

LIQUID TRADE WASTE

Discharge Categories and Management Guidelines

To be read with Hawkesbury City Council's Liquid Trade Waste Policy





This document contains important information.
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Section 1 Introduction

Hawkesbury City is situated within the catchment of the Hawkesbury-Nepean River system and is one of many communities that discharge treated sewage effluent into the river. Two sewerage authorities operate within the City, Sydney Water and Council itself, each operating two wastewater treatment plants. With increased pressure on public authorities and governments from public awareness regarding environmental quality, more stringent regulations controlling the quality of treated effluent discharged to receiving waters are being enforced through the Environment Protection Authority (EPA).

Hawkesbury City Council is licensed by the EPA to discharge treated effluent to receiving waters with strict limits on the pollutant levels of the effluent. Failure to comply with these license agreements can incur heavy financial penalties; as these penalties would be paid for with public funds, it is essential that Council maintain its wastewater treatment plants at optimum performance levels. With this in mind, it becomes necessary to control the quality of the influent to the treatment plants. This is achieved by implementing Council's Trade Waste Policy, to register all non-domestic liquid wastes capable of being discharged to Council's sewerage system and to insure that all toxic liquid wastes are disposed of properly through the appropriate authority.

This document is divided into three main parts being *Hawkesbury City Council's Liquid Trade Waste Policy proposed to Council in 2019; Categories and Procedure for Approval to Discharge* and *Guidelines: Managing Trade Waste*.

In the Hawkesbury City Council's Liquid Trade Waste Policy, trade waste is defined and the purpose and objectives of the policy are presented. The ultimate aim is that all liquid trade waste discharged to the local sewerage system complies with the standards set out in Schedules 'A' & 'B' included in the Policy Statement.

In this document, Section 2: Categories & Procedures for Approval to Discharge, provides details of the discharge categories that are presented along with the procedure to receive permission to discharge liquid trade waste to Hawkesbury City's sewerage system.

In Section 3: Guidelines for Managing Trade Waste, advice and guidelines are provided with regard to pre-treatment equipment, housekeeping sampling and flow monitoring and stormwater management.


What is liquid trade waste?

Liquid trade waste is defined in the Local Government (General) Regulation 2005 as below:
Liquid trade waste means all liquid waste other than sewage of a domestic nature.

Liquid trade waste discharges to the sewerage system include liquid wastes from:

- Business/commercial premises (eg: beautician, florist, hairdressers, hotel, motel, restaurant, butcher, service station, supermarket, dentist)
- Community/public premises (including craft club, school, college, university, hospital and nursing home)
- Industrial premises
- Trade activities (eg: mobile carpet cleaner)
- Any commercial activities carried out at a residential premises
- Saleyards, racecourses and from stables and kennels that are not associated with domestic households
- Septic tank waste, chemical toilet waste, from marine pump-out facilities and established sites for the discharge of pan content from mobile homes/caravans to the sewerage system.

While septic tank, pan and ship-to-shore pump-out waste are defined as trade waste, specific procedures need to be applied to their management as the waste is often transported from its source to the sewerage system. Accordingly, specific references to these wastes are provided in these guidelines where necessary.




Liquid trade waste excludes;

- Toilet, hand wash basin*, shower and bath wastes derived from all the premises and activities mentioned above
- Wastewater from residential toilets, kitchens, bathrooms and laundries (ie: domestic sewage)
- Common use (non-residential) kitchen and laundry facilities in a caravan park
- Residential swimming pool backwash

* Used for personal hygiene only



Glossary



Biochemical Oxygen Demand (BOD₅): The amount of oxygen required for the biochemical degradation of organic material in wastewater over a period of five days at 20 C. In practical terms, BOD is a measure of biodegradable organic content of the waste.

Biosolids: Primarily organic solid product produced by sewage processing. Until such solids are suitable for beneficial use, they are defined as wastewater solids or sewage sludge.

Bunding: Secondary containment provided for storage areas, particularly for materials with the propensity to cause environmental damage.

Chemical Oxygen Demand (COD): A measure of oxygen required to oxidise organic and inorganic matter in wastewater by a strong chemical oxidant. Wastewaters containing high levels of readily oxidised compounds have a high COD.

Chemical Toilet: Toilet in which wastes are deposited into a holding tank containing deodorizing or other chemicals; wastes are stored and must be pumped out (and chemical recharged) periodically.

Clean Dry Trades: Are generally defined as those where showers are not provided on the premises.

Commercial Kitchen/Caterer: For the purpose of these guidelines, a commercial kitchen is a premises that is typically a stand-alone operation and prepares food for consumption off-site. These types of businesses typically cater to wedding functions, conferences, parties, etc. This definition would not apply to a food processing factory supplying pre-prepared meals to an airline company or similar.

Contingency Plan: A set of procedures for responding to an incident that will affect the quality of liquid trade waste discharged to the sewerage system. The plan also encompasses procedures to protect the environment from accidental and unauthorised discharges of liquid trade waste to the stormwater drainage system, and leaks and spillages from stored products and chemicals.


Dirty Dry Trades: Are generally defined as those where showers are provided on the premises.

Domestic Sewage: The waterborne waste derived from human origin, comprising faecal matter, urine and liquid household wastes from water closet pans, sinks, baths, basins and similar fixtures designed for use in private dwellings, but excludes septic waste or pan contents.

Due Diligence Program: A plan that identifies potential, health and safety, environmental or other hazards (e.g. spills, accidents or leaks) and appropriate corrective actions aimed at minimising or preventing the hazards.

Effluent: The liquid discharged following a wastewater treatment process.

Effluent Improvement Plan (EIP): The document required to be submitted by a discharger who is not meeting the acceptable limits for discharge waste quality set down in Council's approval conditions and/or liquid trade waste agreement. The document sets out how a discharger will meet the acceptable limits for the discharge of liquid trade waste to the sewerage system within a given timeframe.



Heavy Metals: Metals of high atomic weight which in high concentrations can exert a toxic effect and may accumulate in the environment and the food chain. Examples include: mercury, chromium, cadmium, arsenic, nickel, lead and zinc.

Housekeeping: is a general term, which covers all waste minimisation activities connected with the way in which operations within the premises are carried out.

Industrial Discharges: Industrial liquid trade waste is defined as liquid waste generated by industrial or manufacturing processes.

Large Fast Food Outlet: A food business that typically discharges more than 5 kL/d. Premises of this nature include K.FC, McDonalds, Red Rooster, Pizza Hut, Hungry Jack's and Burger King.

Local Government Regulations: Regulations under the *Local Government Act 1993*, including the *Local Government (General) Regulation 2005*,

Liquid Trade Waste: The liquid wastes discharged to the sewerage system from any business, trade or manufacturing premises

Methylene Blue Active Substances (MBAS): These are anionic surfactants (see Surfactants definition) and are called MBAS as their presence and concentration is detected by measuring the colour change in a standard solution of methylene blue dye.

Minimal Pre-treatment: For the purpose of these guidelines includes: sink strainers, dry basket arrestors, plaster arrestors and fixed or removable screens.


Open Area: Any unroofed process, storage, washing or transport area potentially contaminated with rainwater and substances, which may adversely affect the sewerage system or the environment.

pH: A measure of acidity or alkalinity of an aqueous solution, expressed as the logarithm of the reciprocal of the hydrogen ion (H^+) activity in moles per litre at a given temperature; pH 7 is neutral, below 7 is acidic and above 7 is alkaline.

Premises: Has the same meaning as defined in the *Local Government Act* dictionary and includes any of the following:

- a) a building of any description or any part of it and the appurtenances to it;
- b) land, whether built on or not;
- c) a shed or other structure;
- d) a tent;
- e) a swimming pool;
- f) a ship or vessel of any description (including a houseboat); or
- g) a van.

Prescribed Pre-treatment Equipment: is defined as standard non-complex equipment used for pre-treatment of liquid trade waste prior to being discharged to the sewerage system (e.g. a grease arrestor, an oil/water separator, solids arrestor, cooling pit).



Septage: Material pumped out from a septic tank during desludging; contains partly decomposed scum, sludge and liquid.

Septic Tank: Wastewater treatment device that provides a preliminary form of treatment for wastewater, comprising sedimentation of settleable solids, flotation of oils and fats, and anaerobic digestion of sludge.

Septic Tank Effluent: The liquid discharged from a septic tank after treatment.

Sewerage System: The network of sewage collection, transportation, treatment and by-products (effluent and biosolids) management facilities.

Surfactants: The key active ingredient of detergents, soaps, emulsifiers, wetting agents and penetrants. Anionic surfactants react with a chemical called methylene blue to form a blue-chloroform-soluble complex; the intensity of colour is proportional to concentration.

Surge Control Device: A device that is installed in a grease arrestor chamber and may improve the arrestor performance by stabilising hydraulic surges.

Suspended Solids (SS): The insoluble solid matter suspended in wastewater that can be separated by laboratory filtration and is retained on a filter; previously also referred to as non-filterable residue (NFR).

Total Dissolved Solids (TDS): The dissolved salts in wastewater.

Waste Minimisation: Procedures and processes implemented by industry and business to modify, change, alter or substitute work practices and products that will result in a reduction in the volume and/or strength of waste discharged to sewer.



Discharge categories and procedure for approval

Trade Waste Discharge Categories

Category 1

Domestic with some non-domestic type wastes in low mass loadings (low volume and low or high strength), examples include but are not limited to dental surgeries, hairdressers photo processors, some service stations, x-ray laboratory, panel beating/spray painting etc.:

- volume not to exceed 1kL/day (1000 L/day)
- the waste-stream must comply with Policy Statement
- where pre-treatment equipment (excluding sink strainers) is installed yearly samples may be required

Trade waste charges are covered by Council's business sewer rate for a Category 1 discharge.

Category 2

Domestic type wastes in higher mass loadings (high volume low strength) with the inclusion of some non-domestic wastes, examples include but are not limited to small restaurants and laundries, dirty dry trades-showers, car detailing etc.:

- volume not to exceed 5kL/day (5000 L/day)
- the waste-stream must comply with Policy Statement
- must provide Water bills to Hawkesbury City Council
- business must complete sampling and analysis at a minimum yearly and provide results to Hawkesbury City Council, or as directed by Hawkesbury City Council

Trade waste charges are covered by Council's business sewer rate for a Category 2 discharge. Mass Load: Fees for Mass Load may apply to this category depending on the pollutant concentrations.

Category 3

Medium volume discharges and/or higher loads of industrial wastes examples include but are not limited to food and dry good manufacturing, metal processing, larger restaurants, laundries or shopping complexes etc.:

- volume not to exceed 10kL/day (10,000 L/day)
- must provide water bills to Hawkesbury City Council or discharge volume may have to be monitored by a flow meter
- business must complete sampling and analysis 6 monthly and provide results to Hawkesbury City Council, or as directed by Hawkesbury City Council
- the waste-stream must comply with Policy Statement

Trade waste charges for volume discharge are covered by Council's business sewer rate for a Category 3 discharge. Mass Load: Fees for Mass Load may apply to this category depending on the pollutant concentrations.

Category 4

Larger volume discharges and/or higher loads of industrial wastes examples include but are not limited to food and dry good manufacturing, metal processing, larger restaurants, laundries or shopping complexes etc.:

- volume not to exceed 20kL/day (20,000) L/day
- must provide water bills to Hawkesbury City Council or discharge volume may have to be monitored by a flow meter
- business must complete sampling and analysis at a minimum 3 monthly and provide results to Hawkesbury City Council, or as directed by Hawkesbury City Council
- the waste-stream must comply with Policy Statement
- BOD, suspended solids and total grease and oil higher than policy limits may be accepted, this will incur mass load levies

Trade waste charges for volume discharge are covered by Council's business sewer rate for a Category 4 discharge.

Mass Load: Fees for Mass Load may apply to this category depending on the pollutant concentrations.

Category 5 (Large Dischargers)

- volume exceeds 20kL/day
- Must provide water bills to Hawkesbury City Council or discharge volume may have to be monitored by a flow meter
- business must complete sampling and analysis at a minimum weekly and provide results to Hawkesbury City Council, or as directed by Hawkesbury City Council
- the waste-stream must comply with Policy Statement
- BOD, suspended solids and total grease and oil higher than policy limits may be accepted, this will incur mass load levies

Are considered by Council to be of a high risk due to the large proportion of flow entering into the treatment plant, compared to the total flow incoming to the plant

Trade waste charges for volume discharge are covered by Council's business sewer rate for a Category 4 discharge plus an excess charge per kilolitre over the 20kL/day limit.

Mass Load: Fees for Mass Load may apply to this category depending on the pollutant concentrations.

Other


For the business listed below fees are based on the capacity of the holding tank and/or frequency of discharge, to fit in to Category 1 to 4 above.

Ship to Shore: Any liquid waste that is pumped to the sewer via the collection facility at Windsor wharf.

Mobile Businesses: Any liquid waste collected by a mobile service and returned to a base for discharge through a designated point.

Sullage: Liquid waste collected from septic pump outs by tanker and discharged at South Windsor Treatment Plant.

Chemical toilets – waste will not be accepted into the sewage network.



Chemical Toilets: Toilet in which wastes are deposited into a holding tank containing deodorising or other chemicals.

Chemical toilet waste will not be accepted.

New Business

For new business with unknown waste volumes, references can be made to the Water Directorate's "Section 64 determinations of Equivalent Tenements Guidelines" to estimate the waste volume that will be discharged, and then use this to classify the business into one of the 5 Categories above.

Fees and Charges

Trade Waste fees and charges are set out in Council's Revenue Pricing Policy. This document is available to the public and is reviewed annually.

Category One through Four

Volume: A standard business sewer rate per annum applies based on average daily discharge.

Mass Load: Fees for Mass Load may apply to these categories depending on the pollutant concentrations.

Category Five

Volume: The standard business sewer rate applies for Category Four plus an excess per kilolitre.

Mass Load: An additional fee may apply for mass pollutant loads.

Ship to Shore: Standard business sewer rates apply depending on the size of the holding tank and/or frequency of discharge.

Mobile Business: Standard business sewer rates apply depending on the size of the holding tank and/or frequency of discharge.

Sullage: Standard residential rates apply for domestic sullage or a rate per kilolitre if collected from a business.

Charge Rates: Charge rates have been established for excess volume discharge, mass load and mass load attributed to pollutant concentrations above standard limits.

- Excess volume: price/kilolitre
- Biochemical Oxygen Demand, Suspended Solids, total Grease and Oil: price/kilogram

Application Fee: The application fee will cover the assessment, one inspection and initial permission for categories 1, 2 and 3 discharges.

Agreement Fee: Fee for preparation of formal Service Agreement.

Mass Loading Charges

Pollutants listed in Schedule 'A' have been divided into four groups based on their detrimental effects on the treatment process, Group 1 being the least expensive to treat and Group 4 the most expensive (rate/kilogram).

Schedule A charge category groups

GROUP 1	GROUP 2	GROUP 3	GROUP 4
Aluminium	Barium	Arsenic	Defoliant
Boron	Chromium	Cadmium	Herbicides
Bromine	Cobalt	Chlorinated hydrocarbons	Mercury
Chlorine	Copper Lead		Organoarsenic compounds
Fluoride	Polynuclear	Cyanide	Pentachlorophenol
Iron	Aromatic hydrocarbons	Formaldehyde	Pesticides all types
Manganese	Selenium	Mercaptans	
Molybdenum	Sulphite	Nickel	
Petroleum hydrocarbons	Tin	Weedicides	
Sulphate	Uranium	Phenolic compounds	
Thiosulphate	Zinc	Silver	
Nitrogen		Sulphide	
Ammonia			
Phosphorus			
Total Dissolved Solids			

Procedure for Approval

General

Under Section 68 of the *Local Government Act, 1993* a person is required to obtain approval from a Council prior to discharging waste into the sewer of a council.

Procedure

1. Obtain a Trade Waste application from Council's Customer Service Counter staff or download from Council's webpage and fill in as much information as possible. If you as the applicant are a tenant of the subject property from where the trade waste discharge will originate, please include the owner's or the property manager's contact details on the application. This information can be added to the last page under 'Other Details'. If this application is being lodged as a condition of consent in a Development Application please include the DA number on the application: again use the space marked 'Other Details'.
2. The applicant must submit a draft 'Plan of Management' along with the application if pre-treatment of the waste is required (this excludes sink/floor screens). This plan will be reviewed during assessment and revised accordingly when approval is granted.
3. Return the completed application to staff at the Customer Service Counter and pay the appropriate fee (Trade Waste application fee is listed under 'Fees and Charges' in Council's *Revenue Pricing Policy*).
4. The applicant will be notified as soon as the application has been assessed.

Considerations

Council's decision to accept any commercial or industrial discharge to the sewer system will be based on meeting council's requirements. When determining a trade waste application, Council officers will consider the following factors:

- the potential for the waste to impact on public health
- the possible impacts the discharge may pose to the environment (land, water, air, noise or nuisance factors)

- the potential impacts of the waste on the health and safety of Council's employees
- the possible impact of the waste on Council's sewerage infrastructure and the sewage treatment process
- the capability of the sewerage system (both transportation and treatment components) to accept both the quality and the quantity of the proposed waste
- the impact the waste will have on the ability of the Sewage Treatment Plant to meet the EPA license requirements
- the potential impacts of the waste on the quality of, and management practices for, effluent and biosolids produced from the sewage treatment process.
- the adequacy of the pre-treatment process to treat the waste to a level acceptable for discharge to the sewerage system, including proposed safeguards if the pre-treatment system fails (if applicable)
- whether appropriate safeguards are proposed to avoid the disposal of other non-approved wastes to the sewerage system
- the adequacy of any chemical storage and handling facilities, and the proposed safeguards for preventing the discharge of chemicals to the sewerage system
- whether the disposal of prohibited substances is proposed
- the potential for stormwater entering the sewerage system and adequacy of the proposed stormwater control
- the adequacy of the proposed due diligence program, contingency plan and plan of management with regard to trade waste where required.

Plan of Management

All trade waste activity must incorporate a Plan of Management. This can be as simple as marking in a diary or on a calendar the date a grease trap is due for a pump-out and clean.

The more complex the process, the more involved the management plan. This could include daily, weekly, monthly or quarterly items regarding cleaning procedures, scheduled maintenance, house-keeping, monitoring the waste-stream, sampling and analysis and a contingency plan with regard to spills.

Approvals: (Registration, Letter of Permission, Formal Agreement)

General

All trade waste activities must be registered by Council regardless of the nature of the activity. The most basic activity that which is less than 1000 L/day and needs no pre-treatment may not need any special permission or agreement, just registered on the Trade Waste Database. However, small businesses with minimum pre- treatment facilities will require a Letter of Permission. Businesses with a large volume and/or mass load discharge and more complicated pre-treatment facilities will require a formal Trade Waste Agreement.

Registration

Any business activity that only consists of domestic waste or does not pose a potential risk of a banned substance entering the sewer system will only require registration on Council's Trade Waste Database.

Letter of Permission

Category 1 businesses and Category 2 businesses will require a Letter of Permission. These are businesses where the volume discharge upper limit is 1000 L/day and 5000 L/day respectively, where their mass load is limited as per Schedule 'A' and there are minimum pre-treatment requirements.

A Category 3 business is one with a discharge between 5000 and 10,000 L/day and depending on the nature of the waste-stream and mass load will determine whether it will need a 'Letter of Permission or a formal Trade Waste Agreement to discharge to the sewerage system. For example a 'Letter of



Permission' will be for business with mostly domestic waste, such as a large school.

The Letter of Permission is subject to an annual review, with a maximum of a 3 year expiry date.

Formal Trade Waste Agreement

Category 4 and 5 businesses will require a formal Agreement. These are businesses with discharges up to and greater than 20,000 L/day. Their waste-stream has significant mass loads and their pre-treatment process is more complex. A formal Agreement is a scheduled document that details the nature of the waste-stream, sampling and analysis, any fees and charges and how they are calculated, pre-treatment infrastructure and any special conditions necessary to comply with Schedule 'A' & 'B' of the policy. A formal Agreement must be renewed every three years . If circumstances warrant, a formal Agreement may be renegotiated during the term of the agreement.

Approval of applicants

Where an application is approved, Council will notify the applicant as soon as practical of the approval and any conditions of the approval. The duration of the approval will be as stated in the approval.

An applicant may make a minor amendment or withdraw an application before it is approved by Council. An applicant may also apply for Council to renew or extend an approval, in accordance with Section 107 of the Local Government Act.

If an application is refused, Council will notify the applicant of the grounds for refusal.

An approval to discharge liquid trade waste to Council's sewer is not transferable. A new application must be lodged and a new approval obtained if there is a change of the approval holder or the activity. Council must be notified of change of ownership and/or occupier in all cases, whether a new approval is required or not, to allow updating of records.

Sampling and Analysis

General

All businesses that require some form of pre-treatment will get involved in sampling and analysis (S and A). All pre-treatment devices when installed must be fitted with a sampling point. S and A can be quite simple from compliance checks and checking to see if newly installed pre-treatment equipment is operating properly, to full-scale daily monitoring and reporting.

All sampling and analysis must be conducted by a NATA registered laboratory accredited for the sampling and analysis of water and wastewater using analysis methods approved by the NSW EPA.

The cost of all sampling and analysis is the responsibility of the trade waste customer.


Compliance and New Installations

S & A for compliance is done at the discretion of Council Officers. It may be a random sample, taken due to a complaint or taken at time of an inspection.

All newly installed pre-treatment equipment will be inspected and samples taken for analysis within 30 days of commencement of operation. This is to ensure that the installation is correct and the waste-stream meets the standards as set out in schedule 'A'.

Full Scale Monitoring and Reporting

When deemed necessary that a business must monitor its trade waste activity daily, weekly, or monthly; it becomes necessary to set a system in place to make this possible. Composite samples are best collected by an 'autosampler' on either a time or flow basis. This way samples can be collected every hour or every 10 kilolitres as an example. At the end of the day all the samples can be



combined and a composite sample can be drawn from the total volume and preserved for analysis. This type of sampling averages minor changes in pollutant concentrations in the waste-stream throughout the day. If the pollutant concentration in the waste-stream is consistent throughout the day then a grab sample may be all that is required.

Pollution Profile

When a waste-stream is unpredictable or a completely unknown, a pollution profile must be compiled to establish the quality of the waste-stream. 20 composite samples must be collected, one sample per day over 20 consecutive production days and sent for analysis. This will establish the quality of the waste-stream and a starting point for management of the wastestream.

Flow Measurement

Where daily volume discharge exceeds 10 kilolitres per day, it must be measured using an appropriate flow meter. Where the discharge is less than 10 kilolitres per day a discharge factor can be applied to the water account.



Guidelines for managing Trade Waste



Introduction

Sewerage systems are generally designed to safely transport and treat domestic sewage. Provided that there is available capacity in the sewerage system, the Council may accept the waste generated by commercial and industrial activities into the sewerage system as a service to business and industry.

Why Manage Trade Waste?

Uncontrolled discharge of liquid trade waste into the sewerage system can cause serious problems to the sewerage infrastructure, environment and health and safety of workers and public. These potential problems are listed below.

High BOD

- May accelerate the generation of sulphides in sewer mains and consequently odours and corrosion problems.
- May overload treatment units at the sewage treatment plant (STP).
- May cause non-compliance with the STP license conditions.

Suspended Solids


- Can cause blockages in the drains of commercial and industrial properties and sewage overflows to the environment.
- Can form deposits in the sewers reducing its capacity and leading to overflow condition.
- Accumulate in wet wells and pump stations resulting in increased maintenance.
- Can deteriorate mechanical equipment (pumps and valves) by abrasion.
- Overload treatment units at the STP.

Grease and Oil

- Cause overflows to the environment from the drains of commercial and industrial properties.
- Cause formation of deposits of greasy solids in the sewage transportation system thereby reducing its carrying capacity. These deposits can lead to the breakaway of accumulated grease at times of high or very low flow.
- Accumulates in wet wells and pump stations causing blockages or failure of pumps leading to an increase in maintenance.
- Deposit in bends of the sewer and cause restrictions and blockages.
- Accumulate on screens at treatment facilities causing blockages.
- Reduce the efficiency of sewage treatment processes.
- Can cause non-compliance of the STP's effluent with license conditions.
- Form an oily film on the receiving water.

Low or High pH

- Can injure people working in and around the sewerage system.
- Can corrode sewerage infrastructure.
- Can upset biological treatment processes at the STP.
- Can cause the release of toxic gas, hydrogen sulphide in the case of low pH and ammonia in the case of high pH.



High Temperature

- Encourages volatile materials to be driven from the sewage into the atmosphere.
- Increase rates of reaction within sewer mains resulting in consumption of oxygen and high levels of noxious gases increasing odours.
- Can cause damage to sewers including loss of strength of plastic components.

Heavy Metals

- May inhibit sewage treatment processes.
- Accumulate in biosolids and therefore limit its beneficial reuse.
- Metal residual discharged with sewage effluent may pollute the environment, accumulate in aquatic organisms and move up the food chain.

Sulphur Compounds

- Sulphites consume oxygen and may cause anaerobic conditions.
- Sulphates can reduce to sulphides.
- Sulphides can cause odours and corrosion problems in sewers.
- Sulphides may result in the release of toxic hydrogen sulphide gas.

Detergents

- Toxic to living organisms.
- May cause foaming problems in sewers and the STP.

Flammable Substances

- Can cause fires and explosions in the sewerage system.

Cyanide

- Toxic to living organism.
- May produce toxic gas in the sewer.

Phenolic Substances

- May inhibit sewage treatment processes.

Chlorinated Solvents

- May inhibit sewage treatment process.
- Are toxic to people working in and around the sewerage system.

Pesticides

- Can inhibit sewage treatment processes.
- Can pass unchanged through the STP and adversely affect the environment.
- Limit the beneficial reuse of the STP effluent and biosolids.
- Organochlorine pesticides are persistent in the environment and accumulate in living organisms.

Trade Waste Pre-Treatment Equipment (overview)

There are many types of 'off the shelf' pre-treatment devices on the market to suit many varied trade waste discharges. Listed below are the more common devices on the market. Consult with Council's Trade Waste Officer as to which device will best suit your needs. See table ' Minimum Treatment Requirements for Trade Waste' for defined waste types and their associated required pre-treatment.

Amalgam Separator: this device removes the amalgam produced as a result of dental procedures.

Coalescing Plate Interceptor/Separator (CPI or CPS): the separator uses a gravity process to remove non-emulsified oil and solids from wastewater. It contains a pack of plates that enhances the gravity separation process. 'Quick Break' detergents and non-emulsifying pumps must be used with this equipment.

Cooling Pit/Tank: a pit or tank used to cool wastewater to 38°C or less, prior to discharge to sewer.

Dilution Pit/Tank: a pit or tank used to balance high strength discharge 'peaks'. Mixing of acidic and alkaline wastes to bring the pH into an acceptable range to discharge to the sewer.

Dry Basket Arrestor: a pit or tank fitted with a fixed screen and removable mesh basket to capture large solids and fibrous material (e.g. lint, fish scales). There are also in-floor dry basket arrestors available with a fixed screen fitted to a floor waste and a removable basket as well as in-sink dry arrestors.

General Purpose - Solid Settlement Pits: a general purpose pit or tank that allows solids to sink and grease or oil to float, thereby removing them from the wastewater.

Grease Arrestor: an above ground tank or in-ground pit that allows kitchen wastewater to cool and grease to separate from the wastewater.

Grease Extractor: a grease extractor is a tank with an effluent filter on the outlet pipe work of the tank.

Hydrocyclone Separation System: this system uses centrifugal force to separate grease/oils from wastewater.

Modular Grease Trap (MGT): this is a modular system of connecting units of plate packs together to adjust the capacity of the grease trap as required. A surge control device must be fitted to the last module.

Plaster Arrestor: an under sink arrestor to capture and settle plaster used in medical procedures or craft workshops.

Silver Recovery Unit: this unit recovers silver from photographic solutions by either electrolytic or chemical processes.

Vertical Gravity Separator (VGS): a separator that uses a vertical cylinder design containing a continuous truncated conical spiral pack to separate non-emulsified oils and solids from wastewater.

Under Sink Pump Unit: a small volume tank with a pump that transfers collected kitchen wastewater to a grease trap.

General Installation Requirements for Pre-Treatment Equipment

The liquid trade waste pre-treatment equipment must be installed in accordance with the relevant regulations: *NSW Code of Practice: Plumbing and Drainage*, *AS3500-National Plumbing and Drainage Code*, local Council requirements if any and the manufacturer's guidelines. The pipes and connecting fittings must also comply with these codes and standards. The plumbing and drainage work must be carried out by a licensed plumber.

Electrical Equipment used in Treating Liquid Trade Waste

Flammable Class 3 liquids (see *Occupational health and Safety Amendment 'Dangerous Goods' Regulation 2005*), such as petrol, kerosene or solvents are potentially dangerous in the workplace. Although these substances must not be discharged to the sewerage system, there is the potential for them to be present or situated near trade waste treatment facilities.

Where a treatment process has flammable liquids present, all electrical equipment within a defined area must be intrinsically safe to avoid a dangerous situation occurring. A discharger must check that the electrically operated pump and other electrical devices have the correct electrical rating for a particular installation. All work must be carried out by a licensed electrical contractor.

Methods of Containment

Roofing of Liquid Trade Waste Generating Areas

When liquid trade waste generation or pre-treatment process does not fully occur within a building, suitable roofing must be provided to prevent the ingress of stormwater to the sewerage system.

Bunding


A bund is defined by **AS4452: 1997 - The storage and handling of toxic substances**, as "an impervious embankment of earth, or a wall of brick, concrete or other suitable material, which may form part or all of the perimeter of a compound that provides a barrier to retain liquid".

All liquid trade waste pre-treatment systems and any substance which could adversely affect the sewerage system, the environment or safety of people must be contained in banded areas, so that any leaks, spillages and/or overflows cannot be directly discharged into the sewerage and/or storm water systems. Leaks, spillages and overflows from a banded pre-treatment area must be pumped back to the head of the pre-treatment system.

The net capacity of a bund should be sufficient to contain 110% of the largest container; this is to provide an allowance for stormwater. Allowances should also be made for the capacity displaced by other tanks, barrels or drums stored within the banded area. For the storage of any flammable liquids, NSW Fire Brigades recommends that the capacity be increased to 133% of the capacity of the largest tank to allow for the capture of fire water.

A collection sump must be provided in the bund floor for the isolation and removal of liquids. All pipework should go over the wall rather than through the wall. There should be no drain valves in the pipework from the banded area, as they can be accidentally or intentionally left open to drain.

For other requirements in regard to bunding refer to the EPA document *Bunding and Spill Management* available on the EPA internet site.



Speed Humps

These are similar to the devices used on roadways where it is desirable to reduce speed. In this case, it is used to contain spills and to separate potentially contaminated areas from clean areas without impeding traffic flow. If bunding is to be driven over, it has to comply with **AS2890.1: 2004 - Parking facilities** for speed humps. Speed humps can be used around such areas as fuelling facilities or truck unloading areas, particularly at storage tanks and remote fill points. A pit is incorporated into the system to isolate contaminated flows for pumping out and disposal through an appropriate onsite pre-treatment facility or removed from site and discharged at an appropriate waste disposal facility.

Speed humps can also be used as a form of containment where relatively small spills are likely to occur.

Minimum Treatment Requirements for Trade Waste

Activity	Characteristics of Waste	Minimum Pre-treatment Required
Automotive/Engineering		
Auto dismantler	Oil, Grease, Suspended solids, Petroleum hydrocarbons, Metals, Solvents, Detergents	Dry basket arrestor.
Bus/coach depot wash bay area		Collection pit sized to suit, minimum capacity 300L.
Car detailing		An oil/water separator, sized accordingly (Note1).
Mechanical workshop		
Service stations (workshop only)		Reuse of wash water.
Carwash - manual		
Carwash - automated		
Carwash with engine degreasing		
Equipment hire	Oil, Grease Suspended solids, Detergents, Solvents	Dry basket arrestor.
Construction equipment maintenance		Collection pit sized to suit, minimum capacity 300L. an oil/water separator, sized accordingly (Note1).
Truck wash (external only)		
Panel beater/spray painter	Oil, Grease, Suspended solids	Dry basket arrestor.
		Collection pit sized to suit, minimum capacity 300L.
		An oil/water separator, sized accordingly (Note1).
		Discharge from spray booth area not permitted.
		Paint solvents, thinners are not permitted into the sewer.
Radiator repair	Suspended solids, pH, Metals	Solids settlement pit.
		Metal removal and pH adjustment may be required before discharge to sewer.
		Capture radiator fluid for reuse or store and remove by licensed contractor.
		Floors must be bunded to prevent spillage draining to the sewer.

Activity	Characteristics of Waste	Minimum Pre-treatment Required
Food Service Industry		
Barbequing process	BOD, Suspended solids, Grease	Grease arrestor, for steam oven or gas vat minimum capacity 2000L, otherwise 1000L minimum capacity (Note 2). The fat and oil generated by barbequing processes and discreet oil must be collected for recycling and must not drain directly to a grease trap or sewer. Only the wash water can drain to the sewer via a grease trap. Collected fat for recycling must be removed by a licensed contractor.
Bakery - hot bread only no meat or dairy products cooked on site. Kitchen waste - no hot food prepared and/or no oily greasy waste generated. Fruit & Vegetable market (retail) Supermarket with fruit/vegetable section.	BOD, Suspended solids	Sink screens and in floor dry basket arrestors in food preparation and handling area.
Butcher retail Supermarket with butcher and/or seafood section	BOD, Suspended Solids, Grease	Grease arrestor, sized accordingly, minimum capacity 1000L. Sink screens and in floor dry basket arrestors in food preparation and handling area.
Butcher wholesale	BOD, Suspended solids, Grease	Grease arrestor, sized accordingly, minimum capacity 1000L. Sink screens and in floor dry basket arrestors in food preparation and handling area.
Commercial Kitchen/Caterer Bakery-cooking meat and dairy products on-site Chicken (fresh) retail only Kitchen waste-hot food prepared and/or oily greasy waste is generated	BOD, Suspended solids, Grease	Grease arrestor, sized accordingly, minimum capacity 1000L. Sink screens and in floor dry basket arrestors in food preparation and handling area.

Activity	Characteristics of Waste	Minimum Pre-treatment Required
Food Service Industry (continued)		
Fast food outlets (e.g. KFC, McDonalds, Red Rooster, Pizza Hut)	BOD, Suspended solids, Grease	Grease arrestor, sized accordingly, minimum capacity 1500L. Sink screens and in floor dry basket arrestors in food preparation and handling area.
Fish-fresh (retail) no cooking on site and not including large sites such as Fish Co-op	BOD, Suspended solids, Grease	Sink screens and in floor dry basket arrestors in food preparation and handling area.
Fish Shop cooking on-site	BOD, Suspended solids, Grease	Grease arrestor, sized accordingly, minimum capacity 1000L. Sink screens and in floor dry basket arrestors in food preparation and handling area.
Wok burner – wet process	BOD, Suspended solids, Grease, large volumes of hot water	Grease arrestor, sized accordingly, minimum capacity 1500L. Sink screens and in floor dry basket arrestors in food preparation and handling area. Cooling pit and water saving practices need to be implemented.
Oyster processing	Grit, Suspended Solids	Dry basket arrestor, solids settlement pit, minimum capacity 1000L.
Restaurants, Takeaways, Cafés	BOD, Suspended solids, Grease	Grease arrestor, sized accordingly, minimum capacity 1000L. Sink screens and in floor dry basket arrestors in food preparation and handling area.
Medical Services		
Dental Surgery a. dental chair b. plaster casts c. x-ray	a. Amalgam b. Suspended Solids c. Silver, Ammonia, Thiosulphate, Sulphite	a. Amalgam separator built into the cuspidor. b. Plaster Arrestor. c. See Photographic Waste
Dental Technician • Plaster casts	Suspended Solids	Plaster Arrestor
Doctor Surgery, Medical Centre a. Plaster casts b. x-ray	a. Suspended Solids b. Silver, Ammonia, Thiosulphate, Sulphite	a. Plaster Arrestor b. See Photographic Waste

Medical Services (continued)

<p>Hospital/Nursing Home</p> <ol style="list-style-type: none"> Solid waste Food waste disposal units Contaminated/infectious waste <p>For other sources of waste, e.g. kitchen, x-ray, various laboratories, laundry, plaster casts refer to relevant clauses in this table.</p>	<p>BOD, Suspended solids, Grease, High Temp.</p>	<ol style="list-style-type: none"> Discharge of solid waste and waste from devices that macerate or pulverise solid waste are prohibited. The installation of food waste disposal units is not permitted. Existing installations in hospitals may be allowed provided the waste water is discharged through an adequately sized grease trap. Contaminated and/or infectious waste must be sterilised by autoclave and removed from site by a licensed contractor.
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Other Services

<p>Carpet cleaning mobile unit</p>	<p>BOD, Suspended Solids, Grease,</p>	<p>20 micron or smaller filtration system fitted to the mobile unit.</p>
<p>Crafts - ceramic, pottery, gem stones, jewellery (e.g. hobby clubs, schools cottage industries.</p> <p>Flow:</p> <ol style="list-style-type: none"> <200 L/day 200L to 1000 L/day >1000 L/day 	<p>Suspended Solids</p>	<ol style="list-style-type: none"> No pre-treatment. Plaster arrestor. Settling pit sized accordingly minimum capacity 1000L.
<p>Dry Cleaning</p>	<p>Solvents</p>	<p>Dry cleaning solvents are not permitted into the sewer.</p>
<p>Florist</p>	<p>Suspended Solids</p>	<p>Sink screens and in-floor dry basket arrestor.</p>
<p>Funeral Parlour</p> <ol style="list-style-type: none"> Morgue Autopsy table 	<p>Suspended Solids</p>	<ol style="list-style-type: none"> In-floor dry basket arrestor. Screen at table drainage point.
<p>Garbage bin cleaning</p> <ul style="list-style-type: none"> hotels, restaurants, shopping centres mobile garbage bin washing 	<p>Suspended Solids, Grease</p>	<p>Fixed screen over floor waste. Liquid waste discharged via grease trap.</p>
<p>Glass cutting (non optical services)</p>	<p>Suspended Solids</p>	<p>Solids settlement pit, minimum 2 hours detention at maximum flow rate. Cleaning of pit before settled material exceeds 200mm in thickness.</p>
<p>Hair dressing Salon</p>		<p>Sink screens and dry basket arrestor for floor waste.</p>
<p>Kennels, Dog grooming, Pet Shop</p>	<p>Suspended Solids</p>	<p>Sink screens and in floor dry basket arrestors. Animal faeces should be collected and not discharged to the sewer.</p>
<p>Laboratory School</p>	<p>Chemicals</p>	<p>600L balancing pit/tank</p>

Other Services (continued)

Commercial laboratory chemical related	Chemicals	Balancing pit/tank sized according to a flow rate, minimum capacity 600L, pH correction may be required.
Laboratory, pathology including autopsy, hospital Contaminated/infectious waste	Chemicals Solid and. /or liquid waste	Balancing pit/tank sized according to a flow rate, minimum capacity 600L, pH correction may be required. Contaminated and/or infectious waste must be sterilised by autoclave and removed from site by a licensed contractor.
Laundry (coin operated)	Lint, High temperature	Lint screens 1mm mesh (washing machine internal screens acceptable). Cooling pit capacity calculated to reduce wastewater temperature to <38°C
Laundry (commercial or industrial)	Lint, High temperature	As above. pH correction may be required.
Optical services (grinding of glass and plastic)	Suspended Solids	Baffled settlement tank, minimum 1 hour detention and easy access for cleaning.
Shopping Centre (including food preparation)		Refer to relevant types of business in this table. For sizing a grease trap, see Note 2
Swimming Pool (municipal) Hydrotherapy pool (new premises are not permitted to install filters that produce large backwash volume, instead cartridge type filters should be installed)	Suspended Solids, Chlorine	Backwash is accepted into the sewer through a holding tank. The waste is to be discharged at a controlled flow rate. The discharge is to be limited to low flow periods in the sewer particularly when draining the pool for maintenance. Existing premises are encouraged to change to cartridge filters.
School a. Canteen, home science b. Photographic/science laboratory		a. Refer to Food Service Industry section. b. Balance/dilution tank to be sized for 1 hour retention.
Veterinary Premises • x-ray	Suspended Solids Silver, Ammonia, Thiosulphate, Sulphite	Sink screens and in-floor dry basket arrestors. Animal faeces should be collected and not discharged to the sewer. See photographic waste
Photographic Waste		
Photographic processing and developing including x-ray	Silver, Ammonia, Thiosulphate, Sulphite	Balancing pit/tank, silver recovery unit for silver bearing waste (Note 3) or remove all silver bearing waste from premises by licensed contractor.

Screen Printing

Suspended Solids, Petroleum Hydrocarbons, Solvents Grease, BOD, Silver, Ammonia, Thiosulphate, Sulphite, Volatile Halocarbons.

Washdown bays, settling pits Coalescing plate separator. Stencil development, cleaning and reclamation.
Solvents used must be reclaimed, stored and removed from site by a licensed contractor. Silver bearing waste must be treated in an SRU or removed from site by a licensed contractor.

Miscellaneous (continued)

Boiler blowdown

Total Dissolved Solids, high temperature

Cooling pit/tank to reduce wastewater temp to <38°C

Comfort cooling tower bleed off.

Corrosion inhibitors, biocides

No treatment.

The use of products containing chromate is prohibited.

NOTES

1. An oil interceptor/separator should be of an approved type such as a coalescing plate, vertical plate gravity or a hydrocyclone separation system sized according to the influent flow rate. The minimum size is 1000L/hr. Only 'quick break' detergents must be used with these systems. Wash areas must be roofed, bunded and graded to exclude stormwater. In some instances where roofing is impracticable a 'first-flush' system must be used.
2. A grease arrestor should be an approved type and sized according to the influent flow rate. The minimum size is 1000L.
3. It is recommended that advice from a trade waste consultant should be sought in regard to activities either not listed in the above table and/or involving a discharge greater than 20 kL/day.



Trade Waste Pre-Treatment (Use Of Equipment)

Screens

The first step in pre-treatment is usually screening. Screens are an essential part and basic pre-treatment requirement to prevent blockages and equipment failures. They will also help reduce the cost of subsequent treatment stages.

A screen is used to retain or remove suspended or floating objects in wastewater. A screen may consist of bars, rods, wires, gratings, wire mesh or perforated plates. Screen with openings of 3mm or greater are considered coarse screens and those with openings less than 3mm are known as fine screens.

The wide variety of screens reflects the range of application and the different mechanisms required to keep them free of solids. They can include internal lint screen for washing machines and flat screens that are cleaned by brushing or hosing to rotary or bar screens that are mechanically or manually cleaned.

Dry Basket Arrestor

This is a pit or tank fitted with a fixed screen and a removable mesh basket. The fixed screen ensures that if the operator neglects to re-install the basket, a failsafe mechanism is in place to continue to capture gross solids.

There are also baskets available with a 'shut-off' valve that automatically stops discharge from the waste outlet as soon as the basket is removed.

Application

Food Preparation Areas: A removable dry basket arrestor with a fixed screen must be fitted to all floor wastes in food preparation and handling areas. There must also be a fixed screen over all floor waste gullies.

Oily waste Areas: A dry basket arrestor or screen must be fitted to all floor wastes that drain to the sewers to strain out gross solids such as rags, packaging, nuts and bolts etc.

In-sink Dry Basket Arrestor: This is a dry basket arrestor fitted in a sink with a fixed screen and a removable mesh basket. There are arrestors with a mechanism that does not allow flow to the sewer when the basket is removed.

Existing Arrestors without Dry Basket Arrestors: For existing premises without basket arrestors, there are units available on the market that can be retro fitted into the existing pipe work.

Rotary Screens: These include externally and internally fed screens. Wastewater is fed over the screen or out through the screen and the solids are collected based on the system used.

Rotary Inclined Drum Screen: As the screen rotates, the solids roll in the face of the drum and are intercepted by diverter flights mounted spirally on the drum. Solids are directed up the inclined drum to a discharge point and drop off into a bin or onto a conveyor or into a dewatering device.



Grease Arrestors

Conventional Grease Arrestors

There are two main types of conventional grease arrestors on the market the 'boat shape' and the Sydney Water design which is a modified version of the boat shape. Both designs are acceptable for most installations. The Sydney Water design is the preferred of the two as it has the following advantages:

- ease of service as the covers have been modified to provide better access for removal of solids and grease and oil
- the outlet has been raised so the solids are captured and removed rather discharged than to the sewer.

Grease arrestors must be sized in accordance with the influent flow rate with a minimum size of 1000 litres.

Modular Grease Trap (MGT)

This is a system of connecting chamber units designed to separate oil, grease and settleable solids. When sludge and oil/grease separate and build up in the first chamber the particles overflow into the next. A surge control device (SCD) is fitted into the last chamber to stabilise high surges and promote even flow and quality of the effluent. The SCD plates trap and deflect suspended particles back into the chamber. The trap can be modified to increase retention time by adding chambers. Connecting configurations should be no less than 1000L and no more than 5000L. An MGT can be very versatile as they are more easily fitted into confined spaces and they do not have to be buried. They can even be set up to fit in a basement of a premises and the effluent pumped into the sewer.

Grease Extractor

A grease extractor is a tank with either an effluent filter or anSCD on the outlet pipe. It can be used for small operations and at premises where conventional grease arrestors cannot be installed due to space limitations. The filter allows high hydraulic flows while grease and suspended solids accumulate on the filter plate

A grease extractor with a SCD unit is designed to stabilise high hydraulic surges. The unit comprises packed plates which will trap grease and suspended solids and deflect them back into the pre-treatment vessel.


Where an existing grease arrestor is in good condition but failing to reduce grease and oils to less than the standard concentration (50 mg/L), a grease extractor can be fitted to the outlet pipe, either internally or externally housed in a separate pit.

Sizing of a Grease Arrestor

The minimum capacity for a conventional grease arrestor is 1000L. This assumes that a hot water tap turned fully on will deliver 0.3 L/s or 1000 L/hr. Therefore, a volume of 1000L should enable one hour detention time within the grease arrestor for cooling, which is considered a sufficient period for breaking the emulsified grease and oil from the hot water solution.

Fast food outlets such as McDonalds, Red Rooster, KFC etc., require grease arrestors sized according to the influent flow rate with a minimum capacity of 1500L. Barbequing process (steam oven or gas vent) requires a grease arrestor minimum capacity of 2000L.

There are also some processes that generate high volumes of wastewater. These will be required to install a grease trap sized in accordance with the influent flow rate.



Maintenance of Arrestors, MGT's and Extractors

Remember, when locating these devices, they must be maintained, therefore allow reasonable access to the site for equipment and the pump-out vehicle.

Servicing these devices is basically the same procedure as an initial pump-out, hose down (preferably high pressure) walls and internal components and pump-out again. Refer to the manufacturer's specification for any specific procedure. Servicing intervals is a minimum four times a year (every 13 weeks). More frequent servicing may be required depending on the load on the device.

Under-sink Pump Units

There are some situations where it becomes necessary to install an under-sink pump unit, such as space requirements or building design that does not allow a grease trap to drain to the sewer by gravity. An under-sink pump unit consists of a tank that should not contain more than 40 litres of kitchen wastewater. A pump located within the tank delivers this wastewater to a grease trap. The unit should be cleaned at the same time the grease trap is serviced.

Oil Separators

Oily wastes (liquid wastewater containing residues of petroleum products) must be treated in an oil separation system before discharge to the sewer. The oil separation system includes coalescing plate interceptors/separators, vertical gravity separators and hydrocyclone separation systems.

General

Cleaning Compounds

Only 'quick-break' and readily biodegradable detergents should be used. 'Quick-break' detergents allow oil/water emulsion to 'break' or separate so that the oil separator removes the oil.


Since the advent of 'quick-break' detergents many chemical companies have labelled their products as 'quick-break' when in fact they are not. The criterion is that the emulsion should break completely and wastewater should separate into an oily and aqueous layer within 20 to 30 minutes.

The user should ensure that the supplied detergent is a 'quick-break' type. It should be verified on a site specific basis that, while using a particular detergent, the emulsion breaks and the final liquid trade waste discharge complies with the standard limits for oil and grease.

The use of degreasers is prohibited as they inhibit the detergent from breaking the emulsion and therefore allowing petroleum hydrocarbons to enter the sewer system.

Pumps

A pump transferring wastewater from a collection pit to an oil separator should be a non-emulsifying type with a suction inlet at least 300 mm above the bottom of the collection pit. It is important to use a pump that is authorised by the manufacturer of the oil separator.



Coalescing Plate Interceptor (CPI)

A coalescing plate separator uses the difference in specific gravity to separate free (non-emulsified) oil and solids from water. The pack of plates is placed across the direction of flow to assist this process. Flow through is laminar to achieve optimum separation of oil from the water phase. The plates are inclined 45 to 60 degrees from the horizontal so that solid particles caught by the plates sink into the sludge hopper. The oil collects on the surface where it is decanted into the waste oil tank. The plate packs are modular and can easily be removed for cleaning.

Some manufacturers supply plate packs for upgrading of existing pre-treatment facilities.

Coalescing plate interceptors should be sized in accordance with the influent flow rate. The minimum size is 1000 L/hr.

Hydrocyclone Separation System (HSS)

This system is based on centrifugal forces separating immiscible, insoluble liquid-liquid mixtures. Oily water is drawn off the top of a pit via a floating skimmer and is pumped into a hydrocyclone unit. Centrifugal force drives oil to the centre of the hydrocyclone vortex and oil is removed via a small hole in the end wall of the unit. The oil is then directed to a storage tank or drum.

This oil storage container has a large settling time where the oil floats to the top. Excess water is drained from the bottom of the container back to the pit. The treated water is recycled through the separator until it reaches a suitable standard for discharge to the sewer.

A hydrocyclone separator should be sized in accordance with the influent flow rate. The minimum size is 1000 L/hr. An influent pit is used to allow sediments to settle. Skimmers should draw wastewater from the surface of the influent pit. The equipment supplier/consultant should set an appropriate recycle time to achieve an acceptable effluent quality.

Vertical Gravity Separator (VGS)

A vertical gravity separator operates by controlling fluid velocity and pressure allowing high density contaminants to fall into a sump and oil droplets to rise.

As liquid enters the VGS, it flows up through a low pressure zone in the middle of a multi-leaved spiral inverted V shaped baffle known as a spiral pack (SPAK). Free oil and impurities float to the surface and overflow into a 'slops tank'. This central low pressure zone creates a flow up through the centre and down the inside of the main body.

As the fluid flows down the sides, due to numerous directional changes non-emulsified impurities fall out of suspension and are drawn to the low pressure core. Heavy contaminants fall into a sump where they can be drained off through a valve. Low density impurities move to the centre and rise to the surface and overflow into the 'slops tank'. Treated water flows from the 'cleaned water outlet'.

The VGS should be sized according to the wastewater flow rate. Sizes range from 1000 to 3000 L/hr.

Maintaining Oil Separators

The manufacturers and or supplier should supply a comprehensive maintenance schedule for an oil separator. However, there are some basic procedures common to all separators such as pumping out the collection pit, drain and collect sludge from sumps, remove collected free oil, all of which must be done by a licensed contractor. In addition all internal components must be cleaned and inspected for serviceability and all electrical components must be inspected and serviced.

These devices should be maintained at a minimum four times a year (every 13 weeks).



Service Station Forecourts

Discharge of waste-water and run-off from service station refuelling areas may be permitted, provided the business complies with the following pre-treatment requirements.

- The forecourt area is to be swept prior to wash-down and any cleaning compounds must be compatible with the waste-water pre-treatment system.
- The forecourt area must be roofed and graded to exclude rainwater.
- Waste-water must drain to a collection well. The collection well should have minimum capacity of 750L and connected to an oil/water separator.

Stormwater Containment

Roofing of Liquid Trade Waste Generating Areas

Areas, where trade waste activities are carried out or pre-treatment equipment is installed, must be roofed to prevent the ingress of rainwater from entering the sewerage system. For a structure where one or more sides are open to the weather, the roof must overhang the containment area 10 degrees from vertical. This is the minimum acceptable cover.

To ensure that no surface stormwater flows onto the process area, a bund/speed hump at least 50 mm high must be installed around the area as necessary. On the upper side of the area a strip drain must be installed, however, this alone may not be adequate as stormwater may flood the drain and flow onto the area. The overall surface water flow across the site has to be considered and the height of the bund/speed hump adjusted.

Method of Exclusion of Stormwater

From a waste management point of view, the prevention of stormwater contamination is the preferred solution. Areas that are likely to be contaminated should be bunded and covered with a roof. Spillage of chemicals, products etc. should be recovered or cleaned by dry methods, so either system sewerage or stormwater drainage is not contaminated.


Separation

Separation of dirty and clean areas is imperative for good waste management. Areas that are likely to become contaminated are those areas where activities such as storage, handling or transferring of liquid or solid materials occur.

Segregating clean and contaminated areas can be achieved by selective changes in surface gradients, the use of speed humps or bunds or by the use of diversion and collection drains.

Bunding

The bund is designed to contain spillages and leaks from liquids used, stored or processed above ground and to facilitate clean-up operations. As well as being used to prevent pollution of the receiving environment, bunds are also often used for fire protection, product recovery and process isolation.



Collection Drains

Collection drains should be constructed to ensure ease of inspection and cleaning. The grates should be easy to remove and the pit should be wide enough so that accumulated solids can be easily removed.

Diversion Drains

Diversion drains such as 'spoon drains' can be successfully used to divert stormwater away from the contaminated area.

Speed Humps

Speed humps can be used to separate potentially contaminated areas from clean areas and a form of containment where relatively small spills are likely to occur or a more substantial structure is not practical.

Housekeeping practices for kitchen and oily waste

The cleaning frequency of a pre-treatment facility is governed by the quantity of accumulated waste; it is therefore in the management's interest to insure minimal waste is disposed through the facility.


If these suggestions are followed the pump-out frequency can be reduced, blockages in the drains may be avoided and money can be saved. The correct management of liquid trade waste and proper maintenance of pre-treatment facilities will result in a cleaner environment.

Kitchen Type Waste

- Use water sparingly, efficiently, and recycle whenever possible.
- Use aluminium foil to collect grease and oil spills around stoves, fryers, etc.
- Use minimal grease and oil for cooking.
- Use detergent sparingly.
- Place screens on sink drains to keep solids from washing down the drain.
- Scrape cooking utensils and plates before washing.
- Place a container under the outlet of cooking vats used in barbeque charcoal rotisserie appliances to collect fat.
- Ensure the dishwasher is full every time it is used.
- Use broom or mop for washing floors instead of the hose.
- Rinse dishes in a plugged sink rather than under a running tap.
- Do not put coffee grounds or tea leaves down the sink.
- Collect oil and grease separately and dispose of separately by licensed recyclers.

Workshops, Garages, Service Stations

- Ensure that the wash area is covered and bunded to secure all waste-water and connect all drains to a pre-treatment facility.
- Forecourt areas must be covered and graded to exclude stormwater.
- Use water sparingly, dry sweep or clean before hosing.
- Use 'quick-break' detergents. This will help capture more grease and petroleum hydrocarbons in the oil/water separator.
- Use cleaning products that have a pH range of 7-10. Metal salts can ionise if the pH of the waste is higher or lower. In this form they are very difficult to remove without expensive pre-treatment.
- If parts are washed in a solvent cleaning bath, it should be done in a closed recycle system.
- Use drip trays to catch oil.

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- Drain oil and fluids from engines, gearboxes, and other parts into storage containers before dismantling.
 - Do not discharge caustic bath and rinse into the sewerage system.
 - Store oil, solvents, cleaning products and other chemicals in bunded areas not connected to the sewerage system.
 - Arrange for collection of oils, grease and solvents for recycling by licensed contractors.

