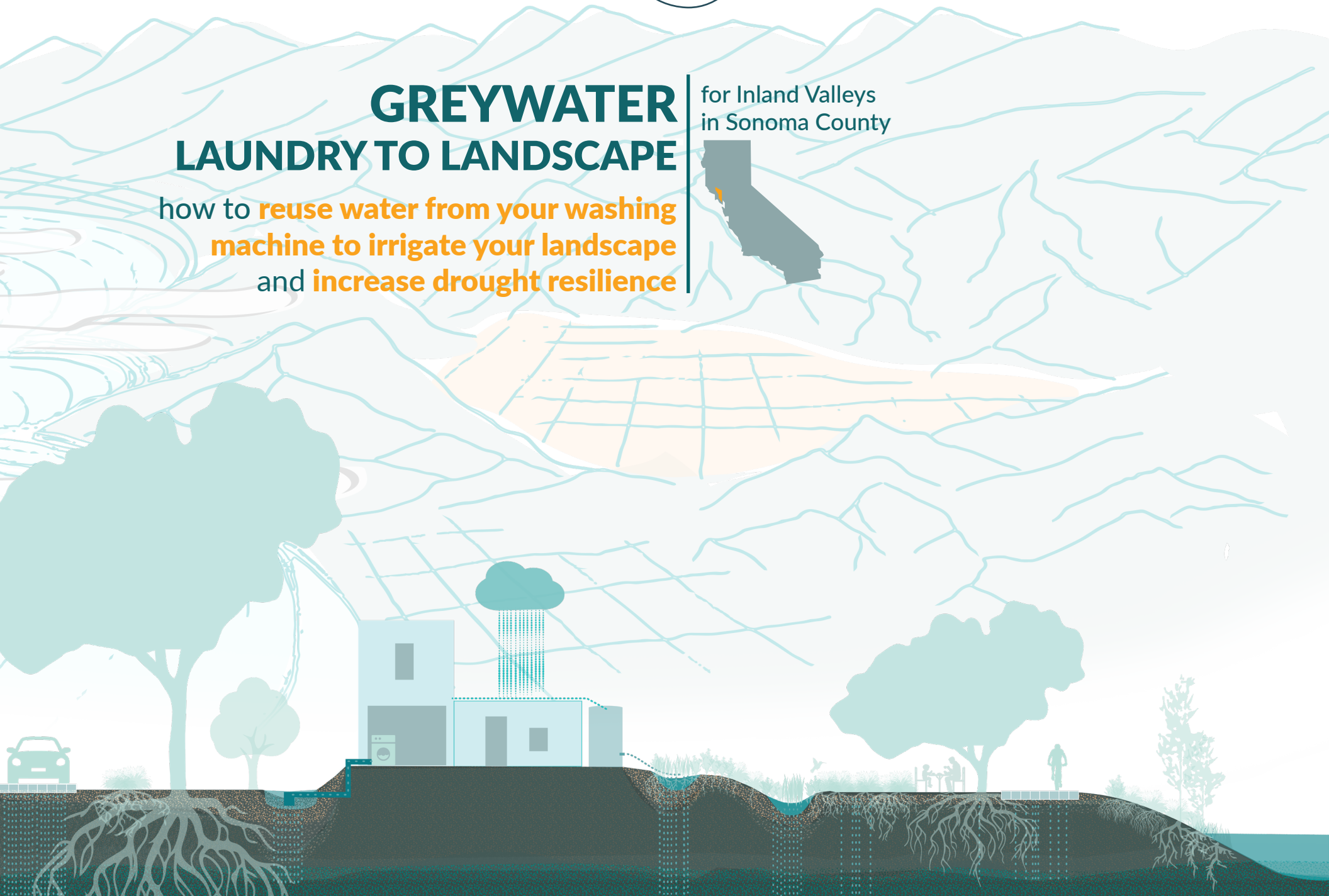




# GREYWATER LAUNDRY TO LANDSCAPE

how to **reuse water from your washing machine to irrigate your landscape and increase drought resilience**

for Inland Valleys  
in Sonoma County



# 1

## GREYWATER: LAUNDRY TO LANDSCAPE

What is **greywater**?

And **how can it benefit your property?**



### INTRODUCTION

Have you ever thought about the waste that occurs through the disposal of water that isn't quite dirty, but isn't quite clean?

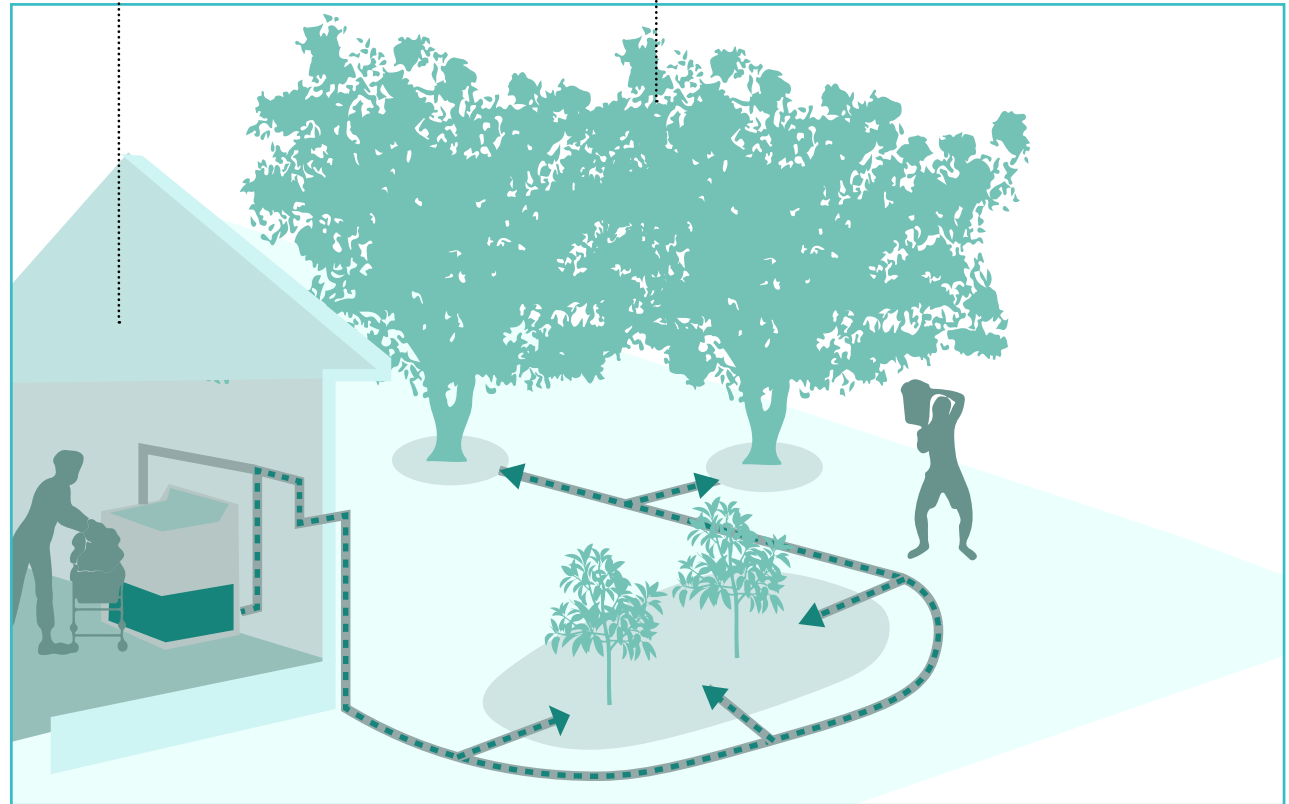
This is considered **GREYWATER**.

Greywater may not be clean enough to be potable, but it's clean enough to serve important functions around your property, such as irrigation. The water that is used to clean your laundry is a great example of this.

While you may not be able to drink it, the water that is used to clean your clothes could be redirected from the sewer to your landscape. Then, you could use it to grow species that you otherwise couldn't in a water-resilient manner, such as many common fruit-bearing trees and shrubs!

These planting areas receive enough water to be able to support plants that would otherwise be water-costly to grow. These plantings can promote food security where non-irrigated plants couldn't. Think fruit trees!

Water that is drained from your laundry is diverted into a greywater system.



This system carries the greywater into planting areas, *mulch basins*, where the excess water is discharged.



# 2

# GREYWATER: LAUNDRY TO LANDSCAPE

## How to build a **greywater system** and **important system considerations**

### 1. Evaluate L2L Feasibility

- ✓ Is your washing machine:
  - a. Near an outside wall?  
*OR*
  - b. Over a crawlspace?
  
- ✓ Is there a landscape area for greywater to irrigate that is:
  - c. Within 50' of your washing machine?  
*AND*
  - d. At or below the elevation of your washing machine?  
*AND*
  - e. Outside of setbacks?  
Check local codes for healthy safety and setback info. Typical setbacks: Structures and Property lines - 2', Wells / Waterways - 100', Septic Tanks - 5'.

### 2. Landscape Planning

- ✓ Identify existing or new plants to irrigate with greywater. Best plant types include:
  - a. Medium water use trees, shrubs, perennials, vines, etc.
  - b. If growing food, edible portions not in direct contact with soil (no leafy green or root vegetables).
  
- ✓ Match the amount of greywater that you use (supply) with the water needs of your plants (demand). Supply varies by occupancy but generally:
  - a. Front-loading washing machines irrigate 4-8 plants;
  - b. Top loaders irrigate up to 15 plants.
  
- ✓ Perform a percolation test: <https://greywateraction.org/how-do-percolation-test/>

### 3. L2L Build It!

- ✓ Locate existing utilities and obstacles before digging: Dial 811 for Dig Alert.
  
- ✓ Install Ansi-Approved 3-way diverter valve: This will switch greywater back to sewer/septic as needed. Locate in accessible place and clearly label orientation.
  
- ✓ Install Air-Admittance valve above fill-line of washer: This valve prevents siphoning of the water.
  
- ✓ Drill pipe passage through wall or crawlspace to landscape: Try to avoid drilling through concrete or foundations unless it is the only route available.
  
- ✓ Use 1" diameter HDPE or Blu-lock irrigation tubing as main-line conveyance piping: All piping should slope at 2%+
  
- ✓ Greywater must be distributed 2" below the surface: Dispense water into mulch basins to avoid human contact with non-potable greywater.
  
- ✓ Install a mulch shield or valve box: Locate at end of open pipe within mulch basins to reduce erosion and direct greywater to plant roots.



Example greywater mulch basin (Source: <https://www.storey.com/article/kitchen-greywater-water-conservation/>)



Example greywater mulch basin (Source: <https://www.milkwood.net/2012/02/29/diy-mulch-pit-greywater-system/>)

### DO

- ✓ DO think about the plants that you would like to grow, but may not have the water allowance to.
  
- ✓ DO ensure that you plan mulch basins to be at least 10 feet from a building foundation that has poor surrounding drainage to limit excess groundwater infiltration.
  
- ✓ DO post signs educating your neighbors that you are irrigating your landscape with recycled water!

### DO NOT

- ✗ DO NOT attempt to install a greywater system yourself if you cannot: call a professional for help.
  
- ✗ DO NOT use laundry detergents that are high in environmentally harmful chemicals such as phosphorus, salt, boron, and chlorine. Ensure that your detergent is greywater-system friendly.

### ADDITIONAL RESOURCES

[Daily Acts: Greywater 101](#)

[Laundry Safe Supplies](#)

[Perform a Greywater Percolation Test](#)

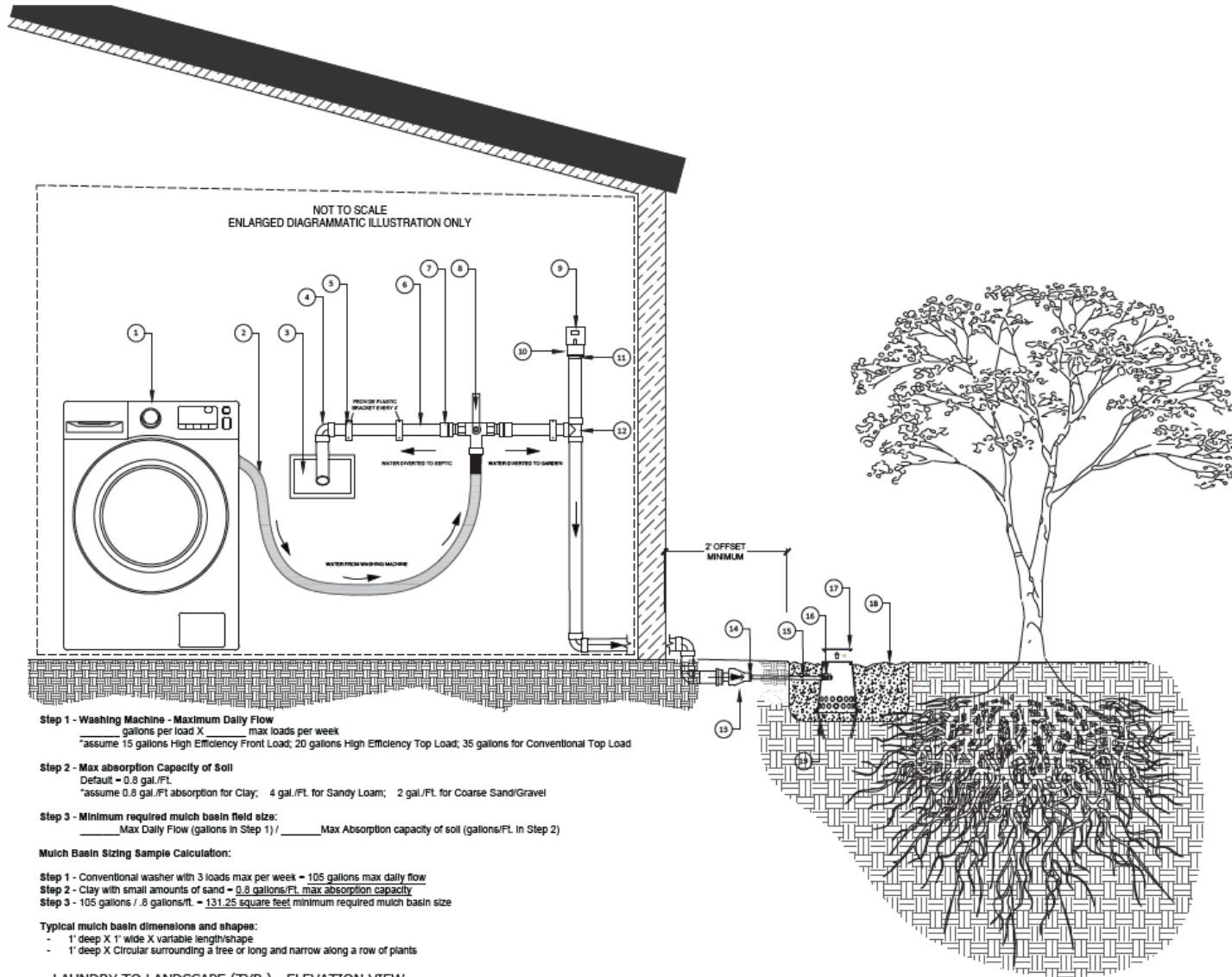
[Sonoma County Greywater Codes](#)

[Sonoma-Marin Saving Water Partnership](#)

# 3

# GREYWATER: LAUNDRY TO LANDSCAPE

## Greywater system construction details and greywater system notes



**Step 1 - Washing Machines - Maximum Daily Flow**  
 gallons per load X \_\_\_\_\_ max loads per week  
 \*assume 15 gallons High Efficiency Front Load; 20 gallons High Efficiency Top Load; 35 gallons for Conventional Top Load

**Step 2 - Max absorption Capacity of Soil**  
 Default = 0.8 gal./FT.  
 \*assume 0.8 gal./FT absorption for Clay; 4 gal./FT. for Sandy Loam; 2 gal./FT. for Coarse Sand/Gravel

**Step 3 - Minimum required mulch basin field size:**  
 \_\_\_\_\_ Max Daily Flow (gallons in Step 1) / \_\_\_\_\_ Max Absorption capacity of soil (gallons/FT. in Step 2)

**Mulch Basin Sizing Sample Calculation:**

**Step 1** - Conventional washer with 3 loads max per week = 105 gallons max daily flow  
**Step 2** - Clay with small amounts of sand = 0.8 gallons/FT. max absorption capacity  
**Step 3** - 105 gallons / 0.8 gallons/ft. = 131.25 square feet minimum required mulch basin size

**Typical mulch basin dimensions and shapes:**

- 1' deep X 1' wide X variable length shape
- 1' deep X Circular surrounding a tree or long and narrow along a row of plants

LAUNDRY TO LANDSCAPE (TYP.) - ELEVATION VIEW

NTS

### General Notes:

- The drawings are diagrammatic in nature and are created to represent the concepts as associated with on-site water reuse and storm water management / basin installations. For all site dimensions and exact relative locations, field condition as-builts should be requested from the property owner.
- Typical front loading washing machine is able to distribute water up to eight locations. A typical top loading washing machine is able to distribute water up to twelve locations (depending on the site conditions).
- All irrigation points to be 2 inches below the surface in mulch basins.
- The end of main line should be fully open with no plug / or valve.
- Verify minimum horizontal offsets for graywater (per CPC 2016) + local county codes for the following:
  - Building Structures
  - Property Line
  - Water Supply Wells
  - Septic Tank
- Laundry to Landscape (L2L) system must be equipped with accessible three way diverter valve with sign that indicates operation, so washing machine discharge water can be diverted to septic/sewer during rain events or if soil reaches a high level of saturation.
- Products with bleach, salt, alcohol or other industrial chemicals are not recommended for use in these graywater systems.
- 1" SCH 40 PVC will slope downward at 2 degrees or 1/4" per foot.
- All graywater conveyance lines shall be marked "Non Potable, Do not Drink".
- Laundry to Landscape (L2L) graywater systems are exempt from permitting per CPC 2016.
  - Water is coming directly from washing machine.
  - No existing house plumbing has been altered
- All devices will be AS/NZS approved. All devices to be accompanied with reference and maintenance instructions per maintenance and monitoring plan.
- Client will be provided with a maintenance manual for the system.
- Auto Vent must be higher than fill line of washing machine.
- All existing tanks, piping, and electrical work will be avoided and protected when necessary throughout construction.
- 811 - know what's below - call before you dig

### Sheet Notes:

- Front loading washing machine (TYP.)
- Washing machine drain hose
- Standpipe to sewage provision
- 1" PVC 90 elbow
- Mounting brackets (4' Spacing)
- 1" PVC Pipe
- 1" PVC Male Barbed X Female Slip Adapter
- 3-Way diverter valve
- Auto Vent (minimum size 1.5") - To prevent potential siphon in the system  
 \*Optional - Install outside if laundry room is not well ventilated or too warm.
- 1.5" Threaded Adapter
- 1.5 to 1" Bushing
- 1" PVC Tee
- 1" PVC Check Valve - To prevent the back-flow of laundry water
- 1" to 1/2" barbed fitting to 1/2" poly line
- 1/2" poly line
- 1/2" Drain valve
- 6" Round irrigation valve box w/ lid for each mulch basin
- Mulch Basin - Irrigating trees, shrubs or ground cover
- Landscape pins to secure irrigation box into place




# 4

# GREYWATER: LAUNDRY TO LANDSCAPE

## GREYWATER PLANTS

Plants to be irrigated by greywater systems

### SUN/SHADE

-  full sun
-  partial sun / shade
-  full shade

### OTHER CONSIDERATIONS

-  edible
-  native
-  Clay Tolerant\*

### TREES

### SHRUBS

### PERRENIALS

### GRASSES

### VINES



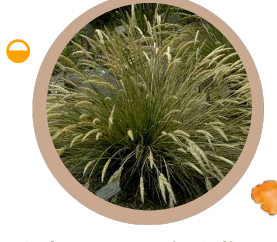
*Diospyros kaki*  
Persimmon



*Acca sellowiana*  
Pineapple Guava



*Achillea millefolium*  
Yarrow



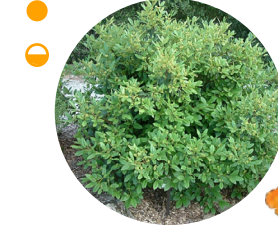
*Calamagrostis foliosa*  
Leafy Reed Grass



*Actinidia argata*  
Hardy Kiwi



*Citrus spp.*  
Citrus tree



*Rhamnus californica*  
Coffeeberry



*Ribes aureum*  
Golden Currant



*Carex barbata*  
Basket Sedge



*Humulus lupulus*  
Hops Vine



*Ficus carica*  
Common fig



*Punica granatum*  
Pomegranate



*Cynara scolymus*  
Artichoke



*Carex praegracilis*  
California Field Sedge



*Celematis ligusticifolia*  
Virgin's Bower

# 5




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## GREYWATER PLANTS

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#### TREES

#### SHRUBS

#### PERRENIALS

#### GRASSES

#### VINES



*Acca sellowiana*  
**Olive Tree**



*Rubus ursinus*  
**California Blackberry**



*Iris douglasiana*  
**Douglas Iris**



*Juncus textilis*  
**Basket Rush**



*Vitis californica*  
**CA Grape**  
(and cultivated varieties)



*Morus alba x rubra*  
**Pakistan Mulberry**



*Rosa californica*  
**California Wild Rose**



*Heuchera spp.*  
**Coral Bells**



*Juncus patens*  
**California Gray Rush**



*Bougainvillea glabra*  
**Bougainvillea**



*Sambucus mexicana*  
**Blue Elderberry**



*Rubus idaeus*  
**Red Raspberry**



*Epilobium canum*  
**California Fuchsia**



*Deschampsia cespitosa*  
**Tufted Hair Grass**



*Passiflora edulis*  
**Passionfruit Vine**

\*other listed plants may tolerate clay if soil is amended, consult resources