On-Site Waste Treatment

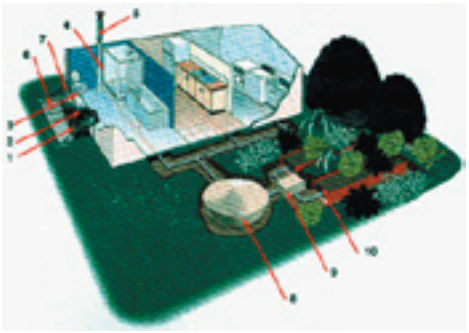
What is On-Site Waste Treatment?

In its simplest form, the effluent in an on-site treatment system runs out from the house through a pipe into a septic tank and from there into sub-surface soakage trenches.

As the effluent flows from the trenches, it is treated by chemical and biochemical agents which are naturally in the soil. Once it undergoes sufficient treatment, the material is safe to enter the environment.

Most on-site domestic wastewater systems use septic tanks for part or all of what is known as "the pre-treatment process".

The wastewater flows into the septic tank, which can have one or more chambers. It is kept in the tank for at least 24 hours. During that time, sediment and scum separate out from the wastewater. This is similar to the primary treatment of a centralised sewage treatment plant, although the period of detention is normally shorter in the centralised system.



1. Rota-Loo
2. Waste chute
3. Toilet pedestal
4. Vent pipe
5. Solar-Flo vent extractor
6. Access to Rota-Loo cellar
7. Clear solar weather roof
8. Greywater pre-treatment tank
9. Distribution box
10. Niimi capillary trenches

Secondary Treatment Systems

The operation of the septic tank can be enhanced with secondary treatment systems. These include composting toilets, sand filters, recirculating sand filters, aerated water treatment systems and biofilter treatment systems.

A variation on the standard approach is to treat toilet wastes, "blackwater", separately from the other wastewaters, known as "greywater".

For instance, the toilet wastes can be treated in a composting toilet while the greywater can be treated in a greywater-treatment system.

Because the volume of wastewater is smaller and the concentrations of pollutants and disease organisms are reduced relative to combined wastewater, greywater can be treated in a smaller treatment system. The differences between greywater and blackwater are outlined on our "wastewater" information sheet.

The wastewaters should be treated wholly within the boundaries of the site, so that there is no pollution of neighbouring properties.

The energy needed to operate an on-site wastewater treatment system is normally much less than for centralised systems.

Energy efficiency

Firstly, the wastewater does not need to be transported off the site, since it will have been treated to a standard sufficient to avoid pollution before it crosses the boundary of the property.

Secondly, most of the treatment is done by natural processes which are powered by the sun or by the energy within the ingredients of the wastewater itself.

On-site Wastewater Treatment

Australian Standard

On-site wastewater management systems are designed according to Australian/New Zealand Standard ANZS1547. It sets minimum standards for site investigations, design of systems, and maintenance.

Advantages of On-Site Treatment	Disadvantages of On-Site Treatment
Capital and operating costs are generally than for centralized sewerage, because of the reduced infrastructure, minimal water transportation, and the use of natural energy processes. For centralized sewerage to be comparable in cost, the quality of treatment is likely to be less than that achieved by on-site processes.	On-site systems need land for water treatment and disposal purposes. The area should be inaccessible to vehicles and other heavy items. Nor should it be covered of paved, since this would prevent evapotranspiration.
The cost to the householder, or the amount of subsidy from government, can be less than for centralised sewerage.	The land-application system needs to be designed for each household according to the properties of the site and the size of the house.
Properly designed and functioning on-site systems do not discharge any effluent to surface or ground waters.	The design of the land application system should have diversion drains to keep surface runoff awary.
The health risk to a household from an on-site system will be low, since the sewerage never contains pathogenic organisms unless there is a member of the household who is sick. Further, if someone is sick, there will be many other routes for others in the household to become infected, so the increase in overall hazard is not significant.	If there is no servicing arrangements made, the householder must operate and maintain the system.
Pathogens and contaminants are not centralized, thereby reducing the risk of a concentrated source of infection.	In on-site systems are improperly located, installed or operated, surface and ground waters can become polluted.
If a single household were to fail, this would constitute only a low level of hazard to the environment. Usually such systems fail gradually, so that there is ample opportunity for rectification.	
On-site infrastructures can be expanded flexibly in line with population changes, requiring little long-term planning or risk of over- or under-capitalisation.	
On-site systems consumer relatively little energy.	
There are few opportunities for stormwater to enter properly designed on-site systems.	
There is no incentive for the householder to divert rainwater from the roof to the on-site system	
The opportunities for industrial discharge are minimized.	
There is an incentive for household which are reliant on on-site systems to actively manage water consumption and water pollution.	
New legislation means that local councils must regulate and monitor on-site systems. This will reduce the chance of systems deteriorating without being fixed.	
The sludge collected in the septic tank is more suitable for soil conditioning than what comes from centralized systems.	