

US EPA ARCHIVE DOCUMENT

Residential Gray Water Reuse

Innovative Energy Management Workshop
Move Less Water & Save Money

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US EPA

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Gray Water Reuse

- Meets fresh water demand for landscaping
- Reduces wastewater entering WWTPs
- Extends life of septic systems
- Contains nutrients to fertilize plants
- Human health risks managed by design
- Reduces energy and costs needed for wastewater transport, treat, and disposal

What is Gray Water?

Hawaii State Department of Health Guidelines for the Reuse of Gray Water June 2009:

For Homeowners of single family dwellings-
Gray Water is wastewater discharged from:

- **showers and bathtubs;**
- **hand-washing lavatories;**
- **wastewater that has not contacted toilet waste**
- **sinks (not used for disposal of hazardous, toxic materials, food preparation, or food disposal)**
- **clothes-washing machines (excluding wash water with human excreta e.g., diapers)**

Gray Water Reuse

- Showers, baths, faucets, and laundry = 30% of indoor water use


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Emerging Products: Graywater Treatment - Package Systems (for water reuse)

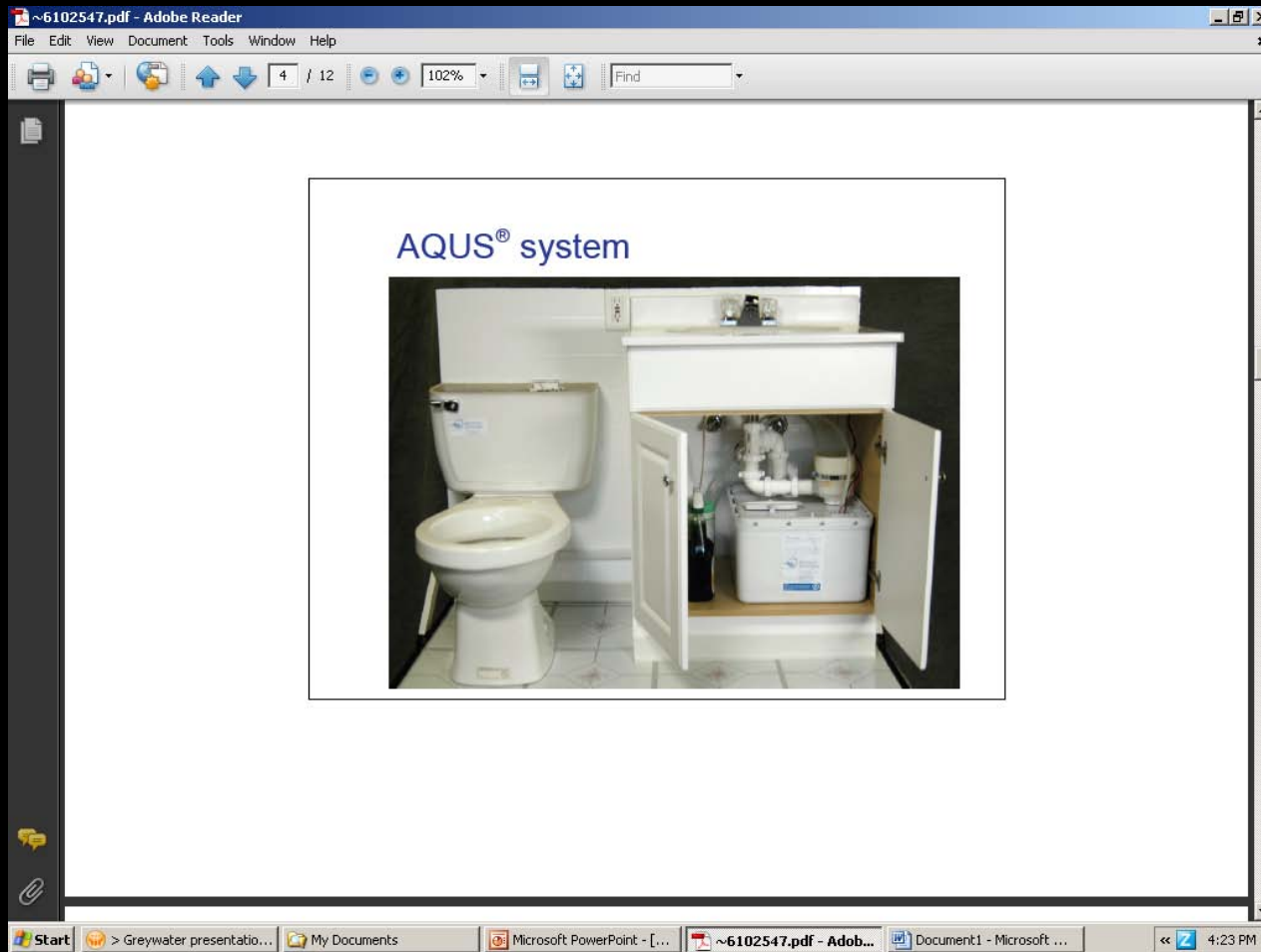
- Sloan® AQUUS® system
 - ✓ U.S. developer-WaterSaver Technologies
 - ✓ Many U.S. field trials
 - ✓ Now in production & marketing
 - ✓ Sloan-WaterSaver partnership for research, development, marketing
 - ✓ About \$400 plus installation
 - ✓ New trials completed in Calif to measure water savings (sponsored by MWDSC)
 - ✓ Compliant with IAPMO IGC 207-2009
 - ✓ www.sloanvalve.com/index_AQUS_Greywater_System_ENU_HTML.htm
 - ✓ www.watersavertech.com/AQUS-System.html



AQUS® system

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Gray Water Reuse



Gray Water Reuse

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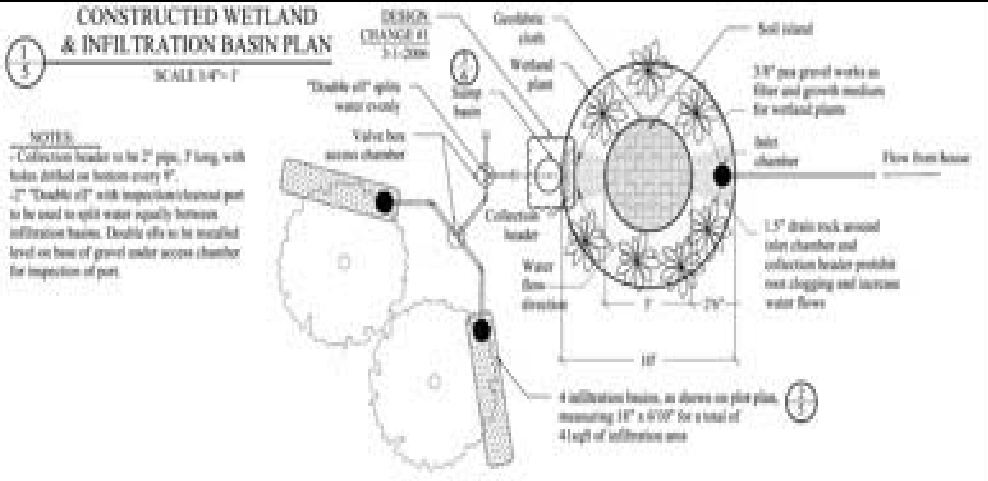
Residence Hall
40 apartments
(water FROM 16 showers TO 40 toilets)

→

Conference Hotel
54 rooms
(water FROM showers and washbasins TO toilets)

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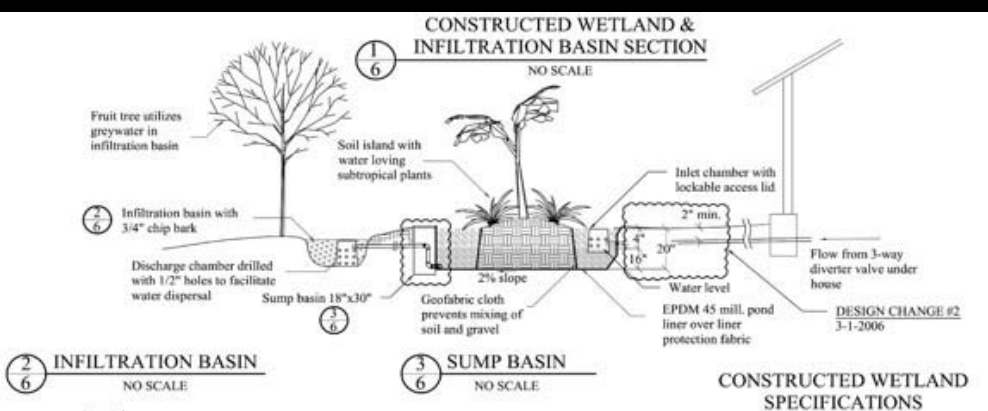
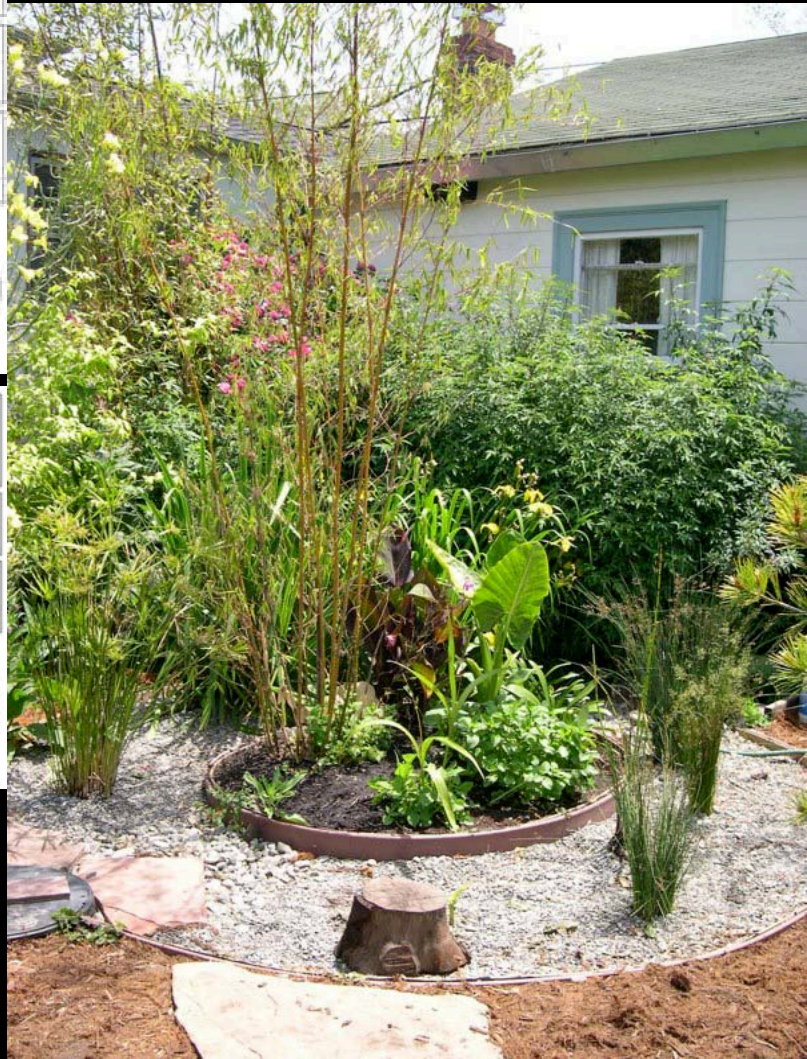
Where are we going?



Lindy Construction
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DIG CITY INC.
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EcoHouse, Berkeley, CA

Restructuring our water infrastructure: Small-scale solutions



Horizontal/
Soft path water
infrastructure



HI Gray Water Reuse

- Systems for households with an individual wastewater treatment system –
 - Designs are submitted to County and HDOH
 - Licensed engineer or certified irrigation designer must prepare plans/specification
 - Final inspection by designer required
 - HDOH will issue an approval to use after designer's inspection report and plans/specs are received

HI Gray Water Reuse

- Systems connected to a county sewer can submit as built drawings and final inspection report to the County only
- Guidelines include acceptable uses of gray water, chemicals to avoid, and general requirements
 - Can not come in contact with black water, must store less than one day, hold tank parameters, subsurface distribution system requirements, and maintenance.

Gray Water Reuse

- **State Regulations**

- <http://www.doh.wa.gov/ehp/Ts/WW/greywater/rule/gw-state-matrix.pdf>

Arizona - Tiered approach – allows private residential reuse for flow of less than 400 gpd without a permit if conditions are met

(Tucson- GW stubouts mandatory for all new home construction)

California – Amended by emergency rule August 09, adopted Jan. 10 - allows tiered approach. Clothes washer does not require construction permit if conditions met

Hawaii – Follows Chapter 16. Gray Water Systems, of the 2006 Uniform Plumbing Code, requires license professional submit plans and specs to State/County for approval

Gray Water Reuse

- **State Regulations Continued**
- <http://www.doh.wa.gov/ehp/Ts/WW/greywater/rule/gw-state-matrix.pdf>
- **Idaho** – Must meet certain disposal requirements; approval required
- **Nevada** – Single family dwelling; permit required
- **New Mexico** – Discharge of less than 250 gpd of private residential graywater allowed without permit if conditions are met
- **Texas** – Single family dwelling; no permit required for domestic use of less than 400 gpd if conditions met
- **Utah** – Single family residences; approval required

Installing A Clothes Washing Gray Water System



GREEN JOBS

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Installing A Clothes Washing Gray Water System



No Holding
Tank

- One valve to sewer or GW
- One valve front or back yard

GREEN JOBS

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Installing A Clothes Washing Gray Water System

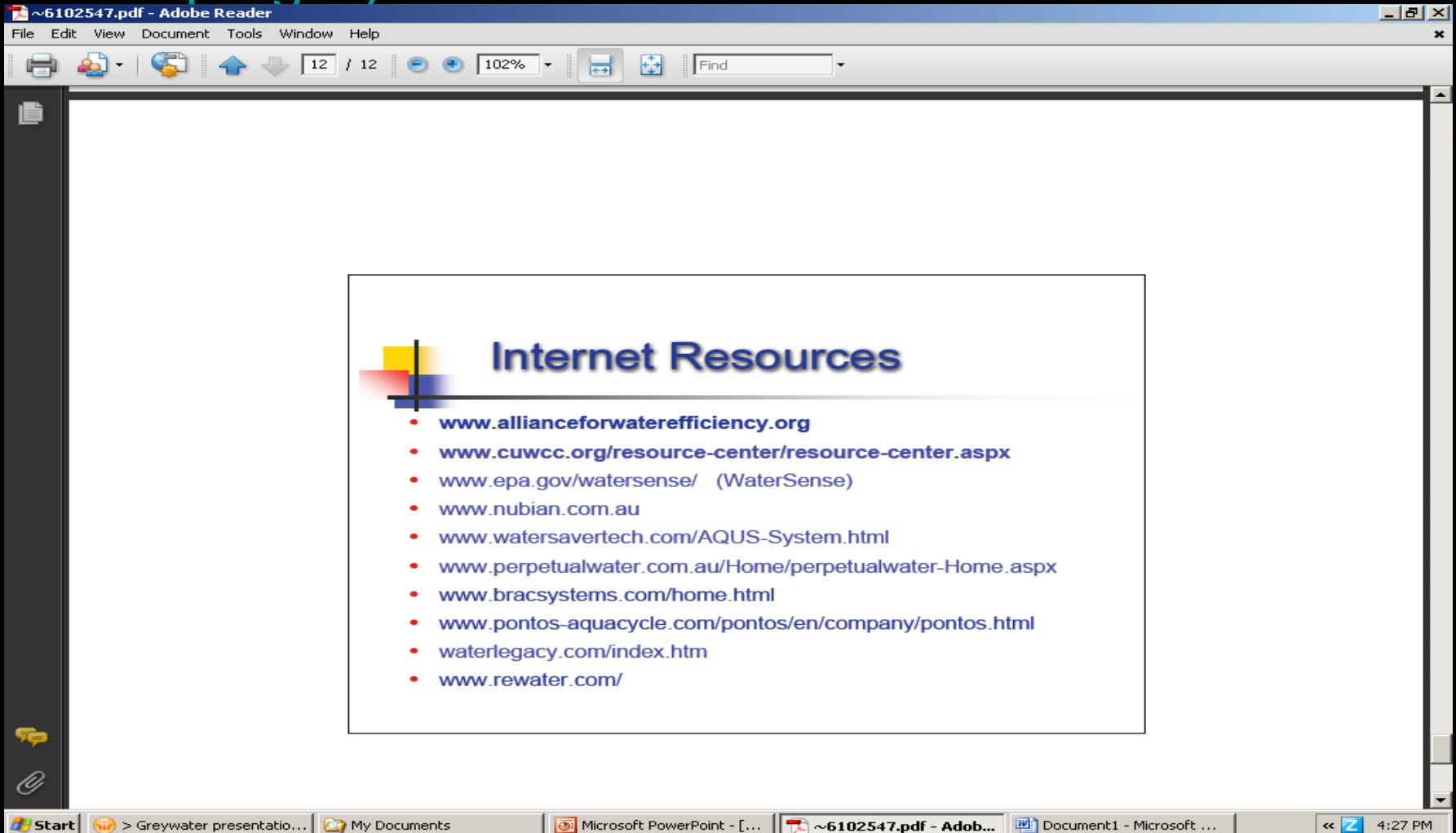


One pipe - back yard
One pipe - front yard
Pump from Washer

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Gray Water References

- http://hawaii.gov/wastewater/pdf/graywater_guidelines.pdf
- <http://greywater.net/>



The image shows a screenshot of an Adobe Reader window displaying a slide titled "Internet Resources". The slide contains a list of ten websites related to water efficiency and greywater. The Adobe Reader interface includes a menu bar (File, Edit, View, Document, Tools, Window, Help), a toolbar with various icons, and a search field. The taskbar at the bottom shows the Start button and several open applications, including a PowerPoint presentation and the Adobe Reader window itself. The system clock indicates the time is 4:27 PM.

Internet Resources

- www.allianceforwaterefficiency.org
- www.cuwcc.org/resource-center/resource-center.aspx
- www.epa.gov/watersense/ (WaterSense)
- www.nubian.com.au
- www.watersavertech.com/AQUS-System.html
- www.perpetualwater.com.au/Home/perpetualwater-Home.aspx
- www.bracsystems.com/home.html
- www.pontos-aquacycle.com/pontos/en/company/pontos.html
- waterlegacy.com/index.htm
- www.rewater.com/