

Regional summaries

This section provides more detail on the waste generation and infrastructure needs of each region in Western Australia. Each summary includes a snapshot of the region's industries, demographics and economy, painting a picture of how the region's activities have influenced waste generation in 2020. The 2020 waste generation and demographic data is then used to estimate 2030 waste generation.

The 2020 resource recovery infrastructure capacity is based on licensed capacity which was obtained through the *State Waste Infrastructure Register*. Gaps in existing infrastructure capacity are identified when comparing 2020 infrastructure capacity and 2030 waste generation data. Projections of needed waste infrastructure are developed using the methodology described in previous sections. Existing and planned infrastructure by region is compared to projected waste volumes to determine need, based on the concept of critical mass presented in this plan and the need for expansion of existing or development of new facilities.

Each regional summary includes waste generation by source, including MSW, C&D and C&I, to provide more insight and guide decision-making at the regional level. Each regional summary includes:

- an assessment of the social, economic and environmental indicators of the region
- a summary of waste generation, treatment and movements in 2020
- a summary of waste generation and treatment in 2030
- infrastructure capacity needs in 2030, including assessment of opportunities to provide or access capacity in neighbouring regions
- breakdown of the waste by facility type and source (MSW, C&I or C&D) in 2030
- breakdown of the material generation and recovery in 2030
- analysis of landfills by type and identified capacity risk
- an assessment of the principles and priorities for the region.

A desktop assessment of facilities' licences has been employed to understand infrastructure capacity and, as such, may not accurately reflect the specific activities conducted on site. This is one of the key limitations of with the *State Waste Infrastructure Needs Analysis* methodology for assessment, particularly in relation to FOGO recovery facility capacity needs and organics recovery facility capacity needs.

The infrastructure plan focuses on identifying infrastructure needs in alignment with meeting the waste strategy targets. Targets specifically relating to FOGO are currently limited to the Perth and Peel regions. In regions outside of Perth and Peel, FOGO waste is collectively categorised as 'organics'. Stakeholder feedback highlighted this gap in the 2030 needs assessment as several major regional centre municipalities, such as the South West and Great Southern, are considering or implementing FOGO recovery as a means to achieve their MSW recovery targets.

While there appears to be sufficient licensed capacity for organics recovery to meet regional demands until 2030, the specific availability of FOGO recovery capacity remains uncertain. In addition, there is potential for barriers to arise in regions outside of Perth and Peel depending on regional approaches on kerbside FOGO recovery. Some facilities, despite being licensed for FOGO waste, either do not accept it or handle quantities below their licensed capacity. This is discussed in more detail in the Considerations and limitations section.

Further, more detailed exploration of FOGO capacity needs outside Perth and Peel is required as an area of future work.

The infrastructure plan includes a summary for each region outlined in Figure 22:

- Perth
- Peel
- Pilbara
- Kimberley
- South West
- Great Southern
- Mid West
- Gascoyne
- Wheatbelt
- Goldfields-Esperance.

Major regional centres as defined by the waste strategy are also included in assessments:

- Albany (Great Southern region)
- Bunbury (South West region)
- Busselton (South West region)
- Greater Geraldton (Mid West region)
- Kalgoorlie-Boulder (Goldfields-Esperance region).

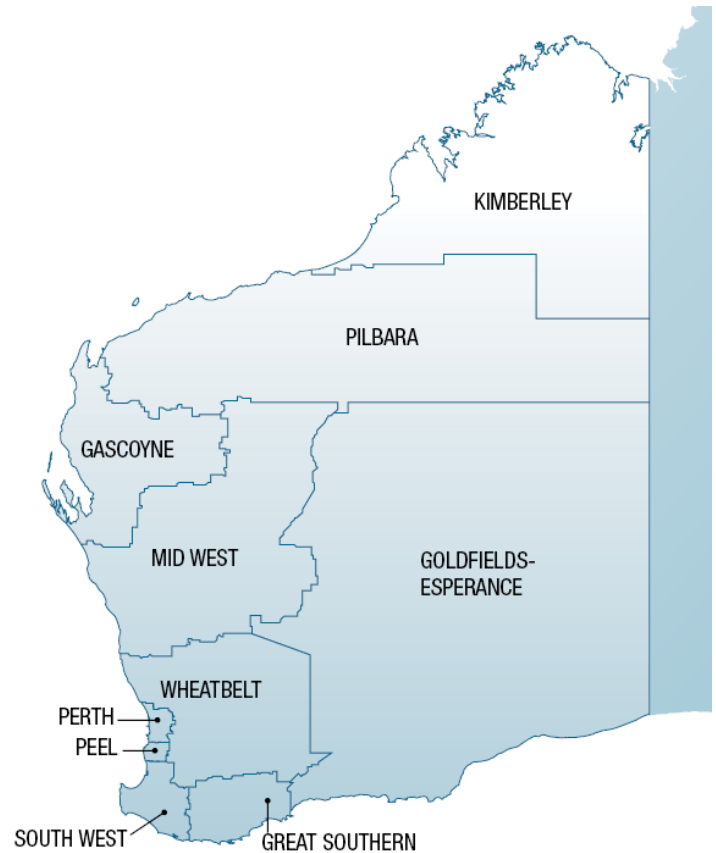


Figure 22 Regions used for the infrastructure plan

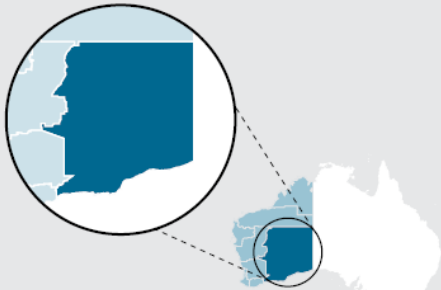
Goldfields-Esperance region

Waste profile in 2020

The Goldfields-Esperance region is the largest region in Western Australia by size, with low-density populations distributed across the region. The region generated 137,000 tonnes of waste in 2020, consisting of C&I (51 per cent), MSW (27 per cent) and C&D (22 per cent). The region treated 121,000 tonnes in 2020, with 45,000 tonnes (37 per cent) recovered and 76,000 tonnes (63 per cent) being landfilled. Key waste profile data for the Goldfields-Esperance region waste and resource recovery in 2020 is presented below.

Residents in Goldfields-Esperance	2 per cent of Western Australia's population resides in the Goldfields-Esperance region.
	Population density of 0.1 people per km ² .
	Residents mostly live the Kalgoorlie regional centre.
Local governments in the region	Shire of Coolgardie, Shire of Dundas, Shire of Esperance, City of Kalgoorlie–Boulder, Shire of Laverton, Shire of Leonora, Shire of Menzies, Shire of Ngaanyatjaraku, Shire of Ravensthorpe, and Shire of Wiluna.
Generating waste	Goldfield-Esperance generates 2 per cent of the waste generated in Western Australia.
Transporting waste	A good transport network of roads and rails connects the region with Perth and neighbouring regions. There is a commercial port in Esperance.
Treating waste	Goldfields-Esperance treats 2 per cent of the waste treated in Western Australia.
	Goldfields-Esperance recovers 1 per cent of the waste recovered in Western Australia.
	Goldfields-Esperance landfills 3 per cent of the waste landfilled in Western Australia.
	Plays a critical role in recycling activities in the Western Australia.

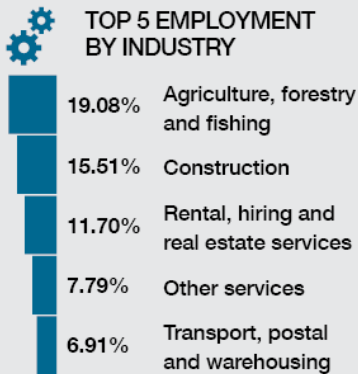
GOLDFIELDS-ESPERANCE REGIONAL SUMMARY



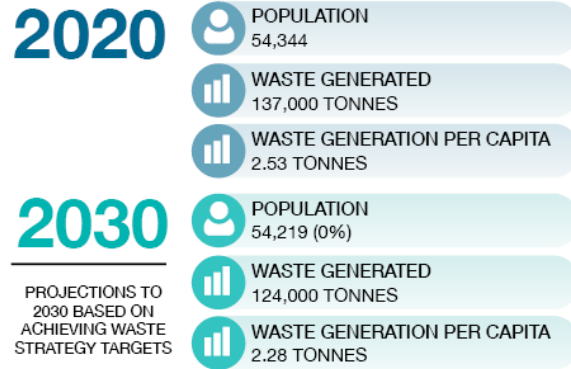
AREA
771,000 km²

GROSS REGIONAL PRODUCT (2019-20)
\$9.31B/CAP

NUMBER OF BUSINESSES (2019-20)
4,049



The mining industry sector makes the greatest contribution to economic output in the region, which at \$22.2B accounts for 67.77% of total output. This industry sector is also the largest employer with 14,773 jobs which represents 39.19% of total employment within the region.



2030 INFRASTRUCTURE CAPACITY NEED

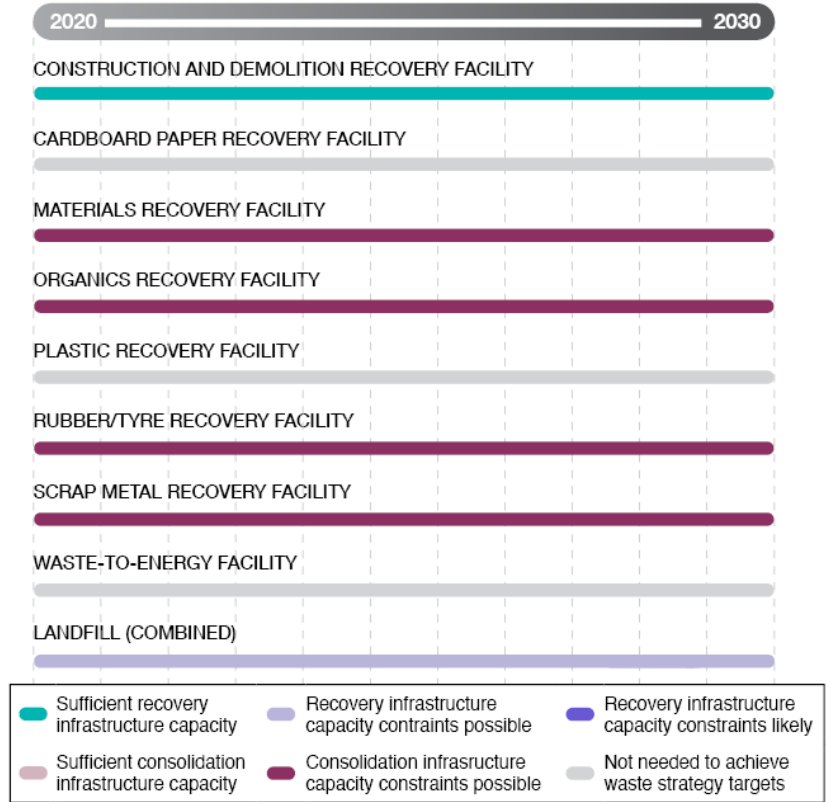
1. Material recovery facility | 13,500 tonnes
2. Organics | 4,000 tonnes
3. Scrap metal | 5,000 tonnes

TOP PRIORITIES

1. Review options to facilitate lifetime and capacity expansion of existing materials recovery facilities.
2. Investigate opportunities to develop regional food organic and garden organic process capacity.
3. Assess whether existing 67A licensed facilities in neighbouring regions can be increasingly utilised to alleviate food organics and garden organics recovery capacity need.

INFRASTRUCTURE NEED BETWEEN 2020 AND 2030

Projections for capacity constraints compare current, approved and planned capacity against the infrastructure needs by 2030 to meet the waste strategy targets.



WASTE IN GOLDFIELDS-ESPERANCE 2020 AND 2030

Waste generation to 2030 based on meeting the waste strategy targets

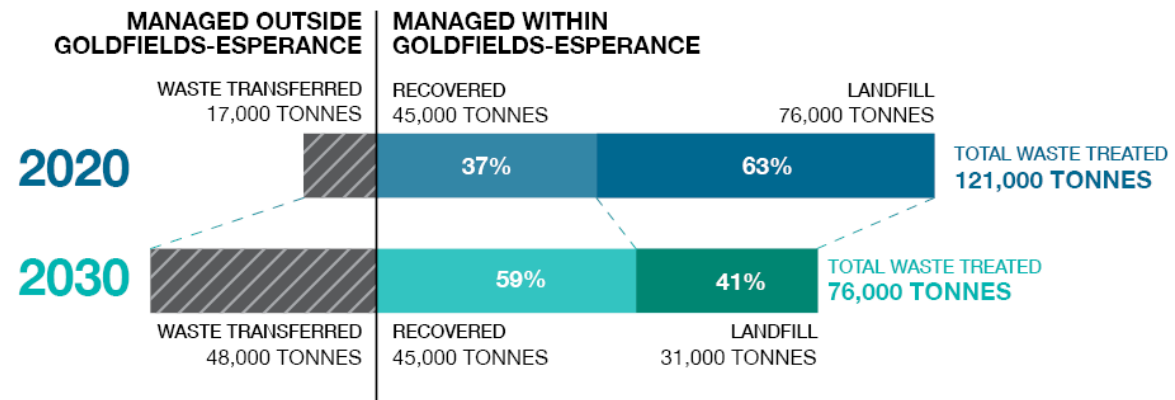


Figure 89 Waste in Goldfields-Esperance: statistics and projections

Waste and resource recovery in 2020

Although Goldfields-Esperance received low amounts material from other regions, it receives difficult-to-manage waste, which is disposed of in the region's one secure landfill (Class IV) and two intractable landfills (Class V). The top five materials processed in the region in 2020 include:

1. mixed putrescible waste – domestic (household)
2. metals – ferrous steel – non-packaging
3. sand/soil
4. mixed C&D
5. biosolids.

Half of the waste treated in the region is disposed of at 12 putrescible landfills. These are complemented by two MRFs, one C&D recovery facility and one organics recovery facility. Recovery facilities are localised to rail/road infrastructure in Kalgoorlie-Boulder and road/port infrastructure in Esperance. There are also six REMS landfills in Goldfields-Esperance.

Goldfields-Esperance transferred 17,000 tonnes of material out of the region, which largely consisted of ferrous steel transferred to Perth. Although road and rail networks are strong through the region, there are geographic barriers to access remote eastern communities. The region's location also makes exports to the Northern Territory or South Australia viable.

Aspects of waste and resource recovery in the Goldfields-Esperance region in 2020 that must be considered when working towards the waste strategy targets include:

- C&I formed the largest waste material source generated in the Goldfields-Esperance region, consisting of about 70,000 tonnes, of which 39 per cent was recovered.
- The majority of waste transfers were to Perth (92 per cent).
- Ferrous steel was the second largest category of material consolidated in the region, and the largest category of material transferred out of the region.
- Development of local capacity for scrap metal recovery will improve the recovery of metals from Goldfield-Esperance and create opportunities to receive scrap metal from adjoining regions.

The location of current and planned recovery infrastructure in the Goldfields-Esperance region in 2030 is shown in

Figure 92 (see Facility lists in the Appendix for a full list of facilities). Facilities granted work approvals since 2020 by the department in the Goldfields-Esperance region are listed below in Table 39. These facilities have not been included in the modelling for the infrastructure plan and may alleviate some of the region's capacity needs.

Table 39 Facilities granted licences or works approvals since 2020 in Goldfields-Esperance

Facility type	Facility name	Location
CDS consolidation and Landfill (Category 63 and 64)	Minesite Recycling Pty Ltd	Goldfields-Esperance

WASTE FLOWS 2020

GOLDFIELDS-ESPERANCE

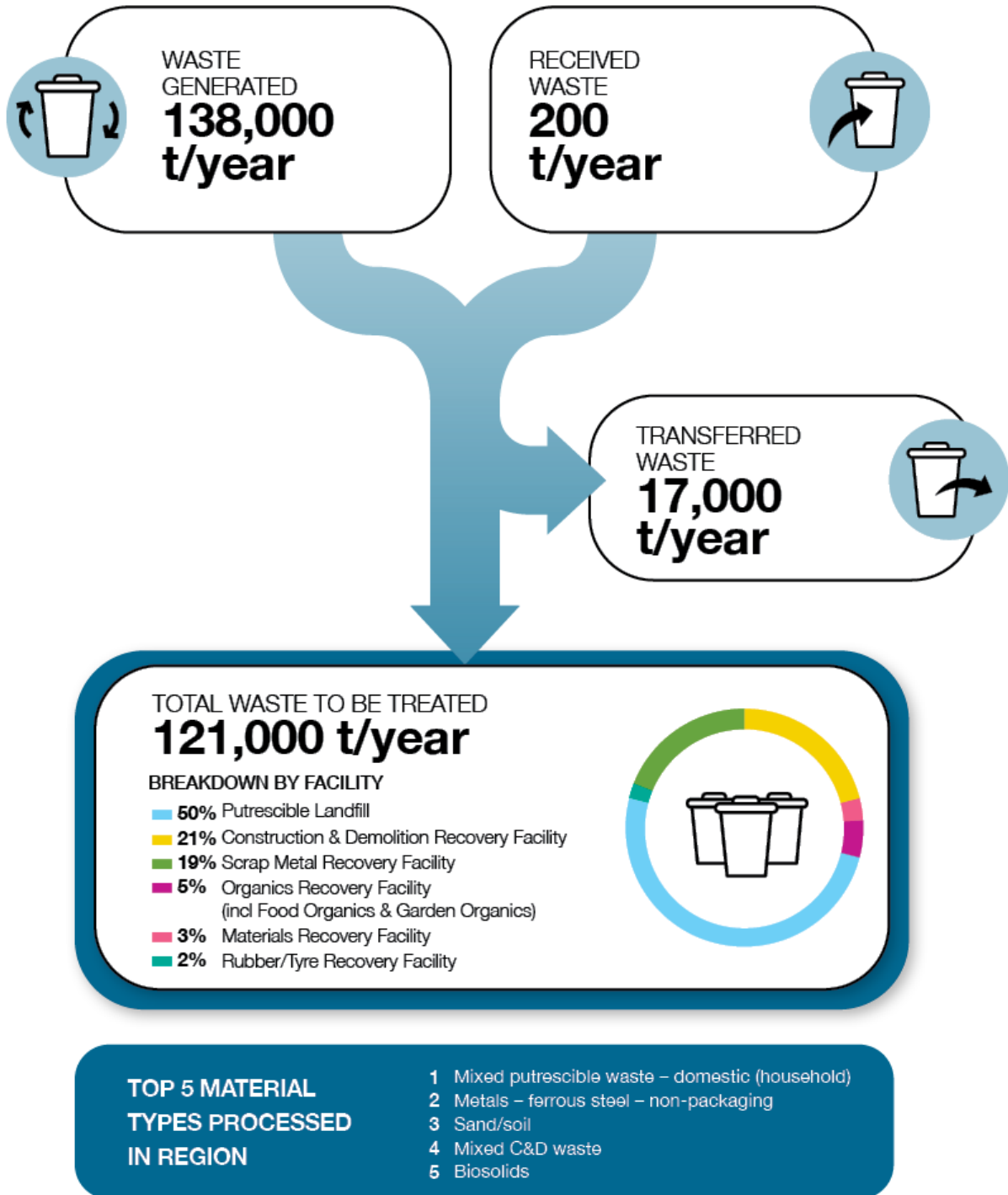


Figure 90 Waste generated, received, transferred and treated in Goldfields-Esperance in 2020

WASTE FLOWS 2020

GOLDFIELDS-ESPERANCE

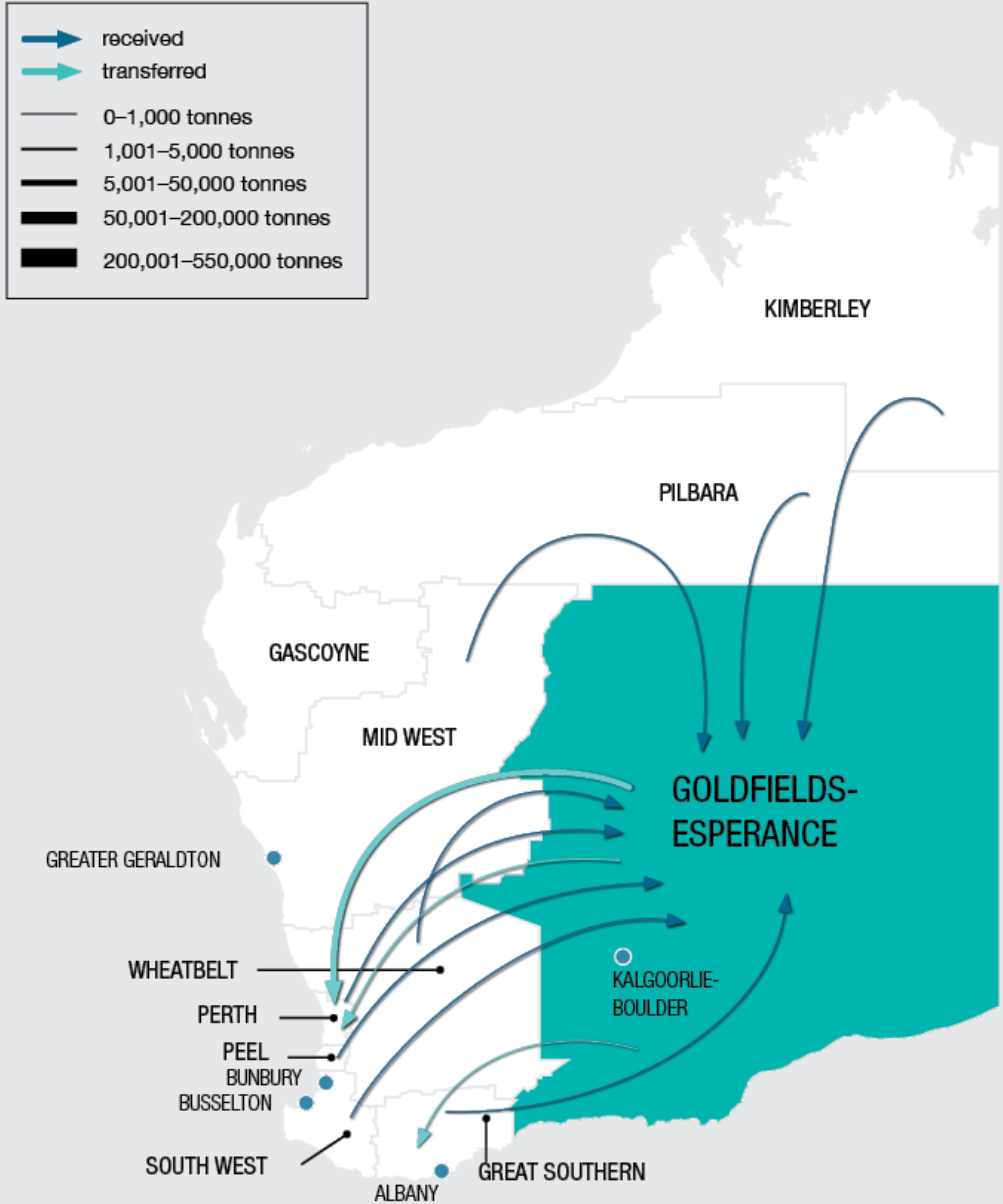


Figure 91 Waste flows in Goldfields-Esperance in 2020

CURRENT AND PLANNED INFRASTRUCTURE BY REGION

GOLDFIELDS-ESPERANCE

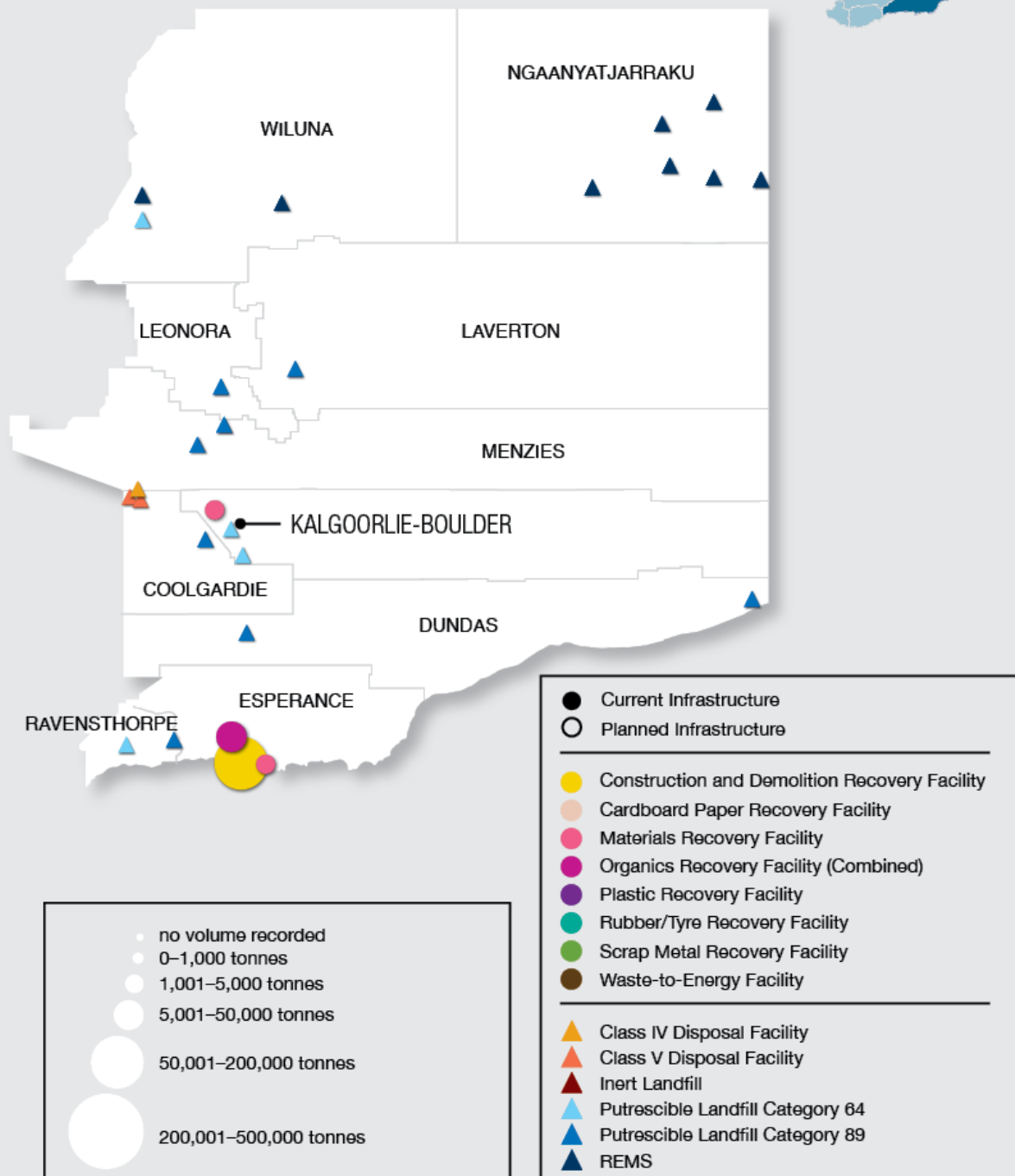
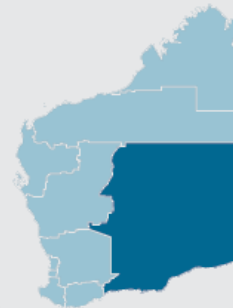


Figure 92 Current and planned infrastructure locations in Goldfields-Esperance in 2020

Waste and resource recovery in 2030

Modelling to achieve all waste strategy targets in 2030 found the Goldfields-Esperance region would generate 124,000 tonnes less material while transferring 48,000 tonnes out of the region, which is a significantly greater quantity when compared with 2020.

However, the increase in materials exported out of the region means the total waste treated in the Goldfields-Esperance region will decrease by 37 per cent. Additional infrastructure planning and waste strategy initiatives will increase the Goldfields-Esperance materials recovery rate from 37 per cent to 59 per cent. Figure 93 shows the distribution of feedstock materials used by each facility type, indicating which waste streams are most significant and where the resource recovery efforts should be concentrated. This is also reflected in the Goldfield-Esperance region Principles and priorities section.

GOLDFIELDS-ESPERANCE

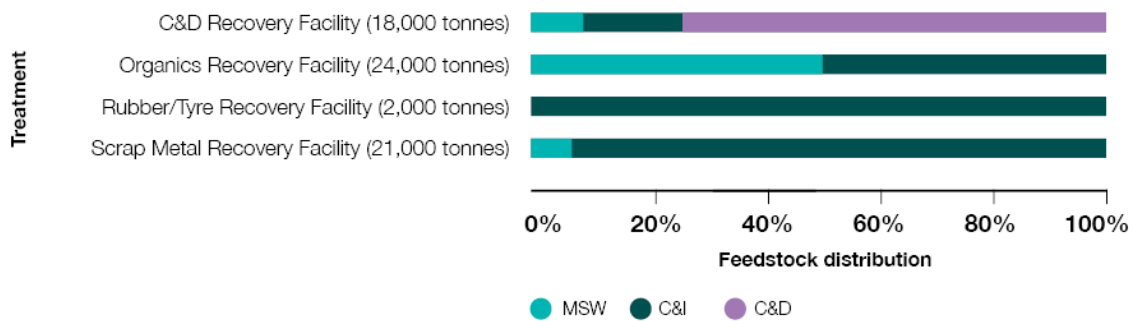


Figure 93 Feedstock distribution of treatments in Goldfields-Esperance in 2030

One of the Goldfields-Esperance region’s local governments (City of Kalgoorlie-Boulder) is considered a major regional centre under the waste strategy. This regional centre is working towards the MSW recovery target of 60 per cent by 2030. Many Goldfields-Esperance local governments may be interested in implementing kerbside FOGO collection and recovery increasing the demand for local FOGO processing infrastructure.

The model uses licensed capacity for facilities and can result in an overestimation of actual capacity. Stakeholder feedback indicates that only a fraction of the region’s licensed capacity of 2,000 tonnes of Category 67A capacity is actually available for the processing of FOGO. The Infrastructure priorities section describes the need to investigate further to confirm actual FOGO processing capacity.

Infrastructure capacity needs in 2030

Based on current, planned and approved infrastructure in 2020, the Goldfields-Esperance region requires the following additional capacities to meet the waste strategy targets in 2030:

- 13,500 tonnes of additional capacity is needed for MRFs, which will require consolidation, although it is not sufficient to allow for a new facility.
- 4,000 tonnes of additional recovery capacity is needed for organics, which is not sufficient volume to allow for development of an organics recovery facility or a FOGO recovery facility. As demonstrated in Figure 93, half of the organics feedstock (50 per cent) is estimated to consist of MSW, indicating that there may also be a need for a FOGO recovery in the region. This may be achieved through the extension or expansion of existing organics facilities to be able to also accept FOGO.
- 5,000 tonnes of additional capacity is needed for scrap metal recovery, which will require consolidation, although in insufficient to allow for a new facility.

Total remaining capacity by landfill types is presented in

CAPACITY REMAINING BY LANDFILL TYPE

GOLDFIELDS-ESPERANCE

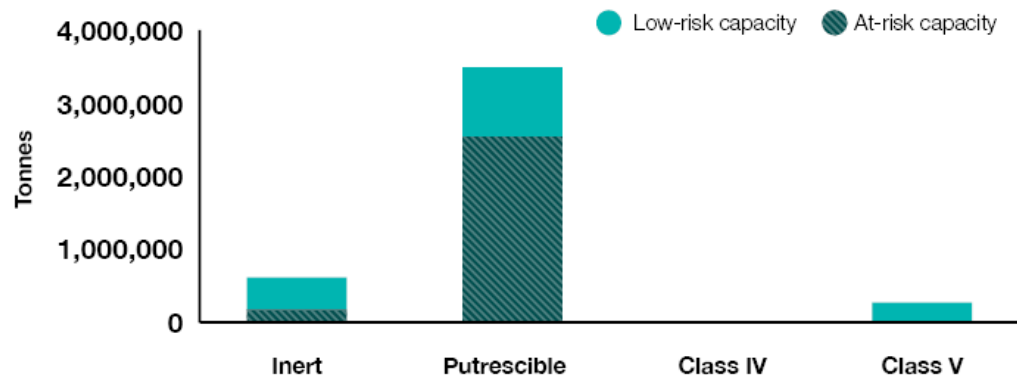


Figure 94 Capacity remaining by landfill type in Goldfields-Esperance, including an assessment of low-risk and at-risk capacity

. This figure also indicates the proportion of that capacity that is at risk (see section on Landfill capacity lifetime assessment to 2030 and 2050).

Under the low-risk scenario, most of the total landfill capacity of 2.5 million tonnes was identified as potentially at risk, of which inert landfills make up 6 per cent and putrescible landfills 94 per cent. *State Waste Infrastructure Needs Analysis* modelling predicts 28,000 tonnes of residual waste will be disposed of in landfill each year. Feedstock lifetime remaining for landfills is shown in Figure 19.

Details of the infrastructure needed to achieve waste strategy targets are outlined in Figure 95, including the expected facilities, capacities and capacity needs in 2030.

CURRENT RECOVERY INFRASTRUCTURE PIPELINE

GOLDFIELDS-ESPERANCE

This overview includes a comparison of projected generation and capacities to determine the infrastructure need in 2030. It includes planned and approved facilities, as well as closures between 2020 and 2030.

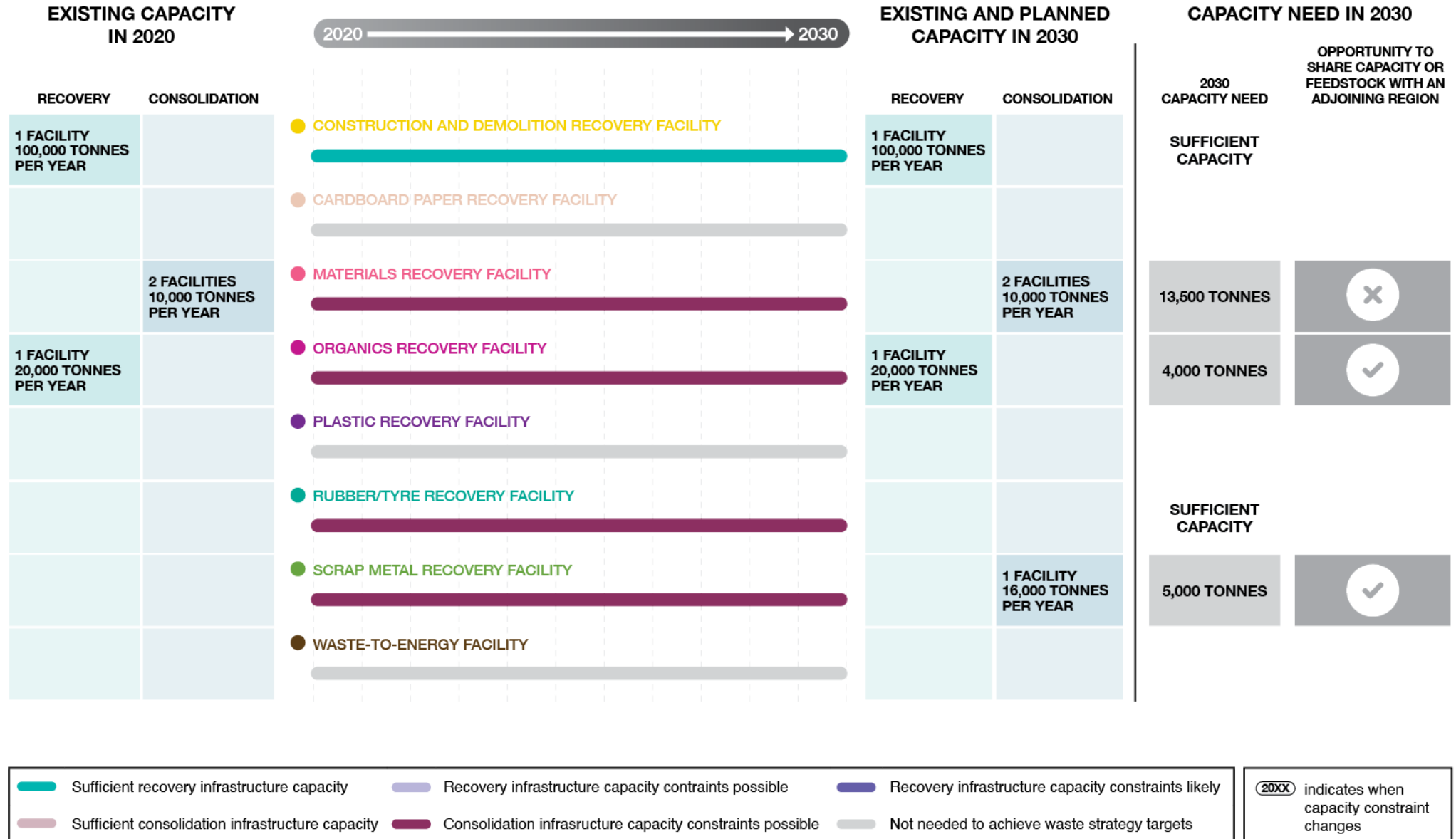


Figure 95 Goldfields-Esperance recovery infrastructure pipeline and capacity needs in 2030

Principles and priorities

The principles outlined in this plan have been used to identify priorities.

Priority areas that are projected to go beyond capacity need, based on the completed modelling for the region, arise when applying the principles.

Based on the analysis, the top priorities for the Goldfields-Esperance region are:

- Review options to facilitate lifetime and capacity expansion of existing MRFs.
- Investigate opportunities to develop regional FOGO processing capacity.
- Assess whether existing 67A licensed facilities in neighbouring regions can be increasingly utilised to alleviate FOGO capacity need.

These are discussed in detail in Table 40 below. The principles are outlined once more in Figure 2 for reference.

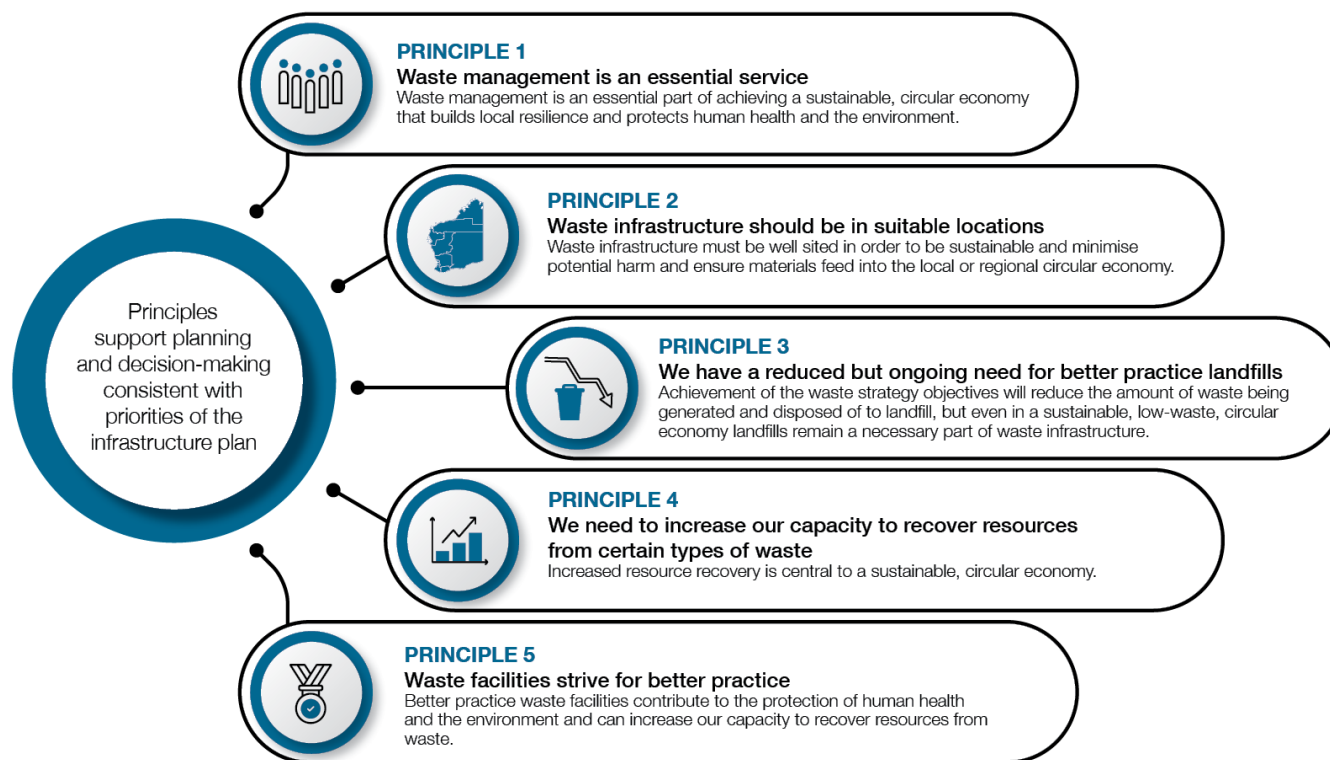


Figure 2 Principles of the State waste infrastructure plan

Table 40 Consideration of infrastructure plan principles and priorities in Goldfields-Esperance

Capacity needs to achieve waste strategy targets 2030	Consideration of infrastructure plan principles	Findings in response to meeting the waste strategy 2030 target (with assigned priority ranking)
13,500 tonnes of additional capacity in materials recovery	<p>Principle 1: Waste management is an essential service</p> <p>According to modelling, Goldfields-Esperance will increase generation of commingled recyclable material to achieve the waste strategy targets, with an additional 13,500 tonnes of capacity sourced through existing and expanded collection services. Principle 1 highlights the need to expand existing services that have established access to feedstocks and downstream markets.</p> <p>Principle 2: Waste infrastructure should be in suitable locations</p> <p>Existing MRFs in the region are well located to serve regional centres of Kalgoorlie and Esperance. Commercial port access in Esperance may also facilitate the transportation of recovered material to wider markets. The expansion of existing infrastructure can shorten timelines to develop new capacity. Capacity building should be shared across the two existing facilities to create contingency during constraint periods (such as when one facility is offline).</p>	<p>Medium</p> <p>Lifetime and capacity expansions of existing MRFs in the Goldfields-Esperance region will decrease the risk, capital costs and timeframes required to meet capacity needs.</p>
4,000 tonnes of additional capacity in organics recovery	<p>Principle 1: Waste management is an essential service</p> <p>To achieve waste strategy Recover targets, there is need to grow capacity to recover organics. The projected amount is minor and could be addressed through the expansion of the existing facility near Esperance. Although, there are opportunities to develop new infrastructure near Kalgoorlie to treat feedstocks closer to their source. A Kalgoorlie FOGO recovery facility would also improve access to the region's extensive mining industry, which can act as an additional source of feedstock and de-risk recovered organic product offtake through rehabilitation activities.</p> <p>Principle 2: Waste infrastructure should be in suitable locations</p> <p>Development in Kalgoorlie may be constricted because of the presence of native land titles and mining claims. These factors can limit the availability of land for development and require careful consideration and coordination to ensure sustainable and equitable land use.</p> <p>However, a local processing option would allow a three-bin system to be offered to the region's major population centre. Additional contingency during shutdown</p>	<p>Medium</p> <p>Upgrading of existing organics facilities in to accept FOGO will support achievement of waste strategy Recover targets for 2030.</p> <p>Medium</p> <p>Lifetime and capacity expansions of existing organics recovery facilities will decrease the risk, capital costs and timeframes required to meet capacity needs.</p> <p>Low</p> <p>Leveraging the mining rehabilitation markets will create opportunities for recovered organic products offtake in the Goldfields-Esperance region.</p> <p>Medium</p>

Capacity needs to achieve waste strategy targets 2030	Consideration of infrastructure plan principles	Findings in response to meeting the waste strategy 2030 target (with assigned priority ranking)
	<p>periods could take advantage of excess capacity in the neighbouring Great Southern and Wheatbelt regions.</p> <p>Principle 5: Waste facilities strive for better practice Review organics recovery facility compliance with the <i>Guideline: Better practice organics recycling</i> to understand capacity risk for this facility type.</p>	<p>Supported implementation of the <i>Guideline: Better practice organics recycling</i> will improve waste strategy Protect target outcomes.</p>
5,000 tonnes of additional capacity in scrap metal recovery	<p>Principle 1: Waste management is an essential service Scrap metal is the largest material type transferred out of the Goldfields-Esperance region, because of access to a strong consolidation and transportation network to Perth. Expansion of the existing consolidation network will be required to achieve waste strategy Recover targets. Principle 2: Waste infrastructure should be in suitable locations New consolidation facilities should be investigated for areas that lack current infrastructure but have access to good transportation connections with Perth. Location of a facility in the Esperance region would allow access to strong road and port transportation options, while having low constraints to new developments.</p>	<p>Low Development of a consolidation facility for scrap metal in Esperance could facilitate low-risk recovery of material in the region.</p>
Used tyre storage	<p>Principle 3: We have a reduced but ongoing need for better practice landfills Waste management of tyres in remote locations poses challenges. Existing landfills are being used for collection and consolidation of tyres and present a suitable centralised location for waste management in remote regions. About 4,700 tonnes per annum of rubber/tyre material is projected to be generated in the Goldfields-Esperance region and this will continue to be generated.</p> <p>Principle 4: We need to increase our capacity to recover resources from certain types of waste Tyres can be processed, but infrastructure may only be available in Perth so the recovery of rubber/tyre materials in the Goldfields-Esperance region is dependent on consolidation and transport to enable recovery. Consolidation and transport will remain the likely fate given the insufficient quantity to support regional processing.</p> <p>Principle 5: Waste facilities strive for better practice Two class 64 putrescible landfills in Goldfields-Esperance are also tyre storage facilities. See the landfill capacity risk assessment below to further understand</p>	<p>Medium Four facilities are listed in the region for Category 57 with total capacity close to 7,000 tyres. Some of these may be sending tyres to Perth. There is an opportunity to consolidate volumes and transport these tyres for reprocessing outside the region.</p>

Capacity needs to achieve waste strategy targets 2030	Consideration of infrastructure plan principles	Findings in response to meeting the waste strategy 2030 target (with assigned priority ranking)
	how the loss of these facilities may occur, noting that this may reduce the ability to consolidate rubber/tyre arising in Goldfields-Esperance.	
Landfill capacity risk assessment	<p>Principle 1: Waste management is an essential service Based on current, planned and approved landfill capacity, the Goldfields-Esperance region has sufficient landfill capacity to 2038. However, under a low-risk approach to landfill, capacity constraints could be reached in 2031 because there are potentially nine facilities classified as at risk (2,455,000 tonnes capacity).</p> <p>Principle 3: We have a reduced but ongoing need for better practice landfills The development of Class IV and Class V landfill capacity in Goldfields-Esperance plays a significant statewide role in treating certain specialist waste. This material is received from as far as Perth, the South West and the Pilbara. There is a deficiency of local inert landfill infrastructure, although because of low expected quantities this material can be treated through putrescible landfills.</p> <p>Principle 5: Waste facilities strive for better practice There is a high need to de-risk existing landfills through better practice management standards. These standards should also be extended to REMS-managed landfills in the region. In addition, potentially 62 per cent of landfills also require post-closure planning, having not completed or updated a plan within the past 10 years.</p>	<p>High Quantification of waste generation and infrastructure needs in remote Aboriginal communities can improve access to adequate services in remote areas.</p> <p>High Quantification of waste generation and infrastructure needs for the local mining sector would decrease scope of infrastructure planning and could lead to complementary activities that support local communities.</p> <p>Medium Updated rural landfill risk assessment methodology of unlicensed landfills and REMS landfills can be used to effectively assess the potential risk of environmental, human health and amenity impacts.</p>