



BEYOND THE BASICS: Graywater to Save Water

Written by Mladen Bandov, Rigi Engineering, with Stephen Ames, Semmes & Co.

GRAYWATER BASICS

Graywater can easily reduce your summer water bills by reusing wastewater from your **shower, bathtub, lavatory sink and washing machine** as irrigation for your landscape.

Although every project will be different, a few basic concepts can help you understand your system:

- Graywater is not the same as *recycled water*, which is wastewater that has been treated to California's tertiary standards, usually at a municipal facility.
- Graywater can be reused directly into your landscape as irrigation without treatment. However, filtration may be necessary for equipment such as pumps.
- If treated to the same standards as *recycled water*, graywater can also be used for toilet flushing in your house.
- Don't store graywater: it will quickly turn foul.
- Wastewater from toilets, kitchen sinks, and dishwashers is *blackwater*, which is not allowed to be reused without treatment.
- Graywater cannot be sprayed above ground or allowed to pond or runoff.
- **At least two inches** of mulch, gravel, soil or other material must cover any graywater that is released into the soil.
- Graywater systems must include adequate capacity for surge flows. For example, a 50-gallon surge tank can be used for a simple residential system. Instead of a surge tank, a number of mulch basins can be used.
- Graywater systems must include overflow piping, a 3-way valve or other switch to the sewer or septic system, backflow prevention, and other plumbing code requirements.

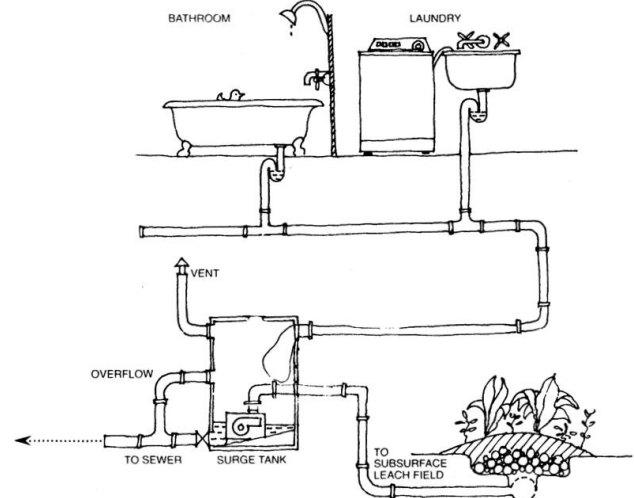
A properly designed graywater systems will minimize any safety risks, while saving water and money on irrigation.

IS GRAYWATER LEGAL?

Yes, graywater is legal in California. The recently updated plumbing code allows for easier compliance.

RESIDENTIAL GRAYWATER SYSTEMS

1. The *clothes washer* system is the easiest and most beneficial system for retrofit projects.
2. The *simple* system (less than 250 gpd) and *complex* system (more than 250 gpd), differentiated by the design flow rate in gallons per day (gpd), are most appropriate for new construction and homes with easy access to the plumbing.
3. The *treated graywater* system for indoor reuse is most appropriate for multi-family homes or commercial projects where there is typically more water use.



www.water.ca.gov/wateruseefficiency/docs/graywater_guide_book.pdf

Construction permits are required for all systems except the clothes washer system. However, always check with your local building department for the most current requirements.

Homes with water softeners should not use graywater, consider switching to potassium instead of sodium salts, or use a non-salt based conditioning system.

Clothes washer systems

Clothes washer systems, also known as *laundry-to-landscape* systems, divert water from the washing machine into the landscape.

Connect the outlet of the washing machine to a 3-way valve, which will allow the flow to be



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diverted either into the standpipe or into mulch basins in the yard. Air breaks and check valves are required if the washing machine is directly connected to the piping. Be careful not to pump uphill or through too much piping, which may decrease the pump's life cycle.

Use flowering pot emitters, mulch basins, tree watering moats, gravel sumps, mini-leachfields, or other configuration as the terminal ends of your system to irrigate shrubs and trees in your landscape.

Switch the graywater flow to the sewer or septic system when washing dirty diapers or using toxic chemicals like bleach. Most detergents, even biodegradable ones, can contain salt and other substances that can be harmful to plants.

Simple graywater systems

Simple systems separate graywater with a dual plumbing system that uses two sets of piping: *blackwater* (toilet and kitchen waste) and *graywater* (shower, bathtub, sink and laundry).



<http://nobhillhaus.blogspot.com/2011/02/more-cabinetry.html>

Although not specifically required, a surge tank is useful to temporarily hold the daily graywater flow. A filter should be used to protect the pump, piping and drip lines from clogging material such as lint, hair and debris. Tanks and piping need to be installed according the building code, including venting and strapping as necessary.

Graywater can be irrigated in a landscape, either by pump or gravity flow, using several methods such as mini-leachfields, drip lines, mulch basins, flower pot emitters, tree watering moats, and vegetated swales.

Manual systems are preferable for homeowners that are interested in equipment cost savings and can perform regular maintenance such as filter cleaning or replacing degraded mulch. Automated systems are desired for ease of use and low maintenance.

Consult with your local nursery or landscape professional to select plants that are tolerant of graywater, including higher salt tolerance.

Complex & treated graywater systems

Qualified professionals are required to design *complex* and *treated graywater* systems. For large multi-family or commercial projects, treated graywater for indoor reuse is more feasible due to increased water use for toilet flushing.

BENEFITS OF A GRAYWATER SYSTEM

California Department of Water Resources' *20x2020 Water Conservation Plan* estimates, for single- and multi-family residences in the Central Coast region, the **total water usage per person is 109 gallons per day.**

Graywater can lower water bill costs, reduce potable water demand, and meet California's water conservation goals by reusing 40 gallons per day typically generated by each person.

An average household (2.6 persons) can save 38,000 gallons each year by using graywater -- about \$150 water bill savings every year.

CHECK YOUR WATER BILL: If it doubles during the summer months, a graywater system may be appropriate for you. Contact your local plumber, landscaper, or general contractor for more information on how to use graywater in your home.