AERATED WASTEWATER TREATMENT SYSTEMS (AWTS)

Sometimes known as: Household Sewage Treatment Plants (HSTP)

There are several types of aerated wastewater treatment systems. The common designs usually consist of one or two tanks with an electrical control box on top. These tanks are made of plastic or concrete. The following general descriptions are not limited to these, as there may be some variation within the manufacture of an actual system.

For specific information on your system, please refer to the manufacturers owner's manual. In all systems the wastewater moves through by hydraulic displacement (wastewater in = treated effluent out). Listed below are the most common designs:

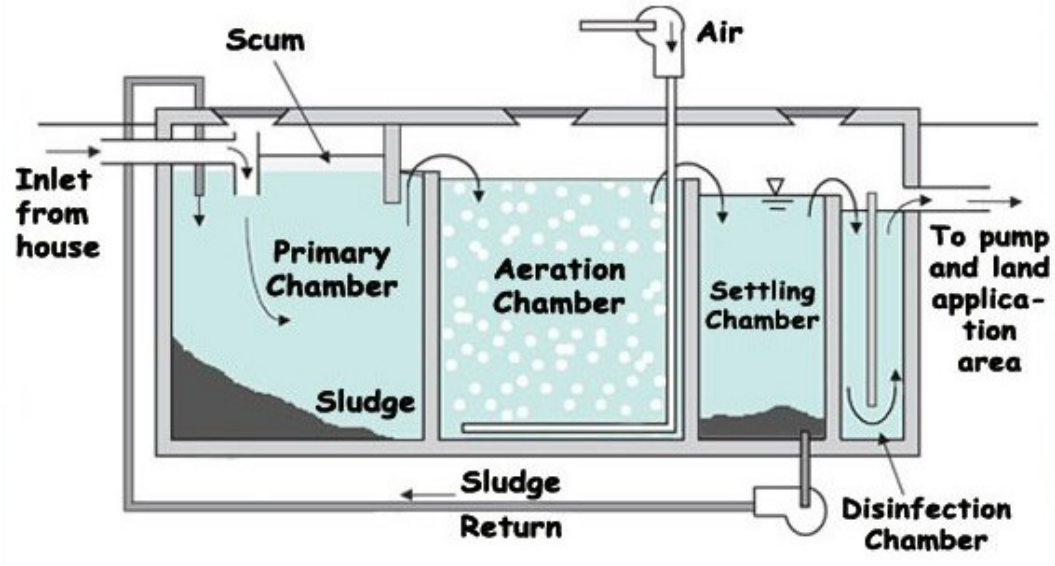
AERATED WASTEWATER TREATMENT SYSTEM

This is the most common of all systems. Generally there are four compartments or tanks and the wastewater is continually processed as it moves through each.

The first is the primary sedimentation tank, this is where the majority of solids are consumed by anaerobic bacteria (bacteria that survive in an oxygen depleted environment).

Wastewater then enters the aeration tank where air is mechanically introduced and there is a further consumption of solids and organic impurities by aerobic bacteria (bacteria that survive in an oxygen rich environment).

The clarification tank is where remaining solids drop out of suspension and fall to the bottom of the compartment, which occurs naturally after having been vigorously mixed previously within the aeration tank.



The enhanced wastewater near the top of this compartment finally passes to the irrigation tank where it is disinfected, usually by chlorine and then pumped to the designated irrigation area (land application area).

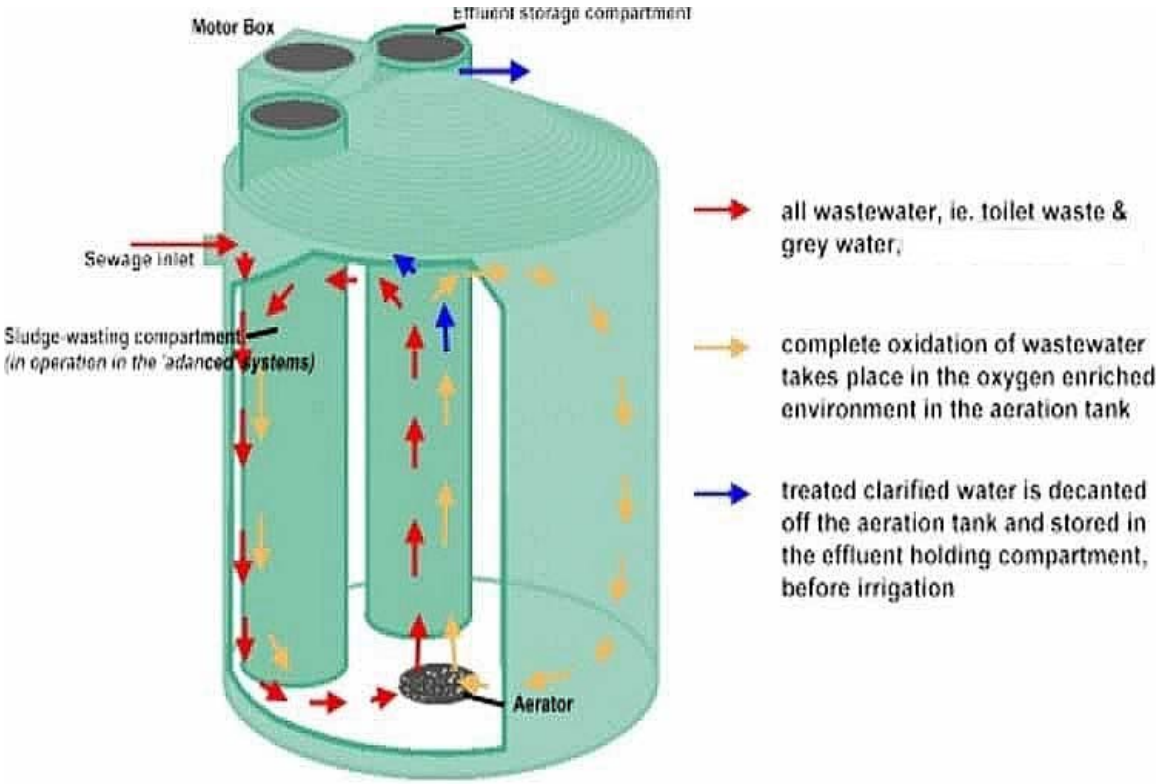
ACTIVATED SLUDGE SYSTEM

The activated sludge process is a biological treatment process in which a mixture of sewerage and activated sludge is agitated and aerated.

In this process, large quantities of air are bubbled through wastewaters that contain dissolved organic substances so that aerobic bacteria can live, grow and multiply.

The process employs bacteria that have been cultured during previous treatment cycles to speed up growth of bacteria populations in new influent, therefore speeding up the breakdown of the waste material, hence the term Activated Sludge.

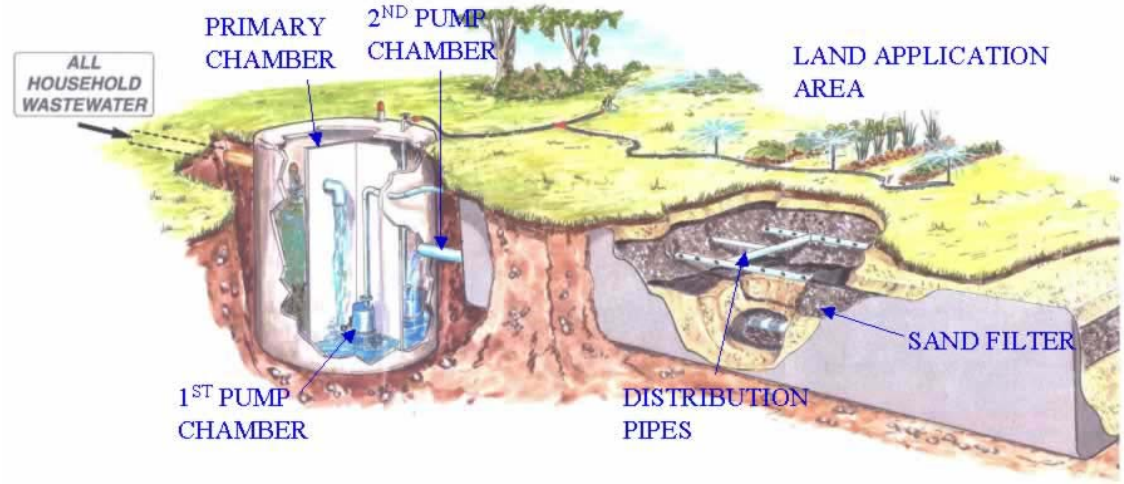
MAINTENANCE – most of these systems require servicing every three months.



SAND FILTER SYSTEM

This system has a primary sedimentation tank as the first stage of the process after which wastewater enters a dosing tank where it is periodically pumped and dispersed into a large inground sand filter. The filter itself is a watertight membrane filled with clean crushed rock and sand that is strategically layered. Physical and biological processes naturally occur within the filter as the wastewater passes down through it. The enhanced wastewater is collected in the base of the filter and channeled back to the irrigation tank where it is disinfected and pumped to the land application area.

MAINTENANCE- most of these systems require servicing every twelve months.



DISINFECTION

The secondary treated effluent from all of the above systems is required to be disinfected prior to disposal if surface irrigated. Methods of disinfection include, but are not limited to chlorination, ozonation and ultraviolet irradiation.

Recently some manufacturers have improved these disinfection methods to achieve advanced secondary treated effluent.

IDENTIFICATION

To help with identifying the type of aerated wastewater treatment system, manufacturers are required to mark their system with their name or registered mark, built item identification, date of construction or installation, serial number (if applicable) and contact details for service.

However if your system has been installed some time ago, weathering and the installation may make it difficult to identify some of these markings on the system.

MAINTENANCE – most of these systems require servicing every three months.

These systems require regular servicing by a qualified service agent and the owner has to maintain a service agreement with a service agent. Here are some general points for the owner to inspect and be aware of.

Tanks

- The aerated wastewater treatment system tank/tanks should be in good condition with its lid and all inspection openings sealed and above ground level so as to stop the ingress of stormwater and allow for maintenance access.
- Electrical control box and power supply are to be in good condition with alarm systems operational.
- Last service date and maintenance carried out is to be tagged or documented on the system, usually in the control box, along with the service agents contact details.
- Vent pipes are to have mosquito proof cowls fitted to minimise mosquito breeding in the system.
- The owner should become familiar with how the system operates and the way it looks, sounds and smells when working correctly. This will help identify any unusual operation of the system, which could lead to plant failure.
- A person on regularly prescribed medication can affect the bacterial process in the plant. It is recommended that you contact your service agent and advise them about the medication used so they may counteract the chemical imbalance in the plant.

Land Application System/Area

- Inspect the land application system (above ground spray irrigation, sub-surface irrigation, covered surface irrigation, absorption trench/bed or elevated mound) to ensure that they are still functional and there is no surface ponding or run off of secondary effluent. All effluent is to be discharged inside the land application area. Know the location of the land application area and if possible provide a means of delineation or keep a record on a site plan.
- Surface water and roof water discharge should be kept away from the land application system. Surface water is to be diverted on the high side by diversion mounds, drains or a moisture barrier.
- Where surface irrigation is installed on a slope (less than 6 degrees) or there is a likelihood of run off, a retention mound on the lower side is to be installed to keep the effluent in the land application area. The downhill retention mound should be suitably planted to act as a nutrient barrier in the event of lateral water movement.

- Surface irrigation areas are to have two signs stating **Recycled Water – avoid contact – Do Not Drink.** Hoses and sprinklers are to be lilac/purple coloured.
- For set back distances from boundaries etc (see **Set Back Distances for Surface Effluent Irrigation**).

MAINTENANCE HINTS FOR AWTS

 **DO**	**DON'T DO** 
• **Do** maintain a service agreement with a service agent approved by council. It is extremely important that AWTS receive regular servicing and maintenance. • **Do** keep your AWTS accessible at all times, yet protected from unauthorised entry. • **Do** call your service agent when you are encountering problems with your system such as alarms and/or unusual odours from the AWTS. • **Do** conserve water and avoid overloading the system. Fix leaking taps and running toilets as soon as they are discovered. • **Do** use toilet paper that disintegrates easily. • **Do** use washing and cleaning products recommended by the service agent or manufacturer. Washing soda is a good cleaner for toilets, baths and basins. • **Do** keep a detailed record about your treatment plant, including model number, contract service agreement, service dates and maintenance performed.	• **Don't** use products that contain bleach, ammonia, antiseptic, antibacterial or high strength detergents. • **Don't** allow foreign objects such as plastic or rubber products, cloth, rags, sanitary napkins, bones, metal, glass and tea leaves to enter the system. • **Don't** discharge chemicals (such as paints, varnishes, thinners, photographic solutions, pesticides and perming lotions) to the system as these items will destroy the bacterial digestion process in your system, resulting in the discharge of polluted effluent. • **Don't** install garbage grinders. • **Don't** switch off the system. • **Don't** cover tanks with earth, concrete, pavers, pine bark, mulch or other materials, as such material will enter the tank when the lids are open for servicing. • **Don't** allow anyone to park or drive over any part of the system. • **Don't** allow stock or animals to enter the land application area.

• **Do** become familiar with how your own particular system operates and the way it looks, sounds and smells when it is working correctly. This way you may be able to identify problems before they become serious. Alert your service agent to anything unusual. • **Do** discharge all treated effluent to the land application area. • **Do** keep the area free of obstructions so that a replacement system can be installed should the existing become unusable. • **Do** be aware of the set back distances if surface irrigating (see Set Back distances for Surface Effluent Irrigation section). • **Do** ensure that rainwater does not enter the system. 	• **Don't** allow children to play in the land application area. • **Don't** make repairs to your system without approval from the service agent or the manufacturer. • **Don't** allow unauthorised alterations to your system without approval from the Department of Local Government, Planning, Sport and Recreation. • **Don't** allow surface sprayed effluent to pond or run off the property. • **Don't** use mist sprays on surface irrigation spray lines. • **Don't** irrigate fruit and vegetable crops with treated effluent.