

## Model for Pool Covers and Pool Filters For Single Family Homes

Developed by Heather Rose, Fall 2019

### Pool Cover

Reduce outdoor water demand by reducing pool filling

$$\text{Water Savings} \left( \frac{Af}{yr} \right) = P_{covered} \times ET \text{ (in)} \times \text{Area}_{avg} \text{ (ft}^2\text{)} \times \frac{144 \text{ in}^2}{\text{ft}^2} \times \frac{1 \text{ US gal}}{231 \text{ in}^3} \times \frac{\text{acre} - \text{feet}}{325,851 \text{ gal}}$$

#### Terms:

$P_{covered}$  = Percent of time the pool is covered, assume 70%

$ET$  = Annual Evapotranspiration by region, assume 52.6 inches (TWDB 2011)

$\text{Area}_{avg}$  = Avg. Pool Size = 384 ft<sup>2</sup> (City of Austin 2012)

#### Resources:

TWDB (2011). *Lake Evaporation and Precipitation*. Water Data for Texas.

Available at: <https://waterdatafortexas.org/lake-evaporation-rainfall>

City of Austin (2012). City of Austin Digest Swimming Pool Covers.

---

### Pool Filter

Reduce outdoor water demand by eliminating backwash needs for sand filters.

$$\text{Water Savings} \left( \frac{Af}{yr} \right) = (WD_{sand} - WD_{cartridge}) \left( \frac{\text{gal}}{\text{year}} \right) \times \frac{1 \text{ acre} - \text{foot}}{325,851 \text{ gallons}}$$

#### Terms:

$$WD_{sand} = \text{Annual water demand of a sand filter} = 400 \frac{\text{gal}}{\text{week}} \times 52 \frac{\text{weeks}}{\text{year}} = 20,800 \frac{\text{gal}}{\text{year}}$$

$$\begin{aligned} WD_{cartridge} &= \text{Annual water demand of a cartridge filter} = 75 \frac{\text{gal}}{\text{cleaning}} \times 4 \frac{\text{cleanings}}{\text{year}} \\ &= 300 \frac{\text{gal}}{\text{year}} \end{aligned}$$

(SAWS 2012)

**Resources**

San Antonio Water System (2012). *Swimming Pool Filter Replacement Rebate*.

Available at: [https://www.saws.org/Conservation/CaseStudies/docs/PoolFilterRebate\\_20121004.pdf](https://www.saws.org/Conservation/CaseStudies/docs/PoolFilterRebate_20121004.pdf)

---

**Percent of Single Family Households with Pools**

*Percent of Single Family Homes with Swimming Pools = 13%*

**Resources:**

US Census Bureau (2013). *2011 Housing Profile: United States*.

Available at: <https://www.census.gov/prod/2013pubs/ahs11-1.pdf>