### RAINWATER CONSERVATION SYSTEMS BY COLE DESIGN MONTECITO

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## COLDSPRINGS WATERSHED CALCULATIONS

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WEB SITE: COLEDESIGNMONTECITO.COM COLD SPRINGS SANTA BARBARA 250 AF/YEAR PILOT PROJECT 81.5 Million Gallons

CONTROLLED FLOODWATER COLLECTION AND RELEASE SYSTEM

### CALCULATIONS



# COLD SPRINGS WATERSHED CALCULATIONS

- A. 10,000 X 10,000 square feet watershed includes 3 forks to East Mountain
  Drive = 100Million square feet / 43,560 = 2,295 acres of watershed.
- B. 30% runoff figure used, thus 30% of 2,295 thus .30 X 2,295 = 688.5 acres of actual acres draining to East Valley Road crossing.
- C. One foot of rain in watershed will produce 688.5 acre feet of water, or 224,185,488 gallons at East Valley crossing per one foot of rain. Divide this by 12" = 18,682,124 gallons per inch.
- D. 18,682,124 gallons / 43,460 = 57 acre feet of water per one inch of rain at crossing.
- E. One inch of rain over 24 hours = 2.38 AF per hour at crossing.
- F. 2.38 AF X 325,851 (gallons per AF) = 778,421 gallons per hour GPH at crossing per one inch of rain.
- G. 778,421 GPH / 60 minutes = 12,973 gallons per minute GPM
- H. 12,973 /60 seconds = 216 GPS (gallons per second) at crossing per one inch rain
- I. <u>216 GPS / 7.48 = 28.87 CFS</u> (cubic feet per second) at crossing in one inch rain over 24 hour period.

### CUBE CAPTURE RATES 16" X16" X 6' with 12" Exit Pipe

- A. Water Captured per cube @ 24" creek height and 7' per second flow rate (FPS)
- B. 12" PVC pipe thus 3.14 X 6 squared = 113 cubic inches, x 12 linear inches of 12" pipe = 113 sq in x 12 = 1,356 sq in / 1728 = .75 cu in per foot or 12" pipe.
- C. .75 cu ft x 7 FPS (Feet Per Second) = 5.25 CFS exit from 12" pipe...
- D. 5.25 CFS x 7.48 = 39.2 GPS per cube @ 7 FPS stream flow
- E. (3) cubes = 39.2 x 3 = 117.8 GPS (gallons per second)
- F. 117.8 x 60 seconds = 7,068 GPM
- G. 7,068 x 60 minutes = 424,040 GPH
- H. 424,040 GPH x 24 hours = 10,177,920 GPD gallons per day
- 10,177,920 gallons / 325,851 = 31.32 AF per one inch rain with (3) cubes at max output.