



WESTERN
AUSTRALIAN
GOVERNMENT
azette

ISSN 1448-949X (print)

ISSN 2204-4264 (online)

PRINT POST APPROVED PP665002/00041



PERTH, FRIDAY, 28 JUNE 2019 No. 97

SPECIAL

PUBLISHED BY AUTHORITY KEVIN J. McRAE, GOVERNMENT PRINTER AT 12.30 PM

© STATE OF WESTERN AUSTRALIA

WASTE AVOIDANCE AND RESOURCE RECOVERY ACT 2007

**WASTE AVOIDANCE AND RESOURCE
RECOVERY AMENDMENT
REGULATIONS 2019**

WASTE AVOIDANCE AND RESOURCE RECOVERY
REGULATIONS 2008

INFORMATION REQUIRED FOR AN ANNUAL RETURN OF—
LIABLE LOCAL GOVERNMENTS THAT PROVIDE WASTE SERVICES
NON-METROPOLITAN LANDFILLS
LIABLE RECYCLERS

Waste Avoidance and Resource Recovery Act 2007

Waste Avoidance and Resource Recovery Amendment Regulations 2019

Made by the deputy of the Governor in Executive Council.

1. Citation

These regulations are the *Waste Avoidance and Resource Recovery Amendment Regulations 2019*.

2. Commencement

These regulations come into operation as follows —

- (a) regulations 1 and 2 — on the day on which these regulations are published in the *Gazette*;
- (b) the rest of the regulations — on the day after that day.

3. Regulations amended

These regulations amend the *Waste Avoidance and Resource Recovery Regulations 2008*.

4. Regulation 13 amended

Delete regulation 13(2)(b) and insert:

- (b) on the Department's website.

Waste Avoidance and Resource Recovery Amendment Regulations 2019

r. 5

5. Regulation 17 amended

In regulation 17(6)(b) after “false” insert:

or misleading

6. Part 3A inserted

After regulation 18 insert:

Part 3A — Annual return

18A. Terms used

In this Part —

annual return means the return required to be lodged by a liable person under regulation 18C(1);

liable person has the meaning given in regulation 18B;

licence means a licence under the EP Act Part V Division 3;

licensed landfill means premises specified in category 63, 64 or 65 of the *Environmental Protection Regulations 1987* Schedule 1 in respect of which a licence is held;

licensee means the holder of a licence in respect of a licensed landfill;

metropolitan region has the meaning given in the *Planning and Development Act 2005* section 4(1);

reportable waste means waste that is solid matter.

18B. Liable persons

- (1) If subregulation (2), (3) or (4) applies to a person, the person is a *liable person* for the purposes of this Part.

Waste Avoidance and Resource Recovery Amendment Regulations 2019

r. 6

- (2) This subregulation applies to a local government that provides waste services.
- (3) This subregulation applies to a person that is the occupier of premises, whether or not the person holds a licence in respect of the premises —
 - (a) if reportable waste is treated, processed or sorted at the premises for the purposes of reprocessing, recycling or energy recovery; and
 - (b) if, as a result of that treatment, processing or sorting, at least 1 000 tonnes of reprocessed, recycled or recovered material is produced in a financial year at the premises that —
 - (i) needs no further processing and is ready for use as a production input or a final product; or
 - (ii) is to be exported from the State.
- (4) This subregulation applies to a licensee, or a person who is the occupier of premises (the *relevant premises*) that would, if the person held a licence in respect of the relevant premises, be a licensed landfill —
 - (a) if at least 20 000 tonnes of reportable waste is received in a financial year at the licensed landfill or the relevant premises; and
 - (b) if the licensed landfill is, or the relevant premises are, outside the metropolitan region.
- (5) A person must inform the CEO in the approved form —
 - (a) if the person is a liable person under subregulation (2) — that the person is a local government that provides waste services; or
 - (b) if the person is a liable person under subregulation (3) or (4) — of the premises or

Waste Avoidance and Resource Recovery Amendment Regulations 2019**r. 6**

licensed landfill in respect of which the person is a liable person.

18C. Liable persons to make and lodge annual return

- (1) A liable person must make a return in the approved form and lodge it with the CEO on or before 1 October in each year.
- (2) The annual return must contain information for the most recently completed financial year relating to reportable waste or the recycling of reportable waste, as required by the notice under regulation 18D(1).

18D. CEO to give notice of information required for annual return

- (1) The CEO must, by notice published in the *Gazette*, describe in detail —
 - (a) the information relating to reportable waste or the recycling of reportable waste that a liable person is required to provide in its annual return; and
 - (b) the procedures to be followed by a liable person for the purposes of —
 - (i) making the necessary records from which that information may be ascertained; and
 - (ii) calculating or estimating that information.
- (2) A notice under subregulation (1) may apply to one or more specified liable persons or to a specified class of liable persons.
- (3) The CEO may, by notice published in the *Gazette*, amend, or revoke and replace, a notice under

Waste Avoidance and Resource Recovery Amendment Regulations 2019

r. 6

- subregulation (1), and the amended or replaced notice is taken to be a notice under that subregulation.
- (4) Without limiting subregulation (1), a notice under that subregulation may describe information —
- (a) that relates to recycling programmes or collection services for reportable waste that have been provided by a liable person; or
 - (b) that relates to reportable waste that has been reprocessed, recycled or recovered by a liable person; or
 - (c) that relates to reportable waste that has been received at landfill premises occupied by a liable person; or
 - (d) that the CEO otherwise reasonably requires from a liable person, in relation to reportable waste or the recycling of reportable waste, to support —
 - (i) the objects of the Act described in section 5(1) of the Act; or
 - (ii) the purpose of the waste strategy described in section 24 of the Act.
- (5) A liable person must keep any record made in accordance with subregulation (1)(b)(i) in a legible written form, or so as to be readily convertible into such a form, for a period of not less than 5 years from the day on which the record was made.
- (6) A notice published in the *Gazette* under subregulation (1) or (3) must also be published on the Department's website.

Waste Avoidance and Resource Recovery Amendment Regulations 2019**r. 6**

18E. Offences

- (1) A liable person commits an offence if the person fails to inform the CEO under regulation 18B(5).
Penalty for this subregulation: a fine of \$10 000.
- (2) A liable person commits an offence if the person fails to lodge an annual return with the CEO on or before the date referred to in regulation 18C(1).
Penalty for this subregulation: a fine of \$10 000.
- (3) A liable person commits an offence if the person fails to lodge an annual return with the CEO that contains the information required by a notice under regulation 18D(1).
Penalty for this subregulation: a fine of \$10 000.
- (4) A liable person commits an offence if the person lodges an annual return with the CEO that contains any information that is false or misleading in a material particular.
Penalty for this subregulation: a fine of \$10 000.
- (5) A liable person commits an offence if the person makes a record in accordance with regulation 18D(1)(b)(i) that is false or misleading in a material particular.
Penalty for this subregulation: a fine of \$10 000.
- (6) A liable person commits an offence if the person contravenes regulation 18D(5).
Penalty for this subregulation: a fine of \$10 000.

Waste Avoidance and Resource Recovery Amendment Regulations 2019

r. 7

7. Regulation 25 inserted

After regulation 24 insert:

25. Transitional provision — first annual return

- (1) In this regulation —
commencement day means 1 July 2019.
- (2) The first annual return that a liable person is required to make and lodge under regulation 18C must relate to the period —
 - (a) for a person that is a liable person on the commencement day — from that day to 30 June 2020; or
 - (b) for a person that becomes a liable person after the commencement day — from the day the person becomes a liable person to the following 30 June.

D. FOSTER, Clerk of the Executive Council.

WASTE AVOIDANCE AND RESOURCE RECOVERY REGULATIONS 2008
INFORMATION REQUIRED FOR AN ANNUAL RETURN OF LIABLE LOCAL GOVERNMENTS THAT
PROVIDE WASTE SERVICES

PERSON WHO DESCRIBES INFORMATION REQUIRED FOR AN ANNUAL RETURN

I, Mike Rowe, in my capacity as the chief executive officer of the department principally assisting the Minister for Environment in the administration of the *Waste Avoidance and Resource Recovery Act 2007*¹ (CEO) hereby describes in this notice the information relating to reportable² waste or recycling reportable waste that is required to be provided in an annual return and the procedures to be followed to record and calculate or estimate that information pursuant to regulations 18C and 18D(1) of the *Waste Avoidance and Resource Recovery Regulations 2008*.

PERSON REQUIRED TO PROVIDE AND USE INFORMATION IN THIS NOTICE

In this notice, a person is a *liable person* as described under regulations 18B(1) and 18B(2) of the *Waste Avoidance and Resource Recovery Regulations 2008* if they are a local government defined under section 1.4 of the *Local Government Act 1995* as established under the *Local Government Act 1995* that provides waste services, which includes regional local governments³ pursuant to the definition of *local government* in section 3(1) of the *Waste Avoidance and Resource Recovery Act 2007*⁴ (referred to as a “liable local government” in this notice).

The liable local government must inform the CEO in a form approved in writing by the CEO⁵ that it is a liable local government that provides waste services pursuant to regulation 18B(5)(a) of the *Waste Avoidance and Resource Recovery Regulations 2008*. Waste services, as defined by section 3(1) of the *Waste Avoidance and Resource Recovery Act 2007*, means the following—

- the collection, transport, storage, treatment, processing, sorting, recycling or disposing of waste; or
- the provision of receptacles for the temporary deposit of waste; or
- the provision and management of waste facilities, machinery for the disposal of waste and processes for dealing with waste.

A liable local government is subject to Part 3A of the *Waste Avoidance and Resource Recovery Regulations 2008* pursuant to regulation 18B(1). Under regulation 18C of Part 3A of the *Waste Avoidance and Resource Recovery Regulations 2008*, a liable local government is required to make and lodge an annual return relating to reportable waste or the recycling of reportable waste containing information as required by this notice under regulation 18D.

RELEVANT WASTE SERVICES

The information described in items 1 to 3 under the heading **INFORMATION REQUIRED TO BE CONTAINED IN AN ANNUAL RETURN** below pertain to the following waste services provided by the local government, whether that service is operated by the liable local government or by a third party under contract with the relevant liable local government.

- Kerbside collection of mixed waste transported directly to landfill or transported to landfill via a transfer station;
- Kerbside collection of mixed waste collected and processed through a waste composting facility.
- Kerbside collection of mixed waste collected and processed through an energy recovery facility, or any other such facility.
- Kerbside collection of co-mingled dry recyclables;
- Kerbside collection of garden organics;
- Kerbside collection of combined food organics and garden organics;
- Kerbside collection of separated dry recyclables;
- Vergeside collection of garden organics;
- Vergeside collection of mixed bulk waste;

¹ The “department principally assisting the Minister for Environment in the administration of the *Waste Avoidance and Resource Recovery Act 2007*” is currently the Department of Water and Environmental Regulation.

² Regulation 18A of the *Waste Avoidance and Resource Recovery Regulations 2008* defines **reportable waste** to mean waste that is solid matter.

³ A *regional local government* is established under section 3.61 of the *Local Government Act 1995*, which provides in section 3.61(1):

Two or more local governments (referred to in this Division as the participants) may, with the Minister’s approval, establish a regional local government to do things, for the participants, for any purpose for which a local government can do things under this Act or any other Act.

⁴ The definition in section 3(1) of the *Waste Avoidance and Resource Recovery Act 2007* of *local government* to include “a regional local government established for the purpose of providing waste services” applies to the *Waste Avoidance and Resource Recovery Regulations 2008* by virtue of section 44(1) of the *Interpretation Act 1984*, which states:

Words and expressions used in subsidiary legislation shall have the same respective meanings as in the written law under which the subsidiary legislation is made.

⁵ The term “approved” is defined in regulation 3 of the *Waste Avoidance and Resource Recovery Regulations 2008* to mean approved by the CEO in writing. The Department of Water and Environmental Regulation is developing an approved form (an online reporting system) for reporting which it will release by 30 June 2020.

- Vergeside collection of specific bulk products;
- Drop-off services for mixed waste;
- Drop-off services for dry recyclables;
- Drop-off services for green waste;
- Drop off-services for hard waste or bulk rubbish, including waste recovered for sale at the drop-off facility;
- Public place services provided through permanent bins in public places for mixed waste;
- Public place services provided through permanent bins in public places for recyclables;
- Special event services provided through temporary bins in public places for mixed waste;
- Special event services provided through temporary bins in public places for recyclables; and
- Any of the services described above that are provided to commercial premises.

Kerbside services are containerised, regular services where waste or recycling are collected from the kerb in front of the residence.

Vergeside services are intermittent or on-demand collection services for garden organic wastes or bulk waste. Typically, these services are non-containerised, but bulk bins may also be used. Bulk waste refers to bulky household items, such as furniture, mattresses and white goods.

Drop-off services allow householders to self-haul their waste to facilities such as transfer stations, landfills and recycling depots that are operated by the local government.

Public place services are permanent public waste and recycling bins, such as street litter bins.

Special Event services are temporary, short-term waste and recycling services designed to service a special event (e.g. a festival or street market)

INFORMATION REQUIRED FOR THE ANNUAL RETURN—REGULATIONS 18C AND 18D

For the purposes of making an annual return under regulation 18C of the *Waste Avoidance and Resource Recovery Regulations 2008*, the liable local government must include the following information in that annual return, and record that information pursuant to regulation 18D(1)(b)(i) and 18D(5).

1. Liable local governments must record and report in their annual return the following data in tonnes against each waste service listed above under the heading **RELEVANT WASTE SERVICES** provided to the residential or commercial premises located within their district for the purposes of regulation 18D of the *Waste Avoidance and Resource Recovery Regulations 2008*—

- total weight of waste collected;
- total weight of waste disposed of to landfill;
- total weight of waste recovered; and
- total weight of waste recovered by the approved waste material category.

2. Liable local governments must record and report in their annual return the following cost and charge data—

- fees charged for waste and recycling collection services; and
- cost of providing waste and recycling collection services.

3. Liable local governments must record and report in their annual return the following data for each waste service provided—

- percentage of households provided with such service;
- participation rate;
- frequency;
- type, size and colour of containers used (for kerbside collection services only);
- number of residential premises covered by the service; and
- number of commercial premises covered by the service.

4. Liable local governments must calculate or estimate by virtue of regulation 18D(1)(b)(ii) of the *Waste Avoidance and Resource Recovery Regulations 2008* the information required in items 1 to 3 using the *Approved procedure for estimation/calculation of annual return information by local governments required under the Waste Avoidance and Resource Recovery Regulations 2008* at Attachment 1 of this notice, which forms part of this notice.

5. Liable local governments must make and submit their annual return in the approved⁶ form.

6. Liable local governments must, by virtue of regulation 18D(1)(b)(i) of the *Waste Avoidance and Resource Recovery Regulations 2008*, keep any records relevant to the calculation, estimation or verification of the information reported in its annual return in a legible written form, or so as to be readily convertible into such a form, for a period of not less than 5 years from the day on which the record was made.

CURRENT REPORTING AND LIABILITY

For the 2019-20 financial year, the CEO requires the liable local government to make and lodge an annual return containing the information required under this notice with the CEO by 1 October 2020 in the approved⁷ form.

⁶ The term “approved” is defined in regulation 3 of the *Waste Avoidance and Resource Recovery Regulations 2008* to mean approved by the CEO in writing. The Department of Water and Environmental Regulation is developing an approved form (an online reporting system) for reporting which it will release by 30 June 2020.

⁷ See footnote 6 above.

There are a number of offences provided for under regulation 18E of the *Waste Avoidance and Resource Recovery Regulations 2008* for breaches by a liable local government under regulations 18B, 18C and 18D, carrying a fine of \$10,000.

MIKE ROWE, Chief Executive Officer,
Department of Water and Environmental Regulation.

25 June 2019.

Attachment 1

Approved procedure for estimation/calculation of annual return information by local governments required under the *Waste Avoidance and Resource Recovery Regulations 2008*

Approved procedure of the CEO of the department principally assisting the Minister for Environment in the administration of the *Waste Avoidance and Resource Recovery Act 2007* as required under regulation 18D of the *Waste Avoidance and Resource Recovery Regulations 2008*

June 2019

Contents

- 1 Objective
- 2 Background
- 3 CEO approved procedure
- 4 Reportable waste material categories
- 5 Hierarchy of approved methods
 - 5.1 Estimating weight of reportable waste collected, recycled and disposed
 - 5.1.1 1st approved method—Estimation by weight
 - 5.1.2 2nd approved method—Volume estimation
 - 5.2 Estimating weight of recyclables diverted vs disposed where reportable waste is delivered to a material recovery facility (MRF) or other regional waste processing facility
 - 5.3 Drop off collections—additional guidance
 - 5.3.1 Where site has a transfer station
 - 5.3.2 Drop-off site with no transfer station
 - 5.4 Combined collections
 - 5.4.1 Combined bin collections
 - 5.4.2 Mixed use developments
 - 5.5 Recycled materials
 - 5.6 Estimating the cost of providing waste and recycling services.
 - 5.7 Charges
- 6 Commercial waste collections
- 7 Default values
- 8 Special provisions for non-metropolitan local governments with a population of less than 5,000
 - 8.1 Estimating weight of reportable waste collected, recycled and disposed
 - 8.1.1 Direct measurement
 - 8.1.2 Indirect measurement
 - 8.1.3 Drop off collections—additional guidance
 - 8.2 Estimating the cost of providing waste and recycling services.
- 9 Special provisions for non-metropolitan local governments with a population of less than 1,500
- 10 Alternative methods
- 11 Glossary

1 Objective

To establish the procedure of the chief executive officer of the department principally assisting the Minister for Environment in the administration of the *Waste Avoidance and Resource Recovery Act 2007*⁸ (CEO) for estimating and calculating information to be reported in an annual return under regulations 18C and 18D(1) of the *Waste Avoidance and Resource Recovery Regulations 2008* (WARR Regulations).

This document is intended for liable persons, as defined by regulation 18B(2) of the WARR Regulations, if they are a local government defined under section 1.4 of the *Local Government Act 1995* as established under the *Local Government Act 1995* that provides waste services, which includes regional local governments⁹ pursuant to the definition of *local government* in section 3(1) of the *Waste Avoidance and Resource Recovery Act 2007*.

⁸ The “department principally assisting the Minister for Environment in the administration of the *Waste Avoidance and Resource Recovery Act 2007*” is currently the Department of Water and Environmental Regulation.

⁹ The definition of *local government* in section 3(1) of the *Waste Avoidance and Resource Recovery Act 2007* to include “a regional local government established for the purpose of providing waste services” applies to the *Waste Avoidance and Resource Recovery Regulations 2008* by virtue of section 44(1) of the *Interpretation Act 1984* which states:

Words and expressions used in subsidiary legislation shall have the same respective meanings as in the written law under which the subsidiary legislation is made.

2 Background

The WARR Regulations require liable persons to make and lodge annual returns with the CEO on or before 1 October in each year. The annual returns must contain information for the most recently completed financial year relating to reportable waste¹⁰ or the recycling of reportable waste, as required by the notice under regulation 18D(1) (Notice).

The WARR Regulations require annual returns to be prepared using procedures for the purposes of calculation or estimation methods described and approved by the CEO in the Notice.

3 CEO approved procedure

This document provides the procedure to be followed by local governments for the purposes of the calculation or estimation liable local governments are required to use to prepare their annual returns under regulation 18C of the WARR Regulations.

This document forms a part of the Notice approved by the CEO.

4 Reportable waste material categories

Liable local governments must categorise and report reportable waste information using the approved reportable waste material categories provided in Appendix A.

Liable local governments must seek the Department of Water and Environmental Regulation's (DWER) approval to prepare their returns using more detailed categories, consistent with their own activities and record-keeping. Where alternative categories are proposed, local governments must demonstrate how these align to the categories in Appendix A.

5 Hierarchy of approved methods

This clause provides a hierarchy of approved methods that liable local governments must use to prepare their annual returns as part of the required procedure under regulation 18D(b) of the WARR Regulations. Liable local governments must choose the method to be used based on the best-available information. That is, the local government must use the "highest" preferred method for which the data is available.

Clauses 8 and 9 of this procedure provide approved methods for use by non-metropolitan local governments with less than 5,000 population and local governments with less than 1,500 population. The population of a local government will be determined as the Estimated Resident Population (ERP) in the latest release of *ABS catalogue 3218.0—Regional Population Growth* at 30 June of the year the return is due.

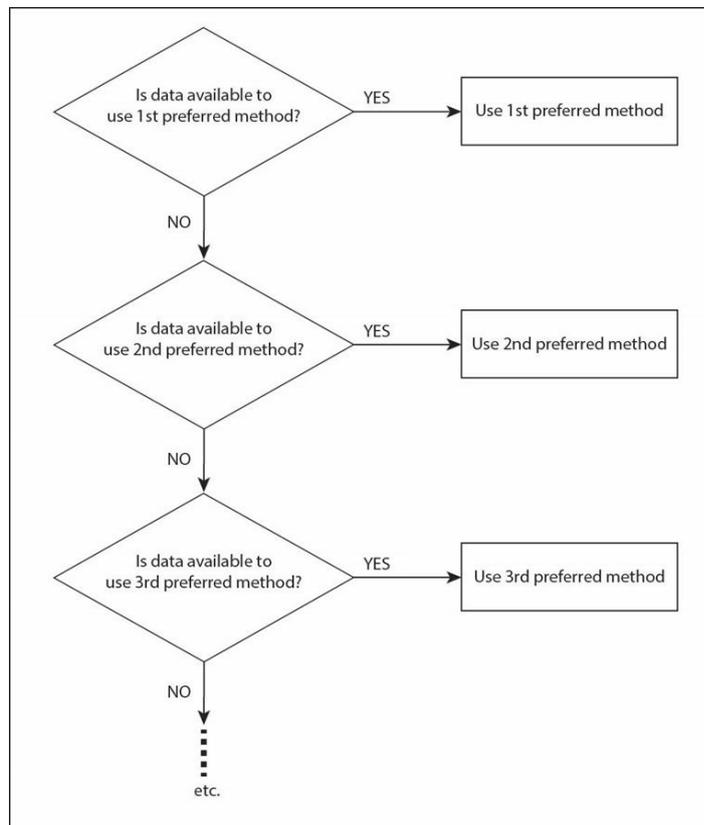


Figure 1: Hierarchy of approved methods

Where liable local governments rely on a third party to provide data (e.g. from a recycler or landfill), local governments must ensure that those facilities use these approved methods to collect and report the data.

¹⁰ Regulation 18A of the *Waste Avoidance and Resource Recovery Regulations 2008* defines **reportable waste** to mean waste that is solid matter.

5.1 Estimating weight of reportable waste collected, recycled and disposed

Liabile local governments are required to record and report data about the waste services they provide to residents and commercial premises located within their local government area. Most local governments already have access to data on the amount of reportable waste and recycling of reportable waste they collect, recycle and dispose. Under the WARR Regulations, recyclers and large regional landfills will be required to record and report the amount of waste and recycling they receive, treat and dispose.

Local governments should obtain accurate data from the waste and recycling facilities where the reportable waste they collect is delivered, whether it is operated by the local government itself or by a third party.

5.1.1 1st approved method—Estimation by weight

The most preferred method for estimating the amount of reportable waste collected, recycled or disposed is for the reportable waste to be weighed on a calibrated weighbridge, load cell or scales at the facility where it is delivered. The total annual weight of the reportable waste collected, recycled or disposed is the sum of all the vehicle loads that enter the facility.

Volume estimation may be used for small loads under one cubic metre in size (i.e. loads transported in cars and utes).

Equation 1: Estimating total annual weight of reportable waste by weighing each load

$$\text{Annual waste} = \sum (\text{weight of all vehicle loads})$$

Table 1: Data to be collected for estimation by weight

Data required to be collected	Data sources
Total weight of each load	Weighbridge records
Material type of each load	Weighbridge records

5.1.2 2nd approved method—Volume estimation

Where weighing reportable waste is not possible, the amount of reportable waste must be calculated by estimating the volume of reportable waste at point of aggregation or disposal/processing and multiplying it by the relevant material category bulk density. Approved default values for vehicle volumes and bulk densities for CEO of DWER approved reportable waste material categories are in Appendix B.

Equation 2: Volume method for calculating total weight

$$\text{Annual waste} = \sum (\text{volume of waste}) \times (\text{density of waste})$$

Table 2: Data to be collected for volume estimation

Data required	Data sources
Volume of each vehicle / container	Gatehouse records
% capacity of vehicle / container in use	Estimated for each load as it arrives—default is 100%
Material category of each load (e.g. mixed paper, co-mingled recycling)	Determined by gatehouse operator as load arrives

5.2 Estimating weight of recyclables diverted vs disposed where reportable waste is delivered to a material recovery facility (MRF) or other regional waste processing facility

Where reportable waste is delivered to a MRF, alternative waste treatment plant (AWT) or other regional waste processing facility, the waste will typically be combined with waste from multiple sources and it may not be possible to directly measure the weight of waste recycled or disposed from a single local government.

Liabile local governments will obtain the total weight (using the relevant approved methods in clauses 5.1.1 or 5.1.2) of their reportable waste delivered to the facility and then estimate the total weight of waste diverted and disposed from the facility residual rate (i.e. the percentage of total waste received at the MRF/AWT that was disposed to landfill).

Equation 3: Estimating total material diverted from a MRF or AWT

$$\text{Total material recycled [t]} = \text{total material collected [t]} \times (100\% - \text{facility residual rate}[\%])$$

Where a facility is unable to provide a residual rate, the default rate of 35% will be used to estimate the amount of reportable waste diverted for recycling.

5.3 Drop off collections—additional guidance

Drop-off collections are where reportable waste is delivered to the waste depot by the residents of the local government i.e. self-hauled waste. Details on the source (i.e. residential or commercial) and type of waste should be determined and recorded as vehicles enter the site. Liabile local governments may assume that all small loads (single axle trailers, utes, cars and vans) are sourced from the domestic waste stream. Small loads of mixed waste types (e.g. garden waste and mixed dry recyclables) should be recorded as the predominant waste type or as “mixed putrescible waste”.

The amount of reportable waste collected must be determined either at point of entry, or after the point of aggregation, if the waste depot uses a transfer station. Liabile local governments may use

volume assessment or use a default weight value (Appendix B) to determine the amount of waste in small loads (single axle trailers, utes, cars and vans), regardless of whether the receiving facility has a weighbridge.

5.3.1 Where site has a transfer station

Reportable waste is weighed or volume-assessed after aggregation at the transfer station, the relevant approved methods listed in clauses 5.1.1 or 5.1.2.

Reportable waste source and type are estimated using averages determined from the transfer station gatehouse records of individual loads.

5.3.2 Drop-off site with no transfer station

Reportable waste is weighed, or its volume is assessed, on entry to the drop off site using the relevant approved methods listed in clauses 5.1.1 or 5.1.2.

Recyclables leaving a drop-off facility may be assessed and recorded for material type and weight or volume when they leave the facility or from records provided by the recycler.

5.4 Combined collections

Liable local governments are required to report the weight of reportable waste collected, diverted and disposed by waste collection service and type of premises (i.e. domestic or commercial). Some local governments collect both commercial, domestic and/or public place waste on the same collection run. In this case, the following methods must be used to determine the proportion of reportable waste collected from each waste stream.

5.4.1 Combined bin collections

Where reportable waste from more than one containerised collection service and/or type of premises is collected in the one vehicle, the weight of reportable waste collected from each may be estimated using relative annual bin capacity (i.e. bin numbers multiplied by bin volume, assuming bins are 100% full).

Equation 4: Estimating amount of each waste stream for combined collections

$$\text{Proportion of Domestic waste} = \frac{\text{domestic annual bin capacity}}{(\text{domestic} + \text{commercial} + \text{public place}) \text{ annual bin capacity}}$$

$$\text{Annual domestic} = \text{Proportion of domestic} \times \text{Total waste collected}$$

If the liable local government does not know how many services it provides, it must undertake an audit of its bins in the field and the waste services it provides.

5.4.2 Mixed use developments

Reportable waste from commercial and domestic premises may be collected in the same bins in some mixed-use developments. Where commercial and domestic waste is collected in the same bin, proportion the commercial and domestic streams for mixed use developments by estimating the total amount of waste collected and then subtracting the estimated total amount of domestic waste based on per household generation rate (either estimated by the local government and approved by DWER or using the default values provided in Appendix B).

5.5 Recycled materials

Liable local governments must obtain the total weight of recyclable reportable waste delivered to the recycling facility using the relevant approved methods described in clauses 5.1.1 or 5.1.2. The weight of residual/contaminated waste must be removed from the weight of recycled materials.

The amount of each material recycled can be estimated by—

- (a) weighing the sorted material;
- (b) volume assessing the sorted material;
- (c) applying waste composition data from waste audits on the liable local government's own waste stream; or
- (d) applying average waste composition data from waste audits at the facility receiving the recyclables.

5.6 Estimating the cost of providing waste and recycling services.

In order of decreasing preference, costs may be reported as—

- (a) costs by waste type and waste service;
- (b) costs by waste or service type; or
- (c) overall cost.

The estimated cost of a service should only include costs directly related to providing that service. These may include—

- Waste management staff salaries / wages, plus “overheads” to cover general administration costs (usually as a relative proportion of staff salary, e.g. 50%)
- Collection and disposal contracts
- Waste education costs
- Operational costs for equipment
- Maintenance on equipment / waste vehicles / bins

- Annual amortised capital costs of new equipment / waste vehicles / bins (i.e. the total cost is distributed over the life of the equipment)
- Annual amortised landfill closure costs (the estimated closure cost is divided by the lifespan of the landfill, with the annual cost incorporated into the annual budget)
- Annual amortised costs of constructing a new, replacement landfill in the future (the estimated closure cost is divided by the lifespan of the landfill, with the annual cost incorporated into the annual budget)
- Waste consultancy costs
- Waste service tender costs (e.g. advertising)

5.7 Charges

Where a liable local government charges different rates for the same service to different customers (e.g. if pensioner discounts are given on waste charges), then the charge reported should be the non-discounted rate for a standard single unit dwelling.

In order of decreasing preference, charges may be reported as—

- separate charges for recycling and/or waste disposal services; or
- combined charge for waste disposal and recycling services

6 Commercial waste collections

Liable local governments are required to report the amount of commercial and industrial (C&I) reportable waste and recycling collected from commercial premises located within their local government area through services they (the individual local governments) provide or are provided under contract on their behalf. Where the reportable waste is not collected separately from the domestic waste, the relative amounts for each waste stream may be estimated by the relative annual bin capacity for each waste stream using the methods in clause 5.4.

7 Default values

Liable local governments must use facility-specific values where this information is available (see also clause 10). Approved default values for estimating volume for various vehicle types and bulk densities for various reportable waste material categories are been provided in Appendix B. These default values can be used where facility-specific data is not available.

8 Special provisions for non-metropolitan local governments with a population of less than 5,000

As an acknowledgement that smaller non-metropolitan local governments may not have the resources or the capability to report in accordance with the above approved methods for local governments, special provisions have been made for liable non-metropolitan local governments with a population of less than 5,000.

8.1 Estimating weight of reportable waste collected, recycled and disposed

8.1.1 Direct measurement

Direct measurement, either by weight or volume, is the preferred approved method for measuring reportable waste, as described in clauses 5.1.1 and 5.1.2. However, if a liable non-metropolitan local government with a population of less than 5,000 does not have the capacity to measure reportable waste directly, then the following indirect measurement methods may be used.

8.1.2 Indirect measurement

In circumstances where the amount of reportable waste collected is not directly measured, liable non-metropolitan local governments with a resident population of less than 5,000 may use alternative methods for estimating the amount of reportable waste collected and disposed.

8.1.2.1 1st approved method—Waste generation rates as determined by a collection service audit

Where a relevant waste collection service audit report is available, the average generation rates estimated from the audit data may be extrapolated to estimate the total weight of reportable waste collected during the financial year. Where the reportable waste is disposed directly to landfill, the extrapolated waste audit data can also be used to estimate the total weight of waste disposed to landfill during the financial year.

The average generation rates can be on a per capita, per household or per bin lift basis.

8.1.2.2 2nd approved method—Number of bin lifts by typical bin weight (containerised services only)

The amount of reportable waste collected is assumed to be the total number of bins collected during the year multiplied by a typical weight of a bin just before being emptied. Approved default material densities that may be used to calculate the estimated weight of each bin are provided in Appendix B. Local governments can request to use alternative weight per bin figures (see clause 10).

8.1.2.3 3rd approved method—Population by typical per capita waste generation rate (all MSW)

The weight of reportable waste generated in a local government area may be estimated by multiplying the number of residents in the local government by a per capita waste generation rate. This method is only suitable as an alternative method for liable local governments that do not provide a kerbside collection service and do not have a staffed landfill.

8.1.3 Drop off collections—additional guidance

Each load of dropped off reportable waste should be assessed for source (domestic or commercial) and waste type. The weight of waste should be weighed, or volume assessed, according to the approved direct measurement methods described in clauses 5.1.1 and 5.1.2.

8.1.3.1 Unstaffed drop-off site (no weighbridge or volume estimates)

Where a liable local government operates an unstaffed drop-off site, and direct measurement of the amount of reportable waste collected is not possible, data must be collected through an annual survey and extrapolated for the whole year. It is recommended that the data is collected for a week at time at four separate occasions over the year to reflect seasonal differences; for example, March, June, September and December.

8.2 Estimating the cost of providing waste and recycling services.

Where a liable non-metropolitan local government with less than 5,000 population is unable to estimate the costs of providing a service, it may use the following default amounts—

- Kerbside collection service—\$200 per service per household per year
- Vergeside collection service—\$15 per service per household per year
- Drop-off—\$215 per tonne received

9 Special provisions for non-metropolitan local governments with a population of less than 1,500

DWER acknowledges the limited resources of non-metropolitan local governments with a low population. Therefore, where accurate information is not available on the amount of reportable waste collected, liable non-metropolitan local governments with an estimated resident population (ERP) of less than 1,500 may choose to only report on the services they provide; they can elect not to report the amount of reportable waste collected in each service. DWER will estimate the amount of waste generated and recycled, based on the population or number of households, using the approved default values in Appendix B).

10 Alternative methods

Liable local governments may propose alternative methods for the following if these are more accurate than the methods set out above—

- estimating the amount of reportable waste received, removed and disposed
- estimating the bulk density
- estimating the reportable waste composition
- estimating the source waste stream

Any alternative methods proposed must be accurate, repeatable and consistent.

Liable local governments may also propose alternative default values to those listed in Appendix B. Liable local governments must submit alternative methods or default values, with relevant substantiating information, to DWER at waste.data@dwer.wa.gov.au for consideration and approval prior to use in the annual return.

11 Glossary

Acronym / symbol	Definition
Σ	Sum of
t	Tonnes
m ³	Cubic metres
C&I	Commercial and Industrial waste—Solid waste generated by the business sector, State and Federal Government entities, schools and tertiary institutions
DWER	Department of Water and Environmental Regulation
ERP	Estimated resident population published in ABS catalogue 3218.0—Regional Population Growth
Landfilled waste	All waste buried in landfill. This includes waste material used as daily cover.
MSW	Municipal solid waste—Solid waste generated from domestic (residential) premises and local government activities
Peel Region	The Peel region is the area defined by the Peel Region Scheme (May 2013).
Perth Metropolitan Region	The Perth region, or Perth metropolitan region, is the area defined by the Metropolitan Region Scheme (June 2014).
Recycling	Recycling: A waste fate in which solid wastes are collected, sorted, processed (including through composting), and converted into raw materials to be used in the production of new products. For data reporting purposes, recycling— <ul style="list-style-type: none"> • excludes materials in stockpiles of unprocessed waste materials • includes all materials processed for recycling, whether they are quickly sold or used, or stockpiled for later sale or use • excludes residuals that are sent to landfill or otherwise disposed of.
Reportable waste	Means waste that is solid matter under regulation 18A of the <i>Waste Avoidance and Resource Recovery Regulations 2008</i>

Acronym / symbol	Definition
Resource Recovery	The process of extracting materials or energy from a waste stream through re-use, reprocessing, recycling or recovering energy from waste.
Stockpiling	Temporary storage of waste or waste products for future sale, resource recovery or disposal. Materials are not to be stored on-site for a period of more than 2 years.

Appendices

Appendix A—Approved reportable waste material categories

Table 1: Approved reportable waste material categories

Category (Tier 1)	Sub-category (Tier 2)	Sub-category description
Paper	White office paper	High quality white office paper
	Old Newsprint (ONP)	Newspapers
	Magazines	Magazines and booklets
	Liquid Paperboard (LPB)	Milk and juice cartons made from liquid paperboard
	Paper—mixed	Combination of the above categories
Cardboard	Cardboard / paper packaging	Corrugated and flat cardboard. Excludes non-recyclable waxed and coated cardboard.
Mixed paper/cardboard	Mixed paper/cardboard	Paper and cardboard collected together.
Glass	Glass packaging—mixed	Glass jars and bottles
	Glass—construction	Glass windows and tiles
	Glass—other	Wine glasses, etc.
Plastic *	PET (1)	Polyethylene terephthalate
	HDPE (2)	High Density Polyethylene
	PVC (3)	Poly-vinyl Chloride
	PE-LD/LLD (4)	Low Density Polyethylene
	PP (5)	Polypropylene
	PS (6)	Polystyrene (hard form)
	PS-E (6)	Polystyrene (expanded form / foam)
	ABS/SAN (7)	Acrylonitrile Butadiene Styrene
	PU (7)	Polyurethane
	Nylon (7)	Nylon
	Mixed plastic packaging	Recyclable plastic packaging (PET, HDPE, PVC, etc.)
	Hard plastic (not packaging)	Mixed hard plastics
	Plastics—other or mixed	Mixture of the above and/or unmarked plastics
Metals	Metals—Ferrous Steel—packaging	Cans
	Metals—Ferrous Steel—Steel—non-packaging	Bars, pipes, etc.
	Metals—Non-ferrous—Aluminium—packaging	Cans and foil
	Metals—Non-ferrous—Aluminium—non-packaging	Bars, tubes, etc.
	Metals—Non-ferrous—Other metals	Copper, zinc, etc.
Organics *	Food waste	Kitchen scraps, unsold food products (unpackaged)
	Garden waste	Leaves, branches, grass clippings, foliage, flowers
	Food and garden organics (FOGO)	Combined food and garden waste collected in kerbside collections (FOGO)
	Organics from mixed municipal waste	Organic outputs from the mechanical biological treatment of mixed putrescible waste
	Forestry waste	Barks and sawdust (from forestry activities)

Category (Tier 1)	Sub-category (Tier 2)	Sub-category description
	Agricultural waste (excluding manure)	Includes animal bedding, animal mortalities, paunch and straw.
	Manures	Raw, untreated animal manure
	Biosolids	Solid organic outputs from processing sewage
	Urban wood, timber, sawdust (also C&D waste)	Wood / timber / sawdust from commercial and industrial activities or construction and demolition activities
	Fats & grease	Waste fats, grease, greasetrap sludge, biodegradable sludges, waste cooking oil, etc.
	Product—Composted Soil Conditioner	Pasteurised material resulting from the controlled microbiological transformation of compostable organic waste under aerobic and thermophilic conditions for not less than six weeks.
	Product—Pasteurised Soil Conditioner	An organic product that has undergone pasteurisation but is relatively immature and lacking in stability
	Product—Composted Mulch	Dry green waste that has been processed by way of chipping, shredding or similar mechanical process, but does not contain putrefying material. Composted mulch has undergone a full composting process.
	Product—Pasteurised Mulch	Mulch that has only undergone a pasteurising process.
	Product—Raw mulch	Dry green waste that has been processed by way of chipping, shredding or similar mechanical process, but does not contain putrefying material. Has not undergoing any further processing.
	Product—Manufactured Soil	Soil that has been specially prepared by blending or additives to achieve set specifications.
	Product—Potting Mixes	Potting mix (or potting soil) is soil that is specially prepared to help plants to grow, especially in containers.
	Product—Playground Surfacing	Recycled organic material that meets the specification in AS/NZS 4422:1996 Playground surfacing—Specifications, requirements and test method.
	Product—biogas	Biogas from processing, used for heat and/or electricity production
	Product—solid biofuel	Processed organic waste sold as solid fuel
	Product—Composted manures	Animal manures that have undergone a full composting process.
Product—Aged / raw manures	Animal manures that have not undergone a composting or pasteurisation process.	
Other organic materials	Other biodegradable organic waste not already listed (please specify).	
Rubber	Tyres	All rubber tyres. Does not include metal rim or hub-caps
	Other rubber, including conveyor belts	All other rubber
C&D waste *	Sand / soil	Clean sand or soil
	Rubble / aggregate <150mm	Stones, etc. also includes clean, processed C&D recycled product less than 150mm in diameter
	Rubble / aggregate > 150mm	Stones, etc. also includes clean, processed C&D recycled product more than 150mm in diameter
	Bricks	Whole or broken bricks
	Concrete	Concrete or cement
	Bitumen	Waste bitumen or asphalt
	Plasterboard	Plasterboard or gypsum
	Masonry material	Mixed concrete, brick, etc.
	Mixed C&D waste *	Mixed construction and demolition waste, sometimes referred to as “inert” waste
	Mixed inert waste *	Type 1 inert waste as defined in Landfill Waste Classification and Waste Definitions 1996 (as amended 2018)

Category (Tier 1)	Sub-category (Tier 2)	Sub-category description
Textiles	Mixed textiles	Cloth, rags, clothes
	Leather	Items mainly leather
	Foam rubber	Includes polyurethane or latex.
	Carpets	Carpets
	Mattresses	Mattresses
Mixed putrescible waste *	Mixed putrescible waste—domestic (household) *	Mixed putrescible waste—domestic (household)
	Mixed putrescible waste—Commercial & Industrial *	Mixed putrescible waste—Commercial & Industrial
		Mixed putrescible waste—Commercial & Industrial—Wet (with food)
		Mixed putrescible waste—Commercial & Industrial—Dry (no food)
Mixed putrescible—other *	Putrescible waste as defined in Landfill Waste Classification and Waste Definitions 1996 (as amended 2018)	
Mixed dry recyclables *	Co-mingled recycling *	Containers, paper and cardboard collected from households and commercial premises.
	Mixed industrial recyclables	Dry recyclable material collected from commercial and industrial premises. Includes mixed cardboard / plastic film collections. Includes mixed timber / steel / cardboard collections.
Bulky Wastes	Electric & electronic goods	Televisions, computers and associated electronics (printers, DVD players, etc.) Electric tools, vacuum cleaners, etc.
	Mattresses	Mixed steel, foam and cloth mattresses
	Whitegoods	Fridges, washing machines, dryers
	Furniture	Mixed material furniture, e.g. lounge chairs
Hazardous	Batteries	Personal and car batteries
	Paint	Recovered paint—may include containers
	Household chemicals	Household chemicals recovered through Household Hazardous Waste collections
	Fluorescent lights	Include CFLs and fluorescent tubes
	Waste Oil	Waste oil collected through waste oil collections and through Household Hazardous Waste Collections, such lubricating oil, mechanical oil.
	Asbestos	Includes asbestos fencing, pipes, insulation.
Contaminated soil	Clinical waste	Includes all medical and veterinary waste
	Contaminated soil	Soil from a contaminated site, as defined by the <i>Contaminated Sites Act 2003</i> .
Other*	Fly ash	Ash produced by burning of coal or other materials
	Other	Waste not otherwise specified (please specify)

*Only use denoted category for waste received, collected and/or disposed. Denoted category not to be used for recycled products.

Appendix B—Default values

Note: Liable local governments must use facility-specific values where this information is available. The default values provided can be used where facility-specific data is not available.

Table 1: Volume by vehicle type

Vehicle type	Assumed volume (cubic metres)	Assumed weight for mixed reportable waste (tonnes)
Single axle trailer, ute, car and van	1	0.3
Small open truck	6	1.8
Large open truck	20	6
Compactor garbage truck	10	4.25

Table 2: Default bulk densities

Reportable waste material category	Default bulk density (t/m ³)
Paper	0.2
Cardboard	0.1
Plastics	0.14
Metals—Ferrous	0.5
Metals—Non-ferrous	0.14
Glass	0.347
Concrete	1.5
Bricks	1.2
Soil, sand, clean fill	1.3
Organics—Garden organics	0.15
Organics—Food organics	0.5
Organics—Timber / wood	0.19
Organics—other organics	0.3
Rubber/tyres	0.3
Textiles	0.15
Hazardous—asbestos	0.31
Hazardous—other	0.2
Mixed co-mingled recyclables (uncompacted)	0.063
Other / mixed—putrescible	0.3
Other /mixed—inert	1.1
Mixed building waste in skip bins	0.7

Table 3: Default composition of recycling collections (post-MRF)

Note: this default composition is only to be used if the information is not available from the liable local government's recycling facility. Liable local governments should request a breakdown of materials recycled from co-mingled collection from their recycler(s), if relevant, to fulfil their reporting obligations.

Reportable waste material category	Composition of co-mingled recycling bin wt% (post-MRF)
Paper	20
Cardboard	20
Plastics	10
Glass	10
Ferrous metal	3
Non-ferrous metal	2
Other	35

Source: Compiled from several WA waste audits and historical Local Government Census data.

Default waste generation rates

Where a liable non-metropolitan local government is using the waste estimation method outlined in clause 8.1.2.3, the following default waste generation rates may be applied—

- 0.6 tonnes per person per year
- 1.47 tonnes per household per year

Table 4: Local Government Default Cost Data

Where a liable non-metropolitan local government with less than 5000 ERP cannot estimate its costs, it may use the following default values for the purposes of reporting.

Kerbside collection cost	\$200 per service per household per year
Vergeside cost	\$15 per household per service
Rural drop-off cost	\$215 per tonne received

Appendix C—Worked examples

Example 1—Combined bin collections

Example—Kerbside collection service collects from households (domestic), small businesses (commercial) and public place reportable waste collected together.

Households have 7,000 weekly collections of 240L MGB, commercial premises have 200 weekly collections of 240L MGBs and 400 twice-weekly collections of 240L MGBs, public place has 25 weekly collections of 240L bins.

$$\text{Proportion of domestic} = \frac{\text{domestic annual bin capacity}}{(\text{domestic} + \text{commercial} + \text{public place}) \text{ annual bin capacity}}$$

Annual domestic premises bin capacity is

$$\text{Domestic bin capacity (L)} = 7000 \times 240 \times 52 = 87360000$$

Annual commercial premises bin capacity is

$$\text{Commercial bin capacity (L)} = (200 \times 240 \times 52) + (400 \times 240 \times 52 \times 2) = 12480000$$

Annual public place bin capacity is

$$\text{Public place bin capacity (L)} = 25 \times 240 \times 52 = 312000$$

TOTAL annual bin capacity is 100,152,000 L

The relative proportions for each waste stream are

Domestic	87%
Commercial	12%
Public place	0.3%

Example 2—Recycling

Example—Amount recycled from green waste collection

During the year, City of HUK collected 245 tonnes through its kerbside greenwaste collection, with a contamination rate of 15%. It also collected 67 tonnes through its annual green waste vergeside collection and 83 tonnes via its green waste drop-off facility.

$$\text{Amount of green waste recycled} = 85\% \times 245 + 67 + 83 = 358.25$$

$$\text{Amount of disposed as contamination} = 15\% \times 245 = 36.75$$

References

1. DWER Local Government Waste and Recycling Census 2016-17
2. DWER (2018) Approved manner for estimating the volume or weight of waste received at and disposed of to landfills *Waste Avoidance and Resource Recovery Levy Regulations 2008*
3. NSW EPA (2018) Waste Levy Guidelines
4. SA EPA (2012) Compost Guideline: draft for Public Consultation
5. UK Environment Agency (1998) *UK Density Conversion Factors for Waste*. <https://www.sepa.org.uk/media/163323/uk-conversion-factors-for-waste.xlsx>
6. Victoria EPA, *Waste Materials Density Data* <https://www.epa.vic.gov.au/business-and-industry/lower-your-impact/~media/Files/bus/EREP/docs/wastematerials-densities-data.pdf>.
7. WA Waste Authority *Converting volumes to tonnes*. <http://www.wasteauthority.wa.gov.au/media/files/documents/GN6VoltoTonnes.pdf>
8. Zero Waste SA, Solid Waste and Recycling Reporting Template

WASTE AVOIDANCE AND RESOURCE RECOVERY REGULATIONS 2008**INFORMATION REQUIRED FOR AN ANNUAL RETURN OF NON-METROPOLITAN LANDFILLS****PERSON WHO DESCRIBES INFORMATION REQUIRED FOR AN ANNUAL RETURN**

I, Mike Rowe, in my capacity as the chief executive officer of the department principally assisting the Minister for Environment in the administration of the *Waste Avoidance and Resource Recovery Act 2007*¹ (CEO) hereby describes in this notice the information relating to reportable² waste or recycling reportable waste that is required to be provided in an annual return and the procedures to be followed to record and calculate or estimate that information pursuant to regulations 18C and 18D(1) of the *Waste Avoidance and Resource Recovery Regulations 2008*.

PERSON REQUIRED TO PROVIDE AND USE INFORMATION IN THIS NOTICE

In this notice, a person is a *liable person* as described under regulations 18B(1) and 18B(4) of the *Waste Avoidance and Resource Recovery Regulations 2008* if they are a licensee, or a person who is the occupier of premises that would, if the person held a licence in respect of the relevant premises, be a licensed landfill—

- (a) if at least 20 000 tonnes of reportable waste is received in a financial year at the licensed landfill or the relevant premises; and
- (b) if the licensed landfill is, or the relevant premises are, outside the metropolitan region,

For the purpose of this notice, these persons will be hereafter referred to as “liable non-metropolitan landfills”.

A licensed landfill premises is a premises specified in category 63, 64 or 65 of the *Environmental Protection Regulations 1987*, Schedule 1, in respect of which a licence is held.

A liable non-metropolitan landfill is subject to Part 3A of the *Waste Avoidance and Resource Recovery Regulations 2008* pursuant to regulation 18B(1). Under regulation 18C of Part 3A, a liable non-metropolitan landfill is required to make and lodge an annual return relating to reportable waste or the recycling of reportable waste containing information as required by this notice under regulation 18D.

PREMISES OR LICENSED LANDFILL

The liable non-metropolitan landfill must inform the CEO in a form approved in writing by the CEO³ of the premises or the licensed landfill in respect of which the person is a liable person pursuant to regulation 18B(5)(b) of the *Waste Avoidance and Resource Recovery Regulations 2008*.

INFORMATION REQUIRED FOR THE ANNUAL RETURN—REGULATIONS 18C AND 18D

For the purposes of making an annual return under regulation 18C of the *Waste Avoidance and Resource Recovery Regulations 2008*, the liable non-metropolitan landfill must include the following information in that annual return, and record that information pursuant to regulations 18D(1)(b)(i) and 18D(5).

1. All liable non-metropolitan landfills must record and report the following data against the approved waste material categories, in tonnes—

- total weight of waste received;
- total weight of waste received from each waste source sector (municipal; commercial and industrial; or construction and demolition)
- total weight of waste removed from the site;
- total weight of waste disposed to landfill;
- total weight of material removed from the site and the destination of the material (used on-site; recycling; waste-to-energy; or disposal to landfill);
- total weight received by geographical location (received from the metropolitan region but to which are exempt from the levy under the *Waste Avoidance and Resource Recovery Levy Regulations 2008*; received from Peel region, received from other regions);
- total weight of stockpiled processed waste at the start and end of the financial year; and
- total weight of stockpiled unprocessed waste at the start and end of the financial year.

2. Liable non-metropolitan landfills must calculate or estimate the information by virtue of regulation 18D(1)(b)(ii) of the *Waste Avoidance and Resource Recovery Regulations 2008* required in item 1 using the *Approved procedure for estimation/calculation of annual return information for non-metropolitan landfills receiving more than 20,000 tonnes of waste per annum required under the Waste Avoidance and Resource Recovery Regulations 2008* at Attachment 1 of this notice, which forms part of this notice.

¹ The “department principally assisting the Minister for Environment in the administration of the *Waste Avoidance and Resource Recovery Act 2007*” is currently the Department of Water and Environmental Regulation.

² Regulation 18A of the *Waste Avoidance and Resource Recovery Regulations 2008* defines **reportable waste** to mean waste that is solid matter.

³ The term “approved” is defined in regulation 3 of the *Waste Avoidance and Resource Recovery Regulations 2008* to mean approved by the CEO in writing. The Department of Water and Environmental Regulation is developing an approved form (an online reporting system) for reporting which it will release by 30 June 2020.

3. Liable non-metropolitan landfills must make and submit their return in the approved⁴ form.
4. Liable non-metropolitan landfills must, by virtue of regulation 18D(1)(b)(i) of the *Waste Avoidance and Resource Recovery Regulations 2008*, keep and records relevant to the calculation, estimation and/or verification of the information reported in its annual return in a legible written form, or so as to be readily convertible into such a form, for a period of not less than 5 years from the day on which the record was made.

CURRENT REPORTING AND LIABILITY

For the 2019-20 financial year, the CEO requires liable non-metropolitan landfills to make and lodge an annual return containing the information required under this notice with the CEO by 1 October 2020 in the approved⁵ form.

There are a number of offences provided for under regulation 18E of the *Waste Avoidance and Resource Recovery Regulations 2008* for breaches by liable non-metropolitan landfills under regulations 18B, 18C and 18D, carrying a fine of \$10,000.

MIKE ROWE, Chief Executive Officer,
Department of Water and Environmental Regulation.

25 June 2019.

Attachment 1

Approved procedure for estimation/calculation of annual return information for non-metropolitan landfills receiving more than 20,000 tonnes of waste per annum required under the *Waste Avoidance and Resource Recovery Regulations 2008*

Approved procedure of the CEO of the department principally assisting the Minister for Environment in the administration of the *Waste Avoidance and Resource Recovery Act 2007* as required under regulation 18D of the *Waste Avoidance and Resource Recovery Regulations 2008*

June 2019

Contents

- 1 Objective
- 2 Background
- 3 CEO approved methods
- 4 Reportable waste material categories
- 5 Hierarchy of approved methods
- 5.1 1st approved method—Estimation by weight
- 5.2 2nd approved method—Volume estimation
- 6 Estimating the weight of stockpiles
- 6.1 1st approved method—Estimation by weight
- 6.2 2nd approved method—Estimation by mass balance
- 6.3 3rd approved method—Volumetric survey
- 6.4 4th approved method—Estimation by physical measurement
- 7 Estimating bulk density of material categories
- 8 Estimating the amount of waste disposed at the landfill
- 9 Source of waste
- 10 Destination/fate of waste
- 11 Default values
- 12 Alternative methods
- 13 Glossary

1 Objective

To establish the procedure of the chief executive officer of the department principally assisting the Minister for Environment in the administration of the *Waste Avoidance and Resource Recovery Act 2007*⁶ (CEO) for estimating and calculating information to be reported in an annual return under regulations 18C and 18D(1) of the *Waste Avoidance and Resource Recovery Regulations 2008* (WARR Regulations).

This is document is intended for liable persons, as defined by regulation 18B(4) of the WARR Regulations, who are licensees, or persons who are the occupiers of premises (the relevant premises) that would, if the person held a licence in respect of the relevant premises, be a licensed landfill—

- (a) if at least 20 000 tonnes of reportable waste is received in a financial year at the licensed landfill or the relevant premises; and
- (b) if the licensed landfill is, or the relevant premises are, outside the metropolitan region.

A licensed landfill premises is a premises specified in category 63, 64 or 65 of the *Environmental Protection Regulations 1987*, Schedule 1, in respect of which a licence is held.

⁴ The term “approved” is defined in regulation 3 of the *Waste Avoidance and Resource Recovery Regulations 2008* to mean approved by the CEO in writing. The Department of Water and Environmental Regulation is developing an approved form (an online reporting system) for reporting which it will release by 30 June 2020.

⁵ See footnote 4 above.

⁶ The “department principally assisting the Minister for Environment in the administration of the *Waste Avoidance and Resource Recovery Act 2007*” is currently the Department of Water and Environmental Regulation.

For the purpose of this document, these persons will be hereafter referred to as liable non-metropolitan landfills.

2 Background

The WARR Regulations require liable persons to make and lodge annual returns with the CEO on or before 1 October in each year. The annual returns must contain information for the most recently completed financial year relating to reportable waste or the recycling of reportable waste⁷, as required by the notice under regulation 18D(1) (Notice).

The WARR Regulations require annual returns to be prepared using procedures for the purposes of calculation or estimation methods described and approved by the CEO in the Notice.

3 CEO approved methods

This document provides the procedure to be followed by liable non-metropolitan landfills for the purposes of the calculation or estimation methods that liable non-metropolitan landfills are required to use to prepare their annual returns under regulation 18C of the WARR Regulations.

This document forms a part of the Notice approved by the CEO.

4 Reportable waste material categories

Liable non-metropolitan landfills must categorise and report waste information reported using the following approved reportable waste material categories provided Appendix A.

Liable non-metropolitan landfills must seek the Department of Water and Environmental Regulation's (DWER) approval to prepare their returns using more detailed categories, consistent with their own activities and record-keeping. Where alternative categories are proposed, liable non-metropolitan landfills must demonstrate how these align to the categories in Appendix A.

An annual waste composition study will be required where the liable non-metropolitan landfill only receives and records reportable waste in categories that do not align with the waste material categories in Appendix A. The study is to be conducted over a period of at least five days.

5 Hierarchy of approved methods

This clause provides a hierarchy of approved methods that liable non-metropolitan landfills must use to prepare their annual returns as part of the required procedure under regulation 18D(b)(ii) of the WARR Regulations.

Methods used by liable non-metropolitan landfills receiving reportable waste subject to the waste levy, must be consistent with the requirements under the *Waste Avoidance and Resource Recovery Levy Regulations 2008*. The hierarchy below applies to reportable waste not subject to the waste levy.

Liable non-metropolitan landfills must choose the method to be used based on the best-available information. That is, the non-metropolitan landfill must use the "highest" preferred method for which the data is available.

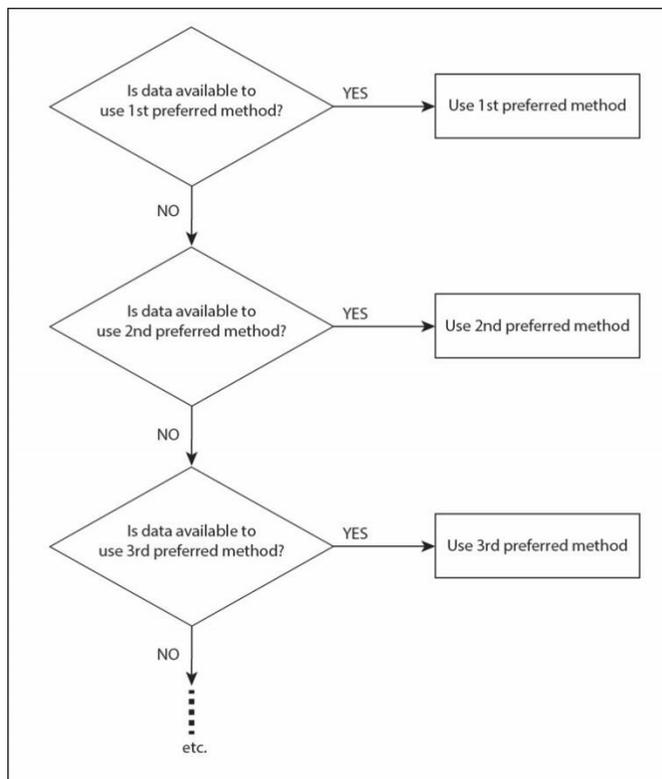


Figure 1: Hierarchy of approved methods

⁷ Regulation 18A of the *Waste Avoidance and Resource Recovery Regulations 2008* defines **reportable waste** to mean waste that is solid matter.

5.1 1st approved method—Estimation by weight

The most preferred method for estimating the amount of reportable waste received, disposed and leaving the facility is for the reportable waste to be weighed at the point of entry or departure at the facility. Where a calibrated weighbridge, load cell or scales is installed at the facility, all compacted waste loads and all waste loads of more than one cubic metre in volume received at and leaving the site will be weighed. Volume estimation (see clause 5.2) may be used for small loads under one cubic metre in size (i.e. loads transported in cars and utes).

Equation 1: Estimating total annual weight of waste by weighing each load

$$\text{Annual waste} = \sum (\text{weight of load})$$

Table 1: Data to be collected for estimation by weight

Data required to be collected	Data sources
Total weight of each load	Weighbridge records
Material type of each load	Weighbridge records

Load cells and scales do not need to be verified for trade, as defined by *National Measurement Act 1960*, for measurement for reporting under regulation 18C of the WARR Regulations. However, where the weight is used as a basis for charging or paying customers (including the waste levy), measuring equipment must still be verified under the *National Measurement Act 1960*.

5.2 2nd approved method—Volume estimation

Where weighing reportable waste is not possible, for example for facilities without a weighbridge or where a weighbridge is inoperable, the volume-estimation method must be used. The volume assessment method requires that each waste load entering and leaving the facility is assessed for material type and volume. Approved default values for vehicle volumes and bulk densities for DWER approved material categories are in Appendix B.

Equation 2: Estimating annual weight from volume

$$\text{Annual waste} = \sum (\text{volume of load} \times \text{density of waste})$$

Table 2: Data to be collected for estimation by volume

Data required	Data sources
Volume of each vehicle / container	Gatehouse records
% capacity of vehicle / container	Estimated for each load as it arrives—default is 100%
Material category of each load (e.g. mixed waste, green waste)	Determined by gatehouse operator as load arrives

For liable non-metropolitan landfills without a weighbridge receiving reportable waste subject to the waste levy, the volume or weight must be estimated using the method provided in the waste levy approved manner *Approved manner for estimating the volume or weight of waste received at and disposed of to landfills: Waste Avoidance and Resource Recovery Levy Regulations 2008*, available at www.der.wa.gov.au/images/documents/your-environment/waste/WARR_Landfill/Approved-manner_12June2018.pdf.

6 Estimating the weight of stockpiles

6.1 1st approved method—Estimation by weight

The first approved method is to weigh material stored in stockpiles. Weighing equipment does not need to be trade certified.

6.2 2nd approved method—Estimation by mass balance

The second most preferred method for calculating the net weight of the stockpiles for the year is using the mass balance approach. That is, determining whether the amount of the stockpiled reportable waste grew or reduced over the year by comparing it to the amount of stockpiled reportable waste at the start of the year.

Equation 3: Estimating annual weight of stockpiles

$$\text{Weight}_{\text{stockpile}} = \text{Weight}_{\text{original}} + \text{Weight}_{\text{received}} - \text{Weight}_{\text{left site}} - \text{Weight}_{\text{contamination removed}} - \text{Weight}_{\text{used on-site}}$$

This method is preferred for facilities with a weighbridge. However, it is only suitable for non-degradable material, such as concrete, dry recyclables, etc. Volume estimation should be used to determine the amount of material in organic waste stockpiles at the end of the financial year (see clauses 6.3 and 6.4).

6.3 3rd approved method—Volumetric survey

If not all reportable waste added to the stockpile or removed and produced from the stockpile has been weighed, a volumetric survey may be used to estimate the amount of waste contained in stockpiles. Volumetric surveys should be used to estimate the amount of organic waste stockpiled on-site at the end of the reporting period. Volumetric surveys are not required to be conducted by a qualified surveyor. For example, surveys may be conducted using a drone or a stockpile measurement App.

Volumetric surveys should be conducted as close to the end of the reporting period as possible.

The volume is converted to weight by multiplying the volume by the bulk density of the material.

6.4 4th approved method—Estimation by physical measurement

Where only a small amount of material is stored on-site (<200m³), the stockpile volume may be estimated by measuring the circumference of the base of the stockpile and the height of the stockpile.

If the material is stored in baled cubes, the amount of material stockpiled is the area multiplied by the height.

If the stockpiles are conical in shape, the amount of material stockpiles can be estimated as the circumference at the base multiplied by the height, then divided by 6.

7 Estimating bulk density of material categories

Facilities without a weighbridge, or where the weighbridge is inoperable for six months or more in one year, must conduct a bulk density survey at their premises to determine the bulk density of the various reportable waste material category loads entering and leaving the facility. A detailed report of the bulk density survey, including raw data, must be submitted to DWER with the next annual data report following conducting the survey.

Where a weighbridge is inoperable for less than six months in one year, DWER approved default values for waste material bulk densities and vehicle/container volumes may be used. These are provided in Appendix B.

8 Estimating the amount of waste disposed at the landfill

For reportable waste received that is disposed directly to landfill on entering the facility, the relevant approved methods for estimating weight set out in clause 5 must be used.

Where reportable waste is stored for recycling or re-use, with some of the load removed and disposed to landfill (e.g. contamination is removed from green waste), the following methods for estimating reportable waste disposed to landfill may be used—

- weighed over the weighbridge (see clause 5.1);
- a mass balance of reportable waste entering and leaving the facility; or
- volume assessment method (see clause 5.2).

9 Source of waste

The source of each load entering or leaving the facility must be recorded by waste stream—

- municipal solid waste (MSW);
- commercial and industrial waste (C&I) waste; or
- construction and demolition waste (C&D) waste.

and by geographic source—

- Perth metropolitan region;
- Peel region; or
- other regions.

Where possible, the waste stream in which the waste was generated should be recorded, otherwise it is recorded as the waste stream in which the waste was collected.

10 Destination/fate of waste

Liable non-metropolitan landfills are required to report what happens to the reportable waste received at the facility.

The options for the fate of reportable waste are: used on-site, landfilled, recycled, stockpiled or waste-to-energy.

The categories for geographical destination of the waste are: local, exported interstate or exported overseas.

11 Default values

For liable non-metropolitan landfills receiving reportable waste subject to the waste levy (i.e. sourced from or disposed in the metropolitan area), the default vehicle amounts to be used are those in the waste levy approved manner *Approved manner for estimating the volume or weight of waste received at and disposed of to landfills: Waste Avoidance and Resource Recovery Levy Regulations 2008*, available at www.der.wa.gov.au/images/documents/your-environment/waste/WARR_Landfill/Approved-manner_12June2018.pdf.

Liable non-metropolitan landfills that do not receive reportable waste subject to the levy may use facility-specific values where this information is available (see also clause 12). Approved default values for estimating volume for various vehicle types and bulk densities for various reportable waste material categories are been provided in Appendix B. These default values can be used where facility-specific data is not available.

12 Alternative methods

Liable non-metropolitan landfills may propose alternative methods for the following if these are more accurate than the methods set out above—

- estimating the amount of reportable waste received, removed and disposed
- estimating the bulk density

- estimating the reportable waste composition
- estimating the source waste stream

Any alternative methods proposed must be accurate, repeatable and consistent.

Liable non-metropolitan landfills may also propose alternative default values to those listed in Appendix B. Liable non-metropolitan landfills must submit alternative methods or default values, with relevant substantiating information, to DWER at waste.data@dwer.wa.gov.au for consideration and approval prior to use in the annual return.

13 Glossary

Acronym / symbol	Definition
Σ	Sum of
t	Tonnes
m ³	Cubic metres
C&I	Commercial and Industrial waste—Solid waste generated by the business sector, State and Federal Government entities, schools and tertiary institutions
DWER	Department of Water and Environmental Regulation
Landfilled waste	All waste buried in landfill. This includes waste material used as daily cover.
MSW	Municipal solid waste—Solid waste generated from domestic (residential) premises and local government activities
Peel Region	The Peel region is the area defined by the Peel Region Scheme (May 2013).
Perth Metropolitan Region	The Perth region, or Perth metropolitan region, is the area defined by the Metropolitan Region Scheme (June 2014).
Recycling	Recycling: A waste fate in which solid wastes are collected, sorted, processed (including through composting), and converted into raw materials to be used in the production of new products. For data reporting purposes, recycling— <ul style="list-style-type: none"> • excludes materials in stockpiles of unprocessed waste materials • includes all materials processed for recycling, whether they are quickly sold or used, or stockpiled for later sale or use • excludes residuals that are sent to landfill or otherwise disposed of.
Reportable waste	Means waste that is solid matter under regulation 18A of the <i>Waste Avoidance and Resource Recovery Regulations 2008</i>
Resource Recovery	The process of extracting materials or energy from a waste stream through re-use, reprocessing, recycling or recovering energy from waste.
Stockpiling	Temporary storage of waste or waste products for future sale, resource recovery or disposal. Materials are not to be stored on-site for a period of more than 2 years.

Appendices

Appendix A—Approved reportable waste material categories

Table 1. Approved reportable waste material categories

Category (Tier 1)	Sub-category (Tier 2)	Sub-category description
Paper	White office paper	High quality white office paper
	Old Newsprint (ONP)	Newspapers
	Magazines	Magazines and booklets
	Liquid Paperboard (LPB)	Milk and juice cartons made from liquid paperboard
	Paper—mixed	Combination of the above categories
Cardboard	Cardboard / paper packaging	Corrugated and flat cardboard. Excludes non-recyclable waxed and coated cardboard.
Mixed paper/ cardboard	Mixed paper/cardboard	Paper and cardboard collected together.
Glass	Glass packaging—mixed	Glass jars and bottles
	Glass—construction	Glass windows and tiles
	Glass—other	Wine glasses, etc.
Plastic *	PET (1)	Polyethylene terephthalate
	HDPE (2)	High Density Polyethylene
	PVC (3)	Poly-vinyl Chloride

Category (Tier 1)	Sub-category (Tier 2)	Sub-category description
	PE-LD/LLD (4)	Low Density Polyethylene
	PP (5)	Polypropylene
	PS (6)	Polystyrene (hard form)
	PS-E (6)	Polystyrene (expanded form / foam)
	ABS/SAN (7)	Acrylonitrile Butadiene Styrene
	PU (7)	Polyurethane
	Nylon (7)	Nylon
	Mixed plastic packaging	Recyclable plastic packaging (PET, HDPE, PVC, etc.)
	Hard plastic (not packaging)	Mixed hard plastics
	Plastics—other or mixed	Mixture of the above and/or unmarked plastics
Metals	Metals—Ferrous Steel—packaging	Cans
	Metals—Ferrous Steel—Steel—non-packaging	Bars, pipes, etc.
	Metals—Non-ferrous—Aluminium—packaging	Cans and foil
	Metals—Non-ferrous—Aluminium—non-packaging	Bars, tubes, etc.
	Metals—Non-ferrous—Other metals	Copper, zinc, etc.
Organics *	Food waste	Kitchen scraps, unsold food products (unpackaged)
	Garden waste	Leaves, branches, grass clippings, foliage, flowers
	Food and garden organics (FOGO)	Combined food and garden waste collected in kerbside collections (FOGO)
	Organics from mixed municipal waste	Organic outputs from the mechanical biological treatment of mixed putrescible waste
	Forestry waste	Barks and sawdust (from forestry activities)
	Agricultural waste (excluding manure)	Includes animal bedding, animal mortalities, paunch and straw.
	Manures	Raw, untreated animal manure
	Biosolids	Solid organic outputs from processing sewage
	Urban wood, timber, sawdust (also C&D waste)	Wood / timber / sawdust from commercial and industrial activities or construction and demolition activities
	Fats & grease	Waste fats, grease, greasetrap sludge, biodegradable sludges, waste cooking oil, etc.
	Product—Composted Soil Conditioner	Pasteurised material resulting from the controlled microbiological transformation of compostable organic waste under aerobic and thermophilic conditions for not less than six weeks.
	Product—Pasteurised Soil Conditioner	An organic product that has undergone pasteurisation but is relatively immature and lacking in stability
	Product—Composted Mulch	Dry green waste that has been processed by way of chipping, shredding or similar mechanical process, but does not contain putrefying material. Composted mulch has undergone a full composting process.
	Product—Pasteurised Mulch	Mulch that has only undergone a pasteurising process.
	Product—Raw mulch	Dry green waste that has been processed by way of chipping, shredding or similar mechanical process, but does not contain putrefying material. Has not undergoing any further processing.
	Product—Manufactured Soil	Soil that has been specially prepared by blending or additives to achieve set specifications.
Product—Potting Mixes	Potting mix (or potting soil) is soil that is specially prepared to help plants to grow, especially in containers.	

Category (Tier 1)	Sub-category (Tier 2)	Sub-category description	
	Product—Playground Surfacing	Recycled organic material that meets the specification in AS/NZS 4422:1996 Playground surfacing—Specifications, requirements and test method.	
	Product—biogas	Biogas from processing, used for heat and/or electricity production	
	Product—solid biofuel	Processed organic waste sold as solid fuel	
	Product—Composted manures	Animal manures that have undergone a full composting process.	
	Product—Aged / raw manures	Animal manures that have not undergone a composting or pasteurisation process.	
	Other organic materials	Other biodegradable organic waste not already listed (please specify).	
Rubber	Tyres	All rubber tyres. Does not include metal rim or hub-caps	
	Other rubber, including conveyor belts	All other rubber	
C&D waste *	Sand / soil	Clean sand or soil	
	Rubble / aggregate <150mm	Stones, etc. also includes clean, processed C&D recycled product less than 150mm in diameter	
	Rubble / aggregate > 150mm	Stones, etc. also includes clean, processed C&D recycled product more than 150mm in diameter	
	Bricks	Whole or broken bricks	
	Concrete	Concrete or cement	
	Bitumen	Waste bitumen or asphalt	
	Plasterboard	Plasterboard or gypsum	
	Masonry material	Mixed concrete, brick, etc.	
	Mixed C&D waste *	Mixed construction and demolition waste, sometimes referred to as “inert” waste	
Textiles	Mixed inert waste *	Type 1 inert waste as defined in Landfill Waste Classification and Waste Definitions 1996 (as amended 2018)	
	Mixed textiles	Cloth, rags, clothes	
	Leather	Items mainly leather	
	Foam rubber	Includes polyurethane or latex.	
	Carpets	Carpets	
Mixed putrescible waste *	Mattresses	Mattresses	
	Mixed putrescible waste—domestic (household) *	Mixed putrescible waste—domestic (household)	
	Mixed putrescible waste—Commercial & Industrial *	Mixed putrescible waste—Commercial & Industrial	Mixed putrescible waste—Commercial & Industrial
		Mixed putrescible waste—Commercial & Industrial—Wet (with food)	Mixed putrescible waste—Commercial & Industrial—Wet (with food)
Mixed putrescible waste—Commercial & Industrial—Dry (no food)		Mixed putrescible waste—Commercial & Industrial—Dry (no food)	
Mixed putrescible—other *	Putrescible waste as defined in Landfill Waste Classification and Waste Definitions 1996 (as amended 2018)		
Mixed dry recyclables *	Co-mingled recycling *	Containers, paper and cardboard collected from households and commercial premises.	
	Mixed industrial recyclables	Dry recyclable material collected from commercial and industrial premises. Includes mixed cardboard / plastic film collections. Includes mixed timber / steel / cardboard collections.	
Bulky Wastes	Electric & electronic goods	Televisions, computers and associated electronics (printers, DVD players, etc.) Electric tools, vacuum cleaners, etc.	
	Mattresses	Mixed steel, foam and cloth mattresses	
	Whitegoods	Fridges, washing machines, dryers	
	Furniture	Mixed material furniture, e.g. lounge chairs	

Category (Tier 1)	Sub-category (Tier 2)	Sub-category description
Hazardous	Batteries	Personal and car batteries
	Paint	Recovered paint—may include containers
	Household chemicals	Household chemicals recovered through Household Hazardous Waste collections
	Fluorescent lights	Include CFLs and fluorescent tubes
	Waste Oil	Waste oil collected through waste oil collections and through Household Hazardous Waste Collections, such as lubricating oil, mechanical oil.
	Asbestos	Includes asbestos fencing, pipes, insulation.
	Clinical waste	Includes all medical and veterinary waste
Contaminated soil	Contaminated soil	Soil from a contaminated site, as defined by the <i>Contaminated Sites Act 2003</i> .
Other*	Fly ash	Ash produced by burning of coal or other materials
	Other	Waste not otherwise specified (please specify)

*Only use denoted category for waste received, collected and/or disposed. Denoted category not to be used for recycled products.

Appendix B—Default values

Note: Liable non-metropolitan landfills must use facility-specific values where this information is available. The default values provided can be used where facility-specific data is not available.

Table 1: Default vehicle volumes

Vehicle type	Assumed volume (m ³)
Small vehicle (car, ute, van, trailer)	1
Open truck—small, 2 axles	3
Open truck—large 2 axles	6
Open truck—3 axles	10
Open truck—4 axles	12
Open truck—5 axles	18
Open truck—6 axles	20
Open truck—8 axles	20
Open truck—9 axles	32
Open truck—11 axles	40
Compactor truck—volume unknown	10

Source: DWER (2018) *Approved manner for estimating the volume or weight of waste received at and disposed of to landfills Waste Avoidance and Resource Recovery Levy Regulations 2008*

Table 2: Default bulk densities

Reportable waste material category	Default bulk density (t/m ³)
Paper	0.2
Cardboard	0.1
Plastics	0.14
Metals—Ferrous	0.5
Metals—Non-ferrous	0.14
Glass	0.347
Concrete	1.5
Bricks	1.2
Soil, sand, clean fill	1.3
Organics—Garden organics	0.15
Organics—Food organics	0.5
Organics—Timber / wood	0.19
Organics—other organics	0.3
Rubber/tyres	0.3
Textiles	0.15
Hazardous—asbestos	0.31
Hazardous—other	0.2

Reportable waste material category	Default bulk density (t/m ³)
Mixed co-mingled recyclables (uncompacted)	0.063
Other / mixed—putrescible	0.3
Other /mixed—inert	1.1
Mixed building waste in skip bins	0.7

Appendix C—Examples of using methods

Example 1—Estimation of weight by volume

$$\text{Annual waste} = \sum (\text{volume of load} \times \text{density of waste})$$

Table 1. Data recorded and calculations

Individual load	Load volume (cubic metres)	% fullness	Source waste stream	Geographic source	Material category	Fate	Material bulk density (t/m ³)	Weight (tonnes)
Load 1	15	100%	MSW	Perth Metro	Mixed putrescible waste (compacted)	Landfill	0.425	6.38
Load 2	20	100%	C&I	Other regions	Mixed putrescible waste (compacted)	Landfill	0.425	8.50
Load 3	1	100%	C&I	Other regions	Mixed putrescible waste (uncompacted)	Landfill	0.087	0.09
Load 4	3	80%	MSW	Perth Metro	Mixed putrescible waste (uncompacted)	Landfill	0.087	0.21
Load 5	15	100%	MSW	Peel region	Mixed putrescible waste (compacted)	Landfill	0.425	6.38

Table 2. Summary data reported

Summary total tonnes of waste received and disposed by source waste stream, geographic source and fate to be reported

Source waste stream	Geographic source	Material category	Fate	Weight (tonnes)
MSW	Perth Metro	Mixed putrescible waste	Landfill	6.59
MSW	Peel region	Mixed putrescible waste	Landfill	6.38
C&I	Other regions	Mixed putrescible waste	Landfill	8.59

References

- DWER Local Government Waste and Recycling Census 2016-17
- DWER (2018) Approved manner for estimating the volume or weight of waste received at and disposed of to landfills *Waste Avoidance and Resource Recovery Levy Regulations 2008*
- NSW EPA (2018) Waste Levy Guidelines
- SA EPA (2012) Compost Guideline: draft for Public Consultation
- UK Environment Agency (1998) *UK Density Conversion Factors for Waste*. <https://www.sepa.org.uk/media/163323/uk-conversion-factors-for-waste.xlsx>
- Victoria EPA, *Waste Materials Density Data* https://www.epa.vic.gov.au/business-and-industry/lower-your-impact/~/_/media/Files/bus/EREP/docs/wastematerials-densities-data.pdf
- WA Waste Authority *Converting volumes to tonnes*. <http://www.wasteauthority.wa.gov.au/media/files/documents/GN6VoltoTonnes.pdf>
- Zero Waste SA, Solid Waste and Recycling Reporting Template

WASTE AVOIDANCE AND RESOURCE RECOVERY REGULATIONS 2008
INFORMATION REQUIRED FOR AN ANNUAL RETURN OF LIABLE RECYCLERS

PERSON WHO DESCRIBES INFORMATION REQUIRED FOR AN ANNUAL RETURN

I, Mike Rowe, in my capacity as the chief executive officer of the department principally assisting the Minister for Environment in the administration of the *Waste Avoidance and Resource Recovery Act 2007*¹ (CEO) hereby describes in this notice the information relating to reportable² waste or recycling reportable waste that is required to be provided in an annual return and the procedures to be followed to record and calculate or estimate that information pursuant to regulations 18C and 18D(1) of the *Waste Avoidance and Resource Recovery Regulations 2008*.

PERSON REQUIRED TO PROVIDE AND USE INFORMATION IN THIS NOTICE

In this notice, a person is a *liable person* as described under regulations 18B(1) and 18B(3) of the *Waste Avoidance and Resource Recovery Regulations 2008* if they are an occupier of a premises, whether or not that person holds a licence in respect of the premises in respect of that premises—

- (a) if reportable waste is treated, processed or sorted at the premises for the purposes of reprocessing, recycling or energy recovery; and
- (b) if, as a result of that treatment, processing or sorting, at least 1,000 tonnes of reprocessed recycled or recovered material is produced in a financial year at the premises that—
 - (i) needs no further processing and is ready for use as a production input or final products; or
 - (ii) is to be exported from Western Australia.

For the purpose of this notice, these persons will be hereafter referred to as “liable recyclers”.

A liable recycler is subject to Part 3A of the *Waste Avoidance and Resource Recovery Regulations 2008* pursuant to regulation 18B(1). Under regulation 18C of Part 3A, a liable recycler is required to make and lodge an annual return relating to reportable waste or the recycling of reportable waste containing information as required by this notice under regulation 18D.

PREMISES OR LICENSED LANDFILL

The liable recycler must inform the CEO in a form approved in writing by the CEO³ of the premises or the licensed landfill in respect of which the person is a liable person pursuant to regulation 18B(5)(b) of the *Waste Avoidance and Resource Recovery Regulations 2008*.

INFORMATION REQUIRED FOR THE ANNUAL RETURN—REGULATIONS 18C AND 18D

For the purposes of making an annual return under regulation 18C of the *Waste Avoidance and Resource Recovery Regulations 2008*, the liable recycler must include the following information in that annual return, and record that information pursuant to regulations 18D(1)(b)(i) and 18D(5).

1. All liable recyclers must record and report the following data against the approved waste material categories—
 - total weight of waste received in tonnes;
 - total weight of waste recycled or recovered in tonnes or cubic metres;
 - total weight of processing losses in tonnes, cubic metres, or percentage of total weight recycled; and
 - estimated weight of stockpiled waste, reported separately for both processed waste and unprocessed waste in tonnes.
2. All liable recyclers must record and report the following details against the approved waste material categories—
 - sector source of waste (municipal, commercial and industrial, construction and demolition)
 - geographic source of waste (Perth metropolitan region, Peel region, other regions, or imported); and
 - destination of processed waste or recycled product (used on-site, final product, further processing in Western Australia, further processing interstate, export overseas).
3. Liable recyclers must calculate or estimate the information by virtue of regulation 18D(1)(b)(ii) of the *Waste Avoidance and Resource Recovery Regulations 2008* required in item 1 and 2 using the *Approved procedure for estimation/calculation of annual return information methods by recycling and reprocessing facilities required under the Waste Avoidance and Resource Recovery Regulations 2008* at Attachment 1 of this notice, which forms part of this notice.
4. Liable recyclers must make and submit their return in the approved⁴ form.

¹ The “department principally assisting the Minister for Environment in the administration of the *Waste Avoidance and Resource Recovery Act 2007*” is currently the Department of Water and Environmental Regulation.

² Regulation 18A of the *Waste Avoidance and Resource Recovery Regulations 2008* defines **reportable waste** to mean waste that is solid matter.

³ The term “approved” is defined in regulation 3 of the *Waste Avoidance and Resource Recovery Regulations 2008* to mean approved by the CEO in writing. The Department of Water and Environmental Regulation is developing an approved form (an online reporting system) for reporting which it will release by 30 June 2020.

⁴ The term “approved” is defined in regulation 3 of the *Waste Avoidance and Resource Recovery Regulations 2008* to mean approved by the CEO in writing. The Department of Water and Environmental Regulation is developing an approved form (an online reporting system) for reporting which it will release by 30 June 2020.

5. Liable recyclers must, by virtue of regulation 18D(1)(b)(i) of the *Waste Avoidance and Resource Recovery Regulations 2008*, keep any records relevant to the calculation, estimation or verification of the information reported in its annual return in a legible written form, or so as to be readily convertible into such a form, for a period of not less than 5 years from the day on which the record was made.

CURRENT REPORTING AND LIABILITY

For the 2019-20 financial year, the CEO requires the liable recycler to make and lodge an annual return containing the information required under this notice with the CEO by 1 October 2020 in the approved⁵ form.

There are a number of offences provided for under regulation 18E of the *Waste Avoidance and Resource Recovery Regulations 2008* for breaches by a liable recycler under regulations 18B, 18C and 18D, carrying a fine of \$10,000.

MIKE ROWE, Chief Executive Officer,
Department of Water and Environmental Regulation.

25 June 2019.

Attachment 1

Approved procedure for estimation/calculation of annual return information methods by recycling and reprocessing facilities required under the *Waste Avoidance and Resource Recovery Regulations 2008*

Approved procedure of the CEO of the department principally assisting the Minister for Environment in the administration of the *Waste Avoidance and Resource Recovery Act 2007* as required under regulation 18D of the *Waste Avoidance and Resource Recovery Regulations 2008*

June 2019

Contents

1	Objective
2	Background
3	CEO approved methods
4	Reportable waste material categories
5	Hierarchy of approved methods
5.1	1 st approved method—Estimation by weight
5.2	2 nd approved method—Volume estimation
6	Estimating the weight of stockpiles
6.1	1 st approved method—Estimation by weight
6.2	2 nd approved method—Estimation by mass balance
6.3	3 rd approved method—Volumetric survey
6.4	4 th approved method—Estimation by physical measurement
7	Estimating bulk density of material categories
8	Source of waste
9	Destination/fate of waste
10	Additional guidance for charitable recyclers
11	Default values
12	Alternative methods
13	Glossary

1 Objective

To establish the procedure of the chief executive officer of the department principally assisting the Minister for Environment in the administration of the *Waste Avoidance and Resource Recovery Act 2007*⁶ (CEO) for estimating and calculating information to be reported in an annual return under regulations 18C and 18D(1) of the *Waste Avoidance and Resource Recovery Regulations 2008* (WARR Regulations).

This is document is intended for liable persons, as defined by regulation 18B(3) of the WARR Regulations, who are the occupiers of premises, whether or not the person holds a licence in respect of the premises—

- (a) if reportable waste is treated, processed or sorted at the premises for the purposes of reprocessing, recycling or energy recovery; and
- (b) if, as a result of that treatment, processing or sorting, at least 1,000 tonnes of reprocessed, recycled or recovered material is produced in a financial year at the premises that—
 - i. needs no further processing and is ready for use as a production input or a final product; or
 - ii. is to be exported from the State.

For the purpose of this document, these persons will be hereafter referred to as liable recyclers.

⁵ See footnote 4.

⁶ The “department principally assisting the Minister for Environment in the administration of the *Waste Avoidance and Resource Recovery Act 2007*” is currently the Department of Water and Environmental Regulation.

2 Background

The WARR Regulations require liable persons to make and lodge annual returns with the CEO on or before 1 October in each year. The annual returns must contain information for the most recently completed financial year relating to reportable waste⁷ or the recycling of reportable waste, as required by the notice under regulation 18D(1) (Notice).

The WARR Regulations require annual returns to be prepared using procedures for the purposes of calculation or estimation methods described and approved by the CEO in the Notice.

3 CEO approved methods

This document provides the procedure to be followed by liable recyclers for the purposes of the calculation or estimation methods that liable recyclers are required to use to prepare their annual returns under regulation 18C of the WARR Regulations.

This document forms a part of the Notice approved by the CEO.

4 Reportable waste material categories

Liable recyclers must categorise and report waste information reported using the approved reportable waste material categories provided in Appendix A.

Liable recyclers must seek the Department of Water and Environmental Regulation (DWER) approval to prepare their returns using more detailed categories, consistent with their own activities and record-keeping. Where alternative categories are proposed, liable recyclers must demonstrate how these align to the categories in Appendix A.

An annual waste composition study will be required where the recycling premises only receives and records reportable waste in categories that do not align with the material categories in Appendix A. The study is to be conducted over a period of at least five days.

5 Hierarchy of approved methods

This clause provides a hierarchy of approved methods that liable recyclers must use to prepare their annual returns as part of the required procedure under regulation 18D(b)(ii) of the WARR Regulations.

Methods used by liable recyclers that are also landfills subject to the waste levy, must be consistent with the requirements under the *Waste Avoidance and Resource Recovery Levy Regulations 2008*. The hierarchy below applies to reportable waste not subject to the waste levy.

Liable recyclers must choose the method to be used based on the best-available information. That is, the liable recycler must use the “highest” preferred method for which the data is available.

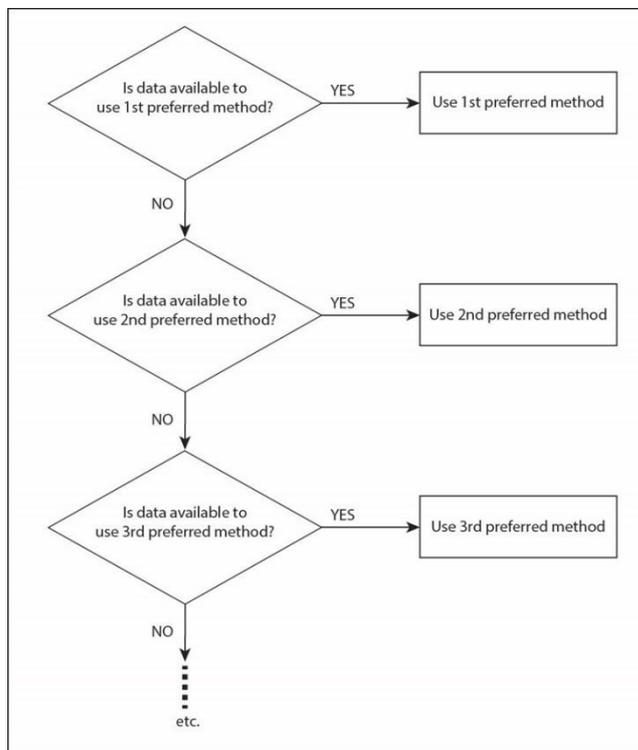


Figure 1: Hierarchy of methodologies

5.1 1st approved method—Estimation by weight

The most preferred method for estimating the amount of reportable waste received at and leaving the facility is for the reportable waste to be weighed at the point of entry or departure at the facility. Where a calibrated weighbridge, load cell or scales is installed at the facility, all compacted waste

⁷ Regulation 18A of the *Waste Avoidance and Resource Recovery Regulations 2008* defines **reportable waste** to mean waste that is solid matter.

loads and all waste loads of more than one cubic metre in volume received at and leaving the facility will be weighed. Volume estimation (see clause 5.2) may be used for small loads under one cubic metre in size (i.e. loads transported in cars and utes).

Equation 1: Estimating total annual weight of reportable waste by weighing each load

$$\text{Annual waste} = \sum (\text{weight of all vehicle loads})$$

Table 1: Data to be collected for estimation by weight

Data required to be collected	Data sources
Total weight of each load	Weighbridge records
Material type of each load	Weighbridge records

Load cells and scales do not need to be verified for trade, as defined by *National Measurement Act 1960*, for measurement for reporting under regulation 18C of the WARR Regulations. However, where the weight is used as a basis for charging or paying customers (including the waste levy), measuring equipment must still be verified under the *National Measurement Act 1960*.

5.2 2nd approved method—Volume estimation

Where weighing reportable waste is not possible, for example for facilities without a weighbridge or where a weighbridge is inoperable, the volume-estimation method must be used. The volume assessment method requires that each waste load entering and leaving the facility is assessed for material type and volume. Approved default values for vehicle volumes and bulk densities for DWER approved material categories are in Appendix B.

Equation 2: Estimation of weight from volume

$$\text{Annual waste} = \sum (\text{volume of waste}) \times (\text{density of waste})$$

Table 2: Data to be collected for volume estimation

Data required	Data sources
Volume of each vehicle / container	Gatehouse records
% capacity of vehicle / container in use	Estimated for each load as it arrives—default is 100%
Material category of each load (e.g. mixed paper, co-mingled recycling)	Determined by gatehouse operator as load arrives

6 Estimating the weight of stockpiles

6.1 1st approved method—Estimation by weight

The first approved method is to weigh material stored in stockpiles. Weighing equipment does not need to be trade certified.

6.2 2nd approved method—Estimation by mass balance

The second most preferred method for calculating the net weight of the stockpiles for the year is using the mass balance approach. That is, determining whether the amount of the stockpiled reportable waste grew or reduced over the year by comparing it to the amount of stockpiled reportable waste at the start of the year.

Equation 3: Estimating annual weight of stockpiles

$$\text{Weight}_{\text{stockpile}} = \text{Weight}_{\text{original}} + \text{Weight}_{\text{received}} - \text{Weight}_{\text{left site}} - \text{Weight}_{\text{contamination removed}} - \text{Weight}_{\text{material used on-site}}$$

This method is only suitable for non-degradable material, such as concrete, dry recyclables, etc. Volume estimation should be used to determine the amount of material in organic waste stockpiles at the end of the financial year (see clause 6.3).

6.3 3rd approved method—Volumetric survey

If not all reportable waste added to the stockpile or removed and produced from the stockpile has been weighed, a volumetric survey may be used to estimate the amount of waste contained in stockpiles. Volumetric surveys should be used to estimate the amount of organic waste stockpiled on-site at the end of the reporting period. Volumetric surveys are not required to be conducted by a qualified surveyor. For example, surveys may be conducted using a drone or a stockpile measurement App.

Volumetric surveys should be conducted as close to the end of the reporting period as possible.

The volume is converted to weight by multiplying the volume by the bulk density of the material.

6.4 4th approved method—Estimation by physical measurement

Where only a small amount of material is stored on-site (<200m³), the stockpile volume may be estimated by measuring the circumference of the base of the stockpile and the height of the stockpile.

If the material is stored in baled cubes, the amount of material stockpiled is the area multiplied by the height.

If the stockpiles are conical in shape, the amount of material stockpiles can be estimated as the circumference at the base multiplied by the height, then divided by 6.

7 Estimating bulk density of material categories

Facilities without a weighbridge, or where the weighbridge is inoperable for six months or more in one year, must conduct a bulk density survey at their premises to determine the bulk density of the various reportable waste material category loads received at and leaving the facility. A detailed report of the bulk density survey, including raw data, must be submitted to DWER with the next annual data report following the survey.

Where a weighbridge is inoperable for less than six months in one year, DWER approved default values for waste material bulk densities and vehicle/container volumes may be used. These are provided in Appendix B.

8 Source of waste

The source of each load received at or leaving the facility must be recorded by waste stream—

- municipal solid waste (MSW);
- commercial and industrial waste (C&I) waste; or
- construction and demolition waste (C&D) waste.

and by geographic source—

- Perth metropolitan region;
- Peel region; or
- other regions.

Where this data is not recorded, the liable recycler will conduct four surveys over the year, each of one week in length, to determine the proportion of reportable waste received at or leaving the facility by geographic source and by waste stream.

Where possible, the waste stream in which the waste was generated should be recorded, otherwise it is recorded as the waste stream in which the waste was collected.

C&D recycling facilities may assume all waste delivered to their premises for processing is from the C&D waste stream.

9 Destination/fate of waste

Liable recyclers are required to report what happens to the reportable waste received at their facility. The options for fate of reportable waste are: used on-site, final product, further processing in Western Australia, further processing interstate, export overseas.

The categories for geographical destination are; local, exported interstate or exported overseas.

For the purposes of reporting, it can be assumed that 100% of reportable waste exported for recycling is recycled.

10 Additional guidance for charitable recyclers

The sorting and sale of unwanted items, such as the activities of charity operated “op shops”, are not required to be reported under regulation 18C of the WARR regulations.

However, charitable recyclers may be liable recyclers, as defined by regulation 18B(3) of the WARR regulations and required to report on other aspects of their operations, such as the sorting of waste textiles for export.

11 Default values

Liable recyclers must use facility-specific values where this information is available (see also clause 12). Approved default values for estimating volume for various vehicle types and bulk densities for various reportable waste material categories are provided in Appendix B. These default values can be used where facility-specific data is not available.

12 Alternative methods

Liable recyclers may propose alternative methods for the following if these are more accurate than the methods set out above—

- estimating the amount of reportable waste received, removed and disposed
- estimating the bulk density
- estimating the reportable waste composition
- estimating the source waste stream

Any alternative methods proposed must be accurate, repeatable and consistent.

Liable recyclers may also propose alternative default values to those listed in Appendix B. Liable recyclers must submit alternative methods or default values, with relevant substantiating information, to DWER at waste.data@dwer.wa.gov.au for consideration and approval prior to use in the annual return.

13 Glossary

Acronym / symbol	Definition
Σ	Sum of
t	Tonnes
m ³	Cubic metres

Acronym / symbol	Definition
C&I	Commercial and Industrial waste—Solid waste generated by the business sector, State and Federal Government entities, schools and tertiary institutions.
DWER	Department of Water and Environmental Regulation
Landfilled waste	All waste buried in landfill. This includes waste material used as daily cover.
MSW	Municipal solid waste—Solid waste generated from domestic (residential) premises and local government activities.
Peel Region	The Peel region is the area defined by the Peel Region Scheme (May 2013).
Perth Metropolitan Region	The Perth region, or Perth Metropolitan Region, is the area defined by the Metropolitan Region Scheme (June 2014).
Recycling	Recycling: A waste fate in which solid wastes are collected, sorted, processed (including through composting), and converted into raw materials to be used in the production of new products. For data reporting purposes, recycling— <ul style="list-style-type: none"> • excludes materials in stockpiles of unprocessed waste materials • includes all materials processed for recycling, whether they are quickly sold or used, or stockpiled for later sale or use • excludes residuals that are sent to landfill or otherwise disposed of.
Reportable waste	Means waste that is solid matter under regulation 18A of the <i>Waste Avoidance and Resource Recovery Regulations 2008</i> .
Resource Recovery	The process of extracting materials or energy from a waste stream through re-use, reprocessing, recycling or recovering energy from waste.
Stockpiling	Temporary storage of waste or waste products for future sale, resource recovery or disposal. Materials are not to be stored on-site for a period of more than 2 years.

Appendices

Appendix A—Approved reportable waste material categories

Table 1: Approved reportable waste material categories

Category (Tier 1)	Sub-category (Tier 2)	Sub-category description
Paper	White office paper	High quality white office paper
	Old Newsprint (ONP)	Newspapers
	Magazines	Magazines and booklets
	Liquid Paperboard (LPB)	Milk and juice cartons made from liquid paperboard
	Paper—mixed	Combination of the above categories
Cardboard	Cardboard / paper packaging	Corrugated and flat cardboard. Excludes non-recyclable waxed and coated cardboard.
Mixed paper/cardboard	Mixed paper/cardboard	Paper and cardboard collected together.
Glass	Glass packaging—mixed	Glass jars and bottles
	Glass—construction	Glass windows and tiles
	Glass—other	Wine glasses, etc.
Plastic *	PET (1)	Polyethylene terephthalate
	HDPE (2)	High Density Polyethylene
	PVC (3)	Poly-vinyl Chloride
	PE-LD/LLD (4)	Low Density Polyethylene
	PP (5)	Polypropylene
	PS (6)	Polystyrene (hard form)
	PS-E (6)	Polystyrene (expanded form / foam)
	ABS/SAN (7)	Acrylonitrile Butadiene Styrene
	PU (7)	Polyurethane
	Nylon (7)	Nylon
	Mixed plastic packaging	Recyclable plastic packaging (PET, HDPE, PVC, etc.)

Category (Tier 1)	Sub-category (Tier 2)	Sub-category description
	Hard plastic (not packaging)	Mixed hard plastics
	Plastics—other or mixed	Mixture of the above and/or unmarked plastics
Metals	Metals—Ferrous Steel—packaging	Cans
	Metals—Ferrous Steel—Steel—non-packaging	Bars, pipes, etc.
	Metals—Non-ferrous—Aluminium—packaging	Cans and foil
	Metals—Non-ferrous—Aluminium—non-packaging	Bars, tubes, etc.
	Metals—Non-ferrous—Other metals	Copper, zinc, etc.
Organics *	Food waste	Kitchen scraps, unsold food products (unpackaged)
	Garden waste	Leaves, branches, grass clippings, foliage, flowers
	Food and garden organics (FOGO)	Combined food and garden waste collected in kerbside collections (FOGO)
	Organics from mixed municipal waste	Organic outputs from the mechanical biological treatment of mixed putrescible waste
	Forestry waste	Barks and sawdust (from forestry activities)
	Agricultural waste (excluding manure)	Includes animal bedding, animal mortalities, paunch and straw.
	Manures	Raw, untreated animal manure
	Biosolids	Solid organic outputs from processing sewage
	Urban wood, timber, sawdust (also C&D waste)	Wood / timber / sawdust from commercial and industrial activities or construction and demolition activities
	Fats & grease	Waste fats, grease, greasetrap sludge, biodegradable sludges, waste cooking oil, etc.
	Product—Composted Soil Conditioner	Pasteurised material resulting from the controlled microbiological transformation of compostable organic waste under aerobic and thermophilic conditions for not less than six weeks.
	Product—Pasteurised Soil Conditioner	An organic product that has undergone pasteurisation but is relatively immature and lacking in stability
	Product—Composted Mulch	Dry green waste that has been processed by way of chipping, shredding or similar mechanical process, but does not contain putrefying material. Composted mulch has undergone a full composting process.
	Product—Pasteurised Mulch	Mulch that has only undergone a pasteurising process.
	Product—Raw mulch	Dry green waste that has been processed by way of chipping, shredding or similar mechanical process, but does not contain putrefying material. Has not undergoing any further processing.
	Product—Manufactured Soil	Soil that has been specially prepared by blending or additives to achieve set specifications.
	Product—Potting Mixes	Potting mix (or potting soil) is soil that is specially prepared to help plants to grow, especially in containers.
Product—Playground Surfacing	Recycled organic material that meets the specification in AS/NZS 4422:1996 Playground surfacing—Specifications, requirements and test method.	
Product—biogas	Biogas from processing, used for heat and/or electricity production	
Product—solid biofuel	Processed organic waste sold as solid fuel	
Product—Composted manures	Animal manures that have undergone a full composting process.	

Category (Tier 1)	Sub-category (Tier 2)	Sub-category description	
	Product—Aged / raw manures	Animal manures that have not undergone a composting or pasteurisation process.	
	Other organic materials	Other biodegradable organic waste not already listed (please specify).	
Rubber	Tyres	All rubber tyres. Does not include metal rim or hub-caps	
	Other rubber, including conveyor belts	All other rubber	
C&D waste *	Sand / soil	Clean sand or soil	
	Rubble / aggregate <150mm	Stones, etc. also includes clean, processed C&D recycled product less than 150mm in diameter	
	Rubble / aggregate > 150mm	Stones, etc. also includes clean, processed C&D recycled product more than 150mm in diameter	
	Bricks	Whole or broken bricks	
	Concrete	Concrete or cement	
	Bitumen	Waste bitumen or asphalt	
	Plasterboard	Plasterboard or gypsum	
	Masonry material	Mixed concrete, brick, etc.	
	Mixed C&D waste *	Mixed construction and demolition waste, sometimes referred to as “inert” waste	
Textiles	Mixed inert waste *	Type 1 inert waste as defined in Landfill Waste Classification and Waste Definitions 1996 (as amended 2018)	
	Mixed textiles	Cloth, rags, clothes	
	Leather	Items mainly leather	
	Foam rubber	Includes polyurethane or latex.	
	Carpets	Carpets	
Mixed putrescible waste *	Mattresses	Mattresses	
	Mixed putrescible waste—domestic (household) *	Mixed putrescible waste—domestic (household)	
	Mixed putrescible waste—Commercial & Industrial *	Mixed putrescible waste—Commercial & Industrial—Wet (with food)	Mixed putrescible waste—Commercial & Industrial—Wet (with food)
		Mixed putrescible waste—Commercial & Industrial—Dry (no food)	Mixed putrescible waste—Commercial & Industrial—Dry (no food)
Mixed putrescible—other *	Putrescible waste as defined in Landfill Waste Classification and Waste Definitions 1996 (as amended 2018)		
Mixed dry recyclables *	Co-mingled recycling *	Containers, paper and cardboard collected from households and commercial premises.	
	Mixed industrial recyclables	Dry recyclable material collected from commercial and industrial premises. Includes mixed cardboard / plastic film collections. Includes mixed timber / steel / cardboard collections.	
Bulky Wastes	Electric & electronic goods	Televisions, computers and associated electronics (printers, DVD players, etc.) Electric tools, vacuum cleaners, etc.	
	Mattresses	Mixed steel, foam and cloth mattresses	
	Whitegoods	Fridges, washing machines, dryers	
	Furniture	Mixed material furniture, e.g. lounge chairs	
Hazardous	Batteries	Personal and car batteries	
	Paint	Recovered paint—may include containers	
	Household chemicals	Household chemicals recovered through Household Hazardous Waste collections	
	Fluorescent lights	Include CFLs and fluorescent tubes	
	Waste Oil	Waste oil collected through waste oil collections and through Household Hazardous Waste Collections, such lubricating oil, mechanical oil.	
	Asbestos	Includes asbestos fencing, pipes, insulation.	
	Clinical waste	Includes all medical and veterinary waste	

Category (Tier 1)	Sub-category (Tier 2)	Sub-category description
Contaminated soil	Contaminated soil	Soil from a contaminated site, as defined by the <i>Contaminated Sites Act 2003</i> .
Other*	Fly ash	Ash produced by burning of coal or other materials
	Other	Waste not otherwise specified (please specify)

*Only use denoted category for waste received, collected and/or disposed. Denoted category not to be used for recycled products.

Appendix B—Default values

Note: Liable recyclers must use facility-specific values where this information is available. The default values provided can be used where facility-specific data is not available.

Table 1: Default vehicle volumes

Vehicle type	Assumed volume (m ³)
Small vehicle (car, ute, van, trailer)	1
Open truck—small, 2 axles	3
Open truck—large 2 axles	6
Open truck—3 axles	10
Open truck—4 axles	12
Open truck—5 axles	18
Open truck—6 axles	20
Open truck—8 axles	20
Open truck—9 axles	32
Open truck—11 axles	40
Compactor truck—volume unknown	10

Source: DWER (2018) *Approved manner for estimating the volume or weight of waste received at and disposed of to landfills Waste Avoidance and Resource Recovery Levy Regulations 2008*

Table 2: Default bulk densities

Reportable waste material category	Default bulk density (t/m ³)
Paper	0.2
Cardboard	0.1
Plastics	0.14
Metals—Ferrous	0.5
Metals—Non-ferrous	0.14
Glass	0.347
Concrete	1.5
Bricks	1.2
Soil, sand, clean fill	1.3
Organics—Garden organics	0.15
Organics—Food organics	0.5
Organics—Timber / wood	0.19
Organics—other organics	0.3
Rubber/tyres	0.3
Textiles	0.15
Hazardous—asbestos	0.31
Hazardous—other	0.2
Mixed co-mingled recyclables (uncompacted)	0.063
Other / mixed—putrescible	0.3
Other /mixed—inert	1.3
Mixed building waste in skip bins	0.7

Appendix C—Examples of using methods*Example 1—Estimation of weight from volume*

$$\text{Annual waste} = \sum (\text{volume of waste}) \times (\text{density of waste})$$

Table 1: Data recorded on incoming loads and calculations

Incoming Loads	Load volume (m ³)	% fullness	Source waste stream	Geographic source	Material category	Fate	Material bulk density (t/m ³)	Estimated weight (tonnes)
Load 1	15	100%	MSW	Perth Metro	Co-mingled recycling	Overseas	0.063	0.95
Load 2	20	100%	C&I	Perth Metro	Cardboard (compacted)	Interstate	0.13	2.60
Load 3	1	100%	C&I	Perth Metro	Glass	Interstate	0.347	0.35
Load 4	3	80%	C&I	Perth Metro	Cardboard (loose)	Interstate	0.055	0.13
Load 5	15	100%	MSW	Perth Metro	Co-mingled recycling	Overseas	0.063	0.95

Table 2: Summary data reported

Summary total tonnes of waste received by source waste stream, geographic source and fate to be reported

Source waste stream	Geographic source	Material category	Fate	Weight (tonnes)
MSW	Perth Metro	Co-mingled recycling	Overseas	1.9
C&I	Perth Metro	Cardboard	Exported interstate	2.73
C&I	Perth Metro	Glass	Exported interstate	0.35

References

1. WA Waste Authority *Converting volumes to tonnes*. <http://www.wasteauthority.wa.gov.au/media/files/documents/GN6VoltoTonnes.pdf>
2. DWER Local Government Waste and Recycling Census 2016-17
3. UK Environment Agency (1998) *UK Density Conversion Factors for Waste*. <https://www.sepa.org.uk/media/163323/uk-conversion-factors-for-waste.xlsx>
4. DWER (2018) Approved manner for estimating the volume or weight of waste received at and disposed of to landfills Waste Avoidance and Resource Recovery Levy Regulations 2008
5. Victoria EPA, *Waste Materials Density Data* <https://www.epa.vic.gov.au/business-and-industry/lower-your-impact/~media/Files/bus/EREP/docs/wastematerials-densities-data.pdf>.
6. Zero Waste SA, Solid Waste and Recycling Reporting Template
7. SA EPA (2012) Compost Guideline: draft for Public Consultation