

This presentation premiered at WaterSmart Innovations

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GRAYWATER: Lessons Learned from Arizona

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What is **Water CASA**?

Member Services

Research

Education

Public Policy



- 💧 Water providers seeking to augment their individual conservation efforts.
- 💧 The voice for improvement of water conservation efforts in the region.
- 💧 Method to achieve economy of scale in purchase of conservation devices and supplies.
- 💧 Begun in 1997.

What is GRAYWATER?

GRAYWATER is wastewater
from your laundry,
bathtubs, showers,
and bath sinks.

- Not water from kitchen sinks or dishwashers.
- Water from your toilets is blackwater.

Where Arizona was 10 Years ago:

- 💧 Residential Graywater permits were almost impossible to get.
- 💧 Enforcement of existing regulations was not occurring.
- 💧 Huge number of illegal systems in existence.

Water CASA took this issue on:

- 💧 Huge potential for water savings 50,000 gphy.
- 💧 High public interest and demand for change.
- 💧 Untenable public policy.

Water CASA devised a 3 part study:

- 💧 Survey of actual illegal usage.
- 💧 Monthly testing of graywater and soil at every site for one year.
- 💧 Risk assessment of the results.

**Actual illegal usage in the
region.**

13%

GRAYWATER REUSE BY PROVIDER

PROVIDER	% Reuse	Weight	Wt. % Reuse
Avra Co-op	25.0	0.02	0.50
Flowing Wells	13.2	0.03	0.40
Green Valley	1.5	0.03	0.04
Marana	14.8	0.01	0.15
Metro	1.8	0.07	0.13
Oro Valley	3.4	0.05	0.17
Ray	15.8	0.02	0.32
Tucson Water	14.6	0.77	11.24
TOTAL	8.4	1.0	13.00

Usage patterns in the region.

GRAYWATER USES

38%	Trees (fruit/nut/ornamental/shade)
18%	Shrubs
13%	Grass
6%	Potted plants
5%	Annual/bedding plants
5%	Other plants
4%	Wildflowers
4%	Vegetable/herbs

GRAYWATER SOURCES

83%	Clothes washer
14%	Kitchen sink
12%	Bath 1 tub/shower
4%	Bath 2 tub/shower
2%	Bath 1 sink
2%	Other

Reasons for not using . . .

REASONS FOR NOT USING GRAYWATER

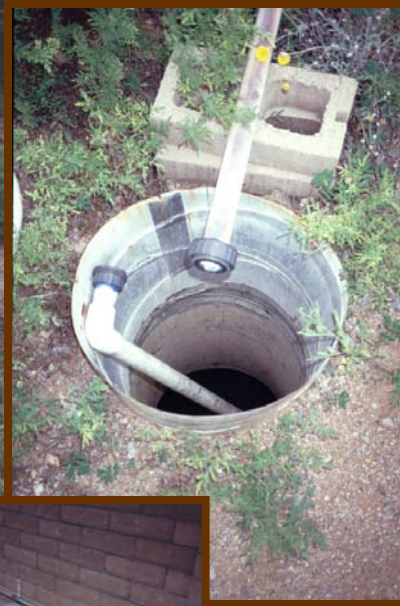
19%	don't know how	5%	water is salty/chems
11%	not worth the cost	5%	isn't worth trouble
11%	no use for the water	4%	may be illegal
10%	need info./assistance	4%	not enough time
10%	other	2%	may need a permit
10%	not sure safe/sanitary	1%	may need inspection
8%	water not near use	0%	tried permit, gave up

Study of graywater quality and soil quality for a representative sample of illegal graywater systems in the region.

Site	TANK*	STORAGE			SOURCES			VECTORS			USAGES					
		Septic	Filter	Pump	Washer	Kitchen	Other	Kids	Diapers	Pets**	IRRIG. TYPE			IRRIG. WHAT		
											Drip	Flood	Sub	Landscape	Fruit trees	Vegetables
1	1800g IG	•	•	•	•	•	2.5 ba				•			•		•
2	S				•							•		•		
5	33g S				•			2	1	D		•		•		
6	50g S				•	•	tub/sh	1	1	C,CH		•		•	•	
7	1000g IG	•	•	•	•		3 ba			D,H		•			•	
10	55g S		•		•			6	2	D,C,B,CH	•	•		•	•	•
13	S				•					D,C		•		•		
14						•						•		•		
17	1000g IG		•	•	•	•	2 ba	1		D,C		•	•	•	•	•
18	300g IG			•	•		2 ba			C	•			•		
19	50g S		•		•					D,C		•		•	•	

* IG - In Ground, S - Surge

** D-Dog, C-Cat, CH-Chicken, B-Bird, H-Horse







Post-Study Developments

- Data and risk assessment turned over to ADEQ.
- ADEQ embarked on a one year effort to develop a new graywater rule package embedded within new reclaimed water rules.
- New Arizona Graywater Rules effective January 2001.

We like to think
Arizona now
has the
most progressive
residential
graywater
regulations in
the country.



If you can answer yes to all. . .

- Originates from my own residence, is used within my property boundary, for watering and composting only.
- My household generates less than 400 gallons of graywater per day (20-35 gpd x # of residents).
- I allow no direct contact with my graywater.
- I only flood irrigate or drip irrigate with my graywater, and subsurface irrigate food crops, except for trees.

If you can answer yes to all. . .

- 💧 **My graywater contains no hazardous chemicals or water used to wash diapers or similarly soiled items.**
- 💧 **I apply my graywater to minimize standing water.**
- 💧 **My system diverts to the sewer/septic system.**
- 💧 **My storage vessel is covered, is sited outside any floodway, and never comes within 5' of the groundwater table.**
- 💧 **Pressure piping in my system is marked.**

If you can answer yes to all. . .

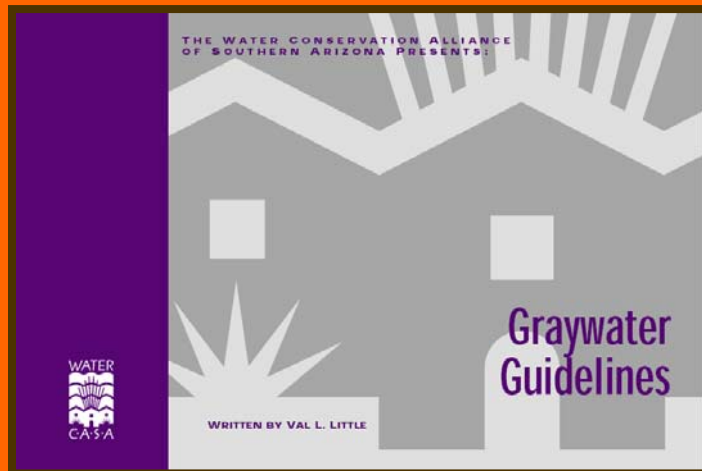
You are covered by a blanket permit.

No one to notify, no paperwork.

Complaint driven only.

Post Rule change happenings. . .

- Graywater Guidelines published
- Guía para la conservación las Aguas Grises
- New Mexico Gray Water Guide.
- Education campaign is ongoing.



Then what ?

In 2005 we offered a bill in the Arizona State Legislature to provide tax credits to encourage graywater reuse.



Rationale

- 💧 Fastest growing state in the nation.
- 💧 A decade into a drought cycle.
- 💧 Potential savings of 50,000 gph/yr.
- 💧 Avoid the prohibitive costs to retrofit.
- 💧 Make graywater plumbing the norm.
- 💧 Create demand for graywater plumbed homes among buyers.

What does it do?

HOME BUILDERS

- 💧 \$200 (costs, up to) per home tax credit to plumb for graywater.

HOME OWNERS

- 💧 \$1000 (25% of costs, up to) tax credit to install a graywater/rwh system.

- 💧 Limited budget allocation
- 💧 Sunsets after five years

What still needs doing . . .

- ♦ **Research**

soaps/detergents
which plants prosper
food crops

- ♦ **Education**

plumbers
building officials
general public

- ♦ **Ordinances**

dual plumbing in new
construction



Some closing caveats . . .

Ordinance and Regulations

- 💧 Incentivize rather than require
 - 💧 Soil type/percolation rates
 - 💧 House-lot ratio
 - 💧 Lot size



Water CASA

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Thank you!



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