

Greywater Recycling

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Greywater is any water that has been used in the home, except water from toilets. Fifty-eighty percent of residential “waste” water is comprised of dish, shower, sink, and laundry water. This “waste” water can be reused for other purposes such as landscape irrigation. Just think about what a waste it is to irrigate with huge quantities of drinking water when plants thrive off of used water that contains small bits of compost.

Some of the benefits of grey water recycling include: lower fresh water use, less strain on a failing septic tank or treatment plant, effectiveness of grey water treatment in topsoil, your ability to build in areas unsuitable for conventional treatment, less energy and chemical use, groundwater recharge, plant growth, and reclamation of otherwise wasted nutrients. All of these benefits provide us with great reasons to incorporate grey water recycling systems into our own homes.

The first benefit listed above, lower fresh water use, is possible because greywater can replace fresh water in many instances (saving you money and increasing the effective water supply in regions where irrigation is needed). Residential water use is almost evenly split between inside the home and out in the yard. All the inside water, except for toilet water, could be recycled outdoors, achieving the same result with significantly less water diverted from nature. The second benefit is that there will be less strain on your septic tank or treatment plant because greywater use greatly extends the life span and capacity of septic tanks. For example, for municipal treatment systems, decreased wastewater flow means higher treatment effectiveness and lower costs. Greywater can help protect your precious topsoil. This is because greywater is purified to a very high degree in the upper most biologically active region of the soil, which protects the quality of natural surfaces and ground waters. Additionally, greywater can allow you to build in sites with slow soil percolation or other problems since grey water can be used as a partial or complete substitute for a very costly, over-engineered system. Greywater can help you cut back on energy and chemical use due to the decrease in the amount of both freshwater and wastewater that needs pumping and treatment. Greywater use can recharge your groundwater as well as support hearty plant growth in most all areas because it enables an area to flourish where water may not otherwise be available. The loss of nutrients through wastewater disposal in rivers and oceans is a subtle, yet highly significant form of erosion. Imagine how much reclaiming nutrients through grey water helps to maintain the fertility of the land. Lastly, it is important to stress how much greywater use builds the satisfaction within us all of taking responsibility for the sensible use of our Earth’s resources.

California’s Greywater Standards are now part of the State Plumbing Code, making it legal to use greywater everywhere in California. These standards were developed and adopted in response to Assembly Bill 3518, the Greywater Systems for Single Family Residences Act of

1992. There are seven steps that will help people plan, design, install and maintain their greywater system:

Step 1. The first is investigating the permit process. You can find such information in Title 24, Part 5, of the California Administrative Code, greywater Systems for Single Family Dwellings. These are the official rules for using greywater in California. The Standards require that a building permit be obtained before a greywater system is installed.

Step 2. Prepare to plan in terms of what kind and how big of a system you need to install. It is important to calculate approximately how much greywater your family will produce and how much landscape you can irrigate with it. Determining whether your soil is suitable for a greywater system is another primary consideration (Department of Water Resources, 1995). Once you have decided that a greywater system will work, the next step is drawing a plan and designing your system. The number of plumbing fixtures which you connect to the greywater system will determine how much greywater is available for irrigation use. The greywater Standards use the following procedure to estimate the daily greywater flow: First calculate the number of occupants of your home (First bedroom with 2 occupants, each addition bedroom at 1 occupant. Then estimate the daily greywater flow for each occupant. Showers, bathtubs and wash basins (total) at about 25 gallons per day per occupant. Then clothes washer at 15 gallons per day per occupant. You then multiply the number of occupants by the estimated greywater flow. For estimating landscape usage you can either estimate the square footage of the landscape or the number of plants, which can be irrigated. The formula used to estimate this number is (the estimated greywater produced in gallons per week divided by the evapotranspiration in inches per week multiplied by the plant factor multiplied by 0.62, which is the conversion factor. For specific information about evapotranspiration and estimating landscape water needs see University of California Leaflet 21493, Estimating Water Requirements of Landscape Plantings, and U.C. Water Use Classification of Landscape Species. These publications can be obtained through your county cooperative extension office. You then need to determine the soil types and ground water level of your property and draw a scaled plot plan of your property which you may be required to include dimensions, lot lines, and direction and approximate slope of the surface. You then need to decide the minimum size of the irrigated field required based on the soil type.

Step 3. Designing the greywater system. A greywater system usually consists of: plumbing system made up of pipes and valves to bring the greywater out of the house, a surge tank to temporarily hold large drain flows from washing machines or bathtubs, a filter to remove particles which could clog the irrigation system, a pump to move the water from the surge tank to the irrigation field and an irrigation system to move the water to the plants.

Step 4. Submitting your plan to the building department for review and approval. They will be looking to make sure you complied with the greywater Standards for your county.

Step 5. Installing the system. In most cases the plumbing parts, pump and tank can be purchased at your local plumbing supply store. Look in the Yellow Pages under "Plumbing Fixtures, Parts, and Supplies, Retail". The Yellow Pages also has listings for "Pump-dealers"

and “Tanks-Fiber Glass, Plastics, Etc.” or “Tanks-Metal”. “Irrigation Systems and Equipment” is the heading to look under for the components of the subsurface drip irrigation system. The pipes for a mini-leach field system can be purchased from a plumbing supply store and the gravel filter material can be found at a “Sand and Gravel” company, listed as such in the Yellow Pages.

Step 6. Arranging for a building inspector to come out for the final inspection and approval. The last step is using, monitoring and maintaining the system.

Information for this article came from:

1. Department of Water Resources, Santa Cruz, 1995.
2. Oasis Design. 2005. <http://www.oasisdesign.net/>.