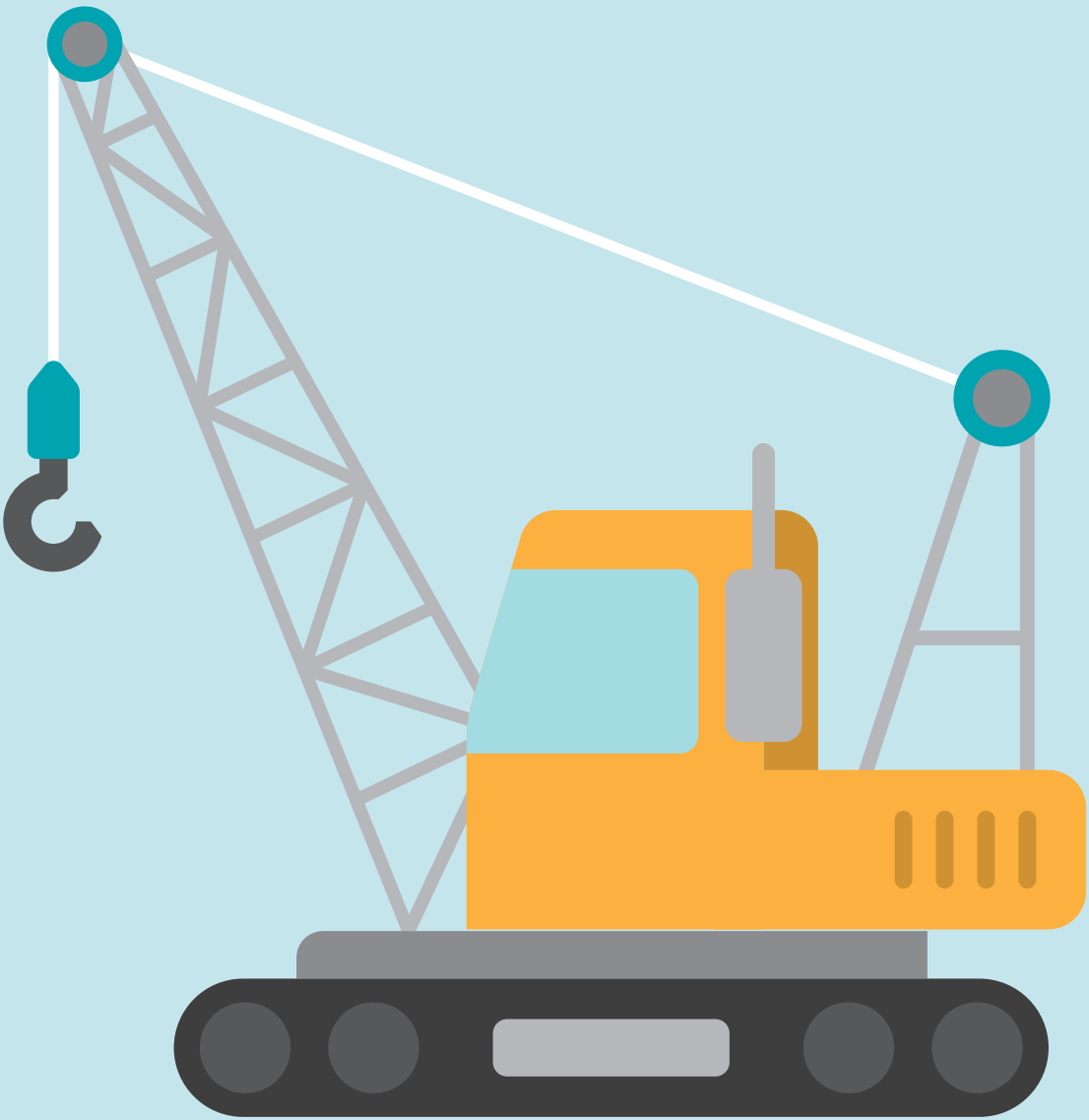
- Yet to commence rehabilitation – Rehabilitation has not commenced.
- Yet to commence rehabilitation* – Rehabilitation status has not been verified by the duty holder or EPA.
- Rehabilitation commenced (PC PAN in place) – All rehabilitation requirements have not been actioned as per EPA PC PAN.
- Rehabilitation commenced (PC PAN in place)# – All rehabilitation requirements have not been actioned. PC PAN status unknown
- Rehabilitation completed – Rehabilitation has been completed to the standards of the day or as per EPA PC PAN.

* Where the rehabilitation status is listed as 'Incomplete or Unverified' the GWRRG proposes to undertake further work with the EPA and the Duty holder to determine this aspect.

	Waste Types Received	Year Closed	Rehabilitation Status	Current Infrastructure on Site
	MSW, C&I, C&D	2005	Rehabilitation completed	Transfer Station
	Uncontrolled	1994	Rehabilitation completed	Bushland
	Uncontrolled	1999	Rehabilitation completed	Unknown
	MSW, C&I, C&D, Asbestos	2006	Rehabilitation completed	Transfer Station

Appendix 1:

Tables



Appendix 1 - Tables

Main Sources of Data

Table 25: Main Sources of Data

Data Source	Description
Victorian Local Government Annual Survey (VLGAS)	Annual data on materials collected through local government kerbside collection systems and published by Sustainability Victoria. All local governments 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, available at www.sustainability.vic.gov.au.
Victorian Recycling Industries Annual Survey (VRIAS)	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.
Australian Bureau of Statistics (ABS) population data	ABS Catalogue Number 3101.0 - Australian Demographic Statistics, Sept 2014.
Victorian landfill audits	Sustainability Victoria'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.
Regional Waste and Resource Recovery Database	Sustainability Victoria's purpose-built database for data storage, analysis and projection to assist development of Regional Implementation Plans and alignment with the State Infrastructure Plan. This information is built on the data provided from state surveys and updated by Groups – i.e. it is not a separate source of data although does provide for a basic level of analysis for projections.
Survey of Reprocessors in Gippsland by Sustainable Resource Use (SRU)	A survey undertaken by Sustainability Victoria in 2015 on behalf of all Regional Waste and Resource Recovery Groups to obtain accurate data on the activities of reprocessors and material recovery facilities across regional Victoria.

Data Source	Description
VicWaste Data Collection Software	In 2013, the former Gippsland Regional Waste Management Group led a project on behalf of the Association of Regional Waste Management Groups to develop a guideline for Collection and Reporting of Waste Data. To support the guide, the GRWMG developed a database for facility managers to use to capture and report their data in accordance with the guideline.
Gippsland kerbside bin audits	Successive audits of kerbside bins (garbage, garden organics and recyclables) carried out by the former Gippsland Regional Waste Management Group in 2008, 2009 and 2010.
Whole-of-life assessments for Gippsland landfill and transfer stations	Work undertaken by the former Gippsland Regional Waste Management Group to model the full lifecycle costings of licensed landfills operating in Gippsland.
Risk assessments for operational landfills and closed landfills	Undertaken as a regional project, the former Gippsland Regional Waste Management Group (GRWMG) worked with all Gippsland councils to facilitate risk assessments and development of subsequent monitoring plans across each of the licensed landfills in Gippsland. The GRWMG then worked with three of the six Gippsland councils to conduct risk assessments of closed or soon to be closed landfills (including unlicensed sites).

Services that Gippsland provides to other regions

Table 26: Services that Gippsland Provides to Other Regions

Infrastructure Type	Facility	Location	
Reprocessing Organics	Gippsland Water Soil and Organic Recycling Facility	1954 Longford-Loch Sport Road, Dutson Downs	
Reprocessing Paper/Cardboard	Nippon Paper (Australian Paper)	Morwell-Maryvale Rd, Maryvale	

Risks and Contingencies

Table 27: Risks and Contingencies

Event (Risk)	Impact to Receiving Gippsland Facility Operation	Impact to Other Infrastructure Within Region	
Failure / unforeseen closure of metro landfill, causing redirection of significant volumes of waste into Gippsland.	**Impact(s):** Council – interruption to forecast airspace by accepting additional source of waste(s) from outside region.	**Impact(s):** Possible need to divert metro waste streams to (multiple) Gippsland infrastructure facilities.	
	Action(s): GWRRG to undertake regular review of available airspace with stakeholders and revise Infrastructure Schedule where required. GWRRG to undertake regular contact with Victorian WRRGs to clarify available airspace within the state. GWRRG to support regional council stakeholders (if required) with redirection of metro waste flows to approved facilities.	**Action(s):** GWRRGs to coordinate with respective regional facility operators to ascertain potential impact to projected airspace. Council stakeholders to assess capacity to accept additional waste streams.	

	Material Streams Processed	Status	Regions Using
	Organics Food, Garden organics Wood/Timber Other	State Important Hub	Metro
	Paper/Cardboard, Woodchip	State Important Hub	Metro

	Impact to Regional Infrastructure Schedule Planning Timeframes (Impact to the GWRRG)	Impact to State
	Impact(s): GWRRG's forecast of projected waste volumes becomes outdated as soon as metro waste streams are diverted to Gippsland.	**Impact(s):** Gippsland's facilities are unable to accommodate metro volumes and (due to lack of available airspace), therefore refuse accept of waste / redirect metro waste(s) to alternative region.
	Action(s): GWRRG to prepare revised Infrastructure Schedule and apply to EPA/Minister for amendment. GWRRG to review entire available airspace within region to ensure ongoing services can be maintained with potential unforeseen need to accept metro waste. GWRRG to determine impact to forecast available airspace for region.	**Action(s):** GWRRG to undertake regular contact with other WRRGs in relation to available airspace. GWRRG to communicate with DELWP and EPA and review/advise Minister of potential multiple WRRG Infrastructure Schedule amendment(s). GWRRG to communicate with Sustainability Victoria to ensure SWRRIP infrastructure information is amended where appropriate.

Table 27: Risks and Contingencies (cont.)

Event (Risk)	Impact to Receiving Gippsland Facility Operation	Impact to Other Infrastructure Within Region	
Significant natural disaster (i.e. state of emergency – fire / flood / biohazard), increased frequency and severity due to climate change	**Impact(s):** Council's routine business interrupted due to isolation of contaminated / biohazardous waste. Council may need to create emergency cell or re-direct facility users to alternative disposal facility and utilise existing open landfill cells. Council and EPA liaison required.	**Impact(s):** Disruption/divergence of municipal and/or commercial waste flows away from site receiving contaminated wastes. Apply to EPA for emergency disposal approval of 'emergency disaster generated waste'.	
	Action(s): Council to be prepared to fast track planning, design, construction actions for new / alternative landfill cell in an emergency. Council to apply to EPA for emergency disposal approval of 'emergency disaster generated waste'. Identify potential other facilities in and outside of the region where waste can be re-directed.	**Action(s):** Council to assess capacity to accept additional waste streams. GWRRG to support emergency services during event as requested.	
Gippsland infrastructure failure / closure due to emergency event, OHS incident, service contractor going into administration	**Impact(s):** Council's routine infrastructure business interrupted, as well as planning cycle (design, construction, rehabilitation actions for new / alternative landfill cell).	**Impact(s):** Council redirection of existing waste streams to alternative facility within municipality if possible.	

	Impact to Regional Infrastructure Schedule Planning Timeframes (Impact to the GWRRG)	Impact to State
	Impact(s): GWRRG to prepare revised Infrastructure Schedule and apply to EPA/Minister for amendment. GWRRG to review entire available airspace within region to ensure ongoing services can be maintained with potential unforeseen need to accommodate 'emergency disaster generated waste' within Gippsland. GWRRG to determine impact to forecast available airspace for region. GWRRG to work with the portfolio, local government, government and industry to identify and manage climate change-related risks.	**Impact(s):** Require 'specialised disposal options' due to impact to receival facility unable to receive emergency event wastes: • Insufficient space to create quarantined disposal option; • Disruption to regular local services; • Inappropriate infrastructure to isolate/ quarantine emergency event wastes such as asbestos, quarantined flora/fauna; and • GWRRG to work with the portfolio, local government, government and industry to identify and manage climate change-related risks.
	Action(s): GWRRG to strategically assist with Municipal Emergency Management Plans and later review Infrastructure Schedule if airspace at receiving facility is impacted or alternative receiving facility airspace is compromised. GWRRG to support local stakeholders with high level risk and contingency planning processes post emergency incident.	**Action(s):** GWRRG to participate within cross border WRRG / portfolio emergency planning processes. GWRRG to align to processes to existing DISPLAN emergency review / planning / participation / processes to ensure municipalities are adequately supported during potential emergency event. GWRRG to participate with other portfolio agencies in risk and contingency planning at state level.
	Impact(s): GWRRG Infrastructure Schedule review and amend if EPA enforcement causes early closure of singular facility. GWRRG reassess Infrastructure Schedule to ensure airspace at alternative site.	**Impact(s):** Statewide impact if facility is of state significance.

Table 27: Risks and Contingencies (cont.)

Event (Risk)	Impact to Receiving Gippsland Facility Operation	Impact to Other Infrastructure Within Region	
Gippsland infrastructure failure / closure due to emergency event, OHS incident, service contractor going into administration (cont.)	**Action(s):** Council to respond to facility failure. Council to communicate with EPA of facility failure and potential enforcement action via statutory processes. GWRRG to undertake regular review of available airspace with stakeholders and revise Infrastructure Schedule where required. GWRRG to work with the affected Gippsland councils and other stakeholders to seek options for diverting waste to approved metropolitan landfills and undertake business contingency planning.	**Action(s):** GWRRG to network with other WRRGs to ascertain potential impact to projected redirected airspace. Council to assess capacity to accept additional waste streams if required. GWRRG to participate in regular updates with Victorian WRRGs to clarify available airspace within the state.	
Inability to complete statutory approval processes to meet need caused by emergency or infrastructure failure	**Impact(s):** Council unable to conduct routine business with facility incident. Council to resolve facility incident issue(s). Facility users redirect waste to alternative disposal facility within municipal boundary. Active council landfill cell fills without prescribed rehabilitation / new cell design ready (and EPA approved) which interrupts landfill operational cycle. Encroachment from newly developed residential sub divisions.	**Impact(s):** Alternative municipalities unable accept waste redirected from 'incident' facility site.	
	Action(s): Council to be prepared to fast track planning, design, construction actions for new / alternative landfill cell in an emergency. Council to apply to EPA for assessment of landfill stage (design, operation, rehabilitation) in timely manner via statutory processes.	**Action(s):** GWRRGs communicate with respective local facility operators to ascertain potential impact to projected airspace. Council to assess capacity to accept additional waste streams.	

	Impact to Regional Infrastructure Schedule Planning Timeframes (Impact to the GWRRG)	Impact to State
	Action(s): GWRRG to review entire available airspace within region to ensure ongoing services can be maintained. GWRRG to review and amend Infrastructure Schedule through regular liaison with councils with respect to available airspace. EPA / GWRRG to undertake statutory assessment process for Infrastructure Schedule revision.	**Action(s):** GWRRG to communicate with MWRRG to ensure contingency measures are in place for failure to accept metro waste in Gippsland. GWRRG to undertake regular communication between WRRGs in relation to available airspace. GWRRG to communicate with Sustainability Victoria to ensure Statewide Infrastructure Plan infrastructure information is amended.
	Impact(s): Refer above to Infrastructure Failure.	**Impact(s):** Statutory processes impact statewide waste flows.
	Action(s): GWRRG to conduct Infrastructure Schedule review and amendment in case of a closure of a singular facility. GWRRG to reassess Infrastructure Schedule to ensure airspace at alternative site.	**Action(s):** GWRRG to undertake ongoing liaison between councils and portfolio agencies to improve BPEM landfill planning processes. GWRRG to participate with portfolio agencies in risk and contingency planning at state level.

Table 27: Risks and Contingencies (cont.)

Event (Risk)	Impact to Receiving Gippsland Facility Operation	Impact to Other Infrastructure Within Region	
Contractor failure – e.g. onsite operations, kerbside collection	**Impact(s):** Operations onsite at facility cease / significantly altered. Service delivery compromised for site. Council contract extends across municipality, and service delivery compromised, requiring immediate council response (planning and budget).	**Impact(s):** Council may need to temporarily divert waste to alternative facility within region and review contract obligations.	
	Action(s): GWRRG to support councils where required including contractor selection panels.	**Action(s):** GWRRG to network with councils and waste industry stakeholders to assess capacity to accept additional waste streams at other local waste and resource recovery facilities.	
Underestimation of projected waste volumes	**Impact(s):** Active landfill cells fill ahead of planning schedule / budget. Council potentially forced to temporarily closed site or seek EPA emergency discharge approval application. EPA to be advised of facility capacity reached and potential enforcement action via statutory processes.	**Impact(s):** Potential to divert waste to alternative site and impact projected cell lifespan.	
	Action(s): GWRRG to regularly collect accurate data from stakeholders within region to ascertain accurate airspace projections. GWRRG to conduct rigorous data analysis to ensure accurate airspace calculations support infrastructure scheduling.	**Action(s):** GWRRG to prompt other local council-based facilities to assess capacity to accept additional waste streams.	

	Impact to Regional Infrastructure Schedule Planning Timeframes (Impact to the GWRRG)	Impact to State
	Impact(s): Possible impact on Infrastructure Schedule if contractor provides multiple services at various sites across region, multiple sites could be impacted with respect to routine daily management practices.	**Impact(s):** Possible if contractor provides services across region.
	Action(s): GWRRG to communicate with all local government stakeholders via GWRRG Technical Reference Group.	**Action(s):** GWRRGs to network with other WRRGs to ensure contract(s) are not impacted across regional borders and develop contingency plans as required.
	Impact(s): Possible early review of Landfill Schedule to ensure alternative nominated sites have suitable airspace to accept diverted waste.	**Impact(s):** Infrastructure Schedule requires review and amendment ahead of schedule to allow alternative site(s) to accept waste therefore impacting Statewide Plan.
	Action(s): GWRRG to regularly collect accurate data from stakeholders within region to align projected forecast with actual data.	**Action(s):** GWRRG to attend regular portfolio meetings to discuss / plan for available airspace and future planning needs.

Table 27: Risks and Contingencies (cont.)

Event (Risk)	Impact to Receiving Gippsland Facility Operation	Impact to Other Infrastructure Within Region	
Failure of waste and resource recovery system/s	**Impact(s):** Municipalities experience financial impost/ onsite stockpiling until solution identified throughout entire waste network in region. Impact on resilience of waste stream's network. Impact on municipal reputation amongst local communities.	**Impact(s):** Potentially all sites stockpiling individual or multiple waste streams. Resilience to entire waste network within region compromised. Potential for stockpiling of waste stream at facilities, generating environmental hazard. Potential impact to commercial / industrial operators unable to dispose of waste streams.	
	Action(s): GWRRG to work with councils to identify and assess possible solutions.	**Action(s):** GWRRG to deliberate with portfolio agencies to quantify local issues with a view to identifying statewide solutions. GWRRG to provide support to councils and problem solve with portfolio agencies.	
Legacy landfill impacts on environmental and public health.	**Impact(s):** Councils challenged by present day BPEM compliance requirements for multiple facilities. Facility operators of legacy landfills face financial impacts for sites potentially causing environmental harm. Councils incurring present day costs to undertake monitoring and risk assessment processes.	**Impact(s):** Any WRRG with legacy landfills face similar costs and environmental challenges.	

	Impact to Regional Infrastructure Schedule Planning Timeframes (Impact to the GWRRG)	Impact to State
	Impact(s): Waste type disposal option removed, potential stockpiling or landfill only solution.	**Impact(s):** Impact on waste management networks across the state, impacting resilience of systems, reputation and commercial confidence in state government initiatives.
	Action(s): GWRRG to communicate with WRRGs and portfolio to align proposed solutions.	**Action(s):** GWRRG to communicate with other portfolio agencies to identify strategies to support councils in line with Victorian Market Development Strategy.
	Impact(s): Impact to GWRRG reputation (and council relationships) providing information to EPA in relation to legacy sites. GWRRG need to include legacy sites rehabilitation status within Infrastructure Schedule.	**Impact(s):** GWRRG to communicate with EPA and seek agreement of 'contingency management arrangements' via statutory processes.

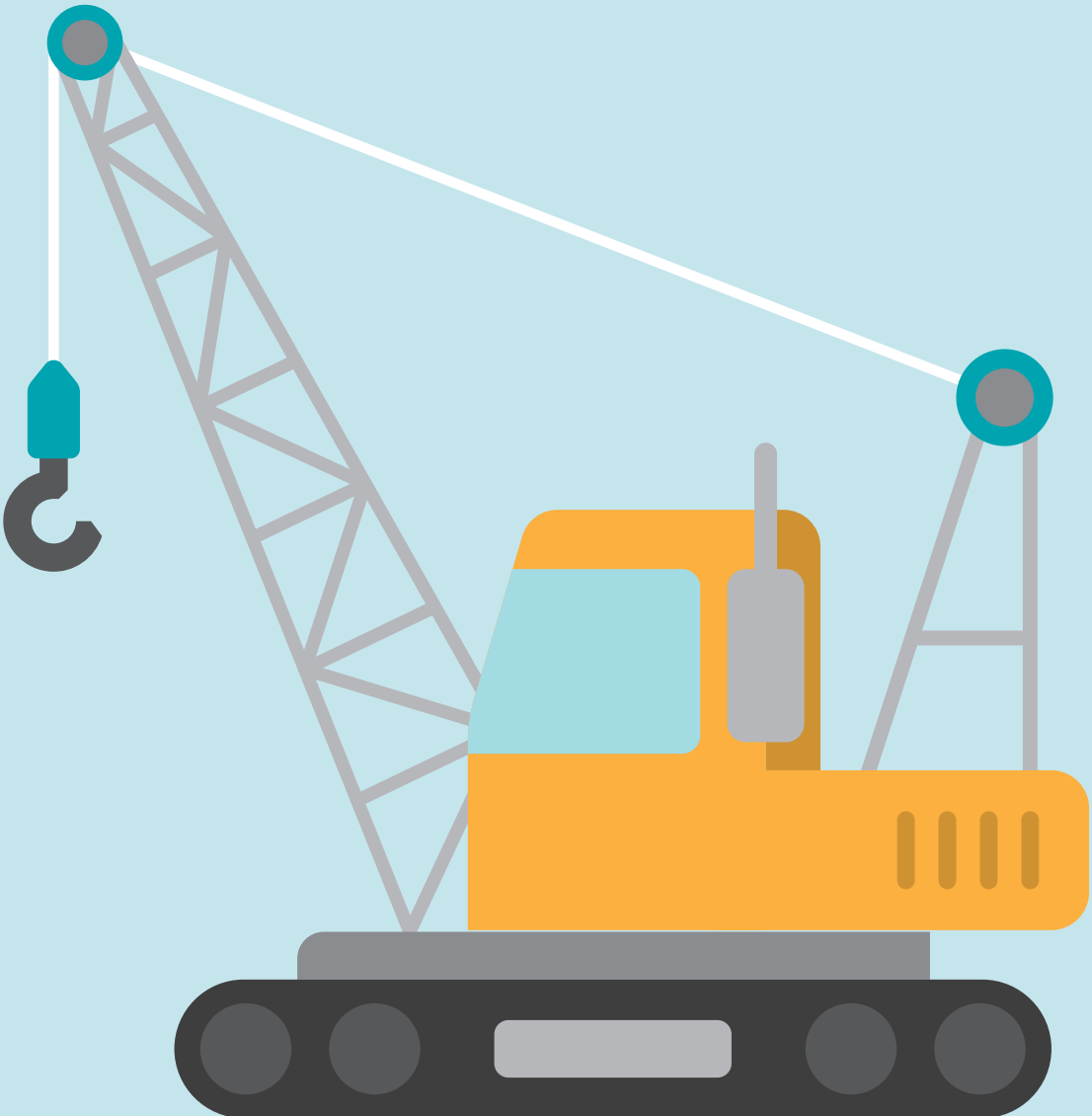
Table 27: Risks and Contingencies (cont.)

Event (Risk)	Impact to Receiving Gippsland Facility Operation	Impact to Other Infrastructure Within Region	
Legacy landfill impacts on environmental and public health. (cont.)	**Action(s):** Councils to communicate with EPA on case by case basis to achieve practical and cost effective outcomes. GWRRG proposes to facilitate work between councils and the EPA to develop appropriate risk-based approaches for rehabilitation of unlicensed closed landfills. GWRRG proposes to facilitate work between councils and EPA in developing and implementing management strategies for unlicensed closed landfills.	**Action(s):** GWRRG to provide ongoing support via GWRRG Technical Reference Group and group initiated projects. GWRRG to facilitate discussions between EPA and councils to seek agreement of 'contingency management arrangements' via statutory processes.	
Occupier / owner of site closes and vacates a major infrastructure facility. Large volume of materials to be disposed of.	**Impact(s):** Potential severe implications on council if operator of a landfill site vacates; need to operate in-house and seek alternative operator within short timeframes; possible closure of site.	**Impact(s):** Other sites may be impacted through increased volumes of re-directed waste causing capacity issues.	
	Action(s): GWRRG to provide support to impacted council where possible.	**Action(s):** GWRRG to assess opportunities for alternative solutions.	

	Impact to Regional Infrastructure Schedule Planning Timeframes (Impact to the GWRRG)	Impact to State
	Action(s): GWRRG to communicate with state government waste portfolio agencies regarding issue of legacy landfills, and work with EPA towards problem solving solutions.	**Action(s):** GWRRG to request guidance from EPA to clarify rehabilitation requirements for legacy landfill sites in Victoria. GWRRG to communicate with state government waste portfolio agencies in relation to potential short, medium and long term financial and non-financial impacts of legacy landfills in Gippsland.
	Impact(s): GWRRG's Infrastructure Schedule becomes outdated with large influx of non-forecast waste materials entering waste disposal facilities.	**Impact(s):** Possible financial implications on state government for site clean-up.
	Action(s): GWRRG to prepare revised Infrastructure Schedule and apply to EPA/Minister for amendment to Gippsland Implementation Plan. Where possible, GWRRG to include estimated waste volumes from rehabilitation within WRRIP airspace / waste forecast.	**Action(s):** GWRRG to commence discussions with state government waste portfolio agencies to identify major infrastructure sites with significant rehabilitation requirements and associated potential decommissioning issues.

Appendix 2:

Collaboration Process and Outcomes



Appendix 2: Collaboration Process and Outcomes

This annexure documents the process undertaken by the GWRRG to collaborate with the other Regional Groups to achieve a coordinated approach to planning for Victoria's waste and resource recovery system.

The GWRRG collaborated with the waste and resource recovery portfolio agencies, comprising the other six Groups, DELWP, EPA and SV. Collaboration over the two years occurred both as a collective and through collaboration with individual Groups.

The GWRRG collaborated with the portfolio through the following:

- A statewide Regional Implementation Plan (RWRRIP) working group, which met monthly throughout the development process. It facilitated a consistent approach to interpreting and applying the legislation and guidelines, informing the development of documented guidance materials, consistent definitions and approach to data analysis, and enabled the Groups to collectively solve problems and devise practical solutions;
- A shared approach to establishing a data system to capture and analyse data from a range of sources, and a survey to capture re-processor information;
- A risk workshop that identified common and shared risks, informing the high level approach to contingency plans;
- An integration conference that addressed final alignment issues, including cross-regional flows and contingency measures;
- An industry forum that was convened collectively to engage industry in the context of the Regional Plans; and
- Sharing of information and draft material throughout.

In developing its Plan, the GWRRG also utilised a SV commissioned study to identify consistent financial and environmental performance factors across the state.

In addition, the GWRRG collaborated with individual Groups. This included:

- Cross checking information with the Metropolitan WRRG in relation to cross-regional flows; and
- Formal correspondence with other Groups.

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 sets 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 which are consistent across the state;
- Consistent response to statewide policy;
- Cross-regional flows and opportunities considered;
- Commitment to annual contingency planning across the state; and
- Commonalities in priority actions, including statewide priorities.

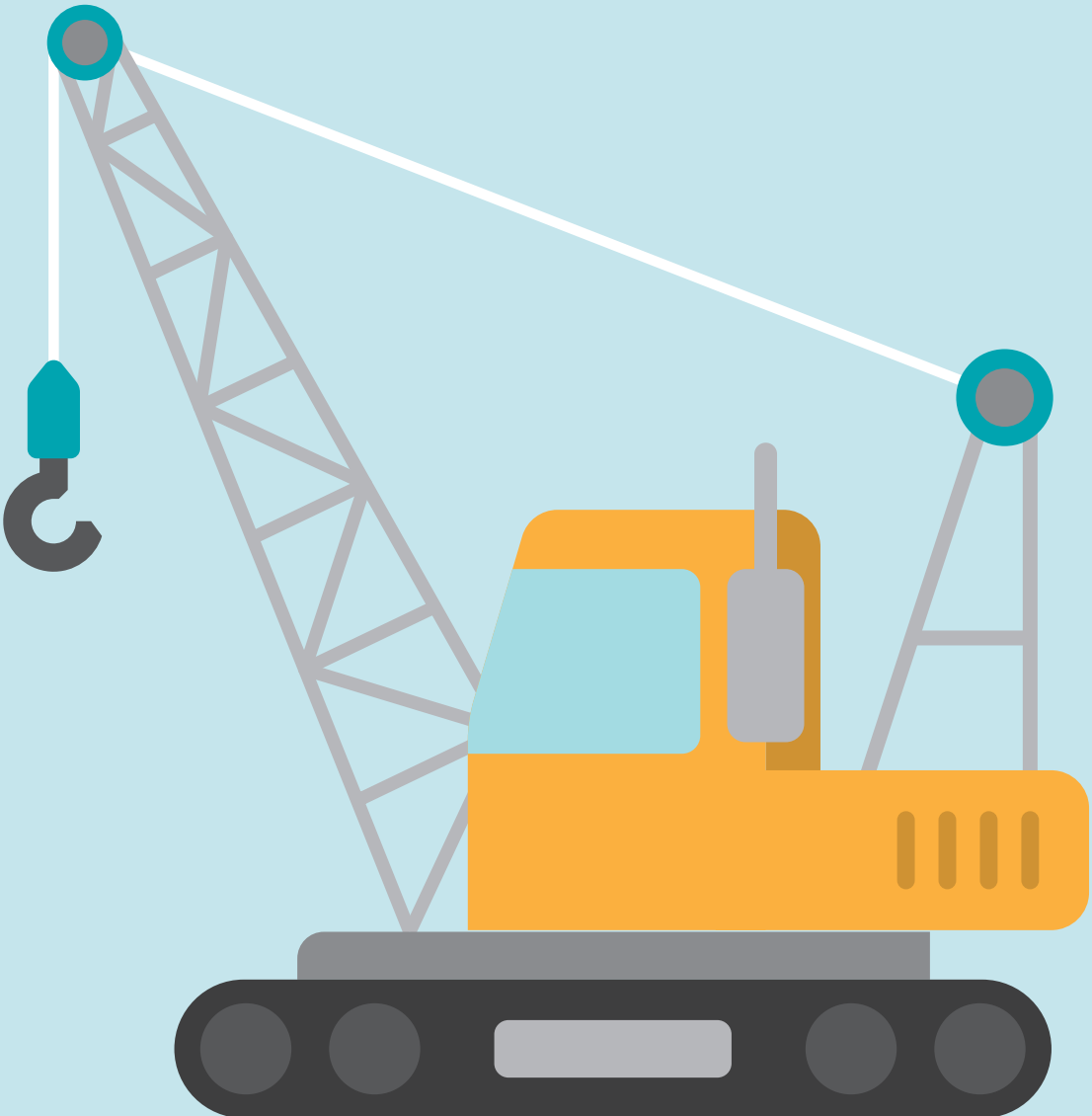
The below table outlines further details on the collaboration processes undertaken, the frequency of activities, the stakeholders involved and the outcomes achieved.

Table 28: Collaboration During Plan Development

Collaboration During Plan Development and Integration			
Collaboration Method	**Timing**	**Stakeholders**	**Outcome**
SV RWRRIP working group meetings	Monthly	SV, EPA, DELWP, RWRRG and MWRRG representatives	RWRRIP Workbook, and supporting templates and guidelines; on-going support to regions in filling knowledge gaps and providing information to assist with RWRRGs to develop consistent assumptions, methodologies and approaches; cross-regional flows and opportunities identified; support integration.
SV data workshop	One-off; 30 June 2015	SV, EPA, DELWP, RWRRG and MWRRG representatives	Consensus achieved on some baseline data methodologies and assumptions to assist with alignment and consistent presentation of regions' data sets.
SV landfill workshop	One-off; 4 August 2015	SV and EPA, RWRRG and MWRRG representatives	Market sounding and infrastructure scheduling EOI process.
SV risk and contingency workshop	One-off; 28 August 2015	SV, EPA, DELWP, RWRRG and MWRRG representatives	Common understanding of the scope of the risk and contingency planning; identified statewide, cross-regional and regional risks to infrastructure; commence discussion on contingency planning for those risks; identified support needs and next steps.
RWRRG Executive Officer meetings	Monthly	SV, EPA, DELWP, RWRRG Executive officers	Resolved high level resourcing, funding, data consistency issues; knowledge sharing and supporting integration.
RWRRG conference calls	Monthly and bi-weekly	RWRRG and MWRRG representatives	Joint approaches to RWRRIP development; exchange of information and experience.
Portfolio reviews	During the final stages of the GWRRIP development; April 2016	EPA, DELWP and SV	Review feedback to assist with legislative/ regulatory compliance of GWRRIP, integration with SWRRIP and consistency across Regional Plans, and in preparation for the GWRRIP submission to the Minister's Office.
Integration Conference	Close to completion of the GWRRIP development; Sept 2016.	SV, EPA, DELWP, RWRRG and MWRRG representatives	Resolving issues to assist integration with SWRRIP and other Regional Plans.
Ad hoc discussions with EPA	Ad hoc; when required	EPA and GWRRG	Assist with legislative/ regulatory compliance of GWRRIP; resolve regulatory/ technical issues.
Ad hoc discussions with DELWP	Ad hoc; when required	DELWP and GWRRG	Resolving resourcing and compliance issues confirm consistency with departmental and Ministerial expectations.
Ad hoc discussions with SV	Ad hoc; when required	SV and GWRRG	Resolving issues to assist with GWRRIP integration with SWRRIP and other Regional Plans.
Market Sounding portfolio meetings	Initially bi-monthly; approx. 12 meetings over a 3-year period	LGV, RDV, SV, GWRRG	Release of market sounding documentation and evaluation.
Ad hoc meetings in relation to the Metropolitan Waste and Resource Recovery Implementation Plan	Ad hoc meetings	MWRRG, GWRRG, SV, EPA and DELWP	Ensure GWRRIP is aligned with MWRRIP strategic actions.
Ad hoc meetings between SV and regional WRRGs regarding communication and engagement activities	Monthly / bi-monthly	SV, MWRRG, Regional WRRGs	Provide information and support about engagement activities between different groups.

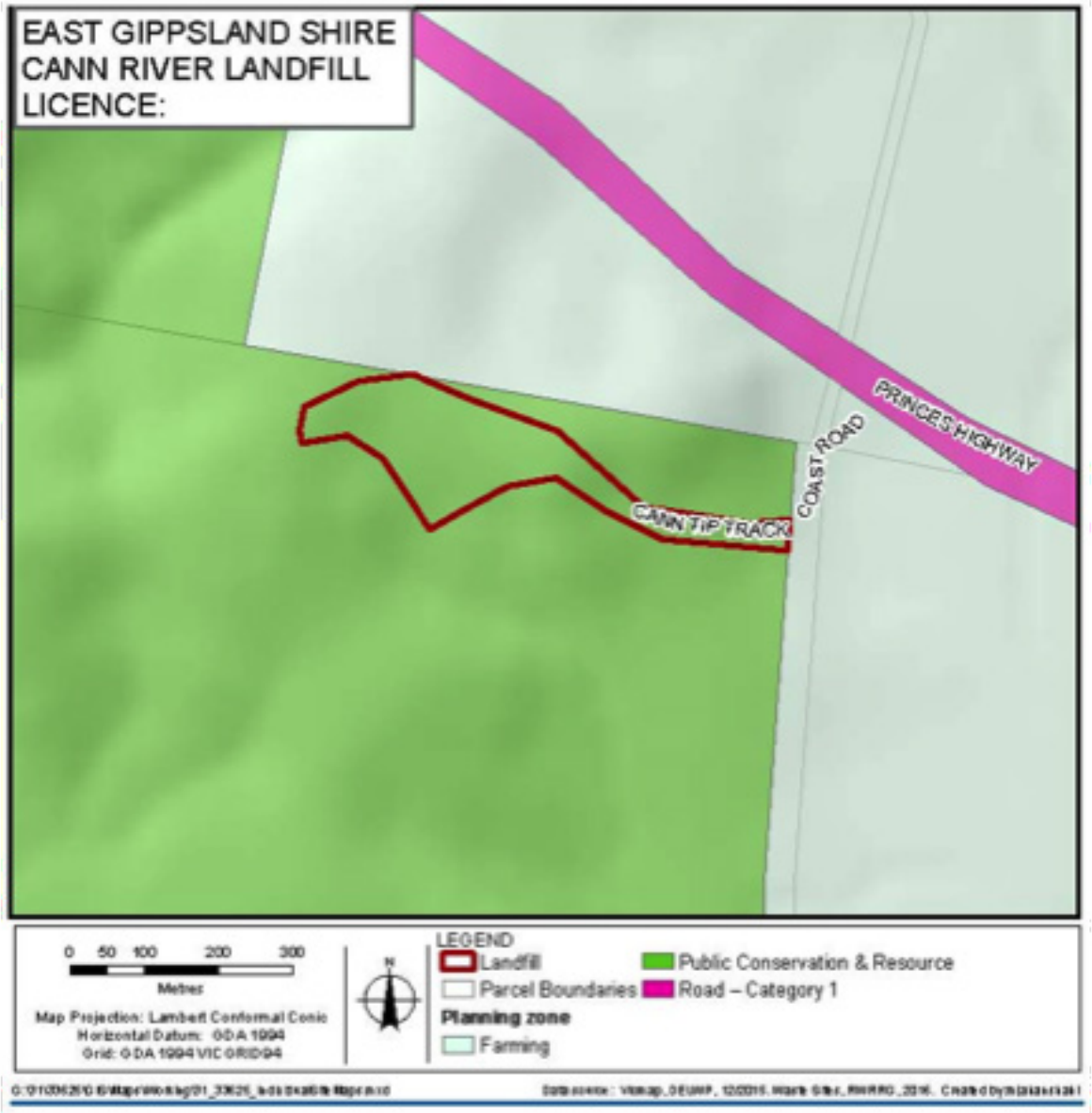
Appendix 3:

Planning Scheme
Zoning Maps

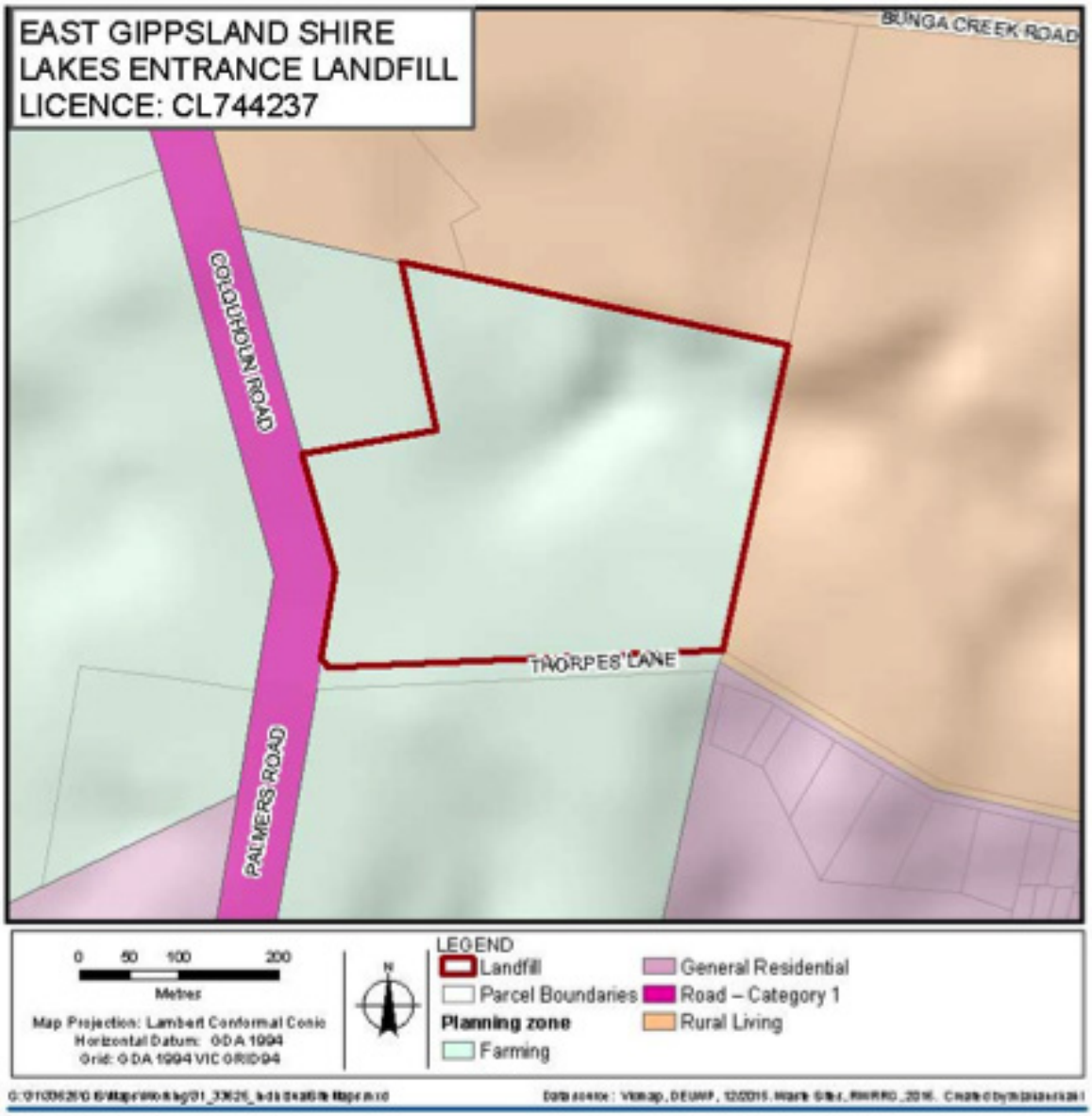


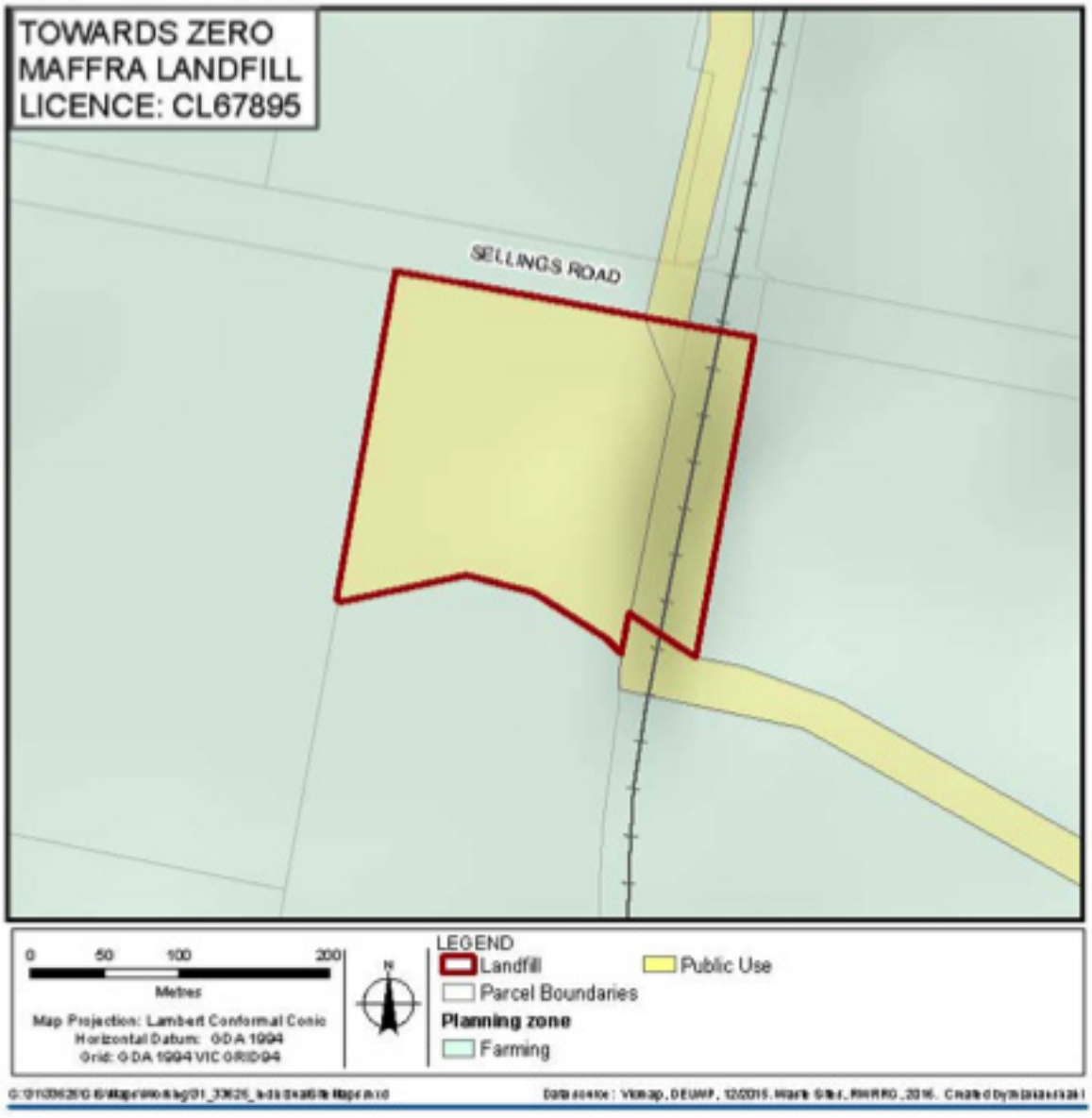
Appendix 3: Planning Scheme Zoning Maps

Landfills


EAST GIPPSLAND SHIRE
CANN RIVER LANDFILL
LICENCE:
PRINCES HIGHWAY
COAST ROAD
CANN TIP TRACK
0 50 100 200 300
Metres
Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA 1994
Grid: GDA 1994 VICGRID94
N
LEGEND
Landfill
Parcel Boundaries
Planning zone
Farming
Public Conservation & Resource
Road – Category 1

Landfills (cont.)




TOWARDS ZERO
MAFFRA LANDFILL
LICENCE: CL67895
SELLINGS ROAD
0
50
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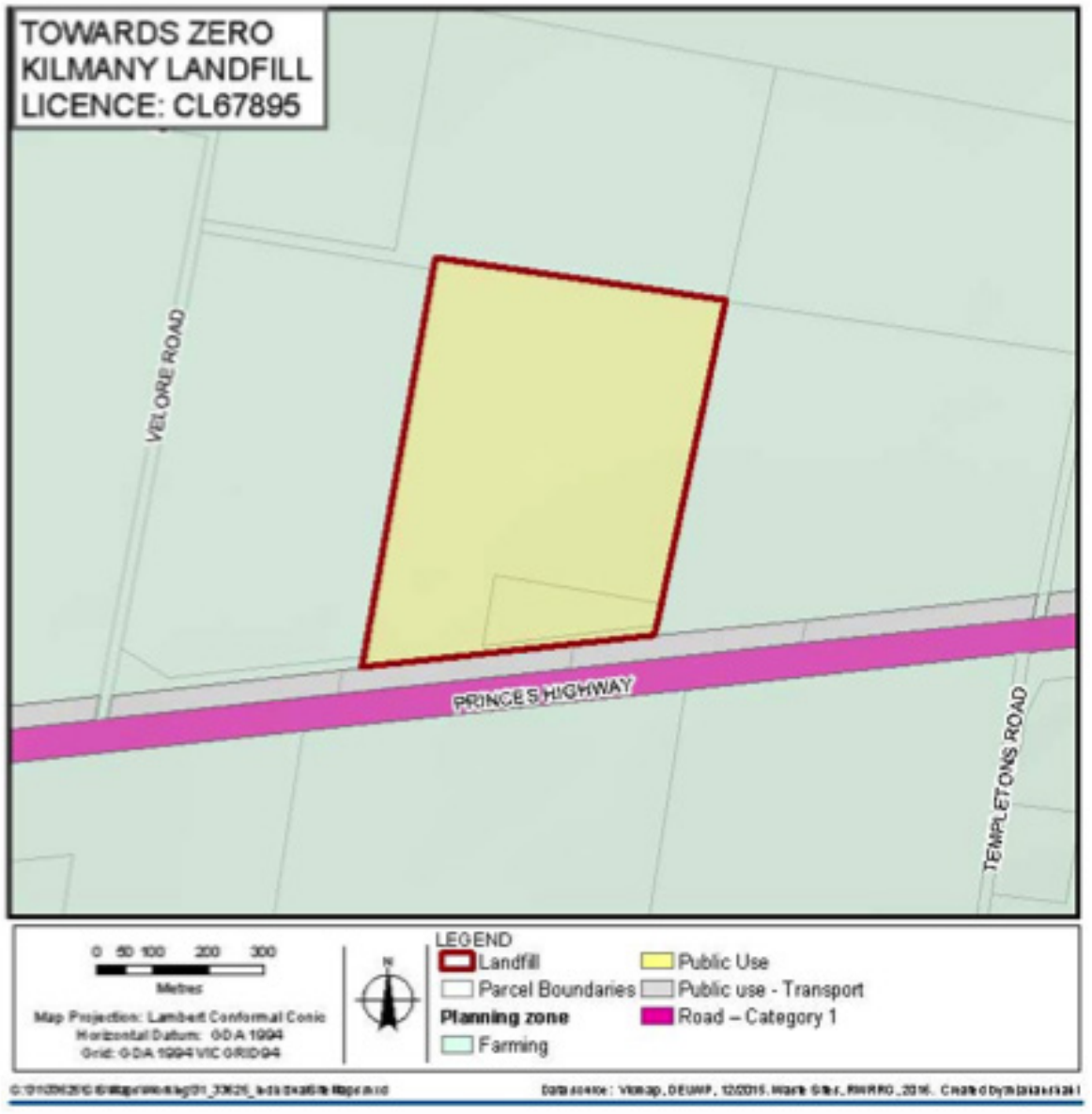
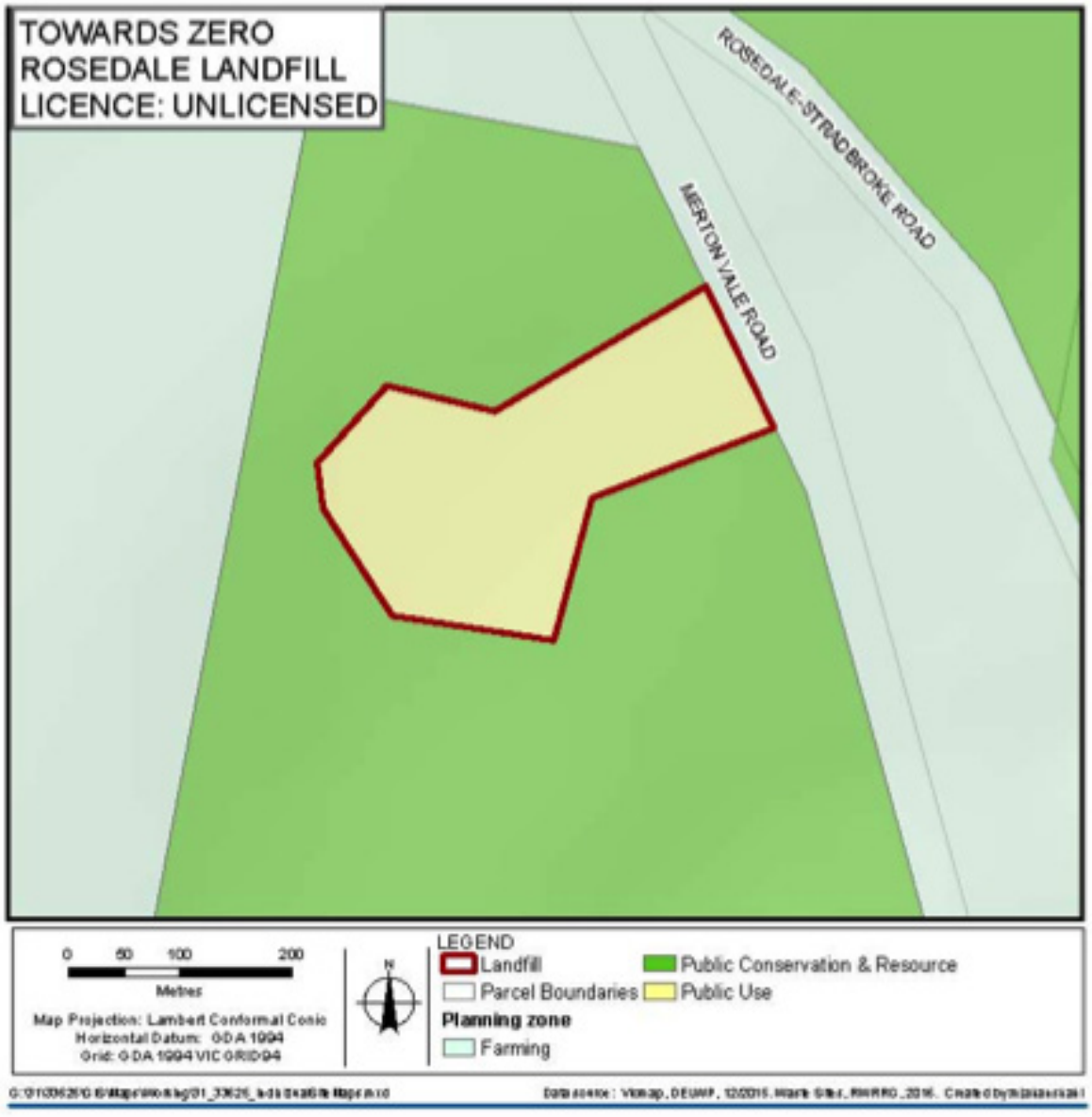
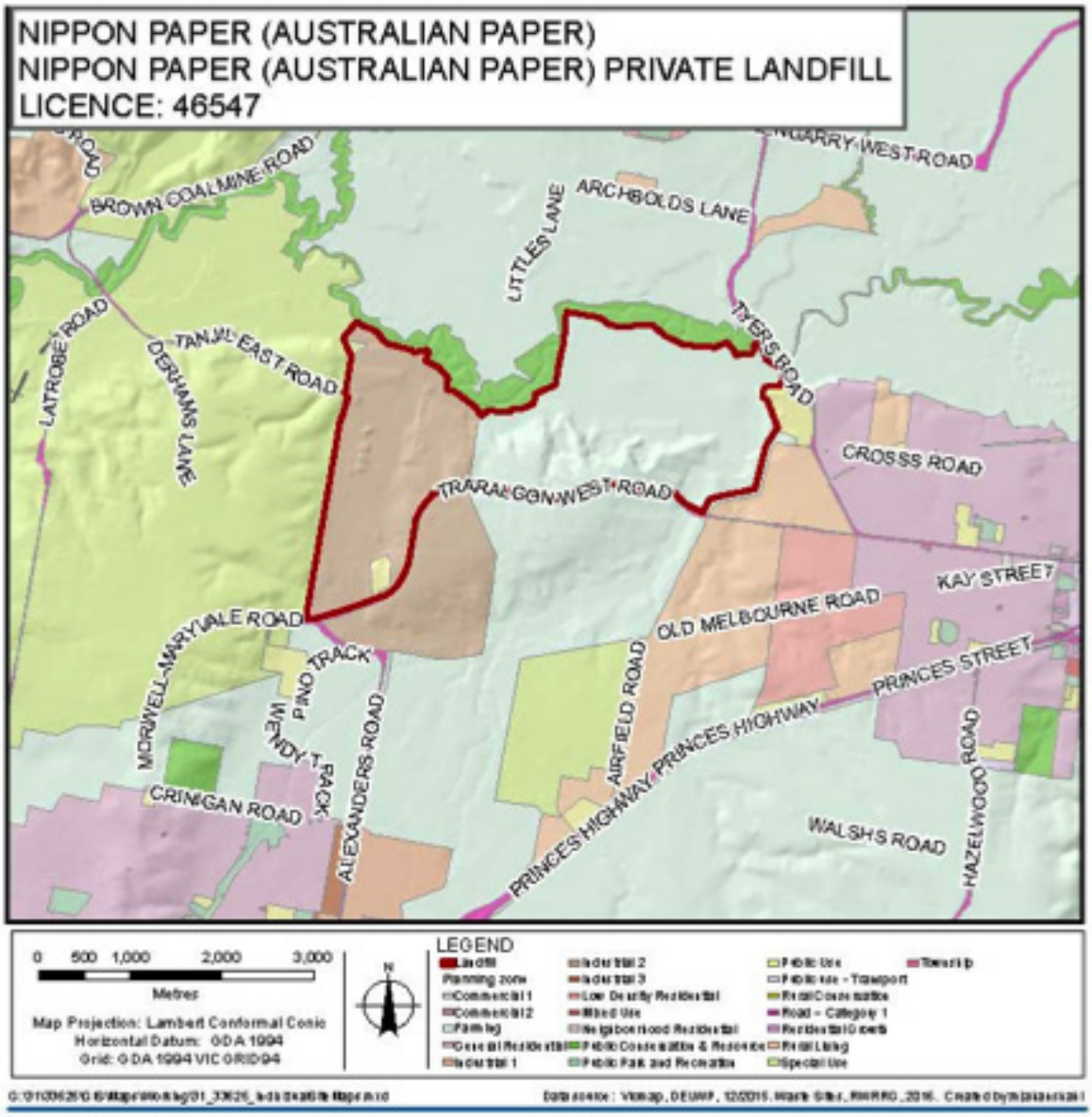
Metres
Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA 1994
Grid: GDA 1994 VICGRID94
N
LEGEND
Landfill
Public Use
Parcel Boundaries
Planning zone
Farming

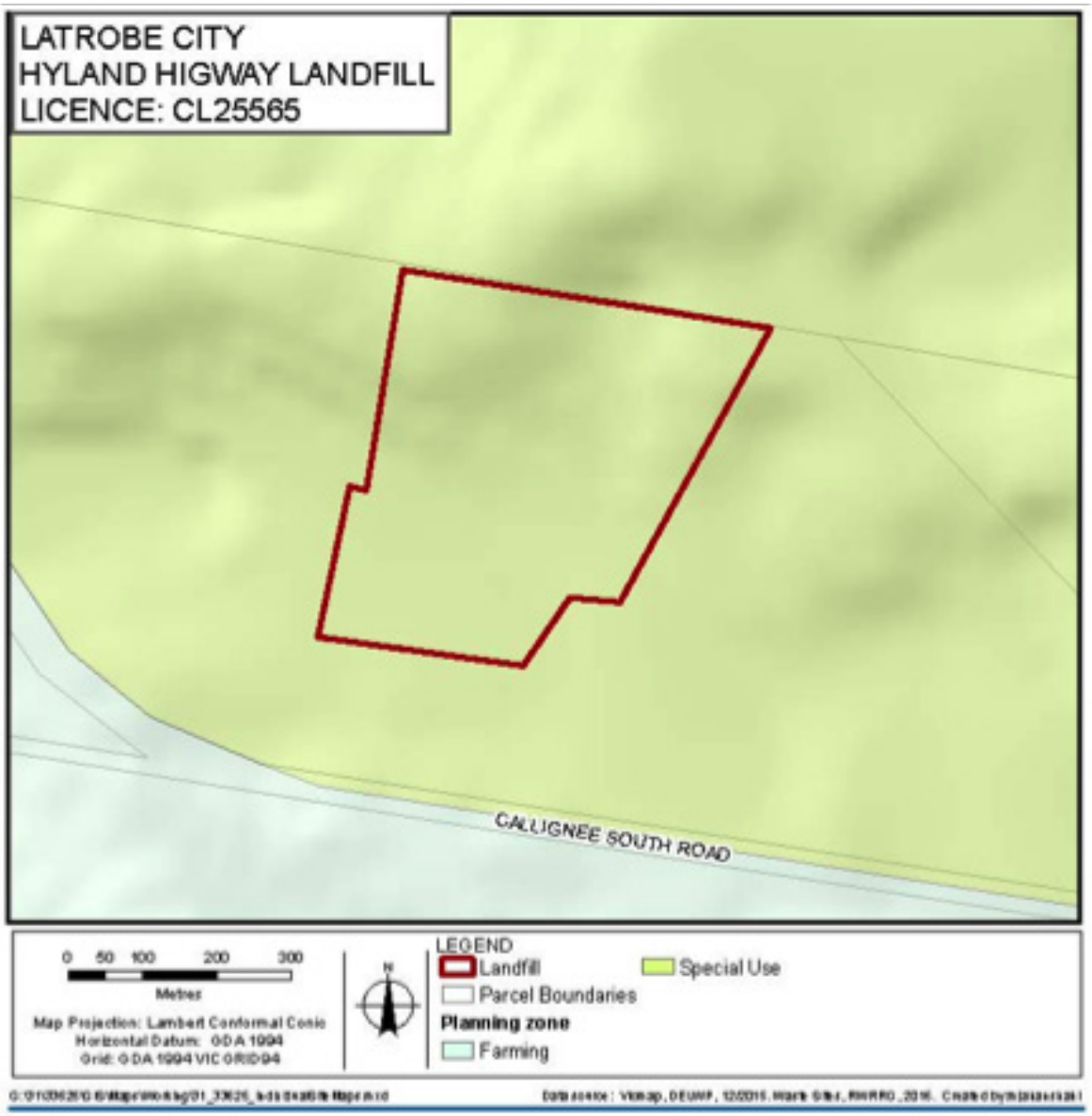
Landfills (cont.)



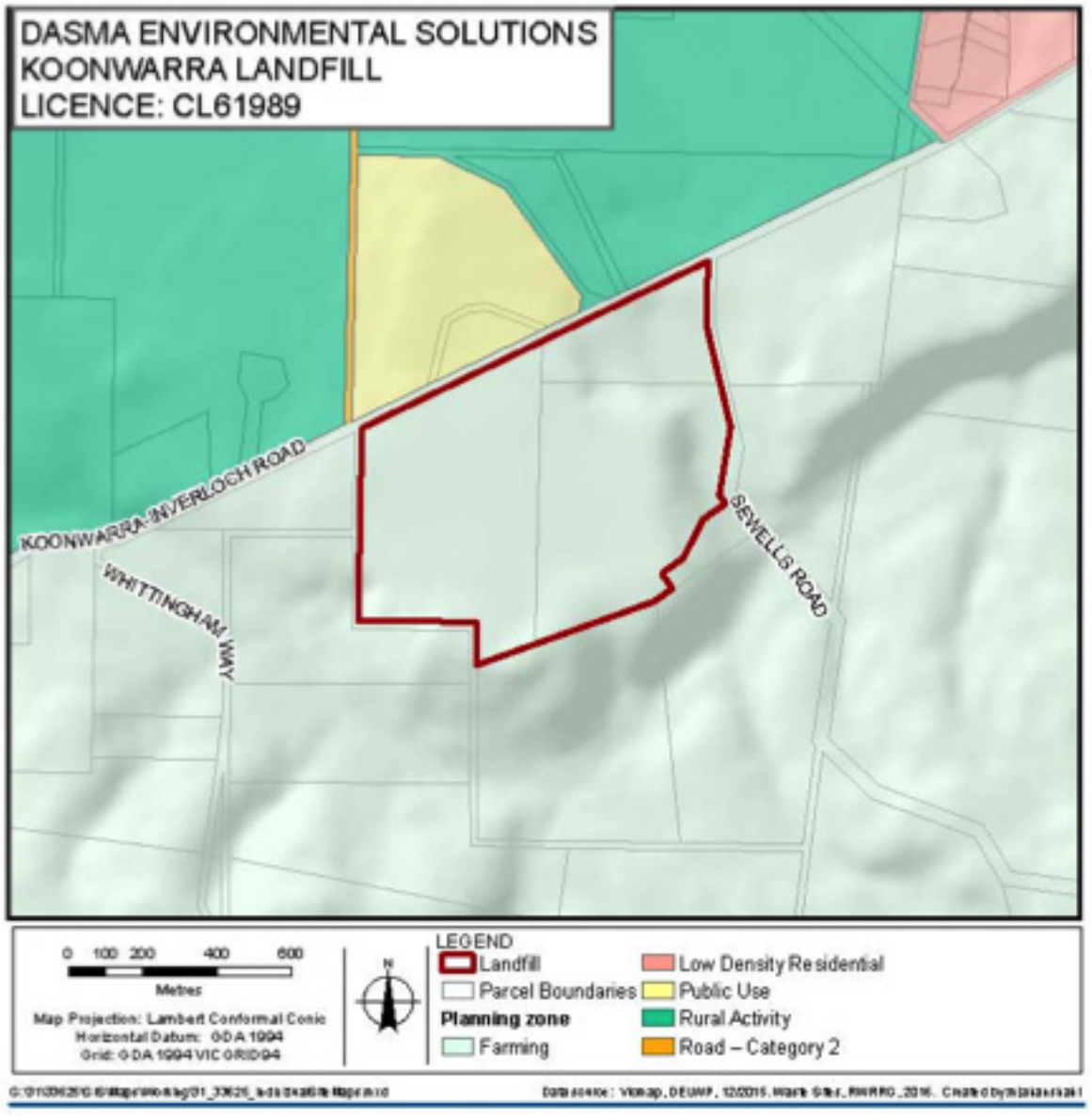

TOWARDS ZERO
ROSEDALE LANDFILL
LICENCE: UNLICENSED
ROSEDALE-STRADBROKE ROAD
MERTON VALE ROAD
0 50 100 200
Metres
Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA 1994
Grid: GDA 1994 VICGRID94
N
LEGEND
Landfill
Parcel Boundaries
Planning zone
Farming
Public Conservation & Resource
Public Use

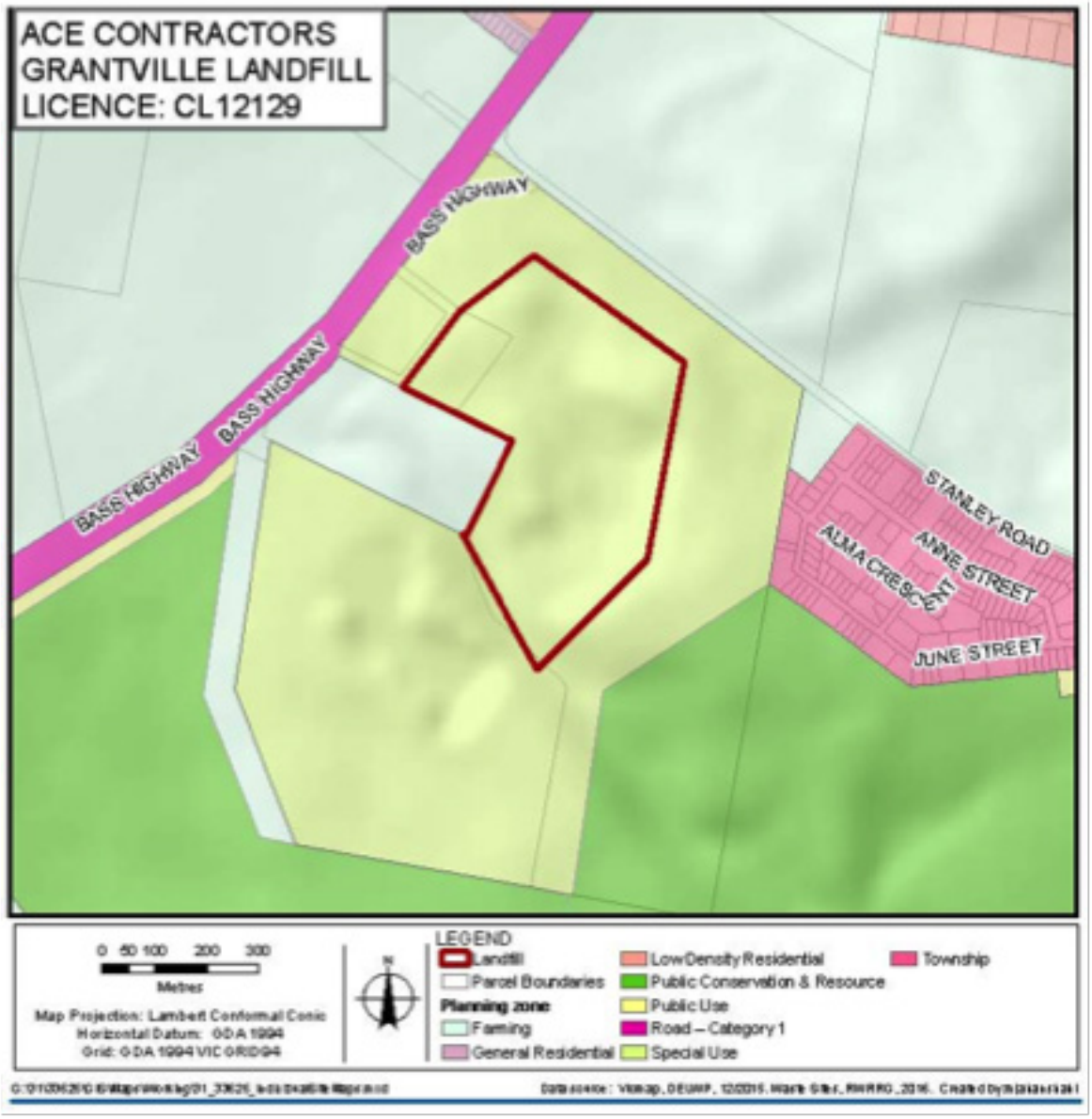
Landfills (cont.)




LATROBE CITY
HYLAND HIGWAY LANDFILL
LICENCE: CL25565
CALLIGNEE SOUTH ROAD
0 50 100 200 300
Metres
Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA 1994
Grid: GDA 1994 VICGRID94
N
LEGEND
Landfill
Special Use
Parcel Boundaries
Planning zone
Farming

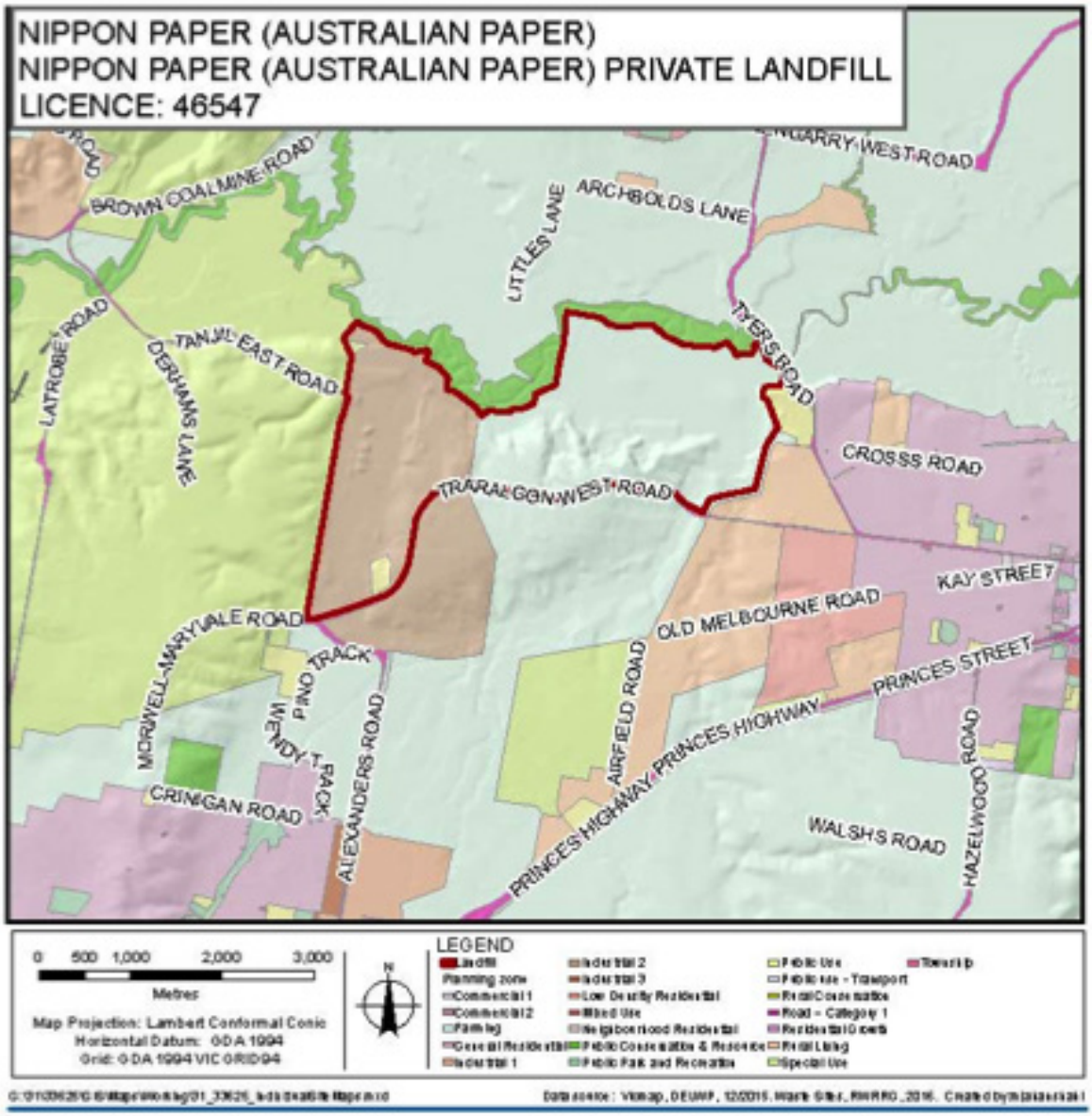
Landfills (cont.)



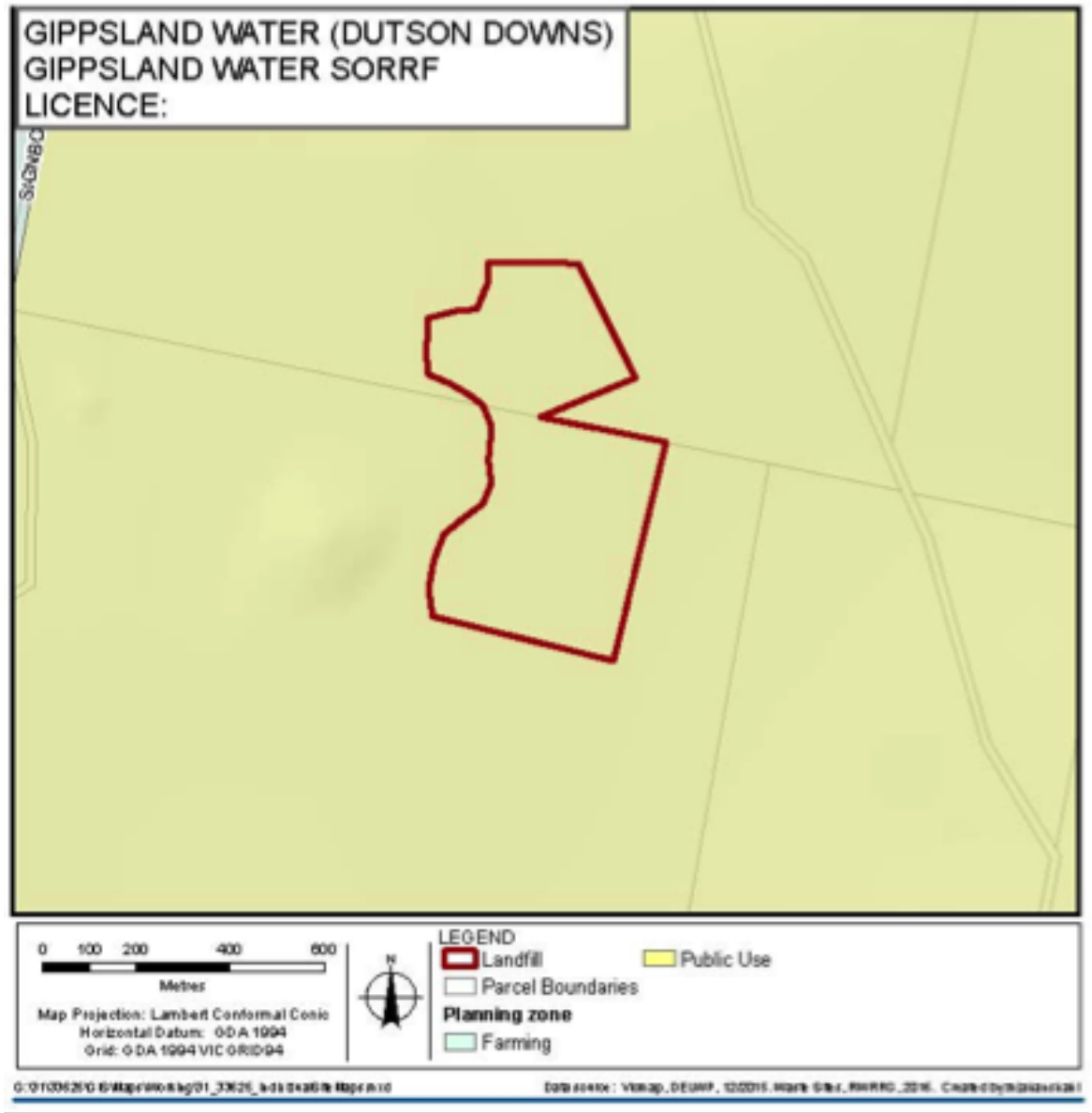

ACE CONTRACTORS
GRANTVILLE LANDFILL
LICENCE: CL12129
BASS HIGHWAY
BASS HIGHWAY
BASS HIGHWAY
STANLEY ROAD
ANNE STREET
ALMA CRESCENT
JUNE STREET
0 50 100 200 300
Metres
Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA 1994
Grid: GDA 1994 VICGRID94
LEGEND
Landfill
Parcel Boundaries
Planning zone
Farming
General Residential
Low Density Residential
Public Conservation & Resource
Public Use
Road – Category 1
Special Use
Township

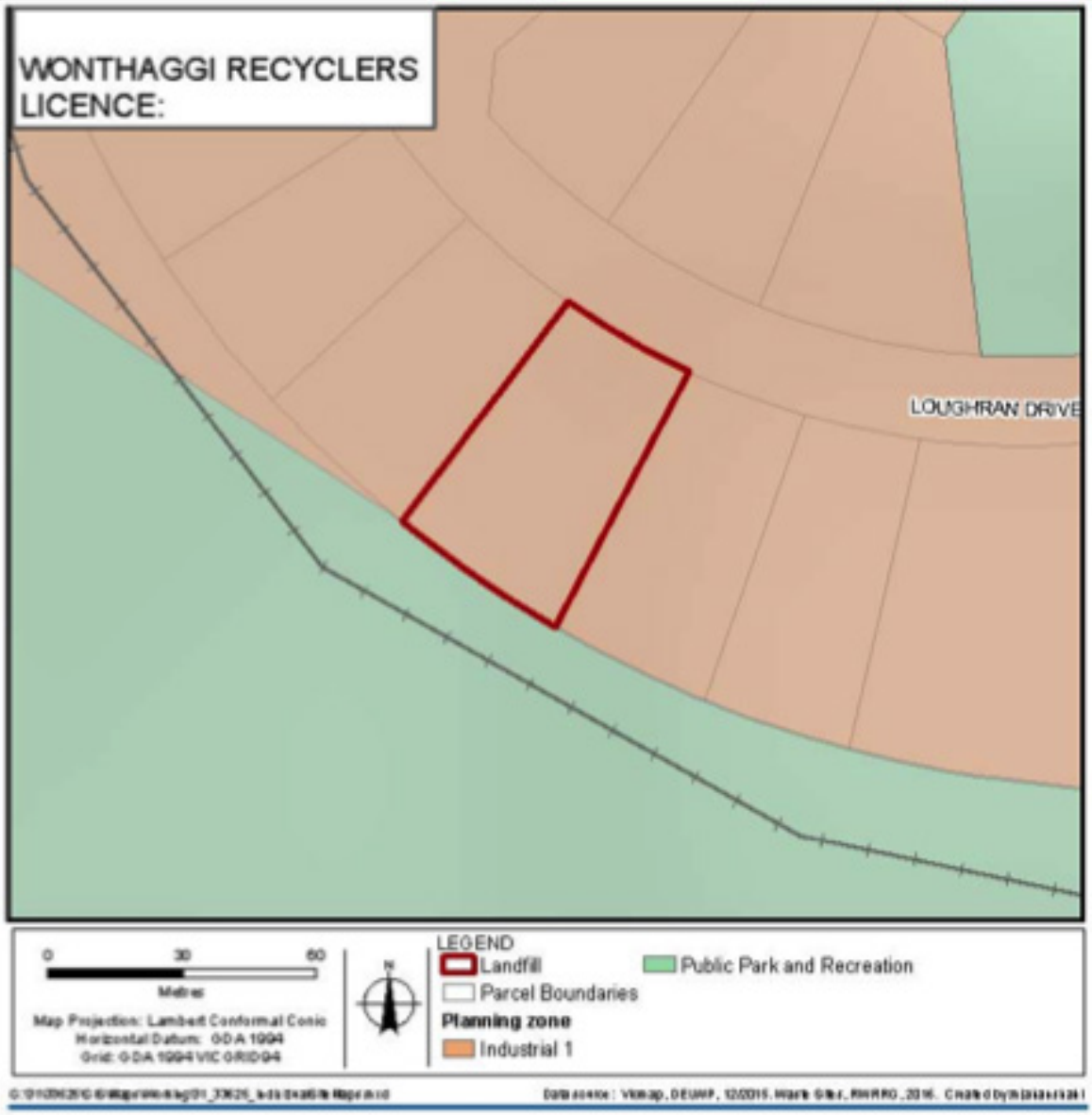
Landfills (cont.)

Resource Recovery and Reprocessor Facilities

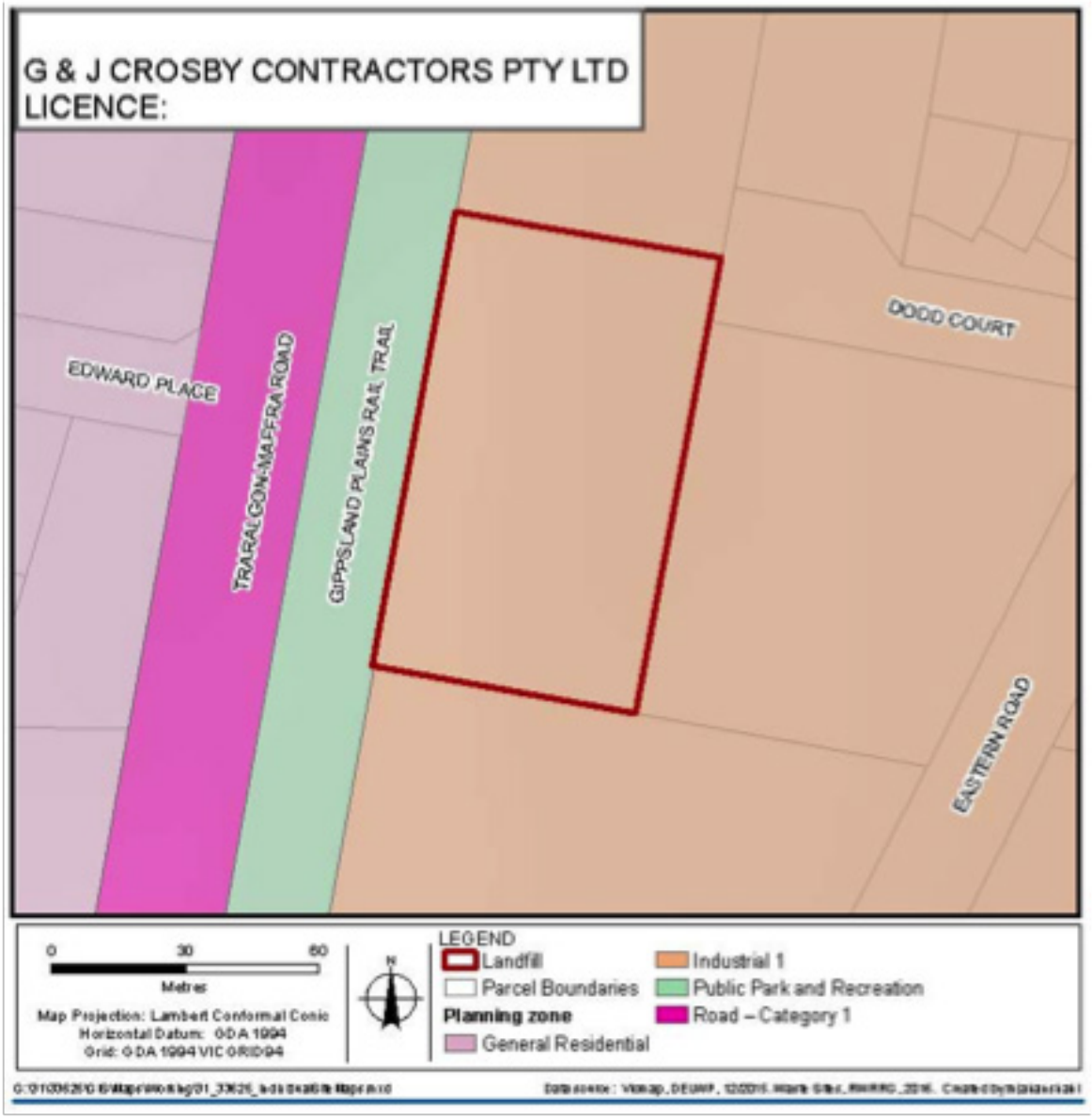


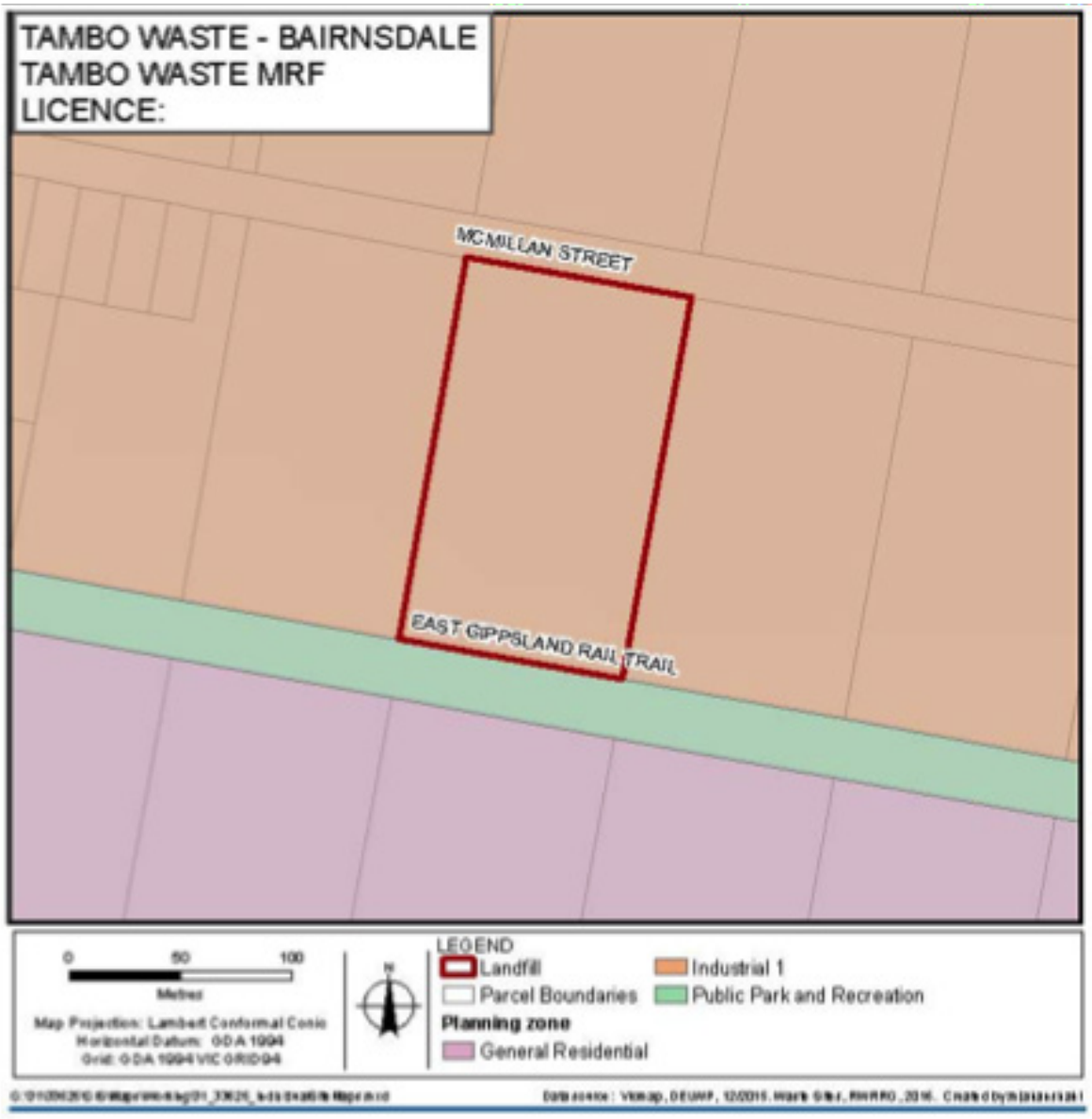
Resource Recovery and Reprocessor Facilities (Cont.)




WONTHAGGI RECYCLERS
LICENCE:
LOUGHRAN DRIVE
0
30
60
Metres
Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA 1994
Grid: GDA 1994 VICGRID94
N
LEGEND
Landfill
Public Park and Recreation
Parcel Boundaries
Planning zone
Industrial 1

Resource Recovery and Reprocessor Facilities (Cont.)




TAMBO WASTE - BAIRNSDALE
TAMBO WASTE MRF
LICENCE:
MCMILLAN STREET
EAST GIPPSLAND RAIL TRAIL
0
50
100
Metres
Map Projection: Lambert Conformal Conic
Horizontal Datum: GDA 1994
Grid: GDA 1994 VICGRID94
N
LEGEND
Landfill
Parcel Boundaries
Planning zone
General Residential
Industrial 1
Public Park and Recreation

Resource Recovery and Reprocessor Facilities (Cont.)

Glossary

Term	Explanation
Airspace	The remaining capacity of a landfill.
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[1]	A term for a group of six naturally occurring mineral fibres belonging to two groups: • 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. 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. 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. The risk of exposure from the built environment is broad, with the potential to impact the entire Australian community.
Beneficiation	An optical sorting process used to separate different colours of container glass to produce cullet for reprocessing and mixed fines.
BEPM (Landfill Best Practice Environmental Management)	Facility management in line with EPA publication in Best Practice Environmental Management – siting, design, operation and rehabilitation of landfills (2015)
Biogas or Syngas	A gas created 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 reprocessed 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.

1 https://www.asbestossafety.gov.au/asbestos-information

Glossary (Cont.)

Term	Explanation
Buffer Zone	Buffer zones, or separation distances, aim to minimise the off-site impacts of sensitive land uses arising from unintended, industry produced odour and dust emissions. 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.
Category C Contaminated Soil	Refer to Prescribed Waste and Prescribed Industrial Waste (PIW).
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 industrial waste generated from trade, commercial and industrial activities including the government sector. It includes waste from offices, manufacturing, factories, schools, universities, state and local government operations and small to medium enterprises e.g. food organics.
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 recycled. 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 industrial 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. Material generally consists of sorted streams of amber, flint and green glass of particle size greater that 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.

Term	Explanation
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 comp 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.
'Dirty' Material Recovery Facility (MRF)	A 'Dirty' Material Recovery Facility (MRF) receives unsorted materials for segregation into materials streams, often this can be from Commercial & Industrial, Construction & Demolition or Municipal sources.
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 or organisation who has a duty or obligation under the EP Act 1970.
E-Waste	E-waste comprises 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.
Waste to Energy (WtE)	The terms 'energy recovery from waste', 'waste to energy' or 'energy from waste' can be used interchangeably to describe treatment processes and technologies used to produce a useable form of energy from waste materials. Examples of useable forms of energy include electricity, heat and transport fuels.
EP Act	Environment Protection Act 1970
Environment Protection Authority Victoria (EPA)	Established under the auspices of the EP Act, 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.
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.

Glossary (Cont.)

Term	Explanation
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 reprocessed to produce a glass sand product, which has a range of potential uses.
Food Organics	Food organics from households and/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 waste.
Gasification	Thermal technology that converts material into combustible gases by partial oxidation under the application of heat, leaving an inert residue.
Gippsland-Generated Waste	Any waste material produced that originated from Gippsland.
Gippsland-Managed Waste	All waste material that have passed through or been managed at a waste and resource recovery facility in Gippsland, including RRC/TS, MRF, reprocessors or landfills. They may have been generated in another region and or they may ultimately be reprocessed or disposed of outside the region.
Green Waste	See 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 into kerbside garbage bins by local councils e.g. old fridges and mattresses.
Hazardous Waste	See Prescribed Waste and Prescribed Industrial Waste (PIW).
Hubs	The concentration of reprocessing facilities where there is sufficient waste derived feedstock to support viable reprocessing 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.
Inter-Generational Equity Principles	Inter-generational equity principles aim to ensure that health and diversity of the environment is maintained and enhanced for the benefit of current and future generations.
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.

Term	Explanation
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.
Kerbside Waste/ Collection	Waste collected by local councils from residential properties, including garbage, commingled recyclables and garden organics (excluding hard waste).
Landfill	Discharge or deposit of solid wastes onto land that cannot be practically or economically removed from the waste stream.
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.
Landfill Levy	A levy applied at differential rates to municipal, C&I 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, Sustainability Victoria 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.
Leachate	Contaminated water that has percolated through or drained from a landfill.
Litter	Any small, medium or large item left inappropriately in a public or open space.
Life Cycle Assessment of Goods	Life cycle assessment of goods – Assessment of the processes by which goods are produced, consumed and discarded.
Local Litter Measurement Toolkit	The Local Litter Measurement Toolkit (LLMT) has been designed for local government and land managers to: • 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; and • Prepare business cases to bid for funding for initiatives to reduce litter and illegal dumping, maximise recycling, improve or introduce infrastructure and enforcement.
Man-Made Mineral Fibre	A general name for fibre materials that are formed by spinning or drawing molten minerals (or "synthetic minerals" such as slag and ceramics).

Glossary (Cont.)

Term	Explanation
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.
Mechanical Biological Treatment (MBT) Plant	MBT plants combine mechanical sorting (such as in a MRF) with biological treatment of garden organics to process residual garden organics. This could include technology such as anaerobic digestion to stabilise the material and produce 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.
Mono-Cell	A landfill cell dedicated to receiving one type of material.
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 in to windrows and turned during reprocessing.
Optical Sorting	Technologies used to sort glass by colour type, and plastics by polymer type.
Organic Material	Plant or animal matter originating from domestic or industrial sources e.g. grass clippings, tree prunings and food organics.
Pollution Abatement Notice (PAN)	Pollution abatement notices are issued under section 31A of the Environment Protection Act 1970. 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 Environment Protection (Industrial Waste Resource) Regulations 2009. 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.
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 reprocessing 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.

Term	Explanation
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 organics and garden organics 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.
Recyclables	While this term strictly applies to all materials that may 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 garden organics.
Recycling	A term that may be used to cover a wide range of activities, including collection, sorting, reprocessing and manufacture into new products.
Refuse Derived Fuels	Refer to Process derived fuels.
Reprocess/ Reprocessing	Change/Changing the physical structure and properties of a waste material that would otherwise have been sent to landfill to add financial value to the reprocessed material.
Reprocessor/ Reprocessing Facilities/ Reprocessing Infrastructure	Facility that uses an industrial process to change the physical structure and properties of a waste material that would otherwise be sent to landfill so it can be used again to add financial value to the reprocessed material. Without reprocessing, the beneficial use of the material would be lost.
Resale Centre/ Shop	A centre/ shop that enables the sale and subsequent re-use 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.
Resource Recovery	The process of obtaining matter or energy from discarded materials.

Glossary (Cont.)

Term	Explanation
Resource Recovery Centre (RRC)	A facility whose primary purpose is to aggregate, sort, and consolidate reusable and recyclable materials prior to transport to another facility for recovery or management. It may include a resale centres. 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. 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 (MRFs).
Reuse	Recovering value from a discarded resource without reprocessing or remanufacture e.g. garments sold though opportunity shops are, strictly speaking, a form of re-use, 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 EP Act 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, reprocessing 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.

Term	Explanation
Stockpiling	Storage of materials.
Sustainability Victoria (SV)	Statutory authority established in October 2005 under the Sustainability Victoria Act 2005 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.
Syngas	Gas produced from a gasification process.
Synthetic Mineral Fibre	Materials such glass fibre, mineral wool and ceramic fibre.
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. Do not undertake reprocessing activities.
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 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. See 'Gippsland Generated Waste' and 'Gippsland Managed Waste'
Waste and Resource Recovery Group (WRRG)	Statutory authorities established under the EP Act 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 amendments to the EP Act and including: • The State Waste and Resource Recovery Infrastructure Plan (SWRRIP); • The seven Regional Waste and Resource Recovery Implementation Plans (RWRRIPs); • Relevant Ministerial Guidelines made under section 50CA of the EP Act; and • The process for integration of the SWRRIP and RWRRIPs.
Waste Management Industry	Applies to those involved in managing waste e.g. collectors, sorters, reprocessors 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.

Acronyms

Term	Definition
ABS	Australian Bureau of Statistics
BAU	Business As Usual
BPEM	Best Practice Environmental Management
C&D	Construction and Demolition
C&I	Commercial and Industrial
DELWP	Department of Environment, Land, Water and Planning
EPA	Environment Protection Authority (Victoria)
e-waste	Electronic Waste
FOGO	Food Organics and Garden organics
GLGN	Gippsland Local Government Network
GWRRG	Gippsland Waste and Resource Recovery Group
LGA	Local Government Area
LGV	Local Government Victoria
LLMT	Local Litter Measurement Toolkit
MRF	Materials Recovery Facility
MSW	Municipal Solid Waste
NORM	Naturally Occurring Radioactive Material
PAN	Pollution Abatement Notice
PC PAN	Post Closure, Pollution Abatement Notice
PIW	Prescribed Industrial Waste
RDV	Regional Development Victoria
RRC/TS	Resource Recovery Centre / Transfer Station
RWRRG	Regional Waste and Resource Recovery Group
SIW	Solid Industrial Waste
SME	Small to Medium Enterprise
SV	Sustainability Victoria
SWRRIP	Statewide Waste and Resource Recovery Infrastructure Plan
VORRS	Victorian Organics Resource Recovery Strategy
WRRG	Waste and Resource Recovery Group
WRRIP	Waste and Resource Recovery Implementation Plan
WtE	Waste to Energy

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Waste and Resource Recovery Group

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