



Somerset Ponds

Shared Facts around the Architecture and Operation Updated 09-28-26

Somerset Pond System – Purpose



- Ponds were designed to be an integrated system for:
 - Irrigation
 - Retention
 - Drainage
 - Aesthetics

Somerset Pond System- Architecture

Two Sections



- Ponds are split into Two Sections:
 - Ponds 2-7 & Decorative Waterfall
 - Water flows downhill from Pond 2 to Pond 7, then is recirculated by Pond 7 to top of Ponds 2 and Waterfall
 - Ponds 8-11
 - Water flows downhill from Pond 11 to pond 8, then recirculated back to top of Pond 11 - Aeration
- Pond 8 is filled from Pond 2
- Pond 7 can be fed from Pond 8 (and visa versa) but normally from Pond 2/3

Pond History and Facts



- Ponds Platt created in mid 90's
- Pond 2-3 sits on Somerset **Common Area** (Outlot D)
- Pond 8-10 sits on Somerset **Common Area** (Outlot C)
- Pond 4-7 sits on an Easement across Private Land
 - Easement was platted in mid-90s to accommodate Ponds 4-7
 - Easement is defined as **Drainage, Utility, and Landscaping**
 - Pond 7 was the initial irrigation pond for Somerset

Ponds 2-7 Purpose - Irrigation



- **Primary Purpose: Irrigation of Somerset's 10 acres of Greenery**
 - Delivered from:
 - Pond 2
 - Pond 7 (in the past)
- Provide a Center Piece for Somerset
 - Waterfalls and Pond 2/3

Pond 2-7 Irrigation Function

Under Fully Functional Ponds



- Pond 2 alone Covers much of the Irrigation need by
 - Pumping 24 hrs a day, 6 days a week.
 - Capacity challenged (some manual intervention for burn spots)
- Pond 2 & 7 can cover needs by watering in parallel in the evening/night.
 - Has Capacity for irrigation needs
 - Avoids Evaporation and burning during day (Approx 2.5 AF evaporation from Day watering per season)
 - Pond 7 is ready to irrigate in 2027 season
- Circulation provides needed Aeration of Water
- Ponds 2-7 at a minimum capture 2.1 AF annually from Niwot's average rainfall of 16 inches. (Just rainwater falling directly into the ponds, no runoff)
- Overflow from Pond 7 flows into the Open Space

Purpose of Ponds 8-11



- Pond 8 and 9 were designed to be:
 - retention
 - aesthetic ponds
- Pond 8 water can be pumped up to pond 7 if the irrigation ponds (7&2) are running low on water.
- Pond 9 can be manually pumped into Pond 8 if more backup water is needed for Irrigation ponds.
- Operational Costs Annually
 - \$7k Electrical
 - \$8k Maintenance (whole outlot)

Delivering water to the Ponds System



- Source of Water comes from the BWR (Boulder White Rock) and BLH ditches (Boulder Left Hand)
- Water flows from Ditches to Pond 1 in Somerset HOA north of Estates, then pumped to Pond 2
- Somerset irrigation water usage:
 - On Average 37 AF per season
 - Standard Dev of 10AF
 - Water Ownership
 - Shares owned = 10.4 AF
 - Water shortage – 26.6 AF
 - 16 AF of free water at beginning of season
 - 10.6 AF Leased per season from other Owners (varies)

Water Challenge



Water shortage – 26.6 AF

- 16 AF of free water (can vary)
- 10.6 AF Leased
- Able to lease shares from other organizations but not guaranteed
 - 2025/2026 leased 10 shares or 7AF for \$140/AF and \$180/AF respectively, from another HOA, but this was a struggle.
- Challenge each year to acquire leased water.
 - Currently exploring establishing a new brokerage relationship to better search for additional Permanent Water Shares.
 - Al Orensdorf – Annual Savior by leasing

Conclusion:

- Acquire Rights to more Water to Protect our Future
 - Leasing Water has become a big Challenge
- Somerset should Initiate creating an environment of lower water usage.
 - Reduce water need of Greenery (need a Lead in community to drive)
 - Stop Leakage of Ponds (attacking now) – 7.6AF Savings

What About Drought Years? Water Retention



- Irrigation needs on Average
 - 0.22 Acre Feet (AF) per day
 - Or about 37 AF a season
- Ponds 2,3,7,8,9 Retain:
 - 6.3 Acre Feet (AF) of water
- Capacity by Pond

• Pond 2 – 2 AF	7 Days of watering
• Pond 3 - .6 AF	2 Days of watering
• Pond 7 – 1.4 AF	5 Days of watering
• Pond 8 – 1.6 AF	5 Days of watering
• Pond 9 – .7 AF	2 Days of watering
- Or About 21 Days of Watering Capacity

Challenge: Drawing down any Pond exposes the liners to damage from direct UV rays
- Reconditioned Ponds 2&3 will have special synthetic cover over whole liner to solve this problem.

Ponds – Evaporative & Leakage Effects



- Estimated Evaporation and Rainwater Capture in Ponds 2-11 Annually
 - 7.4 AF of water in Evaporation loss (Study done 2018)
 - However, 3.4 AF of rainwater is captured (assumes avg rainfall of 16 inches a year in Niwot, and no runoff)
- Leakage of 3 Major Ponds Monthly
 - Major Pond Leakage has Grown to 1.9 AF per **month**
 - Ponds 2 – 0.85 AF
 - Pond 3 – 0.55 AF
 - Ponds 7 – 0.50 AF
- With Leased water at \$180 per AF
 - Little financial issue - \$2,000 per Season but rising
 - **Real Future Challenge is Acquiring Water for the Ponds**

So, Let's Talk on How Pond 7 Supports Pond 2 Irrigation



- Pond 2 needs to deliver water to irrigate but Pond 1 cannot feed pond 2 synchronously, so Pond 2 drops in level.
- However, since pond 7 is pumping back up to Pond 2, it can keep pond 2 full and Pond 7 is the one that loses water and lowers itself to support pond 2.
- Eventually, pond 1 refills the system at night and pond 7 rises.
- This is why we call pond 7 the buffer pond.
- Valves can be adjusted to modify this dynamic



Operational costs of ponds

- Pond operational cost Annually are very similar (maintenance + electricity)
- Pond 2-7 Elect \$7k
- Pond 4-7 Maint** \$5k**+ Pond Repair (last repair in 2001 of \$15k)
- Pond 2-3 Maint \$7k + Pond Repair (last repair of P2 in 2024 of \$60k)
- Ponds 8-11 \$7k Electrical, (Total Redo of Pond 8 in 2020 of \$112k) \$8k Maintenance
- Total Costs \$34k** + Pond Repair

** Homeowners around 4-7 supply most of the maintenance \$\$s, but not for liners

Ponds System Summary

- Pond System Design is well balanced and properly:
 - Irrigates the 10 Acres of Somerset Greenery well, especially if parallel watering is used
 - Supplies 21 irrigation days of water retention
 - Contributes to the Aesthetics of the Area recognizing that aesthetics are in the eye of the beholder
- Operational Cost of the Pond system Annually
 - \$34k in Maintenance and Electrical
 - \$2-3k dollars in water acquisition
- Water supply continues to be challenging
 - Need on average 37AF of water (has been as high as 49AF)
 - Ponds Evaporation rate is about 7.4 AF per year
 - Ponds 2,3,7 leak about 7.6 AF per season (4 months = 2.4 million gallons)
 - Ponds 1-11, 2-7, and 4-7 do acquire at a minimum of 3.6, 2.1, and 0.7 AF of rainwater, respectively, during the year. Average rainfall in Niwot is 16 inches a year. (This only assumes the rainwater that falls directly in the ponds, no runoff)
 - On average need to lease 10 AF of water at \$180 per AF (cost in 2026) to support season
 - Availability of units to lease has become the Challenge, not cost
 - Currently Setting Up Formal Search to Proactively Acquire Water Rights to Protect our Future