

## 5. REPORTED WASTE GENERATION

The 2001 NWD estimated waste arisings at approximately 74.07 million tonnes. 2,704,035 tonnes of municipal waste was generated in Ireland in 2001, of which 54 % was household waste. Applying population figures to this data results in an average household waste generation per capita of 375 kg.

The NWD Interim Report 2002 concluded that the rate of increase in the generation of municipal solid waste (MSW) had slowed compared to previous years' reported data, with a total of 2,723,729 tonnes of municipal waste generated in 2002, which represented an increase of less than 1 % on 2001 figures.

MSW generation in the South East Region has increased since the 2000–2005 Waste Management Plan. Table 5.1 shows a breakdown of waste arisings in the region in 2003.

Household waste arisings (as reported) have increased by 6.5% from 2000 to 2003, reported commercial waste arisings increased by more than 100% and industrial waste arisings decreased by 66%. The wide variance is most likely due to the quality of data reporting rather than large changes in waste generation.

Agricultural waste arisings in the region decreased by 37%. The total quantity of ash and incineration residues reported in 2003 was much lower than that reported in 2000, it is not clear whether this is due to lack of reporting or an actual decrease in arisings.

**Table 5.1: Waste Collected in the South East Region 2003**

Waste Type	Total (t)	Hazardous Fraction (t)
Household	136,326	430
Commercial	86,262	Note 1
Industrial	45,735	Note 1
Industrial Sludges (non-hazardous) (tDS)	91,543	0
Litter and Street Cleansing	8,490	0
Agricultural	435,180	no data
C&D	430,000	0
Contaminated soils	2,834	2,834
Municipal sludges (tDS)	1,277	no data
Sewage sludge (tDS)	5,603	no data
Healthcare waste	955	955
Mining and quarrying waste	700,000	no data
Ash and other incineration residues	55	55
Priority Wastes	6,534	747
Port Waste		0
Hazardous Waste (not reported as other fractions )	17,000	17,000

Note 1: The quantities of waste above are tonnes of waste as reported. Where no returns were reported an estimate has been made. Details of reported and or estimated waste fractions are discussed in further detail in the following sections.

Note 2: Priority hazardous wastes and healthcare waste are included separately in the table. There was no differentiation between commercial and industrial hazardous waste in the returns. They are included as the fraction 'hazardous waste'.

This section reports the quantities of each waste stream in the South East Region and the methods used to acquire the data.

## 5.1. Data Sources

Information on waste arisings within the South East Region has been gathered from the following sources:-

- Local Authorities – C1 Forms, IFS Notes, NWD Returns 2003
- Joint Waste Management Plan for the South East, 2002<sup>40</sup> – (JWMPSE)
- National Waste Database 2001 (EPA, 2001)
- Local Authority returns for EPA National Waste Database (2003)
- EPA, National Waste Database Interim Report 2002, 2004<sup>41</sup>
- EPA, National Waste Database Interim Report 2003, 2004<sup>refxx</sup>
- South Eastern Health Board
- REPAK
- Regional Waste Audit<sup>42</sup>
- National Hazardous Waste Management Plan 2001
- National Hazardous Waste Management Plan Implementation Committee Report 2004

Waste arisings are discussed as separate fractions in Section 5.2 to 5.11.

## 5.2. Household Waste

A total of 136,326 t of household waste was reported to be collected in the South East Region in 2003. There are four main methods of collection:

- local authority household collection service
- private contractor household collection service
- bring centres
- recycling centres

It does not include household hazardous waste as collected by other means such as by the Chemcar<sup>®</sup>.

The total quantities collected are outlined in Table 5.2.

**Table 5.2: Total Household Waste Reported as Collected in the Region in 2003**

Local Authority Area	Total Household Waste (t)	household waste collected by area (%)
Carlow	18,169	13.5
Kilkenny	14,936	11
South Tipperary	26,988	20
Waterford County	15,356	11
Waterford City	22,299	16.5
Wexford	38,578	28
<b>Total</b>	<b>136,326</b>	<b>100</b>

Household waste quantities collected by the private sector were obtained from Annual Environmental Report (AER) returns. The local authorities provided quantities of household waste collected on their collection routes and, from their bring centres and recycling centres.

### 5.2.1. Household Waste Collection

68,401 t was collected by the local authorities from serviced household collection. Of this 5,919 t of dry recyclables and organic waste was separately collected in either 2-bin or 3-bin systems.

**Table 5.3: Household Waste Collected in 2003 by the Local Authorities (as reported)**

Area	Household Mixed Waste (t)	Separate Collection (t)	Total (t)
Carlow	0	0	0
Kilkenny	1,943	6	1,949
Tipperary South	15,742	1,172	16,914
Waterford City	11,603	2,180	13,783
Waterford County	10,511	2,476	12,987
Wexford	20,130	85	20,215
<b>Total</b>	<b>62,482</b>	<b>5,919</b>	<b>65,848</b>

55,071 t was collected by private operators from serviced household collection. Of this 1,298 t of dry recyclables were separately collected in 2-bin systems.

**Table 5.4: Household Waste Collected in 2003 by Private Collectors (as reported)**

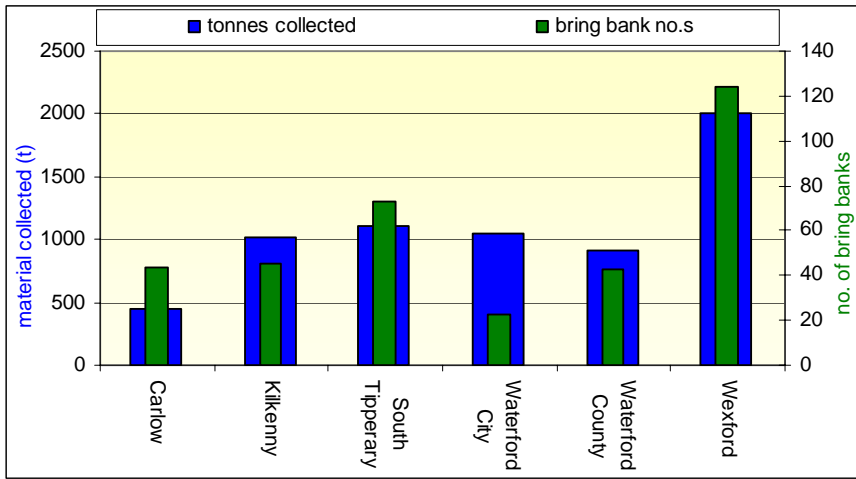
Area	Household Mixed Waste (t)	Separate Collection (t)	Total (t)
Carlow	16,720	0	16,720
Kilkenny*	10,504	1,244	11,748
Tipperary South	8,280	0	8,280
Waterford City	0	0	0
Waterford County	5,522	0	5,522
Wexford	15,300	54	15,354
<b>Total</b>	<b>53,773</b>	<b>1,298</b>	<b>57,624</b>

\*figures are based on estimates

### 5.2.2. Bring Centres and Recycling Centres

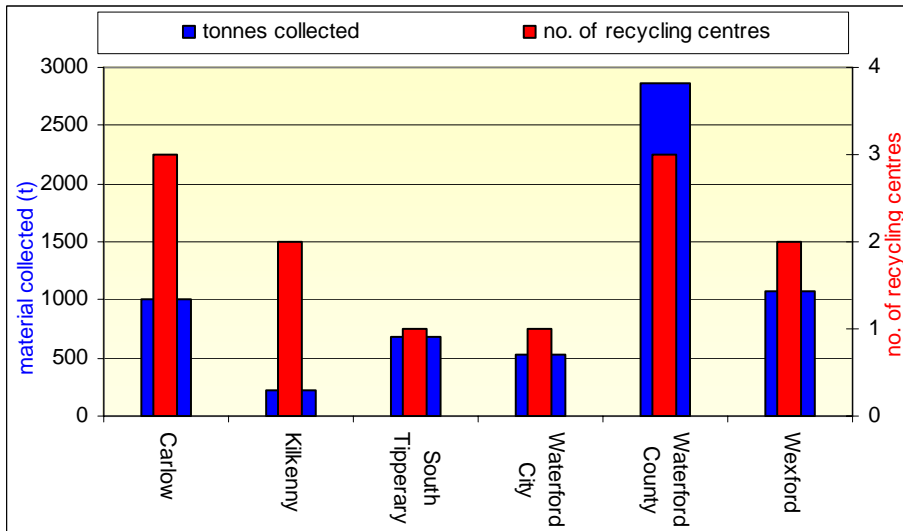
The majority of bring centres within the region are operated by the public sector. A number of bring banks for glass are serviced by the private sector. In 2003 a total of 6,525 t of waste was collected from 352 bring banks across the region. A breakdown by county is given in Figure 5.1. 106t was collected in Kilkenny in 2003 by bring banks serviced by private operators.

**Figure 5.1: Household Waste Reported as Collected at Bring Centres in the South East 2003**



In 2003 a total of 6,329 tonnes of waste was collected from 12 recycling centres located within the region. A breakdown by county is given in Figure 5.2.

**Figure 5.2: Household Waste Reported as Collected at Recycling Centres in the South East 2003**



The largest tonnage of recyclable material were generally collected where there was a wide distribution of bring banks/recycling centres across the county i.e. Wexford or where the facilities were located adjacent to large areas of population, i.e. Waterford City.

### 5.2.3. Comparison with JWMPSE 2002

The JWMPSE estimated waste arisings for 2000 and predicted waste arisings on an annual basis for the years 2002 to 2021. A comparison of this data for household waste is given in Table 5.5.

**Table 5.5: Comparison of Household Arisings Data from 2000 and 2003**

Description	Quantity (t)
household waste arisings (reported as collected in 2000) <sup>Note 1</sup>	127,988
household waste generation as predicted for 2003 <sup>Note 2</sup>	139,000
household waste arisings (reported as collected in 2003) <sup>Note 3</sup>	136,326

Note 1 – JWMPSE 2002 (2000 data)

Note 2 – JWMPSE 2002 (used for financial and scenario modelling)

Note 3 – 2005 review (2003 data)

The JWMPSE (2002) predicted that household waste generation would be 139,000 tpa by 2003, a variance of 2% when compared to the reported total household waste arisings reported for the region, 2003. Quantities of household waste reported as collected grew by 7% from 2000 to 2003.

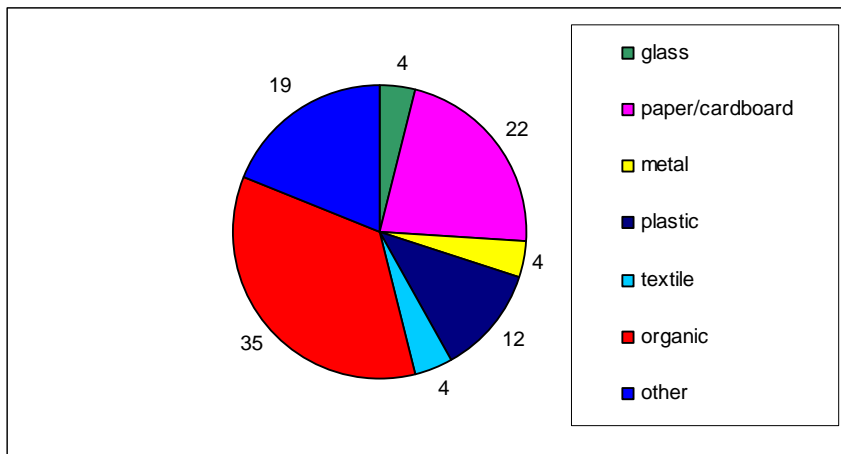
### 5.2.4. Composition of Household Waste

Local authority carried out household waste composition surveys for the 2001 National Waste Database. After review of a number of other household waste characteristics, the NWD, 2001 was used to produce an estimate of household waste composition analysis for the South East Region. It is shown in Table 5.6 and Figure 5.3. The composition is based on the total tonnage reported as collected in the region in 2003.

**Table 5.6: Composition of Reported Household Waste Collected in the South East 2003**

Household Waste Fractions	Quantity (t)	Fraction (%)
Glass	5,453	4
Paper/Cardboard	29,992	22
Metal	5,453	4
Plastic	16,359	12
Textile	5,453	4
Organic	47,714	35
Other	25,902	19
<b>TOTAL</b>	<b>136,326</b>	<b>100</b>

**Figure 5.3: Estimated Fractions of Household Waste Collected in the Region, 2003 (as reported)**



#### 5.2.5. Household Hazardous Waste

Hazardous waste generation in the region is discussed in Section 5.12. It is estimated that 21,600 t of hazardous waste was generated in 2003.

Typically, household hazardous waste consists of waste paint, fluorescent light bulbs, cleaning products, batteries etc. According to the NWD, 2001, 2% of hazardous waste is estimated to be from the household fraction. Using the EPA estimate it is estimated that household hazardous waste arisings in the region is 432 t. The total household hazardous waste reported as collected in the region in 2003 is 18t, 10t from the Chemcar® collection and from Dunmore Recycling Centre in Kilkenny County and 8t is accounted for on C1 forms. Additional battery waste may have been collected throughout the region but there is no data for the portion attributable to the household fraction. An example of a C1 Form is shown in Appendix 5.1.

The local authorities within the region have implemented measures to divert this waste stream from landfill. These are outlined in Table 5.7.

**Table 5.7: Household Hazardous Waste Collection**

County	Collection Measures
Carlow	Chemcar® Collection
Kilkenny	Chemcar® Collection Dedicated collection receptacles placed at Dunmore Recycling Centre
South Tipperary	Chemcar® Collection
Waterford County	Dedicated collection receptacles placed at Lismore, Dungarvan and Tramore recycling centres.
Wexford	Returnbatt receptacles, M. Barter Recycling, Atlas Environmental, receptacles at recycling centres for household hazardous waste, Chemcar® collection, annual waste action days – collection of household hazardous waste.

The Chemcar® is operated by Cara Waste Management

### 5.3. Commercial Waste

In 2003, 86,000t of commercial waste was reported as collected in the region. All commercial waste is collected by private contractors. The majority of commercial waste is collected from commercial premises. A breakdown of the commercial waste collected in the region by private contractors is shown in Table 5.8. Commercial waste is not collected at bring centres or recycling centres in the region. Of the total waste collected, 33,158 t of dry recyclables were collected separately.

**Table 5.8: Total Commercial Waste Quantities Reported as Collected in 2003 by the Private Sector**

Area	Mixed Waste (t)	Separate Collection (t)	Total (t)
Carlow	5,941	0	5,941
Kilkenny	3,261	4,242	7,609
Tipperary South	9,636	6,474	16,110
Waterford City	11,758	4,871	16,629
Waterford County	11,432	0	11,432
Wexford	10,970	17,571	28,541
<b>Total</b>	<b>54,526</b>	<b>33,158</b>	<b>86,262</b>

#### 5.3.1. Comparison with JWMPSE

The JWMPSE estimated waste arisings for 2000 and predicted waste arisings on an annual basis for the years 2002 to 2021. A comparison of this data for commercial waste is given in Table 5.9.

**Table 5.9: Comparison of Commercial Waste Arisings Data from 2000 and 2003**

Description	Quantity (t)
waste arisings (reported as collected in 2000) <sup>Note 1</sup>	40,305
waste generation as predicted for 2003 <sup>Note 2</sup>	42,800
waste arisings (reported as collected in 2003) <sup>Note 3</sup>	86,262

Note 1 – JWMPSE 2002 (2000 data)

Note 2 – JWMPSE 2002 (used for financial and scenario modelling)

Note 3 – 2005 review (2003 data)

The JWMPSE (2002) predicted that commercial waste generation would be 42,800 tpa by 2003, a variance of over 100% when compared to the reported total commercial waste arisings reported for the region, 2003. Quantities of commercial waste reported as collected grew by 114% from 2000 to 2003.

As will be seen later, when commercial and industrial waste arisings are considered jointly, the increase in waste arisings over prediction for 2003 is 6%.

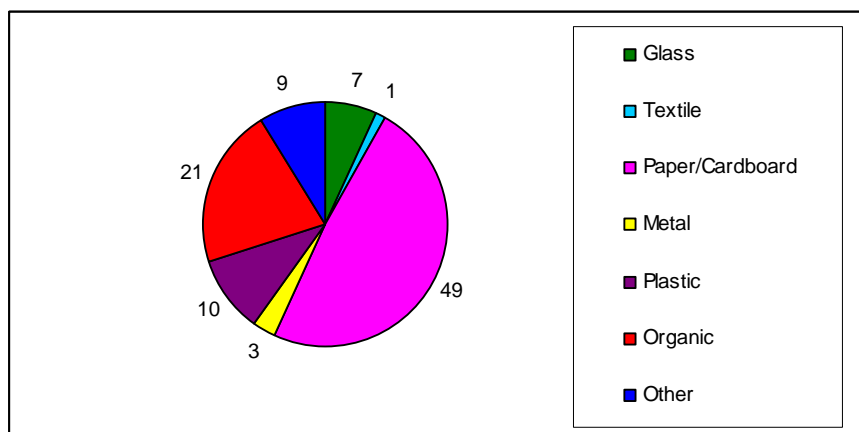
### 5.3.2. Commercial Waste Composition

The proportions of commercial waste fractions were taken from the NWD, 2001. Table 5.10 and Figure 5.4 shows the compositional analysis of commercial waste. The estimate of commercial waste composition is based on the total tonnage reported as collected in the region in 2003.

**Table 5.10: Compositions of commercial waste reported as collected in the South East 2003**

Commercial Waste Fraction	Quantity (t)	Fraction (%)
Glass	6,038	7
Textile	863	1
Paper/Cardboard	42,268	49
Metal	2,588	3
Plastic	8,626	10
Organic	18,115	21
Other	7,764	9
<b>Total</b>	<b>86,262</b>	<b>100</b>

**Figure 5.4: Estimated Fractions of Commercial Waste Reported as Collected in the South East 2003**



### 5.3.3. Hazardous Component of Commercial Waste

Hazardous waste arising in the region were compiled from C1 and TFS returns. It is not possible to determine source fractions from the data. There is nothing to indicate whether the hazardous waste is industrial or commercial. Quantities of hazardous waste fractions such as waste oil, batteries, tyres are discussed as priority wastes. These fractions and others could be classified as commercial waste.



## 5.4. Industrial Waste

A Regional Waste Audit was carried out in November 2004. Private waste contractors collect industrial waste that is not managed at the point of origin. The waste is either disposed of by landfilling or is recovered by landspreading. The quantity of industrial waste managed in the region is shown in Table 5.11.

**Table 5.11: Total industrial waste quantities managed in the region 2003 (as reported)**

County	Waste Arisings
Carlow	no data
Kilkenny	14,050
South Tipperary	4,828
Waterford City	13,806
Waterford County	926
Wexford	12,125
<b>TOTAL</b>	<b>45,735</b>

Note 1 – included in commercial collection

### 5.4.1. Non-hazardous Industrial Sludge

Figures for non-hazardous industrial sludge arisings are taken from the JWMPSE. The quantities were identified from returns for the Inventory of Non-Hazardous Sludges in Ireland<sup>54</sup> and from the sludge management plans. Table 5.12 shows non-hazardous industrial sludge production in the South East Region.

**Table 5.12: Non-Hazardous Industrial Sludges**

Sludge Type	tDS/y	% Fraction
Animal slaughtering	28,898	32
Food processing	60,573	66
Industrial biological sludges	638	1
Industrial chemical sludges	1,434	3
<b>TOTAL</b>	<b>91,543</b>	<b>100</b>

### 5.4.2. Comparison with JWMPSE

The JWMPSE estimated waste arisings for 2000 and predicted waste arisings on an annual basis for the years 2002 to 2021. A comparison of this data for industrial waste is given in Table 5.13. No updated figures on non-hazardous industrial sludges are available. The quantities in Table 5.13 are only of solid industrial waste that is not managed on site by the producer.

**Table 5.13: Comparison of Industrial Waste Arisings Data from 2000 and 2003**

Description	Quantity (t)
<b>waste arisings (reported as collected in 2000)</b> <sup>Note 1</sup>	<b>81,160</b>
<b>waste generation as predicted for 2003</b> <sup>Note 2</sup>	<b>81,600</b>
<b>waste arisings (reported as collected in 2003)</b> <sup>Note 3</sup>	<b>45,753</b>

Note 1 – JWMPSE 2002 (2000 data)

Note 2 – JWMPSE 2002 (used for financial and scenario modelling)

Note 3 – 2005 review (2003 data)

The JWMPSE (2002) predicted that industrial waste generation would be 81,600 tpa by 2003, a variance of 44% when compared to the reported total industrial waste arisings reported for the region, 2003. Quantities of industrial waste reported as collected decreased by 44% from 2000 to 2003.

Due to the wide variance in both commercial and industrial tonnages reported in 2000 and 2003, it can be assumed that the fractions of both were reported incorrectly by private operators. In 2000 there was 121,465 t of commercial and industrial waste, which increased to 132,015 t by 2003, representing an overall increase of 9% and an increase of 6% over the 2003 prediction.

#### 5.4.3. Hazardous Component of Industrial Waste

The hazardous component of industrial waste is not quantifiable alone from C1 and TFS records. It has been included in the overall hazardous waste arisings for the region. Hazardous waste arisings are discussed in Section 5.12.

### **5.5. Litter and Street Cleaning Wastes**

All litter and street cleaning waste is landfilled. The total quantity of arisings in the region in 2003 was 8,490 t as shown in Table 5.14. This is a decrease of 419 tonnes on the 2001 figure. This decrease is attributed to the National Litter Campaign. In general there is no hazardous fraction in litter and street sweepings. If hazardous matter is identified in the waste it would be disposed of with household hazardous waste.

**Table 5.14: Total Litter and Street Sweeping Waste Quantities 2003**

	<b>Litter and street sweepings (t)</b>
Carlow	1,824
Kilkenny	1,755
South Tipperary	1,339
Waterford City	2,027
Waterford County	1,112
Wexford	433
<b>Total</b>	<b>8,490</b>

## 5.6. Mining and Quarrying Waste

The latest edition of Active Quarries and Pits in Ireland was published in 2001. It is estimated from this data source that waste arisings from mining and quarrying activities were excess of 700,000 tonnes in 2001. This waste is managed on site in tailing ponds etc. This data has not been updated since the JWMPSE.

### 5.6.1. Hazardous Component of Mining and Quarrying Waste

There is no available data for the hazardous component of mining and quarrying waste in the region. It is managed on site or by the operators themselves. If hazardous waste is moved off site, the volume will be included in C1 or TFS returns.

## 5.7. Municipal Sludge Arisings

The inventory of sludge arisings was estimated from returns submitted by the Local Authorities. 6,880 tDS (tonnes dry solids) municipal sludge is generated in the region of which 1,277 tDS is sludge from the treatment of raw water to a potable standard and 5,603 tDS of sludge is from wastewater treatment. The quantities of sludge generated per administrative area are listed in Table 5.15. There has been no significant change in quantities generated since the JWMPSE.

It is anticipated that the volume of sewage sludge for management will increase dramatically over the next twenty years as each authority upgrades their existing wastewater treatment infrastructure to comply with the Urban Wastewater Treatment Directive (91/271/EEC)<sup>48</sup>. Under the Waste Management Act all local authorities are required to prepare sludge management plans. The primary function of these plans is to outline management strategies for sludge over the next twenty years. These plans are considered a subset of the Joint Regional Waste Management Plan

**Table 5.15: Municipal Sludge Arisings (2003)**

County	Water Treatment Sludge (tDS.y <sup>-1</sup> )	Sewage Sludge (tDS.y <sup>-1</sup> )
Carlow	80	912
Kilkenny	386	1,678
South Tipperary	204	1,936
Waterford	257	561
Wexford	350	516
Waterford City Council	0	0
<b>Total</b>	<b>1,277</b>	<b>5,603</b>

Water treatment sludge is managed by landfilling or discharging to source. Municipal sewage sludge is managed using anaerobic digestion, lime stabilisation, composting or long-term storage prior to landspreading or landfilling. There is no hazardous component to municipal sludges.

## 5.8. Agricultural Waste Arisings

435,180 t of agricultural waste was generated in the South East region in 2003. This is a 37% decrease on the quantities generated in 2000. According to the NWD 2001 there was a national decrease in agricultural waste arisings between 1998 and 2001, of 12%.

It is assumed that agricultural slurries and manure's generated in the South East Region are those generated during periods for which the animals are housed indoors, and therefore require management. Manures that are returned by direct releases to land are not included.

The over-wintering or housing period for cattle is assumed to average sixteen to twenty weeks. For sheep, ewes are assumed to be housed for a maximum of six weeks during the lambing period. Pigs and poultry in intensive agricultural enterprises (IAEs) are housed all year round while slurry requiring management from horses is assumed to be from housing thoroughbred horses indoors at night for 26 weeks of the year.

Numbers of cattle, sheep, poultry and horses are taken as outlined by the most recent agricultural census.<sup>49</sup> Pig numbers for the region were obtained from Summary of Commercial Units by County, 2003<sup>50</sup>.

Volumes of slurry and litter produced from poultry are taken from estimations made by the Department of Agriculture, Food and Rural Development and Teagasc<sup>51</sup>.

Estimations of volumes of these sludges, density and percent dry solids content of these sludges is shown in Table 5.16.

Statistics for Spent Mushroom Compost (SMC) were obtained from the Census of Mushroom Production 2003<sup>52</sup> which estimated that approximately 42,090 tonnes of compost was used in the mushroom industry in the South East Region in 2003. Teagasc assumes that the weight of SMC is similar to the weight of incoming fresh compost<sup>53</sup>. At 31.5% dry solids, SMC amounts to 13,260 tonnes dry solids (tDS) per annum in the region. Total sludge generated by the agricultural sector during the housing period in the region is shown in Table 5.16.

**Table 5.16: Agricultural Sludge Arisings in the Region 2003**

Sludge Type	Weight (tonnes/year)	Dry Weight (tDS/y)	DS (%)	Density (t/m <sup>3</sup> )
SMC*	42,090	13,260	31.5	0.5
Cattle	5,491,600	378,920	6.9	1
Sheep	95,760	23,940	25	1
Pigs	496,100	15,880	3.2	1
Poultry litter	250	150	60	0.4
Poultry slurry	3,780	1,130	30	1
Horses	23,710	1,900	8	0.65
<b>Total</b>	<b>6,153,290</b>	<b>435,180</b>		

\*Spent mushroom compost

Note: Compost data for South Tipperary is not available. SMC for South Tipperary is based on estimates from Teagasc of number of mushroom farms in North and South Tipperary.

All agricultural sludge arisings are managed by landspreading.

Quantities of straw produced from cereal crops in the region are taken from the South East Waste Management Strategy. It is estimated that 693,577 tonnes of straw is generated per annum in the region. Straw is used for animal bedding, the manufacture of mushroom compost or ploughed back into the ground.

### 5.8.1. Hazardous Fraction of Agricultural Waste

Hazardous fractions such as waste oil, waste batteries and veterinary waste are included in other sections of this plan. It is not possible within the constraints of the plan to distinguish what proportion of each fraction arose from the agricultural sector. There is no data available for hazardous wastes such as sheep dip, pesticides and oily sludges as identified in the National Hazardous Waste Management Plan, 2001.

## **5.9. Ash and Other Incineration Residues**

TFS notes were issued for the export of 55 t of ash and incineration residue by Kilkenny County Council in 2003. This fraction is hazardous. There are no other records of generation of this waste material.

## **5.10. Contaminated Soil**

2,834 t of contaminated soil was transported in the region in 2003, under C1 forms and TFS notes. The quantity of contaminated soil has been included in the total figures for C1 and TFS movements in Section 5.12. This is the only data available for generation of contaminated soil in the region in 2003. Data was assessed to avoid double counting between C1 and TFS records.

## **5.11. Priority Waste Streams**

The European Commission has established specific measures, which aim to manage/prevent specific waste streams. The following waste streams were given priority by the EU:

- packaging waste
- healthcare waste
- batteries
- Polychlorinated Biphenyls (PCB's)
- End of Life Vehicles (ELV's)
- Construction and Demolition Waste
- Waste Electrical and Electronic Equipment (WEEE)
- waste oils
- waste tyres

Waste arisings of priority waste streams are discussed in the following sections.

### 5.11.1. Packaging

Items such as glass bottles, plastic containers, food wrappers, aluminium cans and timber pallets are all classified as packaging (EPA 2001). The main source of packaging waste is highlighted in bold in Table 5.17. Smaller amounts of packaging waste are also found in metals i.e. aluminium cans.

**Table 5.17: Main Source of Packaging Waste Arisings in the South East Region (2003)**

Waste Type	Household		% Packaging	Commercial		% Packaging
	% of Total	Household fractions(t)		% of Total	Commercial fractions (t)	
<b>Glass</b>	<b>4</b>	<b>5,453</b>	<b>4</b>	<b>7</b>	<b>6,038</b>	<b>1.0</b>
<b>Paper/Cardboard</b>	<b>22</b>	<b>29,992</b>	<b>6</b>	<b>49</b>	<b>42,268</b>	<b>30</b>
Metal	4	5,453	3	10	8,626	2
<b>Plastic</b>	<b>12</b>	<b>16,359</b>	<b>10</b>	<b>3</b>	<b>2,588</b>	<b>8</b>
Textile	4	5,453		1	863	
Organic	35	47,714		21	18,115	
Other	19	25,902		9	7,764	
<b>Total waste</b>	<b>100</b>	<b>136,326</b>		<b>100</b>	<b>86,262</b>	
<b>Main Source Packaging</b>		<b>31,355</b>	<b>23%</b>		<b>35,367</b>	<b>41%</b>

The NWD Interim Report 2002, estimates that 0.229 tonnes of municipal packaging waste is produced per capita. At this rate of generation 97,000 t of packaging waste is estimated. Based on Table 5.17 a generation note of 202 kgs/capita can be assumed giving a hotel packaging waste arising of 85,481 t. An estimate of 100,000 t will be assumed for the purposes of the plan in the absence of reported data.

### 5.11.2. Construction and Demolition Waste

The majority of waste permits issued in the region are for land reclamation and only permit the use of soil and stone. There are 38 sites permitted to accept C&D waste, but the permits state that the majority are only permitted to accept 5,000 tpa. It is not possible to calculate a figure for actual C&D recycling in the region from these permits.

Alternatively the latest available figures for national C&D waste generation were reported in the NWD, 2001. It reported that 3, 651,412 t of C&D was generated. Section 2, Table 2.9 gives building and construction outputs employment in the construction sector in the South East at 10.1%, using this figure as an indicator of construction activity and construction waste generation gives 369,000 t/a of C&D in the region in 2001. The period 2002 and 2003 showed a significant increase in house construction (refer Table 2.10) and it is anticipated that this gave rise to a higher than average increase in C&D generation. A figure of 500,000 t/a is assumed.

The National Construction and Demolition Waste Council (NCDWC), is a voluntary industry body set up to promote the reduction, reuse and recycling of C & D waste materials. The NCDWC in conjunction with the EPA are developing statistics for C&D waste generation, recovery and disposal nationally. They have encountered difficulties in collating data for 2003 due to either non-returns of data or incomplete data regarding tonnages.

### 5.11.3. Hazardous Fraction

In 2003, C1 forms were issued for the transport of 13 t of C&D waste with a hazardous fraction. Quantities of asbestos contaminated building materials and construction waste were not defined as hazardous C&D waste for this plan. Tonnages of asbestos contaminated material are included under the general heading, hazardous waste.

#### 5.11.4. Healthcare Waste

Healthcare waste is generated from the following sources hospitals, chemists, private clinics, veterinary/dental/general practices. There are 3,682 beds available at healthcare facilities in the region. Waste arisings can be divided into two categories domestic waste which is mainly kitchen and packaging waste and healthcare risk waste, which includes biological, infectious, chemical, toxic, pharmaceutical, sharps and radioactive waste.

The quantities of hospital waste generated<sup>46</sup> in the South East Region are detailed in Table 5.18. The quantities are taken as the amount of waste that was collected under C1 forms. The majority of healthcare waste notified on the L1 forms is priority waste (hazardous).

**Table 5.18: Healthcare Waste Transported under C1 Forms in the South East in 2003**

<b>County</b>	<b>C1 Notes issued for collection of healthcare waste 2003 (t)</b>
Carlow	230
Kilkenny	215
South Tipperary	68
Waterford City	230
Waterford County	62
Wexford	150
<b>Total</b>	<b>955</b>

The region generated 955 tonnes of healthcare waste in 2003. The majority of this waste is classified as hazardous. Under a national contract healthcare waste is collected, treated and disposed of to landfill as a non-hazardous material outside the region.

#### 5.11.5. Waste Electrical and Electronic Equipment (WEEE)

In 2003, reported WEEE generation was 673 tonnes. This generation volume is low when compared with estimated generation rates outlined in the EPA Report<sup>47</sup>. The volume of WEEE predicted to be produced per capita is estimated at between 9 kgs and 18 kgs for the period 2001-2005. Assuming an average generation rate of 13.5 kgs per capita predicted WEEE generation for the region should be in the range of 5,700 tonnes per annum. An indicative European value for WEEE arisings throughout the member stated is 20kg per inhabitant/year. A lower value was calculated by the EPA for Ireland based on a material flows approach, i.e. sales of items of electrical and electronic equipment.

#### 5.11.6. Batteries

In 2004, 34t of waste batteries were collected in the region by Atlas Environmental. Returnbatt collected 40 t.

2004 data was used for quantities of both batteries and waste oil as more accurate data was available for this year.

#### 5.11.7. Waste Oil

In 2003, Atlas Oil collected 2,667,683 L waste oil collection in the South East Region. This is approximately 2,530 t.

**Table 5.19: Waste Oil Collected in the Region in 2003**

<b>Area</b>	<b>Quantity Collected (L)</b>
Carlow	118,200
Kilkenny	306,752
South Tipperary	308,193
Waterford	397,306
Wexford	1,537,232
<b>Total</b>	<b>2,667,683</b>

#### 5.11.8. PCBs

There are no returns for polychlorinated biphenyls (PCBs) for the region. PCBs are chlorinated chemical compounds that were once used in transformers and capacitors. The use of PCBs in new equipment has been banned so the only source of PCBs will be decommissioned equipment. In 2001 just over 20 tonnes of PCBs were collected in Ireland for export for disposal. It is estimated that approximately 2 tonnes of PCBs were generated in the region in 2003.

#### 5.11.9. Tyres

The NWD 2001 estimated that 34,394 tonnes of tyres were generated nationally in 2001. This equates to 3,715 tonnes of tyres produced in the South East Region. There are no returns for tyres for the South East Region for 2003.

#### 5.11.10. End of Life Vehicles (ELV's)

The NWD 2001 estimated that 126,462 end-of-life vehicles were generated nationally in 2001. Based on national data, it is estimated that approximately 14,774 end-of-life vehicles were generated in the South East Region in 2003. A number of waste recovery permits have been issued by the local authorities for the recovery of ELV's. There is no data available for tonnages or number of vehicles recovered at the permitted sites.

#### 5.11.11. Port Waste

130 t of port waste was accepted at landfills in the region in 2003.



## 5.12. Hazardous Wastes

Table 5.20 is a summary of hazardous waste generation in Ireland, 2001.

**Table 5.20: Hazardous Waste Generation in Ireland**

<b>National Hazardous Waste Data</b>	<b>2001 (t)</b>	<b>%</b>
Generation of reported hazardous waste	274,687	85
Generation of unreported hazardous waste	48,402	15
<b>Sub-total</b>	<b>323,089</b>	<b>100</b>
Generation of contaminated soil	168,579	34
<b>Total hazardous waste generation</b>	<b>491,668</b>	<b>100</b>

### 5.12.1. Data

The export of waste is regulated by local authorities in accordance with the EU Transfrontier Shipment of Waste (TFS) Regulation<sup>58</sup>. All waste bound for export must be accompanied by a TFS note (with certain exceptions). Data was gathered from returns to the local authorities and from the NWD Interim Report 2003. The EPA report notes that notification of waste exports in their document for a particular local authority does not necessarily signify that the waste was generated in that area. Many local authorities are host to hazardous waste transfer stations that operate on a national basis. The quantities of hazardous waste reported as exported from the region accompanied by TFS notes are listed in Table 5.21.

Note 1: In accordance with Section 26 of the Waste Management Act 1996, the EPA is required to provide inter alia, for the identification and assessment of sites at which the disposal of hazardous waste took place. The EPA produced a National Hazardous Waste Management Plan, within which there is a methodology for local authorities to identify and assess such sites.

**Table 5.21: Export of Waste, Notifications processed by Local Authorities in the South East 2003**

<b>Local Authority Area</b>	<b>TFS notes (t)</b>	<b>TFS notes hazardous material (t)</b>
Carlow	2,000	2,000
Kilkenny	162	162
South Tipperary	2,766	1,494
Waterford City	744	383
Waterford County	465	465
Wexford	1,034	1,034
<b>Total</b>	<b>6,130</b>	<b>5,536</b>

The Waste Management (Movement of Hazardous Waste) Regulations<sup>59</sup>, 1998, sets the controls required for movement of hazardous waste within the State. The Regulations require that a consignment note (C1 form), must always accompany all movements.

In 2003, approximately 3,800 consignment notes were issued in the region. A summary of C1 notes issued and reported quantity/volume of hazardous waste is shown Table 5.22.

**Table 5.22: Hazardous Waste Movements permitted by Consignment Notes issued in the Region 2003**

<b>Local Authority</b>	<b>quantity hazardous waste (t*)</b>
Carlow	1,084
Kilkenny	3,464
South Tipperary.	3,568
Waterford City	560
Waterford County	8,646
Wexford	1,046**
<b>Total***</b>	<b>18,367**</b>

\*These figures were reported in litres. It was assumed that 1,000 litres was equal to one tonne.

\*\* C1 notes were also issued for 8 shipping containers of white goods.

\*\*\* Of this total, 2,028 t have been reported separately in this document, as batteries, contaminated soil and healthcare waste.

The waste moved under C1 forms is taken for the purposes of this review to be the quantity of hazardous waste reported as generated in the region 2003.

According to national data as reported in the, National Hazardous Waste Plan Implementation Committee Report 2004, as shown in Table 5.21, it is assumed that a fraction of hazardous waste went unreported. The 2004 EPA report estimated that approximately 15% of the total hazardous waste generated in Ireland goes unreported. Using this statistic, it is estimated that 3,240 t of unreported hazardous waste was generated in the region in 2003.

It is estimated that approximately 21,600 t of hazardous waste was generated in the South East Region in 2003. This quantity includes all hazardous waste fractions including those reported separately in this plan, i.e. contaminated soil, batteries, household hazardous waste, WEEE and healthcare wastes. The total quantity of hazardous wastes that are not reported elsewhere in this plan is 17,000 t.

All hazardous waste produced within the region is managed elsewhere in the country or exported. There are no licensed hazardous waste facilities within the region.

## **5.13. Waste Movements**

### **5.13.1. Inter-Regional Waste Movement**

Reduced landfill capacities, introduction of landfill quotas, non-acceptance of commercial waste at some local authority operated landfills, increased gate-fees and the introduction of source separation of dry recyclables have influenced inter-regional movement of commercial and dry recyclable waste in particular and some household waste.

Estimated volume of inter-regional waste movement is shown in Table 5.23.

**Table 5.23: Known Volume of Inter Regional Waste Movement**

<b>Waste Type</b>	<b>Quantity (Tonnes)</b>	<b>% of Waste Stream</b>
Commercial	16,629	19.2
Household	3,140	2.3
Dry Recyclables <sup>Note 1</sup>	13,928	34.5
<b>Total</b>	<b>33,697</b>	

Note 1 – Volume of dry recyclables shipped directly from the region prior to sorting.

### 5.13.2. Exports of Waste

6,130 t of waste was exported from the region in 2003. This does not include certain types of waste that do not require notifications, such as green list waste being exported for recovery. There is no overall figure for waste exports. No waste was imported into the region from abroad in 2003.

## **5.14. Deficiencies in Waste Statistics**

It is apparent from the waste statistics data gathering undertaken to review this Waste Management Plan that deficiencies exist among the data sets used. These deficiencies are summarised hereunder.

### 5.14.1. Household Waste

- The quantities of household waste generated are based on surveys sent to each of the local authorities.
- Every household does not present their waste for collection or is not serviced by a collection route. In 2003 this accounted for approximately 25% of households across the region.
- Waste collectors in the region do not deliver all waste collected for management within the region.
- Estimates of total household waste arisings were made based on 1.28 t of waste produced per household per annum.

### 5.14.2. Commercial Waste Arisings including Packaging Waste

- Quantities of commercial waste generated are based on surveys sent to each of the local authorities.
- It is not possible to estimate quantities of waste arisings from commercial outlets. Quantities generated are reported in the plan as waste presented for collection by the private sector and reported in AER returns.
- Commercial waste collectors do not present the total waste collected for management within the region.
- Not all producers of packaging waste have signed up to Repak or produced their own management plan.

### 5.14.3. Industrial Waste

Similar to commercial waste with the added uncertainty that many industrial producers manage their own waste. Generation of industrial waste is presented in this plan as a best estimate.

### 5.14.4. Hazardous Waste

The Implementation Committee Report<sup>56</sup> notes that a percentage of hazardous waste goes unreported annually in Ireland. Quantities of hazardous waste arisings in this plan have been estimated using, C1 returns to the local authorities, TFS returns to the local authorities national data base and by assumption that a specific percentage of generation went unreported. The data on hazardous waste is not labelled as household, commercial or industrial.

### 5.14.5. Agricultural Waste

The agricultural sector is responsible for managing a significant proportion of their own waste. Arisings were estimated from a number of sources including, census data, sludge management plans, animal numbers etc. There is no data on quantities of hazardous waste arisings from the agricultural sector such as waste oils, batteries, pesticides, veterinary wastes, oily sludges etc.

## **5.15. Recommendations on Improved Data Management**

The local authorities in the region will address the following issues to improve data collection:

- track waste flows within their functional areas
- monitor the quantity and type of waste that is being exported and imported into their functional area
- ensure that new waste facilities have the necessary technology and procedures to accurately track the source, nature and disposal recovery route for all wastes
- the methodology to collect and track data will be continually upgraded throughout the period of the plan
- data will be routinely submitted to the website [www.wastepermits.ie](http://www.wastepermits.ie) to ensure data is accessible and up to date
- waste collection permit holders will quantify and characterise all wastes collected and in particular, waste collector servicing householders will identify the no. of householders serviced within each local authority functional area.