



Primary Treatment Systems

Sewage and effluent can contain a variety of human disease-causing microorganisms and parasites. Disease can be spread to humans from this material by direct contact or indirectly by consumption of contaminated food or water. The safe disposal of sewage and effluent is therefore essential to protect the health of the community.

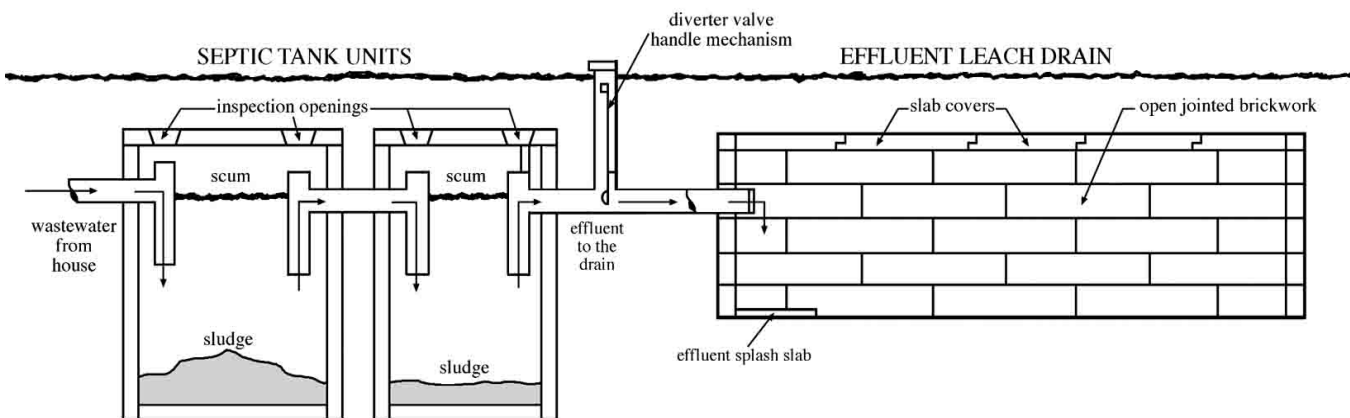
Primary Treatment Systems (Septic tanks)

Most unsewered developments in Western Australia use Primary Treatment Systems (PTSs) also called septic tank systems to treat and dispose of sewage, also referred to as wastewater. PTSs generally consist of one or two watertight cylindrical tanks called septic tanks and land application system which have holes in their sides and no base e.g. leach drains or soakwells (see diagram page 3).

How does a PTS work?

When wastewater passes through the septic tanks, heavier solids sink to the bottom and undergo bacterial digestion. This reduces the quantity of solids and also changes its composition to form a sludge, which builds up in the bottom of the tank. Materials such as grease and oil float to the surface in the tank to form a crust over the liquid. The remaining liquid, called effluent, flows from the tank into a land application system e.g. leach drain or soakwell to soak into the surrounding soil where it may undergo further natural treatment processes.

Since 1989, most household septic tank systems have been installed with either two leach drains or two sets of soakwells. These systems are called alternating systems as they have a diverter box which can change the flow of effluent allowing one half of the soakwells or one of the leach drains to be shut off at any time. This allows the unused portion to dry out which rejuvenates the soil's ability to receive effluent.



SIDE VIEW SECTION (Note: only one leach drain shown)

Where can I install a PTS?

PTSs and their land application systems must be installed to ensure minimum clearance distances from:

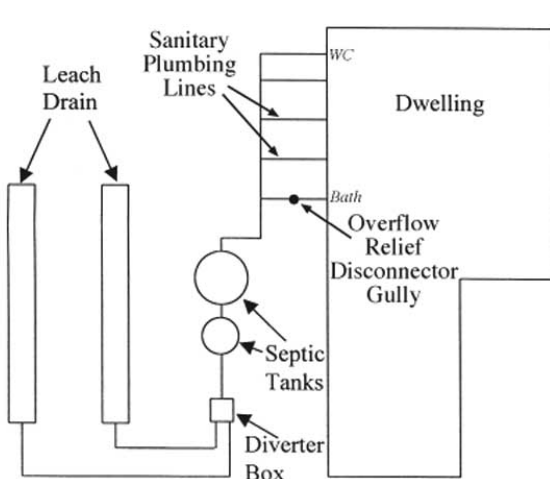
- the highest groundwater level
- heavy soils and bedrock
- water supplies such as bores, creeks, rivers, dams etc,
- buildings and boundaries
- sub-soil and open drainage channels.

They should not be located where vehicles will drive over them. The weight of a vehicle may damage system components and compact the surrounding soil, reducing its ability to absorb effluent.

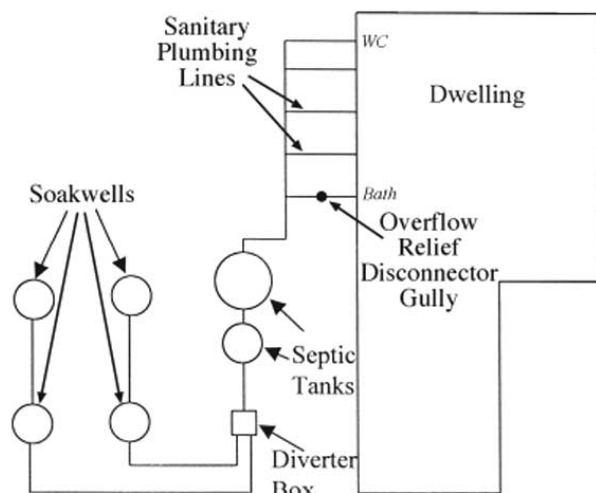
The site and soil conditions must be considered when choosing the type, size and location of any PTSs and land application system.

In poor draining soils, such as clay and rock, special design requirements and soil modification are required to improve soil absorption capability into which the effluent can be applied. In contrast, some coarse sands can be so free draining they provide little ability to filter out pollutants. In these cases, it may be desirable to surround the sides and base of the drainage system with loam or other fine-grained soil.

In areas with either shallow groundwater and/or where only a thin layer of free draining topsoil overlies less absorbent soils, the land application system may need to be installed fully or partially above the natural ground level. This is to achieve the required groundwater clearances and/or to allow effluent to be dispersed into and be absorbed by surrounding soils.



Schematic diagram of septic tank and leach drain system



Schematic diagram of septic tank and soakwell system

Do I have to get an approval to build and use a PTS?

[An application for approval to install or construct](#) a PTS must be made to either the local government or the Chief Health Officer, depending on the development. Your local government can advise you to whom the application should be made. This approval only allows you to install or construct the PTSs.

Please note that it is an offence to construct a PTS without an approval.

Once constructed the local government must inspect the PTS to ensure it is installed correctly. If satisfactory, the local government will issue an approval for the system to be used. It is an offence to commence using the system prior to receiving the local government's approval.

Fees are payable to the local government for the approval and inspection of PTS.

Should I maintain my PTS?

The major function of a PTS is to separate solids, grease and oils out of the wastewater before it enters the drainage receptacles. When a PTS is correctly installed and maintained, it should work effectively for many years.

If the PTS accumulates too much sludge and scum, the effective volume of the tank is reduced which in turn reduces the time for separation to take place. This means not all the solids, grease and oils will separate and will pass out of the septic tanks and into the land application system. This will clog the soil surrounding the land application system and should be avoided. To prevent this from happening, it is necessary to have the septic tanks desludged (pumped out) regularly.

Desludging can be completed by a licensed liquid waste contractor who will open the septic tanks and pump out the contents. The frequency of desludging is dependent on the number of people contributing to the wastewater load. A recommended guide is every eight years for a two-person household, every four years for a four-person household and more often for households with greater numbers.

Alternating land application systems should be switched annually. This is a simple process of opening the diverter box and turning the effluent flow handle from one side to the other.

Do PTSs fail?

Yes. Failure of PTS is generally caused by a failure of the land application system. Failure is most commonly seen in older systems, particularly if large volumes of water are frequently used, or in systems that have not been correctly installed or maintained. In systems that have been used for some time, the soil surrounding the land application system can begin to clog up. Effluent is less able to freely soak into the surrounding soil and begins to accumulate in the land application system until it fills up.

When this happens, the following can occur:

- Sewage begins to back up into household pipes. This is commonly first noticed when household fixtures such as the toilet or kitchen sink won't drain away easily, or you notice sewage

overflowing from a small grated pipe located outside the building called an overflow relief disconnector gully.

- The ground becomes soggy around the land application system and effluent may seep from the soil to the surface. This smell unpleasant and is a health risk.

In either case, a plumber or drainage contractor should be called in for repair work. This may include pumping out the entire system, replacement of the clogged soil or the installation of an additional land application system.

Do PTS additives work?

In recent years many products claiming to improve performance, remove the need for desludging, increase the life expectancy, and fix failing septic tank systems have become available. The Department of Health does not promote the use of these products.

What happens when I connect to sewer?

When a property is connected to sewer a disused PTS will be present on the property and ultimately require decommissioning. The contents out of the tanks must be pumped out and the system should be removed. However, in most cases removal is not possible and the base of the septic tank must be broken and the entire system (septic tanks, leach drains and soakwells) backfilled with clean soil.

Although you are not required to decommission the PTS immediately after connecting to sewer this will have to be done when:

- the property is sold
- the use of the development changes e.g. from a residence to a childcare centre, or when
- building extensions encroach on the minimum setbacks from the system.

Can I use a garbage grinder?

Garbage grinders are common in the USA where they are used to dispose of kitchen waste via the wastewater stream. This practice is not encouraged by Australian authorities because of the increased loading they place on the sewerage system. Garbage grinders are not permitted for use with PTSs, without special authorisation from the Chief Health Officer.

Tips for a healthy efficient PTS

- Pump septic tanks out regularly.
- Allow as little fat or grease as possible into the system.
- Minimise and stagger water usage.
- Regularly switch the drain or soakwells in use if you have an alternating system.
- Do not dispose of non-biodegradable materials into your septic, e.g. plastics.
- Do not dispose of old medicines, large amounts of disinfectant (biocides) or other strong chemicals into the septic tank. These can kill the normal bacteria and interfere with the system. Bleaches and detergents have no adverse effects when used in moderation.
- Do not drive vehicles over the system.

More Information:

Environmental Health Directorate
Department of Health
PO Box 8172
PERTH BUSINESS CENTRE WA 6849

Telephone: 08 9222 2000

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