

CHALLENGE

Hyperscale data center improves **WUE by 25%** and saves **136.8M gallons** of water per year — with Tier 3 / Tier 4 availability intact

A hyperscale data center operator was constrained by water quality and cooling-water chemistry. High calcium, high alkalinity and a phosphate-based program held the system to only 3 cycles of concentration — driving water demand, sewer cost and an ESG / WUE position that blocked expansion into preferred locations.

UNIT SERVED

Hyperscale data center · Main cooling

KEY ISSUE

3 CoC ceiling · Phosphate program

RISK

WUE / ESG · Expansion blocked

RESULT

25% WUE · 136.8M gal/yr saved

CHALLENGE

What was happening

Hyperscale data center operator was blocked from expanding into preferred locations by water demand. High-calcium, high-alkalinity makeup water and a phosphate-based cooling program limited the system to only 3 cycles of concentration, driving high makeup, blowdown and sewer load — and a deteriorating WUE position against ESG targets.

INTERVENTION

What we did

3-year water-quality and operations review, onsite evaluation, operator and service interviews. Advanced saturation modeling, proprietary closed-loop particle-size prediction with failure forecasting, and a redesigned chemistry program: non-phosphate organic / polymeric, no inorganic corrosion inhibitors, automated chemical-feed resiliency and online monitoring — all corrosion and deposition KPIs met.

PROOF · BASELINE > AFTER

1. Cycles of concentration: 3 > significantly higher.
2. WUE: improved 25%.
3. Water saved: 136.8M gal/yr.
4. Availability: Tier 3 / Tier 4 maintained — all corrosion and deposition KPIs met.

VALUE DELIVERED

136.8M gal/yr

saved · 25% WUE improvement · \$150K/yr cost

WUE improvement

25%

Water saved

136.8M gallons / yr

Chem + sewer cost

\$150,000 / yr

Availability

Tier 3 / Tier 4

Expansion

Unblocked

Data centers have multiple critical failure points across main cooling, closed cooling and TCS loops. The right water-chemistry decisions unlock WUE, cost and expansion at the same time — without trading availability. Most systems can be reviewed remotely; your system deserves a look.