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Defining Terms: Greywater, Blackwater and Clearwater

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Greywater Systems

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Why irrigate with treated drinking water when you can meet your irrigation needs through an effective greywater system?

What is greywater*? Greywater includes all wastewater generated in the home, except toilet water (which is considered "blackwater"). In Utah, kitchen sink and dishwasher water are also categorized as "blackwater". Greywater is an abundant resource in both residential and commercial buildings. According to Brad Lancaster of the Watershed Management Group in Tucson, Arizona, "greywater harvesting is the practice of directing greywater to the primary root zone (top 2 feet or 0.6m of the soil) of perennial plants to help grow beautiful and productive landscapes while achieving wastewater treatment without using energy or chemicals. Plants and microorganisms in the soil consume and filter the organic nutrients and bacteria found in greywater, treating it naturally and returning clean water to the water cycle" (Lancaster, 2010, p.294). Though not suitable as drinking water, greywater can be used for irrigation, particularly of trees and shrubs whose woody stems serve as additional filters for contaminants that may be present.

Clearwater is solid-free wastewater which includes water produced while waiting for hot water from the faucet to heat up, refrigerator compressor drip, swamp cooler and air conditioning 'sweat,' and more. Clearwater, like greywater, is an underutilized landscape irrigation resource ripe for harvest in most commercial buildings and homes.

A backyard in Albuquerque, NM, with both a shower greywater outlet (black) and rain barrel overflow (white). Credit - Roslynn Brain

Did you know?

In 1989, the County of Santa Barbara became the first jurisdiction in the United States to change its building codes and legalize the use of household greywater.

Why take the time to establish a system for greywater and clearwater use? The answer is: resource abundance. According to Art Ludwig, "dish, shower, sink, and laundry greywater comprise 50-80% of residential 'wastewater'" (Ludwig, 2012, p.2). The EPA estimates landscape irrigation to account for almost a third of all residential water use, totalling over 7 billion gallons per day (EPA, 2014.) Other water research groups rate irrigation use much higher, at over 50%. The secondary use of at-home greywater and clearwater resources could help offset high rates of water consumption and associated municipal water costs in Utah.

*Accepted spelling also includes: graywater or gray water

Advantages of Greywater

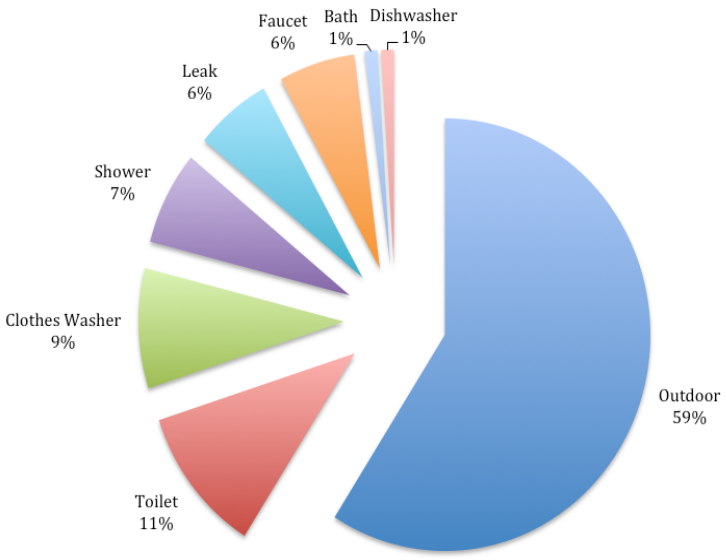
Greywater use results in:

- Less strain on septic tanks and water treatment plants;
- Effective water purification (greywater is better purified in the upper, most biologically active region of the soil);
- Reduced use of freshwater resources;
- Reduced use of energy and chemicals for water treatment;
- Groundwater recharge;
- Improved plant growth;
- Reclamation of nutrients (loss of nutrients via wastewater disposal in rivers/oceans is a significant form of erosion), and;
- Increased awareness of natural cycles (Ludwig, 2012).

What do you need for a greywater system?

- Greywater sources: Washing machine, shower, bathtub, and/or sinks.
- Collection plumbing: Pipes to transport greywater from the house to one or more points outside of the house.
- Surge tank, filter, and pump: Optional parts that add complexity and cost, but can make the distribution plumbing easier, especially for large flows.
- Distribution plumbing: Plumbing that transports greywater through the landscape and divides it among plants.
- A receiving landscape: Soil, roots, plants, and mulch basins that contain, cover, purify, and use greywater.
- People: To design, make, and maintain the system, generate greywater, tend the garden, and enjoy the landscape (Ludwig, 2012).

If considering your own greywater system, develop your landscaping goals, calculate the average amount of water your system would provide to help achieve those goals, and talk to your local health department.



Residential Average Water Use: American Water Works Association Research Foundation (www.waterrf.org)

Enhancing Soil Health

When irrigating with greywater, it is essential to consider what you put down the drain, especially commercial cleaners. Choosing plant- and soil-biocompatible cleaners (the breakdown products are good for/do not harm the environment) is a major way to improve greywater quality (Ludwig, 2012). Examples of products you should never use in your greywater system include: products designed to unclog drains or clean porcelain without scrubbing, boran/borax, bleach containing sodium perborate, whitening and softening detergents. Also, water softeners add high levels of sodium chloride to soils, which may have adverse salinization effects (Ludwig, 2012).

A Greywater-Fed Front Yard in Albuquerque, NM
Credit- Roslynn Brain

Status of Greywater in Utah

In 2004, the Utah Water Quality Board adopted a rule (R317) allowing the use of used water from baths, showers, bathroom sinks and washing machines (greywater) for residential drip irrigation systems. According to Walt Baker, director of the Utah Division of Water Quality, the greywater legislation was "brought to a head by the drought, which prompted us to be more aggressive and put the new rule in place" (W. Baker, personal communication, August 29, 2014). Using water from toilets, kitchen sinks, dishwashers, photo lab sinks and garage floor drains is, however, still illegal in the state.

The 2012 International Plumbing Code, Section 1302, "Systems for Flushing Water Closets and Urinals," was adopted by the State Legislature in 2013. Though adopted, there is no regulatory framework for implementing such systems in Utah.

Researching the "Utah Administrative Code on Graywater Systems (R317-401)" provides good initial information about barriers to - and possibilities for - adoption. In Utah, greywater is under jurisdiction of regional Health Departments. Contact your local office to learn more about specific rules and regulations in your area. To date, no local health departments in Utah have implemented greywater programs.

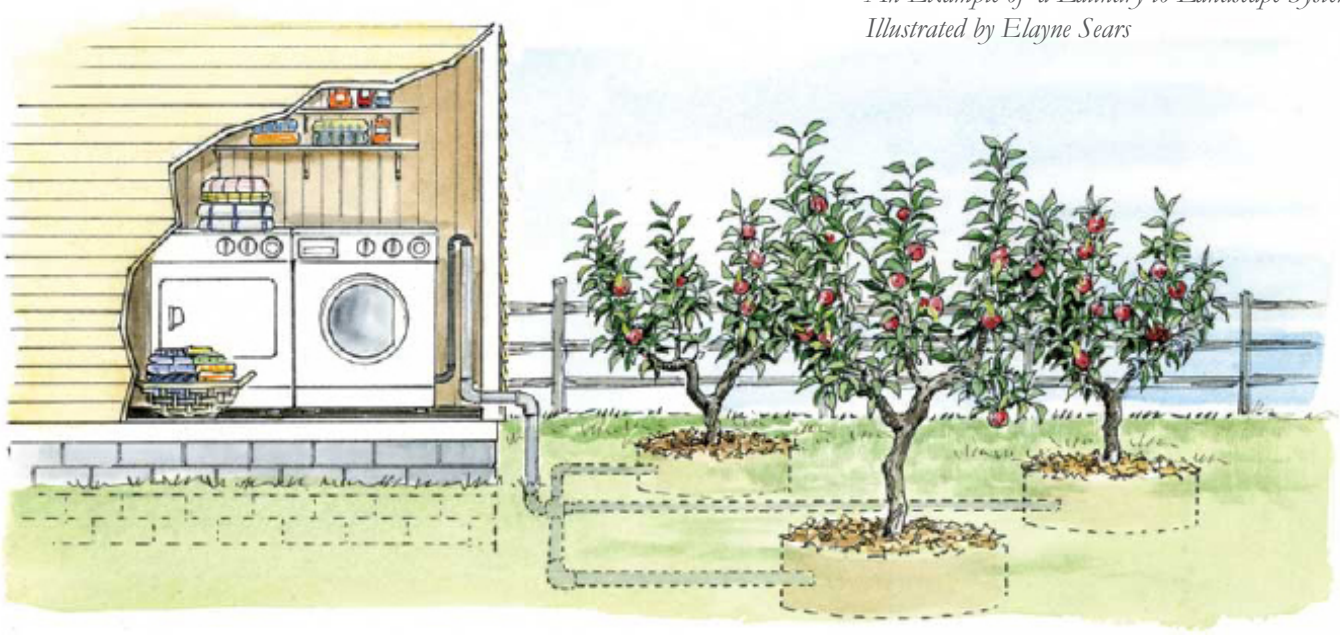
Why Greywater in Utah?

In the western United States, water is treated as currency. As with money, its value is determined not by a single use, but by the many exchanges it experiences moving through the economic system. The more we utilize our water resources in secondary and even tertiary ways, the more we stand to gain in value, and the more we show our initiative in conserving a limited resource. According to the United States Geological Survey (2010), Utah is both the second driest state and second highest per capita domestic water consumer in the nation. The pie chart on page 2 demonstrates how much water is used for landscaping. A greywater system could cut your residential water use by over 50%. Installing a greywater system in your home is one great way to help conserve our scarce western water supply and can save you on municipal water costs as well.

States with Greywater Legislation

- To learn more about the success of greywater programs in other states, search "greywater" and: Arizona, California, Connecticut, Colorado, Montana, New Mexico, Oregon, Texas, Washington, and Wyoming.

An Example of a Laundry to Landscape System
Illustrated by Elayne Sears



A greywater system connected to the washing machine, allowing the homeowner to choose "sewer" or "landscape." This is helpful in areas where pipes freeze in the winter. Credit- Roslynn Brain

Greywater Resources

http://greywateraction.org/
A collaborative group of educators, designers, builders, and artists who educate and empower people to build sustainable water culture and infrastructure

http://greywateraction.org/content/about-greywater-reuse
Grey water system design examples and FAQs.

http://oasisdesign.net/greywater/law/#arizona
Oasis Design – provides examples of the Arizona greywater law and permitting process.

http://www.nmenv.state.nm.us/fod/LiquidWaste/graywater.html
New Mexico greywater definition and law.

http://www.thegreywaterguide.com/utah.html
Utah greywater code simplified.

http://www.epa.gov/region9/water/recycling/
U.S. EPA on water recycling.

http://www.deq.state.or.us/wq/reuse/graywater.htm
Oregon greywater definitions and law.

http://www.azdeq.gov/environ/water/permits/reclaimed.html
Arizona Department of Environmental Quality permitting and contact information related to greywater use.

Utah Greywater Contacts

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Permitting by the DEQ Water Division – These are permits issued to several operating bodies regulating and/or allowing discharge of wastewater treated in various ways.
http://www.waterquality.utah.gov/UPDES/index.htm.

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