17. ECO-INFO – *SEPTIC✓SAFE*
PROTECT YOUR HEALTH AND ENVIRONMENT
YOUR AERATED WASTEWATER TREATMENT SYSTEM (AWTS)
with SELF ASSESSMENT TROUBLE SHOOTING GUIDE

Edited 20/12/01

In unsewered areas, the proper treatment and utilisation of household wastewater on-site is critical in preserving the health of the public and the environment. AWTS have been developed as one way to achieve reuse and utilisation of effluent.

WHAT IS AN AWTS?

An AWTS is a system used for the treatment of sewage and liquid wastes from a single household or multiple dwellings.

It consists of a series of treatment chambers combined with an irrigation system. An AWTS enables people living in unsewered areas to treat and use their wastewater.

HOW DOES AN AWTS WORK?

Wastewater from a household is treated in stages in several separate chambers.

- The first chamber is similar to a conventional septic tank. The wastewater enters the chamber where the solids settle to the bottom and are retained in the tank forming a sludge layer.
- Scum collects at the top, and the primary treated wastewater flows into a second chamber. Here the wastewater is mixed with air, from the small compressor (blower- usually located on top of the tank), to assist bacteria to further treat it.
- A third chamber allows additional clarification through the settling of solids, which are returned for further treatment to either the septic chamber (as shown) or to the aeration chamber through a sludge return pump. The clarified effluent is disinfected in another chamber (usually by chlorination). Disinfected effluent is then pumped to the irrigation field.

Bacteria in the first chamber break down the solid matter in the sludge and scum layers. Material that cannot be fully broken down gradually builds up in the chamber and must be pumped out periodically.

AWTS's need to be serviced quarterly by an approved service provider at a cost to the owner. Wyong Shire Council maintains an electronic register of the servicing of systems.

AWTS's should be fitted with an alarm having visual and audible components to indicate mechanical and electrical equipment malfunctions. The alarm should provide a signal adjacent to the alarm and at a relevant position inside the house. The alarm must have a warning lamp which may only be reset by the service provider.

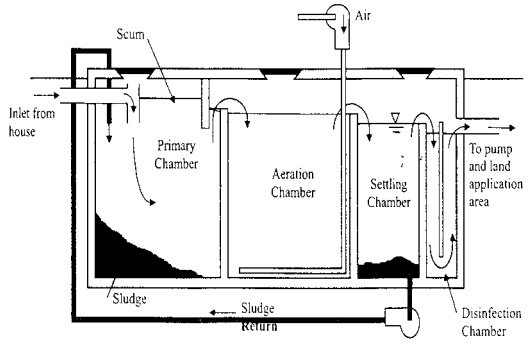

Figure 1:Cross section of an AWTS

REGULATIONS

All AWTS's are accredited by the NSW Department of Health. Wyong Shire Council is responsible for approving all AWTS's in the Shire. The Environment Protection Authority (EPA) approves systems that treat more than 2500 EP, that are permitted to directly discharge to a watercourse, or where the EPA is the approved regulating authority for other activities on a property (e.g. air pollution).

TROUBLE SHOOTING GUIDE

AERATED WASTEWATER TREATMENT SYSTEMS
(Biocycle, Earthsafe, Gardenmaster, Supertreat, etc.)

A self assessment trouble shooting guide to assist you in maintaining your aerated system.

Aerated Wastewater Treatment Systems (AWTS) consist of either one or two tanks, being the treatment plant, (usually constructed of concrete or polypropylene) and an irrigation system where effluent is applied to land.

Problems with system failure (offensive odours and leaking tanks) can occur because-

- The system is not being serviced by a Council approved service provider.
- There has been little or no maintenance on the tank and system.
- The tank has not been desludged to remove accumulated build up of sludge and solids in the bottom of tanks. Sludge build up reduces treatment by the carry over of solids to other chambers in the system and reduced disinfection.
- The irrigation system and filters become clogged with suspended solids from the treatment plant.
- The irrigation system does not have enough sprinklers and adequate coverage.
- The system design and irrigation area is inadequate considering the soil conditions on site. Some soils in Wyong (e.g. Patonga claystones in Jilliby) are dispersive which means that the soil particles can go into permanent suspended solution when effluent or water contacts them. In addition some laundry products (particularly laundry powders) contain high levels of sodium that causes soil structure decline. Refer to Eco-info No 20 for sodium levels in laundry products.
- There is an excessive use of cleaning products, disinfectants and bleaches that affects the natural biological processes of treatment in the tank. Think of the link between your system and your sink when using these products.

This self assessment guide is designed to assist you in understanding how your system works and to undertake an assessment of your own system's performance. The guide starts with a basic visual assessment of the condition of the treatment plant followed by an inspection of your irrigation system. When checking tanks and irrigation systems be aware that effluent is a health hazard. Use appropriate personal protective equipment and safe work practices.

Your system must be regularly serviced by a service provider approved by Council every 3 months. Council does not permit owners to alter or adjust or maintain the operational components of the aerated treatment plant. Please discuss any concerns with your service provider. Council is encouraging the use of the Log Books provided to record any maintenance and servicing undertaken on your system.

Should you require any assistance or further information please contact Council's Customer Service Centre on (02) 4350 5555.

Aerated Wastewater Treatment System Trouble Shooting Guide

The Treatment Plant (tank/s)	[redacted]
Checks	**Actions**
Locate the tank/s on your property	*The tank/s are usually downslope of the dwelling or buildings with plumbing fixtures in them. Council may be able to assist you in locating your tank/s by researching your records if available.*
Are the lid/s and manhole covers accessible?	*The lid/s need to be accessible at ground level. All soil, plants and any overgrowth needs to be removed.*
Are the lid/s above ground level?	*The lid/s of the tank/s ideally needs to be 150 mm above ground level to prevent entry of surface water. The surrounding ground level needs to be graded to fall away from the tank/s.*
Are the lid/s sealed to prevent odours and the entry of rain water and insects like mosquitoes?	*Any cracks or openings in the lid/s of the tank/s need to be sealed. The join between the lid/s and the side of the tank/s needs to be sealed with a 4:1 sand/cement mix to prevent grasses and plant roots entering the tank and causing clogging. Before sealing, lift the manhole cover to ensure that any tree roots that may have entered the tank/s are removed. Missing or broken inspection covers need to be replaced and sealed. Contact your service provider for assistance.*
Are the tank/s of sound construction and holding effluent without leaking?	*Check the surrounds of the tank/s and look for visible signs of a leaking tank where above ground level. Lift the manhole cover and note the level of liquid/scum layer on the surface of the primary chamber. Partly filled systems could be leaking within the system and can cause groundwater and surface water pollution. Contact your service provider for assistance.*
Is the inlet junction present and functioning inside the primary tank?	*Remove the small inspection covers at the edge of the tanks. Check the junctions are intact as they are required to prevent surface scouring within the tank and to prevent carry over of solids (fats, scum, oils, soap waste, etc.) to the aeration chamber. Any broken junctions need to be repaired and replaced. Contact your service provider for assistance.*

The Treatment Plant (tank/s)	
Checks	**Actions**
Are all house drainage lines connected to the tanks?	*Open the inspection inlet opening on the tank and have someone flush the toilet while you view the inlet of the tank. Water should be seen to flow in the tank at the inlet junction. The same can be done systematically for other fixtures (basin, shower, etc.). In some cases it may be necessary to dye test drainage lines and tanks to verify connections and trench*

	locations. Any dye testing needs to be carefully undertaken in view of the proximity to waterways and the environment. Call your local plumber for assistance and advice.
Is the installation fitted with a overflow relief gully?	*The gully (looks like a drainage grate at ground level) is installed externally on house drainage lines with an overflow level @ 150 mm below the floor level designed to ensure that if there are any blockages in the house drainage lines that they overflow outside the building. The top of the gully should be @ 150 mm above ground level. Call your local plumber for assistance and advice.*
Is there a house drainage vent installed?	*An upstream vent is always installed on house drainage before the last fixture (toilet, basin, sink etc.) and appears as a pipe above the roof line of the dwelling. This vent prevents siphoning of trap seals in fixtures and prevents the build up of dangerous gases such methane in the drainage system. Call your local plumber for assistance and advice.*
Your service provider	*You are required to have your system serviced by a Council approved service provider every 3 months. A copy of the service report must be left at the premises and the service provider sends a copy to Council. It is your responsibility to ensure that you have all works outlined in your service report undertaken. This may include-* • *repairing any internal leaks,* • *repairing broken or faulty alarms, electrical wiring and switching,* • *replacing faulty pumps, sludge returns, blowers and diffusers,* • *having the primary and aeration chambers pumped out,* • *replacing damaged filters, sprinklers and irrigation lines/systems.*

Grease Trap (if fitted)

Checks	**Actions**
Some septic systems that were installed prior to 1984 generally had grease traps fitted as the septic tanks did not have internal baffles. Septic tanks were then fitted with internal baffles and grease traps were no longer required. Grease traps collect waste from the kitchen sink and are usually found near to the kitchen. They require periodic cleaning (@ 3 months)	*The lid of the grease trap (@ 600 mm x 400 mm) needs to be lifted and checked for cleaning.* *All fats and solids need to be removed.* *Grease trap contractors can remove contents if required.*

Irrigation Systems
(Land Application Systems)

Walk towards the area where you believe the irrigation system is located to check the following items.

Checks	**Actions**
Is your irrigation system located in accordance	*The system must be installed in the location in*

with the conditions of approval to install the system?	*accordance with the conditions of approval to install the system, unless directed or agreed to by Council.*
Is your irrigation system located in an area not used for recreation purposes (e.g. not likely to be contacted or travelled by a daily basis) and pedestrian access suitably restricted with landscaping, barriers or fencing?	*Treated effluent still contains bacteria, viruses, parasites and other disease carrying organisms. A poorly maintained system can be a serious public health risk. Contact with effluent should be eliminated, particularly for children.* *Areas being used for surface irrigation from aerated treatment plants (e.g. Envirocycle, Earthsafe, Gardenmaster systems, etc.), are to be non recreation garden or turfed areas that discourage entry of persons with either perimeter landscaping, fencing, barriers and defined garden borders or edging.*
Has the system been installed and finalised to comply with the conditions of approval to install the system?	*Check with your installation approval and ensure all conditions are complied with.*
Is the irrigation system in an area that is landscaped with turf or mulched gardens?	*Irrigation systems must be installed only in areas that are adequately landscaped.*
Is the line filter (if installed) clean?	*A visible check of the filter is a sign of the level of maintenance on the system and the level of suspended solids in the treated effluent.*

Irrigation Systems
(Land Application Systems)

Checks	**Actions**
Are there two reclaimed effluent warning signs near the irrigation system?	*Warning signs are required to comply with NSW Health approval. They are reminder to visitors to the property of the presence of treated effluent while also reminding the owners of their responsibilities for safe management. Signs can be obtained from Council or your service provider.*
Is the main distribution line buried 100 mm?	*The main line from the treatment plant to and within the irrigation field has to be buried 100 mm to prevent mechanical damage, reduce the risk of effluent contact from regularly moving systems, and to prevent the build up of pathogens in the line during the heat of the day when not in use. Council is encouraging the burying of effluent irrigation lines where not indicated in your installation approval. Additional areas can be used and managed through either manual line valves or the use of an automatic "water rota". Larger areas are more efficient at removing nutrients and pollutants through evaporation and transpiration by plants and grasses.*
Are there at least the minimum number of sprinklers installed to comply with the conditions to install the system?	*Early approvals stated that at least three sprinklers had to be installed for many systems. Council is encouraging systems to be installed*

	with greater numbers of sprinklers to improve the evapotranspiration potential and to remove nutrients more efficiently. Large areas can be divided into two or more areas managed automatically through a "water rota" or manually through line valves. Contact your service provider for assistance.
Is the irrigation system installed with standard household sprinklers, soaker hoses and attachments?	*Are not permitted due to the risk of cross contamination.*
Is the irrigation system being used to grow fruits or vegetables for human consumption?	*The irrigation field cannot be used to grow fruit and vegetables due to the public health risks.*
Is the land application area wet or soggy?	*YES? Recommend to* • *Reduce water use* • *Ensure surface water and overland flow from rain events is diverted away from the system with a diversion drain.* • *Recheck in a couple of days. If it is still wet this is probably an early sign of the need for relocating the irrigation system.*

Irrigation Systems
(Land Application Systems)

Checks	Actions
Are there depressions at ground surface level causing water to pond around your land application system?	*All depressions need to be filled with absorbent soil so that water does not pond.*
Is surface water run-on diverted away from the irrigation system?	*Any excessive surface water from rain events run-on needs to be diverted away from the irrigation system with upslope dish drains or earth berms(@ 300 mm deep/high and 500 mm wide). Downslope detention berms of a similar size are encouraged to retain minor run-off events*
Are vehicles and stock excluded from damaging the system?	*Vehicles and stock can damage irrigation systems through mechanical damage to irrigation lines and sprinklers, soil compaction, and plugging.*
Is there adequate vegetation cover over the irrigation field?	*The regular application of gypsum and lime over the irrigation field can reduce the effects of sodium in effluent, dispersive soils, prevent soil erosion and assist to maintain land application areas with adequate vegetation. Gypsum can be applied at the rate of between 0.3 - 1 Kg/m^2.*

SUMMARY

MAINTAINING YOUR AWTS

The effectiveness of the system will, in part, depend on how it is used and maintained. The following is a guide on good maintenance procedures that you should follow:

DO

- ✓ have your AWTS inspected and serviced four times/year by an approved service provider
- ✓ have your system service include assessment of sludge and scum levels in all tanks, and performance of irrigation areas

- ✓ have your tanks checked for desludging. Recent evidence suggests primary chambers should be desludged at least every three to five years for an average sized family
- ✓ have your disinfection chamber inspected and tested quarterly to ensure correct disinfection levels
- ✓ have your grease trap (if installed) cleaned out at least every two to three months
- ✓ keep a record of pumping, inspections and other maintenance in your Log Book.
- ✓ learn the location and layout of your AWTS and land application area
- ✓ check household products for suitability for use with an aerated system. See Eco-info No. 20 fact sheet for information on phosphorus and sodium levels in washing and laundry products
- ✓ use biodegradable liquid detergents such as concentrates with low sodium and phosphorus levels
- ✓ conserve water

DON'T

- x put bleaches, disinfectants, whiteners, nappy soakers and spot removers in large quantities into your AWTS via the sink, washing machine or toilet
- x allow foreign materials such as nappies, sanitary napkins, condoms and other hygiene products to enter the system
- x switch off power to the AWTS, even if you are going on holidays

REDUCING WATER USAGE

Reducing water usage will lessen the likelihood of problems such as overloading with your AWTS. Overloading may result in wastewater backing up into your house, contamination of your yard with improperly treated effluent, and

effluent from your system entering a nearby river, creek or dam.

Conservative water use around the house will reduce the amount of wastewater which is produced and needs to be treated.

Your AWTS is also unable to cope with large volumes of water such as several showers or loads of washing over a short period of time. you should try to avoid these 'shock loads' by ensuring water use is spread more evenly throughout the day and week.

Some Water Usage Facts

SHOWERS use 10-30 litres a minute, 200 litres a minute in 10 minutes. Try a AAA shower head.
BATHS use an average of 120 litres.
TOILETS can use up to 11 litres per flush. Dual flush cisterns typically use only 3/6 litres per flush.
WASHING MACHINES use 100 -200 litres per load. Front loaders use less. Fully load before use.
LEAKING TAPS can use up to 5 litres an hour. Repair leaks and replace washers.
DISHWASHERS use approximately 50 litres per cycle. Fully load before use.

WARNING SIGNS

You can look out for a few warning signs that signal to you that there are troubles with your AWTS. Ensure that these problems are attended to immediately to protect your health and the environment.

Look out for the following warning signs:

- * water that drains too slowly
- * drain pipes that gurgle or make noises when air bubbles are forced back through the system
- * sewage smells, this indicates a serious problem
- * water backing up into your sink which may indicate that your system is already failing
- * wastewater pooling over the land application area
- * black coloured effluent in the aerated tank
- * excess noise from the blower or pumping equipment
- * poor vegetation growth in the irrigated area

Odour problems from on the AWTS can be a result of slow or inadequate breakdown of solids and overuse of harmful products in the home. Call your service provider to service the system.

Poorly maintained AWTS's can be a serious source of water pollution and may present health risks, cause odours and attract vermin and insects.

By looking after your treatment system you can do your part in helping to protect the environment and the health of you and your family.

More information can be obtained from additional Eco-info sheets:

- Your Sewage Management Approval
- Your Septic System
- Your Waterless Composting Toilet

- Your Land Application Area
- Options for On-site Sewage Management Systems

This information package has been assisted by the New South Government through the *'Septic✓Safe'* On-site Sewage Management Program administered by the Department of Local Government.

If you would like more information please contact: Wyong Shire Council's Customer Service Centre on (02) 4350 5555