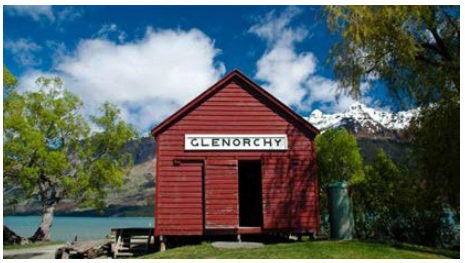
ON-SITE WASTEWATER DISPOSAL

OPTIONS FOR HOMEOWNERS WHO CANNOT CONNECT TO A COUNCIL RETICULATED SYSTEM`



Property owners wanting to build in areas without a council reticulated wastewater network all face a common issue: how to you deal with their domestic wastewater in a manner that doesn't result in contamination of areas outside their property or waterways?

The options in this factsheet are provided as guidance only. On-site Wastewater systems design is a complex field and all systems must comply with the requirements of AS/NZ 1547:2012 New Zealand Standard for on-site domestic wastewater management. QLDC strongly recommends you contract the services of technical experts to review the options for your specific site and to guide you through the consenting process.

COMMUNITY PLANNING FOR RETICULATION

The development of reticulated wastewater treatment infrastructure is a major investment that takes significant time and capital to build. There is currently only one project within the QLDC district:

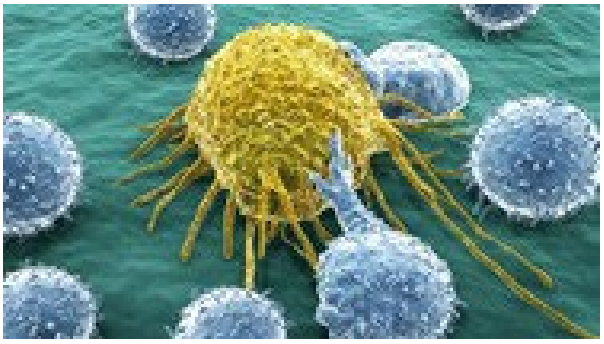
- **Kingston**- A Council reticulated wastewater system is planned to service the Kingston south areas in coming years with potential expansion to service some existing Kingston areas. Check Council's annual plan process and outcomes to stay up to date

Please note this project is not guaranteed and can change for several reasons; however owners should consider the implementation as part of their assessment of their own domestic options.

If you live in this community it may be in your interest as a property owner to install wastewater pipes within your house and to the road boundary in preparation for when the Council scheme is available. Please contact Council on 03 450 0369 if you would like a Council engineer to advise where the best location for the boundary connection is.

WHY ON-SITE SEWAGE SYSTEMS MATTER

Properly set up and installed, on-site wastewater disposal systems treat wastewater to remove pathogens and chemical residues. However, if the system is not properly maintained or is failing for some reason, then it can become a serious public health and environmental risk through contamination of drinking water and the environment.

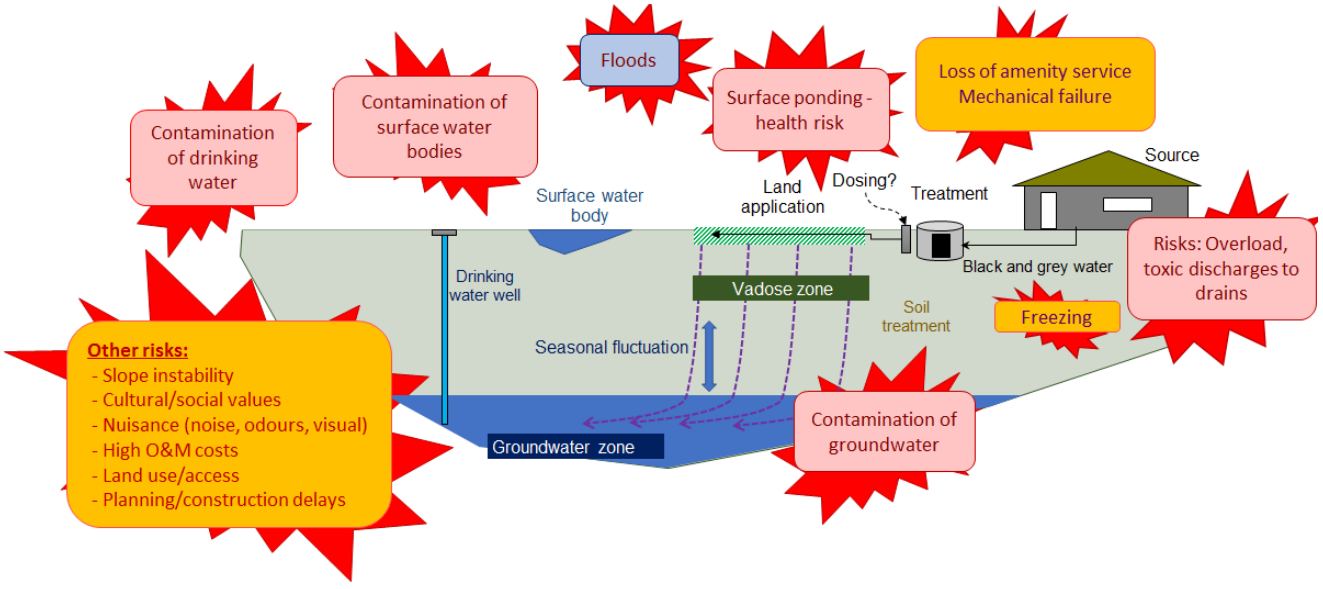


Household wastewater may contain:

- **viruses** e.g. hepatitis A and norovirus
- **bacteria** e.g. campylobacter and salmonella
- **protozoa** e.g. giardia and cryptosporidium
- **helminthes** e.g. hookworms, whipworms or roundworms

These pathogens are the most common causes of general sickness in New Zealand and can cause diarrhoea, vomiting, nausea and stomach pain. If this wastewater reaches a drinking water source, recreational water body or the general environment, they may be difficult to remove and can cause widespread illness that can cause a serious health risk to the local community.

There are a number of risks that a poorly designed or installed systems can generate (see below). The design of your system must therefore be carefully considered by suitably qualified designers to ensure that all of these risks have been fully mitigated. QLDC has developed an Onsite Wasterwater Disposal Application form (AF OSW) to support a risk based approach to evaluating the site, soil and system features associated with the building consent application. This evaluation aims to ensure that any potential risk to the environment or public health is fully mitigated through having a robust system design.

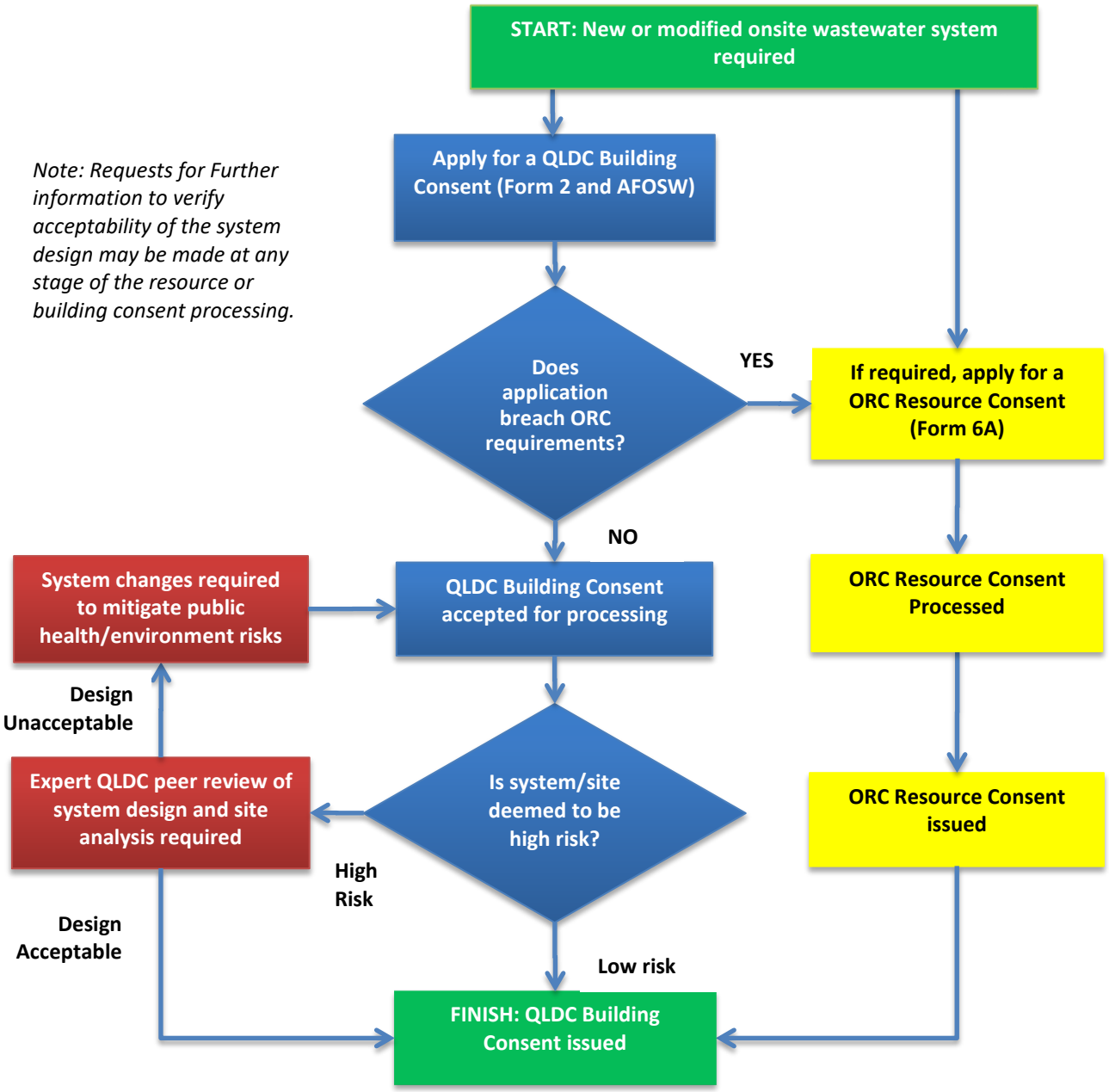


THE CONSENTING PROCESS

Before an on-site wastewater disposal system can be installed, the proposed design must pass through the consenting process. Depending on the nature of the site and the system design selected, this may require both a Resource Consent (issued either from Otago Regional Council or QLDC) and a QLDC Building Consent.

If an ORC Resource Consent is required then then this should be progressed and once it is granted it can be referenced as part of the QLDC Building Consent Application. Even if an ORC Resource Consent is not required, QLDC may engage the services of a technical expert to peer review the system design and site analysis of any applications it deems as high risk. The cost of this will be on-charged to the applicant as part of their building consent fees. The consenting process is summarised in the below diagram:

Note: Requests for Further information to verify acceptability of the system design may be made at any stage of the resource or building consent processing.



APPLICATION FORMS

OTAGO REGIONAL COUNCIL RESOURCE CONSENTS

ORC application Form 6A must be completed and submitted for any system design that breaches the following requirements:

☐ Daily discharge volume exceeds 2,000 litres per day

☐ Discharge will occur in a groundwater protection zone or in the Lake Hayes catchment

☐ Discharge will occur within 50 metres of a surface water body

☐ Discharge will occur within 50 metres of an existing bore/well used to supply water for domestic needs or drinking water for livestock

☐There will be a direct discharge into a drain, water race or groundwater

☐ Discharge may runoff onto another persons' property

Note: Once the ORC Resource Consent has been granted it can be referenced as part of the QLDC Building Consent Application

QLDC BUILDING CONSENT

For a QLDC Building Consent the following forms must be completed and submitted into the QLDC Community portal.

- Application for a Building Consent (Form 2)
- AF CALC Building Consent Fee Calculator
- Proof of ownership: Certificate of Title, Rates Account, S&P agreement or Lease provided.
- AF OSW Onsite Wastewater Disposal Application Form
- The relevant check sheets for specific projects (e.g. CS 19R, CS 19C).
- All applicable plans, specifications and supporting documents as detailed on the relevant check sheet, demonstrating how the work will comply with the building code.
- Other forms specific to your project (e.g. application for an alternative solution).
- Reference any issued project information memoranda (PIMs) or resource consents.
- If restricted building work: A memorandum from licensed building practitioner (Certificate of design work).
- Any pre-lodgement correspondence

These files are available for download on the QLDC Building Services website.

DESIGN OPTIONS FOR ON-SITE WASTEWATER DISPOSAL

The following options exist for on-site waste water disposal systems.

PRIMARY TREATMENT SYSTEM

A primary treatment system is what is commonly known as a "septic tank" system. Solids are collected in the tank and the liquid discharged from the tank into pipelines buried in the trenches full of gravel. Some treatment occurs in the tank and mostly it occurs in the soil below the disposal trenches. A septic tank and soakage trench typically work well for large sites, but have limitations in clay soils (poor soakage conditions) or gravelly soils (too rapid soakage resulting in pollution of wells). For small lot subdivisions, septic tank effluent can result in groundwater contamination it is therefore not a feasible option for many areas within the Queenstown Lakes districts. Unmaintained septic tanks can also exacerbate these problems. A primary system does not treat wastewater in any way, they simply work to reduce solids before discharging the liquid to the soakage trench.

Considerations

- Appropriate for occasional or regular use.
- Can be designed to cater for any number of people using the system. The more people, the larger the tank and the disposal field and the more often the tank will need to be sucked out.
- Suitable for sites with well drained sandy/silty/gravely soils
- Due to their lower quality discharge they are unsuitable for clay soils, sites with high groundwater levels, sites close to water bores or in flood zones (see flood zone map pg 14).
- Only occasional maintenance every 3-5 years (depending on usage) to suck out the solid waste from the tank.
- Once the system is installed it will last for up to 30 years (depending on soil conditions and correct operation & regular maintenance in accordance with O&M Guide- lines) before the disposal field becomes blocked and needs to be replaced.

SECONDARY TREATMENT SYSTEM

A secondary treatment system refers to a system that uses physical phase separation to remove settleable solids and a biological process to remove dissolved and suspended organic compounds. After this kind of treatment, the wastewater may be called secondary-treated wastewater and is a higher "quality" to that from primary treatment.

Typically secondary treatment systems are based on a multi-chambered tank that treats the waste and then disposes the liquid using drippers buried under the surface. Most of the waste treatment occurs in the tank (to a higher standard than a primary treatment system) and some occurs in the soil.

There are two common types of secondary systems (Aerated systems and Packed Bed reactors) however new technologies are commonly being developed.

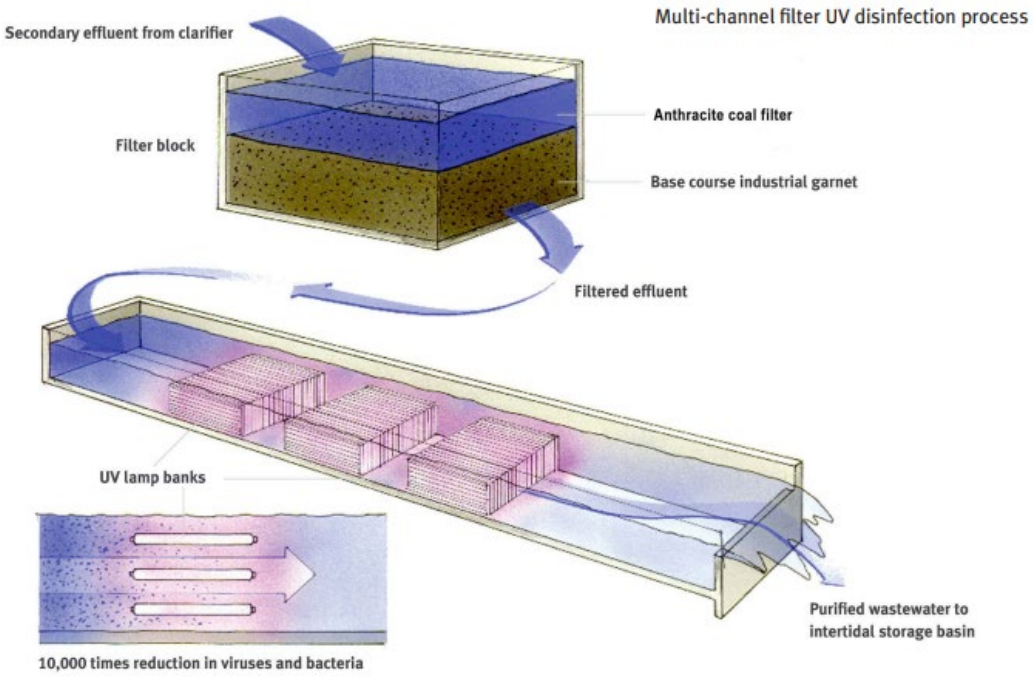
A secondary system is suited to a more sensitive receiving environment and/or sub-standard soil structures. Secondary systems are able to be used in less than ideal soil conditions and work to reduce harmful groundwater contamination. The design of a secondary system requires a careful understanding of the site specific soils and role of soil bacteria in adsorbing and treating waste nutrient material in on-site land-application areas.

Considerations

- Appropriate for occasional or regular use, some systems cope better with occasional use than others. Some systems require time to get up to speed again if they have not been used for a few months.
- The liquid waste can be used for irrigation (except on plants grown for human consumption, e.g. vegetable gardens).
- Can be designed to cater for any number of people using the system.
- The more people, the larger the tank and disposal field.
- Because these treatment plants remove most of the solids and organic material, the effluent can be distributed through dripper lines without blocking and over a larger area of land. This enables more effective pathogen removal in the soils. It also a safer system for a wider range of soils conditions
- Maintenance requirements vary depending on the system however all systems require regular maintenance, sometimes by a trained technician.

TERTIARY TREATMENT

In some cases the characteristics of the site will dictate that an additional “tertiary” level of treatment is required. Tertiary systems carry the same treatment process as a secondary system with an additional filtration or "polishing" process often in the form of UV treatment. This process will further remove the remaining bacteria and pathogen risk. Tertiary systems are required in very sensitive receiving environments such as those close to waterbores, surface water bodies or where groundwater levels and soil categories require a higher level of risk mitigations.



HOLDING TANK EMPTIED BY A “SUCKER TRUCK”

The option of installing a holding tank to collect blackwater so that it can be pumped out and taken to a community treatment may be considered, but typically these are only a temporary solution that is installed prior to a community reticulated scheme being implemented. Because there are always uncertainties associated with the building of these schemes, care must be taken to ensure that a holding tank option is economically feasible should the scheme be delayed.

Holding tanks require the regularly servicing by a “sucker truck”. The costs of this can lead to a risk of occupier misuse – i.e. not pumping out – disposing inappropriately or illegally. Such actions can create a serious public health hazard so they are treated seriously by QLDC and ORC and if detected will result in enforcement action and heavy fines.

Provided the holding tank is correctly vented there should be no serious odour risk. There will only be a risk of odour when they opened up to pump out.

Requirements for a holding tank:

- A double chamber septic tank, with a main chamber and an overflow chamber.
- A mains powered visual alarm should be installed which triggers as soon as fluid enters the overflow tank. These can be installed with telecommunications links to ensure owners are alerted
- Evidence of an on-going service agreement for regular emptying of the holding tank needs to be provided prior to occupation of the dwelling.
- The design waste water flow rates shall be based on AS/NZS1547:2012. Greywater from showers, hand basins and laundry machines should be directed away from the holding tank. Note: if directed to a soak pit greywater shall pass through a filter prior to discharge to ground.
- All blackwater and greywater from dishwashing machines and kitchen sinks to be directed into the holding tank.
- Water reducing features within the dwelling should be used including a 6/3 dual flush WC, low flow shower head(s) and aerator faucets. Front load washing machines are preferable but not mandatory.
- Insinkerator/garbage grinder type of fixtures shall not be installed.
- A bath cannot be installed.

Owner Considerations:

- Is the cost of disposal economic? There will be significant on-going costs for a sucker truck to dispose of the waste at a treatment plant. It is a long way to the Shotover Treatment plant from Glenorchy and Kingston so this is unlikely to be a cost effective option for these communities. A guidance calculator (IS HTCALC) has been developed to help you estimate the costs associated with this option
- A separate grey water system is generally used to reduce the volume of waste that has to be pumped out. This must be disposed to ground via a disposal field (trenches full of gravel).
- Can be appropriate for buildings that only involve occasional use. However careful consideration must be paid to the loading that can occur during peak periods e.g. Christmas holidays
- In high water table areas such as Kingston and Glenorchy, holding tanks must be very well anchored so that they don't pop out when emptied.
- Not suitable for flood zones (see map on page 13 &14)

WATERLESS / COMPOSTING TOILET

There are a range of stand-alone composting toilets now available along with vermicomposting systems which can be installed with traditional flush toilets and whole house wastewater systems.

A waterless toilet can be designed and managed to breakdown human solid wastes by composting or vermiculture processes. If well managed, the end product should be an odourless, soil-like humus that can be buried on site.

There is a significant commitment to monitor and maintain the system which involves:

- Changing the full bins with batch systems
- Removing the compost at regular intervals from continuous systems
- Adding soil, burying or disposing of the compost
- Cleaning the system as required by the manufacturer
- Some systems recommend regular addition of a bulking material into the toilet

If a composting toilet is not properly maintained and monitored, the end product may not be properly composted, which means: removal and cleaning may be unpleasant, there may be a health risk, there may be odours.

For both vermiculture and composting to occur, the moisture content in a composting toilet must be minimal. This generally requires separating out the urine by a separate collection system or some composting toilets separate it in the bowl. Separation of the urine substantially reduces ammonia levels in the pile, which significantly improves worm activity for vermiculture systems. If urine separating toilet seats are used the urine can be disposed of by a septic tank or other on-site blackwater treatment system. Alternatively, it can be diluted at least 5 to 1 with water and be used as an effective fertilising liquid for non-food producing gardens and lawns.

Considerations:

- For a system to be approved it must comply with the standard ASNZS1546.2-2008 Composting Toilets.
- A composting toilet that is working well does not smell and there should be no risks of flies or insects.
- Appropriate for occasional or regular use, some systems cope better with occasional use than others. Some systems require time to get up to speed again if they have not been used for a few months.
- The solid waste can be used for compost in the garden. It must not be buried in areas of the garden that are in general use or where food plants are grown, or be put near streams or other bodies of water.
- Can be designed to cater for any number of people using the system.

- Because these systems do not dispose liquid waste to the ground, they are suitable for any site and soil conditions and they can be used in flood zones.
- Waterless toilets require regular attention including some less pleasant maintenance such as raking, emptying and pest management. How often you have to remove it depends on the size of container, how often the system is used, and local climatic conditions. You generally have to regularly add a bulking agent such as dry leaves or untreated wood shavings to the container. This helps to keep the product aerated promoting the composting process.
- If you're planning to install a waterless toilet to deal with all of your toilet waste, you'll still need another on-site system to safely deal with grey water from the kitchen, laundry, bath, shower and basin.

LONG DROP / PIT LATRINE

These systems are not permitted to be installed in the Queenstown Lakes District due to potential ground water contamination and disease transmission.

"PORT-A-LOO" TYPE PORTABLE TOILET

A portable toilet generally contains a chemical toilet which is typically used as a temporary facility for construction sites or large gatherings because of its durability and convenience.

They are only for toilet waste and do not cater for waste from the kitchen, washing, or bathroom. This makes them unsuitable for most applications where a residential house is involved.

They are readily available for hire including on purpose built trailers.

Portable toilets need to be sucked out or drained, cleaned, disinfect- ed, and deodorized on a regular basis. An average portable toilet is able to hold enough sewage to cater for a 2 or 3 bedroom house for a week before it reaches unsanitary conditions.

The waste must be disposed of into a treatment system, either a privately owned primary or secondary treatment system or a Council treatment plant.

WATER TYPES

BLACKWATER

Blackwater is wastewater from toilets and urinals.

GREYWATER

Greywater is all other domestic wastewater from kitchens, baths, showers, hand basins and laundry machines. Greywater cannot be used for cooking, bathing, brushing teeth, swimming or drinking. Greywater can be used for irrigating your garden and/or it can be disposed of in trenches to soak away.

IS GREYWATER SAFE TO RE-USE?

Yes, if a system is properly installed and maintained. Expert advice is recommended. Greywater can contain faecal matter and microbes which are harmful to human health. Possible detrimental health effects can come about if drinking water becomes contaminated with greywater or there is direct contact with collected greywater that has become septic.

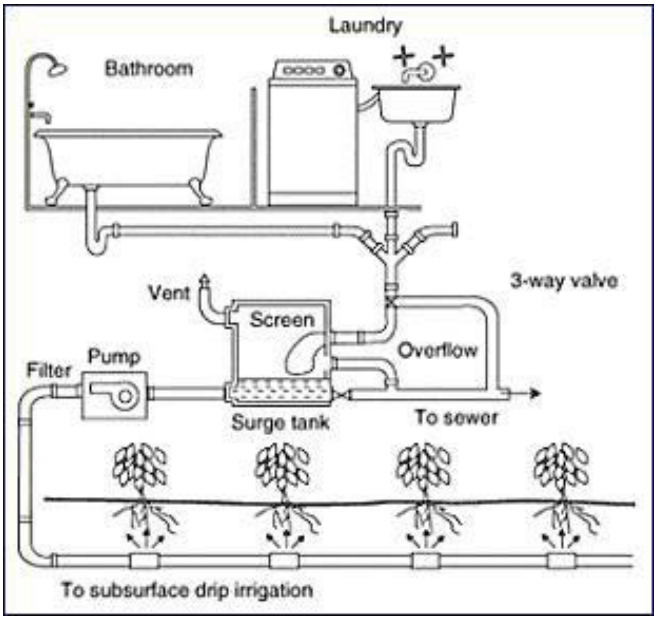
If you do want to have a greywater recycling system at home

- It needs to be properly installed and maintained
- Because of the fats, detergents and cleaning agents found in kitchen wastewater it is recommended that this is separated from all greywater recycling systems and is discharged carefully. Also, water from kitchen sinks can be unsafe for re-use because of the risk of contamination from organic matter such as bacteria from meat
- The greywater needs to be kept away from direct human contact if you're using it in the garden,
- It should be discharged under the soil (not on top) and it should not be discharged in areas where food plants grow,
- It's vital that no-one can unwittingly drink from a greywater storage tank. Put locks on taps and put up signage

USING GREYWATER ON YOUR GARDEN:

In general, a garden greywater system will divert water from your washing machine, shower, bath or basin so that solids such as lint and fats are filtered out. After filtering, the water then flows to a storage tank or directly through an irrigation system to your garden.

With some simple systems, the greywater flows directly to a storage tank with a filter inside. These systems require a high level of maintenance requirement (e.g. emptying the filter every time the washing machine runs).



Considerations:

- The greywater should be discharged below ground or to a covered soil surface to avoid the risk of people being exposed to bacteria in the greywater.
- It's worth having a switch to allow you to bypass the greywater system and have your greywater go straight into the blackwater system. This is handy if you're putting something down the drain that you wouldn't want in the garden.

SEEKING MORE INFORMATION?

Please contact the Queenstown Lakes District Council's if you would like to discuss any issues relating to on-site wastewater and sewage disposal. Phone 03 441 0499 (Queenstown) or 03 443 0024 (Wanaka) or email services@qldc.govt.nz. following teams for further information.

Depending on the nature of your question your enquiry should be directed to the following departments:

- Council Reticulated Wasterwater System enquires: Property & Infrastructure Engineering
- Resource Consent related enquiries: Planning & Development, Resource Engineering
- Building Consent related enquiries: Planning & Development, Building Services

FLOOD ZONE & TREATMENT SYSTEMS

Parts of Glenorchy and Kingston are within the flood zone (1:50). This means that primary treatment systems are unsuitable for use there. To see if your property is within the flood zone go to QLDC's Spatial Data Hub – Natural Hazards and HAIL data.