

### 5.1 Introduction

This chapter draws upon the findings from the previous sections, in particular the analysis carried out for the individual waste catchments in the Council area currently served by a landfill (Section 4), to outline a sustainable and achievable Council wide waste strategy.

The proposed strategy addresses the following key issues:

- Identify suitable locations for transfer and disposal of waste over the 20 year period following closure of individual landfills, taking into consideration optimal use of existing landfills with remaining landfill life in the Council area, to minimise costs associated with transferring waste outside the Council area.
- Estimate costs associated with providing waste and recyclable systems for rural-residential areas in the Council area which currently do not have a suitable service.
- Provide annual capital and operating costs associated with implementing the proposed waste management strategy over a 20 year timeframe.
- Highlight suitable methods for funding the proposed strategy based on the estimated costs.

The works associated with each year are summarised below. The detailed capital and operating costs associated with each years management of waste in the Council is given in Appendix B.

The current waste and recyclable collection and landfill operation costs were obtained from Council, and an increase of 2.5% per year was applied in accordance with inflation.

A nominal cost of \$100,000 in the 2nd year of the strategy increasing by 2.5% each year thereafter has been provided in the waste strategy to fund other initiatives, which may be implemented by Council including:

- General Council clean-up days.
- Provide Bank of Bins services in certain rural areas.
- Implement waste reduction initiatives such as promoting in-house composting waste sorting and recycling at home.

The actions provided in the strategy are based on best available information at the time of preparation, and as the strategy is a “living” document should be reviewed and updated annually as new information becomes available.

### 5.2 Year 1: 2005/2006

The following key actions are recommended for implementation in Year 1 of the strategy:

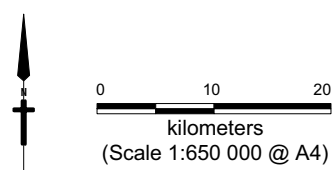
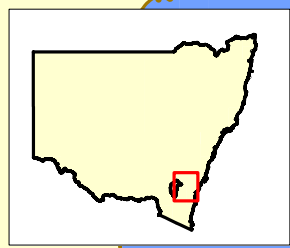
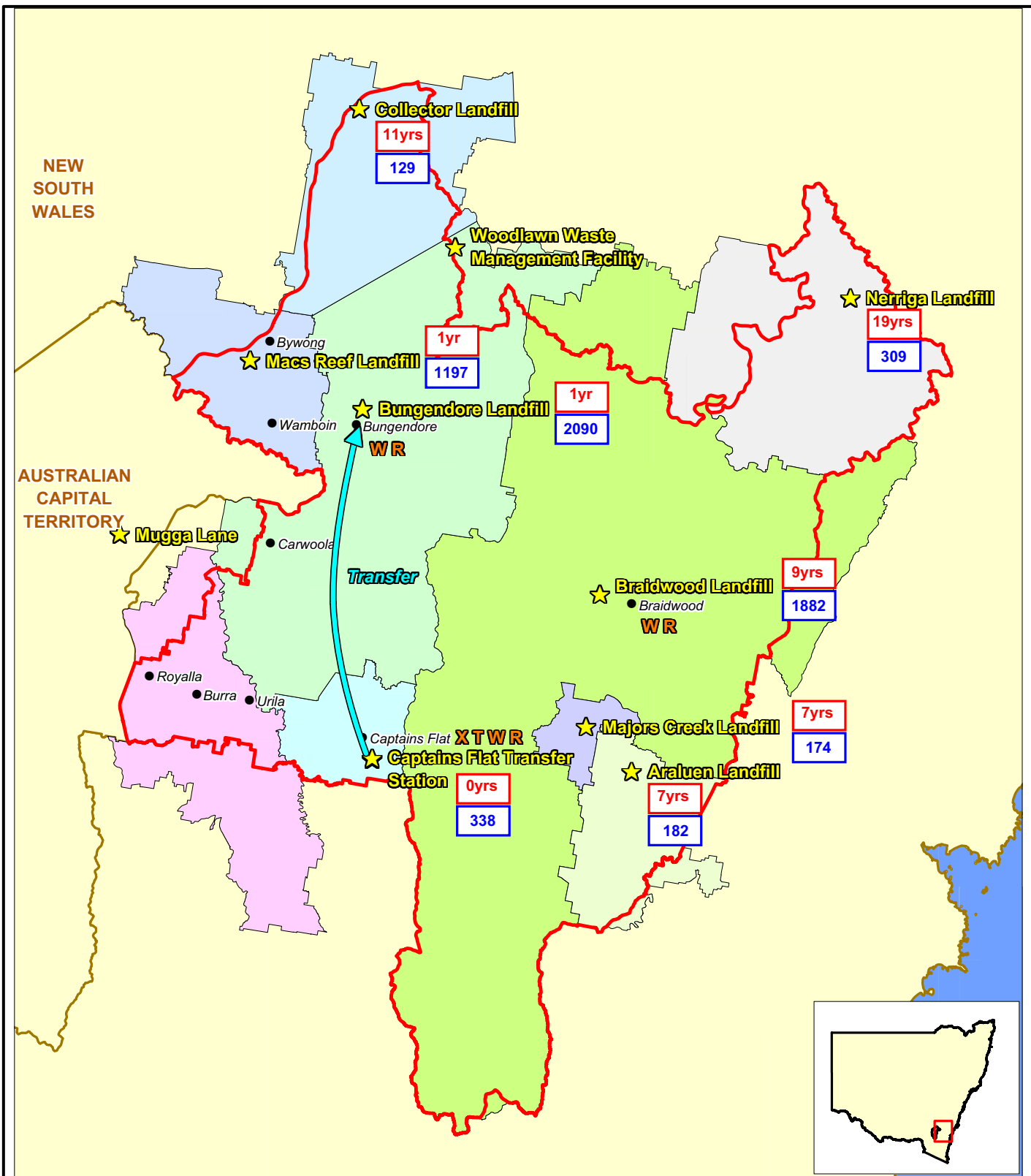
- Closure and Rehabilitation of Captains Flat landfill;
- Construction of a transfer station at Captains Flat and transfer of waste to Bungendore landfill for disposal. This will shorten the life of Bungendore by approximately 1 year at the end of Year 1 of the strategy. A cost has been provided for part time supervision at the transfer station during the operating hours by Council staff. Operating hours for the proposed transfer station will be the same as the current landfill operating hours i.e. 8.00am to 5.00pm Friday, Saturday, Sunday and during non-daylight saving periods and 8.00am to 8.00pm on the same days during daylight saving periods. The staff will be involved in carrying out litter patrols, supervising other un-manned landfills and transfer stations, and other tasks in the future during their remaining time.
- Introduce a fortnightly kerbside recycling service for Captains Flat and Bungendore involving collection of 240L multi-mingled wheelie bins and transfer of recyclables to Hume facility in ACT. The existing kerbside recycling service in Braidwood would continue.
- Prepare Council wide Resource Recovery Strategy from existing funds. The strategy will examine options for reducing waste going to landfill and improving resource recovery. It may include initiatives such as a Council wide education campaign to introduce in-house composting system into households in an effort to reduce food waste to landfill. As mentioned above a nominal amount of \$100,000 starting in Year 2, increasing each year by 2.5% has been allowed for in the strategy for implementation of these initiatives.
- It is recommended that Council implement a groundwater/ surface water monitoring system at all its closed and operating landfill to identify any water pollution, which may be occurring. A cost has been provided for in the waste strategy for this monitoring work. The monitoring will provide good information on key areas to be rehabilitated as part of the closure plans for the operating sites and identify any problems with closed sites. Also efforts should be made by the operators at each of the sites to minimise the size of the tipping face used, thereby reducing the area needed to be covered and consequently potential for windblown litter and other environmental issues such as feral animals, and increased leachate production, which were observed at all the landfills.

The costs associated with implementing Year 1 of the strategy are given in Table 5-1 (detailed costs are provided in Appendix B).

*Table 5-1 Year 1 Cost Summary*

<b>Summary of Capital and Operating costs</b>	<b>Year 1</b>
<i>Item</i>	
New Capital Costs	\$780,000
New Operating Costs	\$274,627
<i>Existing Costs</i>	
Landfill Operating Cost	\$477,900
Waste Transfer & Disposal Costs (transfer to Bungendore included in new operating costs above)	\$0
Collection of Recyclables from Landfills	\$86,715
Kerbside Waste Collection Cost	\$117,875
Kerbside Recycling Collection Cost	\$57,810
Annual Loan Repayment (Capital Cost)	\$72,568
<b>Total Annual Cost (Including loan repayment)</b>	<b>\$1,087,495</b>

The waste management situation at the end of Year 1 is illustrated in Figure 5.1.



Source: Base data supplied by Palerang Council

<b>8yrs</b>	Landfill Life Remaining	●	Towns	<b>Collection Zone</b>
<b>182</b>	Waste Tonnes/Year	●	Palerang LGA Boundray	
<b>T</b>	Transfer Station and Recyclable Drop-off	★	Landfill Location	■ Araluen (278 sq km)
<b>X</b>	Landfill Closed (Captains Flat)	★	Domestic Waste Collection Service	■ Braidwood (2649 sq km)
		★	Kerbside Recycling Collection introduced in Bungendore, Captains Flat	■ Bungendore (1289 sq km)
		★		■ CaptainsFlat (167 sq km)
		★		■ Collector (509 sq km)
		★		■ MacsReef (331 sq km)
		★		■ Majors Creek (70 sq km)
		★		■ Mugga (547 sq km)

Client <b>PALERANG COUNCIL</b>	Project <b>PALERANG COUNCIL WASTE STRATEGY 2005-2025</b>	Title <b>END YEAR 1 (2005/06)</b>			
	Drawn: CDS	Approved: Final	Date: 30-06-2005	Figure: 5.1	Rev:A
	Job No: 43167240	File No: 43167240_004_Fig05_1.WOR			

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### 5.3 Year 2: 2006/2007

The following key actions are recommended for implementation in Year 2 of the strategy:

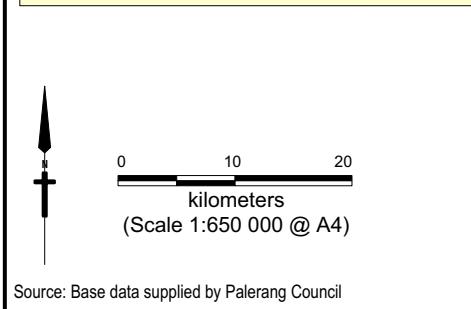
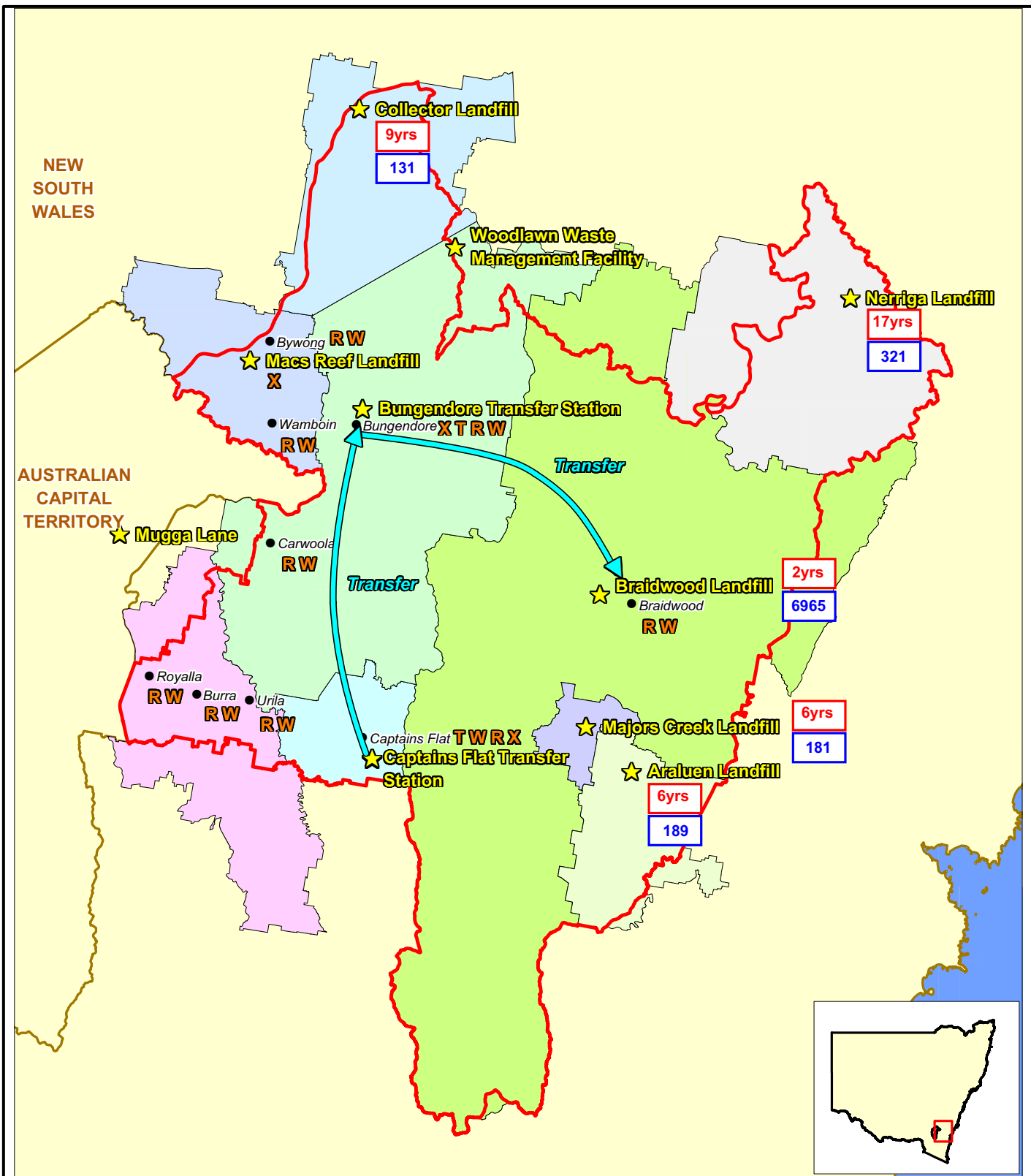
- Closure of Macs Reef Landfill and Bungendore Landfill;
- Construction of a waste transfer station at Bungendore for transfer of waste to Braidwood landfill. The transfer station at Bungendore would be open and supervised during the same opening hours as the current landfill i.e. 7.30am to 5.00pm Friday, Saturday, Sunday and Monday, during both daylight saving and non-daylight saving periods
- Introduce a weekly waste collection in 140L wheelie bins and fortnightly recyclable collection service in 240L wheelie bins for the rural-residential areas of Burra, Urila, Royalla, Carwoola and Wamboin/Bywong, Sutton Acres and Buckingham. The waste and recyclables would be collected by Councils new waste collection truck and taken to the Bungendore transfer station. The service will be provided to all properties in these areas where the truck can travel. For properties, which are difficult to reach due to difficult road conditions, a common area for placement of bins will be identified together with property owners, which can be reached by the truck. Waste to be landfilled from Bungendore would be transferred using a hook lift truck to Braidwood landfill. Recyclables would be taken to the Material Recycling Facility (MRF) operated by Thiess in Hume Act.

The costs associated with implementing Year 2 of the strategy are given in Table 5-2 (detailed costs are provided in Appendix B).

*Table 5-2 Year 2 Cost Summary*

<b>Summary of Capital and Operating costs</b>	<b>Year 2</b>
<i>Item</i>	
New Capital Costs	\$2,004,000
New Operating Costs	\$694,434
<i>Existing Costs</i>	
Landfill Operating Cost	\$237,298
Waste Transfer & Disposal Costs	\$180,631
Collection of Recyclables from Landfills	\$88,883
Kerbside Waste Collection Cost	\$120,822
Kerbside Recycling Collection Cost	\$185,203
Annual Loan Repayment (Capital Cost)	\$259,012
Total Annual Cost (Including loan repayment) (Including costs carried from Year 1)	\$1,766,282

The waste management situation at the end of Year 2 is illustrated in Figure 5.2



Source: Base data supplied by Palerang Council

<b>8yrs</b>	Landfill Life Remaining	●	Towns	<b>Collection Zone</b>
<b>182</b>	Waste Tonnes/Year	□	Palerang LGA Boundray	
<b>T</b>	Transfer Station and Recyclable Drop-off	★	Landfill Location	□ Araluen (278 sq km)
<b>X</b>	Landfill Closed - (Macs Reef & Bungendore)	WR	Introduce Waste and Collection and Recycling Service for Burra, Urila, Carwoola, Royalla, Wamboin and Bywong - Transfer to Bungendore then to Braidwood	□ Braidwood (2649 sq km)

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### 5.4 Year 3 (2007/2008)

The following key actions are recommended for implementation in Year 3 of the strategy:

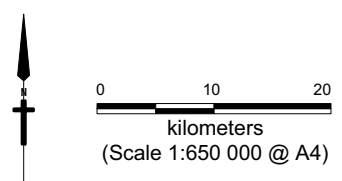
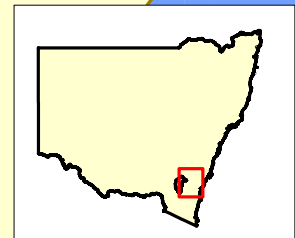
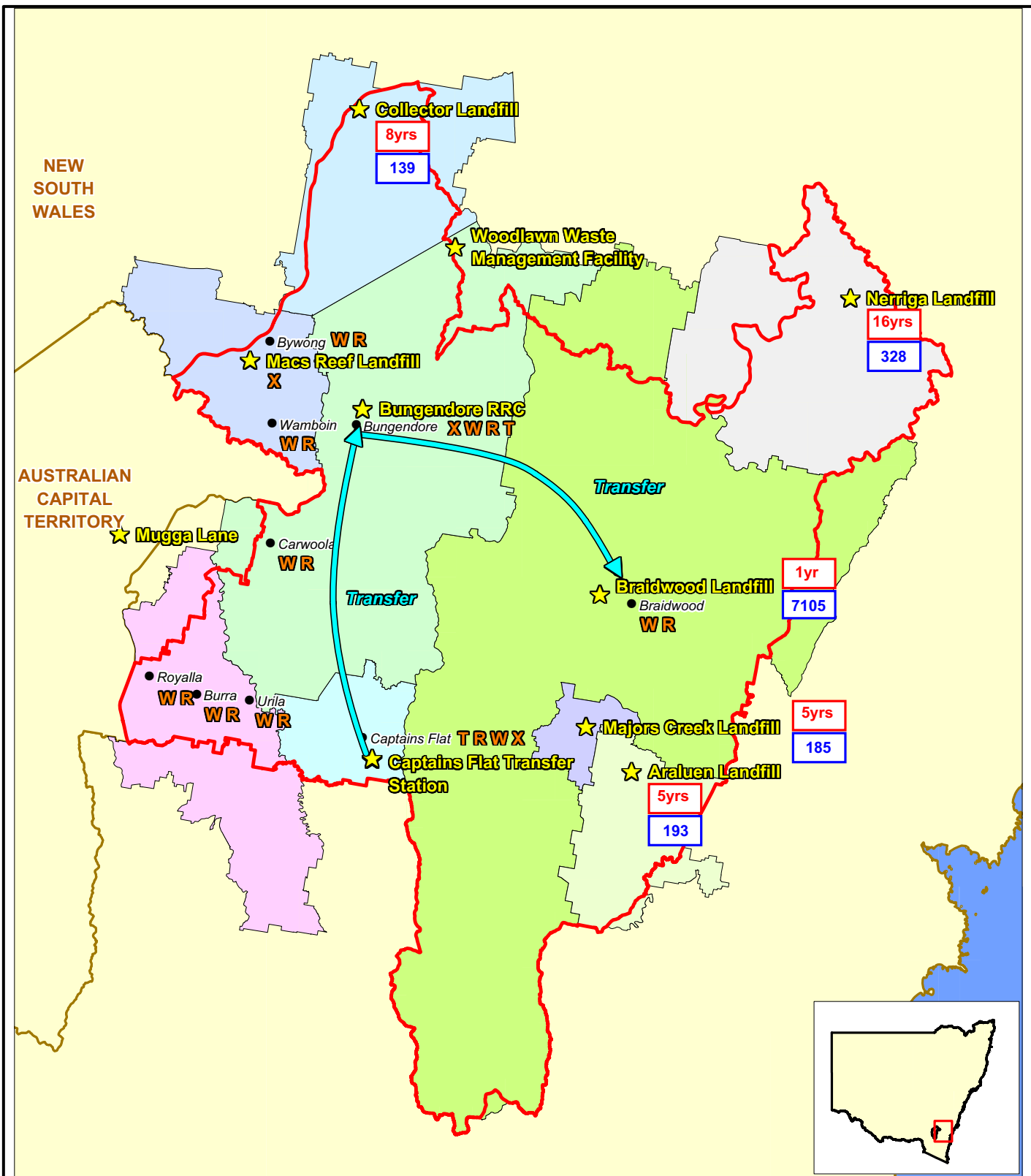
Construction of Resource Recovery Centre at site identified next to existing landfill in Bungendore to service all of Council area. It is envisaged that the resource recovery facility would open 5 days per week including weekends from 8.00am to 5.00pm during daylight saving and non-daylight saving periods. Further details on the Resource Recovery Centre will be finalised following preparation of the detailed resource Recovery strategy for the Council in Year 1 of the waste strategy.

The costs associated with implementing Year 3 of the strategy are given in Table 5-3 (detailed costs are provided in Appendix B)

*Table 5-3 Year 3 Cost Summary*

<b>Summary of Capital and Operating costs</b>	<b>Year 3</b>
<i>Item</i>	
New Capital Costs	\$950,000
New Operating Costs	\$351,500
<i>Existing Costs</i>	
Landfill Operating Cost	\$256,888
Waste Transfer & Disposal Costs	\$299,596
Collection of Recyclables from Landfills	\$91,105
Kerbside Waste Collection Cost	\$314,032
Kerbside Recycling Collection Cost	\$424,935
Annual Loan Repayment (Capital Cost)	\$347,396
<b>Total Annual Cost (Including loan repayment)</b>	<b>\$2,085,452</b>

The waste management situation at the end of Year 3 is illustrated in Figure 5.3



Source: Base data supplied by Palerang Council

<b>8yrs</b>	Landfill Life Remaining	●	Towns	<b>Collection Zone</b> □ Araluen (278 sq km) □ Braidwood (2649 sq km) □ Bungendore (1289 sq km) □ CaptainsFlat (167 sq km) □ Collector (509 sq km) □ MacsReef (331 sq km) □ Majors Creek (70 sq km) □ Mugga (547 sq km) □ Nerriga (690 sq km)
<b>182</b>	Waste Tonnes/Year	□	Palerang LGA Boundray	
<b>RRC</b>	Construct Resource Recovery Centre at Bungendore - Sorted Recyclables Sent to Recyclers - Unsorted Recyclables to Hume Facility, ACT	★	Landfill Location	
		T	Transfer Station and Recyclable Drop-off	
		W	Kerbside Waste and Recyclables Collection	
		R		

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### 5.5 Year 4 (2008/2009)

The following key actions are recommended for implementation in Year 4 of the strategy:

- Closure of Braidwood landfill and construction of Transfer Station and Recycling Drop off;
- Transfer of waste from Braidwood to Bungendore waste transfer station and resource recovery centre;
- Transfer of waste from Bungendore transfer station to a major licensed landfill outside the Council area such as Woodlawn Landfill or Mugga Lane Landfill located in the ACT.

The Woodlawn landfill is located within the Goulburn-Mulwaree Council area just east of the Palerang Council boundary, as shown in Figure 1.1. Previously a copper, lead and zinc open-cut mine, the void is being filled with waste from Sydney, as an in situ bioreactor. Currently a road-rail intermodal facility enables the transfer of containers from the train to the Bioreactor.

Under its current development consent conditions the Woodlawn landfill currently can only receive waste from the Sydney region, and therefore cannot accept waste from Palerang or other local council areas. Discussions with Collex have indicated they are keen to change their development consent condition to receive waste from local areas, and primarily require the support of local councils in the area to achieve this. It anticipated that with the support of the local Councils the development condition would be amended within the next 2 to 3 years. Collex indicated they have sufficient capacity to receive the anticipated future waste generation from Palerang Council over the next 20 to 30 years.

An alternative to Woodlawn landfill would be the Mugga Lane landfill located in the ACT, as shown in Figure 1.1. Discussions held with ACT No Waste (A business unit of ACT Department of Urban Services) the managers of the Mugga Lane landfill, indicated they would be willing to accept waste from Council areas outside the ACT, and an agreement could be reached following further discussion with Palerang Council.

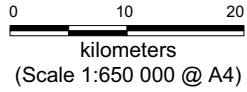
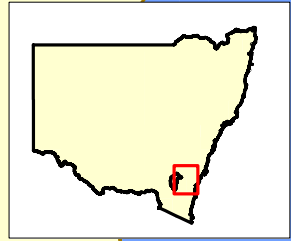
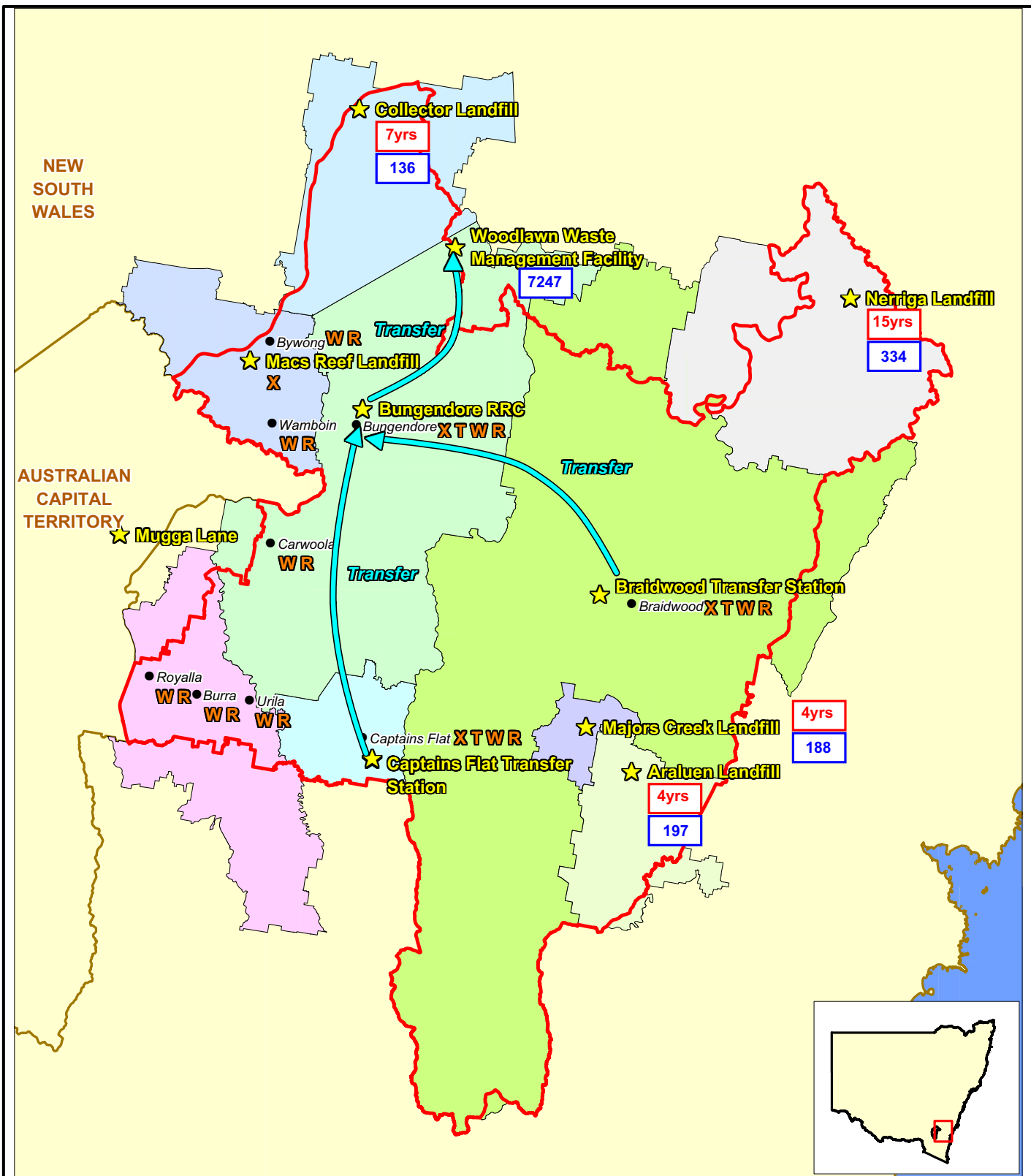
For the purposes of the waste strategy we have allowed for the disposal of waste from Bungendore to Woodlawn landfill in Year 4 based on an indicative cost of disposal of \$60 per tonne. It is recommended that Council enter into discussion with ACT No Waste and Collex, in Year 1 of the strategy to determine the best outcome for Council in the future.

The costs associated with implementing Year 4 of the strategy are given in Table 5-4(detailed costs are provided in Appendix B).

*Table 5-4 Year 4 Cost Summary*

<b>Summary of Capital and Operating costs</b>	<b>Year 4</b>
<i>Item</i>	
New Capital Costs	\$1,452,000
New Operating Costs	\$827,839
<i>Existing Costs</i>	
Landfill Operating Cost	\$100,082
Waste Transfer & Disposal Costs	\$550,063
Collection of Recyclables from Landfills	\$93,383
Kerbside Waste Collection Cost	\$335,788
Kerbside Recycling Collection Cost	\$461,082
Annual Loan Repayment (Capital Cost)	\$482,484
<b>Total Annual Cost (Including loan repayment)</b>	<b>\$2,850,721</b>

The waste management situation at the end of Year 4 is illustrated in Figure 5.4.



Source: Base data supplied by Palerang Council


**KEY ACTIONS**

- Closure of Braidwood Landfill and Construction of Transfer Station and Recycling Drop-off
- Transfer of Waste from Bungendore to Woodlawn Landfill

- Towns
- ▭ Palerang LGA Boundray
- ★ Landfill Location
- 8yrs Landfill Life Remaining
- 182 Waste Tonnes/Year
- W Kerbside Waste and Recyclables Collection
- R Transfer Station and Recyclable Drop-off
- T

**Collection Zone**

- ▭ Araluen (278 sq km)
- ▭ Braidwood (2649 sq km)
- ▭ Bungendore (1289 sq km)
- ▭ CaptainsFlat (167 sq km)
- ▭ Collector (509 sq km)
- ▭ MacsReef (331 sq km)
- ▭ Majors Creek (70 sq km)
- ▭ Mugga (547 sq km)
- ▭ Nerriga (690 sq km)

<p>Client <b>PALERANG COUNCIL</b></p>	<p>Project <b>PALERANG COUNCIL WASTE STRATEGY 2005-2025</b></p>	<p>Title <b>END YEAR 4 (2008/09)</b></p>
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**5.6 Years 5 (2009/2010) and Year 6 (2010/2011)**

During these years there is no significant new capital works planned in the waste strategy. The cost associated with waste management operation during these years is given in Table 5-5.

*Table 5-5 Years 5 to 6 Cost Summary*

<b>Summary of Capital and Operating costs</b>	<b>Year 5</b>	<b>Year 6</b>
<i>Item</i>		
New Capital Costs	\$0	\$0
New Operating Costs	\$107,689	\$110,381
<i>Existing Costs</i>		
Landfill Operating Cost	\$102,584	\$105,148
Waste Transfer & Disposal Costs	\$1,304,661	\$1,337,277
Collection of Recyclables from Landfills	\$95,717	\$98,110
Kerbside Waste Collection Cost	\$358,088	\$380,946
Kerbside Recycling Collection Cost	\$498,133	\$536,111
Annual Loan Repayment (Capital Cost)	\$482,484	\$482,484
<b>Total Annual Cost (Including loan repayment)</b>	<b>\$2,949,356</b>	<b>\$3,050,457</b>