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
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>
<thead>
<tr>
<th>Building structures¹</th>
<th>5±₈</th>
<th>2±₈</th>
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<tbody>
<tr>
<td>Property line adjoining private property</td>
<td>5</td>
<td>5⁹</td>
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<tr>
<td>Water supply wells⁴</td>
<td>50</td>
<td>100</td>
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<td>Sewage pits or cesspools</td>
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<td>5</td>
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<tr>
<td>Sewage disposal field¹⁰</td>
<td>5</td>
<td>4⁵</td>
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<td>Septic tank</td>
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<td>5</td>
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<tr>
<td>On-site domestic water service line</td>
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<tr>
<td>Pressurized public water main</td>
<td>10</td>
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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
Laundry to Landscape

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

Legend
1. 3-way valve
2. PVC 1-inch male adapter
3. 1-inch barbed male adapter
4. Hose clamp
5. PVC 1-inch x 1½-inch bushing
6. PVC 1½-inch female adapter (slip by FPT)
7. Auto vent (or air admittance valve)
8. 1-inch PVC tee
9. 1-inch barbed x slip adapter
10. 1-inch x ½-inch barbed tee or 1-inch x ½-inch Blu-Lock tee
11. "Greenback" ½-inch ball valve
12. Barbed 1-inch female hose thread adapter (not shown)
13. 1-inch by 1-inch by 1-inch tee
14. 1-inch schedule 40 PVC pipe
15. ½-inch poly tubing
16. 1-inch HDPE tubing
17. Mulch shield or valve box

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.

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

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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
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/department/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