

Declaration of Mark Grey, Ph.D., concerning the volume of water required for full retention on-site in order to comply with volume capture and limitation of effective impervious area to less than 5%.

Single Family Home Example (Typical Residential Subdivision)

Assumptions: Whole Lot = 6,600 square feet

Home Footprint = 2,500 square feet (impervious)

Garage Footprint = 400 square feet (impervious)

Driveway/Patio/Sidewalk Footprint = 500 square feet (impervious)

Total Home Imperviousness = 3,400 square feet

Allowable EIA = 6,600 square feet x 0.05 = 330 square feet

Applying 5% EIA allows 330 square feet of directly connected impervious area and requiring complete onsite retention from 3,070 square feet results in the following runoff volume =

$$(3,070 \text{ ft}^2 \times 95\% \text{ runoff coefficient}) \times (0.75/12 \text{ in-ft conversion}) \times 7.48 \text{ gal/ft}^3 = 1,363 \text{ gallons}$$

Public Facility Construction Example (Fire Station)

This case is based on an actual fire station currently under construction in Simi Valley. The project manager has indicated that 15% of the site is landscaping.

Assumptions: Whole Lot = 1.78 acres (77,537 square feet)

Building, Parking, and Driveway Footprint = 65,906 square feet

Total Site Imperviousness = 65,906 square feet

Allowable EIA = 77,537 square feet x 0.30 = 23,261 square feet

Because the fire station under construction is within Simi Valley, I am assuming it would qualify for the Alternative Compliance path (either because of high groundwater or because it is an infill location).

Applying 30% EIA allows 23,261 square feet of directly connected impervious area and requiring complete onsite retention from 42,644 square feet results in the following volume =

$$(42,644 \text{ ft}^2 \times 0.95\% \text{ runoff coefficient}) \times (0.75/12 \text{ in-ft conversion}) \times 7.48 \text{ gal/ft}^3 = 18,939 \text{ gallons}$$

10-Acre Commercial Site Example (Hypothetical Low Density)

This case is based on the example included in the Draft Technical Guidance Manual prepared by Ventura County Watershed Management District. The case is extremely low density and not consistent with most zoning in Ventura County. Nonetheless, the calculations for this hypothetical site are as follows:

Assumptions: Whole Lot = 10 acres (435,600 square feet)

Building and Parking Footprint = One-half of site = 5 acres (217,800 square feet)

Driveway Footprint = 0.5 Acres (21,780 square feet)

Total Site Imperviousness = 239,580 square feet

Allowable EIA = $435,560 \times 0.05 = 21,780$ square feet

Applying 5% EIA allows 21,780 square feet of directly connected impervious area and requiring complete onsite retention from this area results in the following runoff volume=

$$(217,800 \text{ ft}^2 \times 0.95) \times (0.75/12 \text{ in-ft conversion}) \times 7.48 \text{ gal/ft}^3 = 96,730 \text{ gallons}$$

Visualizing Water Volume Storage Requirements

To assist in understanding the physical requirements of handling the volumes above, I offer the following comparisons:

Rain barrels commonly hold approximately 50 gallons. The single family home example would need 27 rain barrels.

The typical backyard swimming pool is between 18,000 and 20,000 gallons, depending on depth. The Fire Station currently under construction in Simi Valley would need to add land to accommodate that swimming pool.

The typical swimming pool used for local competitions is 25 yards in length and 3.5 feet deep. To store water from the commercial site, an area equivalent to a 6-lane pool is required.