



**BARWON REGIONAL WASTE
MANAGEMENT GROUP**

**REGIONAL
WASTE SURVEY
2006-2007**

Prepared by Barwon Regional Waste Management Group



EXECUTIVE SUMMARY

The Barwon Regional Waste Management Group (BRWMG) has conducted its fifth annual survey of materials being deposited into landfills and materials being collected for recycling in the Barwon region. The following is a summary of the survey results for the financial year 2006-2007.

2006-2007

- Total waste deposited into **landfill = 292,581 tonnes**
- Total waste deposited to **landfill and used for landfill operations = 106,111 tonnes**
- Total waste deposited to **landfill = 398,892 tonnes**
- Total **recyclables** collected = **203,735 tonnes**

Of the total volume of waste being deposited to landfill the following items were the most significant:

- Contaminated soil- 100,357 tonnes (25%)
- Industrial waste- 90,654 tonnes (23%)
- Construction/Rehab- 40,067 (10%)
- Municipal waste (kerbside)- 38,840 tonnes (10%)
- Clean Fill- 37,855 (9%)
- Municipal waste (excluding kerbside waste)- 32,804 tonnes (8%)
- Mixed Rubble-15,803 tonnes (4%)

Of the total volume of recyclable materials being collected the following items were the most significant:

- Soil & Rubble- 89,087 tonnes (44%)
- Mixed Recyclables- 56,028 tonnes (27%)
- Green waste- 45,522 tonnes (22%)

Recyclables collected in the region represent 75,313 tonnes of recovered CO₂, equating to 122,587 trees being planted or 12,552 cars being taken off the road for a year.

Comparisons with the 2005-2006 survey indicated that:

- There was 17% more material deposited to landfill in 2006-2007- it is noted that this increase is largely due to an increase in contaminated soil from other regions being deposited within the Barwon Region- if this imported material is removed from the data there was a 5% reduction in material being deposited to landfill in 2006-2007.
- There was 7% more material collected for recycling in 2006-2007
- On average there was 1% less kerbside waste produced by each rateable property in the region in 2006-2007

The following historical data shows a downward trend in the average quantity of waste produced per rateable property per year in the Barwon Region:

- 2001-2002- 664kg per rateable property
- 2002-2003- 550kg per rateable property
- 2004-2005- 343kg per rateable property
- 2005-2006- 343kg per rateable property
- 2006-2007- 339kg per rateable property

RECOMMENDATIONS

1. Standardization

It is recommended that Transfer Station and Landfill Operators within the region standardize their record keeping. Member councils owned sites were involved in a Transfer Station and Landfill product standardization project in 2006. However this project has not resulted in changes to the format in which the data is reported.

2. A focus on reducing industrial waste to landfill

The data shows significant quantities of industrial waste being deposited to landfill (23% of all landfill material). The data also shows that quantities of industrial waste being deposited to landfill is steadily increasing each year. It is recommended that programs aimed at the industrial sector be developed and prioritized in an effort to reverse this trend.

3. Continue efforts to reduce household waste going to landfill

The data shows that there has been a consistent reduction in the average quantity of kerbside waste deposited by households in the Barwon region since 2001-2002. The average quantity of kerbside waste deposited by households in 2006-2007 is 49% less than that of 2001-2002. However kerbside waste comprises a significant portion (10%) of the total materials being deposited to landfill. It is recommended that programs aimed at reducing household waste production continue to be developed and implemented by Member Councils and the Barwon Regional Waste Management Group.

4. Include industry reuse and recycle activities in the region

This survey was unable to determine the quantity of materials, such as tyres, oil, and molasses, which are reused or recycled by industries in the region. It is recommended that this data be included in future surveys.

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1. INTRODUCTION

The aim of this report is for the Barwon Regional Waste Management Group to identify and quantify materials going to landfill and recyclable materials collected in the Barwon region for the financial year 2006-2007. This report aims to build on the historical data from past surveys to demonstrate changing trends in the volumes of materials going to landfill and the volumes of materials being recycled.

Analysis of the different characteristics of materials going to both landfill and recyclers has been conducted. It is anticipated that this survey will continue to be a benchmark for future waste management strategic planning and reporting in the Barwon region.

2. DATA COLLECTION METHODS

Operators of the various private and public waste handling facilities in the Barwon region were asked to provide data on waste volumes for the financial year 2006-2007. The data requested was for all materials going to landfills, transfer stations and other recycling facilities. The contributions were voluntary and confidentiality of the information was assured.

Unfortunately not all of the operators were able or willing to contribute their data to this survey. Some private operators did not keep records relating to materials collected specifically from the Barwon region. Significant concern was raised by some private operators regarding the confidentiality of the data requested for commercial reasons.

2.1 City of Greater Geelong

The City of Greater Geelong (COGG) provided data for materials deposited to its landfill sites at Corio and Drysdale. The data was provided on spread sheets and was measured in tonnes. The COGG has a weigh bridge at both landfill sites. The researcher was also able to acquire data relating to the kerbside collection of recyclables for the COGG and data from the Geelong Recycling and Resource Recovery Centre (GRRRC).

2.2 Surf Coast Shire

The Surf Coast Shire supplied information from Anglesea landfill, parts of this data was only available in cubic metres and was converted to tonnes for the purpose of comparisons made in this report (see Appendix 1 for conversion rates). Data was supplied for the Anglesea, Lorne, Winchelsea, and Deans Marsh transfer stations. Data relating to the kerbside collection of both waste and recyclables was also acquired.

2.3 Colac Otway Shire

Colac Otway Shire kerbside collection was deposited to the Corio and Drysdale landfills in 2006-2007, as the Alvie landfill is an inert landfill. Data was provided for the materials deposited to the Alvie landfill, and from the transfer stations at Alvie, Birregurra, and Marengo. The COS has recently installed a weigh bridge at the Alvie site, but it was not operational for the 06/07 year so for the purposes of this report the data was submit in cubic metres and was converted to tonnes for the purpose of comparisons made in this report (see Appendix 1 for conversion rates).

2.4 Private Operators

Numerous private operators across the region provided data relating to waste they collected. Landfill data was recorded in the product reports for the landfill sites that received the waste (Corio, Drysdale, Anglesea, Fyansford, and Alvie), so has not been included separately in this report. Some private operators deposited materials to landfills outside our region- these quantities have been noted. Recyclables have been recorded under the general heading of Commercial Operators to maintain confidentiality.

3. AVAILABLE REGIONAL DATA

The data in this survey was provided by:

- City of Greater Geelong
 - All waste going to landfills at Corio and Drysdale. This data incorporates materials collected from the Borough of Queenscliffe and Colac Otway Shire.
 - Kerbside recycling data for the Geelong region.
 - Waste and recyclables collected at GRRC.

- Surf Coast Shire
 - All data from Anglesea landfill.
 - The data from Deans Marsh, Lorne, Anglesea, and Winchelsea transfer stations.

- Colac Otway Shire
 - All data from the Alvie landfill.
 - Alvie, Marengo and Birregurra transfer stations.
 - Kerbside collection data including greenwaste, recyclables, and inert waste.

- Private Operators
 - Barwon region commercial waste and recycling data.

- Fyansford Waste
 - All waste going to the Fyansford landfill.

- VISY Recycling
 - All recyclables from kerbside collection in the region.
 - All other recyclables collected from the region (commercial, industrial and non kerbside municipal).

The data has been collated and is presented as follow:

4. BARWON REGIONAL WASTE DATA

JULY 2006- JUNE 2007

Table 1: Total waste deposited into landfill in the Barwon region 2006-2007

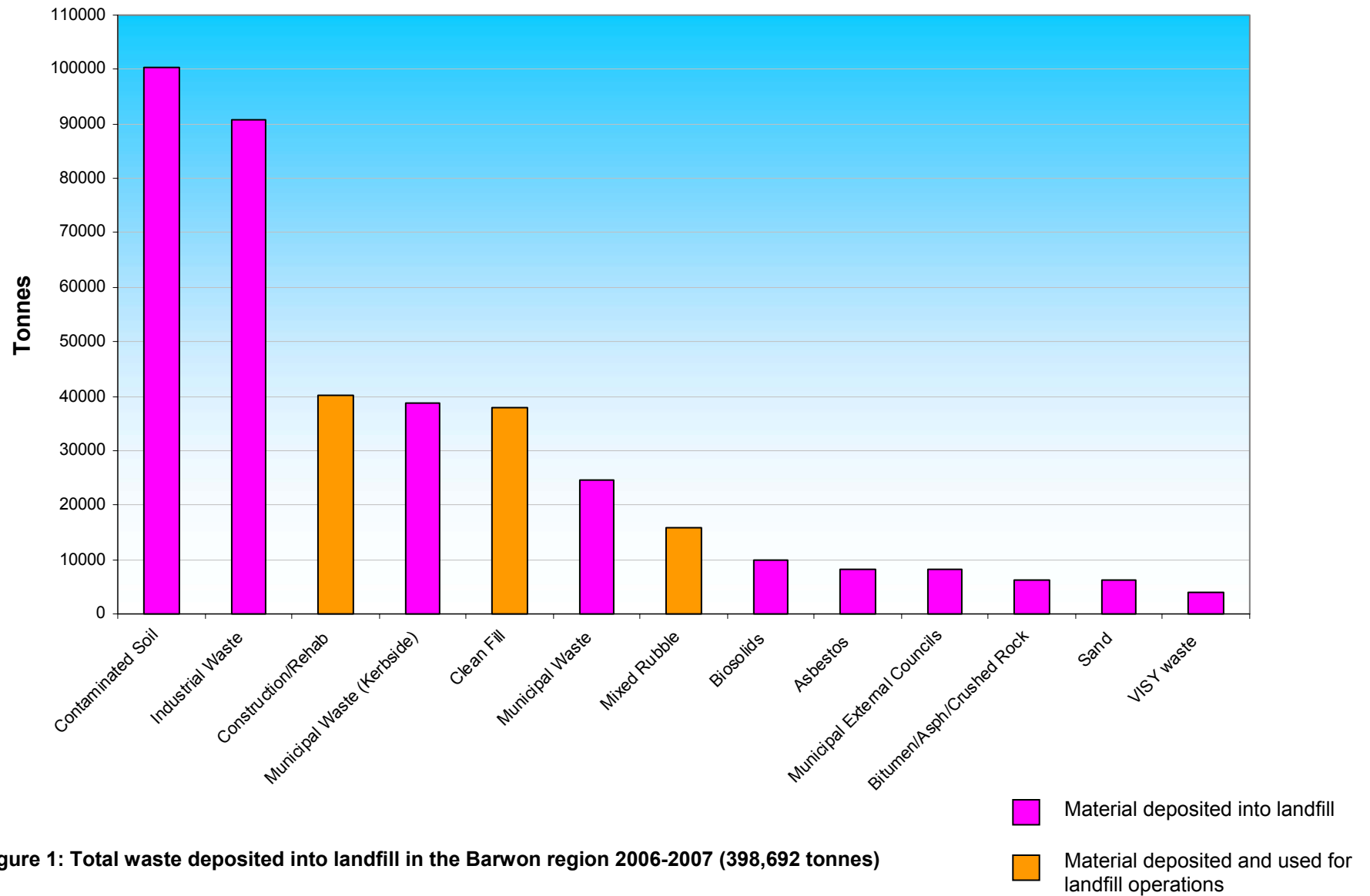
Description	Corio	Drysdale	Colac	Surfcoast	Fyansford	Total
Asbestos	-	-	-	-	8,273.69	8,273.69
Animal Carcasses	0.52	18.34	-	-	-	18.86
Biosolids	9,976.04	-	-	-	-	9,976.04
Car Tyres	-	22.00	-	-	-	22.00
Charities	-	70.82	-	-	-	70.82
Commercial Waste	-	-	-	180.78	-	180.78
Contaminated Soil	100,338.26	18.64	-	-	-	100,356.90
Filter Cake	435.60	-	-	-	-	435.60
Fish Waste	350.34	-	-	-	-	350.34
Green Waste (municipal)	98.64	605.85	-	-	-	704.49
Green Waste (non council)	487.18	-	-	-	8.00	495.18
Green Waste Contaminates	-	1,197.27	-	-	-	1,197.27
Industrial Waste	29,873.06	19,895.93	321.63	9,522.99	31,040.57	90,654.18
Mattress	16.00	-	-	-	-	16.00
Municipal External Councils	7,101.20	1,146.92	-	-	-	8,248.12
Municipal Waste	2,876.93	14,992.33	219.88	3,134.67	3,332.69	24,556.50
Municipal Waste (Kerbside)	34,079.00	-	5472.74#	4,760.80	-	38,839.80
Offal treated	1,404.04	-	-	-	-	1,404.04
Poultry	398.74	-	-	-	-	398.74
Prescribed waste	11.84	42.30	-	-	-	54.14
Public Asbestos	-	33.50	-	-	-	33.50
Scallop Shells	1,182.20	-	-	-	-	1,182.20
Seaweed	830.30	13.74	-	-	-	844.04
Squid	224.04	-	-	-	-	224.04
Sulphate	-	2.50	-	-	-	2.50
VISY waste	3,536.16	488.42	-	-	-	4,024.58
Wool Scour	16.56	-	-	-	-	16.56
Total Tonnage	193,236.65	38,548.56	541.51	17,599.24	34,381.26	292,580.92

Colac Otway Shire's kerbside municipal waste was deposited to Corio landfill in 06/07- this figure has not been included in total tonnage as it is captured in Municipal External Councils for Corio.

* This figure includes the 1,149 tonnes of kerbside waste collected from the Borough of Queenscliffe in 2006-2007

Table 2: Waste deposited and used for capping and landfill rehabilitation in the Barwon region 2006-2007

Description	Corio	Drysdale	Colac	Surfcoast	Fyansford	Total
Clean Fill	6,092.70	12,912.59	-	11,565.76	7,284.12	37,855.17
Construction/Rehab	40,067.00	-	-	-	-	40,067.00
Bitumen/Asph/Crushed Rock	6,243.06	-	-	-	-	6,243.06
Sand	6,142.28	-	-	-	-	6,142.28
Mixed Rubble	6,702.32	7,553.77	-	1,547.37	-	15,803.46
Total Tonnage	65,247.36	20,466.36	0.00	13,113.13	7,284.12	106,110.97



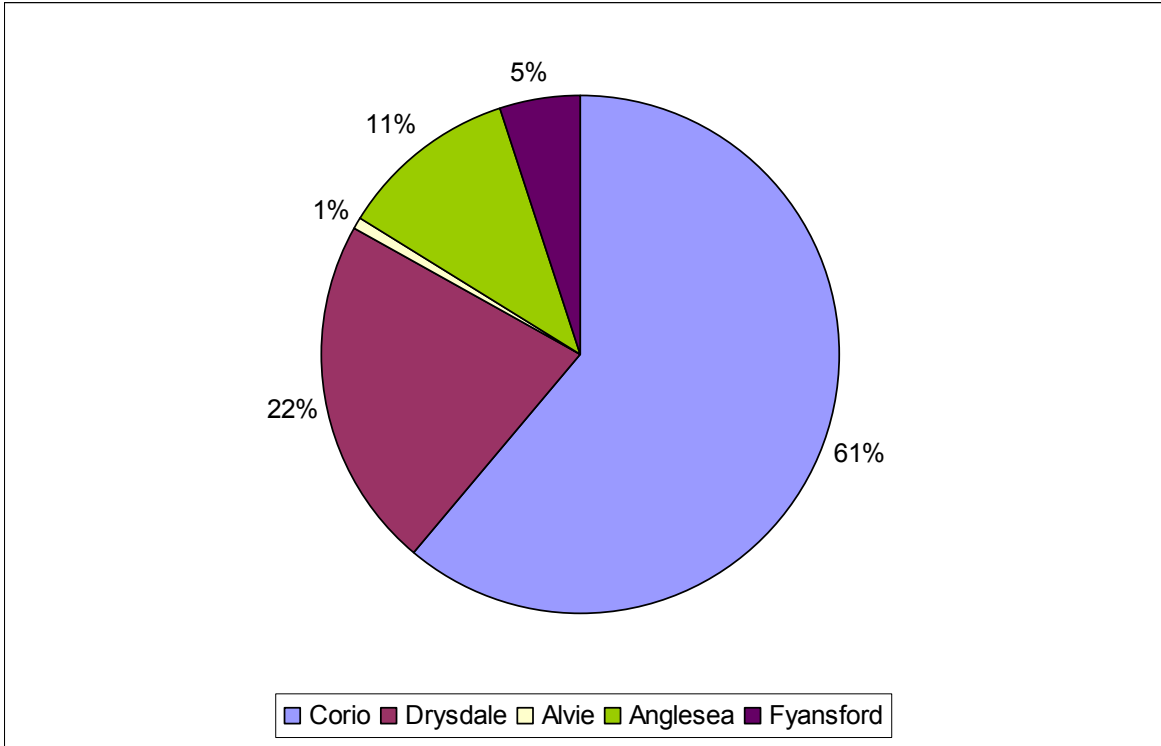


Figure 2: Percentage of Municipal waste deposited into landfills in the Barwon region 2006-07 (total of 71,644 tonnes)

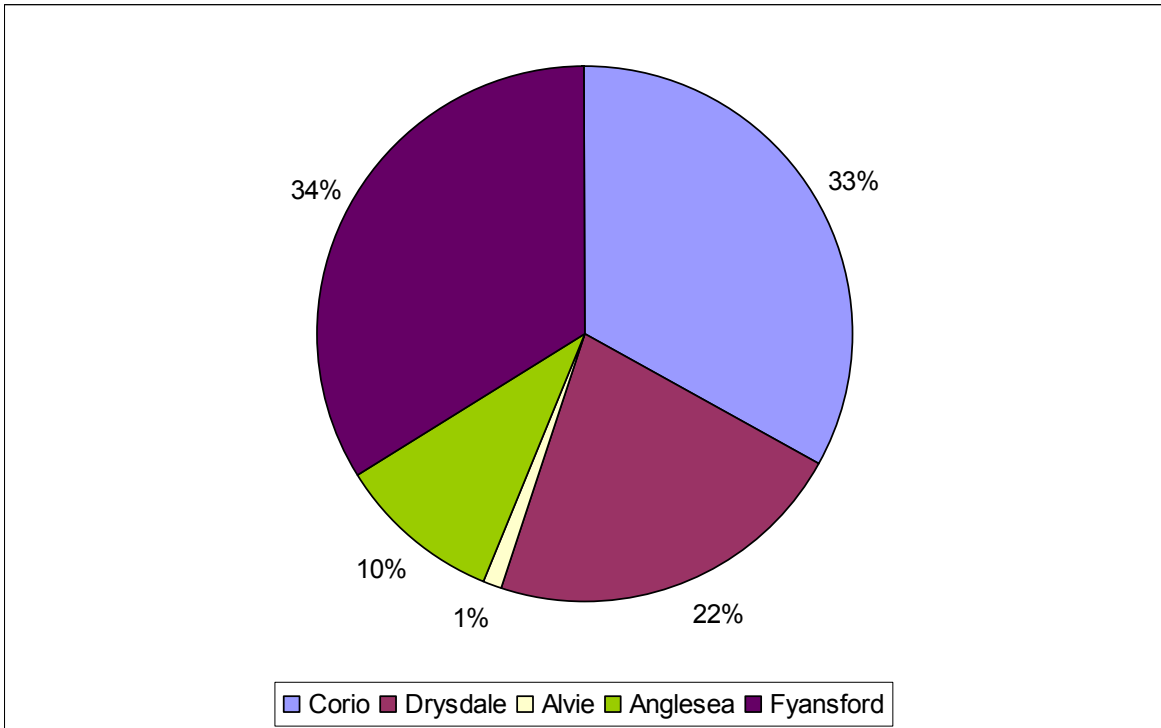


Figure 3: Percentage of Industrial waste deposited into landfills in the Barwon region 2006-07 (total of 90,654 tonnes)

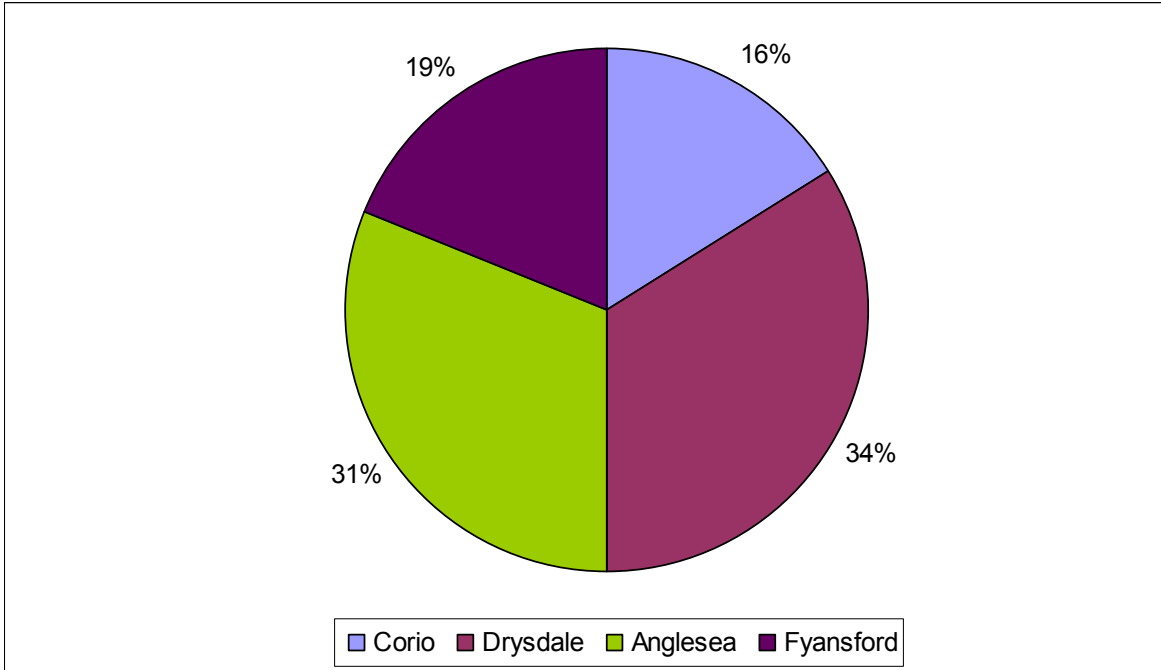


Figure 4: Percentage of Clean Fill deposited to landfills and utilized for landfill operations in the Barwon region 2006-07 (total of 37,855 tonnes)

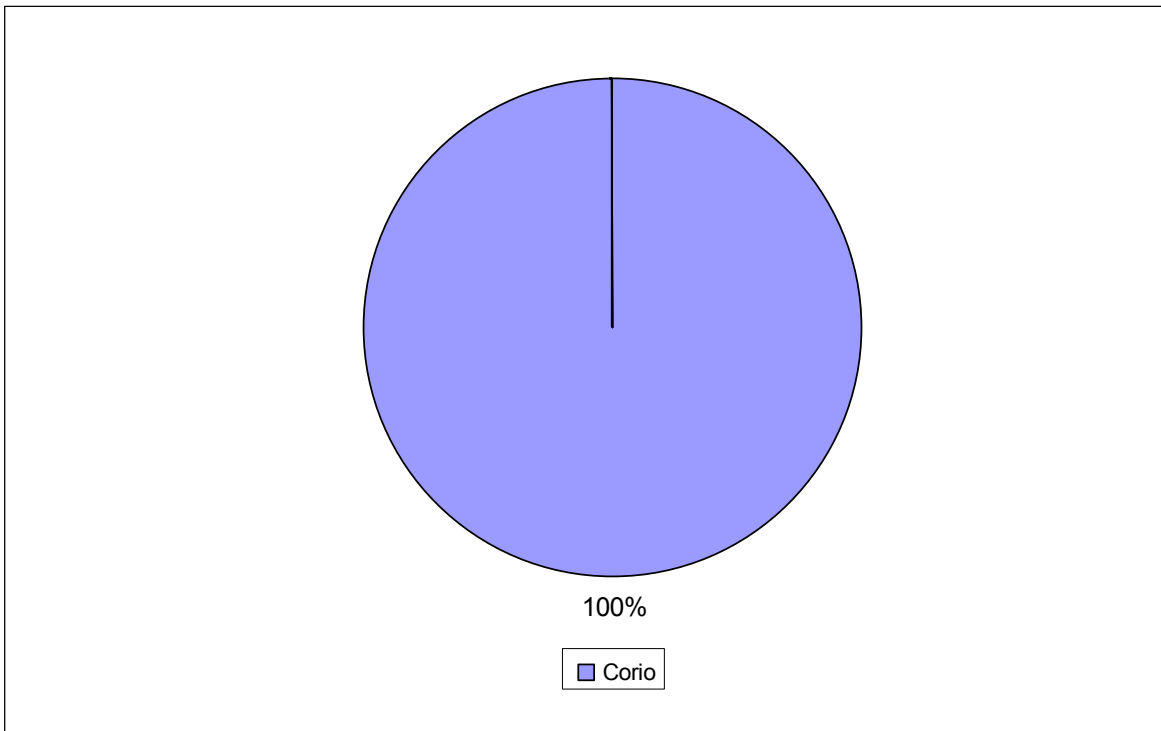


Figure 5: Percentage of Contaminated Soil deposited into landfills in the Barwon region 2006-07 (total of 100,357 tonnes)

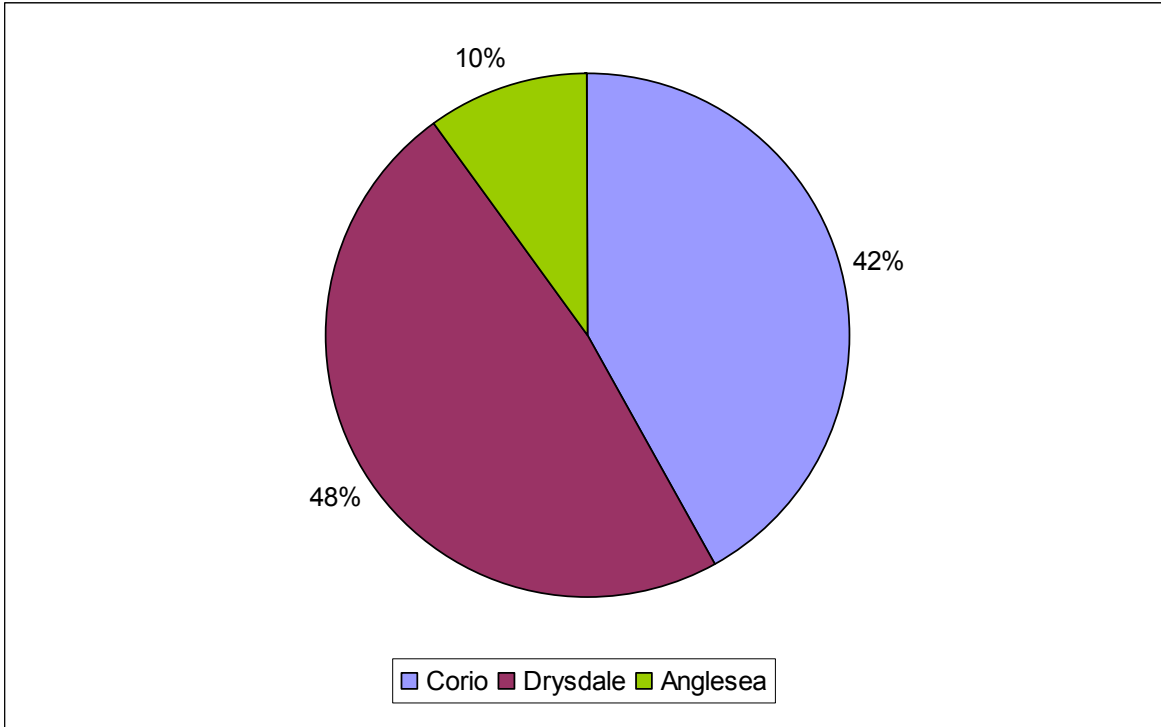


Figure 6: Percentage of Mixed Rubble deposited to landfills and utilized for landfill operations in the Barwon region 2006-07 (total of 15,803 tonnes)

Table 3: Costs of depositing materials to transfer stations in the Barwon region

Description	Corio	Drysdale	SCS	Alvie	GRRC	Fyansford	Pt Henry RRC	Wheelie Waste
Skip- general waste	-	-	-	-	-	\$46.00	\$40-50.00	-
Inert Waste \$/m3	-	-	-	\$23.00	-	-	-	-
Mixed Rubble/Roadbase	\$34.40	\$34.40	\$32.50-\$34.00	-	-	\$11-28.60	\$33.00	-
Builders Rubble	-	-	\$53.00	-	-	-	-	-
Timber	-	-	-	-	-	-	\$35-45.00	-
Concrete	-	-	-	-	-	\$25.00	\$10-15.00	-
Prescribed Waste	\$20.50-\$91.20	\$20.50-\$91.20	-	-	-	-	-	-
Prescribed Waste- Asbestos	-	-	-	-	-	\$125.00	-	-
Putrescible Waste \$/m3	-	-	-	\$38.00	-	-	-	-
Industrial	\$47.80-\$57.40	\$47.80	\$53.00	-	-	-	-	-
Commercial Industrial \$/m3	-	-	\$39.50	-	-	-	-	-
Truck Tyre*	\$30.00	\$30.00	\$6.50-\$27.50	\$15.00	\$30.00	-	\$10-20	-
Car Tyre*	\$8.00-9.00	\$8.00-9.00	\$5.50-\$7.00	\$4.00-5.00	\$8.00-9.00	-	\$7.50	-
Car Body*	-	-	\$40.00	\$40.00	-	-	-	-
Tractor*	-	-	-	-	-	-	-	-
Steel Scrap	-	-	-	\$15.00/m3	-	-	-	free
Chemical Drums*	-	-	-	\$0.70	-	-	-	-
Batteries*	-	-	-	\$4.00	-	-	-	-
Clean Fill	\$9.00	\$9.50	\$8.00	-	-	\$15.00	-	-
Waste Oil	-	-	-	\$0.70/litre	-	-	-	-
Greenwaste	\$39.50	\$39.50	-	\$13.00/m3	-	-	-	-
Seaweed	\$33.00	\$33.00	-	-	-	-	-	-
Car Boot*	-	\$8.50	\$9.50	-	\$8.50	-	\$8.50	-
Car Boot-Green*	-	-	\$7.00	-	-	-	\$8.50	-
Single axle trailer/Ute/Wagon (waterline)*	-	\$17.00	\$17.00	-	\$17.00	-	\$16.50	-
Single axle trailer/Ute/Wagon (waterline)-Greenwaste*	-	-	\$12.00	-	-	-	\$16.50	\$15.00
Single axle trailer/Ute/Wagon (heaped)*	-	\$19.50	\$21.00	-	\$19.50	-	\$20.00	-
Single axle trailer/Ute/Wagon (heaped) Greenwaste*	-	-	\$16.50	-	-	-	\$20.00	-
Tandem trailer (waterline)*	-	\$19.50	\$21.00	-	\$19.50	-	\$20.00	-
Tandem trailer (waterline) Greenwaste*	-	-	\$16.50	-	-	-	\$20.00	\$30.00
Tandem trailer (heaped)*	-	\$39.00	\$23.00	-	\$39.00	-	\$40.00	-
Tandem trailer (heaped) Greenwaste*	-	-	\$18.50	-	-	-	\$40.00	-
Domestic Trucks/Skips Greenwaste	-	-	\$18.50	-	-	-	-	-
Commercial Greenwaste \$/m3	-	-	-	-	-	-	-	\$10.00
Mattresses*	-	\$15.00	\$15.00	\$16.50	\$15.00	\$8.00	\$8.50	-
Commercial Recyclable \$/m3	-	-	\$23.50	-	-	\$44.00	-	-
Commingled recycling	-	-	-	\$19.00/m3	-	-	-	-
Sorted Recycling	-	-	no charge	No charge	no charge	-	-	-

* indicated price per item, all other categories are priced per tonne unless otherwise specified.

Table 4: Total recyclables collected in the Barwon region 2006-2007

Description	COGG	COS	SCS	BOQ	Commercial	Total
Batteries	-	0.10	4.53	-	-	4.63
Cardboard	-	-	-	-	2,596.00	2,596.00
Clean Fill	-	-	-	-	1,246.18	1,246.18
Gas Bottles*	-	-	-	-	0.00	0.00
Glass	-	-	-	-	0.00	0.00
Green waste	37,506.20	1,808.34	2,037.97	81.00	4,089.11	45,522.62
Mattresses	2132*	118*	1395*	-	405*	4050*
Metal	-	128.48	507.19	19.00	2,880.54	3,535.21
Mixed Recyclables	26,799.17	2,075.65	4,126.94	439.62	22,586.76	56,028.14
Oil	-	0.11	-	-	33.44	33.55
Paper	-	-	-	-	1404.00	1,404.00
Plaster	-	-	-	-	152.78	152.78
Plastic	-	-	-	-	2,098.38	2,098.38
Soil & Rubble	-	-	-	-	89,086.98	89,086.98
Timber	-	-	-	-	1,574.85	1,574.85
Tyres	-	2.20	18.03	-	431.83	452.06
Total	64,305.37	4,014.88	6,694.66	539.62	128,180.85	203,735.38

* Indicates materials measured by item and total tonnage does not include these figures

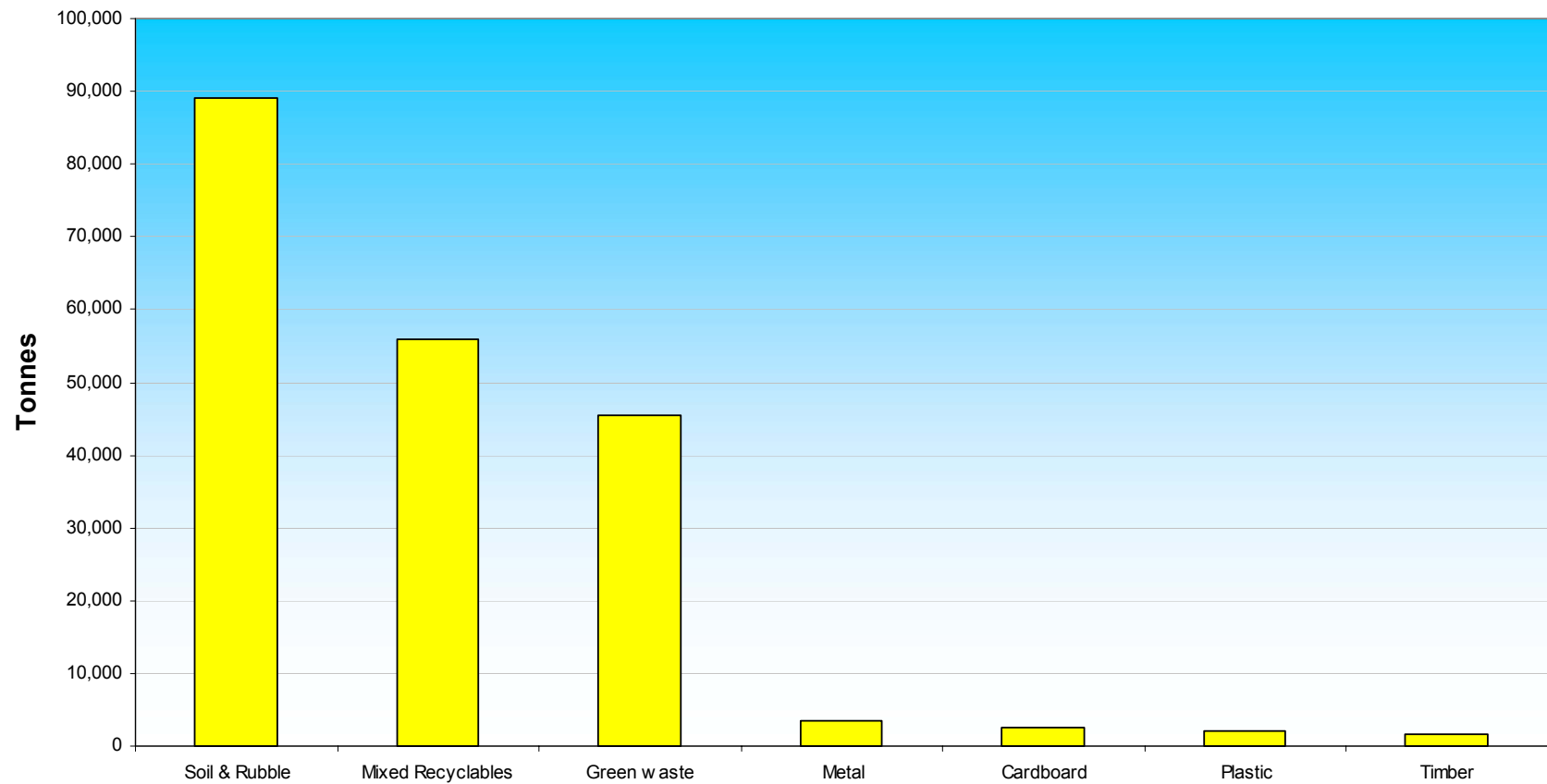


Figure 7: Total Recyclables collected in the Barwon region 2006-2007 (203,735 tonnes)

Figure 8: Average waste produced per rateable property (rp) per annum in each municipality 2006-2007- through the kerbside system

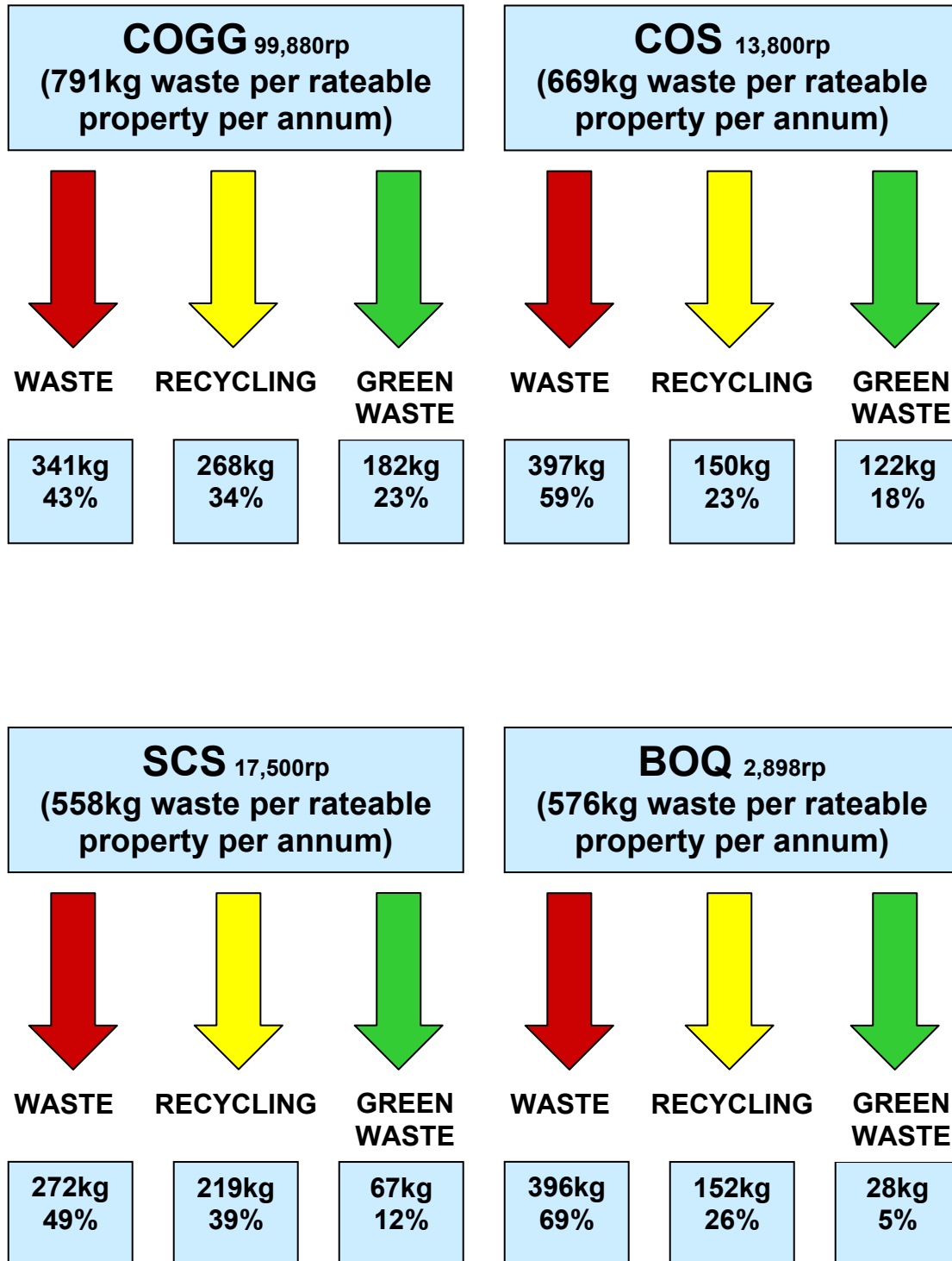


Figure 9: Average waste produced per rateable property (rp) per annum in the Barwon Region 2006-2007 -through the kerbside system

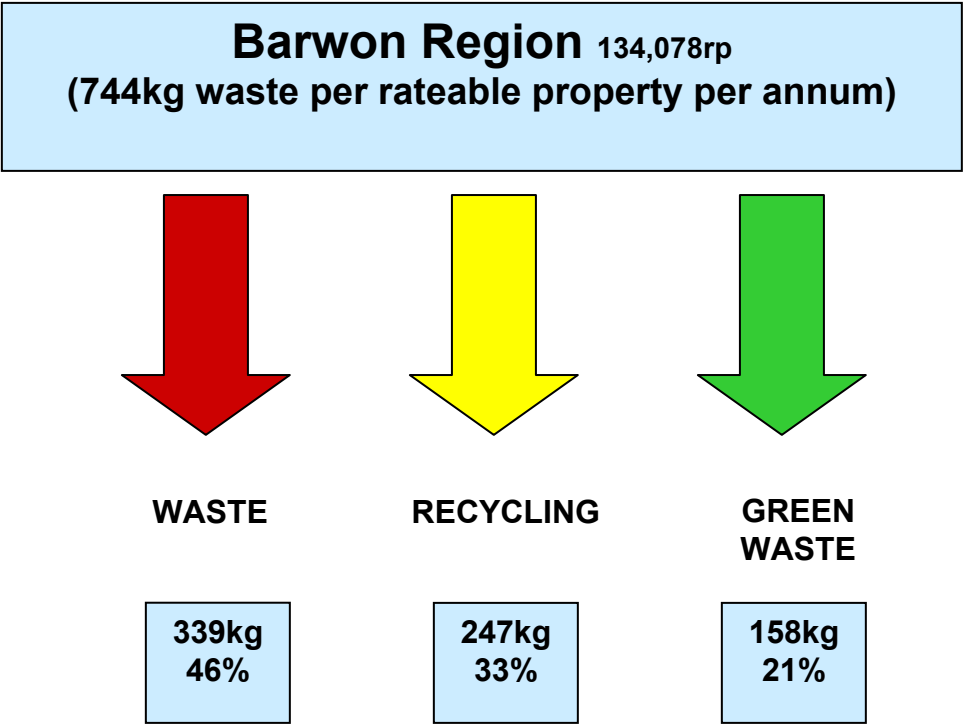


Table 5: City of Greater Geelong Kerbside Bin Audit Data 2007-2008 (Data represents totals from four consecutive audits conducted on 59 households, and represents average quantities per household)

Description	Recycling	Greenwaste	Rubbish	TOTAL
Paper	9.5	0.2	0.2	9.9
Cardboard	4.4	0.1	0.1	4.6
Glass/ Bottles	2.6	-	0.1	2.7
Steel	1.9	-	-	1.9
PET	1.8	-	-	1.8
Aluminium	1.2	-	0.2	1.4
HDPE	0.4	-	-	0.4
PVC	0.1	-	-	0.1
Conforming Green Waste	0.19	30.2	1.8	32.19
Food Waste*	0.18	0.1	26.8	27.08
Non Conforming Green Waste*	0.07	0.2	1.4	1.67
Building Materials*	0.09	0.2	0.2	0.49
Nappies/ Sanitary Products*	0.05	0.2	0.2	0.45
Car parts/ Accessories*	0.12	-	0.2	0.32
Plastic Packaging*	0.06	-	0.2	0.26
Metals*	-	-	0.2	0.2
Clothing/ Fabric*	0.04	-	0.1	0.14
Bricks/ Rocks/ Rubble*	-	-	0.1	0.1
Ceramics/ China*	0.1	-	-	0.1
Other	0.13	-	-	0.13
TOTAL (kg)	22.93	31.2	31.8	85.93

* Indicates materials currently unable to be recovered via the kerbside bin system
 Figures highlighted in red indicate materials currently accepted in each waste stream.

Table 6: City of Greater Geelong Kerbside Contamination Rates 2007-2008

Bin	Correct Use Rate	Contamination Rate
Recycling Bin	95.51%	4.49%
Greenwaste Bin	96.79%	3.26%
Rubbish Bin	94.50%	*5.50%

* this figure refers to materials placed in the Rubbish bin that can be recycled through the other two bins.

Table 7: Colac Otway Shire Kerbside Bin Audit Data 2008 (Audits were conducted on 60 households and data represents average quantities per household)

Description	Recycling	Organics	Rubbish	Total
Paper/Cardboard	6.17	0.42	0.17	6.75
Glass bottles and jars	2.50	-	-	2.50
Steel containers	1.33	-	-	1.33
Aluminium	0.83	-	-	0.83
Plastic Codes 1, to 7,	1.58	-	-	1.58
Milk and juice (liquid paperboard)	0.08	-	-	0.08
Food Waste	-	0.88	0.33	1.22
Green Waste	-	6.33	0.25	6.58
Inert Material*	-	-	5.83	5.83
Plastic/Plastic bags*	-	0.02	-	0.02
Recyclable containers	-	-	0.17	0.17
Other Contamination	1.17	0.52	0.92	2.60
Total weight collected (kg)	13.67	8.17	7.67	29.50

* Indicates materials currently unable to be recovered via the kerbside bin system
 Figures highlighted in red indicate materials currently accepted in each waste stream.

Table 8: Colac Otway Shire Kerbside Contamination Rates 2008

Bin	Correct Use Rate	Contamination Rate
Recycling Bin	91.50%	8.50%
Organics Bin	93.40%	6.60%
Rubbish Bin	88.05%	*11.95%

* this figure refers to materials placed in the Rubbish bin that can be recycled through the other two bins.

Historical Data

Regional

- **Waste to landfill in the Barwon Region 2001-2007**
- **Recyclables in the Barwon Region 2001-2007**

City of Greater Geelong

- **Corio Landfill: 1998-2007**
- **Drysdale Landfill: 1998-2007**

Table 9: Total waste deposited into landfill in the Barwon region 2001- 2007

Description	2001-2002	2002-2003	2004-2005	2005-2006	2006-2007	Total
Animal Carcass	20.98	28.28	32.72	30.42	18.86	131.26
Asbestos lagging	-	-	4,797.82	6,660.53	8,273.69	19,732.04
Asbestos Public	-	-	-	-	33.50	33.50
Asbestos Sheeting	5.70	-	35.60	-	-	41.30
Batteries	-	-	2.02	-	-	2.02
Bitumen/Asph/Crushed Rock	-	532.54	6,760.17	9,156.82	6,243.06	22,692.59
Biosolids	-	-	-	-	9,976.04	9,976.04
Carbon	-	-	37.38	-	-	37.38
Car Tyres	-	-	-	-	22.00	22.00
Charities	-	-	-	-	70.82	70.82
Clean Fill	134,006.41	104,903.56	134,707.86	74,946.94	37,855.17	486,419.94
Commercial Waste	-	-	-	-	180.78	180.78
Construction/rehab	-	-	-	27,651.58	40,067.00	67,718.58
Contaminated Soil	5,428.80	24,992.20	54,400.56	54,030.03	100,356.90	239,208.49
Contaminates- soil	693.80	3,004.94	6,251.31	-	-	9,950.05
Cover Material (Dandos)	20,725.27	9,751.78	-	-	-	30,477.05
Deep Burial	0.34	2.74	-	-	-	3.08
Filter Cake	504.42	583.24	574.11	508.52	435.60	2,605.89
Fish Waste	672.10	1,030.30	681.12	707.02	350.34	3,440.88
Green Waste (contaminated)	-	28.26	383.30	168.26	1,197.27	1,777.09
Green Waste (municipal)	-	521.31	-	631.91	704.49	1,857.71
Green Waste (non-council)	8,632.96	2,068.05	431.22	1,465.48	495.18	13,092.89
Industrial Waste	65,693.43	51,509.11	81,565.06	89,312.36	90,654.18	378,734.14
Mattress	-	-	638.00	-	16.00	654.00
Mill Scale	7.72	-	-	-	-	7.72
Mixed rubble	23,528.56	22,392.26	14,107.79	13,933.68	15,803.46	89,765.75
Municipal External Councils	-	950.04	3,225.84	6,886.66	8,248.12	19,310.66
Municipal Waste	-	-	29,720.58	26,319.15	24,556.50	80,596.23
Municipal Waste (Kerbside)	81,569.27	67,767.26	44,777.36	39,568.18	38,839.80	272,521.87
Offal	4,106.09	3,920.94	50.02	563.70	1,404.04	10,044.79
Poultry	-	-	-	226.40	398.74	625.14
Prescribed waste	940.22	717.22	276.36	230.30	54.14	2,218.24
Quarantine Waste	97.98	81.66	-	-	-	179.64
Sand	-	2,246.42	10,326.40	8,816.44	6,142.28	27,531.54
Scallop Shells	317.94	271.50	293.28	905.46	1,182.20	2,970.38
Seaweed	161.00	589.21	383.36	708.96	844.04	2,686.57
Squid	189.50	197.34	107.58	154.74	224.04	873.20
Street Sweepings	-	197.62	603.18	1,164.12	-	1,964.92
Sulphate	-	-	-	-	2.50	2.50
Unspecified inert & putrescible*	30,000.00	30,000.00	-	-	-	60,000.00
VISY Waste	-	-	-	2,404.02	4,024.58	6,428.60
Wool Scour	264.41	68.90	-	-	16.56	349.87
Total Tonnage	377,302.49	328,287.78	395,170.00	367,151.68	398,691.88	1,866,603.83

* In 2001/2002 and 2002/2003 itemized data was not available for the **Fyansford Landfill** and the materials deposited were categorized as '**Unspecified inert & putrescible**'. Itemized data was available in 2004/2005 and the quantities of waste deposited to **Fyansford Landfill** are included under the appropriate description.

Table 10: Average quantity of garbage deposited kerbside per rateable property in the Barwon region 2001- 2007

Year	2001-2002	2002-2003	2004-2005	2005-2006	2006-2007
Total No. of Households	122,928	123,153	130,694	131,146	134,078
Total Kerbside Waste	81,569	67,767	44,777	44,929	45,462
Waste per Household	664	550	343	343	339

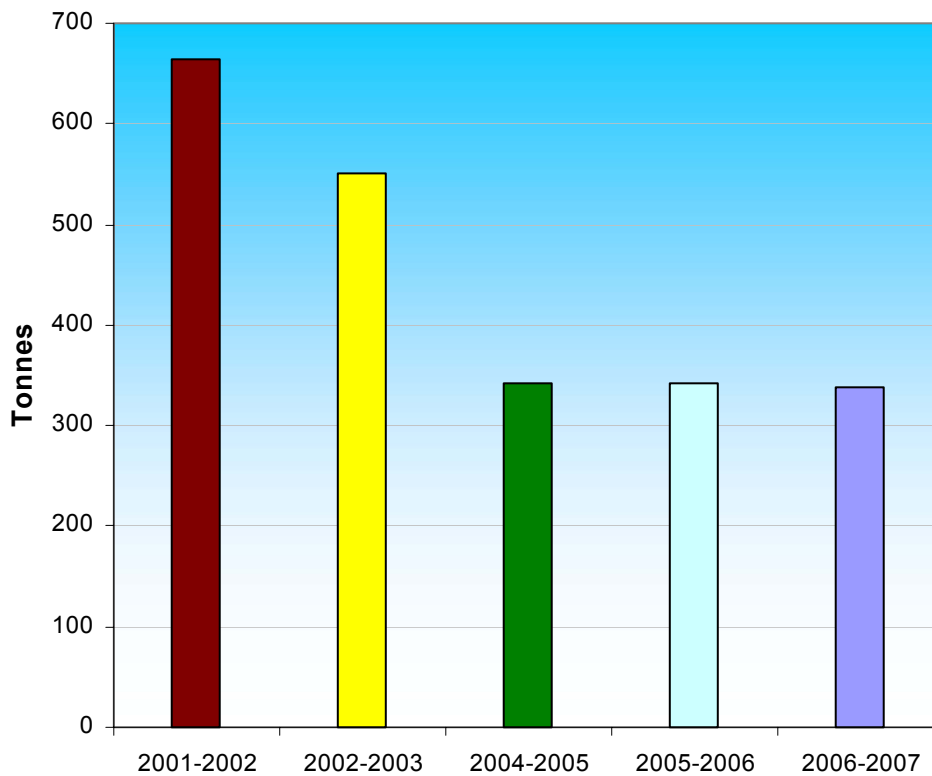


Figure 10: Average quantity of garbage deposited kerbside per rateable property in the Barwon region 2001-2007

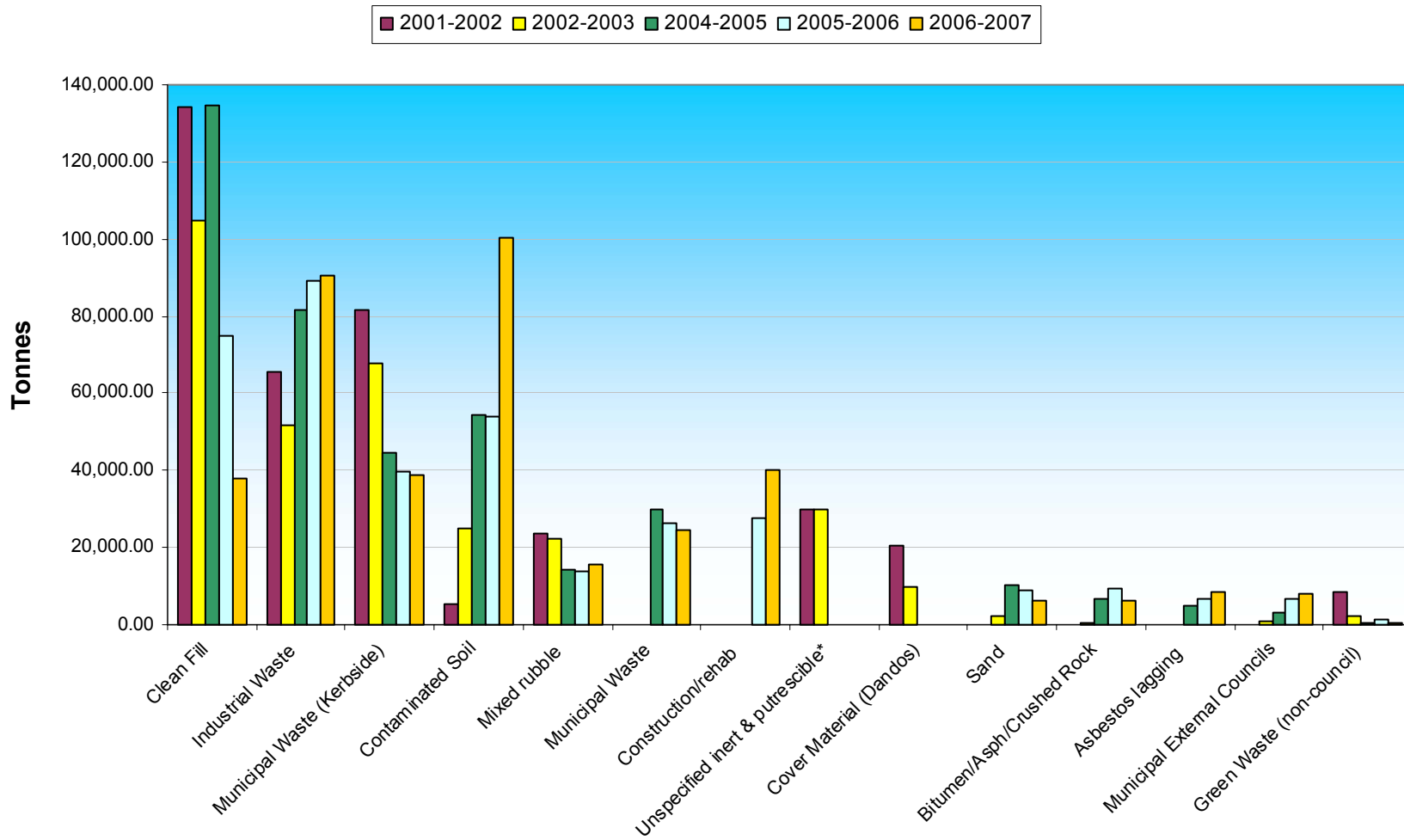


Figure 11: Comparison between waste deposited into landfill 2001- 2007

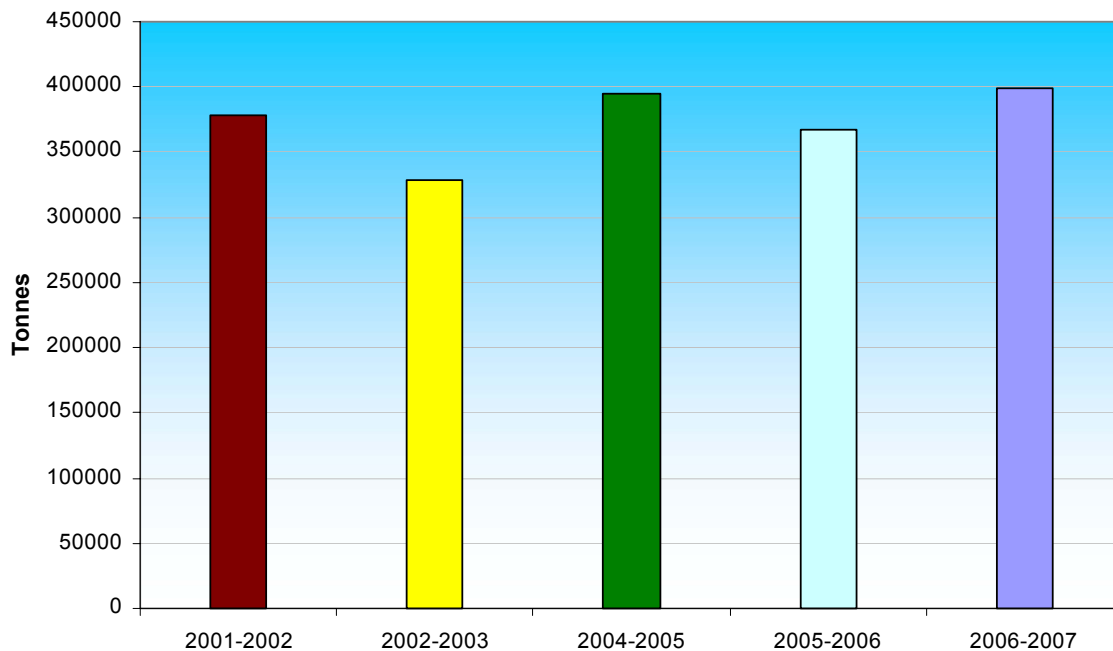


Figure 12: Comparison between total waste deposited into landfill 2001- 2007

Table 11: Total Recyclables collected in the Barwon region 2001-2007

Description	2001-2002	2002-2003	2004-2005	2005-2006	2006-2007	Total
Aluminium	122.56	-	-	-	-	122.56
Batteries	24.00	67.33	7.27	46.95	4.63	150.18
Cardboard	3,718.70	213.10	3,667.00	218.98	2,596.00	10,413.78
Clean Fill	-	-	899.62	3,181.68	1,246.18	4,081.30
Glass	4,626.40	282.31	-	-	-	4,908.71
Green waste	2,587.70	4,788.69	38,358.96	35,370.10	45,522.62	126,628.07
Metal	-	-	1,440.00	5,651.96	3,535.21	7,091.96
Mixed Recyclables	9,000.00	25,170.75	46,092.68	50,256.34	56,028.14	186,547.91
Non ferrous metal	215.10	-	-	-	-	215.10
Oil	-	0.43	32.82	41.94	33.55	108.74
Paper	5,059.96	17.81	1,404.00	1300.00	1404.00	9,185.77
Plaster	-	-	-	-	152.78	152.78
Plastic	764.48	0.62	36.00	1322.86	2098.38	4,222.34
Soil & Rubble	6,018.00	3,427.20	125,138.47	92,525.15	89,086.98	316,195.80
Steel	2,251.92	2,486.02	485.54	-	-	5,223.48
Timber	-	-	3,156.54	974.23	1,574.85	4,130.77
Tyres	50.00	362.00	13.15	16.52	452.06	893.73
Total	34,316.26	36,816.26	220,732.06	190,906.71	203,735.38	482,771.29

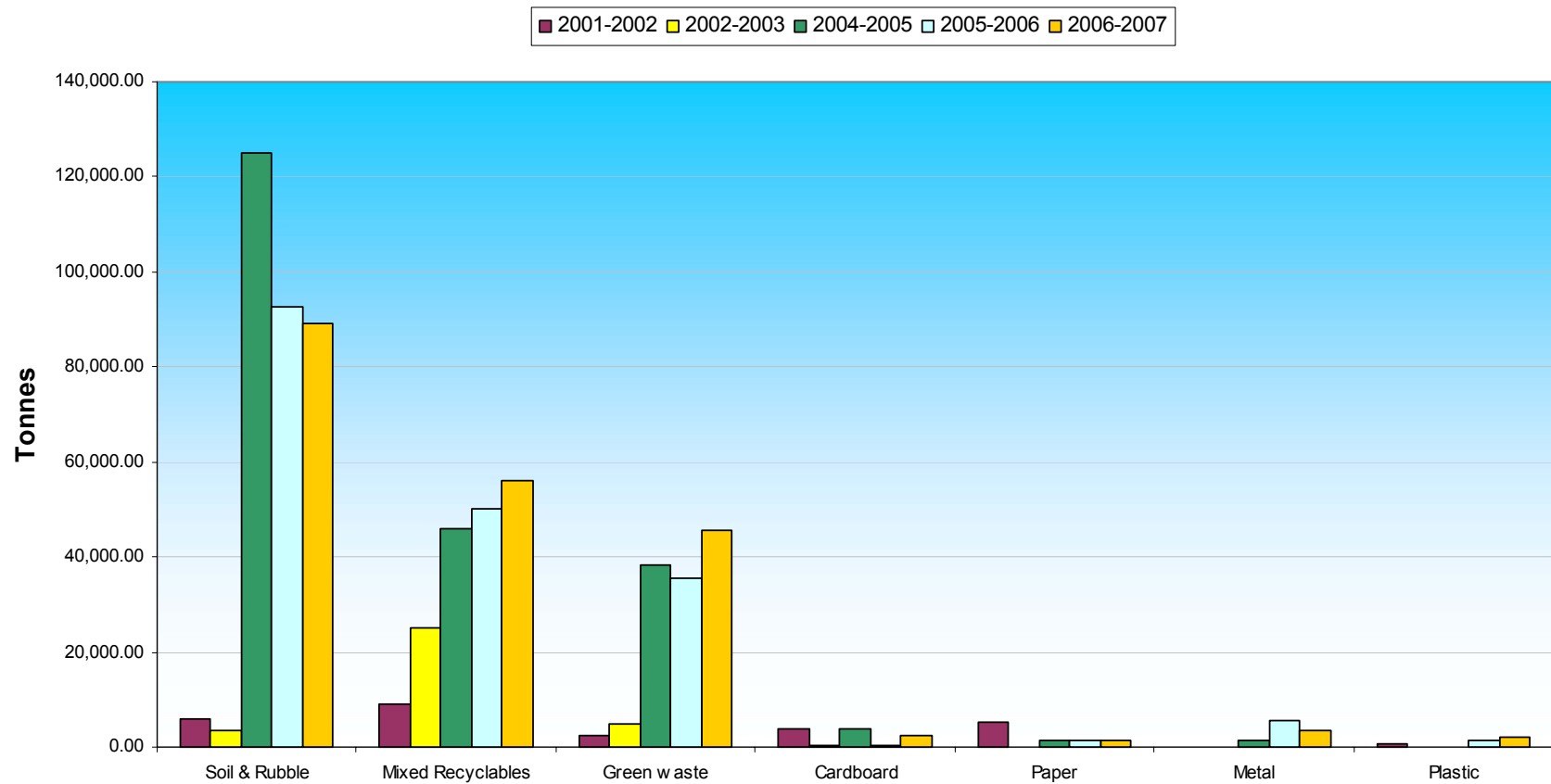


Figure 13: Comparison between Recyclables collected in the Barwon region 2001- 2007

Table 12: Corio landfill historical data 1998-2007

Description	98/1999	99/2000	20/2001	2002/03	2003/04	2004/05	2005/06	2006-07
Cover - Construction & Rehabilitation Soil	61,121	20,487	84,672	104,507	149,150	94,635	53,638	65247
Low Level Contaminated Soil	61,469	24,775	28,504	27,997	117,266	54,400	54,030	100,338
Waste (All Types)	115,646	100,570	100,094	81,273	71,682	102,974	111,770	92898
Total into Landfill	238,236	145,832	213,270	213,778	338,098	252,009	219,437	258,485

Table 13: Drysdale landfill historical data 1998-2007

Description	98/1999	99/2000	20/2001	2002/03	2003/04	2004/05	2005/06	2006/07
Cover	3,168	16,278	12,770	6,714	8,347	13,575	16,786	20,466
Waste (All Types)	49,199	55,036	57,170	54,977	42,476	43,535	38,976	38,549
Total into Landfill	52,367	71,314	69,940	61,691	50,823	57,110	55,762	59,015

Note: Cover at Drysdale is mainly found on-site.

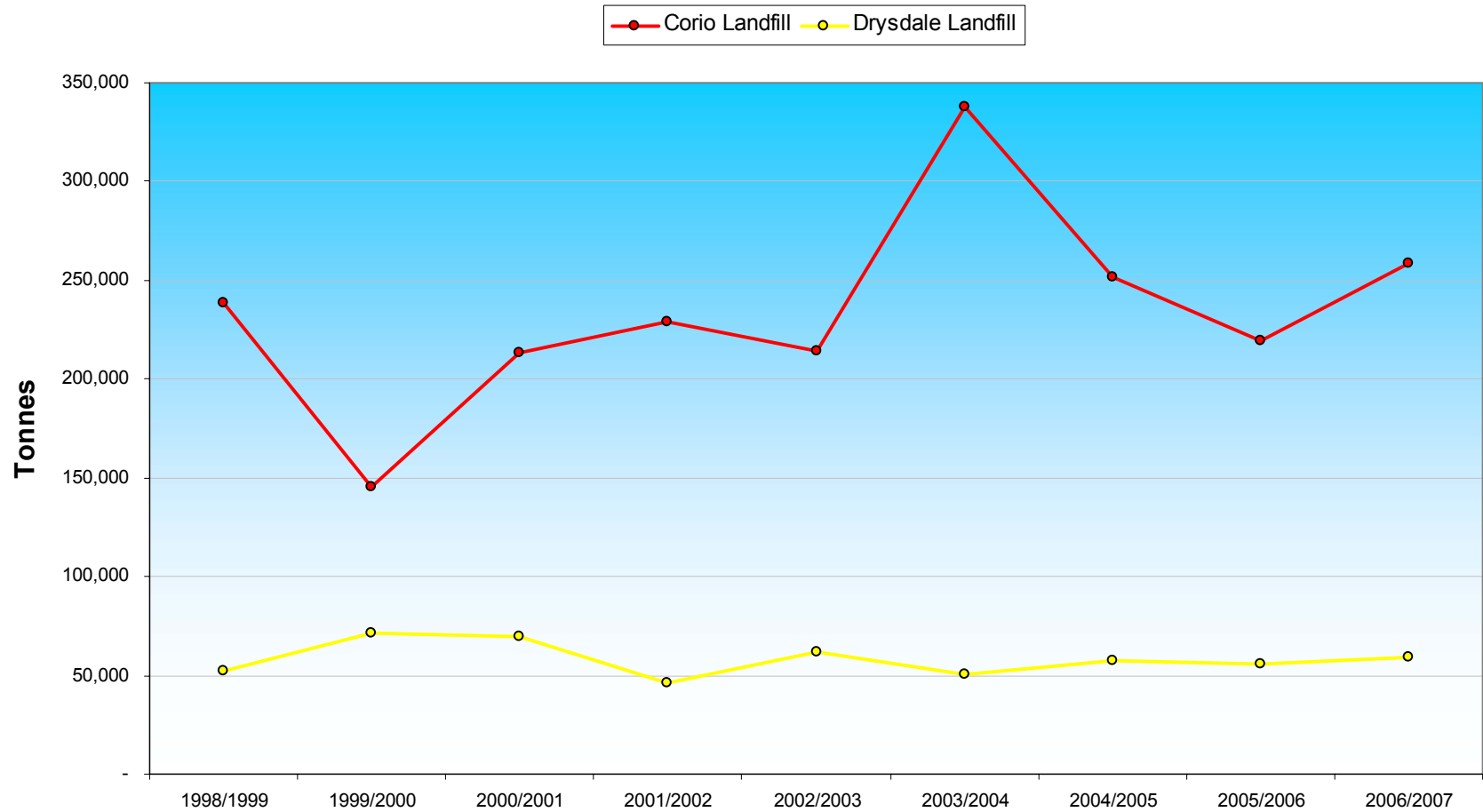


Figure 14: Comparison between total tonnes being deposited into landfill at Corio and Drysdale Landfills 1998-2007

5. DISCUSSION

5.1 Analysis

For the financial year 2006-2007 the total materials deposited in landfill was 398,692 tonnes. This figure includes 106,111 tonnes of clean fill and mixed rubble deposited to landfills in the region and utilized by the landfills in their operations (ie road construction and capping). The most significant quantities of landfilled material come from contaminated soil (25%), industrial waste (23%), municipal waste- including kerbside, drop-off and council works (18%), construction/rehab (10%), clean fill (9%), and mixed rubble (4%). Also over 5,000 tonnes of materials produced in the region is known to be deposited to landfills outside the region by commercial operators- this figure has not been included in the regions total waste data.

For the financial year of 2006-2007 the total material being recycled was 203,735 tonnes. The most significant quantities coming from soil & rubble (44%), mixed recyclables- which includes kerbside collections (27%), and green waste- which also included kerbside collections (22%). Significant quantities of timber are also recycled in the region; however data on the weight of timber was unavailable because of difficulties in estimating the m³ of milled timber.

Using a greenhouse calculator developed by the RMIT Centre for Design, this year the region has been able to calculate greenhouse emission savings from the recyclables collected. The 203,735 tonnes of material collected for recycling in the Barwon Region represents 75,313 tonnes of recovered CO₂. This equates to 122,587 trees being planted, or 12,552 cars being taken off the road for a year.

This year's survey also sees the inclusion of kerbside audit data from the City of Greater Geelong and Colac Otway Shire. The audits indicate that the current diversion of waste from landfill through the kerbside system in Geelong is 60%, the current potential diversion (if the system were used optimally) is 64%, and the possible potential recovery rate with the inclusion of food organics into the recovery streams is 95.5%. The current diversion rate in Colac Otway is 66.8% and the current diversion potential (if the system were used optimally) is 71% -food organics are already included in the Colac Otway kerbside recovery system.

The historical data shows interesting trends over several years. The data shows an overall increase of 17% in total waste being deposited into landfill in 2006-07 when compared with the 2005-06 data. This increase can largely be attributed to an 86% increase in contaminated soil being deposited into landfill. The data also indicates a 13% increase in mixed rubble and a 1% increase in industrial waste being deposited to landfill. For the other major waste streams a reduction in waste has been recorded in 2006-07. Clean fill reduced by 29%, Municipal waste (including kerbside, and municipal drop-off) reduced by 1%.

It is noted that the pricing structure for contaminated soil at Corio landfill has attracted significant quantities of this material into the region from the Metro Region. If this additional stream is removed from the regions total tonnage to landfill, a total reduction in waste to landfill of 5% is measured in 2006-07 when compared to the 2005-06 data.

The Barwon Region now has 6 years of data showing clear trends for the different materials being deposited into landfill- shown in Figure 11. This historical data indicates a decrease in quantities of material being disposed to landfill for most material types with two distinct exceptions. The data for both Contaminated Soil and Industrial waste indicates a continuous upward trend.

This survey has also recorded a decrease of 1% in kerbside waste per rateable property between 2005-2006 and 2006-2007. In 2005-2006 each rateable property in the region deposited an average 343kg of material, and in 2006-2007 this average dropped to 339kg of material per household.

The historical data shows a 7% increase in the quantities of materials being recycled between 2005-2006 and 2006-2007. The most significant increases were measured in greenwaste (up by 29%) and in mixed recyclables (up by 11%). A small decrease of 4% was recorded for quantities of soil and rubble collected. It must be noted that the historical variations in quantities of recyclables collected is in part due to the ability to collect thorough data from commercial operators in the region.

5.2 Limitations

Whilst attempts were made to obtain all of the data relating to landfill, transfer stations and recyclers, for this survey some gaps remain. Significantly data for metals recycling is missing due to concerns regarding confidentiality. There were difficulties in obtaining copies of data records for some of the facilities, resulting in some of the data being received as estimates over the phone.

Data recording inconsistencies continue to be problematic. Coupling and categorizing of data was a significant weakness in the recording. While the researcher was able to collect accurate data for both municipal and commercial waste, the data recording methods used by the landfill operators are still inconsistent. The materials collection site operators differed in how they categorized the different types of waste and whether their records differentiated between commercial and municipal waste. This made the comparison of data difficult. This issue has been noted in last three surveys and it remains a priority recommendation that all Council operated landfills and transfer stations in the Barwon Region commit to consistent data recording categories.

Attempts were also made to determine the level of industry that is reducing and recycling materials- such as tyre, molasses and oil reuse and recycling, however at this point in time accurate data for these activities is not available.

For the recyclable materials data, there were limitations in the comparison of historical data. This was due to the changes in processing, with all kerbside recycling now being categorized as 'mixed recyclables', rather than the detailed itemization that occurred in the past. This said there is now four years of data available under the current categorization allowing for more comprehensive comparisons to be made.

The conversion of volumes in cubic metres and litres into tonnes is also liable to produce inaccuracies. Given that the data recorded in cubic metres is based on a visual inspection of boot and trailer loads, it is difficult to make exact comparisons with the waste weighed at a weigh bridge. Further, how the materials are collected and prepared i.e. crushed or baled, also varies, and affects the accuracy of conversions. Therefore the volumes in this survey can only be considered close to accurate. Colac Otway Shire has just completed the installation of a weigh bridge at the Alvie transfer station, which will allow for more accurate data analysis.

6. CONCLUSION

For the financial year of 2006-2007 the total quantity of material deposited to landfill was 398,692 tonnes. Of the materials being deposited into landfill, the greatest quantities were from contaminated soil, industrial waste, and municipal waste.

For this same period 203,735 tonnes of recyclable materials were collected in the region. Of these materials the most significant quantities collected were for soil & rubble, mixed recyclables, and green waste.

The historical data shows a 1% decrease in total municipal waste (including kerbside, and municipal drop-off) between 2005-2006 and 2006-2007. The data shows an overall increase of 17% in total materials deposited to landfill. For this same period there was a 7% increase in the quantity of material being collected for recycling.

With a much clearer picture of the waste generated by the region, planning for the future management of the Barwon region's waste will be significantly enhanced. Using the historical data, projections can be made that will allow for the adoption of quantity appropriate technology and waste planning systems.

APPENDIX 1

CONVERSION RATIOS

In an attempt to standardize the data collected, the following assumptions were made:

Aluminium	1m ³ : 1.4 tonne
Cardboard (bale)	1.5m ³ : 900kg
Cardboard (loose)	10m ³ : 1 tonne
Clean fill	1m ³ : 1.5 tonne
Glass (44 gallon drum)	1m ³ : 411kg
Glass (crushed)	1m ³ : 1 tonne
Green waste	4m ³ : 1 tonne
Industrial waste	2m ³ : 1 tonne
Mixed rubble/concrete	0.5m ³ : 1 tonne
Municipal waste	2m ³ : 1 tonne
Paper (bale)	1.5m ³ : 900kg
Plastic HDPE	1m ³ : 0.01 tonne
Steel	6.7m ³ : 1 tonne

This information was supplied with thanks to:

VISY Recycling
Officers at the Surf Coast Shire
GRRRC
And BRWMG

