

# GREYWATER



## LAUNDRY TO LANDSCAPE

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EarthCare Landscaping

# Greywater is the water from your sinks, shower/baths, and laundry

- No water from toilets (black water)
- No water from kitchen sinks (food particles)
- No water from diaper laundry
- No water containing any harmful chemicals, including bleach

# Will a L to L system work for you?

- Type of washing machine
- Location of washer within house
- How many loads/week
- Willingness to change laundry products
- Lifestyle – take long summer vacations???

# Assess the outside landscape

- Hardscape around the house –
  - go over or under it, or cut it
- Type of plants to be irrigated
- Number of plants to be irrigated
- Location/distance of plants from washer
  - 50' on level. Further if downhill

# What to irrigate using mulch basins?

- Fruit trees
- Cane berries & grapes
- Vines
- Trees & shrubs
- Perennials & bunch grasses
- Natives – use water-loving, riparian plants

Each laundry system is going to have a max of 8 outlets (can be doubled with an additional 3-way valve)

# What plants to avoid?

- Root or low edibles (radish, strawberry)
- Annuals
- Groundcovers
- Lawns!
- Salt sensitive plants
- Acid loving plants (unless pH is balanced)
- Droughty plants that don't GET irrigated

# Laundry to Landscape

- The only greywater that doesn't require a permit.
- Rebate (\$200) available from SCVWD
- Follow code guidelines
- Don't cut into any house plumbing
- Simplest system is least likely to fail
- Low tech: no pumps, filters or make-up water
- Washing machine already HAS a pump

# Greywater Basics for Irrigation

## DO

- Use mulch
- Use a 3-way valve
- Use plant friendly products
- Use a "proven" design

## DON'T

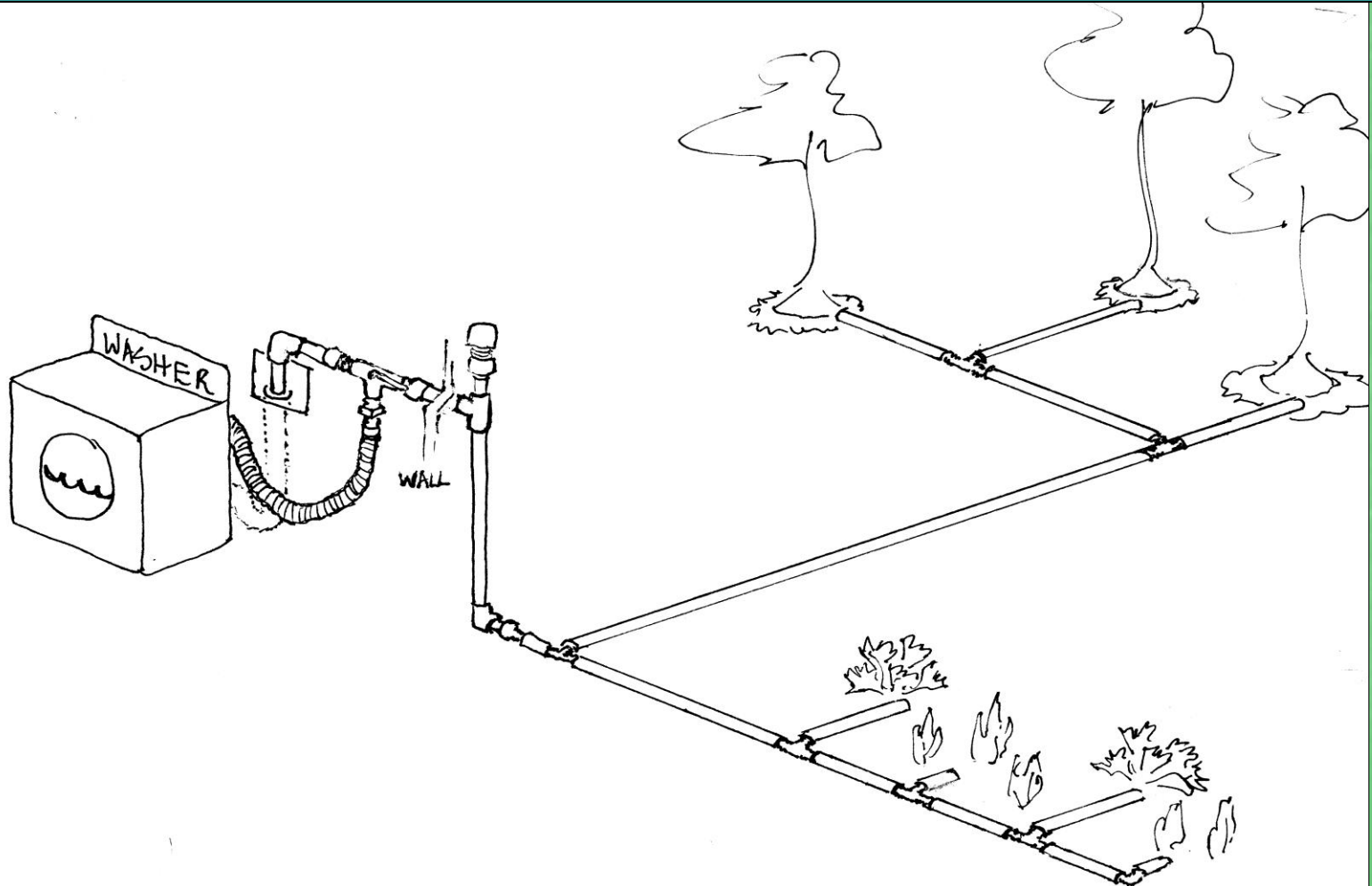
- Store greywater
- Use a filter that needs cleaning
- Use if you're near a creek or river
- Use if water doesn't drain on the site
- Use if ground water table is less than 3' deep



# Laundry to Landscape

DIY materials \$150-\$300

Installation: \$800-\$2,500



Before you put graywater into your landscape, test your drainage.

# Percolation Test



Dig a hole and prefill it if the soil is dry

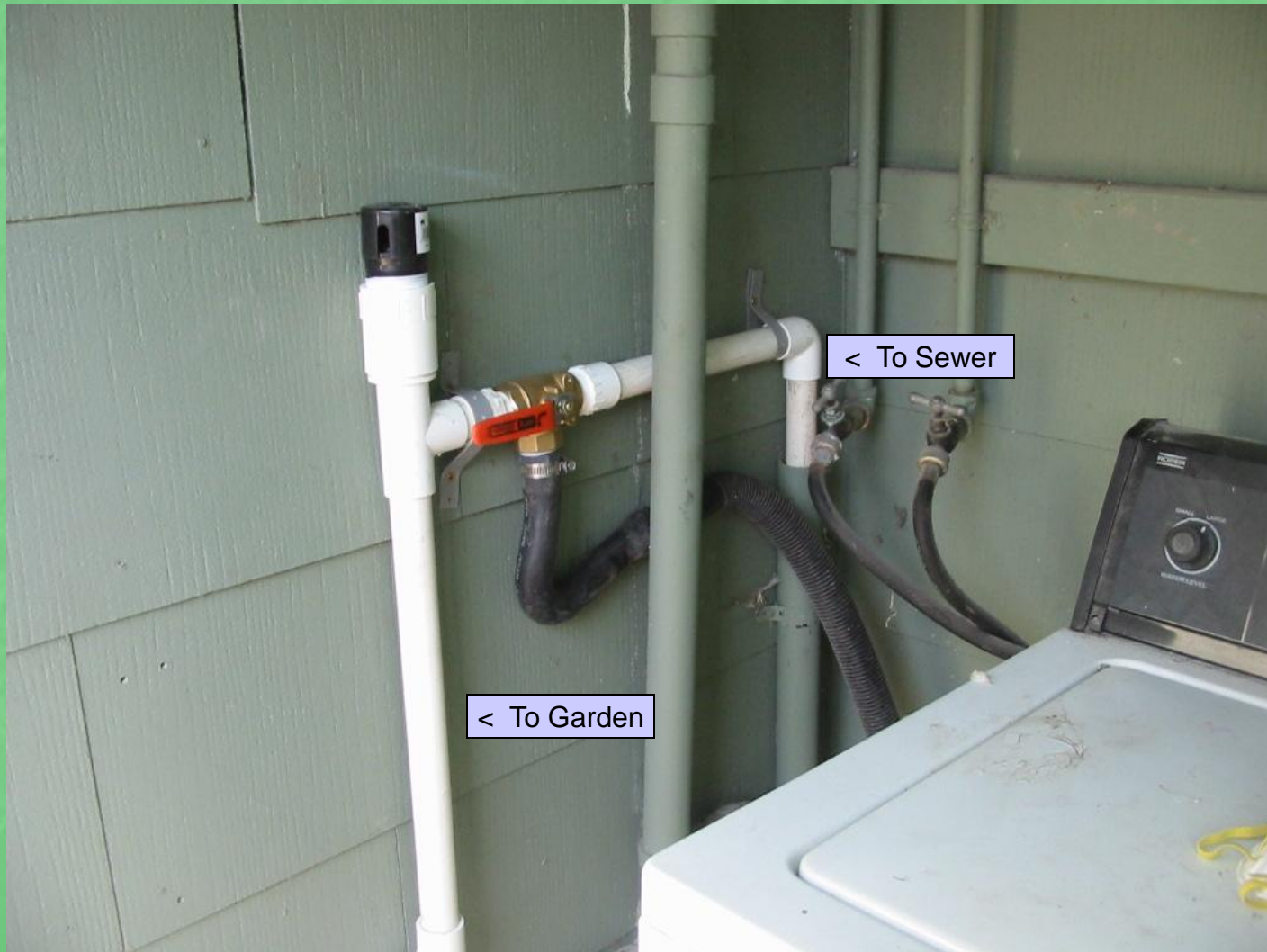
Fill your hole with water





Measure how fast it drains. This soil drained 2 ½" per hour.

# This is what it looks like





Stacking washer - inside

Air gap at highest point - outside



Follow these simple  
graywater guidelines



# “Do’s”

- Be able to easily switch back to sewer
- Discharge under 2" mulch/rock/cover
- Direct water to irrigation field (no storing more than 24 hours)
- Label your system
- Have a maintenance manual
- Minimize contact with humans and pets

# “Don’ts”

- Have ponding, spray or runoff
- Discharge into neighbor’s yard
- Connect to potable water supply
- Include a pump (more room for error)
- Violate other codes/laws
- Damage building
- Discharge closer than 18” prop. line/24” house
- Use diaper wash water or hazardous chemicals (oily rags, etc.)

# Tighten all connections



Leaks are not good.

# Decide where the 3-way goes



# Cut the PVC pipe



# Cut a hole in the exterior wall

Seal it with silicone later



Because this is the highest point, put the air gap assembly here.

# Run a PVC line out of the house



This is from the 2<sup>nd</sup> story

# Connect the PVC to 1" black (or blue) poly tubing



Flexible polyethylene irrigation tubing is a better environmental choice  
Than PVC. Blu-lock is even better.



# Dig trenches for the pipes



They don't have to be deep; you just don't want anyone to trip over them.

Dig mulch basins about 12" deep.  
If your soil percolates slowly, make them wider.

This is a basin to hold the surge of water and sink it into the ground.



# Laying pipe

Ornamental bed  
With mulch basin  
shields



Use 1" x 1/2" barbed tee emitters.  
Don't cap the end.



This prevents clogging by lint . . .or pennies

# Send emitters to mulch basins



Check the flow rates. Add little ball valves on some emitters to adjust the rates.

You can also use Blu-lock pipe and fittings



# Mulch basins

## Flow splitter register

empty 1 gal plastic pot covered with stepping stones allows access to double ell for cleaning without knocking dirt or leaves in (the most common way to disturb the flow)

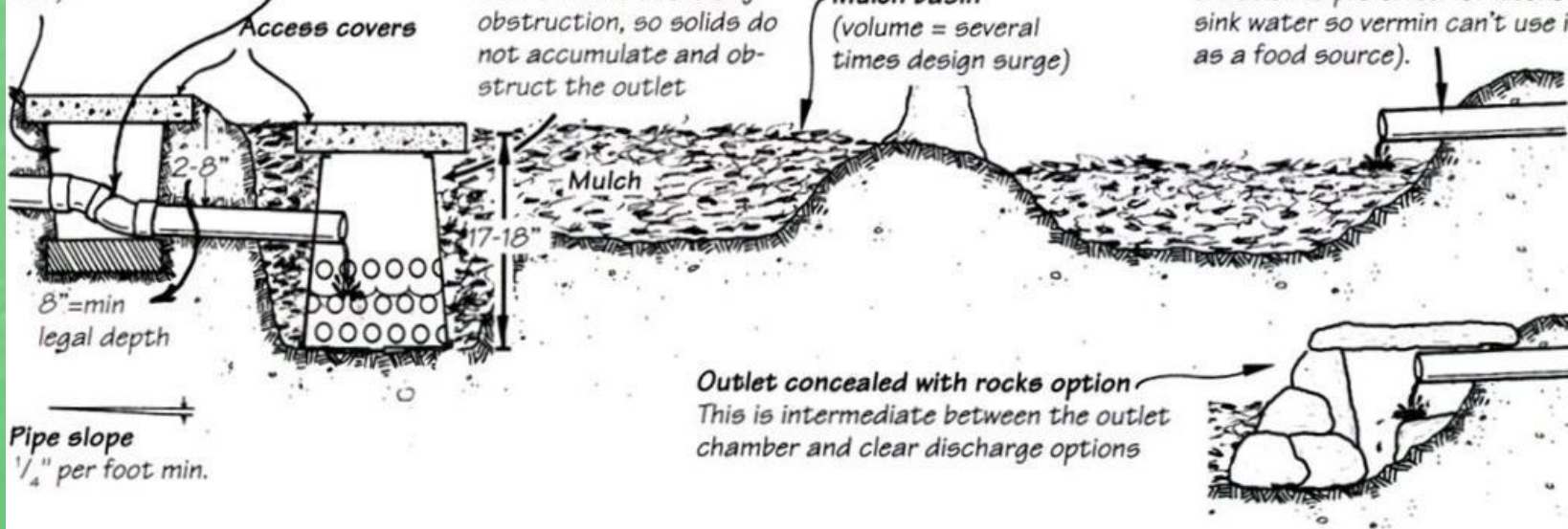
Flow Splitter should sit on brick for easy leveling

## Outlet chamber option

upside-down, empty 5 gal plastic pot with bottom cut out and holes drilled in the sides. Allows solids out into mulch for biodegradation so clogging does not occur. It is very important that discharge end of pipe is 2" or more above any obstruction, so solids do not accumulate and obstruct the outlet

## Clear discharge outlet option

If subsurface distribution is not required, GW can be discharged 2" above surface of mulch, into which it quickly disappears. This is much simpler to construct a maintain and the added health risk is minimal (subsurface distribution is preferred for kitchen sink water so vermin can't use it as a food source).





**Discharge under 2"  
into mulch**



**Bury and stake tubing**

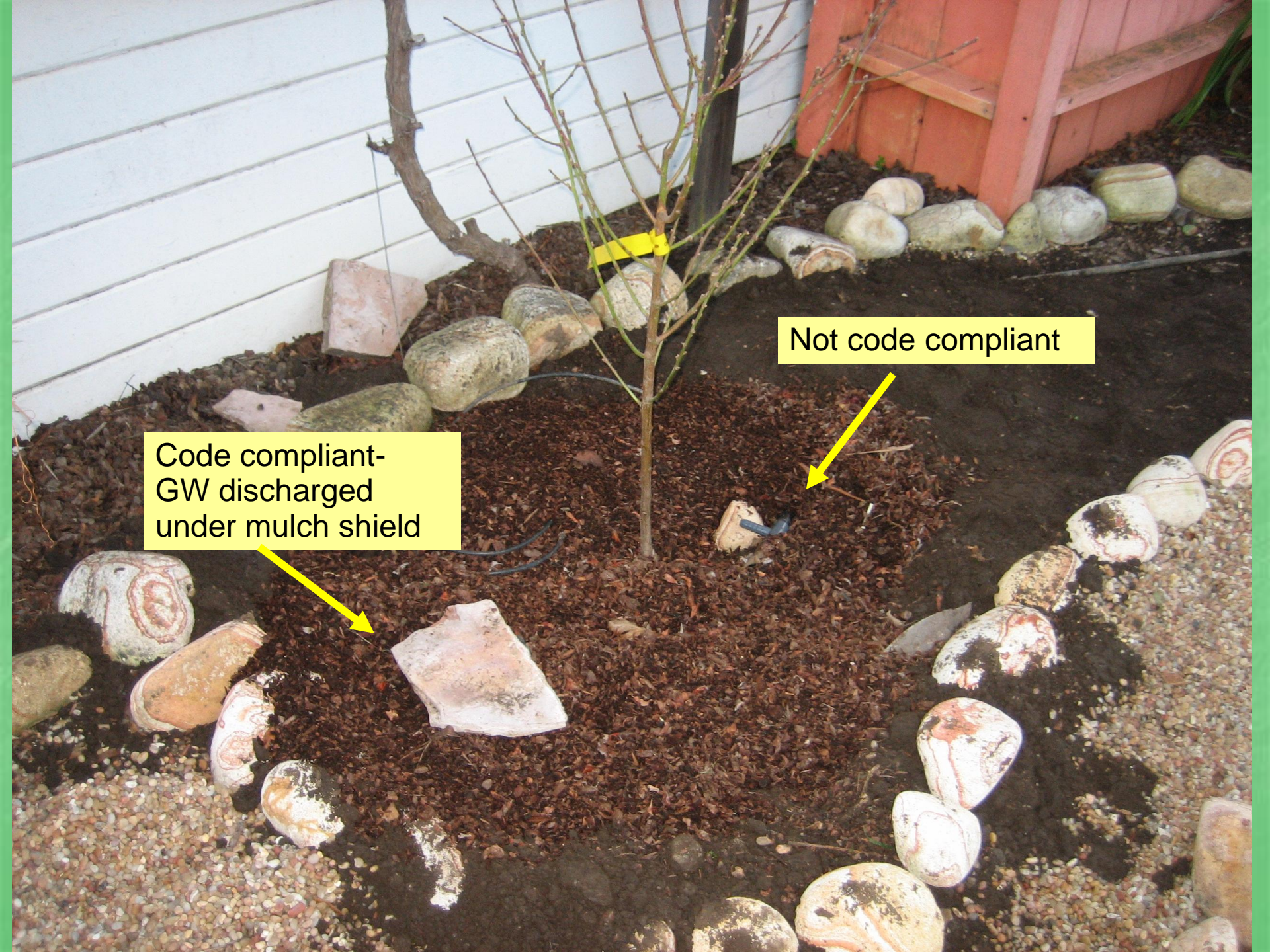


**1/2 inch lines irrigate off  
main 1" line**



Code compliant-  
GW discharged  
under mulch shield

Not code compliant



Laundry irrigates 6 fruit trees around yard.  
City water irrigates vegi beds.

Labeled 3-way valve



Mulch basins around trees, GW discharged under 2", onto mulch.



### System details:

Materials- \$150

Machine- 15 gallons/load, 3 loads a week. to 6 locations

Mulch basins- 6 basins, each 18 sq. ft, receive 3 gallons per load (9 gallons a week)  
(From code- 3 gallons in heavy clay requires only 4 square feet of area)

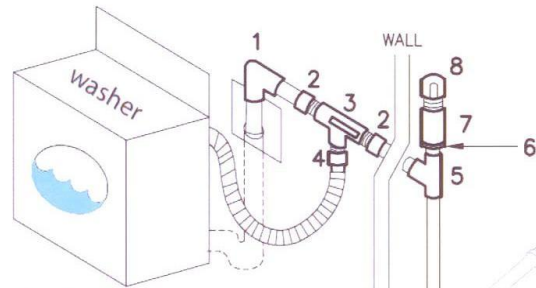
# Where do you get the parts?

- [www.cleanwatercomponents.com](http://www.cleanwatercomponents.com)
- [www.oasisdesign.net](http://www.oasisdesign.net)
- Plumbing, irrigation and hardware stores carry *some* of the parts, but not all

You can purchase all parts online  
from [cleanwatercomponents.com](http://cleanwatercomponents.com)

## Laundry to Landscape Greywater System Kit

\*barbed fittings\*

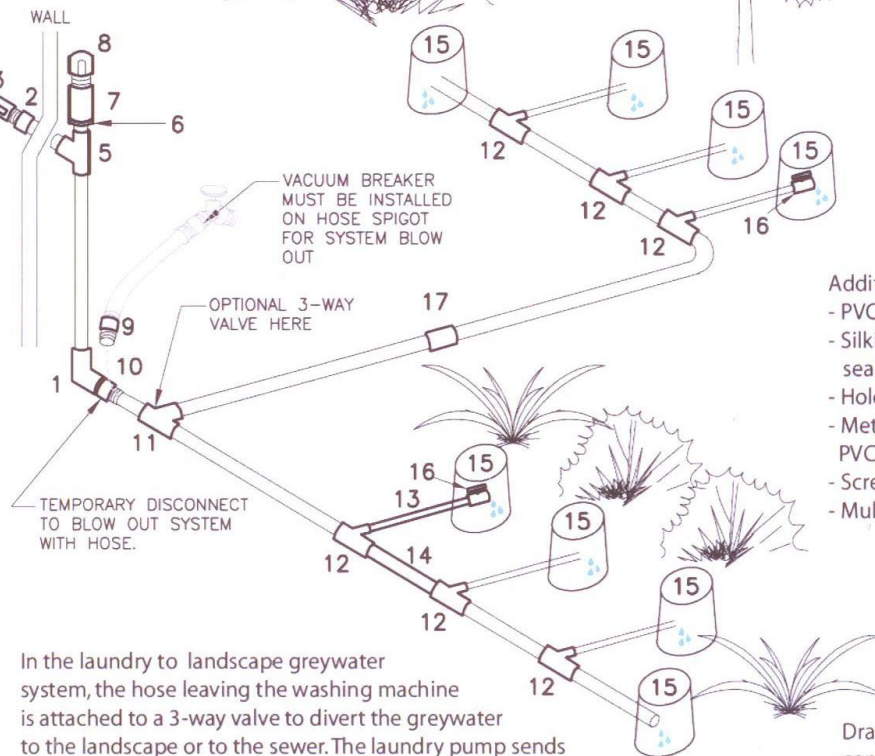


Click to buy!!

- (1) 4- PVC 1" 90 Elbow
- (2) 2- PVC 1" Male Adapter (S x MPT)
- (3) 1- Brass 1" 3-way valve
- (4) 1- Barbed 1" Male Adapter (MPT)
- (5) 1- PVC 1" Tee
- (6) 1- PVC 1.5" x 1" Reducing Bushing (SxS)
- (7) 1- PVC 1.5" Female Adapter (FPT x Slip)
- (8) 1- Auto-vent or Air Admittance Valve 1.5"
- (9) 1- Barbed 1" Female Hose Thread Adaptor
- (10) 1- Barbed 1" Adapter (BxS)
- (11) 1- Barbed 1" Tee
- (12) 6- Barbed 1" x 1/2" Reducing Tee
- (13) 10 ft- Poly 1/2" Tubing
- (14) 50 ft- Poly 1" Tubing
- (15) 8- 7" round valve box
- (16) 2- Green Back Valve Barbed 1/2"
- (17) 1- Barbed 1" Coupling

Included in kit but not shown:  
20- U-shaped wire hold-downs (stakes)  
1- PVC Cement - Gorilla 4 ounce  
1- Teflon tape 1/2"

[www.cleanwatercomponents.com](http://www.cleanwatercomponents.com)



In the laundry to landscape greywater system, the hose leaving the washing machine is attached to a 3-way valve to divert the greywater to the landscape or to the sewer. The laundry pump sends greywater to valve box outlets in the landscape where adjacent plants are watered. This system is low cost, easy to install, and gives great flexibility for irrigation. In most situations this is the number one place to start when choosing a greywater system! Read more here.

Additional items needed:

- PVC pipe 1"- variable length
- Silkiflex adhesive sealant for sealing hole in wall
- Holesaw for 1" pipe
- Metal or plastic strap to secure PVC pipe
- Screws for strap
- Mulch

Drawing not to scale. This is a conceptual drawing only and not to be used for construction

  
**clean water components**  
YOUR SOURCE FOR WATER-WISE SUPPLIES

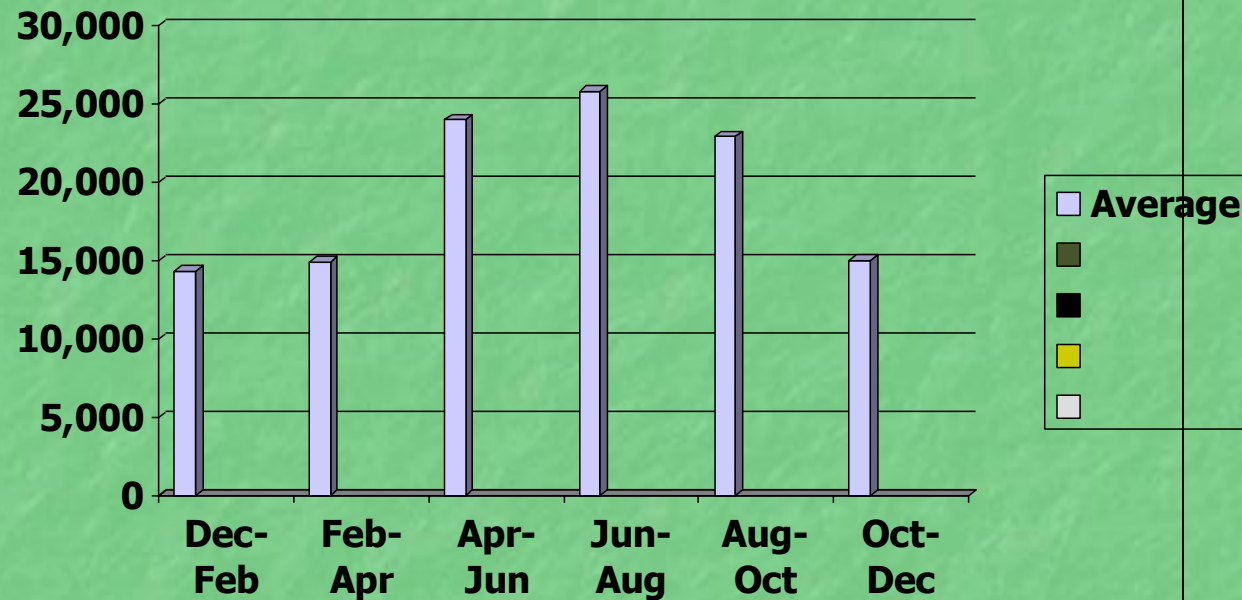
# How much GW do you have?

- Compare your winter and summer water bills – the difference is your outdoor water use.
- Analyze your use:
  - Amount of showers and length
    - Low flow shower head – 2.5 gal/min 10 minute shower= 25 gallons
  - Type of washer and # of loads
    - Top loaders:40 gal, front loaders: 10-20 gallons each time

# Water Use in Typical Bay Area Home

Water use in dry summers almost twice that of wet winter months

- Estimate of 40 gallons of gray water produced per day per person
- Family of four can produce about 9,600 gallons per two month water billing period
- Just about the water required for "typical" Bay Area landscape



# What soaps to use?

Not all biodegradable products  
are good for plants. . .

. . .think biocompatible!

# Ingredients to avoid

Read the labels

- Salt, sodium compounds  
damages soil
- Boron, borax (Bon Ami)  
micronutrient turns into a microtoxin
- Chlorine  
kills bacteria/life (hydrogen peroxide better)





# Use these laundry products

- Oasis
- ECOS (available at Costco and Whole Foods)
- Bio pac liquid detergent
- Wonder balls or Soap nuts



- **No** powdered detergents, salt, borax, bleach, water softener

# Shower and sink products

- Aubrey Organics shampoo and conditioner
  - Dr. Bronner's
  - Oasis all purpose cleaner
- 
- 
- **No** bleach, hair dye, harsh cleaners, salt baths, epon salts

# Cleaning products

- Vinegar based cleaners
  - Liquid soap based cleaners
  - Dr. Bronner's
- 
- **No** high salt products, bleach, harsh cleaners



**A VERY easy  
graywater system:**

# Sink Positive!



[www.sinkpositive.com](http://www.sinkpositive.com)

# Graywater references

- *Create an Oasis with Greywater* by Art Ludwig  
<http://oasisdesign.net>
- Greywater Guerrillas, authors of *Dam Nation*  
[www.greywateraction.org](http://www.greywateraction.org)
- Complete graywater system: Rewater, Inc.  
[www.rewater.com](http://www.rewater.com)
- Many slides courtesy of Sherri Osaka  
of Sustainable Landscape Designs  
and Laura Allen of Greywater Action

The End . . .



. . . or is it just the beginning?