

BARWON REGIONAL WASTE SURVEY 2007-2008



Prepared by Barwon
Regional Waste
Management Group



EXECUTIVE SUMMARY

The Barwon Regional Waste Management Group (BRWMG) has conducted its sixth 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 2007-2008.

2007-2008

- Total waste deposited into **landfill = 285,812 tonnes**
- Total waste deposited to **landfill and used for landfill operations = 67,718 tonnes**
- Total waste deposited to **landfill = 353,530 tonnes**
- Total **recyclables** collected = **186,235 tonnes**

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

- Contaminated soil- 102,346 tonnes (29%)
- Industrial waste- 81,368 tonnes (23%)
- Municipal waste (kerbside)- 40,114 tonnes (11%)
- Municipal waste (excluding kerbside waste)- 32,612 tonnes (9%)
- Clean Fill- 26,270 tonnes (7%)
- Construction/Rehab- 21,856 (6%)
- Mixed Rubble- 14,434 tonnes (4%)

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

- Soil & Rubble- 60,858 tonnes (32%)
- Mixed Recyclables- 53,101 tonnes (28%)
- Green waste- 40,271 tonnes (21%)

Recyclables collected in the region represent 66,681 tonnes of recovered CO₂, equating to 106,173 trees being planted or 11,113 cars being taken off the road for a year.

Comparisons with the 2006-2007 survey indicated that:

- There was reduction in material deposited to landfill of 11% in 2007-2008.
- There was a reduction in material collected for recycling of 8% in 2007-2008- it is noted that a number of large commercial recycling facilities chose not to contribute their data to this survey and this has skewed the figures.
- On average there was 1% more kerbside waste produced by each rateable property in the region in 2007-2008

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
- 2007-2008- 340kg 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. Removal of commingled material from the kerbside garbage bin

Regional kerbside bin audit data indicates that there is over 12,000 tonnes of commingled material currently going to landfill via the kerbside garbage bin, including over 5,000 tonnes of containers. It is recommended that community education programs be developed to assist householders in disposing of this material correctly.

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 2007-2008 is 49% less than that of 2001-2002. However kerbside waste comprises a significant portion (10%) of the total materials being deposited to landfill, and in 2007-2008 there was a significant increase (32%) in municipal waste being dropped off at regional transfer stations and landfills. 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.

5. That Landfill Fees 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 2007-2008. 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 2007-2008. 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*. 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 2007-2008, 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. With an operational weigh bridge at the Alvie site, some data is now available in tonnes, but not all- for the purposes of this report the data that was submit in cubic metres has been converted to tonnes” for the purpose of comparisons made in this report.

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.

*All conversions have been made using the Sustainability Victoria volume to weight calculator

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.
 - Regional kerbside audit data.
- 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.
- Borough of Queenscliffe
 - Kerbside recycling, greenwaste and hard waste collection data.
- 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 2007- JUNE 2008

Table 1: Total waste deposited into landfill in the Barwon region 2007-2008

Description	Corio	Drysdale	Alvie	Anglesea	Fyansford	Total
Asbestos	-	-	-	-	7,444.00	7,444.00
Animal Carcasses	2.94	19.42	-	-	-	22.36
Biosolids	-	-	-	-	-	0.00
Car Tyres	-	-	-	-	-	0.00
Charities	-	-	-	-	-	0.00
Commercial Waste	-	-	-	-	-	0.00
Contaminated Soil	102,346.10	-	-	-	-	102,346.10
Filter Cake	286.04	-	-	-	-	286.04
Fish Waste	228.36	-	-	-	-	228.36
Green Waste (municipal)	77.47	401.37	-	-	-	478.84
Green Waste (non council)	521.78	-	-	-	-	521.78
Green Waste Contaminates	3,045.73	30.18	-	-	-	3,075.91
Industrial Waste	33,512.17	22,475.89	740.82	10,648.10	13,992.00	81,368.98
Mattress	-	-	-	-	-	0.00
Municipal External Councils*	7,725.78	1,254.06	-	-	-	8,979.84
Municipal Waste	18,102.88	4,978.74	304.95	3,229.39	5,997.00	32,612.96
Municipal Waste (Kerbside)	19,260.36	16,232.64	4,597#	4,621.50	-	40,114.50
Offal treated	3,117.38	-	-	-	-	3,117.38
Poultry	12.60	-	-	-	-	12.60
Prescribed waste	603.34	10.08	-	-	-	613.42
Public Asbestos	-	-	-	-	-	0.00
Scallop Shells	620.92	-	-	-	-	620.92
Seaweed	792.60	40.52	-	-	-	833.12
Squid	113.39	-	-	-	-	113.39
Sulphate	-	-	-	-	-	0.00
VISY waste	2,325.74	695.88	-	-	-	3,021.62
Wool Scour	-	-	-	-	-	0.00
Total Tonnage	192,695.58	46,138.78	1,045.77	18,498.99	27,433.00	285,812.12

Colac Otway Shire's kerbside municipal waste was deposited to Corio landfill in 07/08- this figure has not been included in total tonnage as it is captured in Municipal External Councils for Corio.

* This figure includes the 1,253 tonnes of kerbside waste collected from the Borough of Queenscliffe in 2007-2008

Table 2: Waste deposited and used for capping and landfill rehabilitation in the Barwon region 2007-2008

Description	Corio	Drysdale	Alvie	Anglesea	Fyansford	Total
Clean Fill	6,213.92	11,366.68	-	8,689.68	-	26,270.28
Construction/rehab	21,840.56	15.60	-	-	-	21,856.16
Bitumen/Asph/Crushed Rock	4,651.78	3.82	-	-	-	4,655.60
Sand	502.20	-	-	-	-	502.20
Mixed rubble	7,968.63	5,496.10	-	969.85	-	14,434.58
Total Tonnage	41,177.09	16,882.20	0.00	9,659.53	0.00	67,718.82

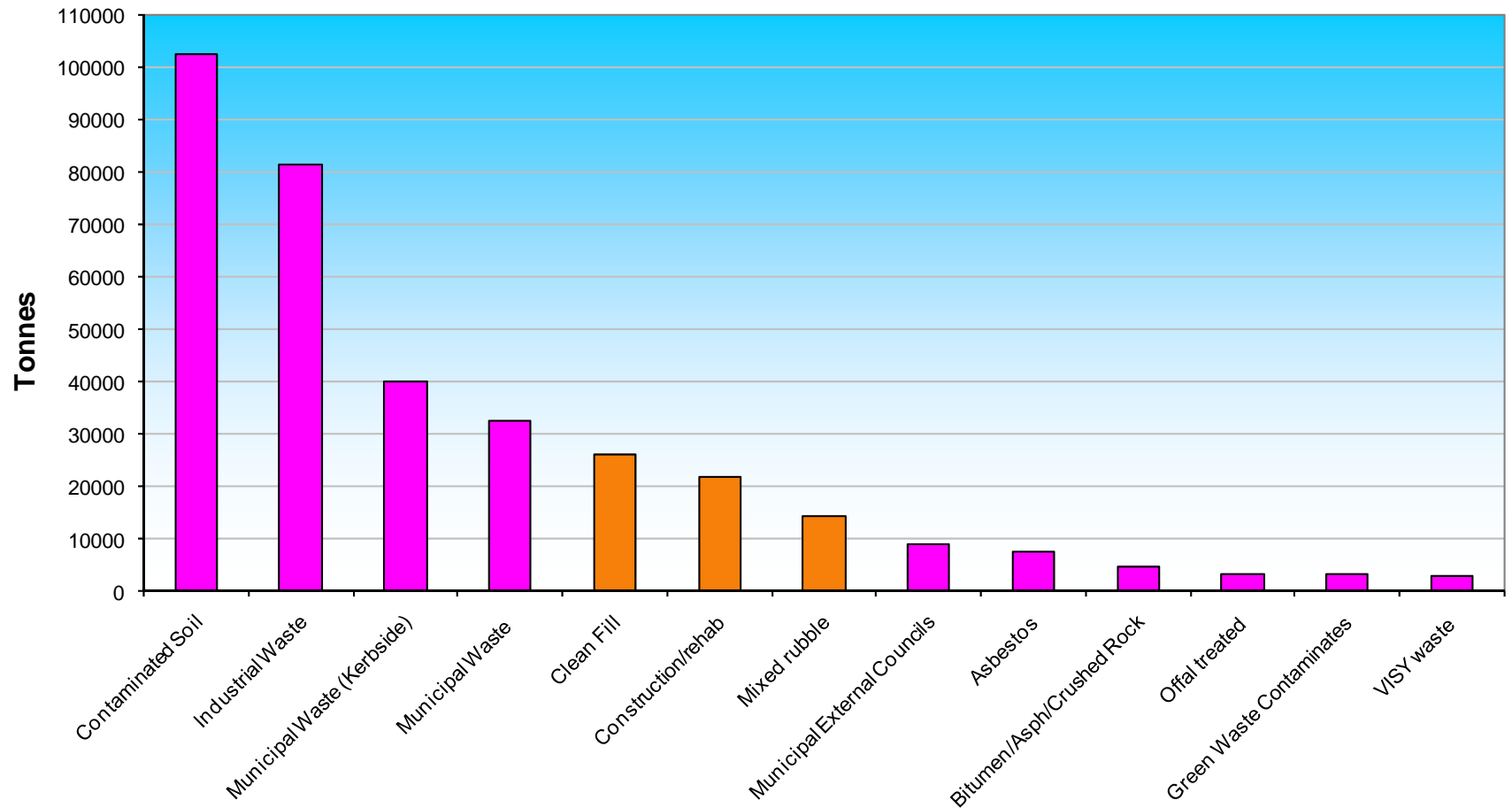


Figure 1: Total waste deposited into landfill in the Barwon region 2007-2008 (353,531 tonnes)

- Material deposited into landfill
- Material deposited and used for landfill operations

Figure 2: Percentage of Municipal waste deposited into landfills in the Barwon region 2007-08 (total of 81,707 tonnes)

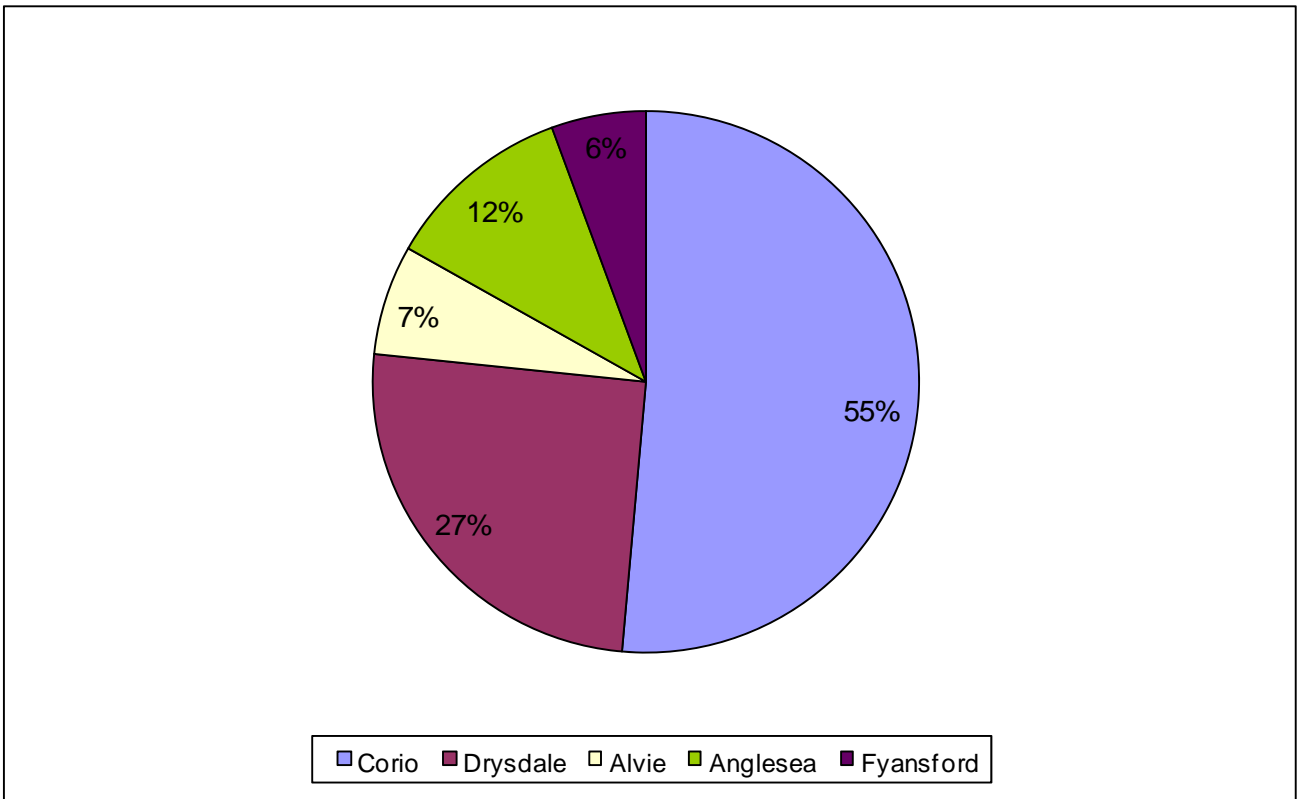


Figure 3: Percentage of Industrial waste deposited into landfills in the Barwon region 2007-08 (total of 81,369 tonnes)

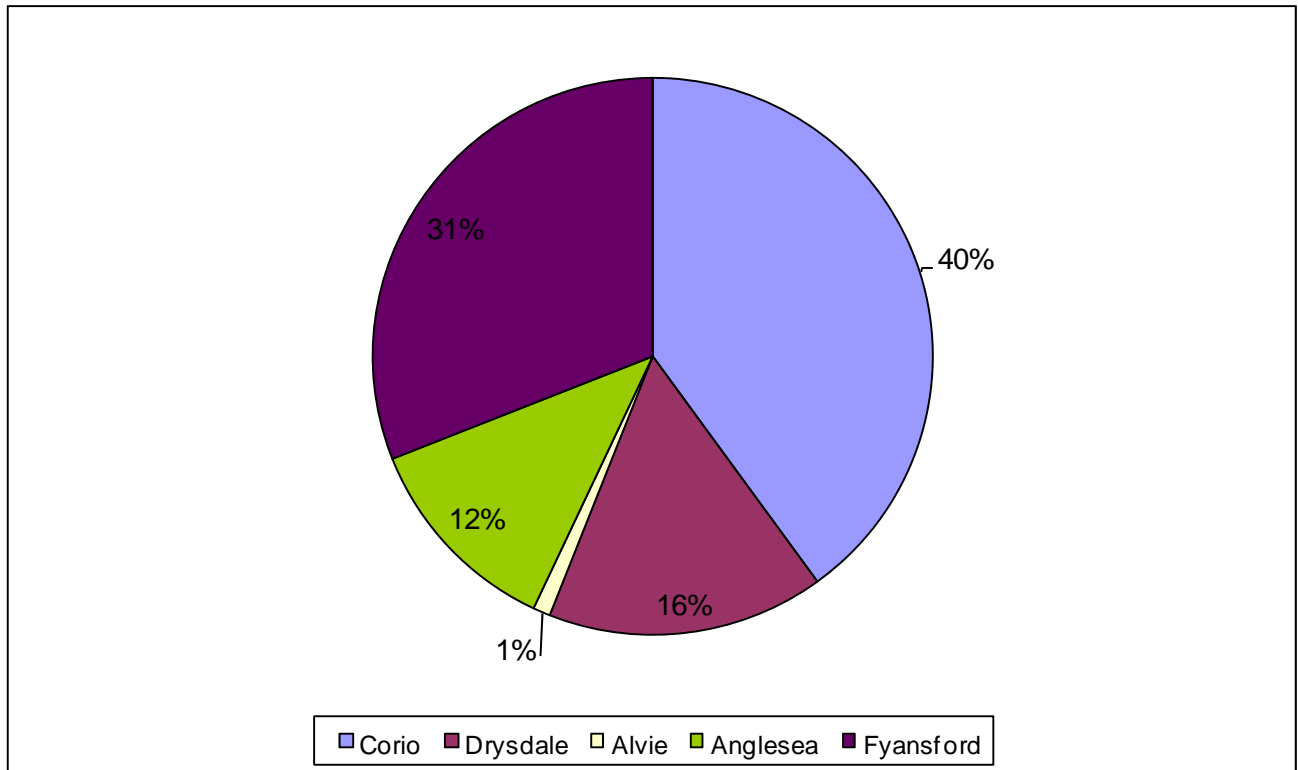


Figure 4: Percentage of Clean Fill deposited to landfills and utilized for landfill operations in the Barwon region 2007-08 (total of 26,270 tonnes)

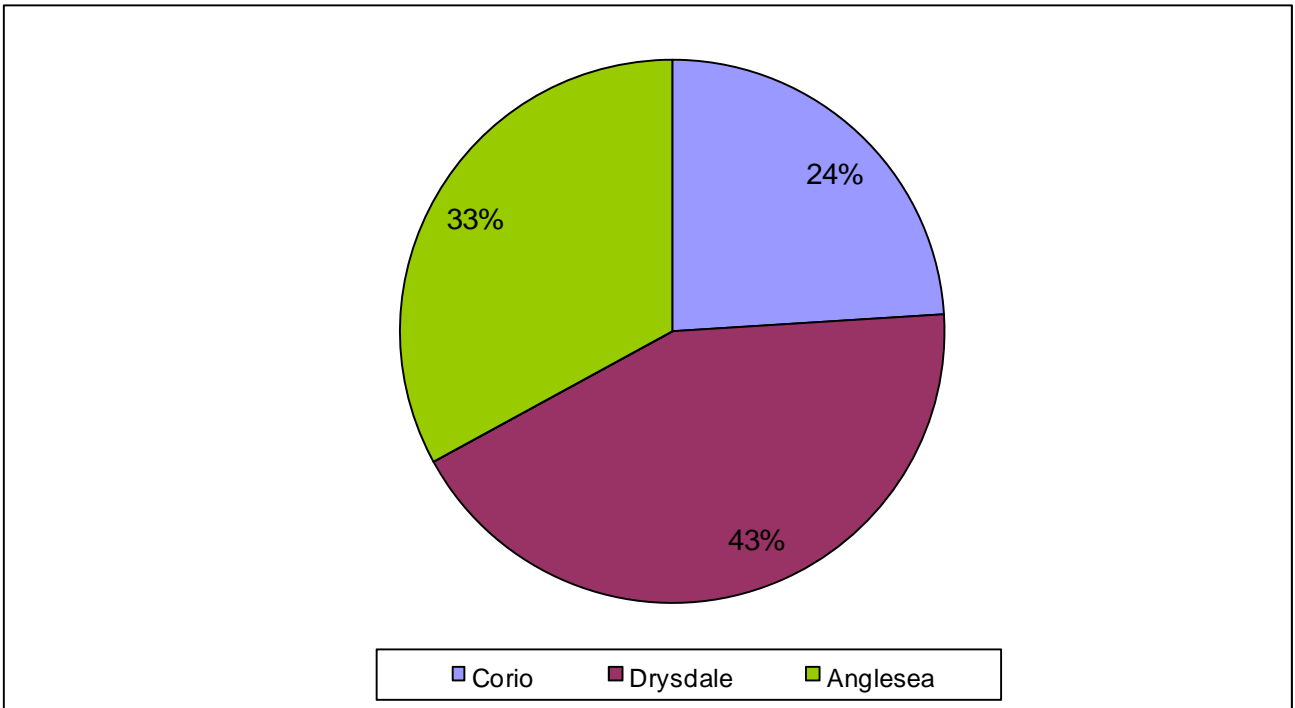


Figure 5: Percentage of Contaminated Soil deposited into landfills in the Barwon region 2007-08 (total of 102,364 tonnes)

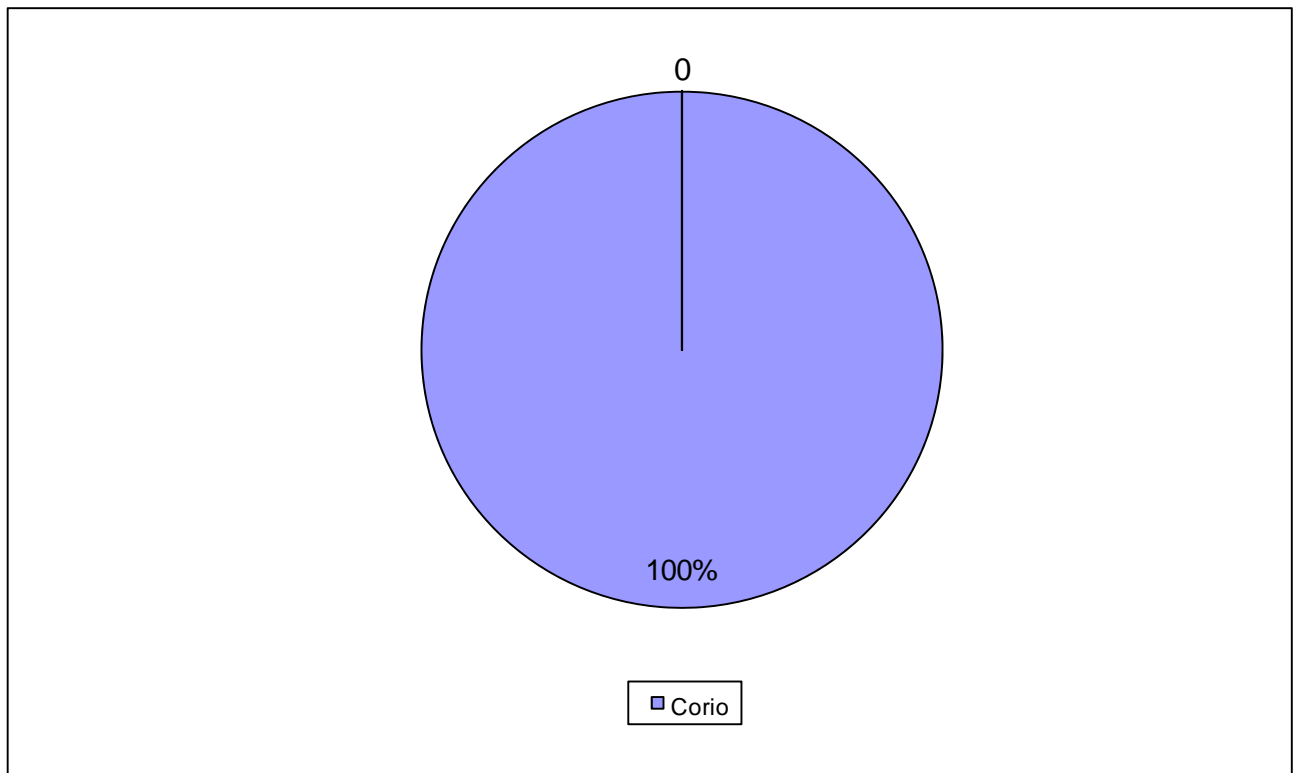


Figure 6: Percentage of Mixed Rubble deposited to landfills and utilized for landfill operations in the Barwon region 2007-08 (total of 14,434 tonnes)

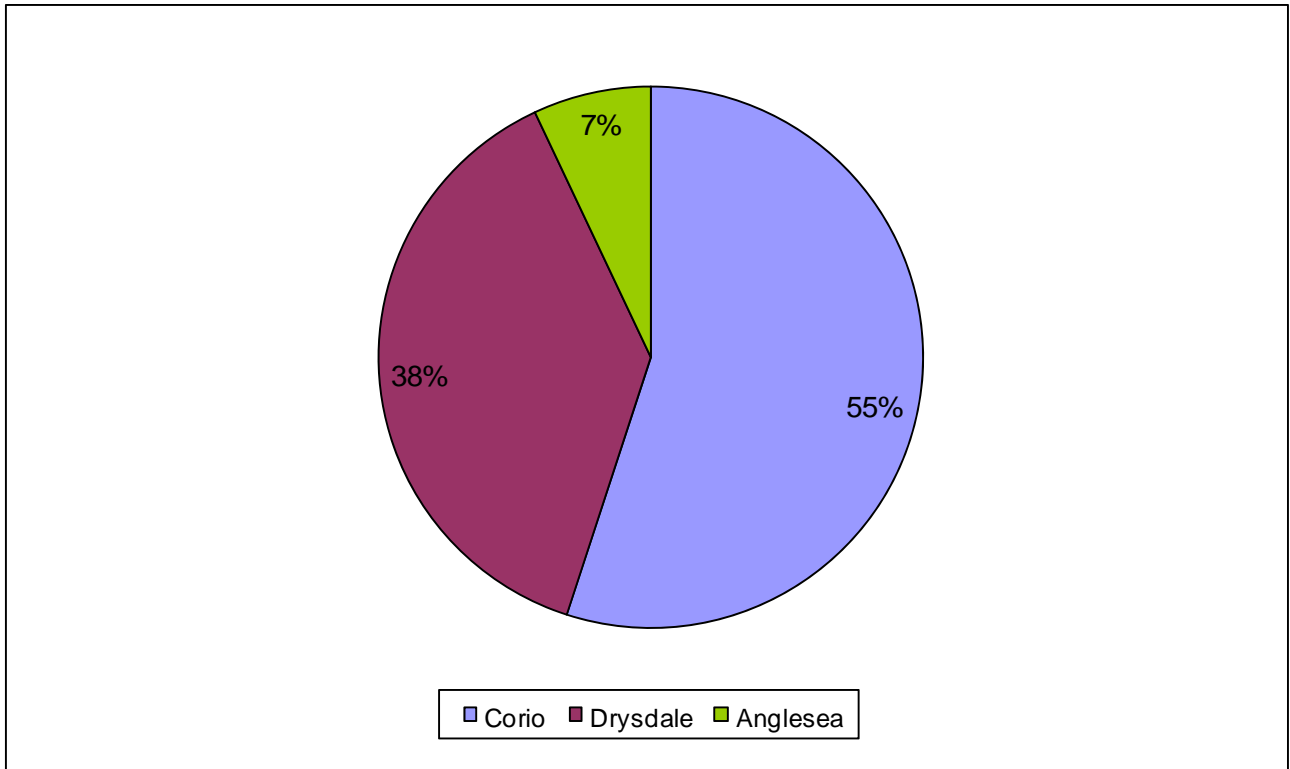


Table 3: Costs of depositing materials to transfer stations in the Barwon region

Description	Corio	Drysdale	SCS	Alvie	GRRC	Fyansford	Pt Henry RRC	Western Waste
Skip- general waste	-	-	-	-	-	-	\$40-50.00	-
Inert Waste \$/m3	-	-	-	\$25.00	-	-	-	\$25/m3
Mixed Rubble/Road base	\$35.90	\$35.90	\$20.00	-	-	\$10-20	\$33.00	\$12/m3
Builders Rubble	-	-	\$55.00	-	-	-	-	-
Timber/Plaster	-	-	\$20.00	-	-	-	\$35-45.00	-
Concrete	-	-	-	-	-	\$25.00	\$10-15.00	\$12/m3
Prescribed Waste	\$21.10- \$113.75	\$21.10- \$113.75	-	-	-	-	-	-
Prescribed Waste- Asbestos	-	-	-	-	-	\$160-280	-	-
Putrescible Waste \$/m3	-	-	-	\$40.00	-	-	-	-
Industrial	\$49.30- \$84.60	\$49.30	\$55.00	-	-	-	-	-
Commercial Industrial \$/m3	-	-	\$42.00	\$34	-	\$38-46	-	-
Truck Tyre*	\$31.00	\$31.00	\$7-\$29	\$15.60	\$31.00	\$10-60	\$10-20	\$50-80
Car Tyre*	\$8.50- 9.50	\$8.50- 9.50	\$6-\$7.50	\$4.20-5.20	\$8.50- 9.50	\$8.00	\$7.50	\$10
Car Body*	-	-	\$42.00	\$41.60	-	-	-	-
Steel Scrap	-	-	-	\$15.60/m3	-	-	-	-
Chemical Drums*	-	-	-	\$0.75	-	-	-	-
Batteries*	-	-	-	\$4.20	-	-	-	-
Silage Wrap	-	-	-	10c-40c/kg	-	-	-	-
Clean Fill	\$10.00	\$10.00	\$8.00	-	-	\$15.00	-	-
Waste Oil	-	-	-	\$0.75/litre	-	-	-	\$1/litre
Greenwaste	\$41.00	\$41.00	-	\$13.50/m3	-	-	-	\$12/m3
Seaweed	\$35.10	\$35.10	-	-	-	-	-	-
Car Boot*	-	\$9.00	\$10.00	-	\$9.00	\$10.00	\$8.50	-
Car Boot-Green*	-	-	\$7.50	-	-	-	\$8.50	-
Single axle trailer/Ute/Wagon (waterline)*	-	\$17.50	\$17.50	-	\$17.50	\$15.00	\$16.50	-
Single axle trailer/Ute/Wagon (waterline)-Greenwaste*	-	-	\$12.50	-	-	-	\$16.50	-
Single axle trailer/Ute/Wagon (heaped)*	-	\$20.00	\$25.00	-	\$20.00	\$25.00	\$20.00	-
Single axle trailer/Ute/Wagon (heaped) Greenwaste*	-	-	\$17.50	-	-	-	\$20.00	-
Tandem trailer (waterline)*	-	\$20.00	\$25.00	-	\$20.00	\$25/m3	\$20.00	-
Tandem trailer (waterline) Greenwaste*	-	-	\$17.50	-	-	-	\$20.00	-
Tandem trailer (heaped)*	-	\$40.00	\$25.00	-	\$40.00	-	\$40.00	-
Tandem trailer (heaped) Greenwaste*	-	-	\$20.00	-	-	-	\$40.00	-
Domestic Trucks/Skips Greenwaste	-	-	\$20.00	-	-	28	-	-
Mattresses*	-	\$16.50	\$16.50	\$19.00	\$16.50	\$12.00	\$8.50	\$20-35
Commercial Recyclable \$/m3	-	-	\$20-24	-	-	-	-	-
Commingled recycling	-	-	-	\$19.70/m3	-	-	-	-
Sorted Recycling	-	-	No charge	No charge	No charge	-	-	-

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

Table 4: Total recyclables collected in the Barwon region 2007-2008

Description	COGG	COS	SCS	BOQ	Commercial	Total
Batteries	-	0.17	1.40	-	22.00	23.57
Cardboard	98.60	-	-	-	6,161.60	6,260.20
Clean Fill	-	8.58	-	-	1,315.00	1,323.58
Glass	17.16	-	-	-	37.00	54.16
Green waste	26,922.57	1,218.40	2,965.37	67.20	9,098.00	40,271.54
Mattresses	5546*	456*	1068*	-	3,091*	10,161*
Metal	1,046.12	295.00	500.59	2.50	8,025.00	9,869.21
Mixed Recyclables	27,879.40	2,460.92	3,759.86	471.98	18,529.47	53,101.63
Oil	30.08	0.23	3.44	-	0.00	33.75
Paper	128.82	-	-	-	11,885.16	12,013.98
Plaster	6.58	-	-	-	178.00	184.58
Plastic	-	-	-	-	46.00	46.00
Concrete, Bricks & Rubble	3,816.31	-	5.55	-	57,037.00	60,858.86
Timber	-	-	-	-	2,179.15	2,179.15
Tyres	-	0.91	10.68	-	4.00	15.59
Total	59,945.64	3,984.21	7,246.89	541.68	114,517.38	186,235.81

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

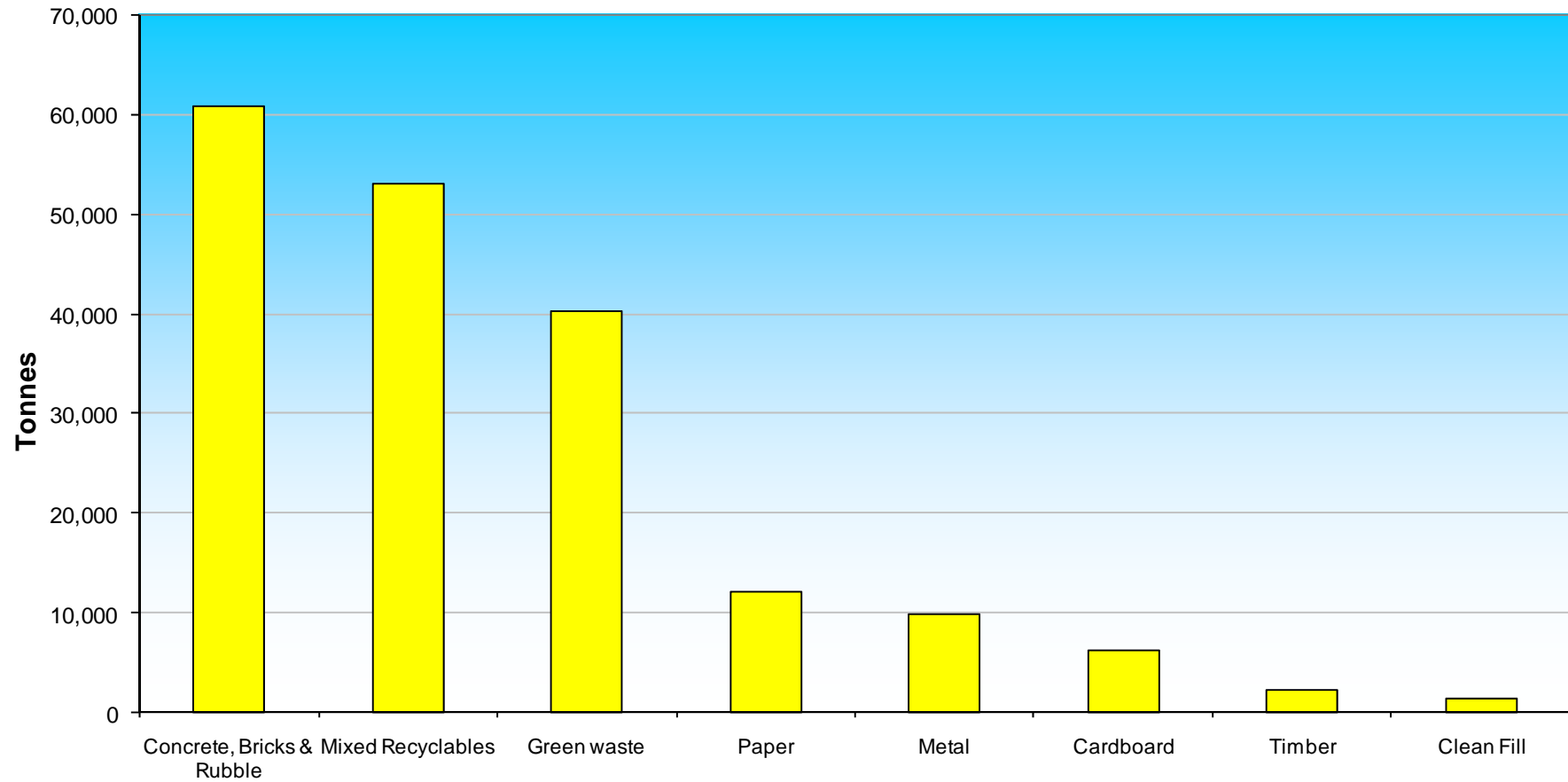


Figure 7: Total Recyclables collected in the Barwon region 2007-2008 (186,235 tonnes)

Figure 8: Average waste produced per rateable property (rp) per annum in each municipality 2007-2008- through the kerbside system

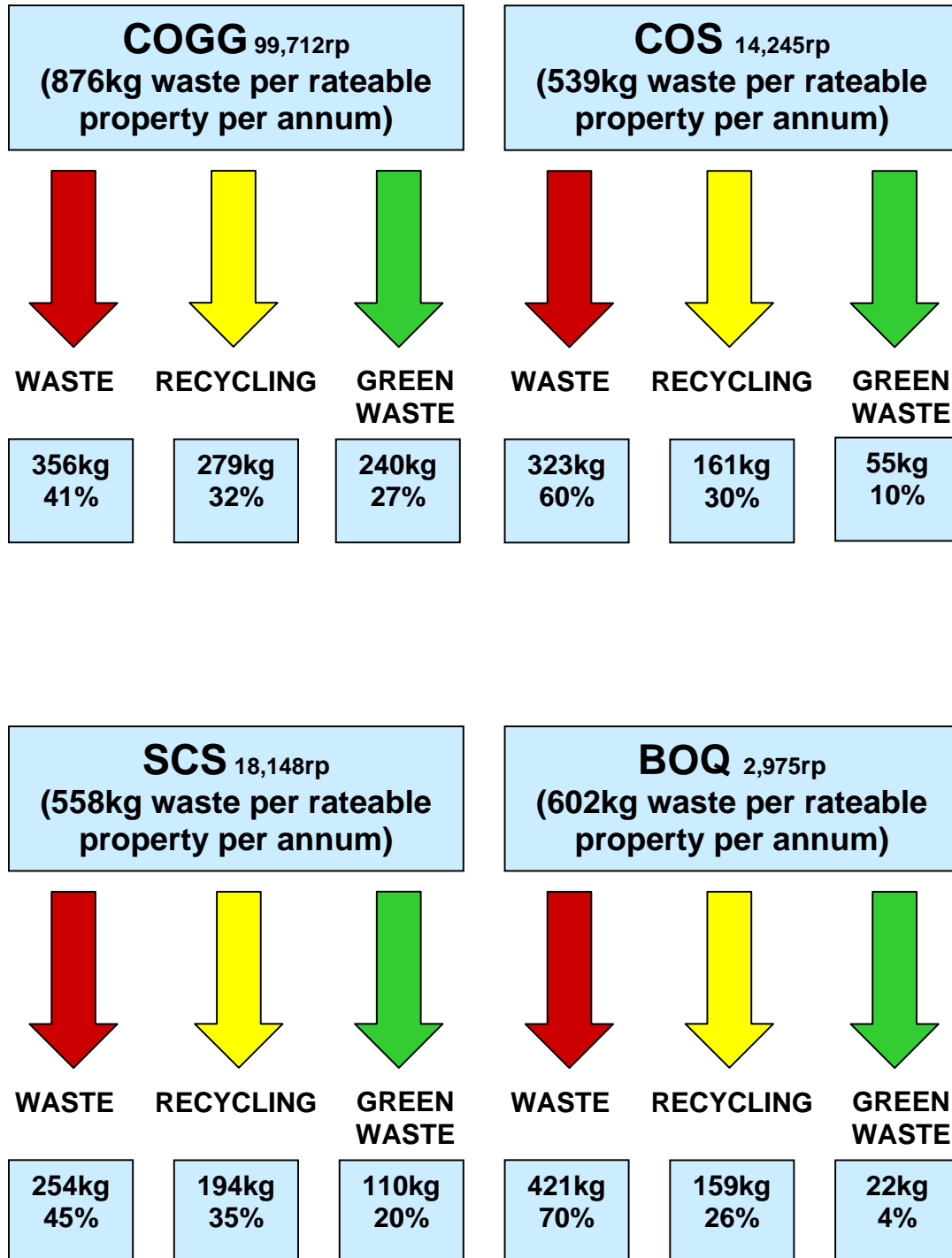


Figure 9: Average waste produced per rateable property (rp) per annum in the Barwon Region 2007-2008 -through the kerbside system

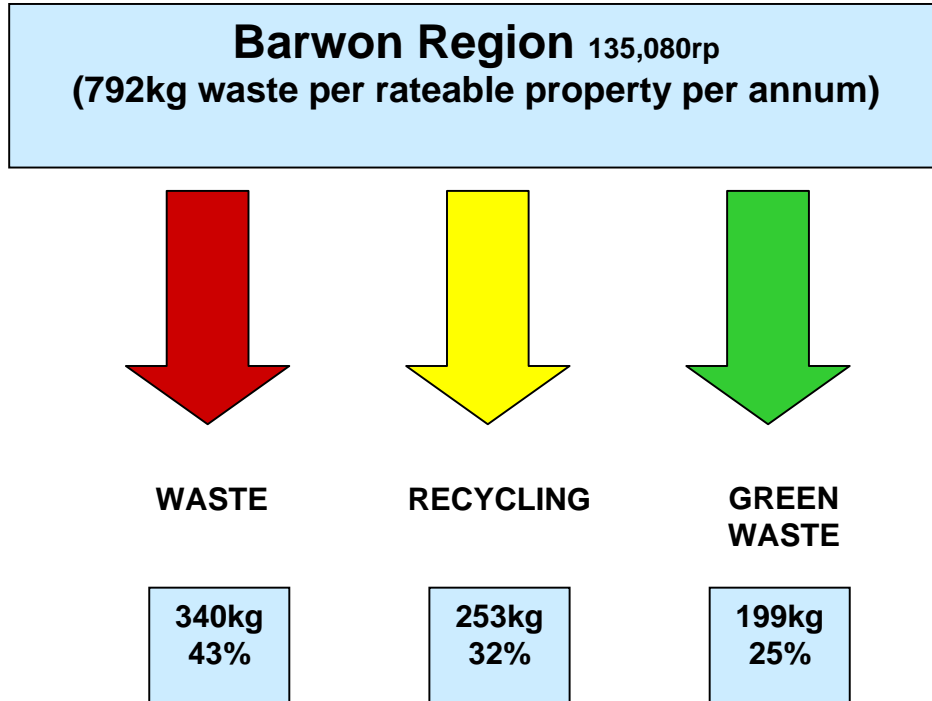


Table 5: Kerbside Bin Audit Data 2009 (Data represents kerbside waste and greenwaste composition for all four member councils)

Council	Bin Type	Annual Tonnage	Organics (including paper and cardboard)	Recyclables (excluding paper and cardboard)	Residual	% Recyclable (organics + recyclables)
Geelong	Mixed Waste	35,000	23,835	3,640	7,525	79%
	Green Material	25,000	25,000			
Surf Coast	Mixed Waste	4,600	3,238	777	585	87%
	Green Material	2,500	2,500			
Colac Otway	Mixed Waste	7,000	2,660	1,008	3,332	52%
Queenscliffe	Mixed Waste	1,300	494	187	619	52%
Total Tonnage		75,400	57,727	5,612	12,061	84%

Historical Data

Regional

- **Waste to landfill in the Barwon Region 2001-2008**
- **Recyclables in the Barwon Region 2001-2008**
- **Landfill data 2004-2008**

Table 6: Total waste deposited into landfill in the Barwon region 2001- 2008

Description	2001-2002	2002-2003	2004-2005	2005-2006	2006-2007	2007-2008	Total
Animal Carcass	20.98	28.28	32.72	30.42	18.86	22.36	131.26
Asbestos lagging	-	-	4,797.82	6,660.53	8,273.69	-	19,732.04
Asbestos Public	-	-	-	-	33.50	7,444.00	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	4,655.60	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	26,270.28	486,419.94
Commercial Waste	-	-	-	-	180.78	-	180.78
Construction/rehab	-	-	-	27,651.58	40,067.00	21,856.16	67,718.58
Contaminated Soil	5,428.80	24,992.20	54,400.56	54,030.03	100,356.90	102,346.10	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	286.04	2,605.89
Fish Waste	672.10	1,030.30	681.12	707.02	350.34	228.36	3,440.88
Green Waste (contaminated)	-	28.26	383.30	168.26	1,197.27	3,075.91	1,777.09
Green Waste (municipal)	-	521.31	-	631.91	704.49	478.84	1,857.71
Green Waste (non-council)	8,632.96	2,068.05	431.22	1,465.48	495.18	521.78	13,092.89
Industrial Waste	65,693.43	51,509.11	81,565.06	89,312.36	90,654.18	81,368.98	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	14,434.58	89,765.75
Municipal External Councils	-	950.04	3,225.84	6,886.66	8,248.12	8,979.84	19,310.66
Municipal Waste	-	-	29,720.58	26,319.15	24,556.50	32,612.96	80,596.23
Municipal Waste (Kerbside)	81,569.27	67,767.26	44,777.36	39,568.18	38,839.80	40,114.50	272,521.87
Offal	4,106.09	3,920.94	50.02	563.70	1,404.04	3,117.38	10,044.79
Poultry	-	-	-	226.40	398.74	12.60	625.14
Prescribed waste	940.22	717.22	276.36	230.30	54.14	613.42	2,218.24
Quarantine Waste	97.98	81.66	-	-	-	-	179.64
Sand	-	2,246.42	10,326.40	8,816.44	6,142.28	502.20	27,531.54
Scallop Shells	317.94	271.50	293.28	905.46	1,182.20	620.92	2,970.38
Seaweed	161.00	589.21	383.36	708.96	844.04	833.12	2,686.57
Squid	189.50	197.34	107.58	154.74	224.04	113.39	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	3,021.62	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	353,530.94	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'; since 2004-2005 itemized data has been available and the quantities of waste are included under the appropriate description.

Table 7: Average quantity of garbage deposited kerbside per rateable property in the Barwon region 2001- 2008

Year	2001-2002	2002-2003	2004-2005	2005-2006	2006-2007	2007-2008
Total No. of Households	122,928	123,153	130,694	131,146	134,078	135,080
Total Kerbside Waste	81,569	67,767	44,777	44,929	45,462	45,965
Waste per Household	664	550	343	343	339	340

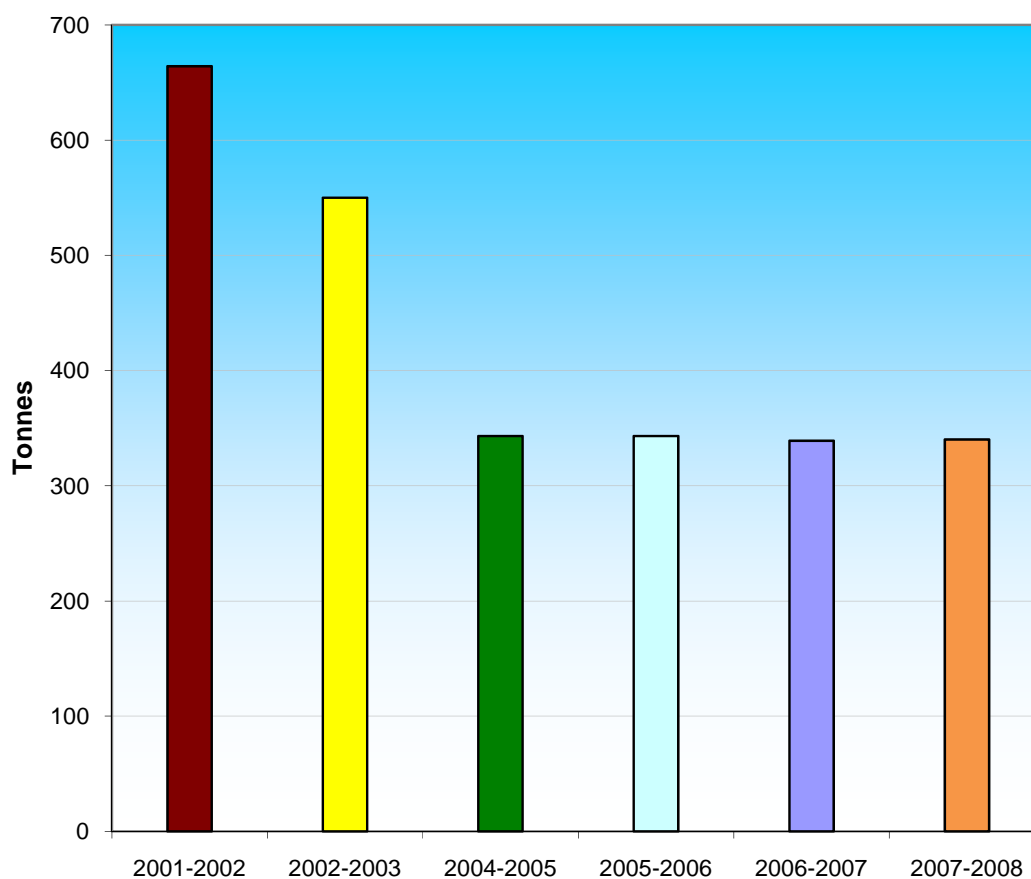


Figure 10: Average quantity of garbage deposited kerbside per rateable property in the Barwon region 2001-2008

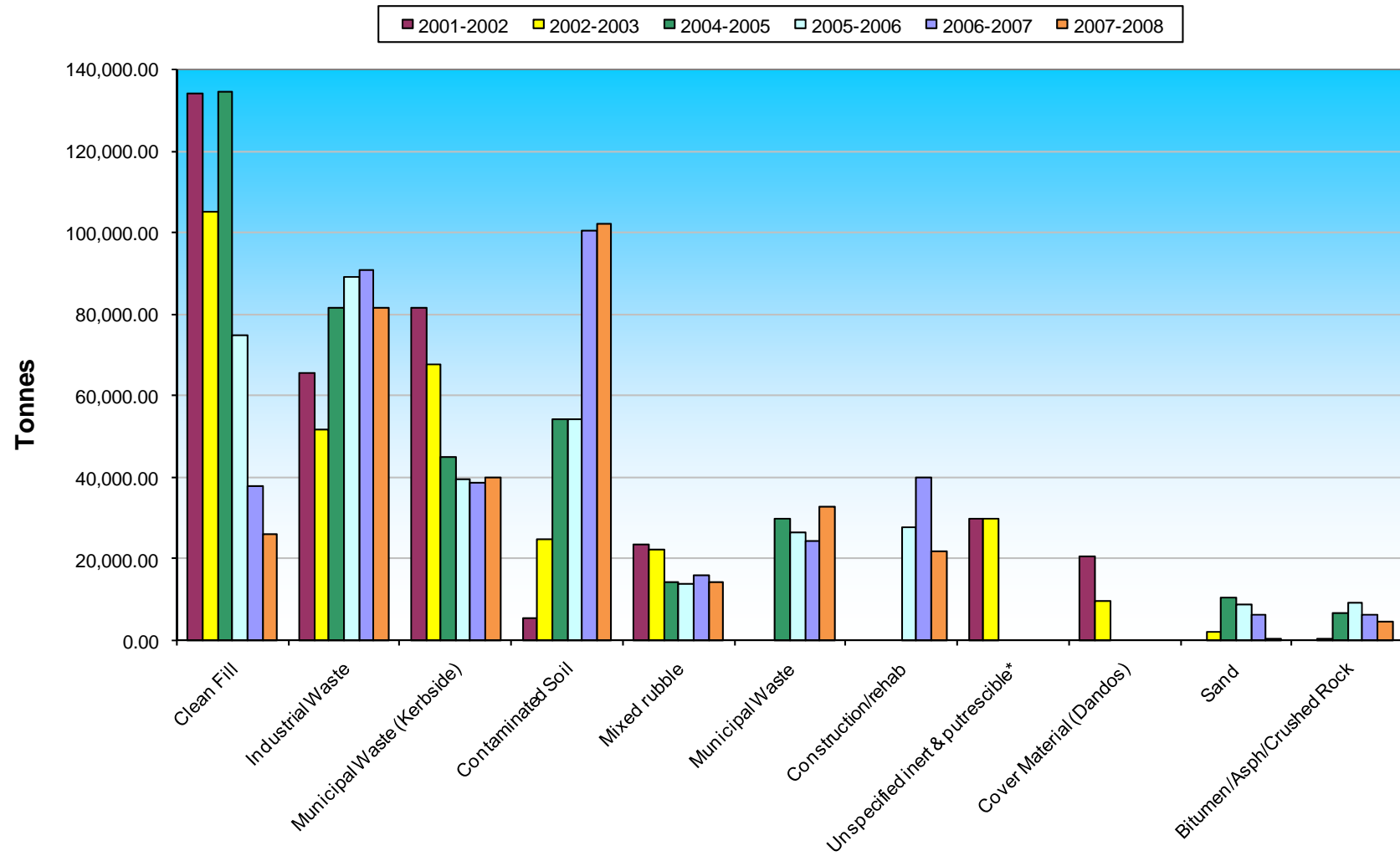


Figure 11: Comparison between waste deposited into landfill 2001- 2008

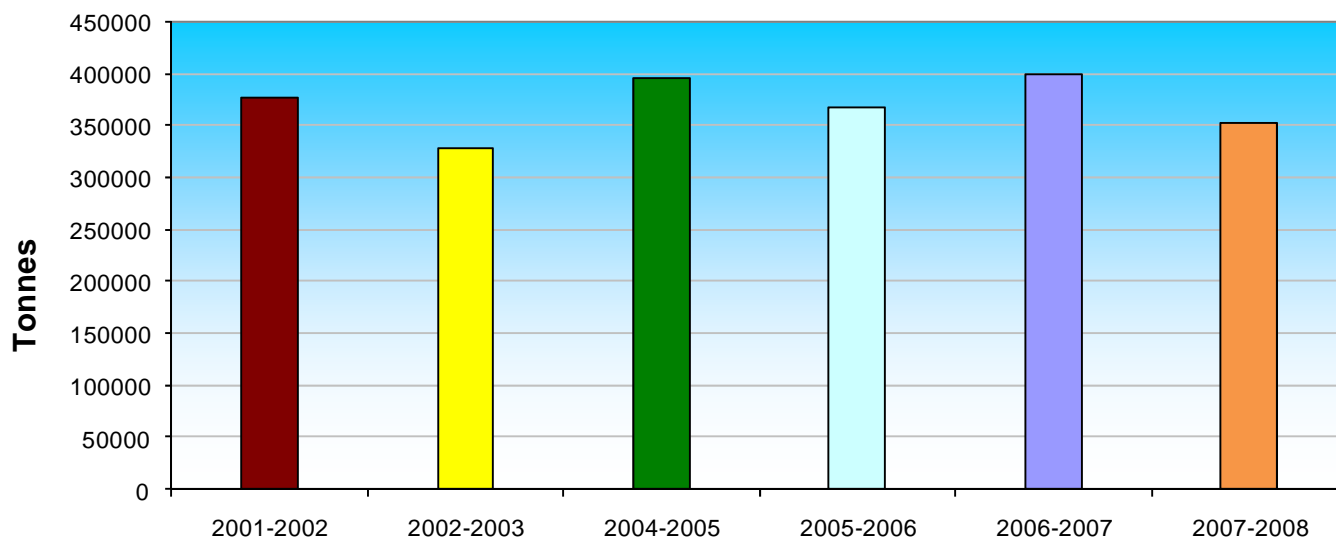


Figure 12: Comparison between total waste deposited into landfill 2001- 2008

Table 8: Total Recyclables collected in the Barwon region 2001-2008

Description	2001-2002	2002-2003	2004-2005	2005-2006	2006-2007	2007-2008	Total
Aluminium	122.56	-	-	-	-	-	122.56
Batteries	24.00	67.33	7.27	46.95	4.63	23.57	173.75
Cardboard	3,718.70	213.10	3,667.00	218.98	2,596.00	6,260.20	16,673.98
Clean Fill	-	-	899.62	3,181.68	1,246.18	1,323.58	4,081.30
Glass	4,626.40	282.31	-	-	-	54.16	4,908.71
Green waste	2,587.70	4,788.69	38,358.96	35,370.10	45,522.62	40,271.54	166,899.61
Metal	-	-	1,440.00	5,651.96	3,535.21	9,866.71	7,091.96
Mixed Recyclables	9,000.00	25,170.75	46,092.68	50,256.34	56,028.14	53,101.63	239,649.54
Non ferrous metal	215.10	-	-	-	-	-	215.10
Oil	-	0.43	32.82	41.94	33.55	33.75	142.49
Paper	5,059.96	17.81	1,404.00	1,300.00	1,404.00	12,013.98	21,199.75
Plaster	-	-	-	-	152.78	184.58	152.78
Plastic	764.48	0.62	36.00	1,322.86	2,098.38	46.00	4,268.34
Soil & Rubble	6,018.00	3,427.20	125,138.47	92,525.15	89,086.98	60,858.86	377,054.66
Steel	2,251.92	2,486.02	485.54	-	-	-	5,223.48
Timber	-	-	3,156.54	974.23	1,574.85	2,179.15	4,130.77
Tyres	50.00	362.00	13.15	16.52	452.06	15.59	909.32
Total	34,316.26	36,816.26	220,732.06	190,906.71	203,735.38	186,233.30	482,771.29

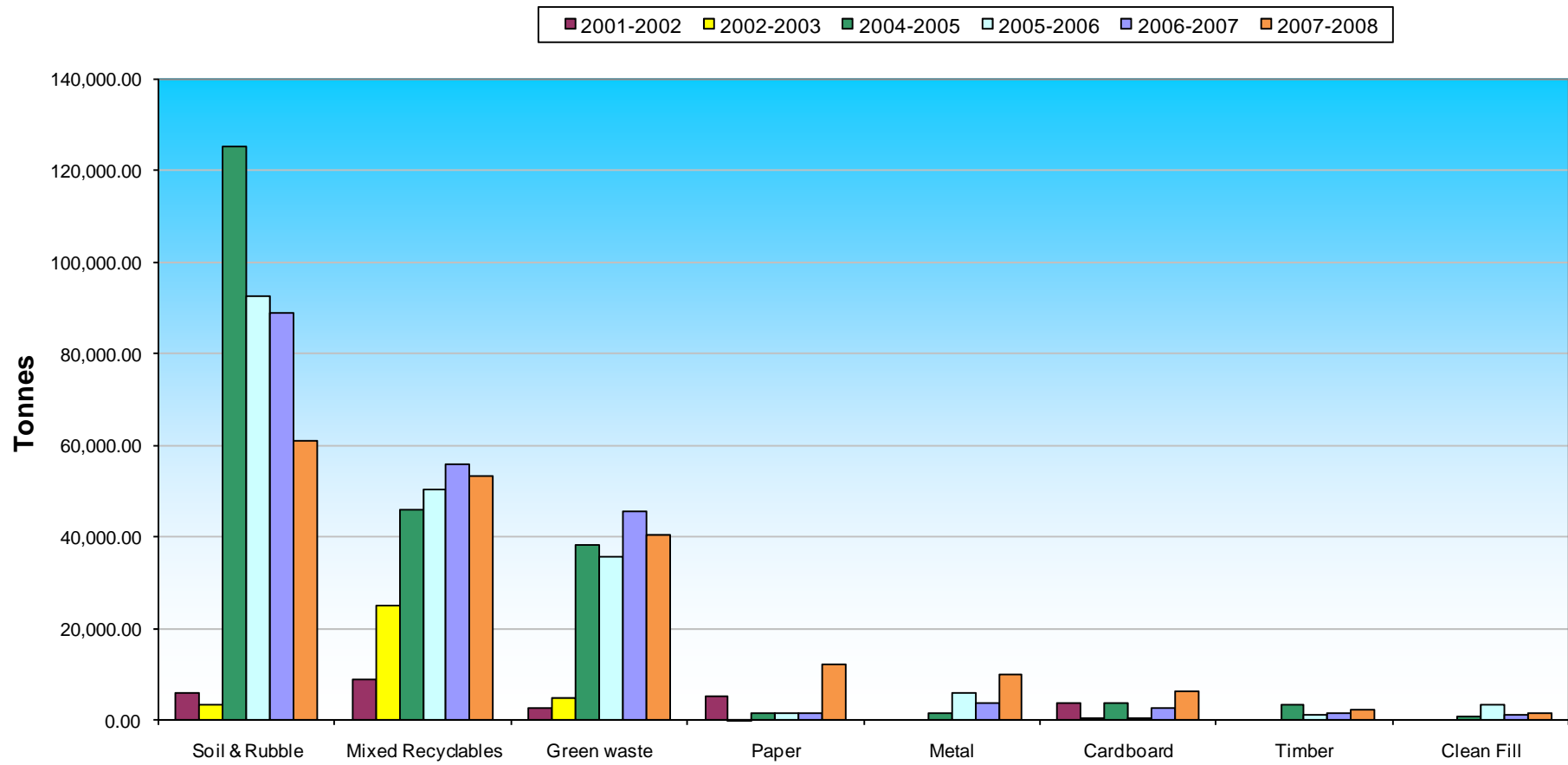


Figure 13: Comparison between Recyclables collected in the Barwon region 2001- 2008

Table 9: Landfill historical data 2004-2008

Year	Corio	Drysdale	Anglesea	Alvie	Fyansford
2004/2005	252,009	57,110	44,473	6,177	36,311
2005/2006	219,437	55,762	42,287	1,778	41,228
2006/2007	258,485	59,015	30,712	542	41,665
2007/2008	233,876	63,021	28,158	1,045	27,433

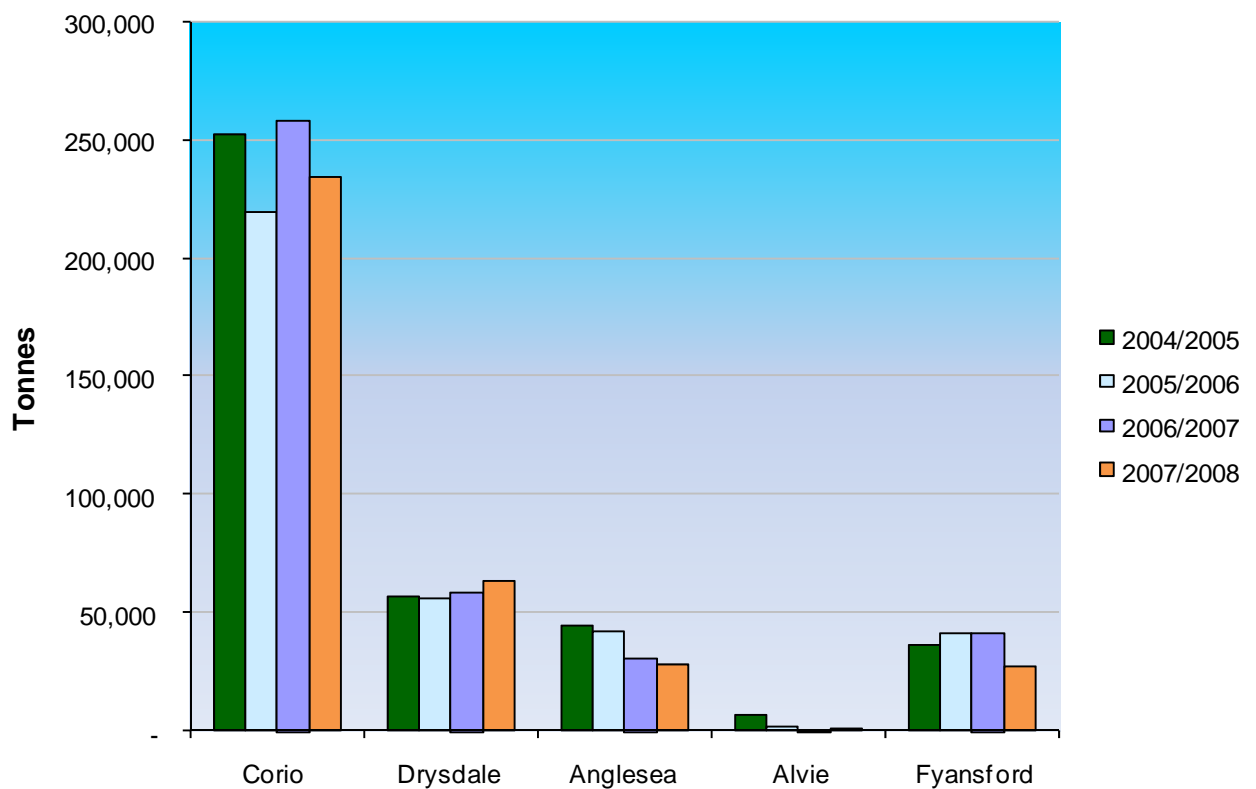


Figure 14: Total materials deposited to each landfill in the Barwon Region between 2004-2008

5. DISCUSSION

5.1 Analysis

For the financial year 2007-2008 the total materials deposited in landfill was 353,530 tonnes. This figure includes 67,718 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 (29%), industrial waste (23%), municipal waste- including kerbside, drop-off and council works (20%), clean fill (7%), construction/rehab (6%), and mixed rubble (4%). Also over 5,500 tonnes of materials produced in the region is known to be deposited to landfills outside the region (predominately Wyndham and Naroghid landfills) by commercial operators- this figure has not been included in the regions total waste data.

For the financial year of 2007-2008 the total material being recycled was 186,173 tonnes. The most significant quantities coming from soil & rubble (32%), mixed recyclables- which includes kerbside collections (28%), and green waste- which also included kerbside collections (21%). 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. This year is the first year we were able to collect comprehensive data for the number of mattresses collected and recycled in the region. In the first full year of the mattress recycling project being implemented over 10,000 mattresses have been collected and recycled.

Using a greenhouse calculator developed by the RMIT Centre for Design, this year the region has again calculated greenhouse emission savings from the recyclables collected. The 186,173 tonnes of material collected for recycling in the Barwon Region represents 66,681 tonnes of recovered CO₂. This equates to 106,173 trees being planted, or 11,113 cars being taken off the road for a year.

The Region has facilitated a regional contract for an AWT facility to be established in the Region by 2011- this facility will enable all organics currently going to landfill from the kerbside bin system to be recovered. To support this contract this year the City of Greater Geelong undertook a survey of kerbside waste composition for the region. This data (see table 5) provides a breakdown of the materials currently being collected through the kerbside garbage and greenwaste bins. The audit data indicates that across the region 84% of the material collected in these two bins is recyclable (this includes both organics and commingled recyclables). The data also indicates that presently there is over 5,000 tonnes of commingled recyclables going to landfill via the kerbside garbage bin.

The historical data shows interesting trends over several years. The data shows an overall decrease of 11% in total waste being deposited into landfill in 2007-08 when compared with the 2006-07 data. The data shows some significant reductions for some material types- clean fill 30% reduction, Industrial Waste- 10% reduction, and Mixed Rubble- 8% reduction; and some significant increases for others- 32% increase in Municipal Waste.

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 over the two years. If this additional stream is removed from the regions total tonnage to landfill, and a baseline quantity of 54,000 tonnes (as recorded by the 04/05 and 05/06 surveys) is assumed, a total reduction in waste to landfill of 23% is measured in 2007-08 when compared to the 2006-07 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 continual decrease in quantities of Clean Fill, Municipal Waste (kerbside) and mixed rubble being disposed to landfill. The data indicates a continual increase in quantities of Contaminated Soil being deposited to landfill.

This survey has also recorded an minor increase of 1kg in kerbside waste per rateable property between 2006-2007 and 2007-2008. In 2006-2007 each rateable property in the region deposited an average 339kg of material, and in 2007-2008 this average increased to 340kg of material per household.

The historical data shows an 8% decrease in the quantities of materials being recycled between 2006-2007 and 2007-2008. 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 and this year a number of commercial contractors who usually contribute to this survey were reluctant to do so because of commercial confidence and unstable commodity prices.

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 four 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 five 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.

6. CONCLUSION

For the financial year of 2007-2008 the total quantity of material deposited to landfill was 353,530 tonnes. Of the materials being deposited into landfill, the greatest quantities were from contaminated soil, industrial waste, and municipal waste.

For this same period 186,235 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.

Kerbside audits indicate that with the establishment of an AWT in the region 84% of municipal kerbside waste (including greenwaste) will be recoverable. Audits also indicate that currently 5,000 tonnes of commingled material is ending up in the garbage bin.

The historical data shows a 35% increase in total municipal waste (including kerbside, and municipal drop-off) between 2006-2007 and 2007-2008. The data shows an overall decrease of 11% in total materials deposited to landfill. For this same period there was an 8% decrease 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.