Watershed Management Group

Step one: Site sketch
Create a site sketch on a blank piece of paper including:
- Property lines
- House & other permanent structures (pool, driveway, shed, guest house)
- Existing trees & plants
- North/East/South/West orientation

Step two: Site Assessment
Choose 3-5 of the following sectors you would like to focus on for your site assessment. Using different colored pencils or marker for each, indicate them on your site plan.

Sectors:

Sun

Wind

View

Wildlife (including birds, pollinators)

Community & human use corridors

Water flow

Fire (potential fire hazards)

Pollution (including noise pollution)

Utilities

Step three: Storm events
Calculate the amount of rain you expect to be able to capture from 0.5", 1", and 2" storms.
Formula: Inches of rain x catchment area x 0.623 conversion factor x runoff coefficient = gallons of rain

Rain event	Catchment area (square feet)	Conversion factor	Runoff coefficient	Gallons of rain
0.5"		0.623		
1"		0.623		
2"		0.623		

Step four: Basin Placement
How many basins would you like to build? _____
Indicate approximate placement of basins on your site plan, keeping natural water flow and plant needs in mind.

Step five: Calculate basin capacity
Calculate the capacity of your basins.
Formula: Length x width x depth x 7.48 conversion factor = Volume (in gallons of water)

Basins	Average length (ft)	Average width (ft)	Average depth (ft)	Conversion factor	Volume (gallons)
Basin 1				7.48	
Basin 2				7.48	
Basin 3				7.48	
Basin 4				7.48	

Does the total volume of your basins match the expected rainfall from a 2-inch rainstorm? If not, can you add a basin or make some bigger to prevent possible run-off?

Runoff Coefficients for the Southwest United States

Surface	Runoff Range	Notes
Roof	0.80 – 0.95	Metal: 0.95, Concrete/asphalt: 0.90, Built up tar/gravel: 0.85 – 0.80
Paving	0.90 – .95	Older irregular surfaces may be lower than 0.90.
Bare Soil	0.20 – 0.75	A best guess based on characteristics of soil and experience. Unprotected soil surfaces tend to surface seal easily unless high levels of organic material or a high content of sand is present.
Soil with Vegetation	0.10 – 0.60	Leaf litter, basal area, and roots all help increase infiltration rates and can also absorb water.
Grass/Lawn	0.05 – 0.35	A high density of leaf area and root densities help reduce runoff. If soil underneath is compacted runoff rates can be higher.
Gravel	0.20 – 0.75	Use the coefficient of the ground below the gravel

*Chart adapted from 1) Lancaster, Brad. 2006. Rainwater Harvesting for Drylands, Vol.1.Rainsource Press and 2) Waterfall, Patricia. 2006. Harvesting Rainwater for Landscape Use 2nd Ed. Pima County Cooperative Extension.

Potential Harvested Rainwater Volume (gallons)

Catchment area (ft^2) x rainfall depth (in) x 0.623 (conversion) x Runoff Coef. = Volume (gallons)

Calculating Basin Volume (gallons)

- Quick Estimate: Average Surface Area (ft^2) x Average depth (ft) x 7.48 (gal/ft^3) = Volume (gallons)
- More Accurate Ballpark: Depth (ft) x ([L1 x W1] + [L2 x W2]) / 2 x 7.48 (gal/ft^3) = Volume (gallons)
- Most Accurate: CAD or GIS based delineation and calculation