# Using Greywater

*Interested in using greywater in your garden? Take a couple of minutes to read this information. It briefly outlines what greywater is, the risks in using greywater and common sense precautions needed to use greywater safely.*

## What is greywater?

Greywater is all the waste water produced in the household, including water from the sink, bath, shower, washing machine and dishwasher but not the toilet. International best practice recommends only using bathwater and washing machine greywater. Kitchen greywater (kitchen sink and dishwasher) is poor in quality for public health and your garden.

## Why reuse greywater?

Most households rely on town supplied water for all uses. Most of the year this is fine but in summer, when everyone is watering gardens, demand can soar past what the water supply can comfortably provide.

As our communities grow both in numbers and use, a reliance on town water can put unsustainable demand on both the town water supplies and the natural water systems we rely on. A well designed greywater system, could be used to irrigate areas of the garden in time of dry weather. This water source can help the gardens through dry periods, while also easing pressure demands on the water supply.

## Are there any health risks?

Faecal coliforms are a type of micro-organism which typically grow in the intestine of warm-blooded animals, including humans. These are shed in their millions in each gram of faeces. If faecal coliform bacteria are present in water, there is a risk that microbes that make us ill may be present in the water.

## What are the best sources of greywater?

The table below shows where in your house greywater is best sourced from:

| Source of Water | Use as Greywater |
|---|---|
| Shower /Bath | Best |
| Basin | Possible |
| Laundry Tub | Possible |
| Washing Machine | Possible |
| Kitchen | Never |
| Toilet | Never |

## Is Greywater safe to use on the garden?

Greywater varies in quality, from house to house, as people use water differently and use different appliances, detergents and shampoos.

The chemicals, nutrients and bacteria found in greywater can have short and long effects on your garden and indirectly your health. It is important you are careful about what you add to greywater and how you store, treat and use greywater. The amount of salt (sodium, calcium, magnesium, potassium and other salt compounds), oils, grease, fats, nutrients and chemicals in greywater can largely be managed by the types of products used within a household.

Greywater is usually applied to the garden below ground or under mulch to minimise any risk to health.

***Greywater cannot be used for cooking, bathing, brushing teeth, swimming or drinking.***

The information provided here has been sourced from "Greywater and your health" – Kapiti Coast District Council

## National Guidelines and Legislation

There are currently no specific national guidelines that address greywater reuse in New Zealand. Some councils have rules and policies on greywater use. Central Otago District Council is investigating this further.

## What is recommended for a greywater system?

Council is currently looking at greywater standards. The New South Wales Health standards for greywater diversion devices (GDD) for greywater reuse, have been adopted on the Kapiti Coast. These systems harvest greywater from the bathroom and laundry and irrigate gardens below the surface.

An overview of the greywater diversion device requirements is detailed below. The best systems are simple, with minimum maintenance requirements. A greywater diversion device:

1. Only uses greywater from the bathroom and washing machine

2. Needs to be able to divert greywater to sewer when greywater not needed for irrigation or if the greywater is of poor quality

3. Has a coarse filter to screen out solids such as hair and soap suds. This will help keep the irrigation system working efficiently

4. Needs a tank to collect greywater while discharging, but not for storage. Washing machines will pump up to 90 litres within minutes. The device needs to be able to collect the water without overflowing on to the ground.

5. Does not store the greywater, as greywater stored longer than a day is likely to start to smell.

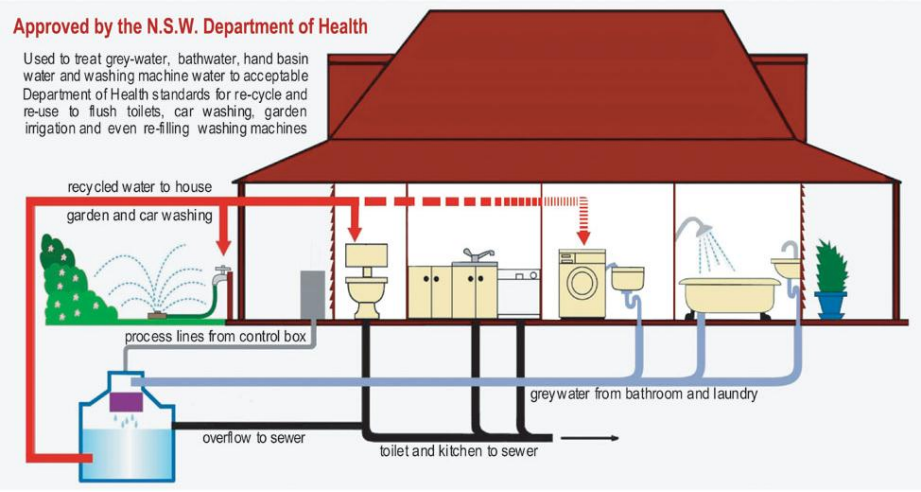
6. Needs to be able to overflow to the sewer in case of failure.

7. Has an irrigation system that irrigates 10 cm below the soil or mulch surface. The soil is very effective at treating greywater and irrigating below the soil surface allows plants to use the water, while preventing people to come into contact with the greywater.

8. Has an irrigation system needs to be able to distribute greywater without blocking up (soaker hoses or drippers aren't suitable)

9. Has an irrigation system that is purple in colour so people are aware it is greywater

10. If you purchase a greywater system, it needs a watermark licence to show it uses quality material that is fit for purpose.



## Do I need building consent for a greywater diversion device?

If you need to modify the existing waste pipes to install a greywater system, you will need to get a building consent. A simple system, which captures water from the washing machine may not. Please contact the Council for further information.

## Greywater and nutrient flows

- Phosphorus and nitrogen are nutrients necessary for plant growth. Greywater that contains nutrients generated from the bathroom and laundry, may substitute for fertiliser and can provide phosphorus and nitrogen to the garden and lawn.

Table 1 shows the estimated amount of nutrients contained in greywater from a residential household used on a one square metre irrigation area over a one year period. This is compared with the amount of nutrients applied by following manufacturers recommended dosage of typical fertilisers over a one year period .

| Table 1 | Bathroom Greywater | Laundry Greywater | Fertiliser |
|---|---|---|---|
| Nutrient | Range grams/year/$m^2$) | Range grams/year/$m^2$) | Range grams/year/$m^2$) |
| Total Nitrogen (N) | 3.22 – 24 | 0.7 - 48 | 17.6 |
| Total Phosphorus (P) | 0.08 – 2.6 | 0.04 – 50.4 | 11.3 |

## Comparing Greywater with Fertilizer

If you are using greywater, you may need to reduce fertiliser use to prevent damage to the soil, plants, groundwater and off-site waterways. You can manage the amount of nitrogen and phosphorous entering your garden by choosing detergents low in phosphorous and nitrogen.

## Salts

Salts in greywater originate from washing detergents and are commonly in the form of sodium, magnesium and calcium compounds. The effect these salts will have on your soil will depend on your soil type, greywater composition and drainage.

The major risk of salts contained in greywater is the accumulation of salts in the soil structure. This can lead to a loss of soil permeability (ability to absorb water) which can cause degradation to vegetation. Sodium salts can also displace other nutrients out of the soil and may affect plant growth and soil structure.

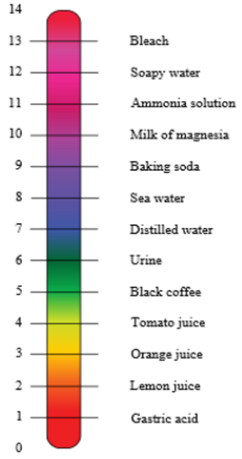
## How can I manage the salt in the detergents?

- Flush greywater lines with fresh water—turn on the shower for five minutes once a week to freshen the soil.
- Break your garden up into zones and rotate the greywater irrigation.
- Change the detergent to liquid soaps—they have much less salt than powdered detergents.
- Feed your soil with compost, mulch and gypsum will help balance the nutrients in the soil.

## Greywater pH

Detergents are alkaline in nature and over time may change the pH of your soil. Most plants grow well with pH of around 6.5-7.2. Lanfax laboratories found that many more powder detergents give highly alkaline results than liquid soaps.

When pH drops (acidity), or increases (alkalinity), plants lose access to nutrients or nutrients become toxic. You can manage the pH of the soil by keeping the soil well fed with compost, mulch and applying gypsum.

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## Growing plants on Greywater

| Do | Don't |
|---|---|
| ✓ use greywater on established plants, not on seedlings or young plants which are more vulnerable to high concentrations of salt and nutrients<br>✓ select plants local to your area that are greywater tolerant<br>✓ water during cooler periods of the day when there is less direct sunlight. Longer, deeper watering, for 30–60 minutes, once or twice a week is better than frequent shallow watering. This allows plants to absorb more efficiently and prevents salt build-up<br>✓ apply greywater directly onto the base of plants or use a council approved irrigation system to prevent leaf burn<br>✓ stop using greywater if plants show signs of distress (such as burning of leaf edges). Water the area with fresh water to remove possible salt and nutrient build-up before commencing greywater reuse. | × use greywater on plants in pots as the risk of salt and nutrient build-up is heightened by the limited soil volume which may damage the plant's root system<br>× use greywater on edible parts of herbs, vegetables and fruit, or allow it to splash on them<br>× store greywater if it can't be used immediately on the lawn or garden.<br>  |

## Which plants to grow?

| | |
|---|---|
| **Acid loving plants that may struggle** | *Azaleas, Begonias, Camellias, Ferns, Foxgloves, Gardenias, Hydrangeas, Impatiens, Oxalis, Philodendrons, Primroses, Rhododendrons, Violets* |
| **Alkaline plants that could do well** | Agapanthus, Fan & Date Palms, Oleander, Australian Tea Tree, Honeysuckle, Olives, Bermuda, Grass, Ice Plant, Rose, Bougainvillea, Juniper, Rosemary, Cottonwood, Oaks |

## Conduct a regular health check on your gardens and lawn

Conducting regular health checks on your garden will ensure that the use of greywater is not damaging the health of your soil and plants. Signs of unhealthy soil, lawn and plants include:

- ***damp and boggy ground hours after irrigation***
- ***burnt or wilting foliage***
- ***poor or excessive plant growth with reduced fruit***
- ***evidence of pests and disease on plants***
- ***unusual odours***
- ***clumping of soil***
- ***surface ponding and run-off of irrigated water***
- ***a fine sheet of clay covering the surface of the soil.***

***If you notice any of the above signs, reassess the amount and quality of greywater you are using or check that your irrigation system is working correctly.***

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