Commercial food preparation and service

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Used waters from business activities such as food preparation and dish washing contain oil/grease and suspended solids at concentrations or quantities greater than a typical household. This material can generate foul odours and build up in sewer pipes, restricting flows and causing blockages. Appropriate management practices at each site are therefore necessary. This guideline applies to, but is not restricted to the following activities:

- Restaurants
- Cafes
- School/college training kitchens
- Takeaway food shops
- Coffee shops
- Caterers
- Cafeterias/canteens
- Bakeries/pizza shops
- Clubs and community centres
- Delicatessens/supermarkets
- Child minding centres
- Hotels, motels, hostels
- Function centres
- Hospital and nursing home kitchens
- Ice cream parlours and juice bars

Important note

Our requirements for businesses with higher contaminant loads and used water volumes, (e.g. where the grease arrestor sizing calculation exceeds 12,000 litres) may be significantly different. Some examples are **large multi-tenant food courts, food manufacturing/processing businesses, wholesalers, etc**. These operators should seek advice from our Trade Waste team about their particular circumstances. The *Advanced Pre-treatment of Trade Waste guideline* contains additional information.

In this document

Wastewater management strategy

A good strategy for managing wastewater from commercial food preparation and service areas will avoid problems such as odours, and minimise pre-treatment equipment installation and ongoing maintenance costs. It is a combination of good work practices and well maintained pre-treatment equipment of the correct type(s) and size(s).

Step 1 – Understand the inputs to the wastewater stream

A variety of activities and locations within the work area contribute to the wastewater stream. Understanding each process may lead to ways of minimising waste at source and will make it easier to plan good work procedures and provide appropriate pre-treatment devices.

Step 2 – Apply good work practices

Training staff and providing the facilities that allow them to easily do the right thing are important. Poor work practices can lead to waste management problems and add to operating costs. Wastewater pre-treatment devices are not a 'catch-all' and can fail if overwhelmed. To minimise the chance of a failure occurring, consider these suggestions:

- Sinks are for wash water, not rubbish. Spoiled food and scraps from preparation or used customer plates should be scraped into a bin before washing up.
- Never pour waste cooking oil down the sink. Set this aside for recycling. Store waste cooking oil in a bunded area, so that it cannot accidentally enter sewer or stormwater drains.
- Contact details for licensed waste contractors who collect waste oil and food scraps for recycling can be found in the Yellow Pages or on websites such as Business Recycling.
- Turn off taps when not in use.
- Avoid using running water to thaw frozen food.
- Wait for a full load before using the dishwasher.
- Sweep or mop the floor instead of hosing it down.

Step 3 – Install and maintain appropriate pre-treatment devices

Almost all sites in this category are required to install and maintain adequate pre-treatment devices. These devices reduce contaminant levels in wastewater from kitchens, sculleries, bin wash areas etc., so it is safe for discharge to sewer.

All discharges in this category are likely to contain significant levels of:

- suspended solids requiring effective screening or settling device(s)
- oil/grease requiring a grease arrestor.

For many sites, a combination of devices, such as screening to remove larger suspended solids, followed by a grease arrestor is preferred.

We specify minimum pre-treatment requirements and servicing frequency as a condition in the discharge authorisation issued to each customer.

Requirements for sites where a grease arrestor is installed

Keep wastewater **volumes and flow rates** to within its design capacity. Avoid rapid discharges of large volumes of wastewater. Otherwise wastes could be flushed into and block sewer pipes.

Minimise wastewater **temperature**. High temperatures make separation of oil/grease difficult and promote odours. The maximum allowed to sewer from the site is 38 degrees Celsius.

Minimise **solids and oil and grease** going to the arrestor. Service calls for cleaning the grease arrestor are expensive, compared to good work practices and upstream screening devices that divert or capture the bulk of solids.

Choose a **quick breaking detergent**. These release emulsified oil, grease and dirt soon after discharge, allowing them to effectively separate in the arrestor. Avoid using caustic soda (sodium hydroxide). Emulsions will not separate effectively in an arrestor, but can break down further downstream and choke sewer pipes.

Using **biological additives** in arrestors is not an alternative to regular servicing. Only those additives approved by our Trade Waste team may be used, and only in the specific applications for which approval was granted.

To remove large solids

The mandatory screening requirements incorporate a fixed secondary strainer with a maximum 3mm hole size for sink/trough outlets and floor silt traps with basket.

- Waste strainer basket (maximum 3mm holes) with a fixed secondary strainer (maximum 3mm holes) installed at the sink outlet.
- Floor waste fittings with a water seal in the work area are fitted with a strainer basket (maximum 3mm holes) and a fixed secondary strainer (maximum 3mm holes).
- Wastewaters discharging from sink outlets to a floor waste fitting with a water seal discharge over a fitted strainer basket (maximum 3mm holes) and a fixed secondary strainer (maximum 3mm holes).
- Strainer baskets are emptied into a solid waste bin daily or more often to avoid blockage and odours.

To remove oil/grease and to moderate temperature

For operations in this category, a conventional underflow grease arrestor is the default choice for lowering oil and grease and fine suspended solids concentrations in wastewater before discharge. We may authorise the use of alternative devices in situations where it is unreasonable to install a conventional underflow arrestor.

A **grease arrestor** (sometimes called a grease trap or interceptor) is basically a 'flow-through box' plumbed into the drain from the food preparation area. Inflow and outflow connections are located so that the arrestor retains a certain volume of waste water at all times. Fresh wastewater enters one end, displacing some of the contained wastewater to sewer via the outlet at the other end. Baffles and other design features minimise turbulence in the arrestor, to enhance its effectiveness. Arrestors can be installed above or below ground level, as required.

Arrestors rely on the different specific gravities of oil/grease, water and suspended solids. Oil and grease floats to the top, solids settle to the bottom and the cleaned wastewater overflows to sewer.

This takes time, so matching arrestor capacity to wastewater flow rate is an important consideration. **Generally, the minimum retention time in a conventional underflow arrestor is one hour at peak usage times.**

Only grease arrestors listed in the *Approved Basic Trade Waste Pre-treatment Products Guideline* must be used. The best choice of arrestor type, design and size will vary depending on the nature of the application. Our Trade Waste team assesses filter/compact type grease removal devices on a case by case basis, as their performance may vary from an underflow arrestor, depending on the application. Some designs have additional features that reduce servicing frequency or regulate flow rate, or will fit into a more restricted space.

Arrestor maintenance

Accumulated oil and grease and settled solids reduce the arrestor's working volume. That shortens the wastewater residence time and eventually results in contaminant carryover downstream. Periodic removal of accumulated wastes is necessary to maintain the pre-treatment devices effectiveness.

The authorisation holder must ensure the effective operation of each unit, i.e. ongoing removal of grease and solids (sometimes called 'pump-out'), and if applicable, cleaning of bio-filter, servicing mechanical skimmers or other components by a qualified technician in accordance with the manufacturer's specifications.

Our Trade Waste team will set a maintenance schedule, to ensure correct operation of the grease arrestor. It can vary from fortnightly to annually, depending on waste accumulation rate and other factors. This will be reviewed as part of routine compliance audit inspections.

In a conventional underflow grease arrestor, the maximum build-up of wastes shall not exceed

- **100mm** of oil and grease and solids accumulation in the **last chamber,** or
- **200mm** of oil and grease and solids accumulation in the **first chamber** of two-chamber arrestors, or
- **300mm** of oil and grease and solids accumulation in the **first chamber** of three-chamber arrestors.

The above waste levels are based on the assumption of an adequate or oversized grease arrestor operation. Where grease arrestor operation is suspected to be undersized it may carry contaminants out of the arrestor, resulting in less build-up of separated grease and solids. In this case, an analytical sample will be collected at the customer's cost to validate performance levels against the restricted waste standards.

Accumulated wastes are removed by a licensed liquid waste contractor of the authorisation holder's choice. When pumping out the grease arrestor, the entire contents must be removed, including scraping down material adhering to the vertical surfaces.

Estimating appropriate grease arrestor size

Appropriate sizing of grease arrestors is necessary to satisfy a number of needs, such as providing adequate retention time to allow separation of grease and oil and suspended solids, reducing outgoing water temperature and adequate holding capacity for separated materials – to minimise service frequency. The following calculation method is **for guidance only** and applies to conventional underflow grease

arrestor designs. Operators should seek further advice from a suitably qualified consultant or our Trade Waste team. Alternative methods for hydraulic or loading considerations will be considered on their merits.

The following steps are to be considered when estimating the size of a grease arrestor:

Step 1 - Determine the hourly flow

Add the hourly flow ratings for all fixtures connected to the arrestor. This gives the minimum arrestor size needed to satisfy the one hour retention requirement.

Fixture	Litres per hour	Fixture	Litres per hour
Bain Marie	50	Sink - single bowl	30
Bin wash area	100	Sink - double bowl	60
Combi oven / steam oven	100	Sink - pot, single	100
Dishwasher (domestic)	30	Sink – pot, double	200
Dishwasher (commercial)	60	Sink - cleaner's	60
Floor wash-down silt trap / bucket trap	100	Sink – with spray rinse	300
Glasswasher (for one existing unit)*	60	Traditional/wet wok	200 per burner
Glasswasher (per additional unit)*	120	Waterless wok	50 per burner
Hand basin	25	Other wet fixtures	Contact our Trade Waste team

**Glasswashers are not required to be connected to a pre-treatment device. This is optional.*

Step 2 - Determine the risk category for your business

A number of factors contribute to the overall risk assessment for a particular food business. These include:

- whether the food is prepared and cooked on site or purchased ready for sale
- the proportion of fat that is in the food products offered for sale
- the proportion of eat-in versus takeaway sales
- the proportion of high-temperature processes contributing to the wastewater stream.

Determining the risk involves assessing two components:

1. *Food-based risk*

Where the food preparation, products and serving characteristics fall into different risk categories, the risk is that which best represents the cumulative effect of all three categories.

Typical activities for various risk categories			
Category	**Low risk**	**Medium risk**	**High risk**
Food Preparation	No cooking Raw whole foods Pre-packaged food Assembling from raw food or food prepared elsewhere Low food waste to sewer	Steaming, boiling, microwaving, grilling lower fat and oil foods Baking Butchery or delicatessen Moderate food waste to sewer	BBQ, frying, deep frying, grilling, roasting meat Poultry cookers/combi ovens High food waste to sewer
Products	Fresh Fruit & Vegetables Sandwiches, rolls Sushi Fresh snack food	Fresh meat and smallgoods Low fat or oil food and meals Coffee and associated hot & cold drinks Pizza	High Fat or Oil food and meals High fat and oil content stocks, bases and sauces Dairy Based Foods (ice cream, cream cakes etc.)
Serving	Predominantly takeaway	Both eat-in and takeaway in similar proportions	Predominantly eat-in

2. *Temperature risk*

	Low risk	**High risk**
Characteristic of temperature risk category	Total volume of hot discharges on site (exceeding 60°C at source) is <50% of the wastewater volume	Total volume of hot discharges on site (exceeding 60°C at source) is ≥50% of the wastewater volume

Effects of temperature risk category on overall risk ranking:

Overall risk ranking	
If the temperature risk is **LOW**	If the temperature risk is **HIGH**
The overall risk category remains the same as the food-based risk.	Increase the overall risk category, one level from the food-based risk. *If the food-based risk category is already high, increase the overall risk category to Extreme.*

Our Trade Waste team will determine the final risk category.

Step 3 - Determine the grease arrestor's storage factor

The storage factor represents the suitable additional volume to store the food, fat, oil and grease (FFOG) that accumulates between cleanout events. The risk profile of each application determines the expected amount of FFOG.

	Low risk	Medium risk	High risk	Extreme risk**
Storage Factor	1	1.5	2	2.5

** *Only applies to high temperature risk activities with food-based risk ranked as high.*

To obtain the grease arrestor minimum size using this method, multiply the hourly volume (step 1) by the storage factor (step 3). Choose the nearest (equal to or larger) available arrestor size. Minimum Grease Arrestor Volume = Minimum Hourly Volume x Storage Factor.

A few examples of grease arrestors sizing calculation are shown in Appendix 1.

Grease arrestor sizing rules

While the calculation method is a good indication, we generally apply the following rules when approving installation of grease arrestors – based on experience gained at many comparable businesses:

- Arrestors have a minimum hydraulic capacity equivalent to discharges from one hour of peak use. Additional capacity may be required to moderate high temperatures or for other reasons.
- The minimum capacity for any arrestor is **400 litres**.
- Where new developments are constructed without knowing the type of future food preparation/service tenancies, SA Water will usually specify a minimum arrestor capacity of **2,400 litres** for stand-alone tenancies and **1,500 litres** for tenancies sharing a pre-treatment device (e.g. food courts).
- In situations where our sewerage system is particularly vulnerable to non-compliant discharges, a larger than normal grease arrestor may be specified.

Specific minimum capacities for certain activities are:

Examples of business types	Description	Minimum grease arrestor capacity required
Asian food, rotisserie/BBQ chickens	Cooking/food preparation on site	1,800 litres
Fast food chain outlet	Cooking/food preparation on site	2,400 litres
Large dine-in restaurant or Fast food operations (24h) or with high throughput of meals.	Cooking/food preparation on site	5,000 litres
Bakery (bread only) Butcher retail only Convenience store/service station selling drinks and foods prepared off site Ice cream parlour (no production on site). Juice/bubble tea/smoothies bars Deli or school canteen preparing sandwiches/rolls, pies, hot dogs for takeaway sale Retail Coffee Shops Takeaway shops using disposable pan liners for reheating meat fillings	No cooking on site No food preparation on site (no wash water generated from food preparation or from extensive washing of contaminated utensils/ equipment) Food can be served to others, but not prepared on site. Examples: standard hot dogs with no extra cooked toppings, sandwiches/rolls, pies, cakes for take away sale or disposable containers for food consumed on premises. Fixtures limited to sandwich toaster, pie warmer, microwave oven, domestic-size sink and domestic under-bench dishwasher	No grease arrestor required

*** *Note that the minimum grease arrestor capacities listed above override the sizing calculator.*

Shared grease arrestors

We allow discharges to a shared grease arrestor by multiple tenancies in food courts and similar situations, providing the following conditions are met:

- Arrestor sizing is the sum of the pre-treatment requirements for the individual dischargers.
- Each business discharging wastewater to a shared grease arrestor must have a trade waste discharge authorisation. Individual dischargers are responsible for

maintaining acceptable work practices and controls of their raw wastewater quality and quantity.

- The property owner or the owner's designated agent (such as the shopping centre manager) also holds a trade waste discharge permit. This permit holder is responsible for the operation and maintenance of the shared grease arrestor.

Food waste disposal units

Discharges from food waste disposal units significantly increase the risks to our sewerage systems. These discharges are to be assessed case by case and only approved under special conditions, or when alternative solutions don't exist.

For more information regarding food waste disposal, refer to Food Waste Disposal to Sewer fact sheet.

For information regarding grease arrestor specific requirements, refer to the *Basic Pre-treatment Devices Accessibility Guideline*.

More information

Mains Water Protection (AS/NZS 3500.1 – 2025)

Backflow prevention - containment protection

Restricted Wastewater Acceptance Standards

Appendix 1

Example 1

A café lists the following installed fixtures:

- 1 x commercial dishwasher (door)
- 1 x double sink
- 1 x double pot sink
- 1 x floor trap
- 1 x hand basin

Step 1 - Determine the hourly flow

Add the hourly volumes together: 60+100+25+60+200 = 445 litres

Fixture	Litres per hour	Fixture	Litres per hour
Bain Marie	50	Sink - single bowl	30
Bin wash area	100	Sink - double bowl	60
Combi oven / Steam oven	100	Sink - pot, single	100
Dishwasher (domestic)	30	Sink – pot, double	200
Dishwasher (commercial)	60	Sink - cleaner's	60
Floor wash-down silt trap / bucket trap	100	Sink – with spray rinse	300
Glasswasher (for one existing unit)*	60	Traditional/wet wok	200 per burner
Glasswasher (per additional unit)*	120	Waterless wok	50 per burner
Hand basin	25	Other wet fixtures	Contact Trade Waste Branch

Step 2 - Determine the risk category for your business

1. *Food-based risk*

The café prepares and serves sandwiches, fried food and coffee. The majority of their sales are takeaway. A medium risk ranking is appropriate for the combination of preparation, products and serving.

Typical activities for various risk categories			
Category	**Low risk**	**Medium risk**	**High risk**
Food preparation	No cooking Raw whole foods Pre-packaged food	Steaming, boiling, microwaving, grilling lower fat and oil foods	BBQ, frying, deep frying, grilling, roasting meat Poultry cookers/combi

	Assembling from raw food or food prepared elsewhere Low food waste to sewer	Baking Butchery or delicatessen Moderate food waste to sewer	ovens High food waste to sewer
Products	Fresh fruit and vegetables Sandwiches, rolls Sushi Fresh snack food	Fresh meat and smallgoods Low fat or oil food and meals Coffee and associated hot and cold drinks Pizza	High fat or oil food and meals High fat and oil content stocks, bases and sauces Dairy based foods (ice cream, cream cakes etc.)
Serving	Predominantly takeaway	Both eat-in and takeaway in similar proportions	Predominantly eat-in

To establish the overall risk ranking, consider the risk category for temperature.

2. *Temperature risk*

	Low risk	High risk
Characteristic of temperature risk category	Total of flow combi ovens, dishwashers, glass washers, woks is <50% of the wastewater volume	Total flow of combi ovens, dishwashers, glass washers, woks is ≥50% of the wastewater volume

The risk category for temperature for the café has been categorised as low. This means that the overall risk ranking is the same as the combined risk ranking for preparation, products and serving.

Therefore the final risk ranking for the café is **medium**.

Step 3 - Determine the grease arrestor's storage factor

	Low risk	Medium risk	High risk	Extreme risk**
Storage factor	1	1.5	2	2.5

** *Only applies to high temperature risk activities with food-based risk ranked as high.*

The café is categorised with a medium risk ranking. The storage factor is 1.5 for medium risk businesses.

To calculate the minimum volume for the grease arrestor, multiply the hourly volume (result from Step 1) by the storage factor (result from Step 3). Choose the nearest (equal to or larger) available arrestor size.

Minimum grease arrestor volume = minimum hourly volume x storage factor

Minimum grease arrestor volume = 445 x 1.5 = 667.5 litres

The required volume is 700 litres (or the next available larger size).

EXAMPLE 2

An Asian food restaurant lists the following installed fixtures:

- 1 x commercial dishwasher (door)
- 4 x woks
- 1 x pot sink
- 2 x double sinks
- 1 x hand basin

Step 1 - Determine the hourly flow

Add the hourly volumes together: 60 + 4x200 +100 + 2x60+25 = 1,105 litres

Fixture	Litres per hour	Fixture	Litres per hour
Bain Marie	50	Sink - single bowl	30
Bin wash area	100	Sink - double bowl	60
Combi oven / Steam oven	100	Sink - pot, single	100
Dishwasher (domestic)	30	Sink – pot, double	200
Dishwasher (commercial)	60	Sink - cleaner's	60
Floor wash-down silt trap / bucket trap	100	Sink – with spray rinse	300
Glasswasher (for one existing unit)*	60	Traditional/wet wok	200 per burner
Glasswasher (per additional unit)*	120	Waterless wok	50 per burner
Hand basin	25	Other wet fixtures	Contact Trade Waste Branch

Step 2 - Determine the risk category for your business

1. *Food-based risk*

The restaurant prepares and serves Asian food. The sales are both eat-in and takeaway, in similar proportions. A high risk ranking is appropriate for the combination of preparation, products and serving.

Typical Activities for various risk categories			
Category	**Low risk**	**Medium risk**	**High risk**
Food preparation	No cooking Raw whole foods Pre-packaged food Assembling from raw food or food prepared	Steaming, boiling, microwaving, grilling lower fat and oil foods Baking Butchery or	BBQ, frying, deep frying, grilling, roasting meat Poultry cookers/combi ovens High food waste to sewer

	elsewhere Low food waste to sewer	delicatessen Moderate food waste to sewer	
Products	Fresh fruit and vegetables Sandwiches, rolls Sushi Fresh snack food	Fresh meat and smallgoods Low fat or oil food and meals Coffee and associated hot and cold drinks Pizza	High fat or oil food and meals High fat and oil content stocks, bases and sauces Dairy based foods (ice cream, cream cakes etc.)
Serving	Predominantly takeaway	Both eat-in and takeaway in similar proportions	Predominantly eat-in

To establish the overall risk ranking, consider the risk category for temperature.

2. *Temperature risk*

	Low risk	High risk
Characteristic of temperature risk category	Total of flow combi ovens, dishwashers, glass washers, woks is <50% of the wastewater volume	Total flow of combi ovens, dishwashers, glass washers, woks is ≥50% of the wastewater volume

The risk category for temperature for the Asian restaurant has been categorised as low. This means that the overall risk ranking is the same as the combined risk ranking for preparation, products and serving.

Therefore the final risk ranking for the restaurant is **high**.

Step 3 - Determine the grease arrestor's storage factor

	Low risk	Medium risk	High risk	Extreme risk**
Storage factor	1	1.5	2	2.5

** *Only applies to high temperature risk activities with food-based risk ranked as high.*

The Asian restaurant is categorised with a high risk ranking. The storage factor is 2 for high risk businesses.

To calculate the minimum volume for the grease arrestor, multiply the hourly volume (result from Step 1) by the storage factor (result from Step 3). Choose the nearest (equal to or larger) available arrestor size.

Minimum grease arrestor volume = minimum hourly volume x storage factor

Minimum grease arrestor volume = 1,105 x 2 = 2,210 litres

The required volume is 2,400 litres (nearest available grease arrestor size)