

GREATER SHEPPARTON RESOURCE RECOVERY PRECINCT FEASIBILITY & SITE SELECTION STUDY

PREPARED BY **URBAN ENTERPRISE** FOR **GREATER SHEPPARTON CITY COUNCIL** | JULY 2016

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ACRONYMS

C&D – Construction and Demolition (waste)

C&I – Commercial and Industrial (waste)

CFA – Country Fire Authority

EPA – Environmental Protection Agency

FO – Flood Overlay

GBCMA – Goulburn Broken Catchment Management Authority

GMW – Goulburn Murray Water

GSCC – Greater Shepparton City Council

GVW – Goulburn Valley Water

GVWRRG – Goulburn Valley Waste and Resource Recovery Group

LSIO – Land Subject to Inundation Overlay

MRF – Materials Recovery Facility

MSW – Municipal Solid Waste`

RWMG – Regional Waste Management Group (now WRRG)

SIW – Solid Industrial Waste

WMF – Wastewater Management Facility

GLOSSARY

The information for the glossary of terms has been sourced from the Sustainability Victoria *Statewide Waste and Resource Recovery Infrastructure Plan* (2013).

Anaerobic digestion – A process of biologically degrading organic materials in the absence of oxygen, yielding methane gas (which may be combusted to produce energy) and stabilised organic residues (which may be used as a soil additive).

Biogas – A gas generated by breaking down organic matter in the absence of oxygen, such as occurs in landfills. Biogas is typically comprised of 60% methane and 40% carbon dioxide, and can be used as an energy source.

Buffer Zone – A buffer is an area of land outside the operating area of a facility that is set aside to maintain 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.

Commercial and Industrial (C&I) Waste – Solid waste generated from trade, commercial and industrial activities including the government sector. It includes waste from offices, manufacturing, factories, schools, universities and state and government operations and small to medium enterprises, e.g. food waste.

Composting – The biological processing of organic matter in the presence of oxygen, yielding carbon dioxide, heat and stabilised organic residues that may be used as a soil additive. Composting can be undertaken using an open windrow or in-vessel system.

Construction and Demolition (C&D) waste – Solid waste generated from residential and commercial construction and demolition activities e.g. bricks and concrete.

Energy from waste / Waste to Energy – Processing technologies that use waste as a feedstock for generating energy, which can be used for heat or for generating electricity. Also called waste to energy.

Landfill Levy – A levy applied at differential rates to municipal, commercial and industrial and prescribed wastes disposed of at licensed landfills in Victoria. Landfill levies are used solely for the purposes of environmental protection and fostering environmentally sustainable use of resources and best practice in waste management. They fund the activities of regional waste management groups, Sustainability Victoria and Environment Protection Authority Victoria, helping to establish waste management 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 landfill.

Materials Recovery Facility (MRF) – A centre for the receipt, sorting and transfer of materials recovered from the waste stream. At an MRF, materials are also sorted by type and treatment, which may include cleaning and compression.

Municipal Solid Waste (MSW) – Solid waste generated from municipal and residential activities, and including waste collected by, or on behalf of, a municipal council.

Processing Facilities – Facilities which either receive materials directly from collection systems or from recovery facilities for further sorting and/or processing to provide material for use in the generation of new products.

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

Residual Waste – Residual materials that remain after any source separation or reprocessing activities or recyclable materials or garden organics.

Resource Recovery – The process of obtaining matter or energy from discarded materials. Occurs at resource recovery centres.

Resource Recovery Centre – Facilities established to receive and/or recover re-usable and recyclable materials that would otherwise be destined for disposal. Can be combined with a transfer station and may include resale centres.

Solid Industrial Waste (SIW) – Non-hazardous, non-prescribed, solid waste materials, ranging from municipal garbage to industrial waste.

EXECUTIVE SUMMARY

BACKGROUND

Greater Shepparton City Council appointed Urban Enterprise to undertake the *Greater Shepparton Resource Recovery Feasibility & Site Selection Study* in 2015.

The 'Industrial Land Review' (June, 2011) determined that there are significant challenges in accommodating material recycling facilities, eco industries and other such land uses that require extensive storage areas in Greater Shepparton.

Greater Shepparton currently has an informal resource recovery precinct located on Daldy Rd adjacent to Shepparton's Wastewater Management Facility. The site is owned by Goulburn Valley Water. This site was earmarked as a candidate for the formal establishment of a resource recovery precinct and a study was undertaken to assess expansion of the precinct. Unfortunately, due to the corporate risks posed to Goulburn Valley Water the site has not formally progressed as the precinct location for resource recovery industries.

The waste and resource recovery sector covers the generation, collection and drop-off, sorting, transfer, reprocessing, export, re-use and disposal of waste materials. These activities occur across all sectors of the economy, including households, businesses, industry and government.

The primary objective of this study is to investigate candidate sites for the establishment of a resource recovery precinct in Greater Shepparton and assess the demand for potential industries and facilities.

PRIMARY FINDING

The review of potential candidate sites for a resource recovery precinct has led to no preferred site being identified.

Although the Cosgrove landfill site has characteristics favourable for establishment of a resource recovery precinct, there is a lack of land available for this purpose on the site and it is therefore not viable for development.

The potential of Greater Shepparton to accommodate a large precinct has been primarily limited by the following key factors:

- A large proportion of the municipality is irrigated land, which has higher levels of dwelling density, when compared to areas of non-irrigated land.
- A lack of infrastructure and transport networks in areas that have lower population densities.
- Extensive areas subject to flood risk.
- Buffer requirements to sensitive land uses.
- High cost of potential infrastructure upgrades for sites in remote areas, as well as distance from key input markets.
- Proximity of existing industrial land to residential settlements or future housing growth areas.

OTHER KEY FINDINGS

The report includes the following additional findings:

1. A review of the Daldy Road precinct has found that the corporate risk to Goulburn Valley Water's EPA license has meant that formal expansion of the precinct is restricted. Council cannot direct potential investors to the precinct with any certainty, resulting in potential missed economic development opportunities. This prompted consideration for the establishment of a new precinct. The Daldy Road precinct may still contain opportunities for niche, low emitting, low labour intensive uses through agreement with Goulburn Valley Water.
2. There are significant opportunities in Greater Shepparton and the wider Goulburn Valley region for increased waste and resource recovery operations and facilities. These include leveraging from the region's agricultural and food processing sectors in recovery of food organics, increased recovery of construction and demolition materials, introduction of a sorting facility, reprocessing facilities for material streams including rubber, glass and plastics and waste to energy opportunities.

3. Greater Shepparton has a number of resource recovery operations in the region including the state significant assets of the Cosgrove Landfill (Council owned) and Western Composting (Daldy Rd). Expansion of the Cosgrove landfill is underway presenting an opportunity to divert waste from landfill and increase recovery of materials. There is existing strategic policy support to transition landfills to resource recovery facilities in appropriate areas.
4. There is significant State, regional and local policy support for the establishment of resource recovery infrastructure. The State Government Sustainability Fund provides potential funding opportunities for the precinct.
5. Site selection and evaluation has been undertaken which includes identification of possible candidate sites for the establishment of a resource recovery precinct. An exclusion mapping exercise was undertaken across the Greater Shepparton municipality to identify high level precincts that may be able to accommodate a resource recovery precinct. The sites identified within the high level precincts were then assessed against criteria in a site assessment matrix to determine their suitability.
6. A site assessment revealed that the Council owned Cosgrove landfill 3 area would have been preferable for the establishment of a resource recovery precinct. However, Urban Enterprise has been advised that the Council owned Cosgrove landfill 3 surplus land will not be sufficient for the establishment of a formal resource recovery precinct on site. Further, sites in the vicinity of the Cosgrove landfill have also been deemed inappropriate due to the impact on view lines, access issues (due to existing leases over the land), infrastructure and servicing costs and purchase and development timing risks. The summary of the site assessment is shown in Table 1.
7. The existing works approval for Cosgrove 3 Landfill includes an area that has been identified as a potential pre-sorting area. Council may wish to consider the establishment of a pre-sorting facility utilising the Council owned Cosgrove land. A pre sorting facility could generate salvaged materials which otherwise would have gone to landfill. These materials can then be reprocessed at alternative locations. There may also be opportunity for limited concrete crushing / recycling facilities on the capped Cosgrove 1 & 2 landfills.
8. Many businesses in the reprocessing industry are structured around low margins that rely on significant volumes of material. A pre-sorting facility may generate appropriate demand to facilitate increased interest in private investment.

TABLE 1 SUMMARY OF SITE ASSESSMENT

Site Number	Site	Potential to be progressed	Progression implications
-	Daldy Road	✓	There is potential for Daldy Road to move forward with niche, low emitting businesses, with agreement with GV Water.
1	Cosgrove Landfill (Cosgrove 3 Landfill Site)	✓	There is insufficient land available for the establishment of a resource recovery precinct. The existing works approval for Cosgrove 3 Landfill includes an area that has been identified as a potential pre-sorting area.
2A	Adjacent to Cosgrove Landfill	✗	-
4	Polan Road Former Landfill	✗	-
6	North of Murchison	✗	-
3	New Dookie Road	✗	-
2B	Adjacent to Cosgrove Landfill	✗	-
5	West of Murchison	✗	-

ALTERNATIVE APPROACHES FOR MOVING RESOURCE RECOVERY FORWARD

Given the complexities associated with identifying a single precinct for the establishment of a resource recovery precinct in Greater Shepparton, alternative approaches may be necessary to progress the opportunity forward. Alternative approaches could include:

- **A Regional Approach:** A regional approach would encompass the Council areas under the Goulburn Valley Waste and Resource Recovery Group. A regional approach provides the opportunity to find a site that is most suitable for resource recovery across a large regional area. The downside of locating a precinct outside of Greater Shepparton may mean lost economic development opportunities in Greater Shepparton, including short term and long term employment opportunities, valued add industries and 'green' branding opportunities.

If a regional approach were to be taken, it could build on the work undertaken for this project including the adopted methodology for identifying potential candidate sites (exclusion mapping, site assessment matrix) as well as the background research, which informed this project.

- **A Multiple Location Approach:** The multiple site approach would leverage off existing locations for resource recovery activities, including:

- Utilising Daldy Road for Niche, low emitting and low employment uses, in agreement with GVV.
- Utilising the Council owned Cosgrove site for establishment of a pre-sorting facility.
- Utilising existing zoned industrial land for recycling and reprocessing centres, which are assessed on a site by site basis against relevant planning controls and EPA guidelines.

The major downside to this option is a loss of synergies that can be established through co-location, as well as the ability for Council to promote and direct business to a precinct that is established for the purpose of resource recovery activities. The 'green' branding opportunities may be lessened through a multiple site approach.

BENEFITS OF A RESOURCE RECOVERY PRECINCT

1. The establishment of a resource recovery precinct presents significant opportunity to generate environmental, economic, and social benefits for the Greater Shepparton region. Development of a \$21 million precinct would inject a total input of \$44 million (direct & indirect) into the local economy and create 129 jobs (direct and indirect) during the construction and development phases of investment. It should be noted that this is an estimate only and there is potential for development investment to exceed \$21 million depending on the type of facilities that are developed in the precinct.
2. The resource recovery precinct will also generate ongoing operational impacts to the local economy. A precinct has the potential to generate 81 jobs (32 direct, 49 indirect) and generate an estimated \$35 million to the Greater Shepparton economy.
3. Other potential economic benefits include:
 - Direct and indirect investment into the local economy;
 - Generation of jobs;
 - Expansion of existing firms and creation of new local businesses;
 - Generates revenues from the recovery of material streams and/or the production of energy;
 - Recovery of economic value of many materials and products households now send as solid waste to landfill;
 - Minimises the impact of increasing landfill costs and the landfill levy;

- Extends the life of landfill sites;
- Facilitates private investment in Greater Shepparton;
- Contributes to the 'green' branding of Greater Shepparton.

4. Potential environmental benefits include:

- Reducing waste to landfill and requirement for new landfill sites;
- Increasing recovery of materials and energy;
- Decreased greenhouse gas emissions;
- Reduction in demand on virgin materials;
- Utilisation of agricultural and food processing discards;
- Production of green energy.

5. Potential social benefits include:

- Increased local job opportunities;
- Job development at a broad range of skill levels;
- Social ties established through working relationships;
- Increased local expenditure;
- Reduces community impact of waste management on the environment;
- Raises community awareness and interest in the importance of sustainable waste management;
- Potential training and employment for disadvantaged job seekers;
- Waste and recovery education opportunities for School and community groups;
- Reduction in disposal costs.

1. INTRODUCTION

1.1. BACKGROUND TO THE STUDY

Greater Shepparton City Council (GSCC) appointed Urban Enterprise to undertake a Feasibility and Site Selection Study for a Resource Recovery Precinct within Greater Shepparton in 2015.

The 'Industrial Land Review' (June, 2011) determined that there are significant challenges in accommodating material recycling facilities, eco industries and other such land uses that require extensive storage areas in Greater Shepparton. Resource recovery operations include waste processing and material recycling, such as composting, biogas cogeneration, and metal, glass and paper recycling. In this sense, resource recovery is primarily related to recycling, reprocessing and re-use of materials that would otherwise go to landfill, creating significant positive environmental outcomes.

A review of the current resource recovery facility located at Daldy Road, Shepparton was conducted by URS in 2012. The review included considerations of various opportunities and constraints to future development of the Daldy Road precinct. Current enterprises involved in the Daldy Road precinct include:

- Goulburn Valley Water's wastewater management facility, which treats the region's wastewater and reuses it for irrigation of surrounding farmland and tree lots;
- Diamond Energy, which uses the biogas produced by the wastewater management facility to generate renewable energy through a process of 'cogeneration';
- Veolia Environmental Services, operating a prescribed waste and septage receiving facility; and
- Western Composting Technologies, which operates the green / organic waste to compost plant material.

Based on the corporate risk to Goulburn Valley Water's interests posed by further development in the area and the implications on their EPA license, the Goulburn Valley Water Board resolved not to pursue formalised expansion of the Daldy Road precinct. Therefore, Council has not been able to direct potential investors to a formalised precinct that can accommodate their operations.

The limitations on future development of the Daldy Road precinct prompted consideration of the establishment of a new site in Greater Shepparton to service resource recovery operations.

This study explores the demand drivers and possible locations for a Resource Recovery Precinct in Greater Shepparton as well as a review of the Daldy Road site to establish whether the precinct is completely off the table or if an outcome can be resolved.

REPORT FORMAT

The report is presented in three parts:

Part A: Background

Part 1 provides an overview of the materials recovery and disposal sector, a literature review to confirm the strategic context and identify any issues and opportunities, a high level review of existing facilities in the region, a review of the Daldy Rd precinct, potential demand for resource recovery in the region, the environmental aspects (relating to EPA guidelines) and case studies of successful resource recovery precincts.

Part B: Issues and Opportunities

Part 2 provides an overview of the issues and opportunities associated with the establishment of a resource recovery precinct in Greater Shepparton.

Part C: Site Identification & Assessment

Part 3 provides identification of potential sites for assessment through an exclusion mapping exercise, establishes criteria for site selection and assessment, assesses identified potential sites through a site assessment matrix, indicative precinct development costs and a high level economic, social and environmental impact assessment.

CONSULTATION

This report has been prepared utilising various sources of information including consultation with stakeholders and referral authorities, review of existing reports and site inspections.

The following stakeholders have been consulted to date in the preparation of this report:

- Greater Shepparton City Council, with representatives from the following internal departments:
 - Planning;

- Environment;
 - Waste Management;
 - Economic Development / Investment Attraction;
 - Property & Business.
- Goulburn Valley Water;
 - Goulburn Broken Catchment Management Authority;
 - Goulburn Valley Waste and Resource Recovery Group;
 - CFA;
 - APA Group;
 - Goulburn Murray Water;
 - Environmental Protection Agency.

A draft report was put on exhibition in December 2015 to January 2016 to provide the opportunity for stakeholders and the community to provide input to the study.

121 submissions to the Draft Report were received.

Face to face meetings were also conducted with a range of submitters to the project. Over 40 face to face meetings were conducted on the 13th and 14th of April in Shepparton. A summary of the draft report consultation outcomes is included in Appendix A.

The feedback received on the draft report has been taken on board and is reflected in this final report.

PART A . BACKGROUND

2. OVERVIEW OF MATERIALS RECOVERY & DISPOSAL

2.1. INTRODUCTION

This section of the report provides an overview of materials recovery and disposal, including the main waste generating sectors, major material streams, current opportunities for main material streams and materials generated and recovered.

2.2. KEY FINDINGS: MATERIALS RECOVERY & DISPOSAL

The main waste producing sectors include Municipal Solid Waste (MSW) and Solid Industrial Waste (SIW), consisting of Commercial and Industrial waste (C&I) and Construction and Demolition waste (C&D).

There is opportunity to increase recovery of organics through municipal waste collection, supplemented by C&I organic waste, this is particularly applicable to the Goulburn Valley Regions fruit production and manufacturing sector. However, organics processing currently exists at the Daldy Road precinct and is therefore unlikely to move / relocate to a new precinct in the near future.

Recovery from the C&I sector could be substantially increased by: collecting more source separated material streams from C&I businesses and improving the sorting capability of Material Recovery Facilities so they generate high quality material streams attractive to re-processors; and using residual waste materials to generate energy products (such as electricity and process engineered fuels).

The C&D sector also presents significant opportunity for recovery and reuse of materials that would otherwise go to landfill.

Tyre recycling is a potential opportunity for resource recovery, however, there are generally low volumes required for soft surfaces produced from tyre recycling, and hence, the biggest opportunity in the short term future is for use in road base. Using rubber and tyres for waste-to-energy is currently not viable on a large scale in Victoria.

More infrastructure is required in regional Victoria to recover concrete, asphalt and brick.

There is opportunity to increase food waste and other organics resource recovery in Greater Shepparton and the Goulburn Valley Region given its agricultural and fruit production sectors.

ABOUT RESOURCE RECOVERY

Victoria's waste and resource recovery system manages over 12.3 million tonnes of solid waste each year. It includes over 590 businesses, employing around 8,000 people and has an annual turnover of \$2 billion¹.

The waste and resource recovery sector covers the generation, collection and drop-off, sorting, transfer, reprocessing, export, re-use and disposal of waste materials. These activities occur across all sectors of the economy, including households, businesses, industry and government.

The resource recovery sector involves a wide range of business activities including collection, sorting and processing of materials; repair, refurbishing or dismantling of equipment and wholesale or retail sales. The defining concept is that discarded materials, goods, and by-products are turned into saleable, useable materials and products.

Resource recovery benefits both the community and natural environment through reduction in disposal costs, creation of new revenue streams, creation of jobs, reduction in demand on virgin materials, increased use of recycled material and reduced waste and pollution.

¹ Waste Management and Environment, *Inside Waste Industry Report*, p.90, 2011-12

2.3. WASTE GENERATORS, MATERIAL STREAMS AND SECTORS

MAIN WASTE GENERATORS

Table 2 provides an overview of the main waste generating sectors, including Municipal Solid Waste (MSW) and Solid Industrial Waste (SIW), consisting of Commercial and Industrial waste (C&I) and Construction and Demolition waste (C&D).

TABLE 2 MAIN WASTE GENERATING SECTORS

Type		Waste Generated By:
MSW		Households, including hard waste, recyclables, organics and residual waste (garbage).
SIW	C&I	Food, beverage and tobacco enterprises; food retailers; accommodation providers, cafes and restaurants; property and business service enterprises; public sector agencies; education institutions, manufacturers and industry
	C&D	Residential, civil and commercial C&D enterprises.

Source: Sustainability Victoria, Statewide Waste and Resource Recovery Infrastructure Plan, September 2013

MAJOR MATERIAL STREAMS & GENERATING SECTORS

Table 3 shows the main material streams and the most prominent generating sectors.

TABLE 3 MAJOR MATERIAL STREAMS AND SECTORS

Material		Prominent Generating Sectors
Organics	Food Waste	MSW, C&I
	Garden Organics	MSW, C&I
	Wood/timber	C&I, C&D
	Textiles	MSW, C&I
	Other Organics	C&I
Commingled recyclables	Paper/cardboard	MSW, C&I
	Glass	MSW
	Plastics	MSW, C&I, C&D
Tyres		C&I
Metals		MSW, C&I, C&D
Concrete/bricks/asphalt		C&D
Other (including electrical and electronic waste, household goods, materials from office refurbishments, plasterboard)		MSW, C&I, C&D

Source: Sustainability Victoria, Statewide Waste and Resource Recovery Infrastructure Plan, September 2013

2.4. MATERIAL STREAMS

An overview of the key material streams is provided below. This information has been sourced from *the Statewide Waste and Resource Recovery Infrastructure Plan*, Sustainability Victoria, 2013.

ORGANICS

A significant amount of organic waste is generated in Victoria. There is opportunity to increase recovery of organics through municipal waste collection, supplemented by C&I organic waste, this is particularly applicable to the Goulburn Valley Regions fruit production and manufacturing sector. Organics processing currently occurs at the Daldy Road precinct on a significant scale.

FOOD ORGANICS

A significant amount of food organics goes to landfill. There is a significant lost opportunity of this waste going to landfill. The greatest opportunity for large scale food organics recovery exists in metropolitan Melbourne, Geelong and large regional centres.

An option that exists in this sector that may be applicable to the Goulburn Valley Region is to use source separated food organics to produce energy, process derived fuels and other products. One factor underpinning the success of this option is establishing new collection systems that complement existing kerbside systems for households, and new systems designed specifically for C&I sources².

GARDEN ORGANICS

There are opportunities to build on reprocessing capabilities in the Goulburn Valley region. Industry has the opportunity to secure base flows from kerbside collections through long term contracts. These base flows can be supplemented with organic waste from other sources, including C&I sector.

Windrow composting is an opportunity in regional areas, because of buffer requirements and potential amenity issues. Adequate management and quality control procedures would need to be established.

² Source: Sustainability Victoria, *State-wide Waste and Resource Recovery Infrastructure Plan*, September 2013

WOOD & TIMBER

There are opportunities for greater recovery of timber in metropolitan Melbourne, Geelong and larger regional centres, including Shepparton.

There are opportunities to improve source separation and recovery of timber in residential construction, commercial fit outs, demolition sectors, and C&I packaging.

PAPER, CARDBOARD, GLASS & PLASTICS

A mature industry already exists for sorting and reprocessing commingled recyclables collected by local government agencies.

Recovery from the C&I sector could be substantially increased by:

- Collecting more source separated material streams from C&I businesses by improving their ability to separate material streams onsite, and by making materials collection convenient and economically viable;
- Improving the sorting capability of MRFs so they generate high quality material streams attractive to re-processors;
- Using residual waste materials to generate energy products (such as electricity and process engineered fuels).

TYRES & RUBBER

Research suggests that at least 51,000 tonnes of tyre rubber is not being reprocessed each year in Victoria and represents a potential opportunity for industry³. An additional unknown quantity of other rubber products is also not being reprocessed. Most reprocessing involves shredding the tyres for use in making soft surfaces. There is however, generally low volumes required for soft surfaces, hence, the biggest opportunity in the short term future is for use in road base. Using rubber and tyres for waste-to-energy is currently not viable on a large scale in Victoria. However, industry should be encouraged to continue market development of this technology.

METALS

Metals reprocessing is already a mature market which is driven by worldwide commodity prices.

³ Price Waterhouse Coopers, *An options framework for end of life tyres*, prepared on behalf of Sustainability Victoria, 2013

CONCRETE, BRICK & ASPHALT

There is a significant amount of infrastructure in Victoria to recover concrete, brick and asphalt, and there does not appear to be the need for substantial further infrastructure investment. However, more processing infrastructure is needed in regional Victoria, including the Goulburn Valley.

RESIDUAL WASTE

Residual waste is made up of materials that cannot currently be viably reprocessed from household and commercial waste and from residual materials from reprocessing facilities.

2.5. MATERIAL STREAMS GENERATED AND RECOVERED

Table 4 shows the key material streams generated, the amount landfilled and the amount recovered. There is opportunity to increase food waste and other organics resource recovery across the state. This would be an appropriate fit for Greater Shepparton and the Goulburn Valley Region given its agricultural and fruit production sectors and strategic location.

TABLE 4 MATERIAL STREAMS RECOVERED, LANDFILLED AND GENERATED, 2010-11

Material	Recovered (tonnes)	Landfill (tonnes)	Generated (tonnes)	Recovered (%)	
Organics	Food Waste	22,000	832,000	854,000	3%
	Garden Organics	815,000	242,000	1,057,000	77%
	Wood / Timber	107,000	285,000	393,000	27%
	Textiles	5,000	146,000	150,000	3%
	Other Organics	n/a	n/a	320,000	n/a
	Sub total	1,269,000	1,505,000	2,774,000	
Commingled Recyclables	Paper / cardboard	1,213,000	447,000	1,659,000	73%
	Glass	196,000	76,000	271,000	72%
	Plastics	146,000	178,000	324,000	45%
	Other plastics	0	216,000	216,000	n/a
	Sub total	1,555,000	916,000	2,470,000	
Tyres & Rubber	55,000	6,000	61,000	n/a	
Metals	1,390,000	65,000	1,455,000	96%	
Concrete/bricks/asphalt	4,194,000	861,000	5,055,000	83%	
Other	0	531	531	n/a	
Total	8,462,000	3,885,000	12,347,000	69%	

Source: Sustainability Victoria, Victorian Recycling Industry Annual Survey 201-11

3. LITERATURE REVIEW

3.1. INTRODUCTION

This section of the report provides a review of relevant literature, including both resource recovery related publications and relevant strategies. This will help frame the strategic context for the establishment of a resource recovery facility, as well as highlighting any relevant issues and opportunities.

3.2. KEY FINDINGS: LITERATURE REVIEW

There is a vast amount of literature related to waste and resource recovery. The documents reviewed pertain primarily to factors affecting the establishment of a resource recovery precinct in Greater Shepparton and the current Daldy Road precinct.

The key findings from the literature review are as follows:

- The establishment of a resource recovery facility in Greater Shepparton has been identified as a way to achieve sustainability and industrial development objectives, including alignment with the waste management hierarchy.
- The barriers to enhanced resource recovery in regional areas include: inadequate infrastructure; buffer distance requirements; legislative and statutory barriers; collection of non-municipal wastes; high processing costs; availability of low cost alternatives such as landfill; high capital investment cost; inexperience with new technologies; high transport costs; product quality and lack of supply.
- Local strategic policy is in support of increasing the amount of waste that is diverted from landfill and increasing resource recovery operations through a variety of policy and strategic objectives.

The Council policy aims to:

- Encourage and attract innovative renewable and alternative energy industries/ businesses development within the municipality.
- Provide (as far as practicable) best practice waste management services to the Greater Shepparton community.
- To increase the recovery of resources and minimise the quantity of waste going to landfill.

The only licensed municipal landfill is at Cosgrove (east via Midland Highway). The amount of waste going to landfill at Cosgrove needs to be reduced.

The majority of Shepparton's industrial land is located to the east of the city centre. Despite this the proposed Shepparton Bypass will be relocated to the West.

The Goulburn River has a major impact on east-west connectivity with all traffic being channelled through a single major route (the Peter Ross Edwards Causeway) traversing the river course and flood plain.

Areas for future residential growth in the municipality include the North Growth Corridor; the South Growth Corridor; the Mooroopna West Growth Corridor; the North-East Growth Corridor and the South-East Growth Corridor. Planning for a resource recovery precinct should have regard to the locations of existing and future residential areas.

Landfills that have either been closed or are scheduled for closure can transition to other resource recovery activities, continuing the provision of services to the community and improving recovery options.

Certain criteria should be addressed in order to establish a precinct of state-wide significance.

There is significant opportunity in Greater Shepparton for increased resource recovery operations particularly in garden organics collection & recovery, municipal food waste recovery industrial organics recovery, recovery of construction and demolition materials, concrete crushing and reuse, collection of agricultural plastics and energy generation.

3.3. RESOURCE RECOVERY STUDIES

REVIEW OF RESOURCE RECOVERY PRECINCT, DALDY ROAD, SHEPPARTON, GSCC & GOULBURN VALLEY WATER, 2012

URS Australia Pty Ltd prepared a review of the Daldy Road precinct, including outlining opportunities and constraints for the precinct and providing recommendations relating to its future development.

The report made the following recommendations and conclusions:

- The Resource Recovery precinct is located adjacent to the Shepparton Wastewater Management Facility at Daldy Road, close to the centre of a large expanse of land owned and managed as a buffer by Goulburn Valley Water.
- The site is on the flat surface of the Goulburn River floodplain and contains two existing developments: a composting facility and liquid waste facility.

- The site also contains a site of Aboriginal cultural heritage sensitivity and may contain native vegetation.
- The formal establishment of a resource recovery precinct was supported by Goulburn Valley Water (GVW), and Greater Shepparton City Council. However, in more recent times the potential corporate risk posed to GVW's operations resulted in no formal expansion of resource recovery operations at Daldy Road. This is primarily related to industrial development in the current EPA corporate licence area posing a corporate risk to GVW, including odour, dust, noise, waste management and stormwater contamination.
- Anecdotally, there is interest from local industries to establish in the area.
- URS prepared two precinct layout options for the Daldy Road precinct, including cost estimates for partial and full service provision. The options included retention and diversion of flood flows.
- The key considerations with implications for the future of the precinct included:
 - Precinct design and flood management requirements;
 - Precinct wide approvals;
 - Commercial return expected from the precinct compared to the cost of commencing works;
 - Risks to GVW posed by the operations of tenants within the licensed premises boundary.

ANALYSIS OF MARKET DRIVERS & OBJECTIVES FOR RESOURCE RECOVERY IN REGIONAL VICTORIA, HYDER CONSULTING, 2009

This report prepared by Hyder Consulting was prepared for Sustainability Victoria to assist the process to identify future directions for Victorian Regional Waste Management Groups (RWMGs). It provides a market analysis for the recovery of waste in regional Victoria and identifies regional objectives for resource recovery and future roles of regional bodies in Victoria.

The key points from the report relevant to this study are as follows:

RESOURCE RECOVERY STATISTICS:

- Regional Victoria generates about 26% of Victoria's solid waste each year, comprising municipal waste (7%), commercial and industrial waste (8%), construction and demolition wastes (11%).
- The recovery rates for each of these wastes are: municipal (37%); commercial and industrial (55% to 65%); construction and demolition (35% to 50%).
- Organic wastes are a significant component of the municipal commercial and industrial waste streams.

RESOURCE RECOVERY ACTIVITY & MARKETS:

- **Concrete Crushing and Reuse** – "Markets for concrete products are usually located close to sources of waste generation due to high unit transport costs and the relatively low value per tonne of recovered product. Some limited cross regional movement of C&D products takes place subject to the proximity between markets and reprocessing facilities. At some resource recovery centres (RRC) as well as privately run sites in regional Victoria, concrete is crushed and reused in a range of applications e.g. road base, drainage, irrigation infrastructure (e.g. channel stops) and on-farm works. There is limited collection of residential sourced demolition concrete due to asbestos concerns. The viability of concrete recycling is lower in more remote, low populated communities".
- **Steel Recycling** – "Facilities for steel recycling are widely available at RRCs in regional Victoria. Steel is generally collected and transported to Melbourne for reprocessing. Some regional contracts are in place for steel recycling (e.g. North Eastern region). The Desert Fringe RWMG has negotiated with a steel firm for the collection at farm of surplus steel, with proceeds returned mainly to farmers with a small commission paid to member councils".
- **Garden Organics Collection & Recovery** – "Council-run kerbside collection of organics takes place in seven of the RWMGs. Garden organics are also recovered from drop-off facilities provided at RRCs and landfills."

"Most of the recovered garden organics is chipped and made available to residents and businesses at drop off centres at landfills and RRCs, or used for low grade applications such as landfill rehabilitation. The mulch generated is usually not subject to a controlled pasteurisation process and hence there are risks of spread of weeds and pathogens. This has been a barrier to market expansion of recycled products, in particular into the agricultural and horticulture sectors."

Only two enclosed processing facilities for garden organics have been identified: one each at Shepparton (Goulburn Valley) and Dutton Downs (Gippsland)."
- **Municipal Food Waste Recovery Programs** – "In regional Victoria, council run organics recovery programs have focussed almost solely on garden organics. With the exception of two local councils (Colac Otway Shire Council, in the Barwon region and Corangamite Shire Council, in the South Western region) municipal food organics are not recovered".
- **Municipal Kerbside Recycling** – "Municipal kerbside recycling is well established across regional Victoria, with about 90% of residential properties in regional and rural areas currently provided with a kerbside recycling service. The quantity of kerbside recyclables collected as a proportion of total domestic wastes collected is about the same in regional Victoria (33%) as for metropolitan Melbourne (32%). Most of the collected material (either in sorted or mixed form) is transported to metropolitan Melbourne, where it is sorted as required, sold to re-processors or

exported. There is a trend towards consolidation of MRF capacity into larger facilities that are able to achieve higher levels of recovery at lower unit costs. Small scale sorting facilities may, however, continue to be viable in some regional areas”.

- **Industrial Organics (excluding timber) Management & Recovery** - “A range of techniques are applied to manage and recover organics generated by industry in regional Victoria, in particular where large quantities of single stream organics are generated at industrial facilities. Many recovery pathways and markets for industrial organics fall outside Sustainability Victoria’s data capture programs. Management and recovery methods include:
 - Reuse of food processing waste as stock feed (understood to occur in several regions);
 - Composting of bedding material from animal husbandry (straw, sawdust, wood shavings, manure, e.g. from piggeries, feedlots and poultry operations);
 - Use of rice hulls and grape marc as animal bedding;
 - Land farming (e.g. commercial sludges, food processing waste, biosolids, manure and animal bedding material);
 - Anaerobic digestion to recover biogas to produce heat and electrical energy (animal manure, fruit processing waste); and
 - Burning of organics on rural properties and farms.”
- **Timber Waste Recovery** – “Established programs exist for recovery of timber waste, including pallets and packaging, sawdust and other forestry residuals and other timber wastes. Where it is not viable to reuse or recycle timber waste into timber-based products such as pallets, boxes and particle board, timber waste is generally either composted or used for energy recovery in applications such as:
 - Cogeneration of timber wastes to recover energy in cement production (Barwon region);
 - Timber wastes used as a fuel for industrial facility boilers as well as at timber mills for drying; and
 - Export of shredded timber residues for energy production.

It is noted that there is large unsatisfied demand for premium pine shavings within the Goulburn Valley region due to contraction in logging.”

- **E-Waste Recovery Programs** – “E-waste recovery programs have been established in a number of regions, where e-waste is collected at drop off points at RRCs, stockpiled and transported to regional facilities for disassembly and sorting. E-waste disassembly facilities have been established at Eaglehawk (Enhance IT), Geelong (GDP Industries),

Mildura (Around Again), Swan Hill (Transpacific), Wodonga (The Recovery GAME) and Warrnambool (Vantage Incorporated).

A barrier to the ongoing viability of e-waste recovery programs is the availability of markets for sorted material. Problems are currently being experienced with some re-processors not fulfilling agreements for the acceptance of this material, leading to stockpiling and reduced financial viability. This is understood to be largely due to commodity price falls over the last 12 months.”

- **Collection of Agricultural Plastics** – “Agricultural plastics include silage wrap, mulch films used in vegetable and cut flower growing, trickle tape subsurface irrigation tube, baling twine, silo bags, grain and fodder pit covers. These are generated in large volumes in some agricultural regions, including Central Murray, Goulburn Valley, North Eastern, South Western, Barwon, Mildura and Gippsland.

While re-processors are available for this material, its bulky nature, coupled with the need to clean and bale it prior to transport to re-processors or for export, have made agricultural plastics recovery challenging in many regions.

Other agricultural plastics, including pipes, are somewhat difficult to manage due to contamination with soil and other matter.”
- **Glass Collecting & Sorting** – “Glass collected through kerbside recycling programs is typically transported to metropolitan Melbourne either sorted or mixed with other kerbside recyclables. Being a heavy material of relatively low value per tonne (i.e. compared to metals and plastics), coupled with problems associated with breakage and glass fines, it is proving costly to recover and has reduced the viability of recycling programs in some regional areas. This is particularly relevant in more remote areas e.g. Swan Hill, Mildura, East Gippsland and Desert Fringe”.
- **Plastics Reprocessing** – “Most plastics recovered in regional Victoria are transported to metropolitan Melbourne for sorting as required and reprocessing. Some regional processing facilities and markets have been established (e.g. Ausplaztik (Mildura), RPM Pipe (Lancaster, Goulburn Valley region), Signum (Wodonga, North Eastern region) and The Green Pipe (Echuca-Moama, in the North Eastern region). There appears, however, to be significant further potential to enhance plastics recovery in regional Victoria, particularly from industry, through establishment of regional collection and processing facilities.”

BARRIERS TO ENHANCED RESOURCE RECOVERY AND THE DEVELOPMENT OF LOCAL MARKETS:

TABLE 5 BARRIERS TO ENHANCED RESOURCE RECOVERY

Primary	Secondary
Inadequate Infrastructure for processing of waste materials into marketable recycled products	Legislative and statutory barriers
	Buffer distance requirements
	Inability for RWMGs to plan for non-municipal wastes under the EP Act 1970 (and therefore to influence the collection of waste materials from businesses and hence the need for processing infrastructure).
	High processing costs due to small collected volumes in some areas. This is influenced by participation levels and population size.
	Availability of lower cost alternatives such as landfill disposal and on-site disposal/use of agricultural organic wastes.
	High capital investment cost.
	Experience with complex technologies.
High production costs of recycled products compared with competing products sourced from virgin materials.	High processing costs due to small collected volumes.
	High transport costs (from collection to processing and from processing to markets).
	Cost of preparation of waste materials for transporting to reprocessing factors.
Perception that recycled products may be inferior to those produced from virgin materials.	Product quality
	Industry and community perceptions
Market failures	Significant drop in recycled product prices and consequential contract failure.
	Availability of supply – a lack of supply reduces demand.

Source: Hyder Consulting, 2009

3.4. STRATEGIES & POLICIES

3.4.1. STATE POLICY

STATEWIDE WASTE AND RESOURCE RECOVERY INFRASTRUCTURE PLAN 2013-2043, VICTORIAN STATE GOVERNMENT, 2013

This plan provides the background and evidence to support planning, at a state-wide level to create the environment in which the industry can invest with certainty. The plan identified major opportunities to increase the recovery of valuable materials from the waste stream, including:

- Increased recovery of garden and food organics;
- Improved source separation to increase recovery rates of paper, cardboard and timber;
- Increased recovery of glass and tyres;
- Smaller scale recovery of construction and demolition waste in regional areas;
- Increased recovery of shredded flock and plastics (particularly film plastics).

The goals and priority actions of the Plan include:

- Facilitate efficient markets by consolidating materials streams to establish economies of scale that attract industry investment;
- Maximise the recovery of valuable resources from waste streams;
- Support the 'Getting Full Value' action to facilitate the long term purpose of landfills to only receive treated residual waste;
- Provide industry, local government, metropolitan and regional WMGs and other government agencies, with information and guidance to inform planning at the state, regional and local levels.

The report also provides key opportunities for the sector. Those relevant to this study include:

- **Protect suitable land for waste and resource recovery activities:**
 - An important consideration in attracting industry investment is that the site will remain available over the term of the investment;
 - Poor planning decisions in the past have allowed the co-location of incompatible activities adjoining sites, within buffers or closely located to waste and resource recovery activities;

- Preserving sites for waste and resource recovery activities does not mean that activities on these sites do not change. Landfills that have closed or are scheduled for closure can transition to other resource recovery activities, including transfer stations and resource recovery centres. This continues the provision of services to the community and improves recovery options.
- **Encourage best practice management of recovery infrastructure:**
 - Designing sites to be operationally efficient and safe;
 - Identifying, understanding and managing social and environmental impacts;
 - Monitoring and measuring the quality of materials accepted and produced;
 - Providing staff with skills they need to implement best practice;
 - Understanding market preferences;
- **Best practice management of recovery infrastructure involves:**
 - Maximising return on investment;
 - Reducing operating risks;
 - Improving the infrastructure's ability to sort effectively;
 - Reducing contamination;
 - Resulting in greater quantities of better quality of feedstock for reprocessing.

The report identifies that there is potential opportunity to increase the recovery of garden organics utilising cross regional flows from Geelong, Ballarat, Bendigo and potentially Shepparton. If established this would need to be supported by appropriate transfer stations and resource recovery centres.

STATE PLANNING POLICY FRAMEWORK: CLAUSE 19 INFRASTRUCTURE

Included in the State Planning Policy Framework is **Clause 19.03-5 Waste and Resource Recovery**. The objective of the policy is to:

'Avoid, minimise and generate less waste to reduce damage to the environment caused by waste, pollution, land degradation and unsustainable waste practices'.

The strategies to achieve this objective include:

- Establish new sites and facilities to safely and sustainably manage all waste and maximise opportunities for resource recovery.

- Encourage facilities for resource recovery to maximise the amount of resources recovered.
- Provide sufficient waste management and resource generators and resource recovery businesses to locate in close proximity to enhance sustainability and economies of scale.
- Ensure buffers for waste and resource recovery facilities are defined, protected and maintained.
- Site and manage waste and disposal and resource recovery facilities in accordance with the **Waste Management Policy (Siting, Design and Management of Landfills)** (EPA 2004).

ENERGY FROM WASTE GUIDELINES, EPA, 2013

This document provides high-level guidance for industry, government and the community on EPA's expectations and requirements for the siting, design, construction and operation of waste to energy facilities.

Waste to energy describes a number of treatment processes and technologies used to generate a useable form of energy from waste materials. Some waste streams are recognised as posing limited risks to the environment and human health and are considered as acceptable feedstock for energy recovery, including:

- Biomass from agriculture;
- Residues from plantation forestry and sawmilling operations;
- Untreated wood waste;
- Recycled oil that meets the specification and standards set out in the Product Stewardship (Oil) Regulations 2000;
- Vegetable residue from virgin pulp production and from production of paper form pulp.

3.4.2. LOCAL POLICY

INDUSTRIAL LAND REVIEW, GSCC, 2011

Habitat Planning prepared the Industrial Land Review in 2011 for Greater Shepparton City Council (GSCC). The review identified the need to establish a precinct for resource recovery operations. It recommended that support be given to the establishment of a Resource Recovery Precinct for its sustainability for industrial development. The report recommended that up to 4ha of land for Resource Recovery materials recycling be set aside.

GREATER SHEPPARTON HOUSING STRATEGY, GSCC, 2011

The Greater Shepparton Housing Strategy was prepared by David Lock Associates in conjunction with CAPIRE Consulting, Essential Economics and GHS in 2009. The study has subsequently been updated by GSCC in 2011. The strategy outlines areas for future residential growth in the municipality.

These areas include:

- The North Growth Corridor
- The South Growth Corridor
- The Mooroopna West Growth Corridor
- The North-East Growth Corridor
- The South-East Growth Corridor

Identification of a resource recovery precinct will need to take account of the proximity to existing and future residential land use in order to mitigate potential conflicts.

WASTE AND RESOURCE RECOVERY MANAGEMENT STRATEGY 2013-2023, GSCC, 2013

GSCC prepared a review of its Waste and Resource Management Strategy 2013-2023 to guide how it deals with waste in the future.

The report was developed to address existing and emerging waste management issues faced by the Greater Shepparton region. The report acknowledges that landfills are running out of tipping space and there is a need to establish a more sustainable approach to the way waste is managed.

The key objectives relevant to this study include:

- Reduce waste, increase resource recovery;
- Focus on diverting organic waste from landfill to minimise current and future financial and environmental liabilities;
- Provide an efficient, convenient and safe resource management system for residents;
- Develop partnerships to develop and deliver sustainable services;
- Support innovation in resource management and look for opportunities to maximise sector development in the Greater Shepparton region.

The Strategy contains a number of future directions in regard to resource recovery, including:

Resource Recovery

- Where possible support implementation of the State Waste Resource Recovery Policy 'Getting Full Value' strategies and continue with resource recovery and environment initiatives currently in place;
- Work with GV Food Processors Group and other commercial and industrial waste generators to develop detailed initiatives to achieve process targets;
- Identify waste reduction and resource recovery opportunities and provide further recommendations to capitalise on these opportunities.

Commercial & Industrial Waste

- Determine the significant source of waste generation by the commercial and industrial sectors and means of intervention for improved waste reduction and resource recovery.

Waste Disposal

- Continue to commit to the development of gas collection control at the Cosgrove landfill sites;
- Continue to improve procedures to dispose of commercial and industrial waste and increase where possible, the amount of material being recycled;
- Investigate the possibility of developing a site for a pre-sorting facility that allows for the pre-inspection of all wastes for recovery prior to disposal.

Hard Waste

- Continue to identify opportunities at Council's three resource recovery facilities for the improved recovery of hard waste materials.

Resource Recovery Centres

- Maintain the existing level of service at Council's three resource recovery facilities and continue their operation on a current cash loss basis funded through the garbage charge;
- Finalise the design of the redevelopment proposed for the Shepparton Resource Recovery Centre in accordance with Best Practice and arrange to call tenders for construction;
- Continue to improve procedures to dispose of commercial and industrial waste and increase, where possible, the amount of material being recycled;
- Investigate the possibility of developing a site for a pre-sorting facility that allows for the pre-inspection of all wastes for recovery prior to disposal;
- Continue to investigate opportunities to improve material recovery at the resource recovery facilities and the landfill;
- Seek to participate in networks that investigate and encourage Best Practice operations at resource recovery centres;
- Investigate and improve the recovery and local market outlets for materials disposed at Council's three resource recovery centres, including:
 - Tyres – through the national product stewardship program;
 - Soil – through developing the products and outlets for soil conditioner where feasible;
 - C&D materials – especially timber, concrete and bricks;
 - Plastics – flexible plastics and PVC piping;
 - Whitegoods – fridges / washing machines / tumble driers etc.
- Continue to develop on-selling of recycled products at the Shepparton Resource Recovery Centre;
- Continue to monitor the performance of Council's three resource recovery centres against the 'Guide to Best Practice at Resource Recovery Centres' with a view to adopting new practices where appropriate and cost efficient.

Commercial Waste and Recycling Program

- Continue to maintain the existing kerbside waste collection services to commercial tenements where appropriate;
- Promote the commercial sector to use Council's kerbside waste collection service where appropriate;
- Consider the opportunities for food waste recovery from commercial premises if appropriate.

GREATER SHEPPARTON ENVIRONMENTAL SUSTAINABILITY STRATEGY 2014-2030, GSCC, 2014

The Greater Shepparton Environmental Sustainability Strategy 2014-2030 was prepared to ensure that environmental sustainability considerations are incorporated into all Council decision-making processes and operations.

Key outcomes from the strategy related to this project include:

Waste generation

- Municipal waste generation is high and is trending up;
- Waste diverted from landfill is high and is trending up;
- Municipal waste to landfill is moderate and is trending down.

Council's Environmental Commitment

- Using our resources wisely – waste and resource efficiency
 - There are significant costs associated with sending waste to landfill and projected population increases will continue to put pressure on waste reduction targets;
 - Council has provided very good services and facilities to ratepayers but significant waste management issues exist, including rubbish dumping and littering;
 - Opportunities to improve pre-sorting of community and industry generated waste needs to be explored further to decrease the quantity of waste going to landfill;
 - Planning for landfill alternatives needs to be part of Council's long term planning.
- Greater Shepparton City Council is committed to achieving the Victorian Government's landfill and resource recovery targets and identifying solutions to rubbish dumping and littering issues. Objectives and actions are shown in Table 6.

TABLE 6 OBJECTIVES & ACTIONS

	Objective	Action
3.3	Encourage and attract innovative renewable and alternative energy industries/ businesses development within the municipality.	Include the development of alternative, sustainable sources of energy generation within the municipality in the new Economic Development Action Plan.
4.2	Provide (as far as practicable) best practice waste management services to the Greater Shepparton community.	Implement the Waste and Resource Recovery Management Strategy (WRRMS) 2013-2023.
4.5	To increase the recovery of resources and minimise the quantity of waste going to landfill	Explore opportunities to reduce the amount of industrial and commercial waste material going to landfill. Explore opportunities to increase resource recovery through transfer station activities.

GREATER SHEPPARTON FREIGHT AND LAND USE STUDY, GSCC, 2013

The Greater Shepparton Freight and Land Use Study was prepared by Aecom Australia for GSCC in 2013. The key areas relevant to this study include:

- The only licensed municipal landfill is at Cosgrove (east via Midland Highway). The amount of waste going to landfill at Cosgrove needs to be reduced.
- The majority of Shepparton’s industrial land is located to the east of the city centre. Despite this the proposed Shepparton Bypass will be relocated to the West.
- The Goulburn River has a major impact on east-west connectivity with all traffic being channelled through a single major route (the Peter Ross Edwards Causeway) traversing the river course and flood plain.

GV LINK

- This is an identified industrial and logistics site to the south of Mooroopna that has the potential to be serviced by both road and rail. The advantages of this facility are that it provides the opportunity to concentrate industry on the western side of the city closer to the transport resources and the ultimate concentration of industry will make the

construction and operation of a new rail intermodal terminal more attractive than the current container terminal at Mooroopna.

- If a new intermodal facility is built, then there will be significant freight movement and land use impacts in the short, medium and longer term. These will need to be understood and mitigated against going forward.

3.5. STATUTORY REVIEW

REVIEW OF WASTE TRANSFER AND RECYCLING FACILITY PROVISIONS IN PLANNING SCHEMES, ADVISORY COMMITTEE, SEPTEMBER 2009

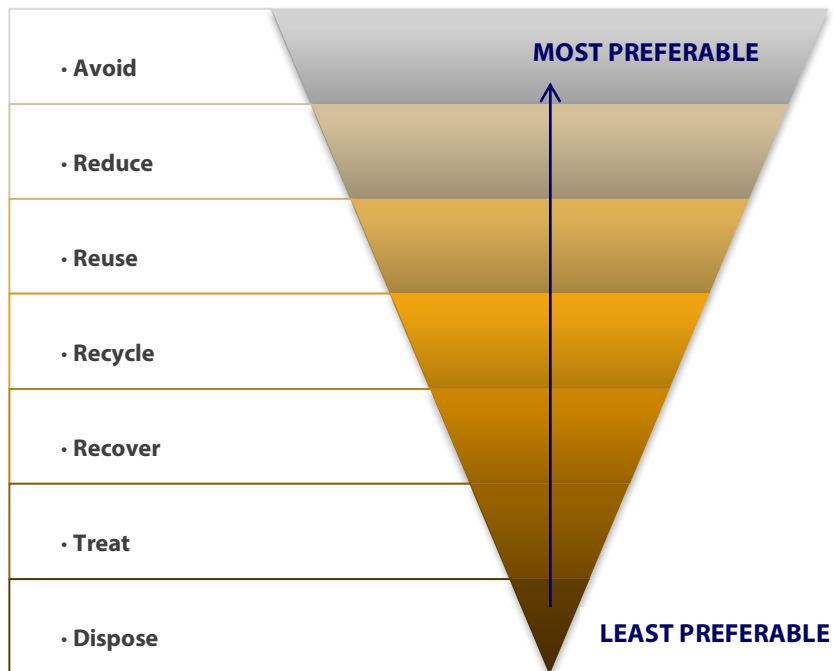
A Review of Waste Transfer and Recycling Facility Provisions in Planning Schemes was undertaken by an Advisory Committee in 2009. The review resulted in the following changes:

- Proposed new planning controls and new definitions for ‘transfer station’ and ‘materials recycling’ to respond to the introduction of new technologies and the increasing demand for resource recovery and reuse facilities.
- The planning provisions encourage recycling and resource recovery provided appropriate environmental and amenity safeguards are in place. The new requirements will limit where transfer stations and recycling facilities can be established. The provisions give local Councils additional power to place conditions on facilities to reduce their impact on the surrounding community. Conditions can include matters such as hours of operations, traffic management, buffers, setbacks and noise limits.
- Transfer stations and recycling facilities will not be established in residential and commercial zones. In all other areas, including industrial zones, a planning permit will be required.

3.6. THE WASTE MANAGEMENT HIERARCHY

The objectives, policies and strategies interlink to form a waste management hierarchy. The hierarchy was disseminated under the Environmental Protection Act. It places waste avoidance as the most preferred option and waste disposal as the least preferred option. This is shown in Figure 1 below.

FIGURE 1 WASTE MANAGEMENT HIERARCHY



4. EXISTING RESOURCE RECOVERY FACILITIES

4.1. INTRODUCTION

This section of the report provides an overview of the existing resource recovery context for the Goulburn Valley and Greater Shepparton region.

4.2. KEY FINDINGS: EXISTING RESOURCE RECOVERY FACILITIES

There are approximately 26 re-processors and 1 MRF in the GV WRRG region.

GVWRRG is the Regional Waste and Resource Recovery Group (RWMG) for the Goulburn Valley Region. GV WRRGs priorities include reducing waste and increasing resource recovery.

Greater Shepparton has the biggest cluster of resource recovery infrastructure in the Goulburn Valley region, including 1 commercial and industrial facility, 2 construction and demolition facilities, 5 organics processing facilities and the largest licensed landfill in the region (Cosgrove Landfill).

In Greater Shepparton there was a total of 15,699 tonnes of waste was disposed to landfill and 11,999 tonnes was recycled, a diversion from landfill rate of 43% in 2012/13.

Council operates three Resource Recovery Centres or transfer stations, the largest of which is the Shepparton Resource Recovery Centre. This centre has had re-development plans prepared, aimed at maximising material recovery but is yet to commence construction.

Greater Shepparton operates the Goulburn Valleys largest landfill at Cosgrove. Cosgrove 1 landfill is capped and producing energy, Cosgrove 2 is being filled and is approaching the end of its life and Cosgrove 3 is being prepared for landfilling. Cosgrove 3 has a surplus of land which may present an opportunity for the location of a resource recovery precinct.

There are opportunities to increase C&D re-processing across the region, including concrete, brick and other masonry materials and timber.

There are also opportunities for recovery of additional materials across the Region, particularly those for which there is no current capacity, or where capacity is concentrated to the north (organics and C&D).

4.3. GOULBURN VALLEY WASTE AND RESOURCE RECOVERY GROUP

There are seven Waste and Resource Recovery Groups (WRRGs) in Victoria. WRRGs are Victorian State Government statutory authorities. The WRRGs succeeded the former Regional Waste Management Groups (RWMG). The objectives of Waste and Resource Recovery Groups are:

- To undertake waste and resource recovery infrastructure planning to meet the future needs of its waste and resource recovery region while minimising the environmental and public health impacts of waste and resource recovery infrastructure;
- To facilitate efficient procurement of waste and resource recovery infrastructure and services for its waste and resource recovery region through the collective procurement of waste management facilities and waste and resource recovery services in the region;
- To integrate regional and local knowledge into State-wide waste and resource recovery market development strategies;
- To educate businesses and communities within its waste and resource recovery region to reduce waste going to landfill by using waste and resource recovery infrastructure and services efficiently; and
- To ensure Regional Waste and Resource Recovery Implementation Plans and programs are informed by local government, business and community and inform State-wide waste and resource recovery planning and programs.

In seeking to achieve their objectives the Groups are required to collaborate with Councils, Sustainability Victoria, the Environment Protection Authority (EPA), industry, business and the community.

The Goulburn Valley Waste and Resource Recovery Group (GVWRRG) includes the following member Councils:

- Greater Shepparton City Council;
- Campaspe Shire;
- Mitchell Shire;
- Strathbogie Shire;
- Murrindindi Shire;

- Moira Shire.

The major population and industrial centres in the GVVRRG region include Shepparton, Echuca, Kyabram, Yarrawonga and Seymour, with organics resource recovery widespread, and non-organics activity concentrated around the Shepparton and Echuca areas.

HUBS OF STATE IMPORTANCE IN THE GV REGION

The following facilities are identified as hubs of State importance in the GV region. Importantly, Western Composting and Cosgrove Landfill are two of the four identified hubs in the GV region, which are in the Greater Shepparton municipality.

TABLE 7 HUBS OF STATE IMPORTANCE IN THE GV REGION

Hub Area and Location	Why is it important to the State System?
Western Composting, Shepparton	This is a hub for organics processing and accepts garden organics for in-vessel composting from the surrounding regions. It is co-located with compatible activities and has sufficient buffers to increase organics processing activities.
Ellwaste Patho Landfill, Echuca	This landfill services a number of local government areas (LGA) and cross regional flows from the Central Murray, Calder and Highland WMG areas. It has the potential to expand its acceptance of both MSW and solid industrial waste (SIW) streams.
Cosgrove Landfill, Shepparton	This landfill serves a large population centre and a significant food processing sector that operates in the greater Shepparton region. It also accepts C&I waste from surrounding areas, including Benalla.
Hildene Landfill, Seymour	This landfill is likely to become important as the population of the Mitchell Shire grows. The risk from residential encroachment resulting in close residential development and incompatible land uses could impact the functionality of the site. This should be managed through preservation of adequate buffers and planning that ensures the establishment of compatible activities conducted in a manner that does not impact on the amenity of surrounding land users.

Source: Statewide Waste and Resource Recovery Infrastructure Plan, Sustainability Victoria, 2013

RESOURCE RECOVERY OPERATIONS IN THE GVVRRG REGION

There are approximately 26 re-processors and 1 MRF in the GVVRRG region. The majority of re-processors are in organics market, followed by plastics. On average, these re-processor facilities and the MRF employ on average 11 people. However, when outliers are removed (including major employers) the average per facility is 5 employees.

In addition to the businesses located in the GV region, there are a number of re-processors located in Moama, which are important contributors to the local resource recovery economy.

TABLE 8 RESOURCE RECOVERY OPERATIONS IN THE GV REGION

Facility Type	Number of Facilities	Average No. of Employees
Re-processor - Organics	15	19
Re-processor - Plastics	6	5
Re-processor - C&D	2	3
MRF	1	25
Re-processor - C&I	1	20
Re-processor - Metals	1	2
Re-processor - Other	1	5
	27	11 (5 excluding Outliers)

Source: GVVRRG, 2015

Re-processing capacity is generally strong for most materials across the Region. However, there are some capacity limitations:

- There are generally low levels of C&D capacity across the region;
- There is no tyres/rubber reprocessing capacity in the region;
- There is no glass reprocessing capacity in the region, with low value glass transported to Melbourne for processing.

There is potential to increase the recovery of major C&D materials such as concrete, brick and other masonry materials, and clean timber.

There are also opportunities for recovery of additional materials across the Region, particularly those for which there is no current capacity, or where capacity is concentrated to the north (organics and C&D).

Greater Shepparton contains a high proportion of the resource recovery infrastructure in the Goulburn Valley region. Facilities include:

- 2 construction and demolition re-processors;
- 1 commercial and industrial re-processor;
- 1 metal re-processor;
- 5 organics re-processors;
- 1 plastic re-processor.

SOURCE LOCATIONS OF REPROCESSED MATERIALS

Table 9 shows the source locations by material types for the 2013-14 financial year for the re-processors and the MRF in the region. The table shows that the majority of material across all material types is sourced from within the region. Greater quantities of comingled recyclables are sourced from regional Victoria outside of the GVMMRG region compared to in region sources.

The GVMMRG region receives high quantities of organic material from other regional Victorian destinations and metropolitan Victoria.

Glass, rubber and textiles are not re-processed / recovered in the GVWRRG region.

TABLE 9 SOURCE LOCATIONS OF MATERIALS RECOVERED IN THE GVWRRG REGION

Material Type	Source Location				
	Within Region	Other Regional Vic	Metro Vic	Interstate	Total
Aggregates, Masonry and Soil	4,200	300	-	-	4,650
Comingled recyclables	5,000	6,000	-	-	11,000
Paper and cardboard	2,400	-	-	-	2,400
Plastic	800	400	700	1,100	3,100
Glass	-	-	-	-	-
Metal	3,000	300	-	<100	3,300
Organics	75,500	13,200	18,800	200	106,700
Rubber	-	-	-	-	-
Textile	-	-	-	-	-
Hazardous Waste	100	-	-	-	100
Other	-	-	-	-	-
Total	91,300	20,700	19,500	2,700	134,200

Source: GVWRRG, 2015

4.4. LOCAL WASTE MANAGEMENT

Council Waste management in Greater Shepparton includes:

- Collection of waste and recyclables at the kerbside in wheelie bins, including:
 - Co-mingles recyclables;
 - Green organics;
 - Garbage (residual waste); and
 - Waste and recyclables from a range of residential, mixed use properties (schools, care facilities, council run facilities and small commercial properties);
- Street litter collection (including street litter bins);
- Street sweeping;
- Public Place Recycling (PPR);
- Collection of illegally dumped waste, usually hard rubbish;
- Collection of waste and recyclables generated at local Festivals & Events;
- Management and operation of three Resource Recovery Centres (transfer stations);
- Solid inert and organic (green waste and timber) waste and recyclables from residential properties disposed of at the Shepparton Resource Recovery Centre;
- Provision of 'drumMuster' and collection of 'E-waste', as a drop-off service at the Shepparton Resource Recovery facility;
- Provision of 'Detox your Home', collection and management service for drop-off of household hazardous/toxic waste at the Shepparton Resource Recovery Centre (e.g. household chemicals, motor oils, paint, car batteries, gas bottles etc.).

The cost to Council in providing these services is expected to increase over time.

WASTE COMPOSITION & QUANTITIES

Quantities and composition of waste and recyclable materials collected from across the Greater Shepparton municipality for the year 2012/13 are detailed in Table 10. The Table shows that 15,699 tonnes of waste was disposed to landfill and 11,999 tonnes was recycled, a diversion from landfill rate of 43%.

TABLE 10 QUANTITIES OF WASTE AND RECYCLABLE MATERIALS COLLECTED FROM RESIDENTIAL PROPERTIES IN 2012/13

	Recycled	Disposed to Landfill	Kg per household per year generated	
	Tonnes	Tonnes	Kgs	Kgs
Residential Collections				
Garbage		15,699	621	253
Commingled Recyclables	6,582		260	106
Green Organics	5,417		214	87
Bundled Green Waste				
Total generated	11,999	15,699		
Diversion Rate	43%			

Source: Greater Shepparton, Waste and Resource Recovery Management Strategy 2013-2023

COUNCIL'S RESOURCE RECOVERY CENTRES

There are three resource recovery centres (transfer stations) in the Greater Shepparton region, including:

- Shepparton Resource Recovery Centre, located on Wanganui Road, Shepparton;
- Ardmona Resource Recovery Centre located on the corner of Midland Highway and Turnbull Road, Ardmona; and
- Murchison Resource Recovery Centre, located on the closed Murchison landfill site.

Transfer stations are a critically important asset to the community and to Council. They provide an effective means of managing waste and recyclables. They allow businesses and members of the public an easy way to dispose of general waste and to recycle bulky items that are impractical for kerbside recycling along with materials such as plasterboard and mattresses that would generally be dumped at landfill. The waste accepted at the transfer stations must be suitable for landfill and therefore not include any liquid waste, chemicals or hazardous wastes.

SHEPPARTON RESOURCE RECOVERY CENTRE

The Shepparton Resource Recovery Centre (SRRC) is the largest in the Greater Shepparton region. The transfer station accepts domestic quantities of waste and recyclable material. Accepted materials include recyclables (paper, cardboard, plastic, glass, metal, tyres etc.), e-waste recycling, oil recycling and concrete, asphalt, bricks, roof tiles.

A major re-development is being proposed for the Shepparton Resource Recovery Centre. The design will be aimed at maximising material recovery, customer and operator safety and ease of use.

ARDMONA RESOURCE RECOVERY CENTRE & MURCHISON RESOURCE RECOVERY CENTRE

The Ardmona and Murchison centres are much smaller in size compared to the Shepparton centre. These centres accept domestic waste, recyclables, scrap metal, oil and green organics.

LANDFILLS

Currently, landfills are an important part of Victoria's waste management infrastructure. The report *Getting Full Value* (2013) strives that the long term purpose of landfills is to receive residual waste only.

Costs of establishing landfills are increasing, making resource recovery more economically viable. Landfills have steadily been decreasing in number, particularly in small regional landfills. Opportunities for landfills include co-locating recovery operations at landfill sites (for example, co-locate pre-sorting facilities to screen materials going to landfill, particularly at rural landfills where community access to resource recovery facilities may be limited).

This could help consolidate some material streams until it is economically feasible to collect them, and attract industry interest). A major advantage of co-locating recovery activities with landfills is that they can use the existing buffers, and are therefore less likely to have adverse impacts on the community.

The Greater Shepparton Council operates the Cosgrove Landfill. The area comprises a landfill site currently in operation, former landfills and future landfill areas. The area is located adjacent to quarrying operations operated by Boral. The Cosgrove landfill is of state significance and receives approximately 25,000 – 50,000 tonnes of landfill per annum⁴.

The Statewide Waste and Resource Recovery Infrastructure Plan (2013) notes that Commercial and Industrial waste from Benalla and Wangaratta probably goes to the Cosgrove Landfill, based on the low percentages of SIW received at the Benalla and Bowser landfills. The percentage of SIW accepted at Cosgrove Landfill is 60% being higher than the regional average of 42%.

Gas collection is currently undertaken at the Cosgrove 1 site by specialised company LMS. This process curbs the amount of methane gas that enters the atmosphere, which is considered to be a significant contributor to global warming. Untreated landfill gas can also cause odour issues and can be explosive under certain conditions. Council currently runs a gas collection

system at Cosgrove landfill, which generates power that is then put back into the City's power grid. Running this system significantly reduces the landfill's gas emissions and contribution to global warming.

Cosgrove 2 is the current landfill servicing the Greater Shepparton region. Cosgrove 2 is approaching the end of its landfill life at which stage the planned Cosgrove 3 will be completed and ready for use.

Council acquired the land for Cosgrove 3 and have undertaken planning investigations and commenced work to prepare the site for future landfill use.

The Cosgrove 3 landfill area may contain a surplus of land which will not be utilised for landfill operations or for stone quarrying. This land may present an opportunity for the location of a resource recovery precinct.

⁴ Source: Sustainability Victoria, Goulburn Valley region infrastructure, 2015.

5. THE DALDY ROAD PRECINCT

5.1. INTRODUCTION

This section of the report provides an overview of the Daldy Road precinct, including current land uses, a review of key reports undertaken in relation to the site and the issues surrounding the site.

URS Australia Pty Ltd prepared a review of the Daldy Road precinct, including outlining opportunities and constraints for the precinct and providing recommendations relating to its future development. Much of this section of the report is sourced from this work.

5.2. KEY FINDINGS: THE DALDY ROAD PRECINCT

Currently the area informally operates as a small scale resource recovery precinct with uses including a wastewater management plant (operated by GVV), Veolia liquid waste facility, Western Composting and Diamond Energy. GVV has formal lease agreements with these operators.

Daldy Road was earmarked as a potential suitable site for the expansion of formal resource recovery operations in the Shire; however, due to GVV's risk approach to development within the precinct, the precinct has remained unchanged, highlighting the difficulties associated with establishing a resource recovery precinct that is out of Council's control.

The precinct posed development constraints including potential flooding, buffer requirements, cultural and heritage issues and high infrastructure costs.

The location of a resource recovery precinct in close proximity to the WMF provided opportunity for the establishment of synergistic industries and uses, some of which are already occurring.

The uncertainty surrounding the potential for businesses to locate to the precinct and the inability for Council to direct potential businesses to the precinct means it is unlikely that the precinct can be formally earmarked for resource recovery.

There remains opportunity for niche businesses to locate to the precinct, which may demonstrate high synergies with GVV operations and not pose a risk to GVV's operations. These would need to be assessed on a case by case basis and agreed with GVV. Statutory controls could be applied to the land that specifies accepted uses, possible uses and prohibited uses, as well as strict development controls. This would need to be discussed and agreed between GVV and Council.

The Daldy Road precinct has highlighted the importance of Council being able to direct businesses to a formalised precinct. A formal precinct would enable Council to direct business to a designated area to undertake resource recovery operations. It would also enable industry to invest with confidence in the precinct, promoting regional environmental and economic development outcomes.

5.3. PRECINCT BACKGROUND

The land identified as the Daldy Road precinct comprises two adjacent land parcels owned by Goulburn Valley Water (GVW) on the southern side of Daldy Road, opposite the Shepparton Wastewater Management Facility (WMF). The two land parcels have a combined area of 30.6 ha.

The precinct is located approximately 6 kilometres north of Shepparton and approximately 2.5 kilometres north of the closest residential areas on the northern outskirts of Shepparton.

The precinct is located within the EPA licensed premises area of the Shepparton Wastewater Management Facility.

The buffer provided for the Wastewater Management Facility has prevented the encroachment of sensitive development in the vicinity of the WMF.

The EPA licensed premises for the Shepparton Wastewater Management Facility covers an extensive area extending north and south of Daldy Road. GVV's land to the north of Daldy Road contains numerous lagoons for the treatment of wastewater as well as land for irrigation of treated wastewater for pasture and woodlots.

Two operations are already well established in the north-west corner of the precinct under lease to GVV:

- Veolia liquid waste facility (leased area approximately 2 ha); and
- Western Composting green waste composting facility (leased area approximately 2.2 ha).

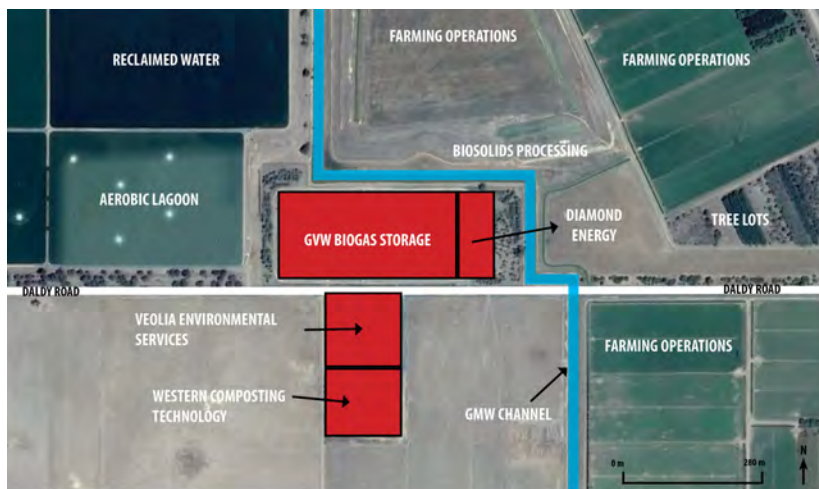
Diamond Energy operates an onsite biogas cogeneration plant on the WMF land.

The precinct is on the floodplain of the Goulburn River, located approximately 1.5 km east of the main river channel. A Goulburn Murray Water supply channel runs along the eastern boundary of the precinct, flowing south to north. The channel supplies irrigation water, as well as domestic and stock supply to various irrigators and rural landowners.

The precinct was awarded the 'Best Specific Environmental Initiative' at the 2010 United Nations Association of Australia World Environment Day Awards. This was in recognition of the sustainable industries that have located within the precinct, and the strategic partners in facilitating resource recovery industry in a location that benefits from existing buffers and provides a source of reusable waste streams. The recognition of the site as a resource recovery precinct prompted the consideration of formally establishing the area for resource recovery operations.

However, due to Goulburn Valley Water's adverse risk approach to development within the Daldy Road Precinct, the board formally resolved not to pursue the expansion of the precinct. The Board noted that individual projects may be considered on a case-by-case basis, should suitable, low risk development opportunities arise. These would include low emitting industries, with minimal employees which do not pose any form of threat to GVW's core business.

FIGURE 2 DALDY ROAD PRECINCT MAP



5.4. EPA LICENSING

The EPA has issued a corporate license to GVW under the category of sewage treatment plants for all of its sewage treatment facilities across its area of operations including the Shepparton WMF. The licence contains the following conditions as relevant to the precinct:

- "There must be no emission odours offensive to the senses of human beings beyond the boundaries of the premises as identified in the relevant plan of premises."
- "Biosolids must be managed in accordance with the 'Biosolids Management Plan' as approved in writing by EPA."
- There are also conditions relating to the discharge of wastewater to land and water.

Both Veolia and WCT have separate licenses from the EPA which have been obtained through the Works Approval Application process.

The buffer surrounding the Shepparton WMF is to protect residential amenity from odour under both normal operating conditions and upset operating conditions.

In terms of licence compliance and attributing cause of potential offsite complaint (odour, dust, noise or other nuisance or amenity issue), this overlap of premises presents the corporate risk to GVW.

5.5. EXISTING INFRASTRUCTURE

- **Daldy Road** - Road access is provided by Daldy Road, which is a sealed road of approximately 6 metres width. The road reserve is approximately 20 metres in width. Daldy Road crosses two irrigation channels, both of which are 6 metres wide.
- **Precinct Access Road** - A north south aligned sealed access road provides access to the eastern boundary of the two leased sites within the precinct. This road extends approximately 175 metres to provide vehicle access to Western Composting. The precinct access road is sealed to a width of approximately 7.5 metres and is located within a 19 m wide strip which is contained within the leased land.
- **Arterial Roads** - Daldy Road intersects with the Barmah-Shepparton Road, which intersects with the Goulburn Valley Highway.
- **Electricity** - The precinct is connected to the electricity grid via the overhead power lines along Daldy Road operated by Powercor.

- **Gas** - There is currently no natural gas transmission to the precinct. The closest gas pipeline (operate by APA group) is 2.7km away on Barmah-Shepparton Road. APA has advised that piping gas to the precinct is possible.

- **Potable Water** - A Goulburn Murray Water channel runs along the eastern boundary of the precinct and contains water diverted from the Goulburn River that could be utilised for industrial purposes.

Potable water is provided to the precinct via an underground pipeline along Daldy Road, however there is limited capacity and pressure.

- **Sewerage** - There is no reticulated sewerage system in the area of the precinct.
- **Recycled Water** - There is a GVW recycled water pipeline from the WMP to the precinct supplying Veolia only. However, this recycled water supply is limited to meeting Veolia's needs only.
- **Stormwater/ Drainage** - Two natural (unnamed) shallow drainage lines enter the precinct from the southern boundary and south-west corner, joining within the Precinct then flow north to Daldy Road. There are open roadside drains running along Daldy Road, flowing to the west towards the Goulburn River.

The existing industrial sites within the precinct are located on raised compacted earthen pads, to elevate the operations above the flood level. Stormwater runoff from the buildings and earthen pads is collected in onsite dams.

5.6. CURRENT LEASING ARRANGEMENTS

GVW has standard leasing arrangements with the existing tenants, with rents based on market rate for un-serviced industrial land. The existing leases commenced prior to the execution of the GVW corporate licence and are standard agreements that do not contain any obligations on tenants to comply with the licence, or to provide information to GVW that could be collected to quantify overall emissions from the precinct.

The leases have general provisions that require leases to remain within defined building envelopes, to maintain the premises, to comply with all relevant legislation and not to carry on any noxious or offensive activities.

5.7. POTENTIAL DEVELOPMENTS

URS undertook consultation with the existing operators in the Daldy Road precinct and the following proposed developments were identified:

- **Diamond Energy** – indicated (2011) that they would be interested in installing an additional generator to increase capacity. However, this may be limited to the amount of biogas that can be captured or whether an alternative biofuel can be readily sourced.
- **Veolia** – considered the future development of a dry waste sorting facility, comprising a 2,000m² shed, located adjacent to the existing premises. No indicative timing has been provided. GVW's approval and a Council permit is required before works can be considered.
- **Western Composting** – potential future development of two dry anaerobic digesters within the existing lease, and the potential future expansion of existing operations into adjacent areas.

EPA works approval is likely to be required if the anaerobic digester capacity and mass rate of air emissions trigger the Environment Protection Regulations.
- Other proposed potential developments:
 - Baling facility at Lemnos;
 - Wood-waste at transfer station.

5.8. CONSIDERATION OF APPROPRIATE TYPES OF INDUSTRY FOR DALDY ROAD

The URS report made recommendations relating to the types of industry that could be considered appropriate for the precinct. These include:

- **Resource recovery industries that demonstrate symbiosis with the WMF.** Industries that display direct industrial symbiosis benefit with the WMF, which would result in the most beneficial environmental outcome and justify the location of the precinct on the floodplain.
- **Resource recovery industries.** Industries that would contribute to the region meeting its resource and waste targets and that would attract tenants to the precinct and demonstrate environmental benefits.
- **General industry with buffer requirements.** Industry that is attracted to the precinct for the buffer requirements. These industries would not meet the environmental benefits test and would be difficult to justify locating in the precinct.

5.9. DALDY ROAD OPPORTUNITIES & CONSTRAINTS

The URS report outlined the following opportunities and constraints in relation to the Daldy Road precinct.

5.9.1. DEVELOPMENT & INFRASTRUCTURE

Development opportunities:

- All existing tenants have identified opportunities for potential expansion of existing operations and future development plans to be sited within the precinct.

Development constraints:

- No strategy exists for assessing types of industry that are appropriate for the precinct.

Infrastructure opportunities:

- Existing tenants have initiated an application to provide natural gas to the precinct.
- The WMF is viewed as a potential source of wastewater for reuse in the precinct.
- The precinct has several non-potable water supply options available, particularly recycled water from the EMF but also groundwater and untreated water from the GMW channel.
- Power, road access and telecommunications are provided to the boundary of the precinct on Daldy Rd.
- The construction of the Shepparton Bypass will improve access and reduce travel times to the precinct from the west and south of Shepparton.

Infrastructure constraints:

- The costs of providing infrastructure (mainly roads and drainage) to comply with Council's Infrastructure Design Manual would be significant.
- No provision of natural gas exists to the precinct. This is likely to be too expensive for just 1-2 tenants.
- Potable water supply to the precinct would need to be augmented. The high cost to upgrade all of the Daldy Rd water main back to Shepparton – Barmah Road would be high.

5.9.2. ENVIRONMENTAL

Buffers opportunities:

- GVW as the landlord has the means to manage siting of new development in the precinct. This can be located so as to ensure compatibility of operations and minimise internal impacts on adjacent operations.

- The WMF has an established buffer that ensures some protection from encroachment of sensitive uses for existing and future operations.

Buffers constraints:

- No coordination or management currently exists to quantify individual and cumulative impacts from the precinct.
- The Shepparton Housing Strategy identifies future residential development that will encroach into the buffer precinct.
- Under certain conditions, there are impacts from the WMF on residential areas, which could be increased with additional industrial activity in the precinct.

Groundwater opportunities:

- Groundwater suitable for industrial use is available at the precinct.

Groundwater constraints:

- Beneficial uses of groundwater would need to be protected from potential impact from industries in the precinct.

Geotechnical opportunities:

- Geotechnical constraints including shallow groundwater, can be managed through standard construction procedures.

Geotechnical constraints:

- The availability of suitable soil for construction of raised pads above the floodplain, could be a constraint.
- There is a risk of soil and shallow groundwater contamination from uncontained resource recovery activities including unplanned incidents (contaminants in raw materials, dust fallout, leachate spills/seepage).

5.9.3. REGULATORY ASPECTS

EPA licence opportunities:

- The precinct can be excised from the GVW corporate license to reduce regulatory risks.

EPA licence constraints:

- Potential for licensed premises boundary adjacent to the WMF.
- Regulatory risk to GVW of having tenant's operations occurring within GVW's premises.

- Compliance risk to GVW of excising precinct and needing to comply at boundary.
- Would require a whole-of-precinct assessment of cumulative impacts.
- Ability to distinguish the source of odour.

Statutory planning opportunities:

- GVW is the referral authority for planning permit applications in the precinct, providing a mechanism for GSCC and GVW to assess and approve developments.

Statutory constraints:

- Requirements for flooding analysis, amenity impacts for each application.

Leasing opportunities:

- GVW as land owner and landlord has the ability to put appropriate conditions on leases to manage risks and condition of the land.

leasing constraints:

- There are some legal limitations on what can be put into lease conditions.

5.10. DALDY ROAD PRECINCT DISCUSSION

The Daldy Road precinct was considered to be the ideal location for the establishment of a formal resource recovery precinct. This was due to the existing resource recovery operations located in the precinct and the potential synergies that could be established with the WMF. The precinct also has existing buffer areas provided by the WMF, which has prevented encroachment of sensitive land uses. These conditions were favourable to potential operators looking to establish resource recovery businesses. However, given the risks to GVWs corporate licencing the precinct has not undergone formal expansion.

The Daldy Road precinct highlights the importance of Council's ability to direct businesses to the precinct. Council needs to be certain it can direct business to invest in a precinct with reliability. Correspondingly, private enterprise needs assurance that they can establish their operations and invest under appropriate lease and/or ownership arrangements.

However, the Daldy Road precinct may still present potential opportunities for low emission businesses that demonstrate high symbiosis with the WMF and the existing businesses in the precinct and that have limited employees on site. This would have to be undertaken through discussion and agreement with GVW. Planning controls could be placed over select areas of land which dictate the types of uses and operations that could be located in this precinct. This would need to be undertaken through discussion and agreement between GVW and Council.

6. DEMAND FOR RESOURCE RECOVERY

6.1. INTRODUCTION

This section of the report provides an assessment of the demand for waste and resource recovery operations in Greater Shepparton. This is primarily a qualitative assessment and includes review of other studies and strategies.

6.2. KEY FINDINGS: DEMAND FOR RESOURCE RECOVERY

Population growth is a key driver of demand for resource recovery. Shepparton's population is expected to reach around 80,000 people by 2031. This will significantly increase the demand for waste and recovery services, particularly municipal waste services. The total annual waste generation in Greater Shepparton could be approximately 95,000 tonnes by 2031.

Transport plays a key role in demand for resource recovery operations, including the proximity to input sectors and end markets, as well as proximity to key transport infrastructure including roads and rail.

The number of building approvals in Shepparton has been steady for the last five years. Much of the waste produced from this sector largely goes unrecovered in Greater Shepparton. Revealing significant opportunity for increased recovery of materials from the C&D sector and supported by an audit of reprocessing infrastructure in section 4.

The Greater Shepparton area employed approximately 30,000 people in 2013/14. Commercial sector activity increases demand for recycled products, including packaging and recycled organics, which presents an opportunity for resource recovery in the municipality.

Greater Shepparton is central to the Goulburn Valley fruit growing and processing region. This sector presents unique opportunities for Greater Shepparton. This industry can be leveraged through resource recovery operations, particularly anaerobic digestion to recover biogas to produce heat and electricity and waste produced through fruit processing.

Several operators have approached Greater Shepparton City Council in search of sites in which to establish businesses related to the resource recovery sector. Existing businesses located in the Shepparton Activity Centre have also faced recent planning challenges, indicating the need for a precinct with limited planning restrictions on development.

6.3. POPULATION GROWTH

Population is one of the key drivers of recycling and demand for recycling and resource recovery services. Population growth increases material inputs, allowing the development of economies of scale and greater sized markets for end products. Growth in population also increase growth in non-domestic waste generation such as waste generated through increased construction and demolition and increased activity in the commercial and industrial sector.

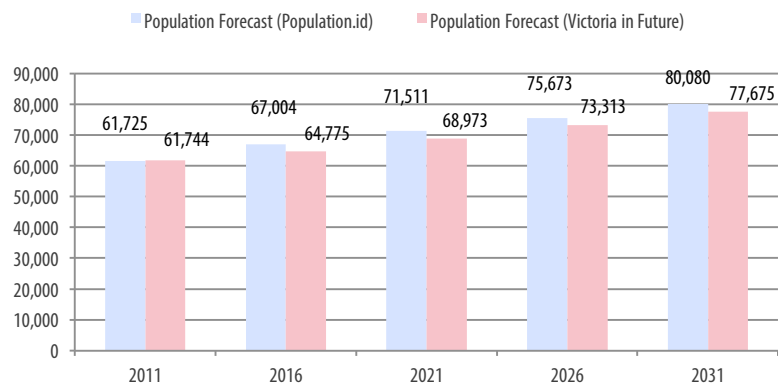
The forecast population of Greater Shepparton is shown in Figure 3 opposite. The chart shows forecast population by Forecast.id and population projections from Victoria in Future. Forecast.id estimates the population will reach 80,080 people by 2031. This is an increase of 18,355 people or 35% from the 2011 population. Victoria in Future estimates that the population of Greater Shepparton will increase to 77,675 people by 2031, an increase of 15,931 people or 26% from the 2011 population. The increase in population will bring an increased demand for waste and resource recovery services.

Population growth has been identified as one of the biggest challenges for waste management. The Victorian waste and resource recovery policy *Getting Full Value* (2013) states that:

- On average, each person generates just over two tonnes of waste per year;
- Over the last 10 years, there has been a 29% increase in the average amount of waste attributable to each Victorian every year;
- Victoria's annual waste generation increased from around eight million tonnes in 2000 to 12 million tonnes in 2011.
- Victorian waste generation is expected to continue increasing by around 4% per year, and may approach 17.4 million tonnes by 2022.

In 2012/13 there was 74,962 tonnes of waste and recyclables generated in the municipality. Using the Victoria in Future population estimates for Greater Shepparton (shown in Figure 4), the current ratio of waste produced per person and not accounting for escalation in per person waste generation, the total annual waste generation in Greater Shepparton could be approximately 95,000 tonnes by 2031.

FIGURE 3 POPULATION GROWTH IN GREATER SHEPPARTON



Source: profile.id, population forecasts, City of Greater Shepparton, 2011.

6.4. DEMAND FOR RECYCLING SERVICES

MUNICIPAL WASTE

Domestic kerbside recycling is strongly driven by population growth and community demand, which sees kerbside recycling as a way of actively participating in improving the environment.

Table 11 provides a summary of waste and recyclables generated and recycled in the municipality for 2012/13, including residential and other waste generators.

The Table shows that a significant proportion of the waste to landfill is contributed from the building and demolition, commercial and industrial sectors. This provides an opportunity to increase the level of recovered materials from these sectors through the establishment of a resource recovery precinct.

TABLE 11 SUMMARY OF WASTE & RECYCLABLES GENERATED AND RECYCLED IN THE MUNICIPALITY FOR 2012/13

	Total (tonnes)	Kg per household	Kg per person
Residential – waste to landfill	16,187	622	261
Residential – materials recycled	11,511	442	185
Non-residential – waste to landfill	24,777	952	400
Non-residential – materials recycled	-	-	-
Other – waste to landfill	3,857	148	62
Other – materials recycled	-	-	-
Facilities – waste to landfill	10,320	396	166
Facilities – materials recycled	8,310	319	134
Total	74,962 (diversion rate of 26%)		

Source: Greater Shepparton, Waste and Resource Recovery Management Strategy 2013-2023

The Statewide Waste and Resource Recovery Infrastructure Plan (2013) noted that the Goulburn Valley region generated an estimated 116,000 tonnes of waste requiring disposal to landfill in 2010-11. This is expected to increase to around 169,000 tonnes in 2041-42.

ECONOMIC ACTIVITY

Demand for resource recovery is affected by economic activity in the form of three core components, being construction activity, commercial activity and industrial and agricultural activity.

COMMERCIAL SECTORS

In the commercial sectors, demand for recycling is driven by financial and economic considerations as well as statutory obligations. There are also other drivers, including corporate responsibility and adoption and implementation of third party certified environmental management systems. Whilst there is demand for recycling services, demand for recycled products needs to be promoted through improved product market development.

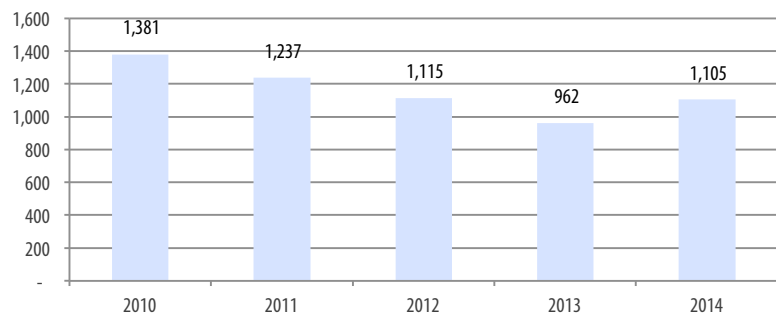
Commercial sectors produce a waste stream that has high levels of recyclables and organics, and often these are not well recovered.

The level of commercial activity, as reflected by the delivery of services by the above sectors, influences the total quantity of waste generated by this sector. Commercial activity can also influence demand for recycled products.

CONSTRUCTION ACTIVITY

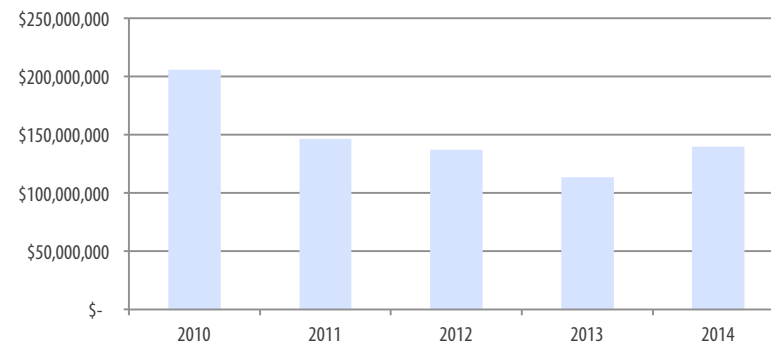
Construction projects generate large amounts of waste, including concrete, asphalt, bricks, rubble, soil and timber. An indicator of construction activity is the number of dwelling approvals per year. Figure 5 shows the number of building approvals 2010 and 2014 and Figure 6 shows the value of these approvals. There were 1,105 building approvals in Greater Shepparton in 2014, corresponding to a value of almost \$140 million. Building approvals increased in Shepparton between 2013 and 2014 after slight declines between 2010 and 2013.

FIGURE 4 NUMBER OF BUILDING APPROVALS GREATER SHEPPARTON – 2010 - 2014



Source: Victorian Building Authority, Building Approvals, 2015

FIGURE 5 VALUE OF BUILDING APPROVALS GREATER SHEPPARTON – 2010 - 2014



Source: Victorian Building Authority, Building Approvals, 2015

TRANSPORT⁵

The transport of recyclable materials from the sources of generation to markets is of primary importance to the viability of resource recovery in regional Victoria. The key issue associated with the transport of materials is the distance from markets and the standard of road and rail infrastructure.

INDUSTRIAL AND AGRICULTURAL ACTIVITY⁶

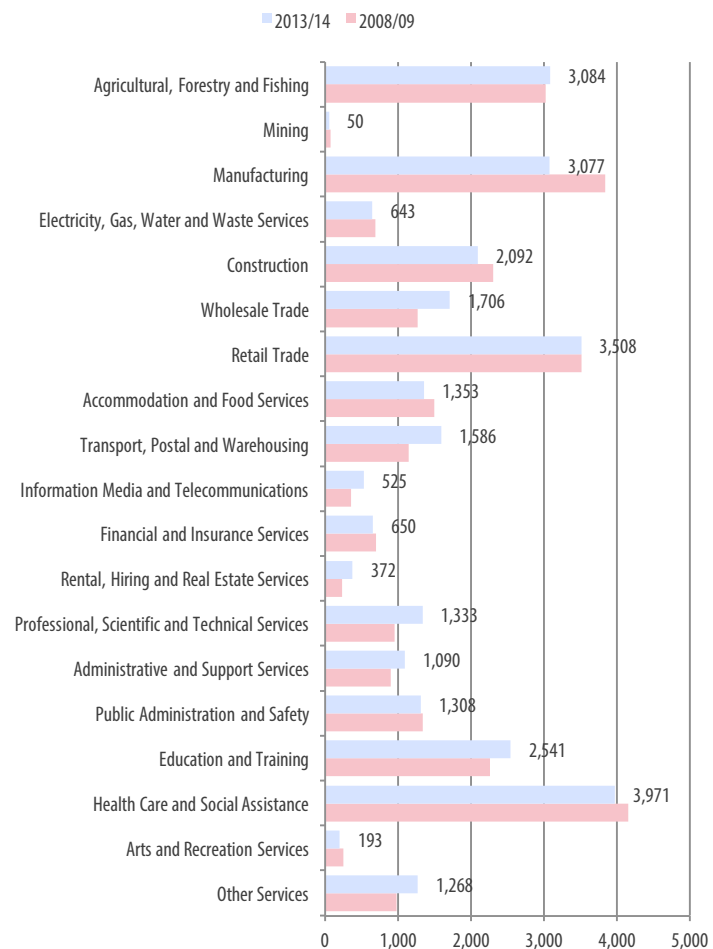
Waste generation in the industrial and agricultural sector increases as activity increases. Demand for recycled products, including packaging and recycled organics, would be expected to increase in some industrial and agricultural sectors as activity increases.

In 2013/14 Greater Shepparton was home to over 30,000 jobs. The majority of people were employed in Health Care and Social Assistance, Retail Trade, Agricultural, Forestry and Fishing and Manufacturing as shown in Figure 7.

⁵ Hyder Consulting on behalf of Sustainability Victoria, Analysis of Market Drivers and Objectives for Resource Recovery, June 2009

⁶ Hyder Consulting on behalf of Sustainability Victoria, Analysis of Market Drivers and Objectives for Resource Recovery, June 2009

FIGURE 6 EMPLOYMENT BY INDUSTRY – 2009/09 & 2013/14



Source: economy.id. City of Greater Shepparton, economic profile, 2015

THE GOULBURN VALLEY FRUIT GROWING INDUSTRY

The Goulburn Valley is the major producer of processed and fresh fruit at a national level. Fruit production in the region contributes significantly to the total national production value. The export market is small, but an important component of fruit production. Major fruits exported include apples, cherries, nectarines, peaches, plumes and pears.

Table 12 below shows the fruit production volume and proportion of national production in the Goulburn Valley Region. The Table shows that the Goulburn Valley produces high volumes and proportions of national fruit production for various fruits. This industry can be leveraged through resource recovery operations, particularly anaerobic digestion to recover biogas to produce heat and electricity.

TABLE 12 GOULBURN VALLEY FRUIT PRODUCTION

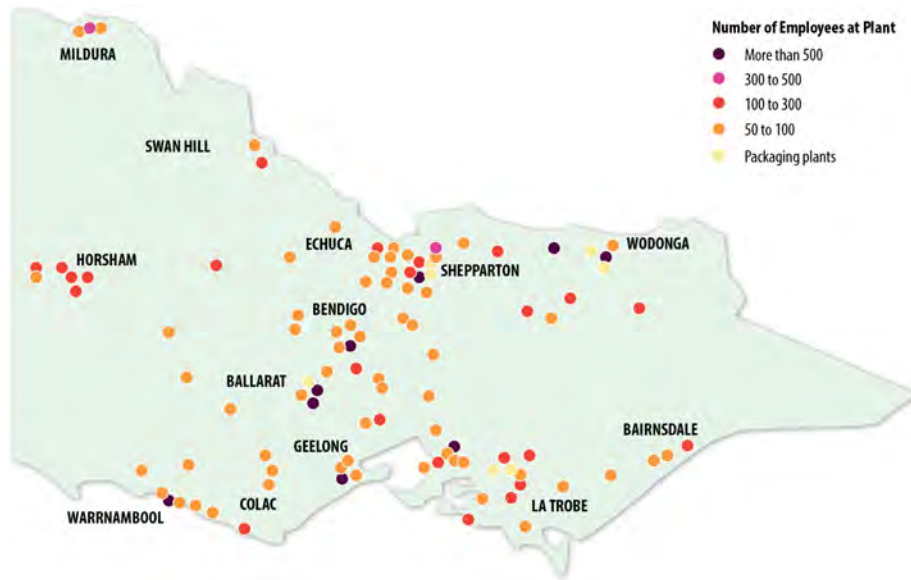
Commodity	Volume (tonnes)	National production (%)
Apple	82,617	28%
Apricot	5,768	43%
Cherry	1,184	11%
Nectarine	9,074	25%
Peach	42,425	70%
Pear (incl. nashi)	105,660	86%
Plum	7,724	49%

Source: Goulburn Valley Fruit Growing Industry Roadmap, RMCG, 2013

The food manufacturing sector is significant in Shepparton and the Goulburn Valley region. Major food processing companies include SPC Ardmona, Campbell's Soups, Tatura Milk and Unilever based in the Greater Shepparton municipality.

Figure 7 shows the Goulburn Valley Region has a high concentration of major food producing plants in Victoria. This high density of food processing plants and associated industries can be leveraged for waste which can be recovered through the establishment of a resource recovery precinct.

FIGURE 7 LOCATION OF MAJOR FOOD PROCESSING PLANTS



Source: Blue Environment Pty Ltd, Resource GV Biomass Survey, Draft, July 2011

OTHER DEMAND INDICATORS

Anecdotally, there has been significant interest by private operators in establishing businesses in the Greater Shepparton region that deal with waste and resource recovery. Council has not had a formal resource recovery precinct in which to direct these businesses. These businesses include tyre and plastics and other recycling, composting and energy generation. Veolia obtained funds and were hoping to establish an industrial waste facility at the Daldy Road precinct, however, the proposal was not supported by GVW and did not progress.

Furthermore, some existing businesses in the Shepparton area have faced significant planning challenges, particularly C&D processors.

The review of re-processing and resource recovery infrastructure in the GVWRRG region revealed that there are opportunities to increase C&D re-processing across the region, including concrete, brick and other masonry materials and timber. There are also opportunities in tyre/rubber re-processing and glass re-processing. It also revealed opportunities for recovery of additional materials across the Region, particularly those for which there is no current capacity, or where capacity is concentrated to the north (organics and C&D).

7. ENVIRONMENTAL ASPECTS

7.1. INTRODUCTION

This section of the report provides an overview of the environmental aspects for the establishment of a Resource Recovery Precinct, primarily relating to EPA buffer requirements, sensitive land use requirements and other site specific environmental considerations.

The EPA's role is to regulate pollution and has independent authority to make regulatory decisions under the Environment Protection Act 1970. Based on its regulatory risk model, the EPA prioritises its compliance and enforcement activity by addressing the biggest risk to the environment and health.

7.2. KEY FINDINGS: ENVIRONMENTAL ASPECTS

The environmental impacts of advanced Resource Recovery facilities are assessed on a case by case basis by the EPA for their buffer requirements.

It will be important to establish a substantial buffer to sensitive land uses to ensure that the resource recovery precincts ongoing operations are not affected. A minimum distance of 500m should be established between sensitive land uses.

Hypothetically, if a business were to apply to be located within a resource recovery precinct, it would need to adhere to the strict buffer requirements of the precinct and would be subject to approval by the EPA.

Other environmental site considerations will include geology and soils, groundwater, floodplain conditions, flora and fauna and cultural heritage.

7.3. BUFFER REQUIREMENTS

In 2013, EPA Victoria published a guideline titled *Recommended Separation Distances for Industrial Residual Air Emissions*. The guideline provides instruction on recommended distances between industrial land uses that emit odour or dust, and sensitive land uses. The guideline has been prepared for:

- Planning authorities, responsible authorities, Environment Protection Authority (EPA), industry, developers and the community, to be used in the preparation and consideration of planning scheme amendments and planning permit applications; and
- Industry, EPA and the community, to be used in the application for, and consideration of, works approvals and licenses for scheduled premises.

The guideline contains a list of recommended minimum separation distances that aims to minimise the off-site impacts on sensitive land uses arising from unintended, industry-generated odour and dust emissions.

Table 13 on the following page provides details regarding the recommended separation distances for waste management.

The table shows that for an advanced resource recovery / technology facility the recommended separation distances are assessed on a case by case basis. However, for other facilities treating or reprocessing waste, a separation distance of 500m is recommended.

TABLE 13 INDEX OF INDUSTRY CATEGORIES, RECOMMENDED SEPARATION DISTANCES, EPA

Industry Type	Industry Activity / Definitions	Recommended Separation Distances (m)	Further Guidelines
Waste Management			
Advanced resource recovery technology facility	Waste treatment facility for the immobilisation, thermal degradation, chemical conversion, biological oxidation (aerobic or anaerobic), incineration, gasification or other treatment of solid waste	(case by case)	
Green Waste Composting Facility	Receiving, storing temporarily and transferring putrescible solid and green waste	(see further guidelines)	Separation Distances for large composting facilities, EPA Publication 1577, Sept 2014 (see Section 8.4)
Materials Recovery and Recycling Facility	Collecting, dismantling, treating, processing, storing, recycling, or selling used or surplus materials	(case by case)	
Permanent Contaminated Soil Treatment Facility	Permanent facility for the temporary storage, processing and treatment of contaminated soil. Excludes on-site (temporary or mobile) contaminated site soil treatment.	500	
Prescribed Industrial Waste Treatment Facility	Storage, treatment, reprocessing, containment or disposal facilities handling any prescribed industrial waste not generated at the premises.	500	
Transfer Station	Collecting, consolidating, temporarily storing, sorting or recovering refuse or used materials before transfer for disposal or use elsewhere.	250	

Source: EPA Victoria, Recommended separation distances for industrial residual air emissions, 2013

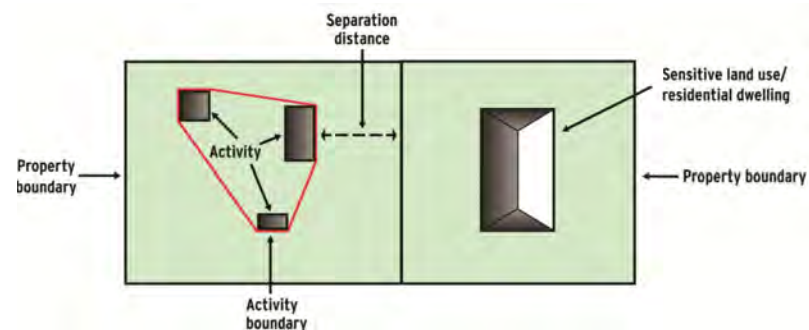
7.3.1. MEASURING SEPARATION DISTANCES

There are two methods to measure separation distances between sensitive land uses; the urban method and the rural method.

THE URBAN METHOD

The urban method is most commonly applied in an urban area or township and on sites less than 0.4 hectares and measures the separation distance from the activity boundary of the industry to the property boundary of the nearest sensitive land use, as seen in Figure 8 below.

FIGURE 8 THE URBAN METHOD



Source: EPA Victoria, Recommended separation distances for industrial residual air emissions, 2013

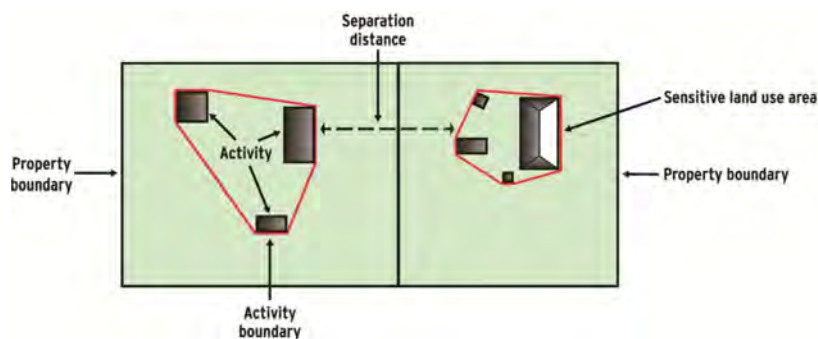
THE RURAL METHOD

The rural method is used on areas not in an urban area or township and on sites at least 0.4 hectares in size. It measures the separation distance from the activity boundary of the industry to the activity boundary of the sensitive land use, as seen in Figure 9 below.

According to the EPA, “this method may be appropriate where there are only a few sensitive receptors, located in rural settings, which are located outside of a sensitive land use zone and the activity area won’t change”.⁷

⁷ EPA Composting Guidelines - <http://www.epa.vic.gov.au/~media/Publications/1577.pdf> p.12

FIGURE 9 THE RURAL METHOD



Source: EPA Victoria, Recommended separation distances for industrial residual air emissions, 2013

7.4. COMPOSTING

The EPA published the Draft Composting Guideline to provide composting facilities with advice on how to design, construct and manage composting facilities in a manner that protects human health and the environment. This guideline is used as the basis for EPA decision making for facilities that require works approval and licences and when assessing the compliance of facilities.⁸

The guideline provides reference facility separation distances for composting facilities, these are shown in Table 14 and 15 below. It should be noted that these are examples only and site specific separation distance information is assessed on a case by case basis.

Given that there are already substantial composting operations occurring in the Daldy Road precinct, it is unlikely that there will be demand for another major composting facility in an alternative resource recovery precinct.

⁸ EPA Composting Guidelines - <http://www.epa.vic.gov.au/~media/Publications/1577.pdf> p. 2

TABLE 14 REFERENCE FACILITY 1

Feedstock	Process Design	Plant Capacity	Separation Distance (metres)
Category 1 & 2: Green Waste	Open air receival Enclosed and controlled aerobic composting	1,200 tonnes per annum	>300
		14,000 tonnes per annum	>500
Category 3: Vegetable Organics	Secondary control odour capture and treatment equipment Open air maturation	36,000 tonnes per annum	>800
Category 4: Grease Inceptor Trap Waste		55,000 tonnes per annum	>1000
		75,000 tonnes per annum	>1200
		90,000 tonnes per annum	>1400

Source: EPA Composting Guidelines - <http://www.epa.vic.gov.au/~media/Publications/1577.pdf> p. 11

TABLE 15 REFERENCE FACILITY 2

Feedstock	Process Design	Plant Capacity	Separation Distance (metres)
Category 1 & 2: Green Waste	Open air receival Open turned windrow Open air maturation	1,200 tonnes per annum	>600
		14,000 tonnes per annum	>1100
		36,000 tonnes per annum	>2000
		55,000 tonnes per annum	>2000

Source: EPA Composting Guidelines - <http://www.epa.vic.gov.au/~media/Publications/1577.pdf> p. 11

7.4.1. INTERNAL BUFFERS

The siting of individual businesses within the premises will also need to be considered. This will be important to minimise potential conflict from neighbouring development on existing and future operations within the precinct. This may also relate to the establishment of specific industries that share synergies.

7.4.2. CUMULATIVE IMPACTS

Where a cluster of industries of the same type exists or is proposed, consideration of cumulative impacts may be necessary. Advice from EPA is recommended when all of the following conditions arise:

- An existing or proposed industrial development occurs within the proximity of the same type of industrial development;
- The industry will have or has overlapping separation distances;
- The combined capacity of the individual industries is in excessive.

7.4.3. INTERFACE LAND USES

Interface land uses are those that can be located within separation distances between industrial land uses and sensitive land uses.

Interface land uses neither generate significant industrial residual air emissions, nor warrant protection from them. Interface land uses typically include zones that are for business, agricultural/rural activity, recreation and conservation, are public open spaces, and other special purpose zones, except where sensitive land uses are permitted.

TABLE 16 EXAMPLES OF INTERFACE LAND USES AND THEIR SUITABILITY

Suitability	Examples of Interface Land Use
To be encouraged	Agriculture, car parks, cinema-based entertainment facilities, emergency services facilities, natural systems, offices, research centres, service stations and veterinary clinics.
To be considered (subject to assessment)	Light industry with no adverse amenity potential and utilities (except for sewerage works).
To be prevented	Sensitive land uses and industrial land uses that require separation distances.

7.5. OTHER CONSIDERATIONS

The following factors may also need to be considered when assessing potential sites for resource recovery operations.

GEOLOGY & SOILS

It will be important that the precinct is located in an area appropriate for development. This includes consideration of the geological and soil conditions of potential sites.

GROUNDWATER

The Shepparton Formation and underlying Calivil Formation both contain groundwater suitable for a range of uses including irrigation, domestic and stock watering. The presence of groundwater should be considered in investigating potential sites for its potential to limit development and/or increase the cost of development.

FLOODPLAIN CONDITIONS

Greater Shepparton is subject to flooding given the presence of the Goulburn River and the Goulburn Broken River. Identifying sites that are less susceptible to flooding would be a preferable outcome. This is due to the potential for polluted floodwaters to enter natural waterways, as well as increased costs associated with development.

FLORA & FAUNA

The presence of native and remnant vegetation should be considered in the assessment of potential sites. This may limit the potential developable area.

CULTURAL HERITAGE

Under the provisions of the Aboriginal Heritage Act 2006, high impact activities, which include industry, occurring within an area of Aboriginal cultural heritage sensitivity require the preparation and approval of a Cultural Heritage Management Plan. When identifying appropriate sites, it would be preferable to avoid areas of Aboriginal cultural heritage sensitivity.

8. CASE STUDIES

8.1. INTRODUCTION

This section of the report provides an analysis of case studies relating to waste and resource recovery facilities. The case study precincts have been primarily sourced from the State-wide Waste and Resource Recovery Infrastructure Plan. These precincts are considered to be of state wide significance to the waste and resource recovery sector.

8.2. KEY FINDINGS: CASE STUDIES

Many resource recovery precincts are located adjacent to existing major waste facilities such as wastewater management facilities, landfill sites and transfer stations. This is due to the ability to establish a high level of symbiosis with these facilities, reduced transport and handling costs and increased levels of recovery.

There needs to be consideration of the potential for sensitive land uses to encroach on the site. The case studies show that many resource recovery precincts are potentially affected by residential encroachment, affecting the viability and day to day operations of the site. This is most evident when the precinct displays significant levels of odour, dust or noise contamination.

Many of the case study precincts are supported by robust input sectors including commercial and industrial sectors, municipal waste and the construction and demolition sectors.

Larger precincts include the establishment of other land uses, such as manufacturing or processing facilities. These industries may utilise recovered material from resource recovery industries, further enhancing synergies in the precinct.

There are strategies to reduce the potential odour levels of the precinct, as seen through the strategies adopted at the Hampton Park Resource Recovery Precinct. Boundary plantings can also provide a barrier to precincts, enhancing the visual amenity.

8.3. CASE STUDIES

Table 17 on the following page provides case study areas of resource recovery in Victoria that are of state significance to the waste and resource recovery sector. These case studies are explored to identify any lessons for the establishment of a resource recovery precinct in Greater Shepparton.

TABLE 17 PRECINCTS OF STATE SIGNIFICANCE

Area / Location	Significance
Cooper Street Precinct, Epping	<p>This precinct is a significant organics hub accepting garden organics, mainly from the metropolitan area. It is also the only C&D hub for northern metropolitan Melbourne. It is well located to service Melbourne, being close to major transport routes and has the capacity to expand all major activities, particularly organics.</p> <p>The risk from residential encroachment resulting in close residential development and incompatible industrial development could impact on the functionality of the site. This should be managed by preserving adequate buffers, and by planning that ensures the establishment of compatible activities conducted in a manner that does not impact on the amenity of surrounding land users.</p>
Kingston / Clayton/ Dingley Precinct	<p>This precinct is a significant hub for the surrounding area for organics, landfill and C&D processing. The landfills are all anticipated to close within seven years, providing an opportunity to transition the site to resource recovery activities that are compatible with surrounding land use and do not impact on the amenity of the surrounding community.</p> <p>Preserving the land for resource recovery activities will increase the ability to meet the future needs of the surrounding metropolitan area.</p> <p>Pressure from surrounding residential activities and community expectations could threaten the functionality of this site for recovery activities. Planning needs to preserve adequate buffers and prevent the establishment of incompatible land uses that could impact on the functionality of the site.</p> <p>Community engagement is needed to demonstrate and explain the benefits to the community of this site remaining available for resource recovery activities, and to reassure the community that activities will have minimal impact on local amenity.</p>
Hallam Road, Hampton Park	<p>This site is a major hub for commercial and industrial (C&I) and C&D reprocessing and for MSW residual waste from metropolitan Melbourne and regional areas. It is well located close to major transport hubs and potential markets.</p> <p>The risk of residential encroachment resulting in close residential development and incompatible land uses could impact on the functionality of the site. This should be managed through preservation of adequate buffers and planning that ensures the establishment of compatible activities conducted in a manner that does not impact on the amenity of surrounding land users.</p>

Area / Location	Significance
Lydnhurst Landfill, Taylors Road, Lydnhurst	<p>The site is the only remaining landfill for prescribed industrial wastes (PIWs) in metropolitan Melbourne. While these wastes are outside the scope of this plan, this site is listed as it is critical to the management of these wastes and contaminated soils, and is listed in the Metropolitan Landfill Schedule.</p> <p>As the site is already involved in waste management activities, there is the opportunity to co-locate additional compatible resource recovery activities on the site that can share buffers.</p>
Ordish Road Precinct, South Dandenong	<p>This is a major hub for organics, C&D reprocessing and commingled C&I recovery activities. It has well-established spokes and is well located with compatible activities.</p> <p>The risk from residential encroachment resulting in close residential development and incompatible land uses could impact on the functionality of the site. This should be managed through preservation of adequate buffers and planning that ensures the establishment of compatible activities conducted in a manner that does not impact on the amenity of surrounding land users.</p>
Moltoni Landfill, Fyansford Geelong	<p>This is a major C&D reprocessing hub for the area. The existing landfill on the site is anticipated to be full around 2018, providing an opportunity to transition the use of this land to additional resource recovery activities.</p> <p>Planning needs to ensure the preservation of adequate buffer distances so incompatible land uses do not impact on the functionality of the site. It should ensure that activities on the site are conducted in a manner that does not impact on the amenity of surrounding land users.</p>
Dutson Downs, Gippsland	<p>This facility is a major organics reprocessing hub and accepts garden organics from metropolitan Melbourne and the surrounding region. Its composting processes use a range of other organic waste streams including biosolids, food waste, petroleum hydrocarbon, animal fats and some liquid PIW. It is ideally located and unlikely to be threatened by residential encroachment</p>
Western Composting, Shepparton	<p>This is a hub for organics processing and accepts garden organics for in-vessel composting from the surrounding regions. It is co-located with compatible activities and has sufficient buffers to increase organics processing activities.</p>
Cosgrove Landfill, Shepparton	<p>This landfill serves a large population centre and a significant food processing sector that operates in the greater Shepparton region. It also accepts C&I waste from surrounding areas, including Benalla.</p>

Source: Sustainability Victoria, Statewide Waste and Resource Recovery Infrastructure Plan, September 2013

8.4. ANALYSIS OF SELECTED CASE STUDIES

Selected case studies from Table 17 are examined further below.

8.5. HAMPTON PARK RESOURCE RECOVERY PRECINCT

The Hampton Park Resource Recovery Precinct is operated by SITA. It is located in an old sand quarry and has been accepting waste since 1997. It is one of the largest landfills in Victoria, service nine of Melbourne's municipal Councils. The land is zoned Special Use Zone.

The area comprises 15 landfill containment cells, of which eight are now filled and capped. Landfill gas extraction infrastructure is installed within completed landfill cells. The landfill gas is then converted to electricity through on site generators and exported into the electricity network.

The Hampton Park Resource Recovery Precinct located at Hallam Rd in Hampton Park is an example of a precinct that incorporates a variety of resource recovery operations, establishing synergies between uses. The resource and waste recovery operations include:

- **Commercial and Industrial (C&I) Sorting Facility** – The Hampton Park site has a C&I sorting facility which sorts recyclables from waste loads presented at the weighbridge. Waste loads that are indicated to have a high percentage of recyclables are sent to the C&I sorting facility for further investigation. The items targeted for diversion from landfill, separation and recycling include steel, untreated timber, cardboard/paper and plastics.
- **Construction and Demolition (C&D) Facility** - In partnership with SUEZ Environment-Resource Co. the Hampton Park site operates a C&D Facility. Waste loads containing reinforced concrete, bricks, asphalt and mixed clean fill with rubble are diverted from landfill to the C&D Facility for sorting. From these materials a 20mm class 4 road base product is produced. The facility currently produces in excess of 100,000 tonnes per annum of crushed rock base for sale back into the local construction market.
- **Hampton Park Education Centre** - The onsite Education Centre provides a venue for the presentation of site information to school groups, community groups, international visitors and businesses interested in recycling, resource recovery and sustainable environmental practices. Since 2006 it has hosted over 4,100 visitors.
- **Transfer Station** - Operated by Outlook Environmental, a not-for-profit organisation that provides employment opportunities for disadvantaged people, recyclables are accepted from the local community, at no charge, to encourage recycling, reuse and diversion from landfill. Employing the theory that 'one man's trash is another man's treasure' the onsite shop sells pre-loved goods such as bicycles, books, clothes, furniture and building materials.

The Hampton Park Transfer Station provides a public drop-off area for general waste and recyclables

- **Engineered Landfill** - The Hallam Road Landfill provides responsible environmental management of waste that cannot yet be reused or recycled from households, businesses and industry in the eastern and south-eastern suburbs of Melbourne.

There have been periods of increased odour due to lengthy periods of rain causing anaerobic activity to take place. This has produced landfill gas that is not normally experienced until the landfill is completely filled and capped. As the precinct is in close proximity to residential areas, this has caused issues for the community. SITA therefore have implemented strategies to manage the landfill odour, including:

- Modifying daily filling practices;
- Modifying covering practices;
- Installing an odour neutraliser;
- Progressive capping and landfill gas extraction in active cells;
- Increased landfill gas utilisation;
- Planting programs (providing a screen and more aesthetic view of the precinct).

FIGURE 10 PLANTING PROGRAM AT HAMPTON PARK



Source: Sita, 2013

8.5.1. KINGSTON/ CLAYTON/ DINGLEY PRECINCT

This precinct is located in the south-east green wedge area and is outside the Urban Growth Boundary that defines the 'urban' area of metropolitan Melbourne. The site forms part of a large precinct formerly used for sand mining operations until the 1980s. Many of the former sand mining areas have been used for landfill and recycling operations over the past 35 years with many sites now completed or coming to the end of their operations. The precinct hosts a variety of uses including industry, nurseries and uses associated with waste disposal and recovery.

The precinct includes the following key land uses related to waste and resource recovery:

- **Landfills** - Closed and open landfill sites, including clean landfill sites and residual landfill sites.
- **Alex Fraser Materials Recycling Facility** – this facility accepts a range of construction and demolition material and commercial and industrial material generated from civil and demolition projects.
- **Enviromix compost** – This facility collects organic wastes collected from residents of metropolitan Melbourne through kerbside green bins, transfer stations, landscapers and home garden maintenance companies and composts it into environmentally beneficial products, including mulch, compost, and soil conditioner. This operation reduces the amount of green waste being sent to landfill.

8.5.2. DUTSON DOWNS SOIL & ORGANIC RECYCLING FACILITY

The Dutson Downs Soil and Organic Recycling Facility is located at Dutson Downs, 20km south-east of Sale and operated by Gippsland Water. The site was once largely known for its treatment of Sale and La Trobe Valley's sewerage, as well as hazardous material sourced from Esso's nearby gas plant.

The facility includes organic and green waste composting of material sourced from Melbourne's south eastern councils and waste by products from Gippsland dairy, egg and food producers. The facility also takes contaminated soils from old petrol stations and commercial waste such as oil from restaurants and fish and chip shops.

Around 100,000 litres of liquid waste is received each day at the site. Liquid waste is stored and processed and then mixed with green and organic wastes. The end product is an agricultural compost. This has been used for agribusiness in the region.

Importantly, the facility diverts thousands of tonnes of commercial, food and green waste from landfill and sewerage each month.

8.5.3. ORDISH ROAD PRECINCT, SOUTH DANDENONG

The Ordish Road Precinct in South Dandenong hosts a variety of resource recovery operations. These facilities include the following:

- **Ace Waste** - Ace Waste operate a hazardous waste incinerator, which incinerates hazardous wastes at temperatures of between 1000° and 1150° Celsius.
- **Visy Board** – A paper and cardboard recycling facility, producing recycled cardboard packaging.
- **Renex** – Soil treatment facility, which treats soils from various construction projects around Victoria, so that it can be safely used again. This reduces the amount of waste soil that is disposed of in landfill sites.
- **Geocycle** – Geocycle is a waste specialist that process flammable and hazardous wastes, transforming them into alternative and raw materials for use in cement kilns.
- **Future Metals Recycling** – operating a metal recycling business, in which they pay for scrap metal. This organisation is also based in Shepparton, where they collect ferrous material from transfer stations in Greater Shepparton.

The precinct is also home to a range of other industrial land uses including manufacturing businesses.

PART B . ISSUES & OPPORTUNITIES

9. ISSUES & OPPORTUNITIES

9.1. INTRODUCTION

This section of the report provides an overview of the issues and opportunities for the establishment of a resource recovery precinct in Greater Shepparton.

9.2. ISSUES & OPPORTUNITIES

OWNERSHIP

The Daldy Road precinct highlights the importance of Council ownership in the establishment of a resource recovery precinct. As the Daldy Road precinct is owned by Goulburn Valley Water (GVW), Council is not able to direct private enterprise wishing to establish resource recovery operations to this precinct with any certainty. Whilst Daldy Rd would be a good candidate for a resource recovery precinct, it is controlled by GVW. It is therefore likely that Council owned land or would need to purchase the land (in agreement with landowners) for the establishment of a resource recovery precinct. Existing council assets that are underutilised are preferable over purchasing other assets due to increased purchase cost, time delays and greater uncertainty.

It is also becoming increasingly difficult to secure sites for waste and resource recovery infrastructure, including landfills that are readily accessible, compatible with neighbouring land uses and accepted by the community.

WASTE IS INCREASING

Getting Full Value (2013) states that on average Victorians produce over 2 tonnes of waste each per year and this is increasing. Population growth is a key driver of increased waste generation. It is estimated that the population of Greater Shepparton will generate over 95,000 tonnes of waste in 2031. It will be important to continually increase material recovery and minimise waste to landfill.

THE LANDFILL LEVY

The landfill levy was introduced by the State Government as a commitment to resource recovery. The levy involves a fee structure that identifies different waste types, and sets fees relative to the level of risk the materials pose to the environment and/or health. A pricing differential is also applied to rural areas under the fee structure.

The levy provides an opportunity to increase recycling and reprocessing as opposed to disposal. The levy has produced an increase in material diversion from landfill, particularly for heavy materials such as from the construction and demolition sector. This may provide a market opportunity.

The landfill level in regional Victoria is comparatively less than in metropolitan Melbourne. This may act to increase the level of waste flowing into regional areas and thus the potential for greater quantities of material to be recovered. This is an important factor when achieving economies of scale in regard to material recovery.

POTENTIAL RESOURCE RECOVERY INDUSTRIES

The precinct has the potential to host a number of resource recovery industries. Potential resource recovery industries that may locate to a precinct may include but are not limited to:

- **Materials Recovery Facility** – These facilities specialise in the sorting and collection of recyclables, which are then forwarded onto recyclers who convert them back into useable products. Materials include plastics, paper and cardboard, glass, aluminium and steel. There is currently one MRF in the GV region.
- **Electronic Waste Recovery Facility** – E-waste dismantling where materials like lead, copper and mercury contained within electronic waste are removed to further produce new products.
- **Construction Waste Recovery Facility** – A construction waste recovery facility concentrating on concrete, timber, metal and aluminium and glass and any other recoverable materials from the C&D sector.
- **Energy Production Facilities** – Bioenergy or co-generation facilities with potential transfer of energy to the grid and/or use by other operators within the precinct. Other energy production facilities such as solar farms.
- **Liquid Waste Treatment Facility** – There are options to collect, treat and dispose of a number of different liquid wastes for commercial and industrial sectors.
- **Sorting Facilities** – There is potential to locate a sorting facility at the precinct. This would primarily be located in conjunction with landfill sites in order to increase resource recovery and reduce the amount of waste going to landfill.
- **Composting Facilities** – The transformation of green and organic wastes into nutrient rich compost. This activity is already occurring within the Daldy Road precinct, it is therefore unlikely that there would be demand for a secondary facility.

INTEGRATION AND SYMBIOSIS

There is potential for the integration of planning and management for resource recovery operations and industries within the sector. This may include the integration of industrial, commercial, civic, residential and agricultural discard streams. It may also include internal integration, where different companies / businesses can leverage off one another to create synergies that enhance the economic and environmental benefits of the precinct.

There is opportunity to co-locate a resource recovery precinct with complementing land uses, such as landfills and major waste generators. Locating a resource recovery precinct close to a landfill could mean that a significant amount of waste could be recovered before going to landfill. This would require infrastructure such as a pre-sorting facility. This would also facilitate a shift toward landfill taking residual waste only.

There is also opportunity to establish synergies between operators within the resource recovery precinct. For example, one operator may use the energy or gas produced by another enterprise, establishing an efficient precinct.

CASE STUDY: WINGFIELD WASTE & RECYCLING CENTRE

The Wingfield Waste and Recycling Centre is a world-class resource recovery and waste recycling operation that contains a collaborative cluster of commercial businesses on a common 94ha site. The former landfill, which was closed in 2004 has been reinvented as an internationally recognised waste and recovery recycling facility that has harnessed commercial drivers to deliver significant environmental benefits. The 94-hectare site has four primary tenants – Orora (paper and cardboard waste), Adelaide Resource Recovery (construction and demolition waste); Jeffries Group (green waste) and Transpacific Industries (residual waste)

To facilitate development of the precinct, a Plan Amendment Report to rezone a 90 hectare area was approved in 2003. The area was rezoned to Industry (Resource Recovery). The Wingfield Eco-Resource Management Centre will form the 'hub' of the larger proposed Industrial Precinct.

The precinct employs more than 80 people and recovers 90% of waste materials delivered to the precinct.

INFRASTRUCTURE AND PLANNING

Planning for resource recovery infrastructure needs to strike the right balance between securing the land and waste streams needed to underpin the commercial viability of infrastructure investment and at the same time provide industry with flexibility to identify and act on emerging opportunities for recovered resources.

COMMERCIAL AND INDUSTRIAL WASTE

A high percentage of the overall waste produced and disposed of in Shepparton is commercial and industrial waste. The Shepparton transfer station accepts industrial waste in the form of concrete, bricks and green waste, however, a large portion of the loads going to Cosgrove landfill comprise of commercial and industrial origin. A potential way of reducing commercial and industrial waste is through the development of a sorting facility. This could be located in conjunction with the Cosgrove landfill.

BUFFER REQUIREMENTS

Proximity to residential area and sensitive land uses needs to be considered in identifying an appropriate site for resource recovery operations. Buffer requirements will change depending on the various uses of the precinct. The buffer requirements relate primarily to the existence of odours, with other considerations being noise and dust.

A review of EPA guidelines has revealed that buffer distances for resource recovery precincts are assessed on a case by case basis, with regard to specific recovery operations. The review has revealed that buffer distances for other uses range from 250m for transfer stations to 500m for soil treatment facilities and industrial waste treatment facilities. Buffer distances for composting uses range from 300m to 2000m, and are heavily dependant on the capacity of the facility. Given there is already a substantial composting facility located in the Daldy Road precinct, which leverages off its proximity to the waste water treatment plant, it is unlikely that a secondary composting facility would locate to another resource recovery precinct.

It should be noted that any application for businesses within a resource recovery precinct require the permission of the EPA. This means that if a business wanted to locate within the precinct, they would be subject to assessment and approval by the EPA and would not be allowed to exceed the buffers of the precinct.

STATUTORY REQUIREMENTS

Planning controls should be favourable to the establishment of a resource recovery precinct or be able to be readily amended. This includes appropriate zoning and overlays. Sites where a resource recovery precinct is a permitted use could be more attractive than sites that would require a planning scheme amendment

Appropriate development controls may also need to be applied to the land, for example through a Development Plan Overlay. This would provide direction on the types of uses that may be appropriate for a precinct as well as built form controls and buffer controls, mitigating inappropriate uses and/or buildings locating in the precinct.

ACCESS & TRANSPORT

Access and transport are key requirements when it comes to identifying an appropriate site for resource recovery operations. Greater Shepparton is ideally located as a logistics centre for northern Victoria and as a central location to a diverse agricultural and food manufacturing region. This makes areas in Greater Shepparton ideal for the establishment of a resource recovery precinct.

The resource recovery precinct would need to be accessed by heavy vehicles, which means sealed roads of adequate size. The location of a precinct also needs to strike a balance between isolation (due to buffer requirements) and proximity to town centres and industry (for decreased transportation costs to and from the precinct and increase private business viability).

For businesses in resource recovery industries that rely on significant volumes of material, the impacts of transport costs to viability can be substantial. Therefore, reducing the potential impacts of transport costs to business viability is very important.

DEMAND FOR RESOURCE RECOVERY

The demand for resource recovery is affected by a variety of factors, including population growth, types of industries, construction activity, commercial activity and agricultural activity and market viability.

The Greater Shepparton and Goulburn Valley region presents opportunity for increased resource recovery operations, particularly through sourcing of waste from the agricultural and food manufacturing sector and increased recovery from the construction and demolition sector.

Opportunities in Greater Shepparton include:

- Opportunities to increase C&D re-processing across the region, including concrete, brick and other masonry materials and timber.
- There may also be future opportunities for recovery of additional materials across the Region, particularly those for which there is no current capacity, or where capacity is concentrated to the north (organics and C&D).

Demand will also be affected by the ability of operators to gain access to key input markets and the viability of transferring recovered goods to end markets.

PROXIMITY TO KEY INPUT SECTORS

It is important that the precinct is located in close proximity to key input sectors in order to increase the viability of operation and to ensure that resource recovery businesses have a steady and guaranteed flow of inputs. The precinct needs to be located in close proximity to the major producers of inputs, including the C&I and C&D sectors.

SECTOR COLLABORATION

Sector collaboration is highly important in the waste and resource recovery sector. In order to increase the viability of resource recovery operations, industry needs to be certain there is ongoing access to input sectors. This can be facilitated through Council municipal waste collections and inputs from key industry sectors.

LEADER IN SUSTAINABILITY & WASTE MANAGEMENT

The Daldy Road precinct was awarded the 'Best Specific Environmental Initiative' at the 2010 United Nations Association of Australia World Environment Day Awards, providing recognition of the sustainable industries that are located within the precinct. There is opportunity for a newly established resource recovery precinct to address sustainability targets and achieve best practice in resource recovery. This will promote increased recovery, reduction of harmful wastes going to landfill and a reduction in greenhouse gases. A successful precinct will also enhance the 'green' brand of Shepparton.

EDUCATION OPPORTUNITIES

Education and awareness programs, in partnership with infrastructure solutions play a critical role in teaching residents about waste management. The establishment of a resource recovery centre could provide the opportunity to run education programs where people can see waste management in action.

ACCESS TO POWER GRID / GAS NETWORK

Unless the precinct is wholly contained and self-serviceable, it is likely that access to the power grid and to some extent the gas network will be required. Access to the power grid is a key factor. Many resource recovery operations have high power requirements, particularly for uses such as plastics reprocessing. It is therefore ideal that the precinct has immediate access to power. Access to the power grid will also allow any energy producing operations to put energy back into the network.

Access to the gas network may be more difficult/ costly to achieve, particularly if the precinct is isolated from the network. However, localised gas storage to service the precinct is possible.

POWER RETAILERS

The viability of development may also be affected by the electricity provider, the key providers being Ausnet and Powercor. Different providers may result in higher or lower electricity charges.

SUSTAINABLE ENERGY PRODUCTION

There is opportunity to power the precinct primarily through on-site energy production such as solar panels. The sustainable production of energy to power the precinct will contribute to the sustainable operation of the precinct.

NICHE USES FOR DALDY ROAD

The Daldy Road precinct has the potential to allow highly complementary resource recovery operations within the precinct. These uses would need to demonstrate a high level of symbiosis with the current operations of the precinct, in particular including Goulburn Valley Water's WMF. These would need to be considered on a case by case basis by GWV. However, given the nature of the Daldy Road precinct, potential operators cannot be directed to this site with any certainty of establishing their operations.

FUTUREPROOFING & POTENTIAL FOR FUTURE EXPANSION

Resource recovery operations may involve differing forms of noise, dust and odour pollution. In order to safeguard the precinct it is important that sensitive uses do not encroach on the precinct, over time. Many of the case studies (particularly metropolitan case studies) have shown that encroaching residential development on resource recovery precincts can affect the viability of operations. Therefore, appropriate buffers need to be established between any current or future residential areas.

A resource recovery precinct may make provision for potential future expansion if demand increases or new operations/activities emerge. This includes the reservation of land for expansion of operations and ensuring other sensitive land use types do not encroach on the precinct and that buffer requirements are adhered to.

SITE DESIGN

Site design should optimise logistics, including easy access for drop-off of materials and product discards and for easy management of materials and product flows between uses and companies.

FUNDING OPPORTUNITIES

The Sustainability Fund is a perpetual fund managed by the Department of Environment, Land, Water and Planning that receives money collected from Victorian landfill levies. Its purpose as defined by the *Environmental Protection Act 1970* is to foster:

- Environmentally sustainable uses of resources and best practices in waste management to advance the social and economic development of Victoria; and/or
- Community action or innovation in relation to the reduction of greenhouse gas substance emissions or adaptation or adjustment to climate change in Victoria.

Funding allocations are made by the Premier and Minister for Environment, Climate Change and Water, taking into account government policy and the Fund's Priority Statement.

Since its creation in 2005, the Sustainability Fund has supported businesses, local governments and communities through a range of waste management, recycling, resource efficiency and climate change programs.

The priority statement of the Victorian Sustainability Fund is currently under review, however the statement prepared in 2012, provides the following:

1. "As a first priority, the Sustainability Fund will provide funding to:
 - a. Support Victorians to reduce waste and dispose less waste to landfill;
 - b. Support innovators in the waste management and recycling industry and local government who are willing to invest early in better technologies, facilities and services; and / or
 - c. Remove logistical and systematic obstacles to recovering commercial value from otherwise abandoned material.
2. As a second priority, funding will be provided for initiatives to assist all sectors of the community to improve our environment, respond to climate change, use our resources efficiently and to support sustainability to advance the social and economic development of Victoria."

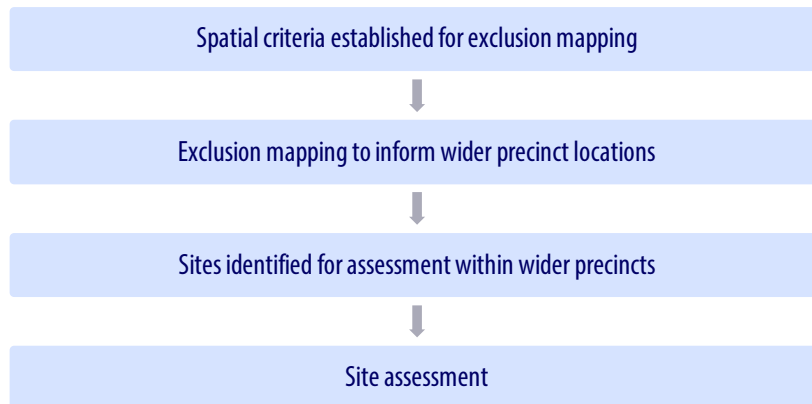
The Sustainability Fund provides an opportunity for Greater Shepparton to gain access to funding to support the development of a resource recovery precinct in Greater Shepparton that aligns with the objectives of the Sustainability Fund.

PART C . SITE IDENTIFICATION & SITE ASSESSMENT

10. SITE IDENTIFICATION

10.1. INTRODUCTION

An exclusion mapping exercise has been conducted in order to narrow the scope of areas and identify potential sites that can be assessed for consideration for the establishment of a resource recovery precinct. The flow chart below shows the process for identifying sites. The exclusion mapping exercise utilises a selection of spatial criteria overlaid across the Greater Shepparton LGA to assess potential locations.



10.2. SPATIAL CRITERIA FOR EXCLUSION MAPPING

A range of spatial criteria has been used to identify potential candidate precincts and sites. These criteria include:

RESTRICTIVE ZONES

Zones that are restrictive to the establishment of a resource recovery precinct have been spatially mapped in order to identify locations where a resource recovery centre could not / should not be located. These zones include Residential Zones (RZ), Public Conservation and Resource Zone (PCRZ), Rural Living Zone (RLZ), Urban Floodway Zone (UFZ), Township Zone (TZ).

RESTRICTIVE OVERLAYS

Overlays that may restrict or inhibit development of a resource recovery centre are spatially presented on the maps. The key overlays mapped include the Flood Overlay (FO), Heritage Overlay (HO), Land Subject to Inundation Overlay (LSIO), Environmental Significance Overlay (ESO) and Bushfire Management Overlay (WMO). These overlays present restrictions to development, however, if candidate sites include a portion of an LSIO this can be mitigated through development.

IRRIGATED AGRICULTURAL LAND

Much of the land in Greater Shepparton is irrigated and therefore is compatible with intensive farming uses. Irrigated agricultural land offers the option for a variety of intensive farming uses and generally yields smaller allotments and higher densities of residential uses. A resource recovery facility should target locations outside irrigated land in order to avoid higher densities of residential uses.

LOCATION OF KEY TOWNS

Towns will provide a service and employment base for the establishment of a resource recovery precinct. Sites should be within serviceable distance from towns yet not conflict with potential residential growth from towns or encroach on sensitive land uses. Key towns within Greater Shepparton have been mapped.

KEY INFRASTRUCTURE

The identification of sites is dependable on their ability to be accessed by large vehicles. Major sealed roads have been included in the exclusion mapping. Ideally, potential candidate sites located on major sealed roads are preferred over those located on unsealed roads. This is to avoid the potential costs associated with road upgrades. Rail lines have also been included on the exclusion maps. Sites closer to rail infrastructure are preferred for their potential to leverage off rail activity in the long term.

LOCATION OF POTENTIAL RESIDENTIAL USES

The location of potential sensitive residential land uses, including single dwellings located on farm land have been included in the detailed exclusion maps. These will form an important consideration when considering buffers requirements to sensitive land uses.

10.3. PRECINCTS IDENTIFIED THROUGH EXCLUSION MAPPING

The Greater Shepparton LGA exclusion map reveals that there are limited land opportunities unencumbered by restrictive overlays, zones or irrigated land. The eastern portion of Shepparton LGA reveals the highest amount of land that is unencumbered. There is also a significant bank of land in the south west corner of the Greater Shepparton LGA that is unencumbered. These areas are referred to as 'eastern precinct' and southern precinct'. Individual exclusion maps for the eastern and southern precinct are included on the following pages.

The eastern and southern precincts key weaknesses and strengths are summarised below.

SOUTHERN PRECINCT (NEAR MURCHISON)

- **Strengths:**
 - Large unencumbered lots;
 - Limited sensitive land uses on unencumbered lots (i.e. dwellings);
 - Good access to Bendigo-Murchison Rd and to the Goulburn Valley Highway via Bendigo-Murchison Road;
 - Close proximity to rail line.
- **Weaknesses:**
 - Limited sealed roads for access to key sites;
 - Considerable distance from Shepparton (approximately 32km);

- Heritage sites in proximity to unencumbered land;
- Proximity to Waranga Basin;
- Sensitive environmental areas i.e. Waranga Basin and Mosquito Depression.

EASTERN PRECINCT (NEAR DOOKIE)

- **Strengths:**
 - Large unencumbered lots;
 - Presence of existing resource recovery infrastructure (Cosgrove landfill);
 - Close proximity to rail line;
 - Presence of sealed roads with direct access to Shepparton;
 - Relative close proximity to Shepparton (approximately 16km);
 - Dookie as service town / employment base.
- **Weaknesses:**
 - Presence of sensitive land uses (i.e. dwellings) in close proximity to major sealed roads;
 - High grade agricultural land for grain growing.

10.4. POTENTIAL SITES

A number of sites have been identified through the exclusion mapping exercise in the southern precinct and eastern precinct. These sites demonstrate potential to be established as a resource recovery precinct and are progressed to the assessment matrix to determine their validity. Many of the sites identified would not require the entire land parcel, however, larger sites may enable buffers to be located within site boundaries.

The sites identified are marked on the exclusion maps and include the following:

Eastern Precinct:






1. Cosgrove 3 Landfill;
2. Adjacent to Cosgrove Landfill (Sites 2A and 2B);
3. New Dookie Rd Site;
4. Polan Rd Former Landfill.

Southern Precinct:






5. West of Murchison;
6. North of Murchison.

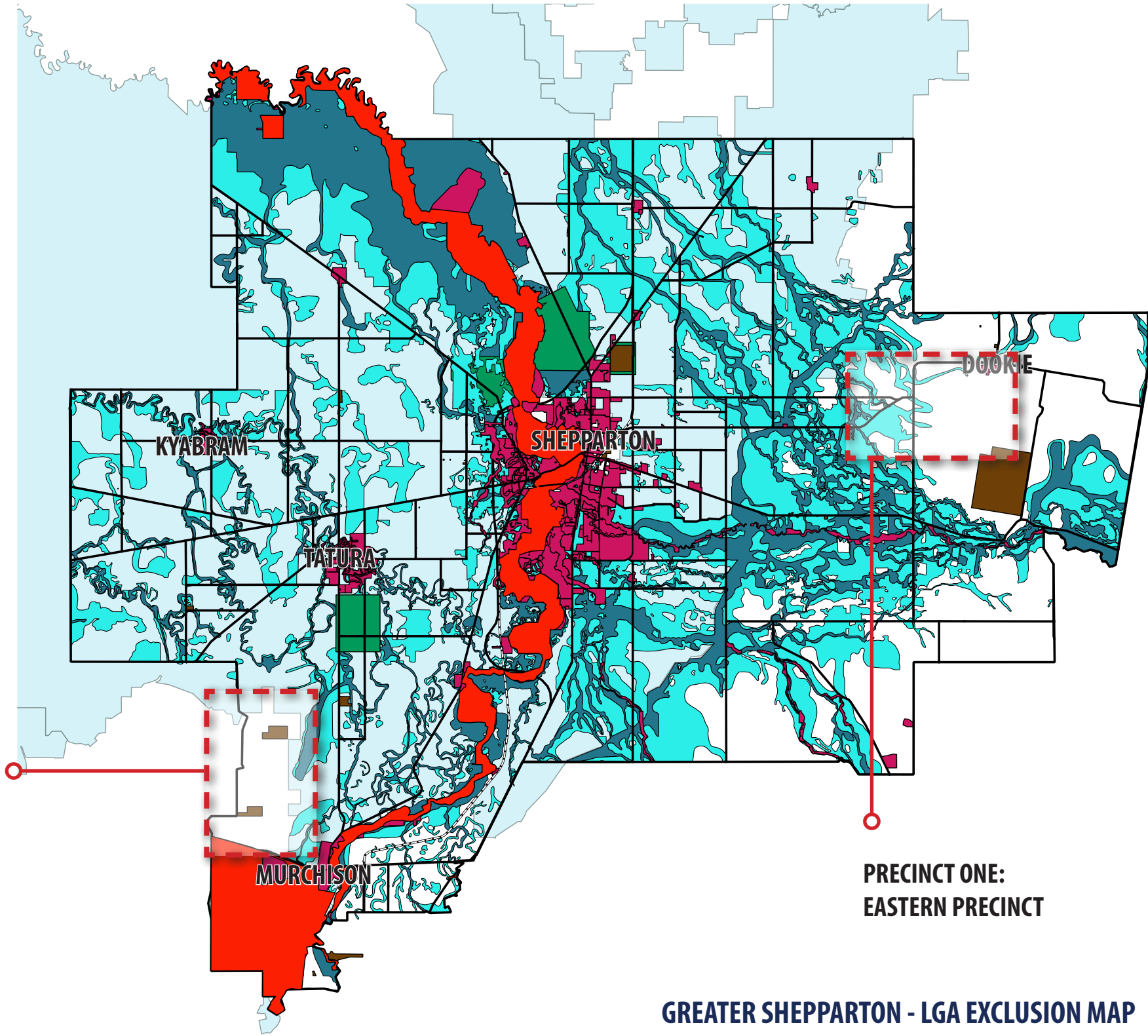
In addition to the sites identified through the exclusion mapping exercise, a site located on Daldy Road adjacent to the Goulburn River was mentioned through consultation as a potential candidate site. An initial assessment by Urban Enterprise has deemed that the site is not suitable for a resource recovery precinct. This is due to its size (approximately 2.5ha), proximity to the Goulburn River (approximately 120m), proximity to a Bushfire Management Overlay (approximately 51m) as well as being an area of Aboriginal Cultural Heritage Sensitivity. For these reasons the site has not been included in the assessment matrix in the following section.

KEY

-  SHEPPARTON LGA
-  IRRIGATED LAND
-  RESTRICTIVE ZONES (RZ, PCRZ, RLZ, UFZ)
-  ROADS
-  SHEPPARTON RAIL LINE

OVERLAYS

-  FLOOD OVERLAY
-  LAND SUBJECT TO INUNDATION OVERLAY
-  ENVIRONMENTAL SIGNIFICANCE OVERLAY
-  HERITAGE OVERLAY
-  BUSHFIRE MANAGEMENT OVERLAY

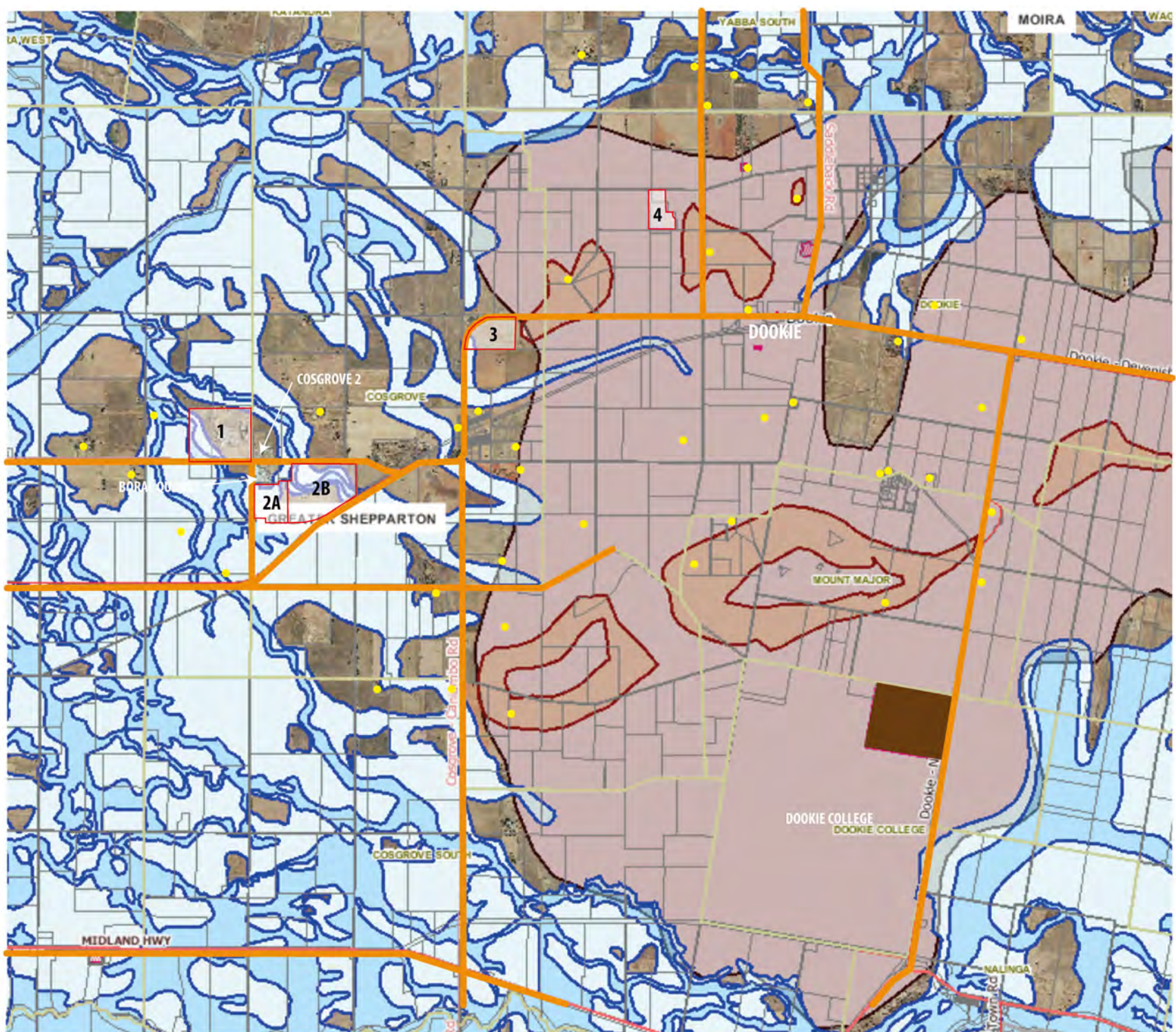


**PRECINCT TWO:
SOUTHERN
PRECINCT**

**PRECINCT ONE:
EASTERN PRECINCT**



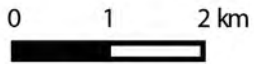
GREATER SHEPPARTON - LGA EXCLUSION MAP



OVERLAYS

- HERITAGE OVERLAY
- LAND SUBJECT TO INUNDATION
- SALINITY MANAGEMENT OVERLAY
- FLOOD OVERLAY
- EROSION MANAGEMENT OVERLAY

- SEALED ACCESS ROADS
- IDENTIFIED POTENTIAL SITES
- LOCATION OF POTENTIAL SENSITIVE LAND USE*



*Note: Not all sensitive land uses have been mapped. Only those in close proximity to major sealed roads and potential site areas.

GREATER SHEPPARTON - EASTERN PRECINCT EXCLUSION MAP

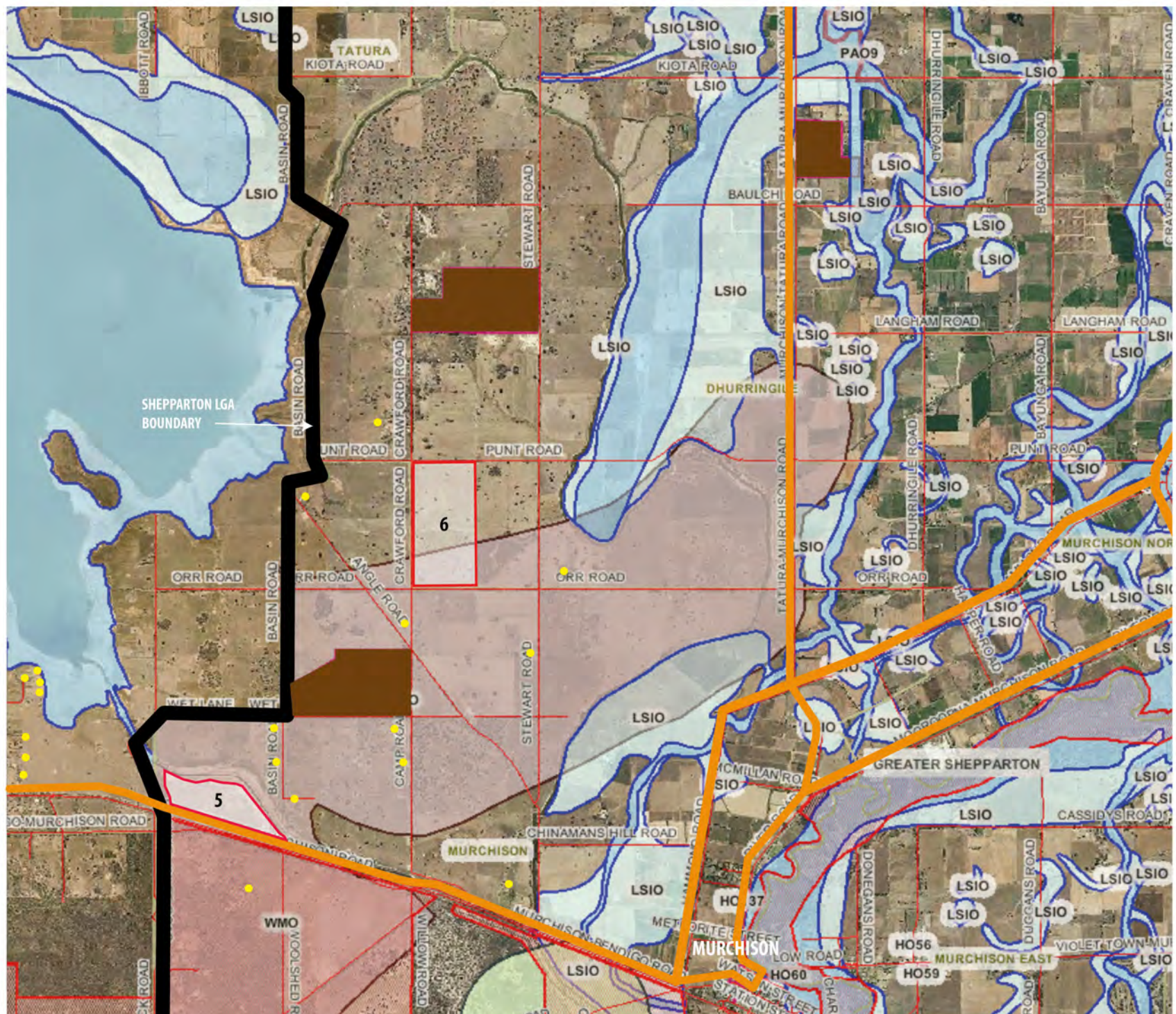
OVERLAYS

- FLOOD OVERLAY
- HERITAGE OVERLAY
- LAND SUBJECT TO INUNDATION
- BUSHFIRE MANAGEMENT OVERLAY
- SALINITY MANAGEMENT OVERLAY

- SEALED ACCESS ROADS
- IDENTIFIED POTENTIAL SITES
- LOCATION OF POTENTIAL SENSITIVE LAND USE*

0 1 2 km

*Note: Not all sensitive land uses have been mapped. Only those in close proximity to major sealed roads and potential site areas.



GREATER SHEPPARTON - SOUTHERN PRECINCT EXCLUSION MAP

11. SITE EVALUATION CRITERIA & ASSESSMENT MATRIX

11.1. INTRODUCTION

The following section of the report identifies criteria against which identified sites are evaluated. These criteria are then utilised to form a site assessment matrix. The criteria are derived from the background research, consultation, and case studies. The criteria are weighted in terms of their importance in evaluating sites. This is reflected in the site assessment matrix.

The site evaluation criteria have been updated to reflect the outcomes of community consultation. The additional site evaluation criteria are included in the site assessment matrix.

Further, the Daldy Road precinct has been assessed in the site assessment matrix. This is not intended to provide an assessment of the precinct as being formalised into a resource recovery precinct, rather it is intended to provide a baseline assessment for which other sites can be assessed.

11.2. CRITERIA

The criteria have been organised by weighting. The most important criteria have double the weighting to other criteria. The criteria are as follows:

DOUBLE WEIGHTED CRITERIA

1. Appropriate Buffers to Sensitive Land Uses:

It is critical that sites have the ability to establish buffer distances to sensitive land uses. The presence of sensitive land uses within the buffer distances will impact on resource recovery operations.

2. Proximity to Future Housing Areas:

The site should not be located in areas that are earmarked for future housing growth. This is to ensure that there are no land use conflicts in the future.

3. Proximity to Major Waterways:

Ideally, the precinct should avoid being located in proximity to major waterways such as the Goulburn River and Broken River. This would reduce the possibility of pollution as well as fire risk due to the presence of native vegetation. The precinct should be located at least 200m from major waterways.

4. Bushfire Considerations:

The potential for bushfires needs to be considered in the establishment of a resource recovery precinct. The CFA have advised on potential fire risks associated with development of a resource recovery facility.

Tyre recycling is a large fire risk, particularly when tyres are stored in large quantities. This is primarily due to the toxic smoke produced from a tyre fire. The establishment of a tyre recycling / partial storage facility would be better located in a more isolated area away from main population centres.

Isolated sites with little access to water create logistical challenges for the CFA. An isolated site may be required to include static water storage tanks to deal with the risk of fire. Even if the site has access to reticulated water, a lack in water pressure, may still prompt the need for static water storage tanks.

Proximity of the precinct to major towns and highly vegetated areas will need to be considered as part of the site selection study.

5. Flood Zone or Flood overlay:

The precinct should not be established in an area that is in a Flood Zone or subject to a Flood Overlay. These areas are very restrictive to development and will increase the cost of development if development is possible at all. The potential for sites to flood may also be potentially harmful for discharge of pollutants into the natural water system.

6. Access:

The precinct needs to be highly accessible, particularly to key input sectors and roads must be able to accommodate heavy vehicles. The precinct also needs to be located as close as possible to major input sectors to ensure viability of operations. The precincts location in relation to an employment base will also be important. This means the precinct should not be located in areas that may restrict employment access to the precinct.

7. Infrastructure & Servicing Cost:

The cost of infrastructure to develop the precinct is a key consideration for potential sites. Sites that will require high infrastructure and servicing costs are likely to pose a considerable limitation on the potential for future development. This is therefore included as a double weighted criteria consideration.

SINGLE WEIGHTED CRITERIA

8. Council Owned Land:

It is preferable if the site is already owned by Council. This will avoid purchase costs in agreement with landowners, delays incurred through the purchase process and sensitivities around purchase of land. Council ownership of the land is important in order to drive the precinct establishment process and ensure that potential operators can be directed with certainty to a precinct for the establishment of their operations. However, if a privately owned site demonstrated unique characteristics and compatibility for resource recovery operations, Council may be willing to purchase the site.

9. Access to the Power Grid:

Access to the power grid is important for both powering the precinct as well as putting power back into the grid through co-generation facilities.

10. Land Area:

The site needs to be able to accommodate a variety of industry of differing land area requirements. The Daldy Road precinct contained two development options, one with 17.5ha of developable area and one with 24.1ha of developable area. Additional land may be required to accommodate buffers. The land must be large enough as to not restrict the potential for development, therefore land should be a minimum of 15 hectares. If larger sites are identified, only a portion of the site may be required for development, effectively allowing for the incorporation of buffers within the site.

11. Favourable Zoning for Establishment:

Sites with existing zoning favourable for resource recovery operations are preferred over sites that would require a planning scheme amendment. Favourable existing zones include Special Use Zones, Industrial Zones and Public Use Zones. However, if the land is not appropriate for the establishment of a resource recovery precinct, a planning scheme amendment is possible to ensure the appropriate planning regulations are applied for development.

12. Leverage off Existing Resource Recovery Infrastructure:

The identification of sites that can leverage off existing resource recovery infrastructure may facilitate increased viability of new industries as well as the creation of an agglomeration of uses and synergies between uses. This includes existing recycling and waste infrastructure located within Greater Shepparton.

13. Limited Restrictive Overlays:

Ideally, the site would not be subject to overlays that may restrict the potential for development. Greater Shepparton is prone to flooding and therefore a large portion of the land is subject to the Land Subject to Inundation Overlay (LSIO). Ideally, potential sites would be free of the LSIO, however, this is not considered to be completely restrictive to development. Measures can be adopted in order to mitigate the LSIO, including through earth works to raise the land above potential inundation levels.

14. Irrigated Land:

Greater Shepparton is home to a significant amount of irrigated land compatible with intensive farming uses. Irrigated agricultural land offers the option for a variety of intensive farming uses, bringing with it residential homes and workers at a greater intensity than non-irrigated land. A resource recovery facility could aim to be located in areas that are not irrigated and therefore may be limited in their application for intensive farming uses as well as less densely settled populations.

15. Regular Land Configuration:

A precinct of regular shape is preferred for ease of site layout and development.

16. Flat Topography:

The land should be generally flat to minimised development costs.

17. Limited Encumbrances:

Sites should be free of encumbrances such as easements, which would affect the development and viability of establishing a resource recovery precinct.

18. No presence of Cultural heritage:

Ideally, the site should not be affected by areas of Aboriginal cultural sensitivity.

19. Limited Native Flora:

The presence of native vegetation should be assessed to ascertain the limits on development and potential fire risks if any.

20. Geology & Soils:

It will be important that the precinct is located in an area that has geological and soil conditions suitable for development. This should also have consideration for areas where soils are conducive to high quality agricultural production.

21. Timing of Development:

The timing in delivering the precinct is a factor in identifying suitable sites. Timing will vary between sites and depend on the level of investigation and planning work that is required to be undertaken such as studies and planning scheme amendments.

22. Cost of Development:

The cost associated with establishing a resource recovery precinct will vary between identified sites; potential costs incurred may include purchase costs, site investigation studies, planning scheme amendments and infrastructure costs.

23. Limited Risk:

There are various risks associated with various sites, these could include acquisition risks (not being able to acquire), planning risk, political risk (community backlash to identified site) and market risk (insufficient operator demand for sites).

24. Landscape Values:

Landscape values includes aesthetic qualities of a landscape that may be compromised through development. This primarily relates to sites that have high exposure to existing roads and may effect existing view lines. Nevertheless, strict planning controls should be included to appropriately guide development, including consideration to landscape and aesthetic values.

25. Biodiversity Values:

Biodiversity values include sites that have high levels of biodiversity or are in close proximity to areas with high biodiversity value. It is likely that detailed analysis of biodiversity would be required for any preferred sites to be progressed.

11.3. SITE ASSESSMENT MATRIX

Each of the identified sites is assessed against the criteria developed in section 11.2. These criteria have been adapted in order to measure the suitability and viability of selected sites for resource recovery operations. Each option is allocated a rating which reflects the extent to which the site meets the criteria, and the outcome likely to be generated from the site for resource recovery operations. The criteria are rated as 'single weighing' or 'double rating' as outlined in section 11.2 using the following scale:

TABLE 18 CRITERIA RATING SCALE

	Clearly does not meet criteria (potential to detrimentally affect development)	Does not meet criteria (potential for negative development outcome)	Neutral (criteria can be mitigated through planning / development)	Meets criteria (positive development outcome)	Clearly meets criteria (strongly positive development outcome)
Single Weighting	-2	-1	0	1	2
Double Weighting	-4	-2	0	2	4

TABLE 19 SITE ASSESSMENT MATRIX

SITES	Daldy Road (used as baseline assessment site only)		Cosgrove 3 Landfill (Quarry Road, Pine Lodge)		Adjacent to Cosgrove Landfill (Quarry Rd and New Dookie Rd)			New Dookie Rd (New Dookie Rd, Cosgrove)		Polan Rd Former Landfill (Polan Rd, Dookie)		West of Murchison (Bendigo-Murchison Rd, Murchison)		North of Murchison (Punt Rd, Dhurringile)	
Site Number	-			1		2A	2B		3		4		5		6
Criteria	Response	Rating	Response	Rating	Response	Rating	Rating	Response	Rating	Response	Rating	Response	Rating	Response	Rating
Double Weighted Criteria															
Buffers – Does the site provide adequate buffers to the nearest sensitive land use (minimum 500m) / Does the site contain existing buffer zones?	Yes, the site has adequate buffers and is located within the EPA licensed premises area of the Shepparton Wastewater Management Facility.	4	Nearest sensitive land use (dwelling) approx. 542m from site boundary. Can leverage off existing buffers from landfill.	2	Nearest sensitive land use (dwelling) approx. 860m from Lemnos-Cosgrove Rd (2A) and 700m (2B). Cosgrove Golf Course is also located east of the site, however, the entire site would not be required and buffers could be established within existing land parcels.	2	2	Nearest sensitive land use (dwelling) approx. 810m from site boundary.	2	Nearest sensitive land use (dwelling) approx. 520m from site boundary.	2	Nearest sensitive land use (dwelling) approx. 400m from eastern site boundary (potential to build buffers within site area)	-2	Nearest sensitive land use (dwelling) approx. 500m from southern boundary (potential to build greater buffers within site area).	2
Proximity to future housing growth areas – Is the site located so as to not interfere with any potential for future housing growth?	Yes, the site is located within the EPA licensed premises area of the Shepparton Wastewater Management Facility and will not be impacted by future housing growth.	4	No, the site will not interfere with any future housing growth.	4	No, the site will not interfere with any future housing growth.	4	4	No, the site will not interfere with any future housing growth.	4	It is unlikely the site will interfere with any future housing growth.	2	The site is located adjacent to a rural living zone.	-4	No, the site will not interfere with any future housing growth.	4
Proximity to major waterways – Is the site located at least 1km from the Goulburn and Broken Goulburn Rivers and other waterways?	Yes, the site is located approximately 1 km from the Goulburn River and 8 km from the Broken River	4	Yes, approx. 20km from Goulburn River and 9km to Broken River.	4	Yes, approx. 20km from Goulburn River and 9km to Broken River.	4	4	Yes, approx. 24km from Goulburn River and 10.1km from Broken River.	4	Yes, approx. 27km from Goulburn River and 12.2km from Broken River.	4	The site is located 6.1km from the Goulburn River and 30km from Broken River. However, it is adjacent to a water channel and in close proximity to Waranga basin.	-2	Approx. 5km from the Goulburn River and 25km from Broken River. However, is in relative close proximity to Waranga Basin.	-2

SITES	Daldy Road (used as baseline assessment site only)		Cosgrove 3 Landfill (Quarry Road, Pine Lodge)		Adjacent to Cosgrove Landfill (Quarry Rd and New Dookie Rd)			New Dookie Rd (New Dookie Rd, Cosgrove)		Polan Rd Former Landfill (Polan Rd, Dookie)		West of Murchison (Bendigo-Murchison Rd, Murchison)		North of Murchison (Punt Rd, Dhurringile)	
Site Number	-			1		2A	2B		3		4		5		6
Bushfire considerations – the site should be free of heavy vegetation and not pose a threat to any surrounding heavily vegetated areas.	The Daldy Road precinct is cleared of vegetation. May be some risk due to proximity to wastewater treatment plant.	-2	Presence of remnant vegetation only. Some clearing may be required. May pose potential threat to neighbouring grain growing land.	-2	Minimal presence of native vegetation. However, potential threat to neighbouring grain growing land.	-2	-2	Minimal vegetation through bulk of site, presence of vegetation along New Dookie Rd. Poses potential threat to grain growing land.	-2	A large portion of the former landfill is heavily vegetated from plantings works after the landfill was closed.	-2	Presence of remnant vegetation on site. Site is opposite land parcel affected by WMO.	-4	Some presence of remnant vegetation on site.	1
Flooding – does the site contain a FO or is it in FZ which will significantly affect development area?	No, the site is unaffected by an FO or FZ.	4	Yes, a small portion of the south west corner of the site is affected by the FO which may affect developable area.	-2	Yes, 2B is largely affected by an FO. 2A is unaffected by an FO.	4	-4	No, the site is unaffected by an FO or FZ.	4	No, the site is unaffected by a FO or FZ.	4	No, the site is unaffected by a FO or FZ.	4	No, the site is unaffected by a FO or FZ.	4
Access – Does the site provide access from a sealed road and can the road accommodate heavy vehicles? Does the site pose potential access conflicts?	Yes, the site has sealed road access. The road may require upgrading with additional uses on site. Limited access conflicts.	4	Access via Quarry Rd / Lemnos Cosgrove Rd. Existing vehicle access to site. Potential conflicts with cycling routes. May require access upgrades.	0	Access via Quarry Rd for 2A and New Dookie Rd for 2B. Potential conflicts with cycling routes, particularly for 2B, access would need to be from alternative to New Dookie Road. May require upgrades.	-2	-2	Site is located on New Dookie Road. Potential conflicts with cyclists and direct access arrangements to site off major arterial. May require upgrades.	-4	Polan Road is unsealed. Would require significant upgrades.	-4	Yes, the site is located on Bendigo-Murchison Rd. Potential difficult access arrangements off major arterial. Significant upgrades may be required.	-2	No, direct access to the site is from an unsealed Rd. Would require significant upgrades.	-4
Infrastructure & Servicing Cost – What are the likely required infrastructure costs?	Likely to be medium infrastructure costs for development (requires detailed analysis).	-2	Likely to be medium infrastructure costs for development (requires detailed analysis).	-2	Likely to be medium-high infrastructure costs for development for 2A and high costs for 2B (requires detailed analysis).	-2	-4	Likely to be very high infrastructure costs for development (requires detailed analysis).	-4	Likely to be very high infrastructure costs for development (requires detailed analysis).	-4	Likely to be very high infrastructure costs for development (requires detailed analysis).	-4	Likely to be very high infrastructure costs for development (requires detailed analysis).	-4
Single Weighted Criteria															
Council owned – Is the site owned by Council?	No, the site is owned by GWV.	-2	Yes, the site is in Council ownership.	2	No, the site is privately owned.	-2	-2	No, the site is privately owned.	-2	Yes, the site is in Council ownership.	2	No, the site is privately owned.	-2	No, the site is privately owned.	-2
Access to power grid – is access to the power grid available?	Yes, current access to power is available.	2	Yes, current access to power is available.	2	Yes, the site is within the Powercor service area.	2	2	Yes, the site is within the Powercor service area.	2	Yes, the site is within the Powercor service area.	2	Yes, the site is within the Powercor service area.	2	Yes, the site is within the Powercor service area.	2

SITES	Daldy Road (used as baseline assessment site only)		Cosgrove 3 Landfill (Quarry Road, Pine Lodge)		Adjacent to Cosgrove Landfill (Quarry Rd and New Dookie Rd)			New Dookie Rd (New Dookie Rd, Cosgrove)		Polan Rd Former Landfill (Polan Rd, Dookie)		West of Murchison (Bendigo-Murchison Rd, Murchison)		North of Murchison (Punt Rd, Dhurringile)	
Site Number	-			1		2A	2B		3		4		5		6
Land area – Is the site area at least 15 hectares (gross)?	Yes, the site area earmarked for development was 30ha.	2	Yes, the gross area is 74 ha (approx.), however, this may be significantly reduced by land fill and quarrying activities.	1	Yes, 2A is approximately 30ha and 2B is approximately 79 ha. Only a portion of the site would be required.	2	2	Yes, the gross area is 34.5 ha (approx.). Only a portion of the site would be required.	2	Yes, the gross area is 20.7 ha (approx.)	2	Yes, the gross area is 66ha (approx.) Only a portion of the site would be required.	2	Yes, the gross area is 130 ha (approx.). Only a portion of the site would be required.	2
Zoning – Is the sites zoning favourable for development?	Yes, the site is zoned PUZ.	2	Yes, the site is currently zoned PUZ.	2	The site is currently zoned FZ.	0	0	The site is currently zoned FZ.	0	Yes, the site is currently zones PUZ.	2	The site is currently zoned FZ.	0	The site is currently zoned FZ.	0
Overlays – Are restrictive overlays present on site (e.g. LSIO)?	Yes, the majority of the site is affected by an LSIO.	-1	Yes, a portion of the site is subject to the FO and LSIO.	-1	The majority of 2A is affected by an LSIO. A portion of 2B is affected by an LSIO and FO.	-2	-1	A small portion of the south west corner is affected by an LSIO. The site is adjacent to an EMO and SMO.	-1	The site is affected by an SMO.	-2	The site is affected by an SMO.	-2	The site is partly affected by an SMO.	-2
Irrigated Land – Is the site located within an irrigated land district?	Yes, the site is within the irrigated land district.	-2	No, the site is not within an irrigated land area.	2	No, the site is not within an irrigated land area.	2	2	No, the site is not within an irrigated land area.	2	No, the site is not within an irrigated land area.	2	No, the site is not within an irrigated land area.	2	No, the site is not within an irrigated land area.	2
Existing Infrastructure – does the site contain existing resource recovery infrastructure that produces unique synergies with a resource recovery precinct?	Yes, the site contains existing resource recovery operations and is adjacent to a wastewater treatment plant.	2	Yes, the site contains the Cosgrove 2 Landfill and planned Cosgrove 3 Landfill and adjacent to stone crushing operations.	2	No, however, 2A is adjacent to the Cosgrove 2 Landfill and planned Cosgrove 3 Landfill and adjacent to stone crushing operations. 2B is also in close proximity to these uses.	1	0	No, however, the site is in close proximity to Cosgrove 2 Landfill and planned Cosgrove 3 Landfill.	-1	The site is a former landfill, however, no current resource recovery infrastructure exists.	-1	No, the site does not have any existing resource recovery infrastructure.	-2	No, the site does not have any existing resource recovery infrastructure.	-2
Land Configuration – Is the land of regular shape for ease of lot layout and design?	Yes, the site is of regular shape.	2	Yes, the site is of regular shape.	2	Yes, the site is of regular shape.	2	2	Yes, the site is of regular shape, with a curved boundary along New Dookie Road.	2	The site is mostly regular in shape.	1	The site is irregular in shape.	-1	Yes, the site is of regular shape.	2
Topography – Is the land flat for ease of development?	Yes, the land is flat.	2	Yes, the land is flat.	2	Yes, the land is flat.	2	2	Yes, the land is flat.	2	No, the land is undulating.	-2	Yes, the land is flat.	2	Yes, the land is flat.	2
Encumbrances – Does the site contain encumbrances, such as easements that may restrict development?	There is an existing water channel on the eastern boundary however, this would not limit development.	2	Yes, the site has a power line easement that may restrict the developable area.	-1	2B and 2A is affected by a powerline easement, however, this will not restrict the developable area to detriment of the precinct.	0	0	The site does not appear to be affected by any encumbrances; however, this will be subject to further investigation.	0	The site does not appear to be affected by any encumbrances; however, this will be subject to further investigation.	0	The site does not appear to be affected by any encumbrances; however, this will be subject to further investigation.	0	The site does not appear to be affected by any encumbrances; however, this will be subject to further investigation.	0

SITES	Daldy Road (used as baseline assessment site only)		Cosgrove 3 Landfill (Quarry Road, Pine Lodge)		Adjacent to Cosgrove Landfill (Quarry Rd and New Dookie Rd)			New Dookie Rd (New Dookie Rd, Cosgrove)		Polan Rd Former Landfill (Polan Rd, Dookie)		West of Murchison (Bendigo-Murchison Rd, Murchison)		North of Murchison (Punt Rd, Dhurringile)	
Site Number	-			1		2A	2B		3		4		5		6
Cultural heritage – Does the site contain any cultural heritage elements, that may restrict development?	A small area of the site is a statutory area of Aboriginal cultural heritage sensitivity, being a stone artefact scatter. The area would be subject to further investigation.	-1	Cultural study undertaken. Congupna Creek area should be avoided by development.	-1	Subject to cultural study (no cultural heritage overlay)	0	0	Subject to cultural study (no cultural heritage overlay)	0	Subject to cultural study (no cultural heritage overlay)	0	Subject to cultural study (no cultural heritage overlay)	0	Subject to cultural study (no cultural heritage overlay)	0
Flora – will development determinately affect existing flora?	The area has been fully cleared of remnant floodplain vegetation.	2	Flora study completed for site. Presence of scattered native vegetation.	-1	Subject to Flora and Fauna study.	0	0	Subject to Flora and Fauna study.	0	Subject to Flora and Fauna study.	0	Subject to Flora and Fauna study.	0	Subject to Flora and Fauna study.	0
Geology & Soils – are geological and soil conditions suitable for development?	Yes, geology study completed.	2	Yes, geology study completed.	2	Subject to investigation.	0	0	Subject to investigation. However, the area provides quality soils for grain agriculture.	-2	Subject to investigation. However, area provides quality soils for grain agriculture.	-2	Subject to investigation.	0	Subject to investigation.	0
Timing – Can the site be delivered in an efficient and timely manner?	The site is owned by GVV, placing restrictions on timing of development.	-2	Yes, site can be delivered quickly, given favourable planning conditions, council owned and studies already undertaken for site.	2	The site is privately owned. Requirement for planning scheme amendment, and detailed site analysis studies.	-2	-2	The site is privately owned. Requirement for planning scheme amendment, and detailed site analysis studies.	-2	Currently in Council ownership and favourable zoning. May require new detailed sites analysis studies.	1	The site is privately owned. Requirement for planning scheme amendment, and detailed site analysis studies.	-2	The site is privately owned. Requirement for planning scheme amendment, and detailed site analysis studies.	-2
Cost- is cost minimised through limited purchase costs, favourable zoning and consultant costs?	Site will require agreement for development with GVV. However, existing studies completed and the site has favourable zoning.	-1	Yes, site is in Council ownership, existing studies have been undertaken, no requirement for a planning scheme amendment. Further studies would be required for development.	1	Site will require agreement for purchase, site analysis studies, planning scheme amendment.	-2	-2	Site will require agreement for purchase, site analysis studies, planning scheme amendment.	-2	Site may require site analysis studies and potential upgrade of access road infrastructure.	-2	Site will require agreement for purchase, site analysis studies, planning scheme amendment.	-2	Site will require agreement for purchase, site analysis studies, planning scheme amendment.	-2

SITES	Daldy Road (used as baseline assessment site only)		Cosgrove 3 Landfill (Quarry Road, Pine Lodge)		Adjacent to Cosgrove Landfill (Quarry Rd and New Dookie Rd)			New Dookie Rd (New Dookie Rd, Cosgrove)		Polan Rd Former Landfill (Polan Rd, Dookie)		West of Murchison (Bendigo-Murchison Rd, Murchison)		North of Murchison (Punt Rd, Dhurringile)	
Site Number	-			1		2A	2B		3		4		5		6
Landscape Values – does the site compromise existing landscape aesthetics through impacts on existing views?	Daldy Road is concealed of views to main road corridors.	2	The site is largely concealed of views to main road corridors.	1	2A is largely concealed of views to main road corridors. 2B is exposed and may affect landscape aesthetics.	1	-2	The site is highly exposed and may affect landscape aesthetics.	-2	The site is largely concealed of views to main road corridors	1	The site is highly exposed and may affect landscape aesthetics.	-2	The site is concealed of views to main road corridors	2
Risk – does the site minimise risk to Council (planning, purchase, political, market)?	The site requires agreement with GVW, posing substantial risk to development potential.	-2	Yes, the site is of minimal risk to Council and will provide the ability to test the market.	1	Potential purchase risk. Planning risk may be reduced due to proximity to Cosgrove Landfill.	-2	-2	Potential purchase risk, planning, political and market risk (if site is purchased).	-2	The site provides some risk to Council through development.	-1	The site potentially includes purchase, planning, political and market risk (if site is purchased).	-2	The site potentially includes purchase, planning, political and market risk (if site is purchased).	-2
Biodiversity Values – Does the site contain high levels of biodiversity or is it in close proximity to areas of high biodiversity?	The site is primarily cleared farming land. High levels of biodiversity are unlikely, however, this is subject to detailed analysis.	1	Given the site is largely cleared, high levels of biodiversity are unlikely, however, this is subject to detailed analysis.	0	Given the site is largely cleared, high levels of biodiversity are unlikely, however, this is subject to detailed analysis.	0	0	Given the site is largely cleared, high levels of biodiversity are unlikely, however, this is subject to detailed analysis. The site is also opposite areas of vegetation that may have biodiversity values.	-1	Scattered vegetation on site, which may have biodiversity values. Subject to detailed investigation.	-1	Scattered vegetation on site, which may have biodiversity values. Subject to detailed investigation. Proximity to Waranga Bushland Reserve and Waranga Basin.	-2	Scattered vegetation on site, which may have biodiversity values. Subject to detailed investigation. Proximity to Waranga Basin and Mosquito Depression.	-2
Total		26		22		10	-3		-1		4		-23		-1

Source: Urban Enterprise, 2015

11.4. IDENTIFIED SITE DISCUSSION

The site assessment matrix analysis has provided a comparative ranking of sites, shown in Table 20. The site assessment matrix is complemented by a discussion of individual sites in this section.

TABLE 20 SITE ASSESSMENT MATRIX ANALYSIS RESULTS

Site Number	Site	Points
-	Daldy Road	26
1	Cosgrove 3 Landfill	22
2A	Adjacent to Cosgrove Landfill	10
4	Polan Road Former Landfill	4
6	North of Murchison	-1
3	New Dookie Road	-1
2B	Adjacent to Cosgrove Landfill	-3
5	West of Murchison	-23

DALDY ROAD

The Daldy road site has been assessed for the purposes of providing a benchmark with other potential sites for the establishment of a resource recovery precinct. Overall the site ranks favourable for resource recovery operations. However, the site has been determined to be unsuitable for further major development due to the corporate risk posed to GVV. It is therefore not suitable for the formal establishment of a resource recovery precinct. The precinct can continue to accommodate niche recovery operations, that are low emitting and low employing businesses with agreement with GVV.

COSGROVE 3 LANDFILL SITE

The Cosgrove landfill site has ranked highly in the assessment matrix.

However, more recent findings for the site (findings made after first draft report was issued) reveal that the intended plans for the landfill over the next 30 years and existing quarry operations will leave minimal space for the formal establishment of a Resource Recovery precinct on this site. However, there remains opportunity for the establishment of a pre sorting facility in conjunction with the landfill. A sorting facility could provide potential operators with a guaranteed waste stream for which to recover in the region. There may also be opportunity to accommodate limited concrete crushing and concrete recycling on the capped Cosgrove 1 & 2 landfills.

The establishment of a sorting facility at the Cosgrove landfill also presents an opportunity to consolidate regional landfills in order to increase the level of material passing through Cosgrove and increasing material recovery.

The landfill levy and the cost of landfill cell construction is increasing. A reduction in the quantity of material going directly to landfill could increase the life of the Cosgrove landfill reduce future landfill costs. There is also strong policy setting to divert material from landfill.

SITES ADJACENT TO COSGROVE LANDFILL

Sites 2A and 2B adjacent to Cosgrove landfill presented opportunity to co-locate a resource recovery precinct in close proximity to the Cosgrove landfill. However, the site assessment matrix and more recent findings for site 2A suggest that the site has been licenced for clay extraction and is not a viable option for development.

Further, the impacts on view line corridors, as well as the presence of a FO on site 2B as well as the potentially high infrastructure servicing and infrastructure costs and land cost, limit its potential for development for resource recovery operations. Sites 2A and 2B are therefore not viable for further consideration.

NEW DOOKIE ROAD SITE

The site on New Dookie road presented opportunity for development as a large unencumbered site for development. However, when considering the impact the site may have on view lines from main road corridors, the potential traffic conflicts between cyclists and vehicles, the high infrastructure costs, high land cost and potential fire risk to grain growing land, the site is not viable for further consideration.

POLAN ROAD SITE

The Polan road site was considered as it is Council owned land and is a former landfill site. However, the site has not ranked well in the site assessment matrix, primarily due to the SMO, undulating land, high infrastructure costs and poor access arrangements. The Polan Road site is not considered to be a viable option for future development of a resource recovery precinct.

SITE WEST & NORTH OF MURCHISON

The sites west and north of Murchison were identified due to their relative isolation from residential settlements and large unencumbered lots. However, the site assessment matrix has revealed that the sites have not ranked well due to critical issues concerning access and very high infrastructure costs. Therefore, these sites are not considered viable for future development for a resource recovery precinct.

11.5. SUMMARY OF SITE ASSESSMENT

The review of potential candidate sites for a resource recovery precinct has led to no preferred site being identified. Although the Cosgrove landfill site has characteristics favourable for establishment of a resource recovery precinct, there is a lack of land available for this purpose on the site and it is therefore not viable for development.

The potential of Greater Shepparton to accommodate a large precinct has been primarily limited by the following key factors:

- A large proportion of the municipality is irrigated land, which has higher levels of dwelling density, when compared to areas of non-irrigated land.
- A lack of infrastructure and transport networks in areas that have lower population densities.
- Extensive areas subject to flood risk.
- Buffer requirements to sensitive land uses.
- High cost of potential infrastructure upgrades for sites in remote areas, as well as distance from key input markets.
- Proximity of existing industrial land to residential settlements or future housing growth areas.

Table 21 provides a summary of the site assessment analysis and implications.

TABLE 21 SUMMARY OF SITE ASSESSMENT

Site Number	Site	Potential to be progressed	Progression implications
-	Daldy Road	✓	There is potential for Daldy Road to move forward with niche, low emitting businesses, with agreement with GV Water.
1	Cosgrove Landfill (Cosgrove 3 Landfill Site)	✓ (pre-sorting only)	There is insufficient land available for the establishment of a resource recovery precinct. However, the existing works approval for Cosgrove 3 Landfill includes an area that has been identified as a potential pre-sorting area. There may also be opportunity for limited concrete crushing / recycling facilities on the capped Cosgrove 1 & 2 landfills.
2A	Adjacent to Cosgrove Landfill	✗	-
4	Polan Road Former Landfill	✗	-
6	North of Murchison	✗	-
3	New Dookie Road	✗	-
2B	Adjacent to Cosgrove Landfill	✗	-
5	West of Murchison	✗	-

11.6. ALTERNATIVE APPROACHES FOR MOVING RESOURCE RECOVERY FORWARD

Given the complexities associated with identifying a single precinct for the establishment of a resource recovery precinct in Greater Shepparton, alternative approaches may be necessary to progress the opportunity forward. This section outlines potential alternative approaches moving forward for resource recovery.

OPTION 1: A REGIONAL APPROACH

Given the complexities of identifying a suitable site in Greater Shepparton for a resource recovery precinct a regional approach could be taken to attempt to identify a site suitable for these purposes. A regional approach would encompass the Council areas under the Goulburn Valley Waste and Resource Recovery Group. A regional approach provides the opportunity to find a site that is most suitable for resource recovery across a large regional area, taking account of multiple factors including input and end market locations, buffer areas, infrastructure and road and other transport access. The downside of locating a precinct outside of Greater Shepparton may mean lost economic development opportunities, including short term and long term employment opportunities, value add industries and 'green' branding opportunities.

If a regional approach was pursued, it could build on the work undertaken for this project including the adopted methodology for identifying potential candidate sites (exclusion mapping, site assessment matrix). An initial first step of this approach would be to contact neighbouring municipalities in the Goulburn Waste and Resource Recovery Group Region to gauge support for the study.

OPTION 2: A MULTIPLE LOCATION APPROACH

A multiple location and site approach could be an option for progressing resource recovery in Greater Shepparton moving forward. The multiple location approach would leverage off existing locations, including:

- Utilising Daldy Road for niche, low emitting and employing uses, in agreement with GVW.
- Cosgrove 3 landfill site for the establishment of a pre-sorting facility.
- Existing zoned industrial land for recycling and reprocessing centres, which are assessed on a site by site basis against relevant planning controls and EPA guidelines.

The major downside to this option is a loss of synergies that can be established through co-location, as well as the ability to direct businesses to a precinct that is established for the purpose of resource recovery. Further, the 'green' branding opportunities may be lessened through a multiple site approach.

11.7. POTENTIAL PRECINCT FACILITIES

Table 22 provides an overview of the potential facilities that could be accommodated in a resource recovery precinct in Greater Shepparton. These facilities are designed to fill a potential market gap in Greater Shepparton / GV region. A range in the potential number of jobs per facility, estimated land areas and the type of building improvements for each facility is also included in the table. It should be noted that the type, size and number of employees for facilities is very variable across the industry. Therefore, these figures are estimates only based on the available data for waste and recovery facilities in the GV region. This list is not intended to provide a guide to development, rather it is to provide a high level assessment of the types of businesses that may be possible.

11.8. HYPOTHETICAL DEVELOPMENT COST

The likely development cost of a resource recovery precinct has been estimated. This is intended to be a general estimate of development cost only to provide an indicative guide to Council. The development cost includes general servicing infrastructure as well as an indicative cost for construction of factory facilities (excluding fit out) of a 24ha site. The construction cost has been predominately sourced from the *Review of Resource Recovery Precinct* report (URS Australia Pty Ltd) and supplemented with *Rawlinsons, 2015* Construction Handbook. The development cost will also inform the economic impact assessment. Construction costs will require further feasibility and investigation based on more rigorous investigation and master planning work.

A breakdown of development cost is included in Appendix B. The development of a resource recovery precinct in Greater Shepparton would cost approximately \$21 million. It should be noted that this is an estimate only and there is potential for development investment to exceed \$21 million depending on the type of facilities that are developed in the precinct.

TABLE 22 POTENTIAL PRECINCT FACILITIES

Facility	Description	Estimated Land Area (range)*	Median and Range of Employees for Facilities	Type of Improvements
Construction and demolition (C&D) Facility	<p>There is potential to establish a construction and demolition facility in the new precinct. Waste loads containing reinforced concrete, bricks, asphalt and mixed clean fill with rubble would be diverted from landfill to the C&D facility for sorting. This material can then be reprocessed on site or transported to another facility for reprocessing.</p> <p>The following C&D materials could include: concrete, soil, bricks, bitumen, steel, processed timbers, plaster boards, plastic and general builders waste.</p> <p>Potential recovered products could include recycled concrete pavement materials, aggregates and recycled sand.</p>	3.5 to 6.5 ha	Median 3 (range in GV region 1 - 5)	A sorting facility is likely to involve the manual sorting of C&D loads on a conveyor belt.
Commercial and industrial (C&I) Sorting Facility	There is potential to establish a C&I sorting facility which sorts recyclables from waste loads. Waste loads that are indicated to have a high percentage of recyclables would be sent to the C&I facility for further investigation. Items targeted for diversion from landfill would include steel, untreated timber, cardboard/paper and plastics.	3.5 to 5 ha	Median 5** (range in GV region 1 - 25)**	A sorting facility is likely to involve the manual sorting of C&D loads on a conveyor belt.
Organics Facility	There is opportunity to locate an organic wastes facility to process organic green waste into environmentally beneficial products, including mulch, compost, and soil conditioner. This operation reduces the amount of green waste being sent to landfill.	0.5 to 1 ha	5 (range in GV region 1 - 105)	A windrow system for converting organic material to compost, soil conditioner and mulch.
Glass Reprocessing	There is opportunity to establish a glass-reprocessing facility. This facility would require adequate economies of scale in order to be a viable undertaking. There is currently no glass reprocessing capacity in the region, with low value glass transported to Melbourne for processing.	1 to 2 ha	Median 5** (range in GV region 1 - 25)**	This facility would involve factories and internal storage areas for processing glass.
Plastics Reprocessing	There is currently one plastics reprocessing plant in Greater Shepparton. The site may provide opportunity to establish plastic recycling centre. This would be complemented by a sorting facility which would contribute to the material waste stream.	1 to 2 ha	Median 6 (range in GV region 2 -7)	This facility would involve a manual / mechanised screening and sorting process. Most plastics would be baled, however some would be pelletised for transport to manufacturing industries.
Rubber / Tyre Reprocessing	There is currently no tyres/rubber reprocessing capacity in the region. Most reprocessing involves shredding the tyres for use in making soft surfaces. There are however, generally low volumes required for soft surfaces, hence, the biggest opportunity in the short term future is for use in road base. Using rubber and tyres for waste-to-energy is currently not viable on a large scale in Victoria. However, market development of this industry should be encouraged.	1.5 to 2.5 ha	Median 5** (range in GV region 1 - 25)**	A rubber / tyre recycling facility would involve a mechanised facility that creates rubber crumb and granules.
Waste to Energy	There is opportunity to investigate the use of source separated food organics to produce energy, process derived fuels and other products. One factor underpinning the success of this option is establishing new collection systems that complement existing kerbside systems for households, and new systems designed specifically for C&I sources.	0.5 ha 1	2 (one business, no range available)	This facility may likely involve modular digesters to produce methane gas.
Education Centre	There is opportunity to provide an onsite education centre to provide a venue for the presentation of site information to school groups, community groups, international visitors and businesses interested in recycling, resource recovery and sustainable environmental practices.	0.1ha to 0.2 ha	1	Small office and meeting rooms associated with a key facility.
		11.1 ha to 19.7 ha	32	

*Land areas are estimates only. Specific land requirements will be subject to individual enterprise.

**Low sample size. Median and range used across re-processing facilities in GV region.

12. ECONOMIC, ENVIRONMENTAL & SOCIAL IMPACTS

12.1. INTRODUCTION

The following section of the report outlines the potential economic, social and environmental impacts of establishing a resource recovery precinct in Greater Shepparton. This section should be used as a guide only to the potential benefits of resource recovery and is based on the assumptions included in Section 12.

12.2. ECONOMIC BENEFITS

The economic benefits of establishing a resource recovery facility include:

- Direct and indirect investment into the local economy;
- Generation of jobs;
- Expansion of existing firms and creation of new local businesses;
- Generates revenues from the recovery of material streams and/or the production of energy;
- Recovery of economic value of many materials and products households now send as solid waste to landfill;
- Minimises the impact of increasing landfill costs and the landfill levy;
- Extends the life of landfill sites;
- Facilitates private investment in Greater Shepparton;
- Contributes to the 'green' branding of Greater Shepparton.

12.3. ECONOMIC IMPACT ASSESSMENT

CONSTRUCTION / DEVELOPMENT IMPACTS (SHORT TERM)

Utilising Remplan's economic input-output modelling and the estimated total development cost for the development of a resource recovery precinct in Greater Shepparton the direct and indirect benefits have been calculated. Table 23 shows a total output of \$44 million (including \$21 m direct and \$23 m indirect) and 129 jobs (including \$50 direct and 79 indirect) during the construction and development phases of investment.

TABLE 23 ECONOMIC IMPACT

Impact Summary	Direct Impact	Indirect Impact	Total Impact
Output (\$M)	\$21	\$23	\$44
Employment (Jobs)	50	79	129

Source: Remplan, 2015

ONGOING IMPACTS

The resource recovery precinct has the potential to generate 32 ongoing jobs directly within the precinct as shown in Section 11.

Table 24 shows the total direct and indirect impact of ongoing 'new' resource recovery operators to the region. In total, ongoing resource recovery operations will generate an estimated \$35 million to the Greater Shepparton economy and create 81 jobs.

TABLE 24 ONGOING OPERATIONAL IMPACTS (ANNUAL)

Impact Summary	Direct Impact	Indirect Impact	Total Impact
Output (\$M)	\$22	\$13	\$35
Employment (Jobs)	32	49	81

Source: Urban Enterprise & Remplan, 2015

Potential occupations from resource recovery precinct industries include truck drivers, recycling and rubbish collectors, managers, factor process workers, production managers, earthmoving operators, miscellaneous technicians and trades, supply and distribution managers, forklift drivers, administrative workers and others.

12.4. ENVIRONMENTAL BENEFITS

Resource recovery facilities play a vital role in improving sustainability outcomes both locally and globally and ensuring maximised recovery of materials that would otherwise go to landfill. The following are some possible environmental benefits:

- Reducing waste to landfill and requirement for new landfill sites;
- Increasing recovery of materials and energy;
- Decreased greenhouse gas emissions;
- Reduction in demand on virgin materials;
- Utilisation of industrial and commercial energy and materials and by-products currently underutilised or wasted;
- Utilisation of C&D materials currently sent to landfill;
- Utilisation of agricultural and food processing discards;
- Production of green energy.

12.5. SOCIAL BENEFITS

Resource recovery facilities provide social benefits to the community. Potential social benefits include:

- Increased local job opportunity;
- Job development at a broad range of skill levels;
- Social ties established through working relationships;
- Increased local expenditure;
- Reduces community impact of waste management on the environment;
- Raises community awareness and interest in the importance of sustainable waste management;
- Training and employment for disadvantaged job seekers;
- Waste and recovery education opportunities for School and community groups;
- Access to employment for disadvantaged;
- Reduction in disposal costs.

13. CONCLUSIONS

Urban Enterprise has prepared this report for Greater Shepparton City Council which provides a site selection study and feasibility assessment of a resource recovery precinct in Greater Shepparton. The report has identified opportunities and issues related to resource recovery, assessed potential sites for the establishment of the precinct and undertaken an economic, social and environmental impact assessment.

Victorian State Government policy setting has a strong focus on diverting material from landfill both to reduce the negative environmental impacts associated with landfills and to realise the full value of materials in the economy. Therefore there is considerable policy support and potential funding support for the establishment of a resource recovery precinct in Greater Shepparton.

A review of the Daldy Road precinct has revealed that the formal establishment of a resource recovery precinct in this location was rejected due to the corporate risk posed to Goulburn Valley Water. Council's lack of control of the precinct and inability to direct and guide investment poses a constraint to economic development. It is therefore difficult for Council to direct potential operators and investors to this precinct with any certainty of establishment. Loss of investment in this sector would result in foregone economic development opportunities and green branding opportunities for Greater Shepparton.

The Daldy Road precinct has an important role to play in Shepparton's waste and resource recovery sector. Niche, low emitting, low employment industries that demonstrate high synergies with the Wastewater Management Facility could still be considered for development in this precinct. However, individual agreement between Goulburn Valley Water and operators would need to be established and formalised.

The uncertainty surrounding Daldy Road has resulted in the investigation of alternative sites for the establishment of a formal resource recovery precinct.

The review of potential candidate sites for a resource recovery precinct has led to no preferred site being identified. Although the Cosgrove landfill site has characteristics favourable for establishment of a resource recovery precinct, there is a lack of land available for this purpose on the site and it is therefore not viable for development.

The potential of Greater Shepparton to accommodate a large precinct has been primarily limited by the following key factors:

- A large proportion of the municipality is irrigated land, which has higher levels of dwelling density, when compared to areas of non-irrigated land.

- A lack of infrastructure and transport networks in areas that have lower population densities.
- Extensive areas subject to flood risk.
- Buffer requirements to sensitive land uses.
- High cost of potential infrastructure upgrades for sites in remote areas, as well as distance from key input markets.
- Proximity of existing industrial land to residential settlements or future housing growth areas.

Council may wish to consider the establishment of a pre sorting facility utilising the Council owned Cosgrove land. This facility could generate salvaged materials which otherwise would have gone to landfill. This would generate material streams for recovery and reprocessing at other locations.

The assessment has found that there are considerable complexities associated with identifying a single precinct for the establishment of a resource recovery precinct in Greater Shepparton, alternative approaches may be necessary to progress the opportunity forward and to realise the potential significant environmental and economic opportunities associated with this sector. The potential alternative approaches moving forward for progression of resource recovery in Greater Shepparton may include:

- A regional approach, encompassing neighbouring municipalities within the Goulburn Valley Waste and Resource Recovery Group region.
- A multiple site approach, utilising various sites across the municipality.

The establishment of a resource recovery precinct presents significant opportunity to generate economic, social and environmental benefits for the Greater Shepparton region. The development of a resource recovery precinct could produce an estimated economic impact of \$44 million and approximately 129 jobs to the local economy during the construction and development phase. This will vary depending on the level of private investment in the precinct, the scale of facilities and labour intensive uses. The ongoing impacts will produce an estimated 81 annual jobs and \$35 million in input to the Greater Shepparton economy.

For further progression of the resource recovery sector in Greater Shepparton in the short term, Council in collaboration with Goulburn Valley Water may wish to develop a list of niche, low emitting businesses that are suitable for location in the Daldy Road Precinct. This could provide some direction and certainty in regard to directing businesses to the Daldy Road precinct.

14. WORKS CITED

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- Greater Shepparton City Council, Greater Shepparton Environmental Sustainability Strategy 2014-2030, 2014
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- Greater Shepparton City Council, Waste and Resource Recovery Management Strategy, 2013
- Ministerial Advisory Committee, Review of Waste Transfer and Recycling Facility Provisions in Planning Schemes, 2009
- Profile id. Population Forecasts for City of Greater Shepparton, 2015
- RMCG, Goulburn Valley Fruit Growing Industry Roadmap, 2013
- State Planning Policy, SPPF Clause 19.03-5 Waste and Resource Recovery
- Sustainability Victoria, An Options Framework for End of Life Tyres, prepared by Price Waterhouse Coopers, 2013
- Sustainability Victoria, Analysis of Market Drivers for Resource Recovery in Regional Victoria, prepared by Hyder Consulting, 2009
- Sustainability Victoria, Goulburn Valley Region Infrastructure, 2015
- Sustainability Victoria, State-wide Waste and Resource Recovery Infrastructure Plan, September 2013
- Sustainability Victoria, Victorian Recycling Industry Annual Survey, 2010/11
- Victoria in Future, Population Forecasts, 2015
- Victorian Building Authority, Building Approvals, 2015

Appendix A CONSULTATION SUMMARY

INTRODUCTION

The consultation process undertaken to support the identification of a site for resource recovery operations in Shepparton and review the current Daldy Road precinct includes:

- Goulburn Valley Water;
- Goulburn Broken Catchment Management Authority;
- CFA;
- APA Group;
- Goulburn Murray Water;
- Environmental Protection Agency (EPA);
- Goulburn Valley Waste and Resource Recovery Group;
- Greater Shepparton City Council - Waste Management;
- Greater Shepparton City Council - Economic Development / Investment Attraction;
- Greater Shepparton City Council – Planning;
- Greater Shepparton City Council – Environment;
- Greater Shepparton City Council – Property & Business;
- Community consultation.

Following is a summary of the outcomes of the consultation process for the establishment of a resource recovery precinct in Greater Shepparton and the review of the Daldy Road precinct. The consultation summary is grouped under key headings.

DALDY ROAD

Owned and operated by Goulburn Valley Water (GVW), the wastewater treatment plant located at Daldy Road is one of the biggest in regional Victoria.

The land is within an EPA licensed premises which comes with strict EPA performance requirements for water discharge and odour. T

The current resource recovery activities located at Daldy Road include: Veolia, a liquid waste facility that helps GVW with septage receipt; Western Composting, a green waste composting operation and Diamond Energy, a co-generation facility located adjacent to Goulburn Valley Water bio-gas storage facility. Together, these operations cluster to form a resource recovery precinct.

There has been interest from other operators to locate within the precinct, including a plastics recycling plant, capable of recycling up to 20 tonne of mixed plastics or 10 tonne of tyres per day; a plastics wrapping business and peach kernel composting business.

The continued expansion and development of the Daldy Road precinct poses a commercial risk to GVWs operations, particularly related to increased odour risks as part of an expanding precinct.

Given the risk to the EPA licensed premises and GVWs operations, the formal establishment of the Daldy Road area as a resource recovery precinct is unlikely. However, there is opportunity to locate low risk, no hazardous, low staffed operations in this area. GV water has noted that an operation such as a solar farm may be a permissible use on site.

The Daldy Road site is also subject to flooding. The Goulburn Broken Catchment Management Authority has noted that they would be in support of resource recovery operations, however, flood impacts of development must not be adverse on other operators. It is also important to maintain the irrigation channel in the area, to be free from pollutants. Smaller scale facilities, comparable to the current operations would be more likely acceptable than larger scale facilities.

FLOODING

The Goulburn Broken Catchment Management Authority oversee the implementation of the Regional Catchment Strategy and work to ensure land and water resources are protected and enhanced as well as improving the region's social wellbeing, environmental quality and productive capacity in a sustainable manner.

For the location of resource recovery operations a site less prone to flooding would be preferable. However, a site with a Land Subject to Inundation Overlay (LSIO) can be managed through specific earth works such as fill pads.

Land within proximity to an irrigation channel needs to ensure that uses are established at least 30 metres from the channel and that the channel is kept free from potential pollutants and hazardous wastes.

For development within an L510 or flood overlay, the establishment of new buildings needs to prove that there are no adverse impacts on adjoining land owners. This would be assessed on a site by site basis.

FIRE RISK

The Country Fire Authority (CFA) is a volunteer and community based fire and emergency services organisation. The CFA have advised on potential fire risks associated with development of a resource recovery facility.

Tyre recycling is a large fire risk, particularly when tyres are stored in large quantities. This is primarily due to the toxic smoke produced from a tyre fire. The establishment of a tyre recycling / partial storage facility would be better located in a more isolated area away from main population centres.

Isolated sites with little access to water create logistical challenges for the CFA. An isolated site may be required to include static water storage tanks to deal with the risk of fire. Even if the site has access to reticulated water, a lack in water pressure, may still prompt the need for static water storage tanks.

GAS

The Daldy Road precinct is currently not serviced by gas. 2.5 km of gas piping would be required to service the Daldy Road site, which would come at considerable cost.

Servicing isolated sites with gas mains can be a costly exercise; however, alternatives such as on site storage facilities exist as an alternative.

COSGROVE LANDFILL

The Cosgrove landfill is a significant asset to Council's waste management operations and has been identified as an asset of state importance. Currently, there are three landfill facilities in Shepparton. Located 20km east of Shepparton, the land is owned and operated by Council. Council also lease part of the site to Boral to undertake stone extraction operations.

There is currently a report being produced which will decisively delineate the boundaries for landfilling and quarrying operations. This will identify land that can be utilised for other purposes.

The land is currently partly underutilised. Particular areas are not used for quarrying or landfill and will not be required for these purposes. There is, therefore a need to investigate whether this land could be utilised for a higher use and becoming an income generating asset to Council. This may include the potential for resource recovery operations and the relevant synergies that could be established.

This may include the inclusion of a pre-sorting facility of waste that goes to landfill. A pre-sorting facility would greatly increase the level of recovered materials that avoid landfill and complement potential resource recovery operations. This would also enable maximum life to be generated from the landfill site. Anecdotally, there is a significant amount of material that is currently going to the Cosgrove landfill that could be recovered.

SOILS

New sites should have appropriate soils to ensure that there is no seepage of hazardous or polluting materials into the water system if the site floods, particularly the Goulburn River and Goulburn Broken River.

EPA REQUIREMENTS

The EPA is a key referral authority for the establishment of resource recovery precincts. Resource recovery precincts do not have set criteria; rather they are assessed on a case by case basis. The predominant issue that will need to be considered is the buffer requirement to sensitive land uses to limit the impact of potential odour, dust and noise. The EPA will also assess potential surface water and ground water contamination that could result in the pollution of natural waterways.

INTEREST FOR SITES

Anecdotally, there has been significant interest by private operators in establishing businesses in the Greater Shepparton region that deal with waste and resource recovery. Council has not had a formal precinct in which to direct these businesses. These businesses include tyre and plastics and other recycling, composting and energy generation.

Veolia obtained a grant of \$700,000 to establish an industrial waste facility at Daldy Road 4 to 5 years ago; however the proposal was not supported by GVW and did not eventuate.

COMMUNITY CONSULTATION

A draft report was put on exhibition in December 2015 – January 2016 to provide the opportunity for stakeholders and the community to provide input to the study.

121 submissions to the Draft Report were received.

Face to face meetings were also conducted with a range of submitters to the project. These meetings were conducted on the 13th and 14th of April in Shepparton.

The feedback on the first draft report has been taken on board and is reflected in this second iteration of the draft report.

SUMMARY OF CONSULTATION

The following provides a summary of the key points raised through submissions during the exhibition period of the Draft Report and community consultation meetings conducted at Greater Shepparton City Council on Wednesday the 13th and Thursday the 14th of April.

The significant community response to the project has indicated that whilst the community generally acknowledges the importance of planning for resource recovery operations, including minimising our impact on the environment, there is difficulties in identifying a site that will be supported by all community members due to the perceived impacts of a resource recovery facility. This increases the challenge of identifying one site/precinct that can accommodate a diversity of resource recovery facilities.

TABLE 25 SUMMARY OF SUBMISSIONS

	Opposed to Specific Sites	Generally Against	Generally For	Unclear	Total
All Sites	1	5	2	0	8
Cosgrove / Dookie Sites	53	5	5	2	65
Murchison Sites	45	1	0	2	47
Total	99	11	7	4	121

Issues raised primarily relating to sites identified in the eastern precinct (Cosgrove / Dookie sites):

- Site 4 not appropriate due to former landfill remediation works as unsatisfactory, including weeds, pollutant potential;
- Original location of Cosgrove tip was flawed;
- Negative impacts on tourism, views, landscape values, rail trail, cycling use and cycling events;
- Negative traffic impacts, increased truck movements and increased safety issue for cyclists;
- Infrastructure (roads) not adequate to deal with increased use;

- Too many possible unknowns with establishment of a resource recovery precinct, with regard to the types of activities that could take place;
- Negative impacts on land value;
- Agricultural quality of the land is underestimated;
- Proximity to Cosgrove Golf Club;
- Some newer dwellings missed in exclusion mapping;
- Increased fire risk in proximity to grain farming land;
- Doesn't align with economic future for Dookie (tourism, creative economy), including in the Dookie Community Plan;
- Buffers not adequate. Buffers need to consider worst case scenarios;
- Potential rodent / vermin / weed issues;
- Water supply limitations;
- Potential for smoke from resource recovery to taint grain;
- LSIO Should have negative not neutral ranking.

Issues raised primarily relating to sites identified in the southern precinct (sites west of Murchison):

- Biodiversity in area not given enough weight (important and rare birdlife);
- Potential to contaminate Waranga Basin and water channels;
- Rodent / vermin / weed issues;
- Conflict with the possible extension of rail trail to Rushworth;
- Road system unable to support increase in heavy vehicle traffic;
- Poor access to the area;
- Impacts on eco-tourism / tourism;
- Greater weighting to fire risks;
- Proximity to residential land in Campaspe;

General comments:

- Further development on Daldy Road would be through leases with GVW;
- Council should recommend compatible uses at Daldy Road with agreement from GVW;

- Daldy Road should be included in site assessment matrix.
- Site needs to be located close to markets or the source of waste;
- Waste from the building sector is the key opportunity;
- Uses such as composting will likely remain located in Daldy Road in the near future and will not move to a new precinct.
- Study needs to be more specific about what businesses would be included in a resource recovery precinct.
- Buffers of the precinct should be included within the same land parcels and not impact on adjoining land owners.

ADDITIONAL SITES IDENTIFIED THROUGH CONSULTATION

The consultation process included the identification of potential alternative sites for the establishment of a resource recovery precinct. The sites identified through consultation are shown below, as well as some implications for these sites.

- Sites north of Cosgrove Landfill

Sites north of the Cosgrove Landfill site were mentioned as possible alternatives to the identified sites. A site visit and high level desktop assessment was conducted for sites north of the Cosgrove Landfill. It is likely that the issues associated with the sites in this area are likely to be similar for sites north of the Cosgrove Landfill. The major issues for sites located north of the Cosgrove Landfill is the lack of infrastructure and the high cost of development. These sites are not considered to be viable alternatives.

- Boral Quarry Site

The Boral Quarry site located on Kellows Road in Cosgrove was mentioned as a potential alternative site for the establishment of a resource recovery precinct. A site visit and high level desktop assessment has been conducted of the site. The site is predominately occupied by existing quarrying operations, however there may be residual land available that could be utilised. The road infrastructure to the site is good, however the land is undulating posing potential issues for development, including increased infrastructure costs and layout issues.

- Former Heinz site in Girgarre (Campaspe Shire)

The former Heinz site located on the corner of Winter Road and Girgarre-Rushworth Rd, was mentioned as a potential site for the establishment of a resource recovery precinct. The site is located in Campaspe Shire. The site contains existing infrastructure and is zoned Industrial 1 Zone. This sites suitability could be considered in a region approach or multiple location approach moving forward.

Appendix B DEVELOPMENT COSTS

Category	Sub-Category	Description	Works	Approximate Indicative Unit Rate	Unit	Approximate Qty.	Indicative Cost	Source of Cost Estimate
SERVICING								
Roads	Precinct Service Road	Internal precinct service road.	Paved Road with shoulders. 6m wide. Swale drainage trenches on both sides.	\$550	m	950	\$522,500	URS - Review of Resource Recovery Precinct Daldy Road
	Streetlights	2x on Quarry Rd. 5x lights on internal rd.	5.5m columns. Main road lantern with internal control gear. 250W lights.	\$2,500	no.	7	\$17,500.00	URS - Review of Resource Recovery Precinct Daldy Road
							\$540,000	
Potential Flood Management	Floodway diversion channel	Diversion channels along Quarry Rd. boundary	10m wide. 1m deep. 400m length.	\$15	m3	4000	\$60,000	URS - Review of Resource Recovery Precinct Daldy Road
	Flood Reserve	Excavation of flood reserve.	40m wide. 1m deep. 70m length.	\$15	m3	2800	\$42,000	
							\$102,000	
Utilities	Trade Waste / Sewer	Sewer Mains Extensions	50-80mm PVC pressure pipe. 300mm excavation trench depth and backfill.	\$80.00	m	950	\$76,000	URS - Review of Resource Recovery Precinct Daldy Road
	Potable Water	Water Mains Extensions	50-80mm PVC pressure pipe. 300mm excavation trench depth and backfill.	\$80.00	m	950	\$76,000	URS - Review of Resource Recovery Precinct Daldy Road
	Power	3-Phase electrical mains extension. Underground. 200A.	300mm excavation trench depth and backfill.	\$100.00	m	950	\$95,000	URS - Review of Resource Recovery Precinct Daldy Road
							\$247,000	
Approvals	Cultural Heritage			\$20,000	no.	1	\$20,000	URS - Review of Resource Recovery Precinct Daldy Road
	Air Assessment			\$35,000	no.	1	\$35,000	URS - Review of Resource Recovery Precinct Daldy Road
	Sub-Division			\$10,000	no.	1	\$10,000	URS - Review of Resource Recovery Precinct Daldy Road

	Flood Assessment (CMA)			\$20,000	no.	1	\$20,000	URS - Review of Resource Recovery Precinct Daldy Road
							\$85,000	
Miscellaneous	Landscaping	Re-vegetation of road construction areas	Installation of grass and trees	\$10	m2	4900	\$49,000	URS - Review of Resource Recovery Precinct Daldy Road
		Revegetation of floodway	Installation of grass, trees and shrubs	\$10	m2	400	\$4,000	URS - Review of Resource Recovery Precinct Daldy Road
		Vegetation of flood Reserve	Installation of grass, trees and shrubs	\$10	m2	2800	\$28,000	URS - Review of Resource Recovery Precinct Daldy Road
							\$81,000	
Sub Total (Servicing)							\$1,055,000	
Design @ 10%							\$105,500	
Contingency @ 40%							\$422,000	
Total (Servicing)							\$1,582,500	
FACILITIES								
Facilities	Site Facilities	Indicative cost of single storey small span factory - includes metal roof, sliding doors, small office, toilet and amenities, all services, precast / tilt slab (1500 sqm of floorspace per facility)	Development of facilities on site.	\$1,095,000	no.	12	\$13,140,000	Rawlinsons, 2015
Sub Total(\$13,140,000	
Design @ 10%							\$1,314,000	
Contingency @ 40%							\$5,256,000	
Total (Facilities)							\$19,710,000	
Total Servicing & Facilities							\$21,292,500	

Sources: URS Australia, Pty Ltd. Rawlinsons Australian Construction Handbook, 2015.

