

TOWARDS BETTER ONSITE WASTEWATER MANAGEMENT IN VICTORIA - COMMUNITY EDUCATION SERIES

FACT SHEET 1: AERATED WASTEWATER TREATMENT SYSTEMS (BASIC DESIGN INFORMATION)

This information will be of interest to you if you live on a property that is not connected to a town sewerage system. You will most likely either have a conventional septic system or an aerated wastewater treatment system (for further information on septic systems refer to Fact Sheet 1 and Fact Sheet 6). This fact sheet focuses only on aerated wastewater treatment systems. It is recommended that this fact sheet be read in conjunction with Fact Sheet 7: Common Disposal Methods (Aerated Wastewater Treatment Systems).

2.1 WHAT IS AN AERATED WASTEWATER TREATMENT SYSTEM (AWTS)?

AWTSs use a primary settling chamber, mechanical aeration and final settling or clarification stage to treat domestic wastewater (refer to Diagram 1). Many systems also have a disinfection stage. AWTSs generally produce a higher quality effluent and are used when residents would like to reuse their wastewater or to help address the disposal issues on environmentally sensitive sites. The following are the main features of AWTSs which begin at the primary treatment stage:

Primary Clarifier Chamber

This is where the wastewater from your toilet, kitchen, laundry and bathroom travels to first. Here the solid material is allowed to settle out and forms a sludge at the bottom of the chamber. There is no oxygen in this chamber and there is some digestion of the wastewater by good bugs that live in a low oxygen environment. This is called anaerobic biological treatment. The wastewater then goes to the next stage – aerobic biological treatment in the aerated chamber.

Aeration Chamber

Here the wastewater is mixed with air and this allows good bugs that require oxygen to digest the wastewater. The digestion process in this chamber is much quicker than anaerobic digestion. The wastewater then goes to the next stage – sedimentation and clarification in the sedimentation/clarification chamber.

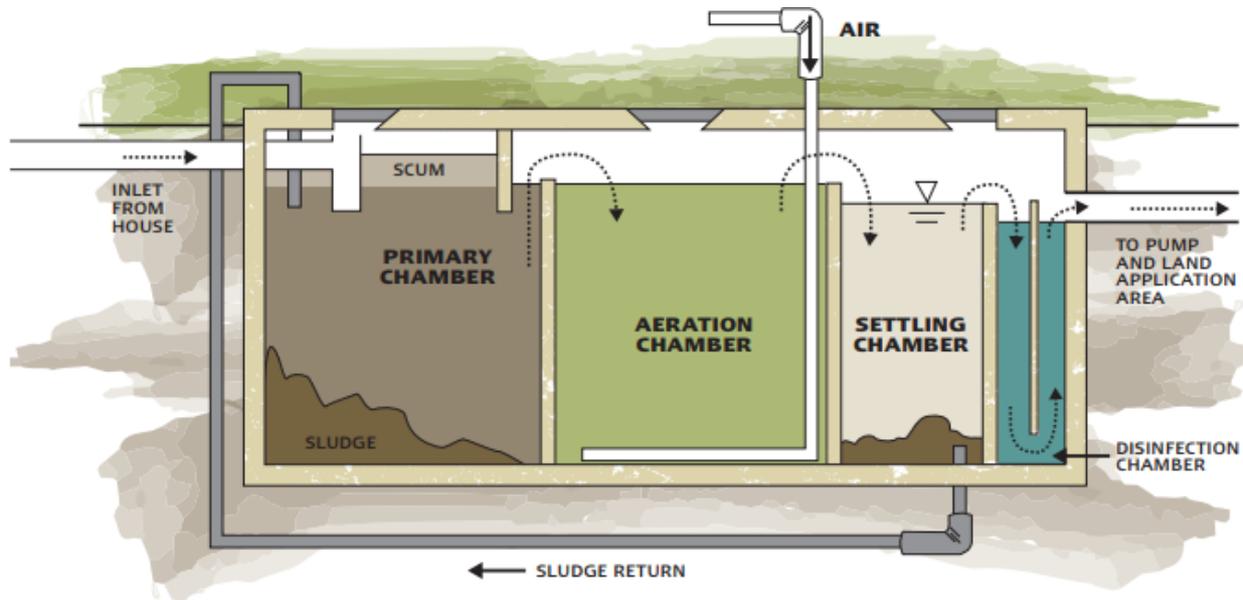
Settling Chamber

Here more of the solid material is allowed to settle out and you will see that the remaining wastewater appears quite clear. However, this water still contains high numbers of bad bugs that can be harmful to your health. This is the end of the treatment process for many makes of package treatment plants. The final wastewater from these systems is then delivered to an underground irrigation system located in your yard. There are other makes that have another stage to the treatment process, and this involves chlorinating or UV the water exposing it to ultraviolet light (UVR). These are likely to be more popular with as treads.

Chlorination Chamber

For package treatment plants that have this treatment process, the wastewater is exposed to chlorine and then is usually sent to a surface irrigation bed in your yard. The wastewater is held in this chamber to allow the chlorine to do its work and kill any remaining bad bugs. If you have a system relying on chlorination, it is very important that the chlorine tablets in the chlorine chamber do not run out and are not replaced or the wastewater that leaves the package treatment plant will still contain high levels of bad bugs.

DIAGRAM 1: A BASIC AWTS



2.2 COMMON ISSUES ASSOCIATED WITH AWTS AND SOME RECOMMENDED SOLUTIONS THAT YOU SHOULD BE AWARE OF:

AWTS are mechanical systems made up of many parts which can breakdown and need to receive regular servicing in order to operate effectively. You need to have the system serviced by an accredited servicing agent once every three months or as indicated within the Certificate of Approval issued by Victoria's Environment Protection Authority (a list of approved systems can be found at <http://www.epa.vic.gov.au/your-environment/water/onsite-wastewater/wastewater-secondary-domestictreatment-systems#L3P3>). It is important to note that the servicing agent needs to send a copy of every service report on your system to your local council.

The AWTS should have an electronic alarm fitted to warn of any system malfunctions. These alarms maybe an audible system or a strobe light or both. You need to make sure that this alarm has been correctly installed and is working. The alarm needs to be checked when the system is being serviced. Beware that most systems will not be able to trigger the alarm during power outages.

Your system may include a disinfection stage usually provided by running the clear effluent through a chlorine dispenser or UV light. UV light disinfection systems need to be cleaned regularly and checked that the UV light tube is working. While the chlorine dispenser needs to have chlorine tablets properly fitted in the dispenser. The disinfection processes need to be checked when the system is serviced.

The irrigation system can become damaged (e.g. damaged by animals looking for water) or blocked by solids from the effluent. In these cases you need to contact your licensed plumbing practitioner to have any work carried out on your irrigation system. Too much sludge in the primary chamber can result in wastewater heavy with solids entering other chambers of the AWTS, clogging components and reducing the ability of the system to treat the wastewater adequately. The sludge levels need to be checked when the system is serviced and the primary chamber will need de-sludging from time to time (recommended to be undertaken every 3-5 years depending on use).

Too much wastewater entering the AWTS. Your AWTS has been designed to manage a calculated amount of wastewater. Should this amount be exceeded, the ability of the AWTS to adequately treat the wastewater could be compromised. If this situation is occurring then you need to consider steps to reduce your wastewater generation (e.g. install water saving devices) or the system needs to be upgraded to cope with this new volume. To discuss the options available contact your licensed plumbing practitioner.

There are many domestic chemicals that can hurt the operation of your AWTS. Chemicals such as bleach and commercial cleaners, entering the system can result in good bugs being killed off, halting the biological digestion process crucial to the treatment process. Use only septic safe chemicals when cleaning your house.

Common signs of a failing AWTS include: water draining away too slowly; pipes making noises or gurgling when draining; sewage smells; or water ponding in the irrigation system. If you notice any of these occurring then contact your regular servicing agent or licensed plumbing practitioner.

2.3 SERVICE REQUIREMENTS FOR AWTS:

When an authorised person or servicing agent services your AWTS, the items they look at should include:

- The general condition of the system and immediate surrounding area is checked for leakage and contamination,
- Primary chamber/tank is checked for scum crust on the surface, odours, sludge depth, inlets are clear and there is good biological activity.
- Aeration chamber/zone is checked for odour, oxygen levels, pH (whether it is acidic or alkaline), the air blower is doing the job, colour of the effluent and there is adequate biological activity within.
- The final clarification or settling chamber/zone is checked the effluent is clear to look at, how much sludge is in the chamber, and if the sludge return is working (if present).
- If your system includes disinfection then the service agent should ensure that the chlorinator is stocked, clean and operating depending on the type of disinfection used.

2.4 SETBACK DISTANCES FOR AWTS:

The treatment plant for an AWTS should be installed at least two metres from a house or other permanent structure. For further setback distances refer to the current EPA Code of Practice for On-site Wastewater Management available at <http://www.epa.vic.gov.au/~media/Publications/891.4%203.pdf>

2.5 DISPOSAL FIELDS FOR AWTS:

For information on disposal methods appropriate for AWTS refer to Fact Sheet 7 Common Disposal Methods for AWTS.

2.6 COMPARISON BETWEEN CONVENTIONAL SEPTIC TANKS AND AWTS

Conventional Septic System	Package Treatment Plant
Generally do not require power, unless the effluent needs to be pumped	Requires a continual supply of power.
Limited maintenance – de-sludging is required every 3-5 years, depending on use.	Requires regular maintenance – must be serviced once every 3 months, an annual water sample test is required and de-sludging every 3-5 years depending on use.
A full list of approved conventional septic and secondary treatment systems can be found on the Environment Protection Authority website at http://www.epa.vic.gov.au/your-environment/water/onsite-wastewater	
It is important to note that secondary treatment systems are likely to be the best option on properties with environmentally sensitive features such as creeks and dams or where there is limited area available for disposal areas.	

2.7 WHO TO CONTACT:

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