



A Guide to Choosing the Right Effluent Disposal System

Health Services Information Package

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one city diverse places

Choosing your system

There are a number of different types of systems all with their own unique advantages and disadvantages. In most cases a conventional septic tank – leach drain system will be adequate. However in some cases there may be restrictions on the type of system permitted usually due to environmental factors. Where this is not the case it is a matter of personal preference as to which type of system is selected.

This guide has been designed to provide information on the different types of systems available and help proponents make an informed choice. The City does not endorse or recommend one system over another and will consider all applications subject to the specific conditions relevant to that particular system. In comparing one system to another no consideration of price has been made due to the varying nature of costs due to different manufacturers and installers.

Conventional Septic Systems

Conventional septic systems are those most commonly encountered and usually consist of precast concrete septic tanks connected to precast concrete leach drains. There are however a range of new products using new materials which have also been approved for use by the Department of Health.

Conventional systems operate by having two chambers which break down the solid matter before being discharged via a leach drain. These different chambers are usually in different tanks but can be combined into one large tank with a baffle.

Leach drains discharge effluent into the surrounding soil. It is a requirement that there be at least 1.2m of free draining soil beneath the base of the leach drain. This can mean that for areas with a heavy clay content or high water table the leach drain may be required to be partially or fully inverted. This means the leach drain is raised relative to the natural ground level i.e base of system is at ground level and is then covered with clean sand.

For more information on conventional septic systems please refer to the Department of Health pamphlet Understanding Septic Systems:

<http://www.public.health.wa.gov.au/cproot/2372/2/Understanding%20Septic%20Tank%20Systems.pdf>

Concrete system:

For residential premises they typically consist of two tanks (1500mm and 1200mm diameter) connected to 2 alternating leach drains (600mm internal width and 450mm effective depth). The length of the leach drain is determined by the soil type as well as the number of bedrooms in the attached house.

Advantages:

- One of the most common type of systems
- Large range of suppliers and widely available
- Has been used for many years

Disadvantages:

- May not be permitted in areas of environmental sensitivity
- May require the leach drain to be raised either partially or fully out of the ground due to site constraints
- Effluent disposal is usually confined to a small area which does not allow effective reuse of wastewater
- May require heavy machinery to install due to weight of precast modules

Plastic or Polymer System:

New innovations have seen the development of polymer or plastic septic tanks and leach drains. Polymer septic tanks are usually combined into one tank with a baffle instead of the two separate concrete tanks. Polymer leach drains are usually assembled onsite. Because they are generally narrower than standard concrete leach drains the required length is often longer to achieve a similar infiltrative area.

For a list of approved polymer tanks go to:

<http://www.public.health.wa.gov.au/cproot/2369/2/ApprovedPlasticTanks.pdf>

For a list of approved polymer leach drains go to:

<http://www.public.health.wa.gov.au/cproot/2457/2/DOHApprovedPlasticLeachDrains.pdf>

Advantages:

- Lighter than concrete systems so easier to transport
- Reasonable range of suppliers
- Smaller machinery may be used due to reduced weight of the system

Disadvantages:

- May not be permitted in areas of environmental sensitivity
- May require the leach drain to be raised either partially or fully out of the ground due to site constraints
- Effluent disposal is usually confined to a small area which does not allow effective reuse of wastewater
- Leach drain lengths are generally longer than equivalent concrete modules

Alternative Systems for Environmentally Sensitive Areas

Where conventional systems are unsuitable an alternative system may be required. These usually fall within the two main categories of Aerobic Treatment Units or Nutrient Removal Systems.

Aerobic Treatment Units

These function like small treatment plants with their own mechanical aeration, recirculation and disinfection stages. The quality of effluent at the point of discharge is higher than that from a conventional septic system and is disposed of through an irrigation area. The irrigation method is usually subsoil drippers but can be surface irrigation (sprinklers). Flexibility in the irrigation disposal area shape allows it to be used to supplement garden watering requirements.

As it is a mechanical system it is required to be serviced every three months by an authorised service technician. More information on Aerobic Treatment Units please refer to the Department of Health pamphlet Aerobic Treatment Units:

<http://www.public.health.wa.gov.au/cproot/3912/2/Aerobic%20Treatment%20Units.pdf>

For a list of approved Aerobic Treatment Units go to:

http://www.public.health.wa.gov.au/cproot/1331/2/approved_aerobic_treatment_units.pdf

For a list of approved service technicians go to:

<http://www.public.health.wa.gov.au/cproot/1332/2/Authorised%20Service%20Persons%20for%20ATUs%20in%20WA.pdf>

Advantages:

- May be used in more environmentally sensitive areas
- Allows improved reuse of wastewater
- Allows flexibility in shape of disposal area
- Irrigation areas using subsoil drippers have reduced setback requirements (distance from boundaries and structures) when compared to conventional leach drains
- Irrigation area does not need to be inverted or raised out of the ground as may be required with conventional leach drains

Disadvantages:

- Requires servicing every three months by an authorised technician which has cost implications
- Waste water generation may not meet the needs of plants in the irrigation area and may require topping up through a secondary normal irrigation system depending on the volume of wastewater produced or during periods of absence such as when on holiday
- System is mechanical and has moving parts which require replacement periodically
- Power consumption required to operate system

Nutrient Removal System

These systems function similar to a conventional system except that the leach drain is modified to form a cell, usually by having a plastic lining, whereby the effluent is forced to pass through a modified soil. The modified soil strips the effluent of Phosphorus before being discharged into the environment. An advantage these systems have over Aerobic Treatment Units is they do not require regular servicing however wastewater reuse is limited.

For a list of approved systems go to:

<http://www.public.health.wa.gov.au/cproot/2992/2/Approved%20Alternative%20Leach%20Drains%20120806.pdf>

Advantages:

- May be used in more environmentally sensitive areas
- Does not require servicing every three months as with Aerobic Treatment Units

Disadvantages:

- Effluent disposal is usually confined to a small area which does not allow effective reuse of wastewater
- The plastic membrane also limits the range of plants that can be planted in the disposal area

Other Non Conventional Septic Systems

Composting Toilets

Composting toilets receive and treat human waste using natural decomposition processes, usually without the use of a water flush system. Some composting toilets have electric or wind driven heating/drying units to assist with the process.

A well maintained composting toilet should not smell or create a nuisance.

Wastes are retained for a sufficient period of time so that they are broken down to a safer, more stable and less offensive product. This material is not sterile and should still be handled with care.

There are two basic system arrangements. Some composting toilets are batch systems while others are of a continuous composting design. The continuous system generally has a large single chamber through which waste moves as it decomposes. They are designed to allow for a minimum detention time to allow wastes to break down before the compost is removed. They should not be overloaded.

Batch systems have more than one receiving receptacle (and more can usually be added to the system if required). When the receptacles are full, they can be removed for the composting period and rotated with an empty receptacle.

Material from composting toilets must be buried onsite and is not permitted to be used for the growing of fruit or vegetable plants. Composting toilets cannot be installed on lots which are less than 1000m² in size.

Residences with composting toilets will still need another effluent disposal system to treat and dispose of wastewater flows from the kitchen, laundry and bathroom although this system can be reduced in size.

For a list of approved systems go to:

<http://www.public.health.wa.gov.au/cproot/1337/2/ApprovedAlternativeToilets.pdf>

Advantages:

- Reduced water usage as toilets are waterless
- Effluent disposal system for other waste sources may be reduced in size

Disadvantages:

- Requires a separate effluent disposal system for other waste sources
- System is installed directly below toilet
- May not be able to service all toilets within residence depending on the location of the fixtures
- Requires composted material to be collected and buried onsite
- Can only be installed on properties greater than 1000m²

Greywater Systems

Greywater system

Greywater systems allow residents to divert waste water from bathrooms, laundries and sometimes kitchens onto garden areas via subsoil drippers. These systems can also be installed on properties connected to sewer. Where sewer is not available a separate waste water disposal system will be required to handle toilet waste although this can be reduced in size from the normal requirement.

For a list of approved systems go to:

<http://www.public.health.wa.gov.au/cproot/1342/2/ApprovedGreywaterSystems.pdf>

Advantages:

- Allows reuse of wastewater
- Most greywater systems can be used on properties connected to sewer
- Water consumption for irrigation purposes may be reduced

Disadvantages:

- Requires a separate effluent disposal system for other waste sources
- Requires regular servicing by the occupier
- Greywater generation may not meet the needs of plants in the irrigation area and may require topping up through a secondary normal irrigation system depending on the volume produced or during periods of absence such as when on holiday
- Greywater may not be suitable for all plants (particularly natives)

Lodging an Application

All the different systems mentioned above require approval from the City prior to installation. For more information on the application process please see the City's Application Guide:

[http://www.swan.wa.gov.au/files/02231e79-a145-4e10-9360-a34c00bd481c/AP A Guide to Onsite Effluent Disposal Applications.pdf](http://www.swan.wa.gov.au/files/02231e79-a145-4e10-9360-a34c00bd481c/AP_A_Guide_to_Onsite_Effluent_Disposal_Applications.pdf)

For an Application form please go to:

[http://www.swan.wa.gov.au/files/64872950-b39b-452a-a6c4-a34c00c30ce0/AP Application to Construct or Install OED.pdf](http://www.swan.wa.gov.au/files/64872950-b39b-452a-a6c4-a34c00c30ce0/AP_Application_to_Construct_or_Install_OED.pdf)

Further Information

Additional information, including fact sheets and guidelines on wastewater and effluent may be found on the following websites;

Department of Health – www.public.health.wa.gov.au

City of Swan – www.swan.wa.gov.au

Should you have any queries regarding any of the above, please do not hesitate to contact the City of Swan's Health Services on 9267 9153.