

## A More Responsible Future

- Now more than ever we need to utilize our water to it's full potential. As the population increases and the demand for water rises the cost of water production can only go up. With the recent drought many California systems are imposing mandatory rationing and some are projected to run out of water soon .
- With a little effort gray water can be safely recycled and used as an untapped form of this precious resource that is otherwise simply wasted.

If you're interested in creating a gray water system in your home contact the City of Angels Camp Building Dept at (209)736-1346 Also there is wealth of information online. Below is a list of some reputable sites that contain many of the resources needed to get you on the road towards more responsible water use.

### For More Information

- [Greywateraction.org](http://Greywateraction.org)  
*Workshops & general info*
- [sfwater.org/graywater](http://sfwater.org/graywater)  
*San Francisco Graywater Design Manual*
- [cleanwatercomponents.com](http://cleanwatercomponents.com)  
*Purchase kits for systems*
- [Oasisdesign.org](http://Oasisdesign.org)  
*Design manuals & general info*



## About the City of Angels

The City of Angels is Located within the County of Calaveras and is the only incorporated city in the County. The City of Angels operates a 2 MGD water treatment plant and, 1.9 MGD Title 22 wastewater treatment facility. We provide water and wastewater services for a population of approximately 3600. We operate and maintain over 23 miles of water distribution lines and over 25 miles of gravity and forced main sewer lines. We also operate and maintain 5 sewer lift stations as well as 126 acres of spray fields. The City is also the land planning agency for all privately owned lands within the City of Angels and regulates land use within this area.

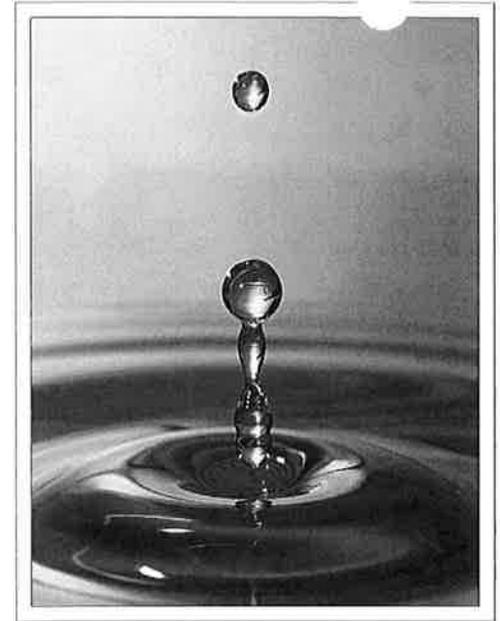


City of Angels

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# Gray Water Recycling

For Residential Occupancies

## City of Angels

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## What is Gray Water?

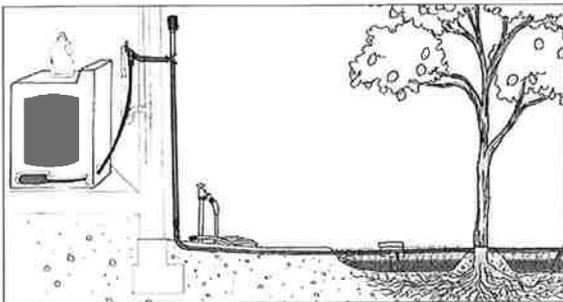
Gray water is the water that drains from showers, tubs, sinks and washing machines. It contains some soap, hair and dirt but is relatively clean and can be collected for uses around the home that do not require drinking water quality. Most commonly it is used for landscape and garden watering, but with the proper treatment it can even be used indoors for toilet flushing. Water from toilets, wash water from diapers or water containing hazardous chemicals is not

## What are the benefits?

considered gray water in California. Recycling gray water can reduce potable water use in homes by 16 to 40% (depending on site) and also saves energy. Every gallon of gray water we let go down the drain has to be treated as raw sewage which consumes large amounts of chemicals and electricity (2 watt-hours per gallon). Using gray water saves you time watering plants and encourages the use of environ-

## Gray Water Systems

Gray water systems range from very simple to very complicated. There are three basic types: Clothes Washer System, Simple System and Complex System. The Clothes Washer System or **Laundry to Landscape** is the easiest, least expensive option and does not require a permit



Picture courtesy of Oasisdesign.org

## Developing a plan

Before choosing a gray water system type you'll want to check the groundwater level and do a few calculations.

💧 **Groundwater Level Check**— Dig a test hole 3 vertical feet. If no water enters the hole it is safe to irrigate with gray water.

💧 **Calculate Gray Water Discharge**— Count 2 occupants for first bedroom and 1 occupant for each additional bedroom. (A 2BR house would be 3 occupants). Then multiply by daily amounts according to source. **Showers, bathtubs and Washbasins**- 25 gallons per day/occupant, **Laundry** -15 gallons per day/occupant. So a household w/ 3 occupants collecting showers, baths, washbasins and laundry would generate (3 x 40gals) 120 gals/day.

💧 **Estimate Water Needs**— An easy rule of thumb to estimate a plant's weekly water needs is to find the square footage of the plant's canopy and divide by 4. For example an apple tree with a canopy area of 80 square feet might need 20 gals per week.

💧 **Estimate Minimum Square ft. Irrigation**— Depending on soil type irrigation must be sized accordingly. The absorption capacity of the soil must be able to accommodate the maximum discharge of the gray water system. Ponding or runoff is prohibited. Irrigation must also be a minimum distance from property lines, surface waters, septic disposal fields and domestic water supplies. For more information see Table 1602.4 of 2013 California Plumbing Code.

Type Of Soil	Min. Square ft. per gal/day
Coarse Sand or Gravel	.2
Fine Sand	.25
Sandy Loam	.4
Sandy Clay	.6
Clay w/ considerable sand or gravel	.9
Clay w/ small amounts of sand or gravel	1.2

Adapted from 2013 California Plumbing Code Table 1602.10

## Gray Water Systems Types

💧 **Clothes Washer System (Laundry to Landscape)**

- no permit required
- connects to washing machine only

💧 **Simple System**

- requires permit
- may include showers, tubs & washbasins
- discharge capacity of 250 gals/day or less
- may include storage tanks, filtration and disinfection

💧 **Complex System**

- requires permit
- may include showers, tubs & washbasins
- discharge capacity over 250 gals/day
- may include storage tanks, filtration and

Many options exist for collection, treatment and storage under the simple and complex systems including motorized valves, storage tanks, filtration equipment and disinfection methods. All gray water systems must include a diverter valve to direct flow to building's sewer and a detailed operation and maintenance manual.

There are also manufactured systems available for purchase but be sure to research the system you are considering to ensure it complies with Califor-

## Regulations

All gray water systems including Clothes Washer systems must comply with 1602.1 General gray water provisions in 2013 CALIFORNIA PLUMBING CODE Chapter 16 Alternate Water Sources for Nonpotable Applications.

For more information and a free copy of the California Plumbing Code Chapter 16 contact the

City of Angels Building Dept.

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