

A Graywater Overview

Grow Green Landscape Professional Training

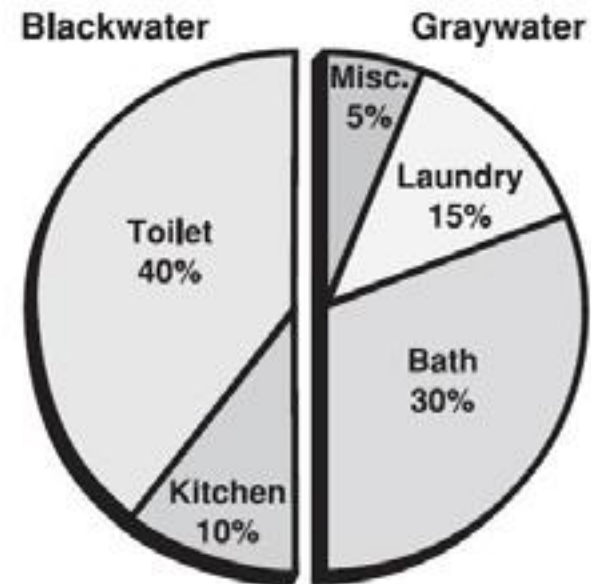
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Robert Stefani
Environmental Program Coordinator
Austin Water



What is Graywater?

- Untreated wastewater from bathtubs, showers, lavatories and laundry
- Benefits:
 - Potential savings of 40-90 gpd
 - Sustainable onsite water reuse
 - Reduces pressure on wastewater infrastructure
 - Reliable source for irrigation during drought



Graywater History


- TAC 210 Subchapter F adopted in 2005
- 2009 UPC Local Amendments
- 2012 Graywater Working Group
- 2012 UPC Local Amendments
- 2014 Austin Water Auxiliary Water Code Revisions Consultant
- 2014 revisions to 2012 UPC Local Amendments
- 2015 House Bill 1902
- 2016 revisions to TAC 210 Subchapter F
- 2015 UPC Local Amendments adopted in 2017

Regulatory requirements

- TCEQ Regulations (TAC Chapter 210, Subchapter F)
 - Connected to public wastewater system
 - Approval not required for domestic use under 400 gal/day
 - Originates from a private residence
 - Diversion to wastewater system
 - Tanks labeled, access restricted, pest habitat eliminated, cleanable
 - Does not create a nuisance or damage water quality
- City of Austin Regulations (2015 UPC Chapter 15 & City Code §25-12-153)
 - Level, sturdy, durable tank
 - Connections to drain or sewer
 - Non-potable labeling & coloring
 - Subsurface, subsoil and mulch basin irrigation
 - Backflow protection required for pressurized systems

Permit requirements

- Required for all graywater systems
- Homestead permit available for Lawn to Laundry Systems
- New Auxiliary Water Permit sub-work type available



Auxiliary Water System Permit Application
Special Services Division 3907 South Industrial Drive, Suite 100, Austin, TX 78744
 (512) 972-1060 www.austintexas.gov/department/special-services-division
AWUCrossConnection@austintexas.gov

Property Address: _____		Zip Code: _____
Contact Name: _____		Phone Number: (____) _____
Mailing Address: _____		
City: _____	State: _____	Zip Code: _____
Email: _____		

Type of Auxiliary Water on site <i>(check all that apply):</i>		
<input type="checkbox"/> Condensate	<input type="checkbox"/> Gray Water	<input type="checkbox"/> Ground Water
<input type="checkbox"/> Lake/River	<input type="checkbox"/> Reclaimed	<input type="checkbox"/> Rainwater
<input type="checkbox"/> Re-Irrigation	<input type="checkbox"/> Spray Aerobic (OSSF)	<input type="checkbox"/> Well
<input type="checkbox"/> Other (please describe): _____		

Distribution Method <i>(check one):</i>		<input type="checkbox"/> Gravity	<input type="checkbox"/> Pumped
Does the Auxiliary Water enter the building?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is potable water used for makeup?		<input type="checkbox"/> Yes	<input type="checkbox"/> No

Usage <i>(check all that apply):</i>			
<input type="checkbox"/> Car Wash	<input type="checkbox"/> Cooling Tower	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Toilet/Urinal Flushing
<input type="checkbox"/> Trap Primer	<input type="checkbox"/> Process Water	<input type="checkbox"/> Water Feature	
<input type="checkbox"/> Other (please describe): _____			

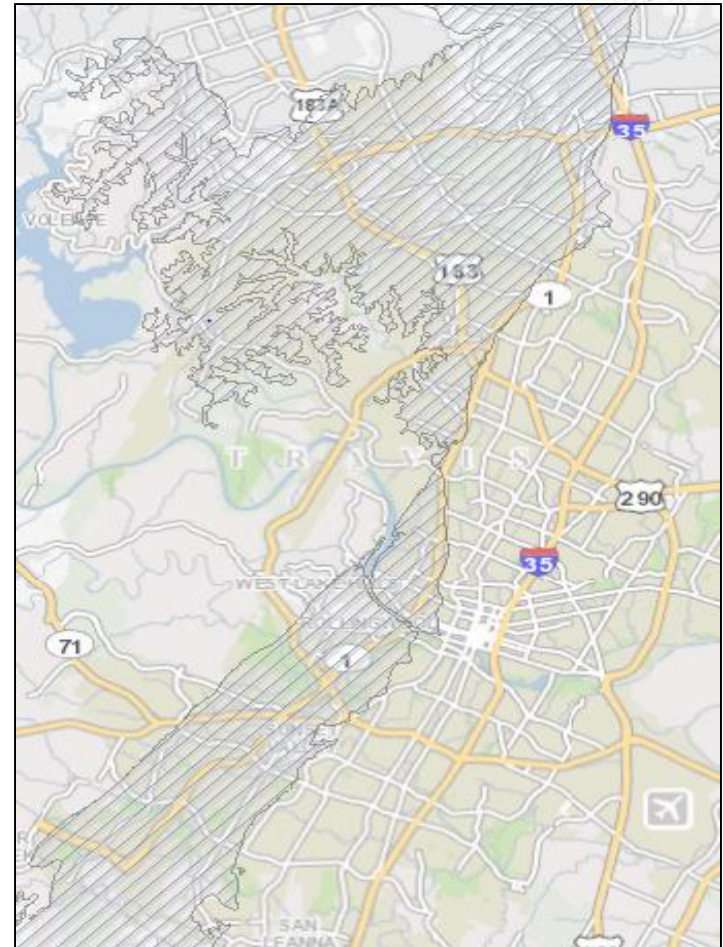
Print Name: _____ Date: _____

Signature: _____

FOR OFFICE USE ONLY			
Received by: _____			Date: _____
Entered by: _____			Date: _____
Status: <input type="checkbox"/> Approved	<input type="checkbox"/> Rejected	<input type="checkbox"/> Withdrawn	
Notes: _____			

Prohibited Locations

- 1502.6 Prohibited Location:
 - Where there is insufficient lot area or inappropriate soil conditions for adequate absorption to prevent the ponding, surfacing, or runoff of the graywater.
 - A graywater system is not permitted in the Edwards Aquifer Recharge Zone or in any other geologically sensitive area.
 - A Laundry to Landscape system is not allowed on a site that exceeds a three to one slope



Setback requirements

- Main concerns related to structures, adjoining property, septic tanks, and potable water lines
- Measured from system to structure
- Could be greater due to special hazards and circumstances

TABLE 1602.4
LOCATION OF GRAY WATER SYSTEM⁷

MINIMUM HORIZONTAL DISTANCE IN CLEAR REQUIRED FROM	SURGE TANK (feet)	SUBSURFACE AND SUBSOIL IRRIGATION FIELD AND MULCH BED (feet)
Building structures ¹	5 ^{2,9}	2 ^{3,8}
Property line adjoining private property	5	5 ⁸
Water supply wells ⁴	50	100
Sewage pits or cesspools	5	5
Sewage disposal field ¹⁰	5	4 ⁶
Septic tank	0	5
On-site domestic water service line	5	5
Pressurized public water main	10	10

Additional Requirements

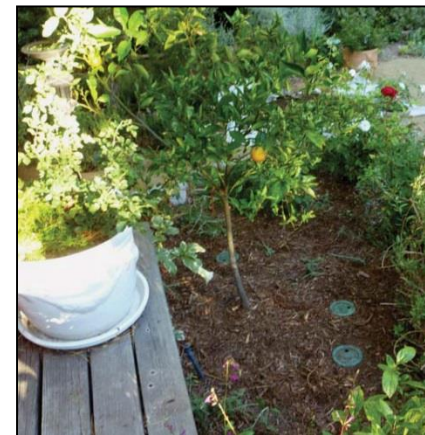
- 1502.7 Drawings and specifications
 - Plot Plan drawn to scale including proposed location of system
 - Details of construction and description of installation, and materials
 - Details of holding tanks
 - Log of percolations tests including soil formations and groundwater levels
 - Distance between plot and surface waters and other CEF's

System types

- Laundry to Landscape
- Branched drain
- Gravity fed
- Pressurized

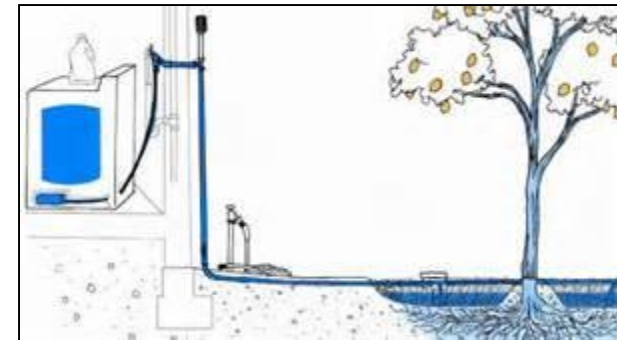


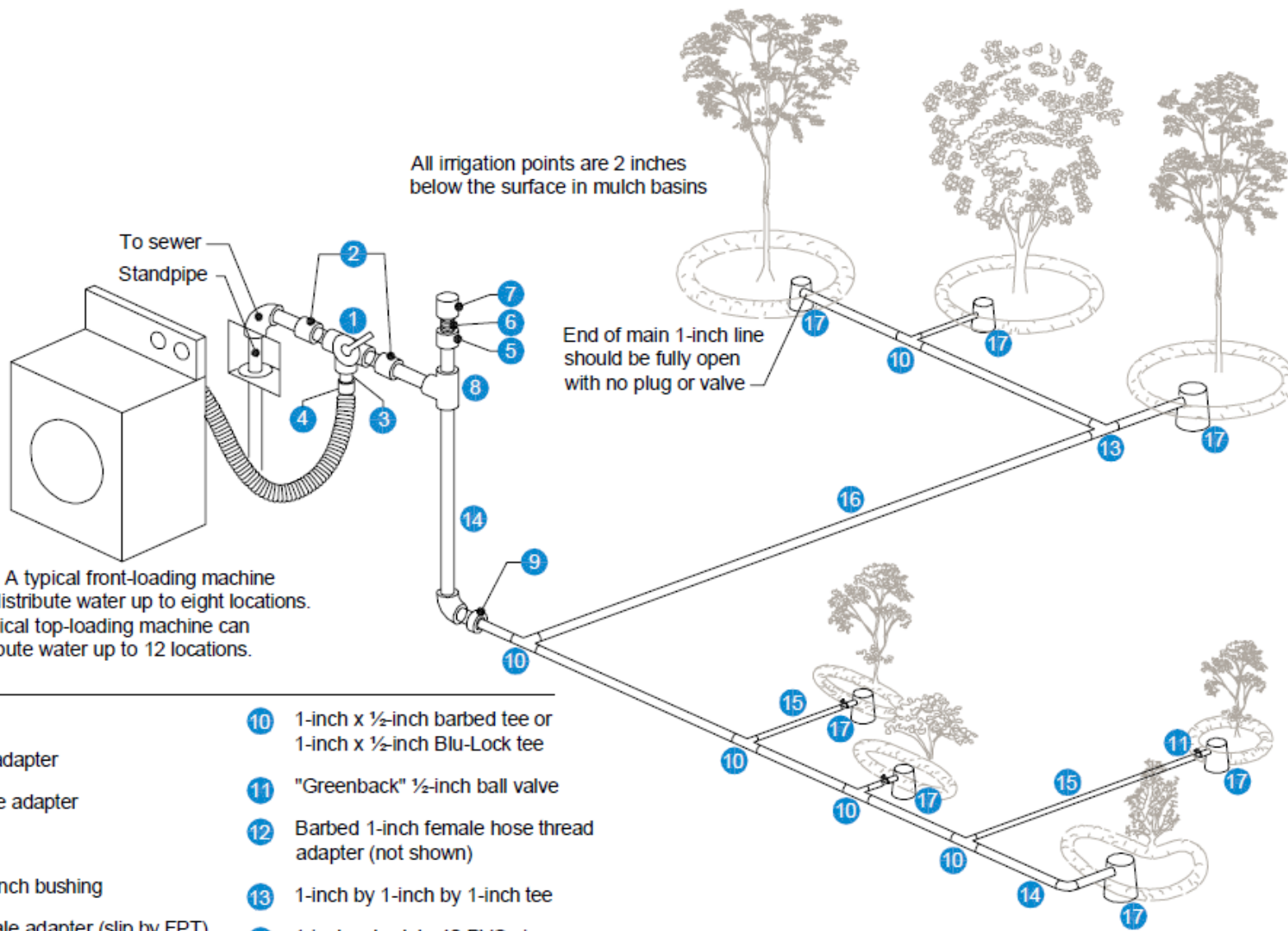
This landscape is irrigated with graywater that has passed through a sand filter before entering the subsurface drip irrigation system. Note: The pond is not supplied by graywater and is lined so that graywater doesn't enter it. Photo: WaterSprout.



Laundry to Landscape

- Simple design
- Single Source (Washing Machine)
- Low cost
- Tankless
- Homestead permit available
- Only available for private one and two family dwellings





To sewer
Standpipe

All irrigation points are 2 inches below the surface in mulch basins

End of main 1-inch line should be fully open with no plug or valve

Note: A typical front-loading machine can distribute water up to eight locations. A typical top-loading machine can distribute water up to 12 locations.

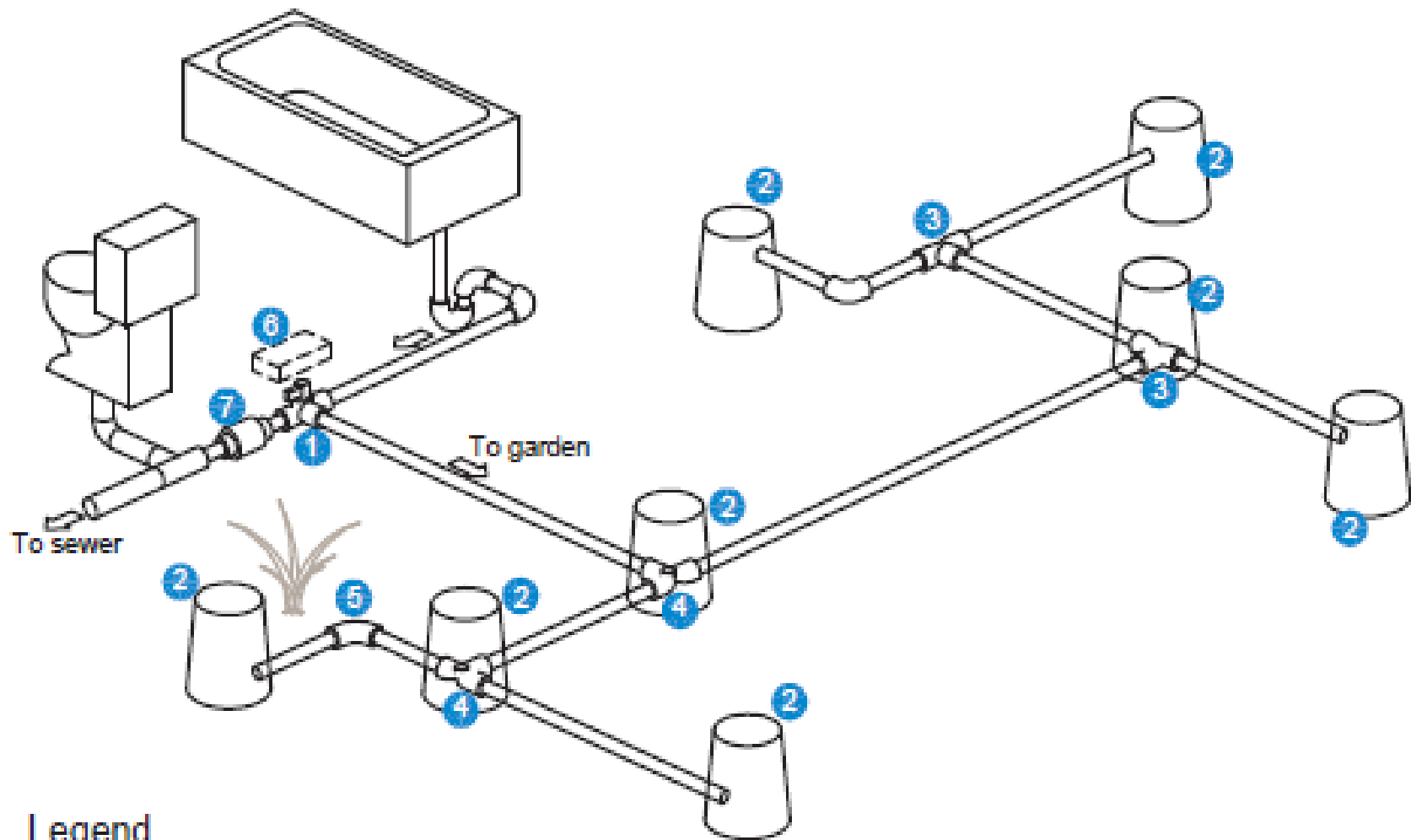
Legend

- | | |
|---|---|
| 1 3-way valve | 10 1-inch x 1/2-inch barbed tee or 1-inch x 1/2-inch Blu-Lock tee |
| 2 PVC 1-inch male adapter | 11 "Greenback" 1/2-inch ball valve |
| 3 1-inch barbed male adapter | 12 Barbed 1-inch female hose thread adapter (not shown) |
| 4 Hose clamp | 13 1-inch by 1-inch by 1-inch tee |
| 5 PVC 1-inch x 1 1/2-inch bushing | 14 1-inch schedule 40 PVC pipe |
| 6 PVC 1 1/2-inch female adapter (slip by FPT) | 15 1/2-inch poly tubing |
| 7 Auto vent (or air admittance valve) | 16 1-inch HDPE tubing |
| 8 1-inch PVC tee | 17 Mulch shield or valve box |
| 9 1-inch barbed x slip adapter | |

Branched

- Complex design
- Multiple sources
- Higher cost
- Requires a tank
- Requires professional design and installation
- Available for all dwellings and sectors
- Larger yield





Legend

- | | | | |
|---|--|---|--------------------------------|
| 1 | 3-way diverter valve | 5 | 1.5" or 2" long sweep 90° bend |
| 2 | Small valve box or rigid plastic pot | 6 | Optional 3-way valve actuator |
| 3 | ABS 1.5" or 2" double ell (aka twin 90) | 7 | Backwater valve |
| 4 | ABS 1.5" or 2" double ell (aka twin 90) with inspection/clean-out port | | |

Distribution methods

- End-use is an important consideration
- Graywater should not be allowed to pool or pond
- Three distribution methods available
 - Subsoil
 - Subsurface
 - Mulch Basin



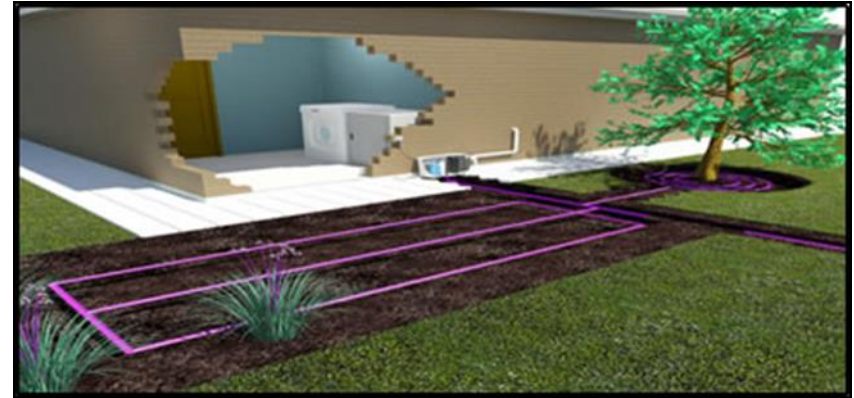
Subsoil

- Distribution piping not less than 3" in diameter
- Good choice for established shrubs
- 10" minimum distribution depth
- Single zone allowed
- Irrigation field requires sizing per soil type and distribution
- Available for all dwellings and sectors



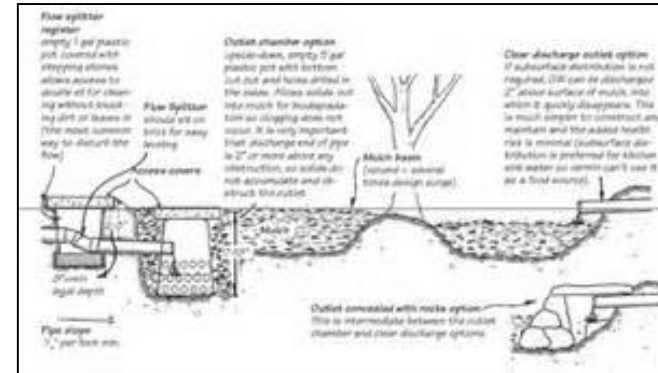
Subsurface

- 2" minimum distribution and supply line depth
- Best for planting beds or turf irrigation
- Single zone allowed
- Irrigation field requires sizing per soil type and distribution
- Available for all dwellings and sectors



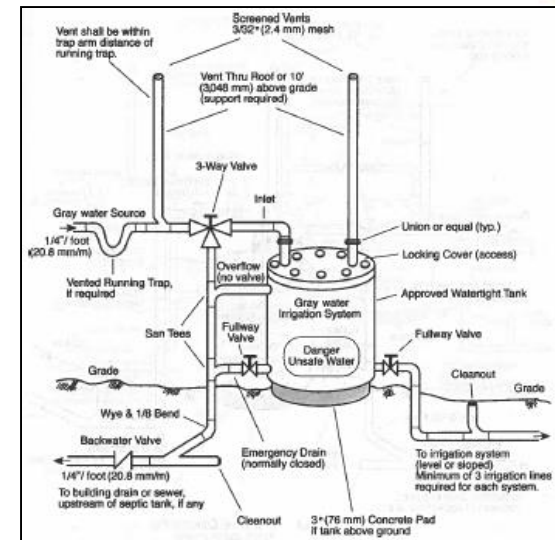
Mulch Basin

- Only available for single family and multi-family dwellings
- Depth of basin not less than 10"
- Supply piping no less than 2" in depth
- Good choice for larger established trees and shrubs
- Basin sizing dependent on soil type and distribution volume



Surge Tanks

- Required for most systems
- Must have overflow connected to Sanitary Sewer System
- Constructed of a durable material
- Should not be stored for more than 24 hours
- Sized to accommodate peak flow




Commercial Graywater Uses

- Commercial process use
- Cooling tower make up supply
- Toilet flushing
- Trap Primers
- Alternate uses can be approved by Plumbing Officials
- Treatment required for most non-irrigation uses



Best Management Practices

- Understand system design
- Routine maintenance
- Biocompatible cleaning products
- Even flow rate important
- Divert or shut down system in wet weather



RESIDENTIAL GRAY WATER
FREQUENTLY ASKED QUESTIONS

WHAT IS GRAY WATER?
 Gray water is wastewater from:

- Bathroom sinks
- Showers and bathtubs
- Clothes washers and laundry tubs.

Gray water **does not** include wastewater:

- From toilets, dishwashers or kitchen sinks
- That has had contact with human waste (such as from washing diapers)
- That has had contact with hazardous materials (such as pesticides or chemicals)

Water used in those ways is called "black water". You may not use black water in a gray water system.

WHY SHOULD I USE GRAY WATER?
 Your home's landscape or foundation does not need water that has been treated to the same level as for drinking or bathing. A gray water system can help to lower your water bills since you will be paying for water once but using it twice!

HOW DO I COLLECT GRAY WATER?
 The simplest way is to divert your clothes washer's wastewater to an in-ground mulch basin. This is called a Laundry-to-Landscape system. Complex systems can include several water sources, a holding tank, pump, and filtration. A complex system usually needs more maintenance, is more expensive, and uses more energy.

HOW CAN I USE GRAY WATER?
 You may use gray water for non-drinking outdoor uses (such as watering your landscape or your home's foundation). As you decide where to use gray water, keep the following in mind:

- Gray water **cannot**:
 - o Spray in the air, pool, pond, or runoff a property
 - o Be used for toilet flushing in single-family properties;
 - o Be used in water features (ponds, fountains, waterfalls, creeks, etc.)
 - o Be used to water vegetable gardens that have root crops or crops where the edible part of plant touches the ground
 - o Be used at properties within the Edwards Aquifer Recharge Zone
- You must distribute gray water at least 2 inches below grade through a mulch basin or underground irrigation system topped with soil, mulch, or gravel.
- Because gray water is a little alkaline, avoid using it on plants that like acidic soils.

HOW MUCH WATER CAN I SAVE BY USING GRAY WATER?
 It depends on how many people live in the home and the number of fixtures you're collecting from. An average home with all available fixtures connected can collect about 40 to 50 gallons a day.

WHAT REGULATIONS DO I HAVE TO FOLLOW WHEN I DESIGN MY SYSTEM?
Local:

- 2012 Uniform Plumbing Code (UPC) Chapters 6 and 16
- Austin City Code §25-12-153

WaterWiseAustin.org | watercon@austintexas.gov | 512-974-2199

Revised: 10-Sep-2016

Graywater Looking Forward

- Austin specific guidance under development
- Water Forward Task Force
- NWRI onsite water treatment standards project
- National Blue Ribbon Commission to Accelerate the Adoption of On-Site Systems



Graywater Resources

- Austin Water Conservation Division – (512) 974-2199
- Austin Water Special Services Division (512) 972-1260
- City of Austin Permit Center – (512) 978-4000
- Austin Water’s Graywater homepage –
(austintexas.org/departments/water-conservation)
- Oasis Designs* (oasisdesign.net)
- Greywater Action* (greywateraction.org)
- San Francisco Graywater Design Manual* (sfwater.org)

***Check with local regulations when referring to guidance not specific to Austin**



Questions?

Robert Stefani

Environmental Program Coordinator

(512) 974-9302

Robert.Stefani@austintexas.gov