

Year 12 Earth and Environmental Science

Resource management

Kimbriki resource recovery centre

Student Name:

1. THE LANDFILL - THE LAST RESORT FOR MATERIALS DELIVERED TO THE CENTRE

Kimbriki started out as a landfill in 1974 and still has a landfill facility today.

Since commencing operations it has diverted some tonnes of waste from landfill through resource recovery operations on site.

Through materials separation and innovative recycling and reuse initiatives Kimbriki has managed to extend the life of the landfill far beyond the initial projections and boasts a resource recovery rate of % of waste materials that come through the gate.

What is the name for the waste that is allowed to be landfilled at Kimbriki?

What fees are residents or businesses charged to dispose of this waste?

1.1 Outline some of the mixed waste that are accepted as mixed waste.

Can Kimbriki do more?

The challenge to recover even more resources from landfill continues at Kimbriki and the next target is the mixed waste stream.

1.2 Looking at the mixed waste, what materials do you think could be removed for reuse or recycling using the current facilities at Kimbriki?

1. ENVIRONMENTAL IMPACTS OF LANDFILL

2.1. Describe 3 environmental impacts associated with the Kimbriki landfill and solutions for managing or minimising these issues either now or in the future.

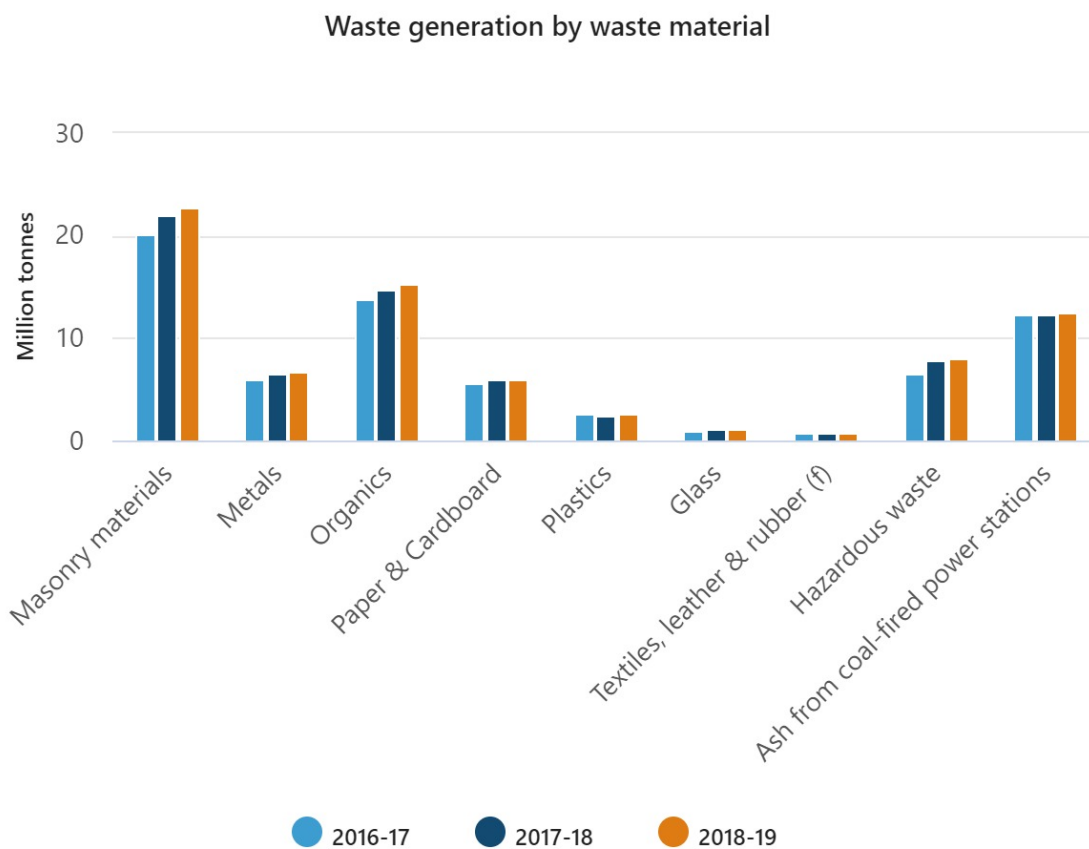
2.2 Outline the benefits of a well-managed landfill.

3. CASE STUDY - VEGETATION AND WOOD WASTE RECYCLING AT KIMBRIKI

Organic Waste in Australia

Australia generated some 75.8 million tonnes of solid waste in 2018-19, which was a 10% increase over the 2016-2018 period. Over half of all waste was sent for recycling (38.5 million tonnes), while 27% was sent to landfill for disposal (20.5 million tonnes. (Australian Bureau of Statistics Waste Account 2018-019).

Look at the graph depicting waste generated in Australia by material. What is the second largest category of waste in Australia?



a. Tyres are included in hazardous waste.

Source: Australian Bureau of Statistics, Waste Account, Australia, Experimental Estimates 2018-19 financial year

Organic waste

Organic waste, or green waste, is organic material such as food, garden and lawn clippings. It can also include animal and plant based material and degradable carbon such as paper, cardboard and timber.

Below are some statistics from the ABS about Australia's organic waste stream across households **and** industry (2018-19).

Organic waste:

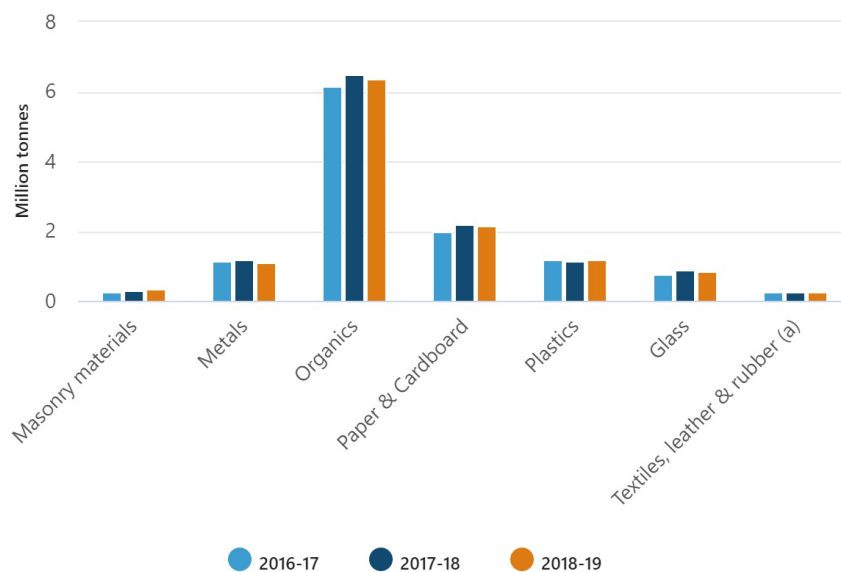
- 15.3 million tonnes generated
- 20% of total waste
- 42% was sent for recycling (6.4 million tonnes), while 45% was sent to landfill (6.9 million tonnes)
- 37% was food organic waste
- Households were the largest contributor, supplying 42% of all organic waste (6.4 million tonnes); second was manufacturing at 14% (2.1 million tonnes)
- Organic waste tonnage increased by 10% since 2016-17



Organic Waste from Households

Let's drill down to organic waste at the household level. Look at the graph below. What is the major household waste stream by material?

Household waste by waste material



a. Textiles, leather and rubber excludes tyres.

Source: Australian Bureau of Statistics, Waste Account, Australia, Experimental Estimates 2018-19 financial year

Organic Waste at Kimbriki

Mosman and Northern Beaches Councils provide their residents with dedicated greenwaste bins (green) for garden waste along with paper (blue) and container recycling (yellow) bins and a garbage bin (red). Greenwaste collected from these council areas is taken to Kimbriki for processing.

The graphic below shows the Northern Beaches waste and recycling service available to residents.



Look at the diagram below from a Melbourne Council with similar recycling services. Despite offering separate bins for recycling garden waste they estimate that organic waste made up of both (40%) and garden waste (6%) makes up nearly half of the waste sent to landfill from the garbage bin. The graphic suggests there is a significant opportunity to reduce landfill reliance and improve recovery rates. Some Councils such as Randwick Council are offering a service called FOGO to tackle this waste stream. FOGO stands for =

3.1 Can you suggest other environmental benefits from recovering the remaining organics from garbage bins?

Organic waste



Source: Banyule Council's Towards Zero Waste Management Plan.

ANL at Kimbriki

Australian Native Landscapes (ANL) operates the vegetation and wood waste recycling area at Kimbriki. The operation receives approximately 100,000 tonnes of vegetation and wood waste per annum from Council collections, self-haul residents and commercial customers.

Once received the material is shredded and stockpiled for up to 6 months before it is screened and used to produce a variety of woodchip mulch and soils. Kimbriki's proud history of very low contamination supports the quality of these mulches and soils which can be purchased at their retail outlets as well as delivered direct to customers.

The vegetation recycling operation at Kimbriki diverts over tonnes/year.



3.2 Draw a diagram or flow chart of the key processes that occur at Kimbriki when garden waste comes in for recycling into compost or mulch.

3.4 If your council doesn't offer a FOGO collection service you can compost your food and garden organic waste at home. On your visit to the Kimbriki Eco Garden you would have seen a home composting and worm farming presentation.

What does the acronym ADAM stand for? (all the secret ingredients for producing good compost)

A =

D =

A =

M =

Contact your local council to see if they offer worm farms and compost bins to residents at a reduced rate or even for free and get composting at home.

3.3 *Evaluate* the sustainability of two waste management options by completing the table below.

Comparing sustainability criteria for two waste management options for vegetation waste		
Sustainability criteria	Option A: Recycling as compost or mulch	Option B: Disposal in Landfill
Energy used to recycle the vegetation vs landfilling it:		
Is it resource intensive? Are there any usable by-products?:		
Types of and impacts of pollution from the recycling vs landfill disposal of vegetation: (Greenhouse gases? Water? Air? Other?)		
Water requirements of each option:		
Space requirements for ongoing recycling vs landfilling of vegetation:		
Is there demand (people willing to buy and use) the end product of each option?:		

3.4 In a few sentences, *evaluate* the sustainability of vegetation recycling into compost or mulch. (Refer to the criteria you used in the table above to come to your judgement.)