

save it on a rainy day



Wonderland Water Systems



Save the Rain

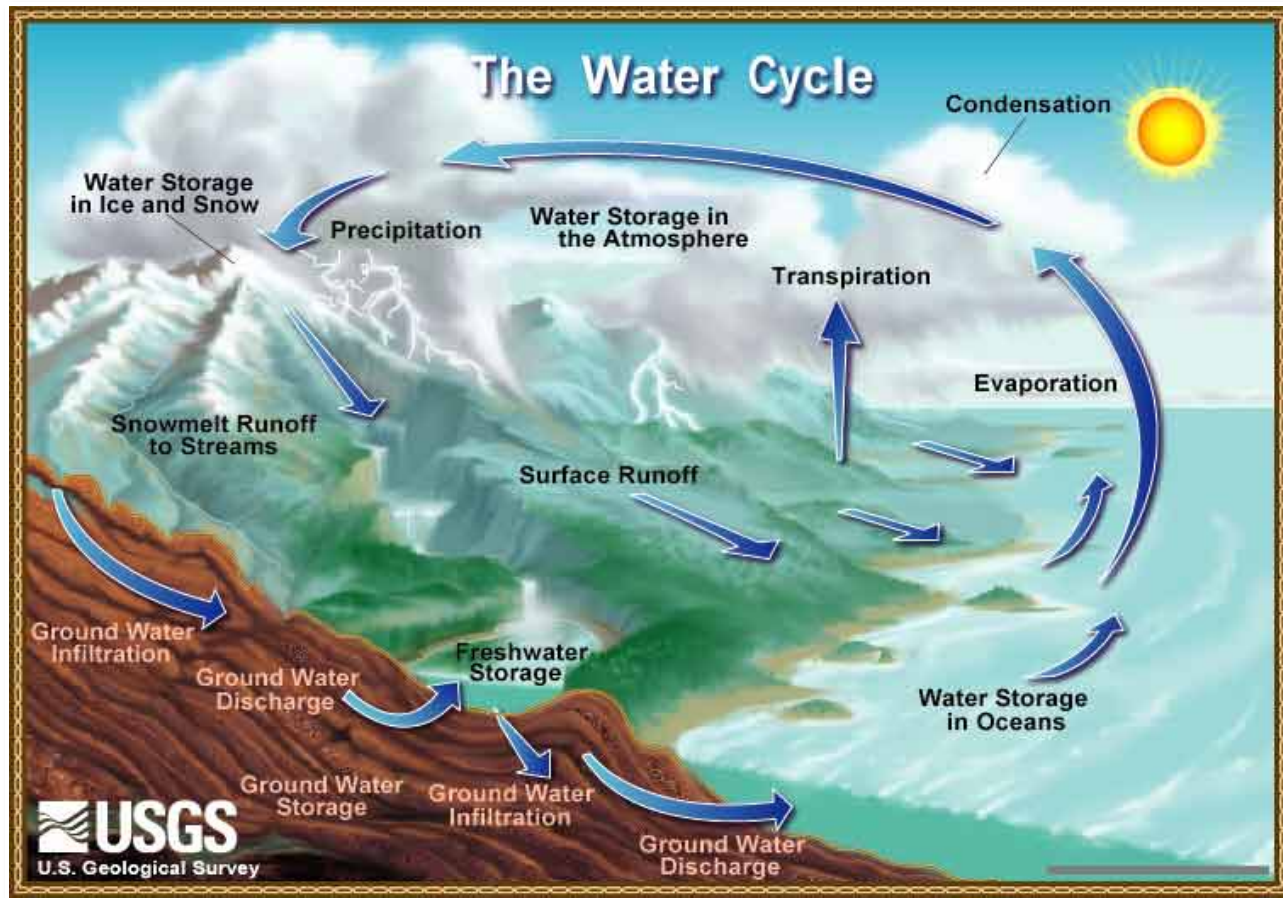


Save a Raindrop - Save a life.

530.925.2586

dylan@wonderlandinc.net

www.wonderlandinc.net



*"God must think we're crazy. We let the rain fall off our roofs onto our soil. It washes the soil away and flows to the bottom of the hill. We then climb down the hill and carry it back up to drink." ~Ugandan project worker*

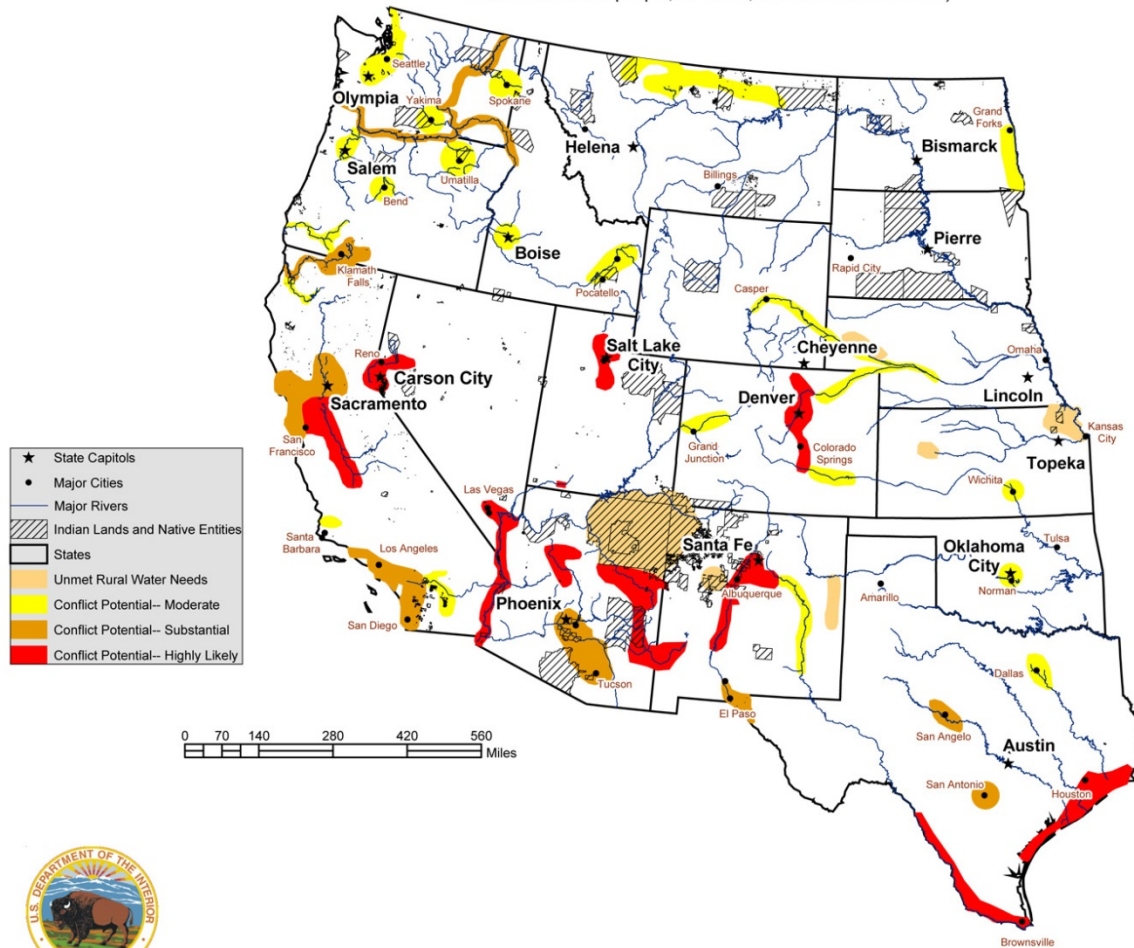
**“Don’t pray for rain, if you can’t  
take care of what you get.”**

**R.E. Dickson**

**(1937 Superintendent Texas Agricultural Experiment Station)**

## Potential Water Supply Crises by 2025

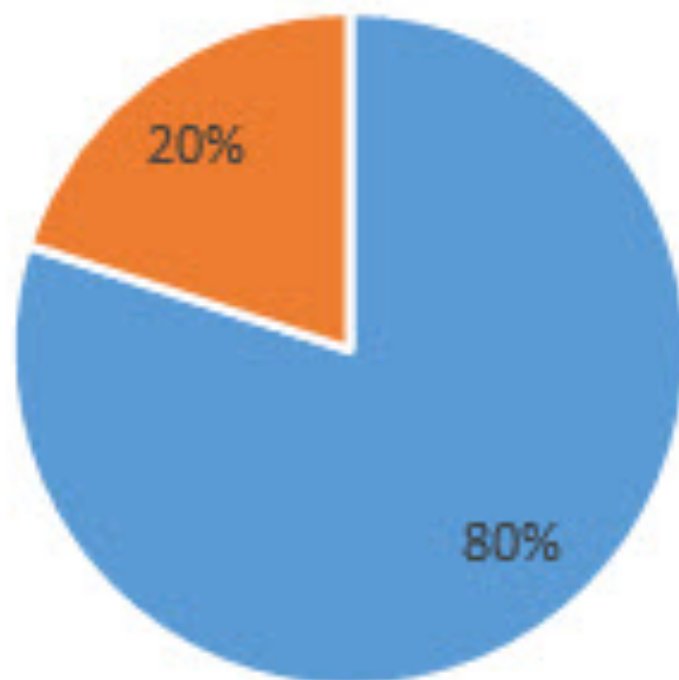
(Areas where existing supplies are not adequate to meet water demands for people, for farms, and for the environment)



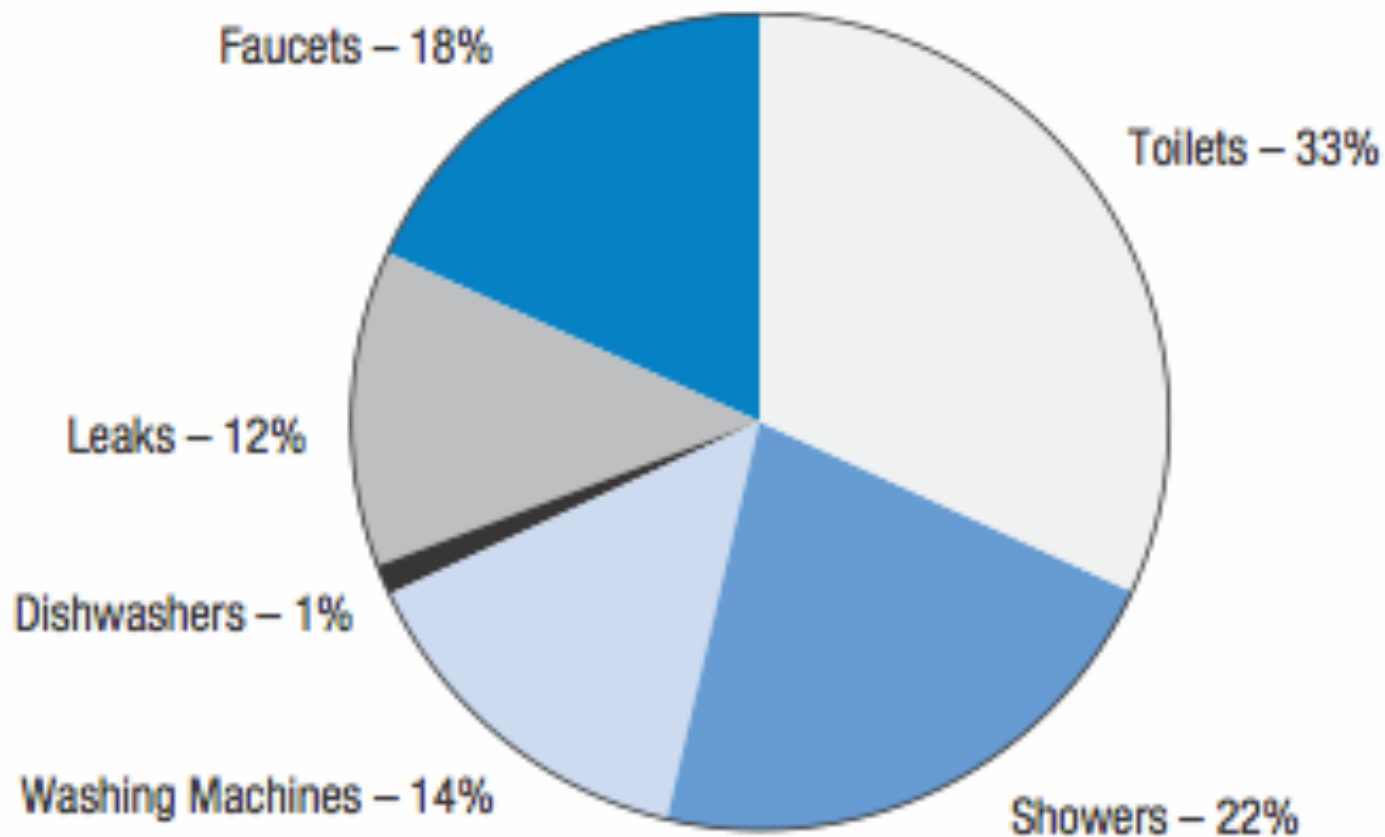
May 2003



## Water Use in California



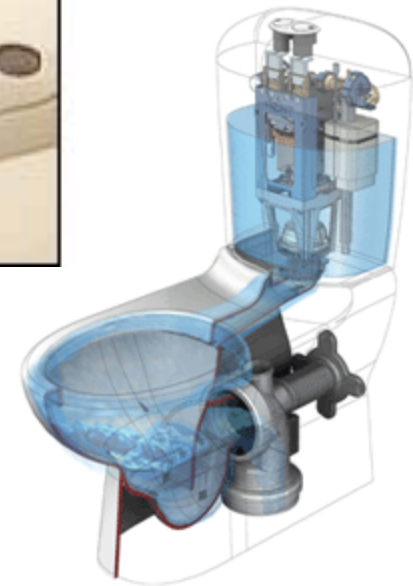
■ Agriculture ■ Everything Else



California household water usage

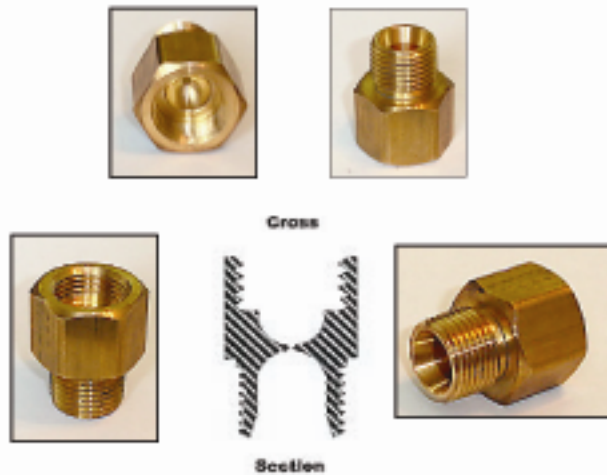
The average American consumes 180 gallons per person per day.

# Indoor Conservation Products

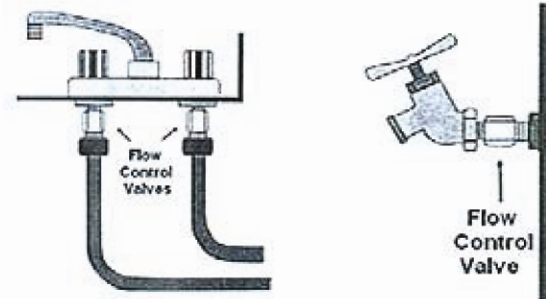


**Dual flush toilets – 0.8 / 1.6 gallons per flush**

## Low Flow Shower Heads



## Low Flow Solar Powered Faucets



**Flow reduction valves**

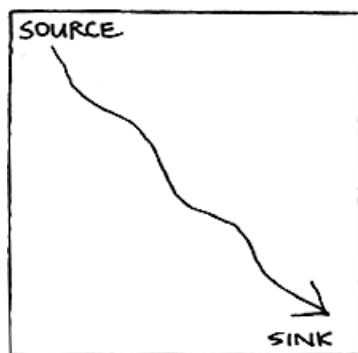


When 1 inch of rain falls on  
1000 square feet, you can harvest  
600 gallons of water.

When 1 inch of rain falls on 1  
acre, you can harvest  
26,000 gallons of water.

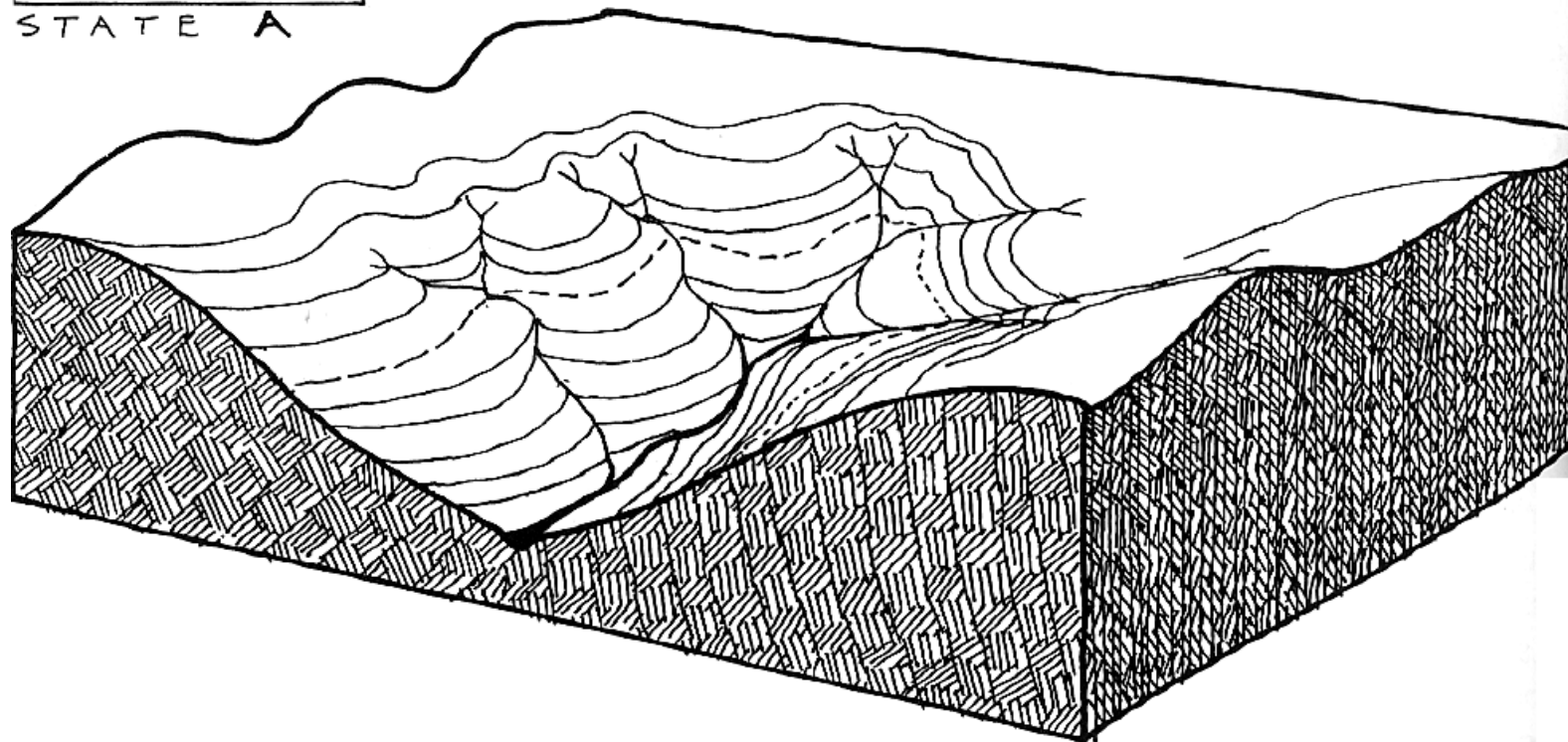
# **Benefits of collecting Rain water:**

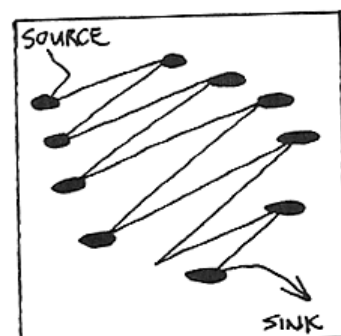
- \* Having a self sufficient water supply.**
- \* Protects Property investment**
- \* A cost effective alternative source of water.**
- \* Reduces the demand on the water shed. Helps to replenish the watershed**
- \* Filtered rainwater is soft water with low mineral content.**
- \* Unfiltered rainwater is preferred by plants and trees over most well water and municipal water sources.**
- \* Reduces erosion, flooding and pollution caused by runoff.**
- \* Filtered rainwater costs substantially less than bottled water.**
- \* Water storage for fire protection.**
- \* Tax credits and rebate programs available in many areas.**



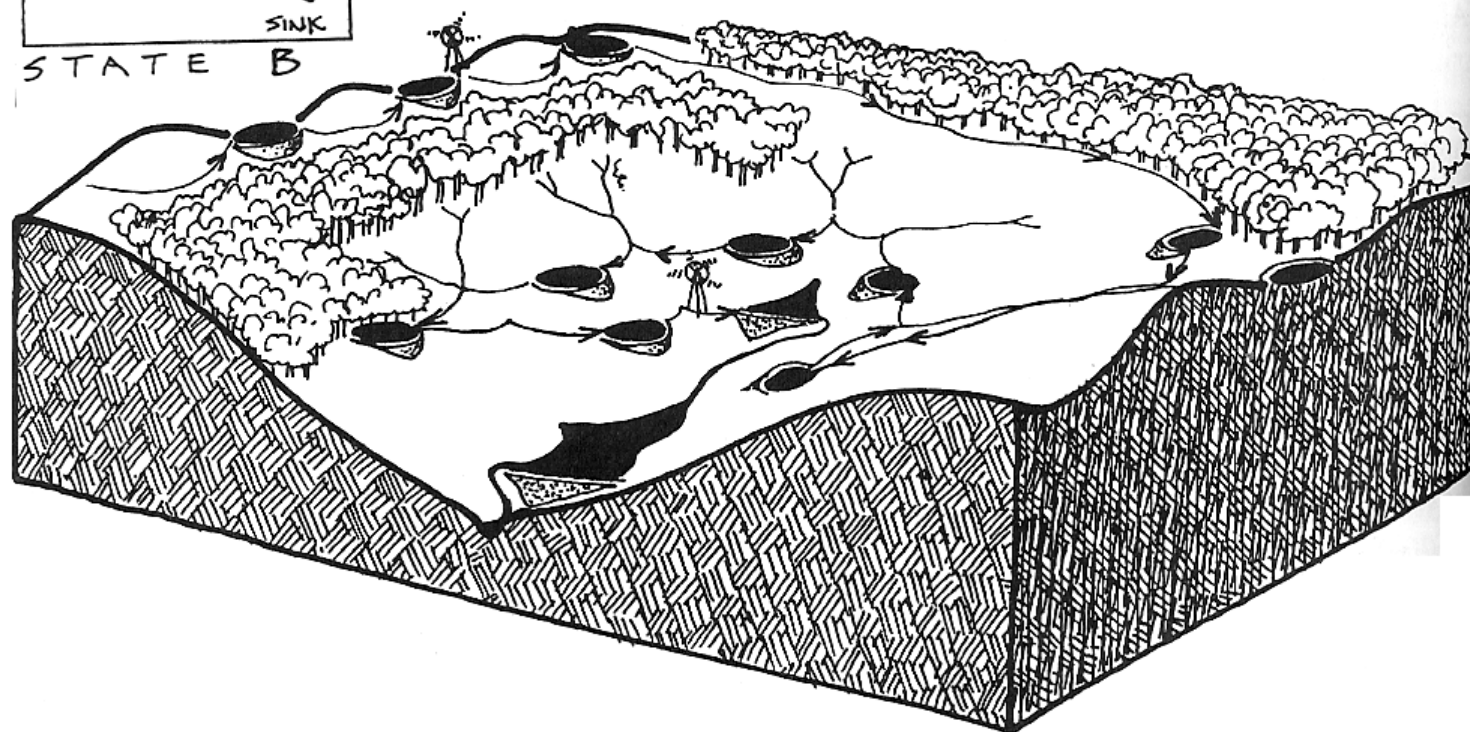
SCHEMATIC  
VERSION  
OF  
ENERGY  
PATHWAY  
THROUGH  
THE  
VALLEY  
SYSTEM.

STATE A





STATE B





## Small Dams Yield More Water Than Large Dams

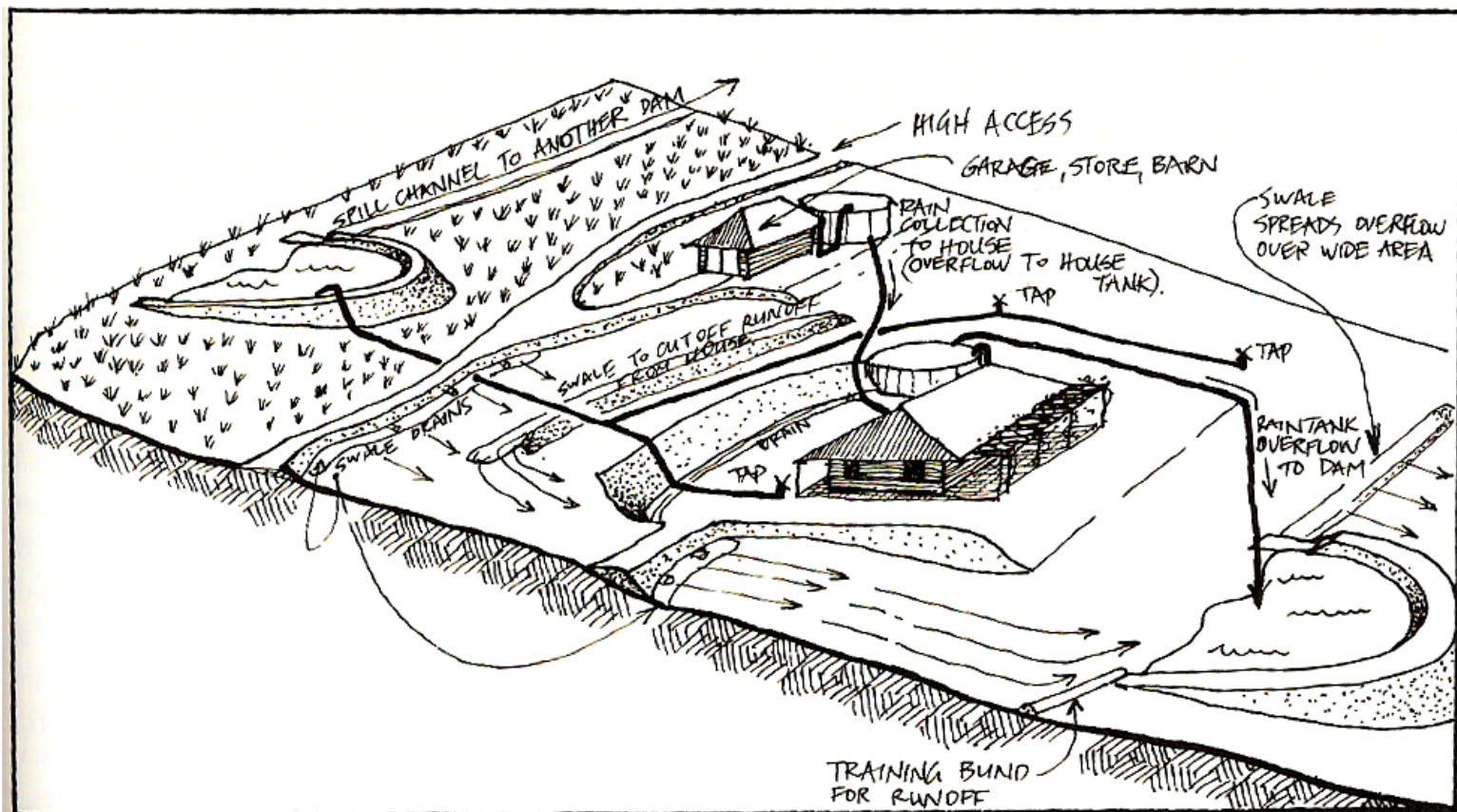
“In a drought-prone area where water is scarce, 10 tiny dams with a catchment of 1ha. each will collect much more water than one larger dam with a catchment of 10ha.”

~ Central Soil and Water Conservation Research Institute, Dehra Dun, India

“While a 1 hectare watershed yielded as much as 95 cubic meters of water per hectare per year, a 345 ha. watershed yielded only 24 cubic meters of wa./ha./yr. In other words, as much as %75 Of the water that could be collected (in the larger watershed) was lost (to evaporation and the soil).” The loss was even higher in a drought year.

“during drought years with less than 2 in.(50mm)of rainfall, watersheds larger than 123.5 acres (50ha.) will not Produce any appreciable water yield, while small natural watersheds will yield 4,400-8,800 gals. (20-40 cubic meters) per hectare, and micro-catchments, smaller than 0.24 acre (0.1 hectare) will yield as much as 17,597-21,997 gals. (80-100 cubic meters) per hectare.”

~Michael Evenari, Israeli Scientist



**FIGURE 1.7** Idealised layout of water, buildings, and access (vegetation not drawn to better show water movements). Swales distribute water over a wide grassed slope to prevent gully erosion during wet seasons.





**San Juan Islands, WA**  
**-15 500 gallon system**  
**Rain water is the**  
**sole water source.**







**Ashland, OR – 27 000 gallon system - Rain water supplies all fixtures in home.**





# RAINWATER — Rooftops - Storage

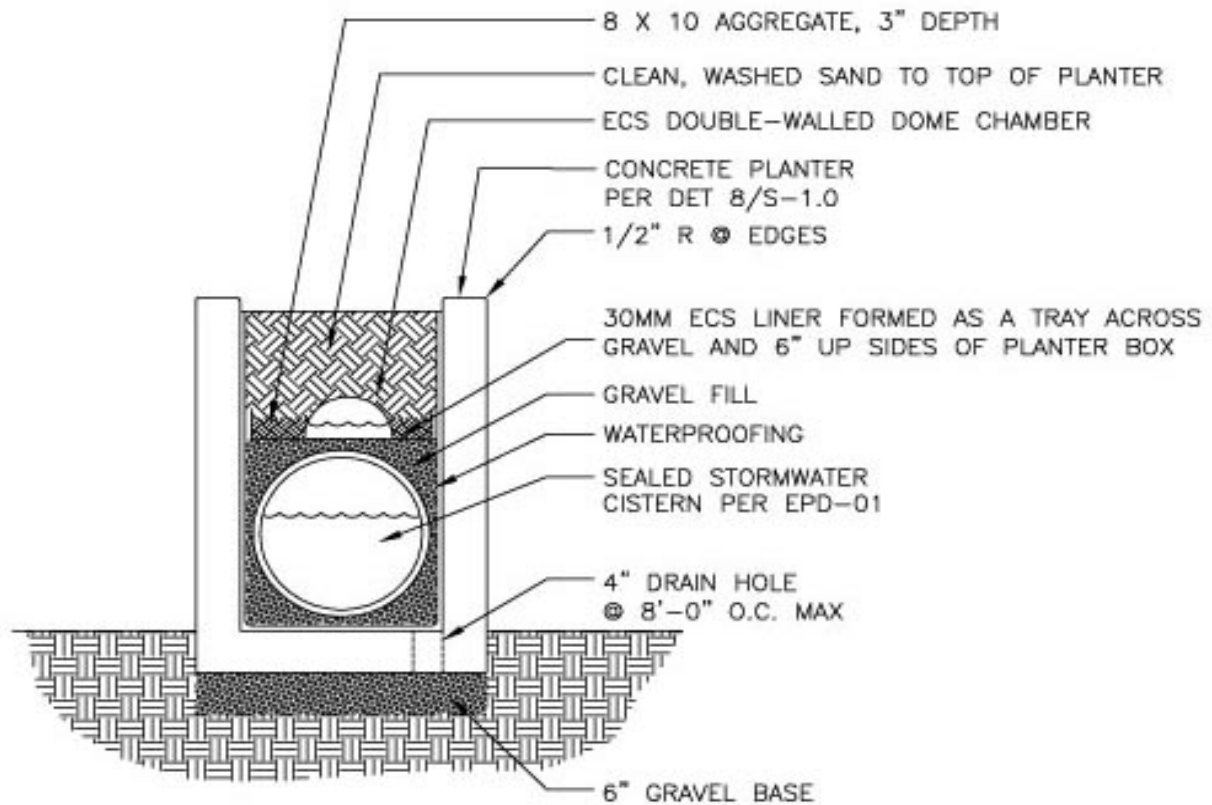


## ■ Planter Boxes

- Distributed Cistern
- Can be at grade, or below grade

## ■ Example:

- 2' diameter pipe along one side of one building (300') will yield 7,000 gallons of storage.
- Similarly, 3' diameter pipe at same length (300') will yield 16,000 gallons of storage.



## SECTION THROUGH CISTERN

1/2"=1'-0"

7



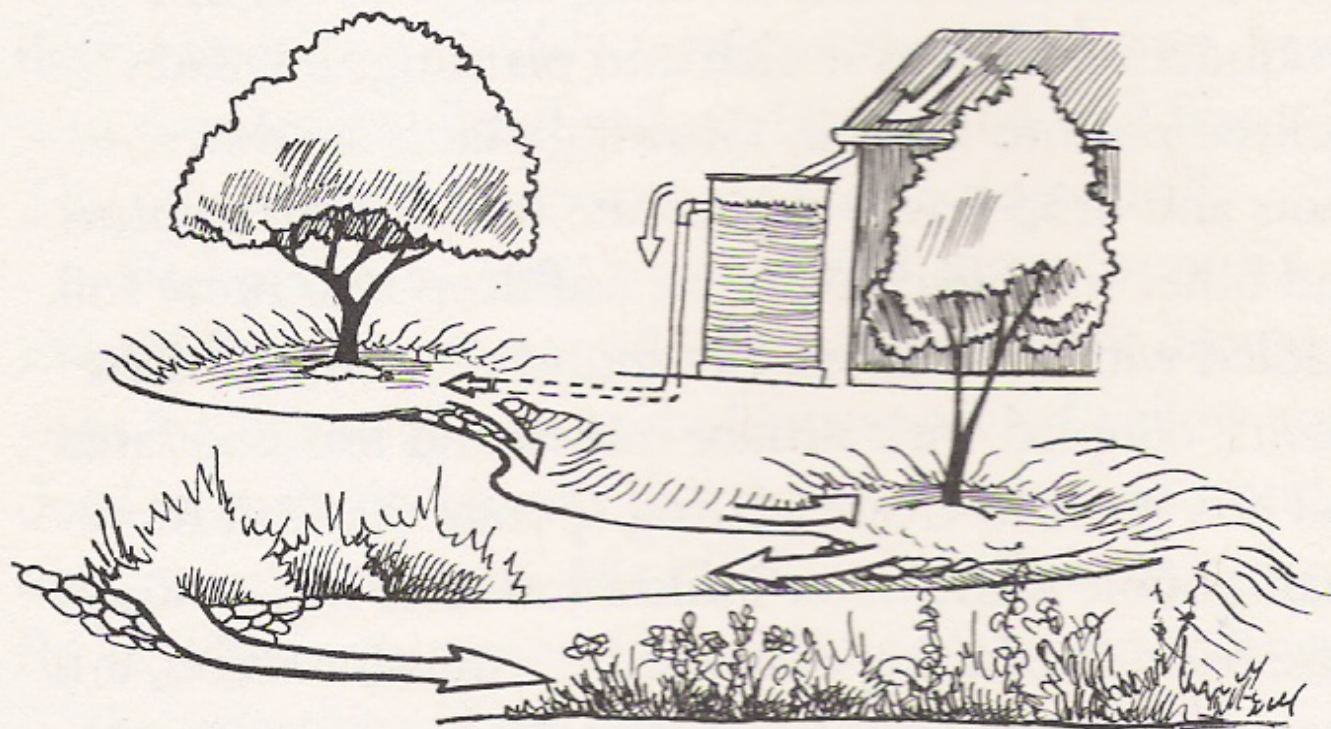


Fig. 1.17. Cistern overflow water directed to, filling, and then overflowing one earthwork to fill another and another



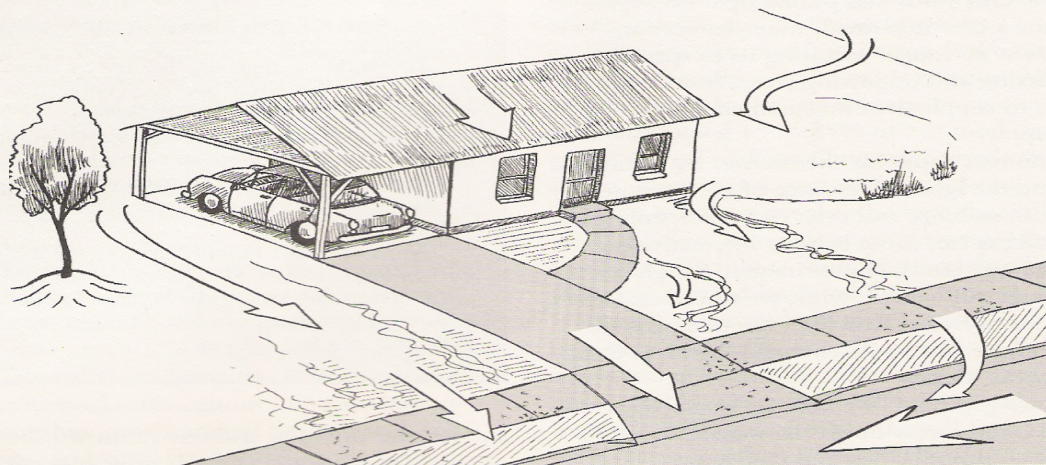


Fig. 1.1A. A landscape draining resources.  
Arrows denote runoff flow.

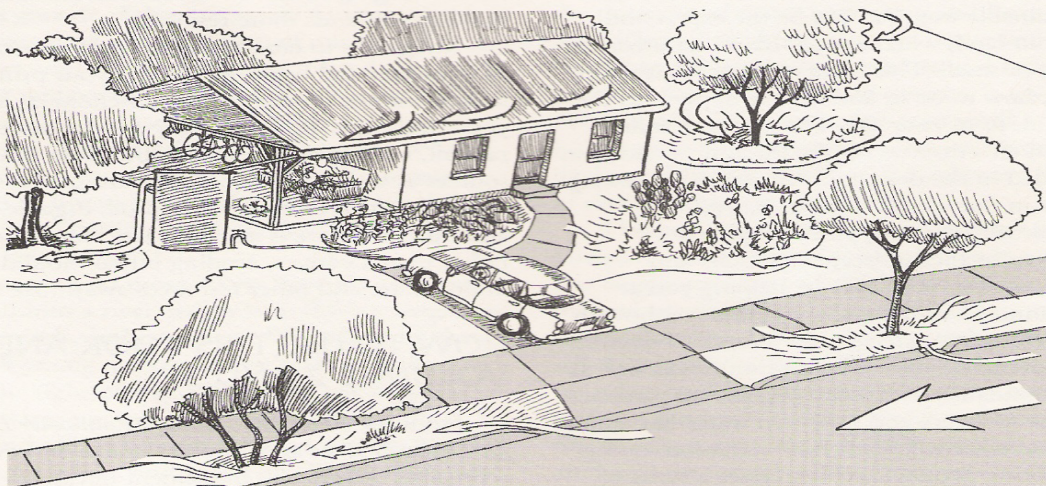


Fig. 1.1B. A landscape harvesting resources.  
Arrows denote runoff flow.





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Concrete cistern, aesthetically appealing,  
also provides  
passive heating and cooling with thermal  
mass



**Seattle City Hall  
-215 000 gallon  
system  
Rain Water use  
for toilets and  
irrigation.**





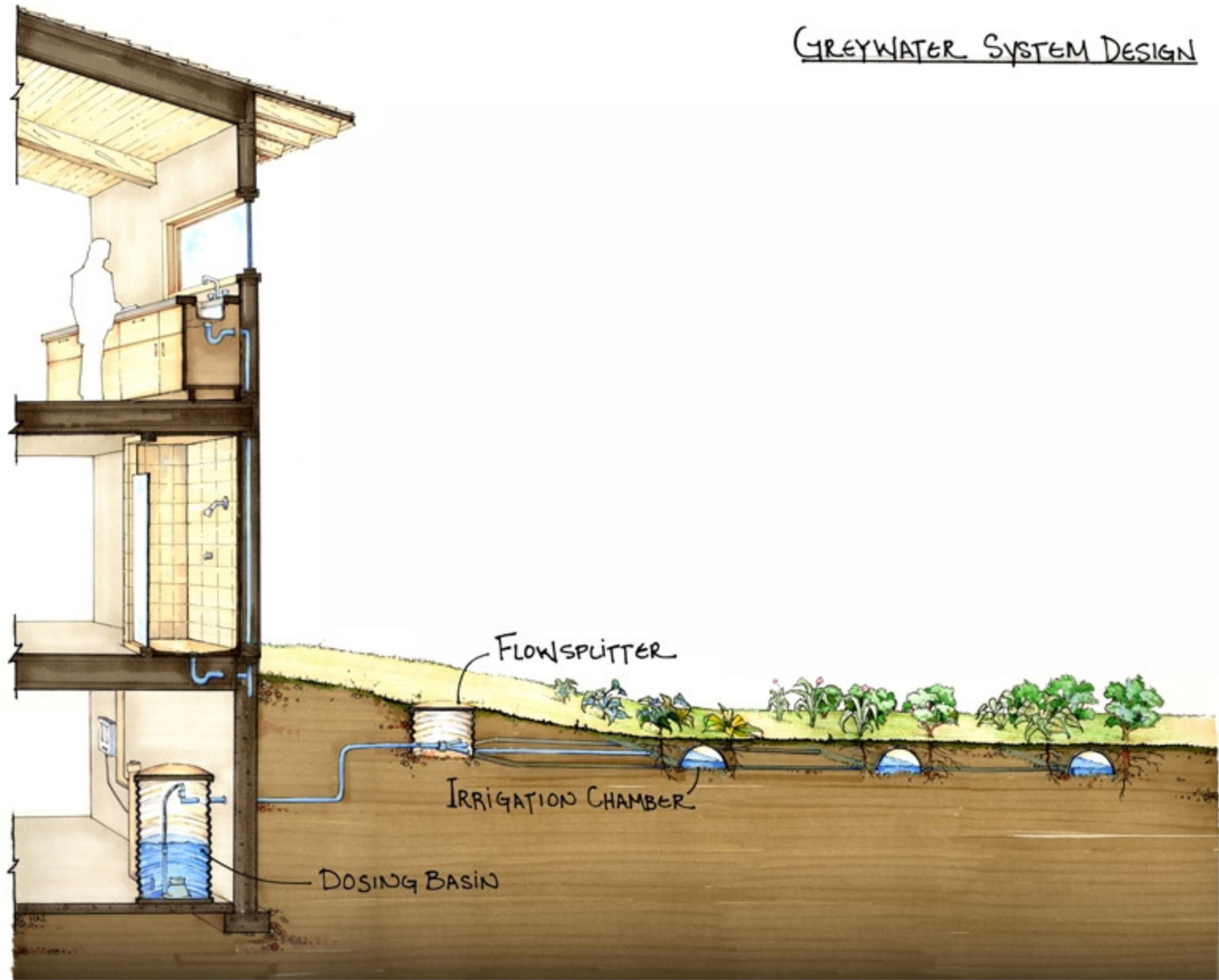
## ALTERNATE WATER SOURCES FOR NONPOTABLE APPLICATIONS

**1602.1.1 [HCD 1] Clothes Washer System.** A clothes washer system in compliance with all of the following is exempt from the construction permit specified in Section 1.8.4.1 and may be installed or altered without a construction permit:

- (1) If required, notification has been provided to the enforcing agency regarding the proposed location and installation of a gray water irrigation or disposal system.
- (2) The design shall allow the user to direct the flow to the irrigation or disposal field or the building sewer. The direction control of the gray water shall be clearly labeled and readily accessible to the user.
- (3) The installation, change, alteration, or repair of the system does not include a potable water connection or a pump and does not affect other building, plumbing, electrical, or mechanical components including structural features, egress, fire-life safety, sanitation, potable water supply piping, or accessibility.  
**Note:** The pump in a clothes washer shall not be considered part of the gray water system.
- (4) The gray water shall be contained on the site where it is generated.
- (5) Gray water shall be directed to and contained within an irrigation or disposal field.
- (6) Ponding or runoff is prohibited and shall be considered a nuisance.

- (7) Gray water may be released above the ground surface provided at least two (2) inches (51 mm) of mulch, rock, or soil, or a solid shield covers the release point. Other methods which provide equivalent separation are also acceptable.
- (8) Gray water systems shall be designed to minimize contact with humans and domestic pets.
- (9) Water used to wash diapers or similarly soiled or infectious garments shall not be used and shall be diverted to the building sewer.
- (10) Gray water shall not contain hazardous chemicals derived from activities such as cleaning car parts, washing greasy or oily rags, or disposing of waste solutions from home photo labs or similar hobbyist or home occupational activities.
- (11) Exemption from construction permit requirements of this code shall not be deemed to grant authorization for any gray water system to be installed in a manner that violates other provisions of this code or any other laws or ordinances of the enforcing agency.
- (12) An operation and maintenance manual shall be provided to the owner. Directions shall indicate that the manual is to remain with the building throughout the life of the system and upon change of ownership or occupancy.

## GREYWATER SYSTEM DESIGN









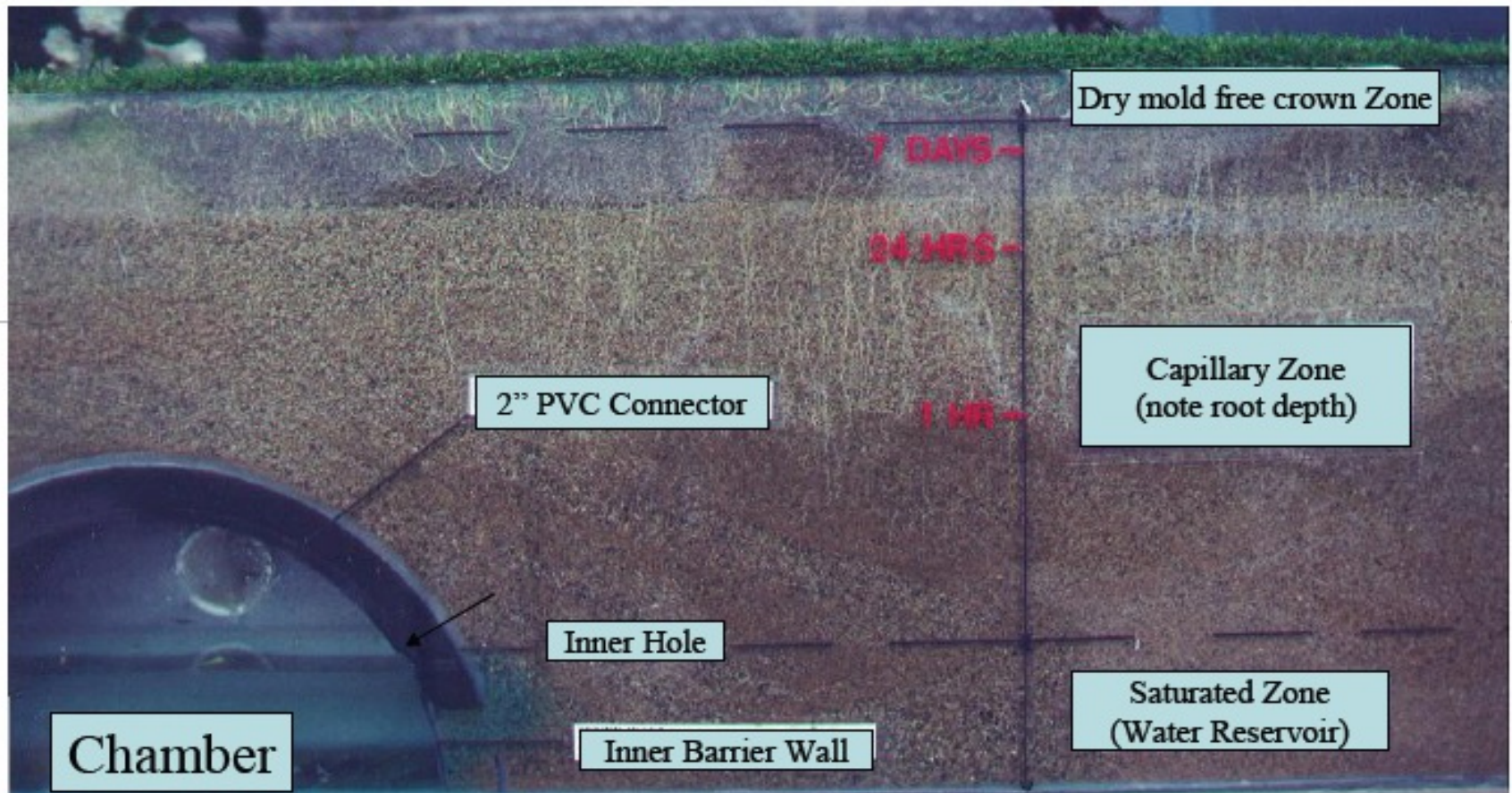
# Outdoor Conservation Products



**ECS System reduces water consumption by a minimum of 50%.**



# CROSS SECTION OF AN EPIC GROWTH CELL







**BELOW FIELD  
RESERVOIR  
40 PIPE X 380 FT.  
2,200,000 GALLONS  
CAPACITY**

**HIDDEN, NO ALGAE,  
NO EVAPORATION,  
RETRIEVAL BY SUMP  
PUMP TO ECS AND  
DRIP @ 12 GPM/ACRE**









**30,000 gallon rainwater  
harvesting storage**



**20,000 gallon rainwater  
harvesting storage**







**"When the well is dry,  
we will know the value of water. "  
~ Benjamin Franklin**

**Water conservation, collection and reuse  
are necessities for the future.**

**Thank you for your interest, your consciousness and your time.**

*save it on a rainy day*

