Residential Greywater

Leslie Crenna
Chrissy Backman

solutions@ecoassistant.org
530-306-9185
Overview

- EcoAssistant Introduction
- Greywater System Basics
  - Is It Right for You?
- Two System Types
  - Laundry to Landscape
  - Branched Drain
- Site Assessments and Portfolio
- Wrap Up, Contact Info, Questions
What Is EcoAssistant?

Personal Assistance
Consultation and Research
Design and Installation
Motivation and Celebration

Living lightly

Energy, water and landscape, food and urban farming, and more....

www.ecoassistant.org
Water Related Services

- Greywater
  - Laundry to Landscape
  - Branched Drain

- Rainwater Harvesting
  - Raingardens, rainbarrels, and larger tanks

- Lawn Conversions
  - Sod cutting, solarization, sheetmulching

- Appliance and fixture recommendations
- Water saving behaviors around the house
Who are we?

**Leslie Crenna**, Level 1 Greywater Designer and Installer

**Chrissy Backman**, P.E., Professional Mechanical Engineer

**Scott Ragsdale**, Residential Photovoltaic Systems Expert

**Keli Rutan-Jorgensen**, Certified Permaculturist

Also partner with GrowWater, Blue Barrel Systems, and other local contractors and service providers
How about you?

Who already has a greywater system?

Who’s interested in getting a system?

Who’s just curious?

Rate your greywater knowledge level:

1-Beginner
3-Some experience or knowledge
5-Expert
Residential Greywater in CA

Drainage water from . . .

Clothes washers
Showers and tubs
Bathroom sinks ("lavatories")

Not for toilets, kitchen sinks, or dishwashers . . . sorry
Why Greywater?

✧ Saves potable water
✧ Saves some money
✧ Healthier shade trees
✧ Great for most outdoor irrigation
✧ Increases yield for food producing trees
✧ Improves groundwater recharge
✧ Reduces embodied energy consumption
Greywater potential

Possible to cut water usage significantly

http://www.cityofsantacruz.com/
Is it right for you?

✓ Suitable receiving landscape? Lawns 😞
✓ Plumbing accessible?
✓ Are appliances and fixtures near exterior walls and landscape?
✓ How much water can you save?
Consider the landscape first

- Best for trees or thirsty shrubs
- Non-root crop veggies ok
- Wetlands for limited landscapes
- Great for fruit trees!
Two Primary System Types

Laundry to Landscape (L2L)
Uses Washer Pump

Branched Drain (BD)
Uses Gravity
Standard Features (all systems)

- Water directed to the landscape
- 3-way valve
- No storage
More Complex Features

Higher tech systems require:
- Pumps
- Filters
- Surge tanks
- Pressure tanks
- Wetlands
Laundry to Landscape (L2L)

Requires no permit

Diverts washer water to landscape
(20-100 gallons/week/person depending on output)

Requires specific laundry soap

Salts, bleach, oils, and toxics to sewer

Costs about $500 to $1200
Typical Washer Drainage

- Standpipe
- clothes washer drain hose
- standpipe
- trap
- waste stack

Indirect connection:
- 18” min. to 30” max. (some areas)
- 6” min. to 18” max.
Laundry 2 Landscape

Art Ludwig: Creating an Oasis with Greywater
Landscape friendly detergents
No sodium, boron, bleach

Balanced pH
Site Assessment for L2L

Exterior
- Landscape features
- Slope considerations
- Water needs
- Infiltration rate
- Distance from laundry room

Interior
- Access to exterior
- Type of washer and gallons per load
- Loads per week
We consider the receiving landscape first.
3-Way Valve and Anti-Siphon Vent
Valve Signage

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Home. Life. Solutions.

- **P**oop
- **O**il
- **O**ther toxics (if you must)
- **B**leach and regular detergent (ditto)
- **S**ofteners or salts (double ditto)

**TO SEWER/SEPTIC**

- **H**ydrogen Peroxide (awesome stain remover)
- **E**co-friendly detergents only! (ECOS or Oasis brands are great)
- **N**o SODIUM (salts)
- **N**o BORON/BORAX

**TO LANDSCAPE**

handle to left

handle up
Transition to exterior with hose cleanout
Clean stucco cuts
Exposed pipes painted
Tidy and tucked away
Three inches mulch and cardboard
Mulch shield
Protection from root intrusion
Buried under mulch and cardboard layer
Perforated tubing buried under mulch layer
Branched Drain (BD)

Diverts water from showers and bathroom sinks to landscape

Safe shampoos, soaps, cleansers

Often not feasible with slab

More water but also complexity, cost

Costs about $1200 to $2200 and up

Requires permit ($75 min in Davis)
Landscape Friendly Hygiene

No sodium (SLS)
Neutral pH, bar soaps can be too alkaline

Dr. Bronner’s
Aubrey Organics
Aveeno?
pHisoderm?
REDKEN for Men
Acid balanced?

Skin Deep database
Cleaning Your Tub or Shower

Either send the cleaners to the sewer or use:

- Oasis
- Orange oil
- Bio Pac
Site Assessment for BD

Exterior
- Same but slope is more critical
- Higher water needs
- Exterior plumbing

Interior
- Crawl space
- Remodeling plans
- Showerhead gallons per minute
- Number of showers per week
- Length of showers
Branched Drain Interior

Laura Allen: The Water Wise Home
Branched Drain with Actuator

Toggle switch controls flow of greywater

Plug-in transformer

Sewer

Landscape

Backwater valve

3-way diverter valve with actuator

To sewer

To landscape

Actuator installed
3-way valve located outside
Greywater Action Five Day Certification Course
Branched Drain ABS Drainage Parts and Plan
BD

3-way valve
Distribution plumbing
Anchoring to foundation
Leveling splitters
BD

Zone 2 mulch basins open
Zone 2 mulch basins completed
Zone 3 mulch basins completed
Valve after painting and signage
Owner’s Manual

Greywater System
Owner’s Manual

Congratulations on your new greywater system installed ____________(date)! This manual will help you maintain a well-functioning, water-saving greywater irrigation system.

Type of greywater system:

- _Laundry to Landscape_
- _Branch drain_

Boil type in irrigation area:

System was sized to accommodate ___________ gallons of water per day.

Total mulch basin areas ___________ square feet.

This manual is designed to remain with the building throughout the life of the system. Upon change of ownership or occupancy, the new owner or tenant must be notified that the structure contains a greywater system.

A system design showing the location of all greywater system components is included at the end of this owner’s manual.

1. The First Year of Greywater.
   
   [Since many new plants were added and the fruit trees are immature, some additional watering will most likely be required until the root systems are large enough to reach the mulch basins. You will want to keep an eye on the general health of the plants and water as you would any new plant that you are trying to establish.]

2. What products can I use in my greywater system?

   During normal operation of your greywater system, when greywater is being diverted and distributed to the landscape, always use biodegradable and plant-friendly soap and washing products. Products must be free of all sodium and boron (borax), common ingredients that are safe for people but harmful to plants and/or the soil. Generally, all-powered laundry detergents have boron so you will have to switch to liquid soaps for your greywater fixtures.

   Some products also affect the pH of the greywater. In general, liquid soaps do not change the pH, but bar soap makes the water very alkaline (the opposite of acid). If you use bar soap or are uncertain if the pH is being affected, avoid adding plants such as ferns, azaleas, camellias, and many other plants as they are not compatible.

   Shampoo is fairly diluted so it is not as important as using plant-friendly soap in your washing machine for a laundry to landscape system. But it is important to have products that are not harmful to our health. Surprisingly, many shampoos and conditioners contain carcinogenic chemicals, reproductive toxins and neurotoxins. You can find out what's in your products at the Campaign for Safe Cosmetics online database (www.campaignforcosmetics.org).

   Aluminium based shampoos and conditioners containing Boron should be avoided. The Boron is leached out by the water and ends up in the greywater system.

   To the landscape: Bait (sodium) and boron (borax) FREE soaps, shampoos, and other hygiene products. Hydrogen peroxide is less harmful and can be used instead of chlorine bleach. Laundry soaps include Oasis, Dr. Bronner, and EcoSan, brands.

   JR Liggett’s Old Fashioned Shampoo Bar: https://www.liggetts.com
   It’s a national brand and is available online if it’s not available in a local store.

   There is also a North Bay soap company that makes several delicious flavors of shampoo bars: Three Sisters Apothecary. They sell in a few local stores and online: http://www.scentsofjohn.com/three-sisters-apothecary/shampoo-bars
   http://www.localsecretshampoo.com

   To the sewer: If you plan to use any type of cleansing powder, chlorine bleach, or wash diapers, oily rags, or any other toxic substance, switch the diverter valve to direct the greywater to the sewer/septic system.

   and should be diverted with any other harmful products to the sewer or septic by switching the diverter valve.

3. How do I turn my greywater system on/off?

   If you ever need to turn your greywater system off, turn the handle of the diverter valve. (Note: the words "off" on the handle show which pipe is shut off. When the sewer pipe is shut off, water flows to the greywater system, and vice-versa.)

   INSERT IMAGE of valve in both on and off positions.

   These are common situations when you’ll need to turn off your system:

   - Any time you use products in the greywater fixture that might be harmful to plants (like chlorine bleach or powdered cleaning agents)
   - When washing dirty diapers or anything soiled with toxic chemicals (or oils, motor oil, cooking oil, household chemicals)
   - Any time you notice water instead draining well and you see pooling or runoff in the landscape
   - During the rainy season if the ground water table has risen above 3 feet
Wrap Up

- Landscape needs dictate system design
- Best for trees and larger landscape features
- Laundry to landscape easiest and cheapest *(No permit)*
- Branched drain more complex and expensive but usually more water *(Permit required)*
- Sometimes not feasible
- Remodeling? Incorporate greywater into the plans
Questions?

We love our work!

Check out our website for more information:

ecoassistant.org

Chrissy and Leslie installing a 4-barrel rainwater harvesting system (RWH) and having entirely too much fun.