

Greywater: The Basics

Australia is experiencing record breaking droughts. Never has water conservation been more important. Ordinary people can help by being wise with water in their own homes.

Part of smarter water use is matching various water sources to the right uses. Garden watering and toilet flushing, for example, don't require drinking quality water. **Greywater**, the 'waste' water from the laundry and bathroom, is now seen as a resource – water that can be reused, reducing our demand for potable water. However, greywater can carry higher levels of pathogens and residual chemicals and shouldn't be used unadvisedly. This fact sheet provides a brief overview of how greywater can be reused in the home.

Water use in the home

The following diagram shows how the 'average' Australian home uses water. We use up to 44% or more of our water on gardens over the hot summer months. This can vary depending on the size of your yard and the way it has been landscaped. This huge demand on mains water can be dramatically slashed by choosing the right plants, smarter landscaping, capturing rainwater and reusing greywater.



What is greywater?

Greywater is the water that goes down plug holes inside the house. This is distinct from the 'brown' or 'black' water from toilet flushing and the storm water that flows off rooftops and streets into gutters and storm water drains.

- **Kitchen** waste water is generally not recommended for reuse as it tends to contain high levels of fats, food residue and other contaminants, which can block plumbing and cause odours.
- **Bathroom** greywater is sometimes used on gardens provided it is not heavily tainted with soap, bubble bath and other toiletries. However, bathroom plumbing can be difficult to access in order to set up greywater diversion systems.
- **Laundry** water is most commonly reused on gardens. Raised laundry sinks make pipes accessible and allow gravity to help the water flow into the garden. The use of eco-friendly laundry powders, such as Planet Ark and Aware brands, ensures that the greywater has relatively low chemical content, protecting the health of the garden.

How is greywater used?

Reusing greywater can be as cheap and easy (but labour intensive) as bucketing water outside, or as complex and costly (but convenient to use) as installing automatic greywater diversion, treatment and/or irrigation systems.

Garden use is most common. In some states it can be bucketed or diverted to the garden for immediate use. In some states greywater can only be used on the garden using an approved permanent greywater system. See the fact sheet *Greywater State by State* for a quick guide to local regulations.

Special systems are also available that collect, filter and treat greywater and use it for **toilet flushing**.

Using laundry water in your garden

Clothes washing accounts for 10-30% of the average household's water use.

Greywater from the laundry is easy to capture and, with the right choice of laundry products, can have low levels of contamination, making it ideal for reuse in the garden. This fact sheet is a guide to safe laundry water reuse in the garden.

Laundry products: what to look for

Many chemicals go into modern laundry products in the push for sterile, whiter than white clothes and linen. Plants, beneficial insects and soil microbes are sensitive to certain chemicals, so it's important to use an environmentally responsible laundry powder if you are planning to reuse laundry water on the garden.

When choosing a laundry powder, avoid those containing antibacterial agents, phosphates and extras such as optical brighteners, enzymes, synthetic fragrance and bleach.

Instead, look for laundry powders that:

- are **phosphate-free** (phosphates can harm sensitive native plants)
- are **low in sodium** as this can damage your garden
- state that all of their ingredients are readily **biodegradable** (the Australian Standard for laundry powder biodegradability only requires the surfactant to be biodegradable)
- are **concentrated** (cheaper powders can contain extra salt as a bulking ingredient)
- can be used in **cold water** (hot water can damage plants and soil)

How to use Aware laundry powder

The greywater from *Aware Laundry Powder* is garden safe because it is readily biodegradable, and is made without phosphates, petrochemicals & is low in sodium.

The wash and rinse water of **Aware** has been independently tested by Sydney Environmental and Soil Laboratory and found to be suitable for use on the majority of crops and plants in the long term with few precautions.



If greywater from Aware is used on the garden over the long term (several years), a rise in soil pH and sodium levels is possible (mostly only in very dry climates), so it is recommended that in this instance:

- soils be well drained
- application areas have gypsum applied occasionally
- if soil pH rises above about 8.0, sulphate of iron be applied to reduce it to about 7.0
- avoid using on plants which prefer more acidic soil and are intolerant of salt (ex Camellias, Azaleas, Roses)

Tips for 'garden safe' laundry greywater

- Regulations require that you keep greywater within your property. It must not run into neighbouring properties or drains.
- To reduce health risks, don't allow greywater to pool on the surface of the ground. This can be avoided by using a subsurface greywater irrigation system.
- Take care to avoid water pooling on the surface if pets may drink the water.
- Don't use the greywater from washing nappies on the garden and don't allow children to play with greywater.
- Health authorities advise against using greywater on plants that you intend to eat, except to the roots of fruit trees,
- Don't use hot laundry water directly from the machine on your garden
- Do not store greywater for more than a few hours

Greywater systems

There are many methods for reusing greywater, from simple bucketing to complex treatment and recycling systems.

Factors that can influence your choice of greywater reuse method include:

- **Budget** – Costs range from simple relatively inexpensive diverters to complex treatment, storage and irrigation systems that cost several thousand dollars. Some state governments offer rebates on greywater recycling products.
- **Where you live** – Laws governing greywater reuse can vary from state to state, and may differ in unsewered areas (see the fact sheet *Greywater State by State*). Some local councils also have special requirements for greywater use.
- **Existing plumbing** – The accessibility of the pipes that carry greywater inside your home will affect your options.
- **Existing garden landscape** – Some systems incorporate surge tanks, which may require space in the garden against the external wall of the laundry. The installation of irrigation systems may disturb existing plants or soil. Your garden design and choice of plants will also determine the your garden's watering needs.
- **The elevation of garden beds compared with greywater sources** – This will partly determine whether or not the force of gravity alone is enough to push the greywater through the system to where it is needed. Some sloping blocks are well suited to gravity fed greywater diversion systems, while systems that recycle greywater for toilet flushing or flat blocks with raised garden beds may require a pump.

Types of greywater system

The various methods of greywater reuse fall into two categories: diversion systems and treatment systems.

Diversion systems typically direct greywater from the laundry or bathroom to the garden for immediate use, without making changes to its quality. The water is not stored for more than a few hours, if at all.

Treatment systems improve the quality of the wastewater by filtering, disinfecting and otherwise treating it. Treated water can be stored for longer periods without the risk of it going septic. Its higher quality and ability to be stored means that it can be used for more purposes, including garden watering, toilet flushing and even clothes washing.

Components

Greywater systems can have a combination of various components, as outlined below:

- **Diverter** – A diverter is a fundamental component; a device connected to waste water pipes that can switch the flow of water away from the sewer and direct it elsewhere.
- **Overflow device** - Many systems also include an overflow pipe or device that directs greywater to the sewer in the event of the system becoming overloaded or not functioning properly.
- **Filter** - Greywater can contain soap scum, lint, hair, bits of sand and dirt and other small debris, all of which can block drippers or porous hoses, so it is useful to have some sort of filter connected to the diverter or elsewhere in the system.
- **Simple distribution pipe or hose** - Water can be diverted into a pipe or hose and (subject to local laws) applied directly to parts of the garden. This effectively floods areas of the garden, if only temporarily, increasing the risk of the water running off the property. This concentrated application of the greywater to the ground can lead to a build up of chemical residues in the soil.

Greywater systems

- **Surge tank** – Greywater is often produced faster than a drip system can distribute it to the garden. Some systems have a surge tank, a temporary holding vessel for the large quantities of greywater that come from a washing machine, shower or bath.
- **Pump** – A pump may be needed to push greywater through a distribution system when gravity alone is inadequate to do the job. Most pumps run on electricity.
- **Distribution system** – It is generally safer, more convenient and more effective to direct greywater directly to the soil through distribution or irrigation systems. **Drip lines** can be laid on top of the soil and covered with a layer of mulch to prevent greywater pooling on the surface. **Subsurface irrigation trenches** involve slotted pipes laid in shallow trenches filled with coarse sand, aggregate or blue metal under a layer of topsoil. However, this type of system is difficult to lay in established gardens.
- **Treatment systems** – Treatment systems can involve storage tanks, filter beds or sand filters, pumps and assorted plumbing.

Choosing and installing a system

Greywater use at its best is a great way to reduce your demands for fresh drinking quality water and, used on the garden, a great way to keep your plants thriving during times of drought and water restrictions. At its worst, poorly conducted greywater use can be a health risk, and can cause household floods and odours.

For this reason, only permanent greywater systems approved by health and/or water authorities should be installed. Changes to any plumbing systems should only be made by a licensed plumber to avoid any risk of cross connection between wastewater and fresh water supplies. Water authorities and

plumbers specialising in greywater systems can provide advice on the right system for your particular situation. You can find a specialist plumber in your area through the GreenPlumbers initiative - visit www.greenplumbers.com.au

Price guide

Following is a rough guide to the costs of various greywater systems and components. Keep in mind that some state governments offer rebates for approved products and systems (see the fact sheet *Greywater State by State*).

Products (for those with plumbing competence):

- **Simple diverters** - from \$50 - \$200.
- **Greywater hose** – around \$20-30 for a 10m length.
- **Suldi Greywater Valve** – connects to the drain pipe from your washing machine and diverts the run-off water into the garden. Around \$50
www.planetarkdirect.com.
- **Nylex Greywater Diverta™** Features a removable filter. - Around \$190.
www.nylexwater.com.au
- **Nylex Greywater Diverta™ & Irrigation System** - utilises a series of irrigation domes, which act as mini subsurface surge tanks, eliminating the need for a large tank. Around \$700
www.nylexwater.com.au
- **G-Flow** - a laundry greywater distribution system – from \$900
www.qflow.com.au

Systems (licensed plumber required):

- **Waterwise Greywater Gardener 230** – a gravity fed diversion and garden irrigation system, from \$3600.
www.waterwisesystems.com
- **Eco-Care Grey Waste Water Diverter System** - a semi-automatic, pump driven diverter system, around \$1000.
www.plasticplumbing.com.au

Greywater systems

- **Wattworks Greywater Systems** – diversion and holding tank system that recycles greywater for toilet flushing and gardening watering. The tank is automatically emptied every 24 hours, avoiding any need for treatment. \$2300-2800. www.wattworks.com.au
- **Aqua Reviva from New Water** is a self-contained automatic system that treats and recycles your greywater– from \$10,000 - \$15,000. www.aquareviva.com.au

Greywater: State by State

The use of greywater is regulated by state or territory government environmental health and/or water authorities. Local councils may also have special requirements for the installation of greywater systems on sites within their area.

This sheet provides an overview of permitted greywater use in each state and territory and, where available, the rebates on offer. This information is intended to provide guidelines only, so it is important that residents wishing to reuse greywater check their local council regulations before proceeding.

Australian Capital Territory

The ACT Government does not specifically regulate greywater use. However residents must operate their greywater systems sensibly and follow the guidelines available in the document *Greywater Use: Guidelines for Residential Properties in Canberra* (available by searching for 'greywater' at www.health.act.gov.au).

Greywater treatment systems do not require formal approval, but normal plumbing approvals are required by the ACT Planning and Land Authority (www.actpla.act.gov.au) phone 02 6207 1923

New South Wales

In NSW greywater can only be diverted to your garden via sub-surface irrigation using a licensed greywater diversion device or irrigated above ground and used for toilet flushing and in the washing machine via a NSW Health accredited domestic greywater treatment system. The local council is the approval authority. There is more information at www.health.nsw.gov.au - look for "greywater" under the A-Z index of the site.

In addition, Sydney Water provides user-friendly information, guidelines and case studies of greywater recycling at www.sydneywater.com.au/SavingWater/GreyWater/. An excellent draft greywater document is available from the Department of Energy Utilities and Sustainability at www.deus.nsw.gov.au/index.asp and look for the Greywater link under "Quick Links." There are currently no rebates available for greywater systems in NSW.

Northern Territory

All greywater reuse needs to be approved by the Department of Health and Community Services. A fact sheet is available.

www.nt.gov.au/health/healthdev/enviro_n_health/factsheets/Greywater.pdf

Queensland

The Queensland Government allows residents to manually bucket greywater from the laundry and bathroom. They may also connect a flexible hose to divert greywater from the washing machine outlet hose to their garden. Permanently installed diversion devices and greywater treatment systems must be accredited by Standards Australia or the Department of Local Government, Planning Sport and Recreation, respectively (see www.lgp.qld.gov.au/?id=1415 for a list of approved devices and systems). Residents must obtain approval from their local council before installation. Greywater diversion devices and greywater treatment systems must be installed by a licensed plumber.

Rebates: The Queensland Government offers rebates on greywater installations through the Home Garden WaterWise Rebate Scheme. Rebates available: 50% of purchase cost and installation up to a

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maximum of \$200 for an above-ground greywater system; or a maximum of \$500 towards the purchase and installation of a below-ground system. For greywater guidelines and rebate details see www.nrw.qld.gov.au/water.

South Australia

Manual bucketing onto the lawn and garden using water from the laundry or bathroom, or temporary use of a hose manually fitted to the washing machine outlet hose is permitted, subject to advice found at <http://www.dh.sa.gov.au/pehs/branches/wastewater/greywater-manual-bucketing-jan07.pdf>. Permanent greywater systems need to be approved by the Department of Health. See <http://www.dh.sa.gov.au/pehs/branches/wastewater/greywater-general-nov06.pdf>.

Tasmania

Generally greywater reuse is not permitted in Tasmania's sewerage areas. In unsewered areas, greywater systems must be accredited by The Department of Justice and need approval from local council.

Victoria

No permit is needed to divert greywater for immediate use on the garden. However, there are a number of guidelines which should be considered. For details, go to www.epa.vic.gov.au and follow the links from the side menu as follows: Water > Water reuse > Household greywater reuse.

Systems which collect, treat and reuse greywater must be approved by the EPA and be issued with a council permit. The EPA Greywater Reuse webpage allows you to download a useful information

bulletin *Reuse Options for Household Wastewater* (Publication 812.2). For more greywater information relevant in Victoria, also visit www.savewater.com.au.

Rebates: The Victorian Government offers a rebate of \$500 for the purchase and installation of approved permanent greywater tank systems that recycle wastewater from laundries and bathrooms for use on the garden or in the toilet through the Water Smart Gardens and Homes Rebate Scheme. See www.ourwater.vic.gov.au for details.

Western Australia

Greywater can be reused in WA by bucketing without a permit. Installation of a greywater system must be approved by the Department of Health and local council. For information, see the *Code of Practice for the Reuse of Greywater in Western Australia*, available online at www.population.health.wa.gov.au - (under C for "Code of Practice..." on the A-Z directory). Don't be turned off by the technical first part of this document; the *Homeowner's Guide* in Part 2 is much easier to read.

Rebates: The WA Government's Waterwise Rebate Program has been extended until 30 June 2007. A Waterwise Rebate of up to \$500 or 50% of the purchase/installation cost (whichever is the lesser amount) is available for an approved greywater re-use system or aerobic treatment unit. For more information and a list of approved greywater systems visit www.water.wa.gov.au and click on the Waterwise Rebate Program link.