

## Fact Sheet – Source Material – Updated March 11, 2022 v2

### SONOMA COUNTY COMMERCIAL CANNABIS WATER DEMAND

**Water Demand:** Several sources of data were used to determine cultivation water demand:  
1) Sonoma County 2021 SMND estimates (pgs. 67-74), when methodology is applied correctly;  
2) Napa 911 Report (pg. 17, with footnote), and 3) cannabis industry research by New Frontier Data and the Illinois State University Study, as summarized in MjBiz.

**Bottom Line:** Reports show that cannabis product cultivation water use, when compared to other crops production, find that cannabis is a significant water user, using more water than other products and certain food crops. These analyses are on a plant vs plant or acre comparison. Wine grapes are very water efficient; however, the winery production uses significant amounts of water, and cannabis manufacturing uses significant amounts of energy.

**Sonoma and Napa County Estimates:** When the correct methodology is used to translate inches to gallons and acre-feet/year, the Sonoma and Napa estimates bracket an estimated **water demand of one (1) million gallons/year**, noting that outdoor and mixed light are limited to 1 acre on 10-acre parcel, and greenhouse grows are limited to 2,500 square feet/new greenhouse, yet can do 2-3 harvests per year.

**Sonoma County 2021 ASSUMPTIONS (pg 69) – “water use requirements for outdoor cannabis production are 25 to 35 inches per year” – Correct Mathematical Calcs below**

35 inches/year of irrigation (about 3 feet) on 1 acre (3 feet x 43,560 sq ft = 130,680 cubic feet)  
130,680 cu ft x 7.48 gallons/cubic foot = **977,486 gallons**  
(25 or 35 inches /12 inches/foot) = translates from 2.08 AFY to 2.92 AFY

Link: [https://www.winebusiness.com/content/file/9111\\_Report\\_082019.pdf](https://www.winebusiness.com/content/file/9111_Report_082019.pdf)

**Napa County 9111 Report, August 2019, (pg. 17) assumed about 40 inches per year per harvest. 40 inches translates to **1.1 million gallons/year** or 3.38 acre-feet per year.**

Note: Napa Supervisors concluded that outdoor cannabis cultivation in the Ag Zone or hillside areas would interfere with tourism and wine grape production; thus, limited cultivation to Industrial zoned areas.

**Source and Methodology - Napa County 2019 Assumptions** were drawn from review of the literature (Napa 9111 Report pg. 17)

“A review of a number of studies and articles regarding water usage for cannabis cultivation<sup>xv</sup> suggests that it takes **around 250 gallons of water to produce one pound of dried cannabis flower**. For our cannabis productivity projections, we commonly assume that it **takes 10 square feet of canopy to produce one dried pound of cannabis outdoors**. By this measure, one acre (43,560 square feet) of cannabis plants should yield around 4,356 pounds of dried flower. Applying the figure of 250 gallons of water per pound, the total water consumption for an acre of cannabis production would be around 1,100,000 gallons per year, or 3.38 acre-feet per year (AFY).<sup>xvi</sup>

**Comparison to wine grapes and residences:** One acre of vineyard irrigation uses 0.2 to 0.5 AFY per acre (65,170 to 162,295 gallons) Primary residences use 0.5 to 0.75 AFY.<sup>xvii</sup>

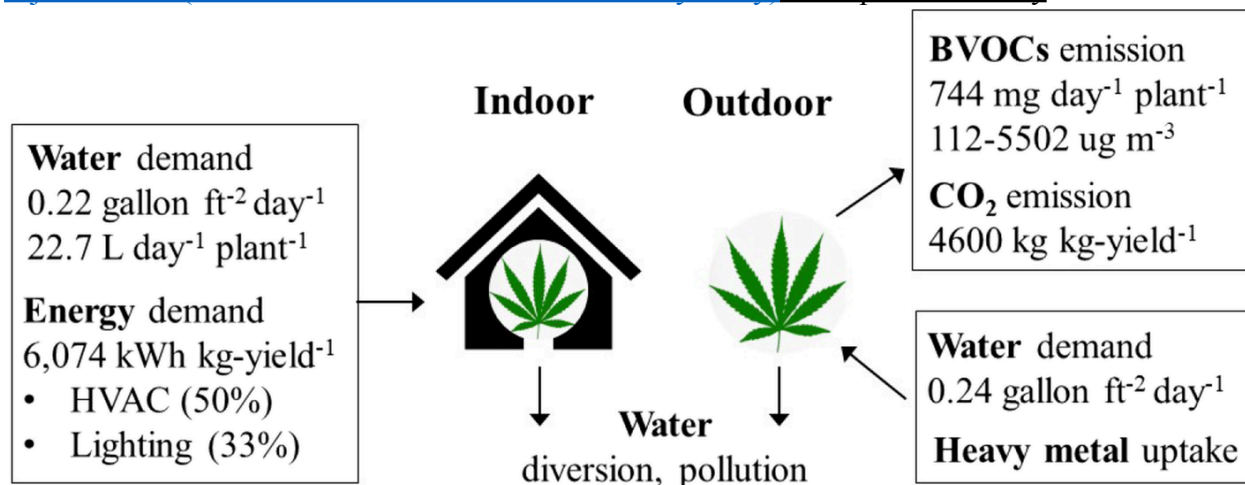
Napa Baseline recognizes that land use and water demand go together, and acknowledges existing vineyard and residential water use.

**Cannabis vs Wine Grapes:** Like the cannabis industry's New Frontier Data and MjBiz with comparisons of cannabis water demand against cotton and almonds, the 2021 Sonoma analysis compared cannabis water use against alfalfa, tomatoes and hops – all with a high demand rate of 30+ inches/ year.

The comparison crops are not generally grown in Sonoma County- wine grapes are grown. Translating from acre-feet to inches, vineyards use about 3 to 6 inches per year vs. cannabis at 25 to 35 inches or Napa's cannabis demand assumption of 40 inches/year. Thus, cannabis uses about six times more water than wine grape cultivation.

**Cannabis Industry Source:** Researchers conclude that cannabis product cultivation requires about **twice the amount of water** than commodities and certain food crops. This challenges the belief that cannabis is a good alternative for regions with scarce water supplies.

[MjBiz article \(and associated Illinois State University study\)](#) – Graphic Summary



**Baseline Acreage Data – New Water Demand:** Current State (end 2021): Permitted outdoor cannabis acreage was reported in the County's [March 15, 2022 Supervisor report](#). As of March 2022, Sonoma County reported permitting about 44 acres of outdoor cultivation, about 2 acres of mixed light, and 1.5 acres of Indoor Greenhouse. Assuming **Sonoma has permitted about 46 acres: Water demand using Napa's 3.38 AFY yields about 50 Million gallons or 155.5 AFY. Using Sonoma County's 2.9 AFY yields 133.4 AFY.**

**Napa Scenario Planning:** Napa studied a range of water use impact **from 32 to 64 acres:** Napa Report (Pg 17): "... Implementation of 32 to 64 acres of cannabis cultivation would result in **new water demands** of 108.16-to-216.32-acre feet/year (AFY)."

And, to date, the **County has not completed a cumulative impact assessment.** Cannabis water demand grows to astronomical levels very quickly: i.e.: 1,000 acres @ 1M gallons/acre/year

results in demand for 1Billion gallons of water. Unlike other Counties, Sonoma County has not placed a cap on the total acreage of cannabis permits.

Note: A baseline analysis needs to balance supply with demand: currently, how much cannabis is grown in the county vs. how much is sold in County. How much is being grown in California, and how much sold within California, it is illegal to transport cannabis over state lines. (Despite RCRC's recommendation to break Federal law.)

**Take Away:** New Frontier Data issued a [2021 report stating that cannabis water use will almost double by 2025](#). The report reveals that water use practices are highly diverse in the new regulated cannabis industry, and the illicit cannabis crops are expected to remain the driver of water use even past 2025.

Because of this, the researchers recommend that evaluation of future cannabis water efficiency be based upon canopy square footage, not plant count as it has in the past.

**Key Findings:** By 2025, total water use of the legal cannabis market is expected to increase by 86%.

- Combined legal and illicit cannabis crops used nearly 2.8 billion gallons in 2020, with usage forecast to reach 3.6 billion gallons by 2025 fueled by demand-driven growth.
- The illicit market will remain the primary driver of water use over the next five years, accounting for 83% of water use in 2020, and declining to 69% in 2025.