Residential Rainwater Catchment Systems in Portland, OR

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Opportunity

- Portland area receives an average rainfall of about 40 inches per year
- During the wet season this water could be collected to serve water needs throughout the dry season
- No permit required to use rainwater outside the house



http://www.google.com/imgres?imgurl=http://www.bryankappa.com/Rainwater/portlandRainfall.jpg&imgrefurl=http://www.bryankappa.com/ rainwater.html&usg=__eQhavDSnl7Nolz0ylMxq1pYpAUI=&h=330&w=500&sz=22&hl=en&start=13&zoom=1&tbnid=tFsLEJKIVLN4XM:&tbnh=133&tbnw=184&ei=UN9xTdD-NYasQPnjvDDCw&prev=/images%3Fq%3Dgraph%2Bof%2Bportland%27s%2Byearly%2Brain%26um%3D1%26hl%3Den%26client%3Dfirefox-a%26sa%3DN%26rls%3Dorg.mozilla:en-US:official %26biw%3D1020%26bih%3D615%26tbs%3Disch:10%2C486&um=1&itbs=1&iact=rc&dur=389&oei=RN9xTY24FYKesQO3ztS7Cw&page=2&ndsp=14&ved=1t:429,r:12,s: 13&tx=134&ty=18&biw=1020&bih=615

Residence

- In this model home the roof has an area of 1,350 square feet
- This could catch approximately 30,000 gallons per year
- Calculating estimated water supply: Collection Area (sq.ft) x Rainfall (in/yr.) / 12 (in/ft) = Cubic Feet of Water/Year Cubic Feet/Year x 7.43 (Gallons/ Cubic Foot) = Gallons/Year

For example, a 500 sq. ft roof that gets 36 in/yr. will produce 1,500 Cubic Feet or 11,145 Gallons of water per year.





Elevation Diagram



Total Dynamic Head

- > 5% Friction Loss
- > 3 foot vertical incline
- > Approximately 5 foot head (2 meters)
- Flow rate 3 gallon/minute (.2 Liters)
- > Power (W)=TDH x Flow Rate x 9.81
- >4 Watts= 2 meters x $.2L^3$ /s x 9.81m/s²

Water Needs

- Catchment system for gardening purposes only
- The amount of water needed for gardening during the dry season of four months would be 30 gallons a day or 3,600 gallons for the season



Materials

• Little Giant 5-MSP 1/6 HP, 1200 GPH - Submersible Utility Pump, 10' power cord (505086) \$90









3- Rainwater Pipe HDPE 25mm Black Green,
25 meter coil- (RWH-HDPE25/25) \$50 ea.

• 45 Watt Solar Panel Kit, Chicago Electric Item # 90599



•2- 300 Gallon Above Ground Water Storage Tank, Polyethylene Plastic (TC4560IW) \$240 ea

5- 50 Gallon Reconditioned
Water Barrels, HDPE \$45 ea

• Garden Hose Shut Off Ball Valve, Gilmour 07 VGT \$8 ea



1/4" micro-line drip line,100 ft. drippers every 9".57 GPH at 15 PSI \$10 ea



Total cost: \$1,250

\$230



- Portland Bureau of Planning and Sustainability <u>http://www.portlandonline.com/bps/index.cfm?a=114750&c=42113</u>
- Portland Bureau of Environmental Services <u>http://www.portlandonline.com/BES/index.cfm?c=43081</u>
- Portland Bureau of Planning and Sustainability <u>http://www.portlandonline.com/bps/index.cfm?a=114750&c=42113</u>
- Portland Bureau of Environmental Services <u>http://www.portlandonline.com/BES/index.cfm?c=43081</u>
- Rainwater Harvesting Company <u>http://www.rainwaterharvesting.co.uk</u>
- Rain Exchange <u>http://www.rainxchange.com/</u>
- Build-It Solar- Rainwater Catchment <u>http://www.builditsolar.com/Projects/Water/Water.htm</u>
- > The Rainwater Harvesting Community <u>http://www.harvesth2o.com/</u>