BE WATER WISE

Rainwater Conservation

Rain Barrel Construction Workshop
York County Parks & Recreation
Nixon Park
May 7, 2006

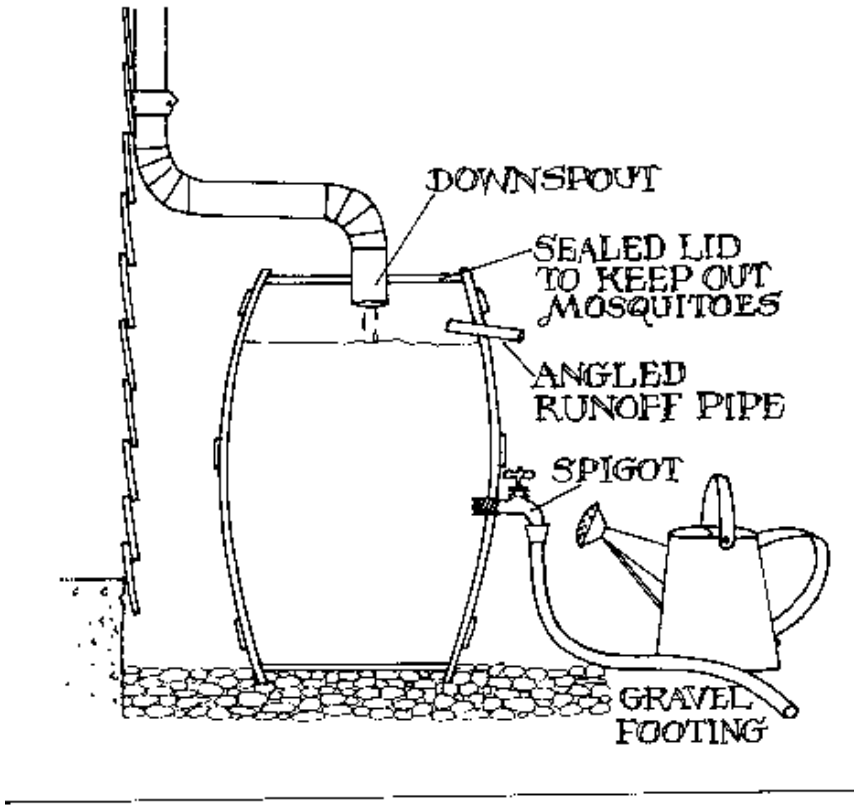
What we'll cover

- What is a Rain Barrel?
- Specifications
- Operational Features
- Size
- Regulation
- Costs
- Construction
- Benefits

What is a Rain Barrel?

- Rain barrels are low-cost, effective, and easily maintainable retention and detention devices that are applicable to residential, commercial and industrial sites to manage rooftop runoff.

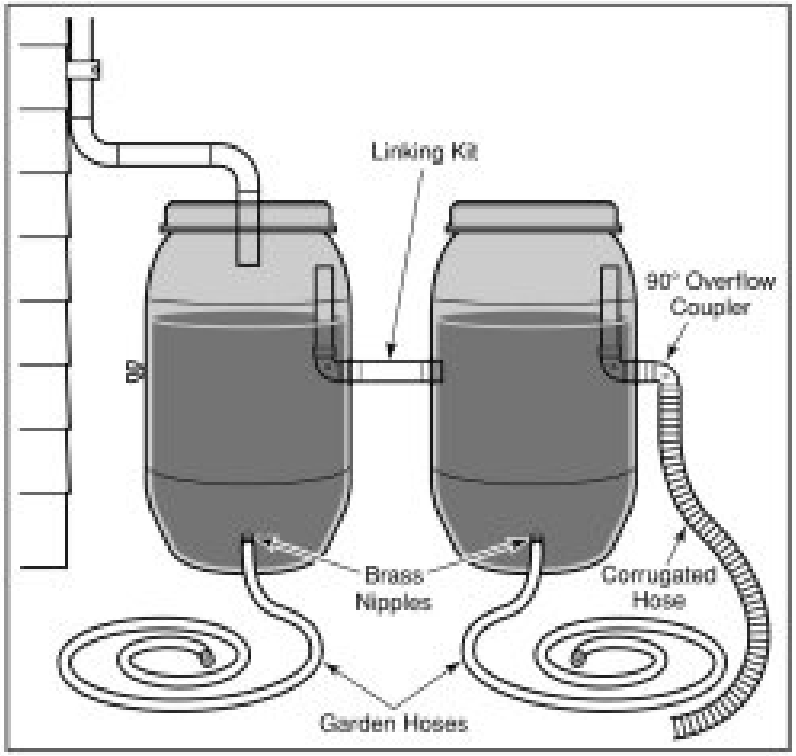
What is a Rain Barrel? (cont.)



- Typical rain barrel design will include a hole at the top to allow for flow from a downspout, a sealed lid, an overflow pipe and a spigot at or near the bottom of the barrel.

What is a Rain Barrel? (cont.)

- The water can then be used for lawn and garden watering.
- Rain barrels can be connected to provide larger volumes of storage.



Rain Barrel Specifications

- The design of any rain barrel is relatively simple, with its basic components consisting of:
  - Barrel (metal, plastic, wood) is recommended to be at least 55 gallons
  - Top should be sealed or removable to exclude mosquitoes and allow easy access for cleaning
  - Connections to the downspout, spigot and overflow outlet

Rain Barrel Operational Features

- The following rain barrel technical and operational features should be considered:
  - Screens on gutters and downspouts to remove sediment and particles as the water enters the barrel
  - Bottom drain plug for maintenance (optional)
  - Aesthetic features that are compatible with the lot's landscaping plan
  - Adequate storage capacity

Rain Barrel Size

- The required capacity of a rain barrel is a function of the rooftop surface area that drains to it, the inches of rainfall required to fill the barrel, and water losses, due mainly to evaporation. A general rule of thumb to utilize in the sizing of rain barrels is that 1 inch of rainfall on a 1000 square foot roof will yield approximately 600 gallons.

Rain Barrel Size (cont)

- Rain barrel volume can be determined by calculating the roof top water yield for any given rainfall, using the following general equation:
  - *V = A2 x R x* 0.90 *x* 7.5 g*als./ ft.3* where:
    - *V*= volume of rain barrel (gallons)
    - *A2*= surface area roof (square feet)
    - *R*= rainfall (feet)
    - 0.90 = losses to system (no units)
    - 7.5 = conversion factor (gallons per cubic foot)

Rain Barrel Size (cont)

- Example: one 60-gallon barrel would provide runoff storage from a rooftop area of approximately 215 square feet for a 0.5 inch (0.042 ft.) of rainfall.
  - 60 *gallons* = 215 *ft.2 x* 0.042 *ft. x* 0.90 *x* 7.5 *gallons/ft.3*

Rain Barrel Regulation

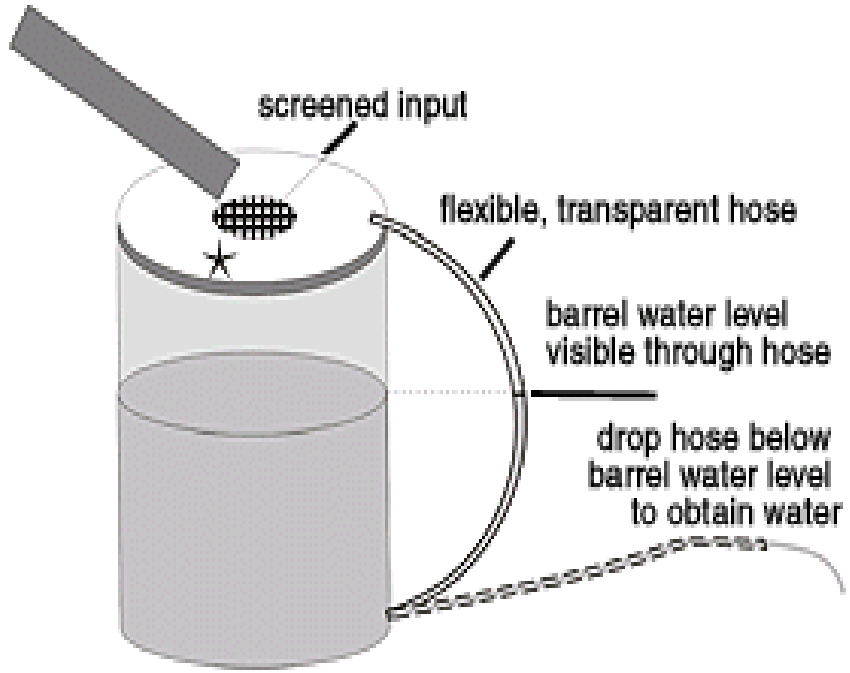
- While rainwater catchment systems are largely unregulated in many areas, local regulations may require that plumbing and health codes are be met.

Rain Barrel Cost

- This rain barrel system was put together for less than $20.
  - *Rain barrel* $5-10
  - *Flexible elbow adaptor* $2
  - *Bung port adaptor* $1
  - *Spigot* $1.50
  - *Hose clamp* $0.50
  - Total $10-15

Rain Barrel Construction

- Home made rain barrels are relatively easy to construct from 55-gallon drums and a few other basic components.
  The following is a simple construction sequence.



Rain Barrel Construction (cont.)

- Materials:
  - 1, 55-gal barrel
  - 1, 2” ABS Bung Port Adaptor
  - 1, Hose Bibb (1/2” hose)
  - 1, Flexible plastic elbow (2”x3”)
  - 1, 3” Hose clamp
- Tools:
  - 1, Measuring tape
  - 1, marking pencil
  - 1, Electric drill
  - 1, ¾” Keyhole drill bit

Rain Barrel Construction (cont.)

1. Bung port adaptor installation

- On barrel top locate medium coarse threaded bung port opening
- Screw 2” bung port adaptor into opening
- Lay barrel on it’s side with bung port opening on bottom (closest to ground)
- On the top-side of barrel measure 3” up from bottom and mark

Rain Barrel Construction (cont.)

2. Drill hole(s) & attach fittings

- Drill ¾” hole in the barrel for the ½” spigot to connect your garden house to the barrel
- Slide hose clamp over flexible elbow and both over bung port adaptor
- Tighten hose clamp snug

Rain Barrel Construction (cont.)

3. Mark & cut down spout at the proper height

- Level ground of chosen spot
- Place rain barrel on 1-2 course of concrete blocks and mark to edge of flexible elbow on down spout
- Cut down spout 1-2” below mark
- Slide flexible elbow over down spout and rest on concrete block

Rain Barrel Construction (cont.)

4. End product

- Remove remaining bung port cap on top of barrel and cover it with a small screen for overflow
- Or, if overflow is desired, then drill 1” hole 3” below top of barrel on side of choice and screw in plastic hose adaptor
- Place ½” wire-cloth screen in rain gutter

Rain Barrel Maintenance

- Maintenance requirements for rain barrels are minimal and consist only of regular inspection of the unit as a whole and any of its constituent parts and accessories. The following components should be routinely inspected, at least twice a year, and either repaired or replaced as needed.

Rain Barrel Maintenance

- *Roof catchment*, to ensure that no particulate matter or other parts of the roof are entering the gutter and downspout to the rain barrel.

Rain Barrel Maintenance

- *Gutters*, to ensure that no leaks or obstructions are occurring.
- *Downspouts*, also to assure that no leaks or obstructions are occurring.

Rain Barrel Maintenance

- *Entrance at rain barrel*, to ensure that there are no obstructions and/or leaks occurring.
- *Rain barrel*, to check for potential leaks, including barrel top and seal.

Rain Barrel Maintenance

- *Runoff / overflow pipe*, to check that overflow is draining in non-erosive manner.
- *Spigot*, to ensure that it is functioning correctly.

Rain Barrel Maintenance

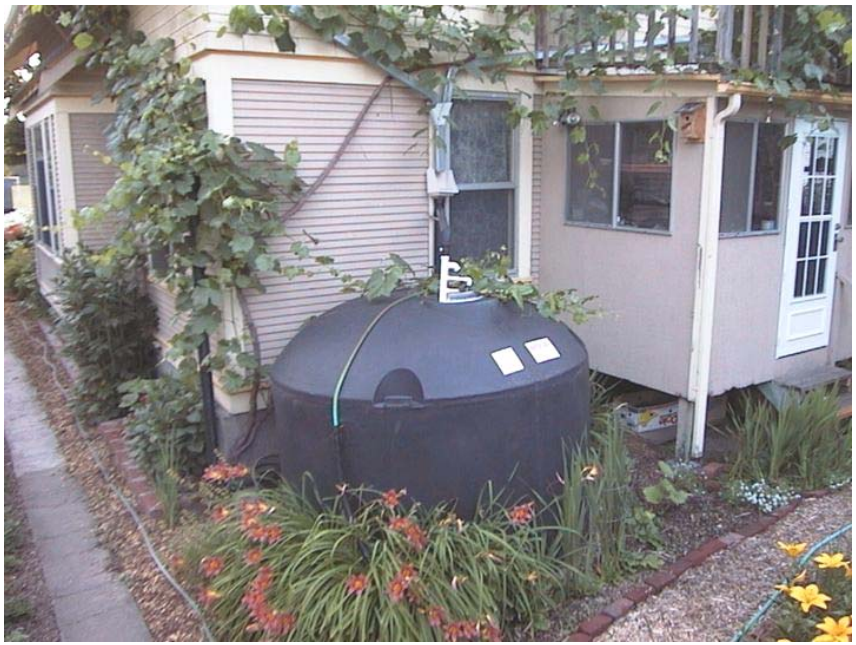
- *Any accessories*, such as rain diverter, soaker hose, linking kit, and additional guttering.
- *Winter months* either maintain barrel volume at ½ capacity or completely and leave spigot open

Rain Barrel Benefits

- Rain barrels are low-cost water conservation devices that can be used to reduce runoff volume and, for smaller storm events, delay and reduce the peak runoff flow rates.

Rain Barrel Benefits

- By storing and diverting runoff from impervious areas such as roofs, these devices reduce the undesirable impacts of runoff that would otherwise flow swiftly into receiving waters and contribute to flooding and erosion problems.



Rain Barrel Benefits

- Rain barrels can provide a source of free water for flower and vegetable gardens and landscapes, free of most sediment and dissolved salts.

Rain Barrel Benefits

- Because residential irrigation can account for up to 40% of domestic water consumption, water conservation measures such as rain barrels can be used to reduce the demand on the municipal water system, especially during the hot summer months.

More About Water Conservation

- Mid-Atlantic Ecological Landscapes

www.watershedsyork.org "MAEscapes"

- York County Conservation District

www.yorkccd.org "Water Wise"

- PA Dept. of Environmental Protection

www.dep.state.pa.us "Water Resources"

Be Water Wise!

Rose Anne Bair
York County Dept. of Parks & Recreation
428-1961
E-mail: parks-nixon@york-county.org
Gary R. Peacock
York County Conservation District
840-7430
gpeacock@yorkccd.org