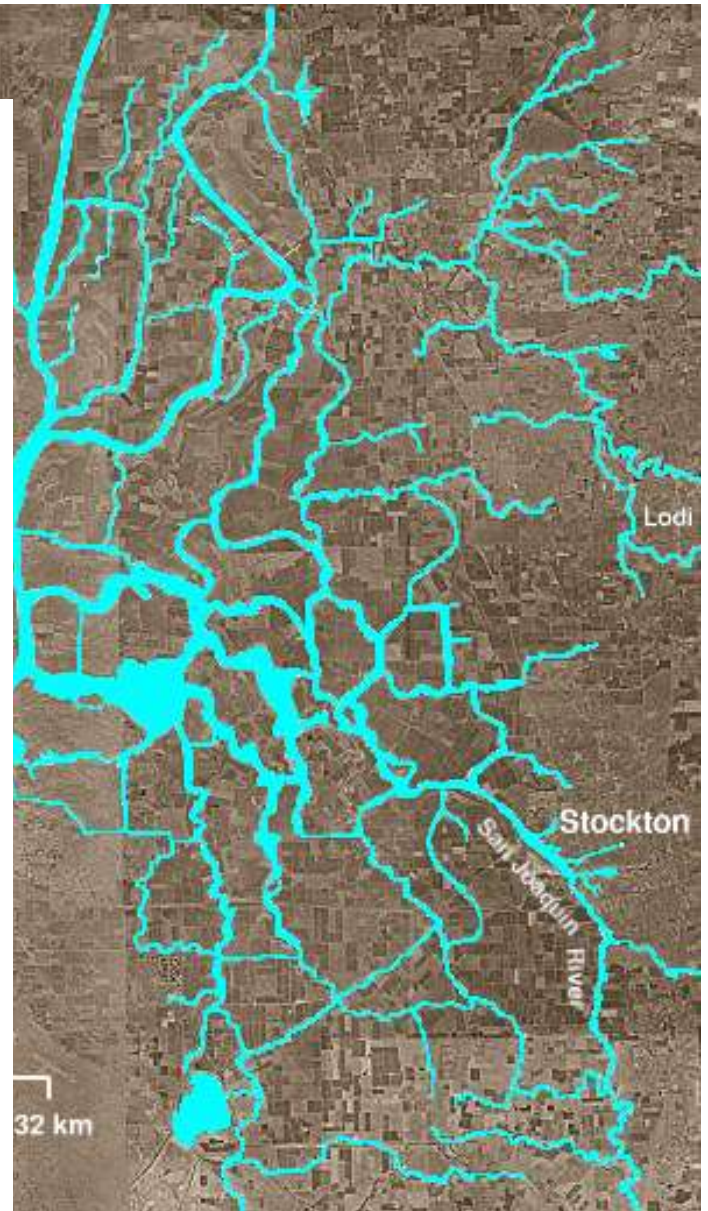


CSD RECYCLE

Water Balance – 2021-



AUGUST 4

MURIETA CLUB PROPERTIES

For Residences East of Murieta Hills

Authored by: John M. Sullivan

Executive Summary

Previously published RMCS D studies and Reports have been reviewed with an emphasis on confirming the District’s WWTP Secondary Storage volumes being converted to tertiary recycle water (“RW”) available for delivery to RMCC and others. And then presenting the golf courses demands for healthy turfgrass irrigation.

Distilling calculations from the reports listed on page 7, it is clear that assumptions made by consultants for these studies were repeated as ‘fact’ in many future calculations. Embedded “unsubstantiated assumptions” were made going back to the ‘Second Amendment to the Acquisition and Services Agreement’ (1991). In addition, some terminology has confused the issues of water uses and **Recycle Water Availability**.

Terms such as Equivalent Water Supply Units, Average Gallons Per Day, EDU’s, Commercial/Industrial EDU’s, Projected Use in gallons per day, Conversion Ratios, Seepage, Evaporation, Infiltration and Inflow all serve to make the analysis difficult unless the data can be distilled to the core numbers and digested by the decision makers of the District.

The Integrated Water Master Plan (2006) and other studies over the last 15 years have yielded varying numbers for gallons per day that reach to WWTP per residence and were published in the reports previously provided to the District. (page 7)

- | | |
|--------------------------------------|--|
| 1. 2006 IWMP | <u>315</u> gallons per day |
| 2. 2009 HDR Sewer Management Plan | <u>276</u> gallons per day (.31 af. Yr./Unit) |
| 3. 2010 Integrated Water Master Plan | <u>210</u> gallons per day |
| 4. ADWF July 2012-2021 (July Report) | <u>159</u> gallons per day average |
| 5. June 2021 404,000 gpd average | <u>154</u> gallons per day – current ADWF |

Previous studies and reports have shown up to 1,089,690 gallons per day at Build-out as the Average Dry Weather Flow (ADWF) to the WWTP or 3.34 Acre Feet per day. (1219 ac.ft.)

The Build-out analysis using 159 gallons per day (the historical average over the last 10 years) and 4490 homes at Build-out would only produce 2.19 Acre Feet per day at the WWTP or 713,910 gallons per day. (799 ac.ft.)

This is a stunning 35% difference.

In a nutshell, this difference between studies without an accurate Build-out unit projection and any interim review of the actual flows into the WWTP, is the reason for much for the discrepancy between projections and actuals RW on an annual basis.

A portion of the reduction from the earlier studies is the averaging down of home sizes and the tightening up of the CSD's Sewer Collection system. During the 2010-2012 era, the leaky manholes were sealed and other I/I was reduced which noticeably affected WWTP Wet Weather Inflows.

A true Recycle Water Balance between the WWRP and RMCC is not that simple because of the variability of rainfall, carry over storage, and how much irrigation water is supplemented from the Bass Lake River Pump. This year that water from the river 'saved' the golf courses. So let's talk about a complete irrigation season with the "other" variables.

District practice is to have less than 100 ac.ft. of treated wastewater in the two secondary storage reservoirs at the WWTP each October 15th. As long as the Reclamation Plant can come online in early April, there should never be a time when the District can't store all of the Inflow from October 15, to April 1st, even with a 100 year return event. Even when there is a 100 year return event, the 757 acre foot Secondary Storage Reservoirs can handle the storage with 2 foot of freeboard. The spreadsheet we have updated and attached, shows normal rainfall, and golf course

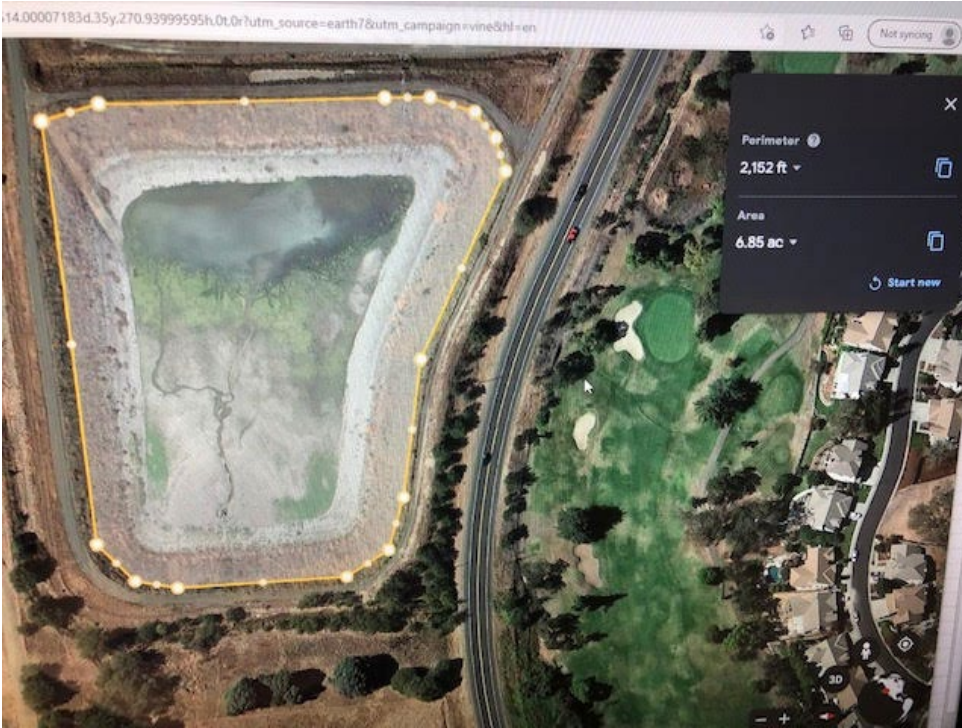
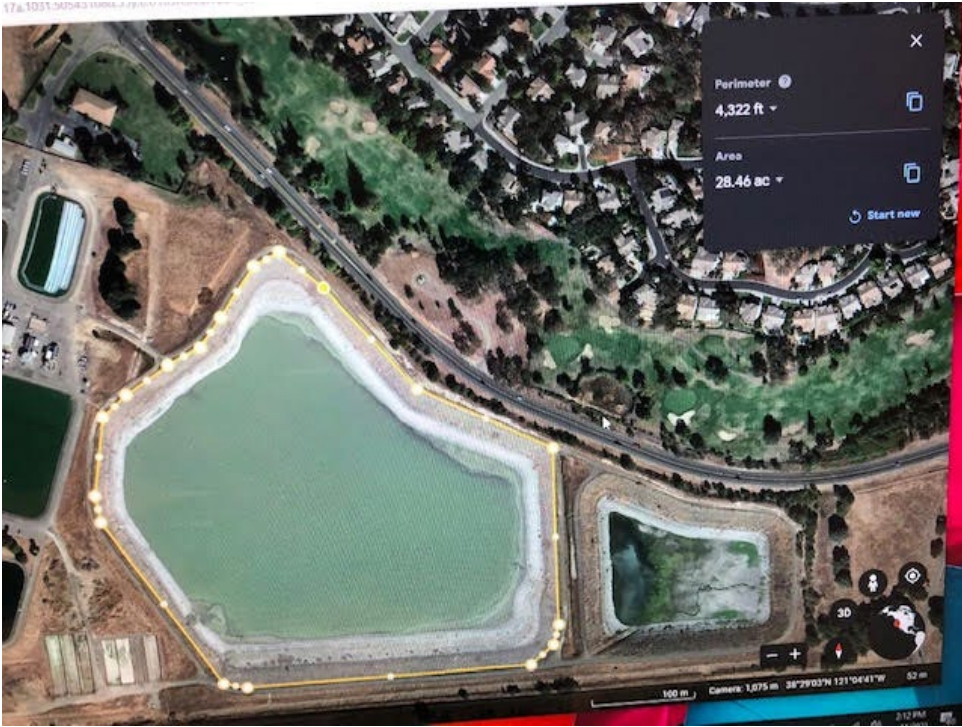
irrigation demand of 812.57 ac.ft. This is significant in that it accounts for volume from the Bass Lake River pumping in the spring and delaying irrigation delivery from the WWRP till May. The meetings between RMCCSD and RMCC staff and management was helpful for each party to understand the start up procedures and timelines necessary to get the 2 DAFs operational each year. The 2.3 mgd peak capacity will be aided by the disinfection expansion now funded by the state grant. Getting water into ponds at #16 #17 South for transfer to Lakes #10/#11 South and to Bass Lake should be more efficient once the RMCC irrigation season begins each Spring.

As stated not all irrigation water for RMCC is supplied by RW. It is envisioned that RMCC will continue to augment the early season irrigation with raw water from the Bass Lake River pump in March and April.

The primary irrigation demand for the courses in the months of June/July/August and September in normal years about 637 ac.ft. of irrigation water for healthy turfgrass. Half of October requires another 40 ac.ft. RMCC has been remiss in punching fairways and improving the root structure of the turf. That practice needs to return in order to limit compaction and runoff from nightly irrigations during the hot summer months. CalPoly San Luis Obispo has online research we used to determine the evapotranspiration rates for turf in Area 14 (Sacramento)

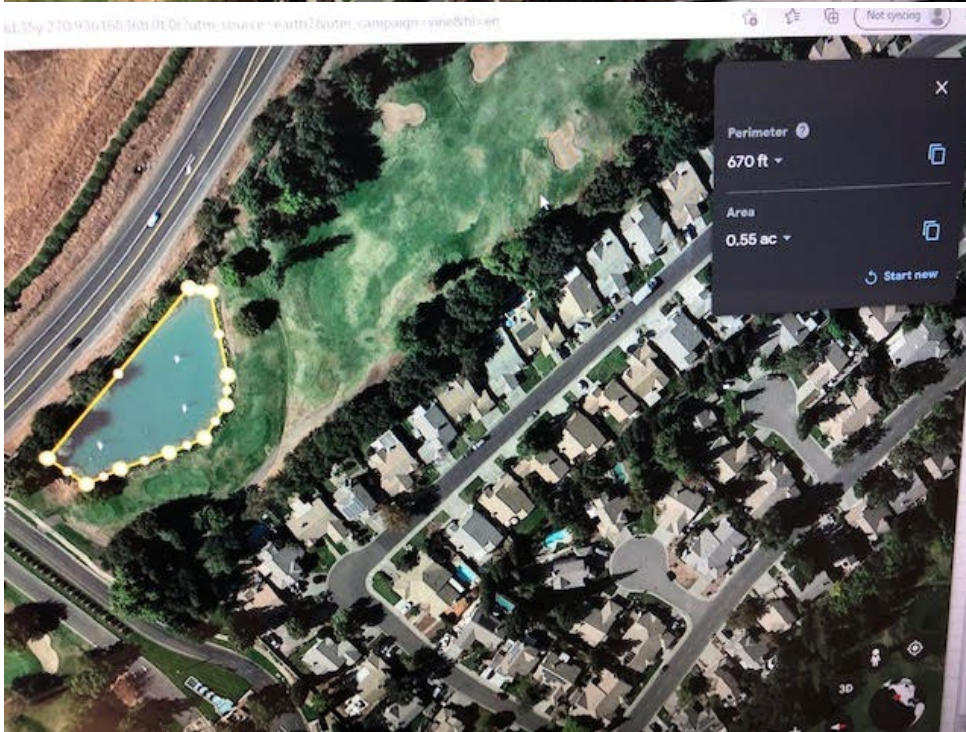
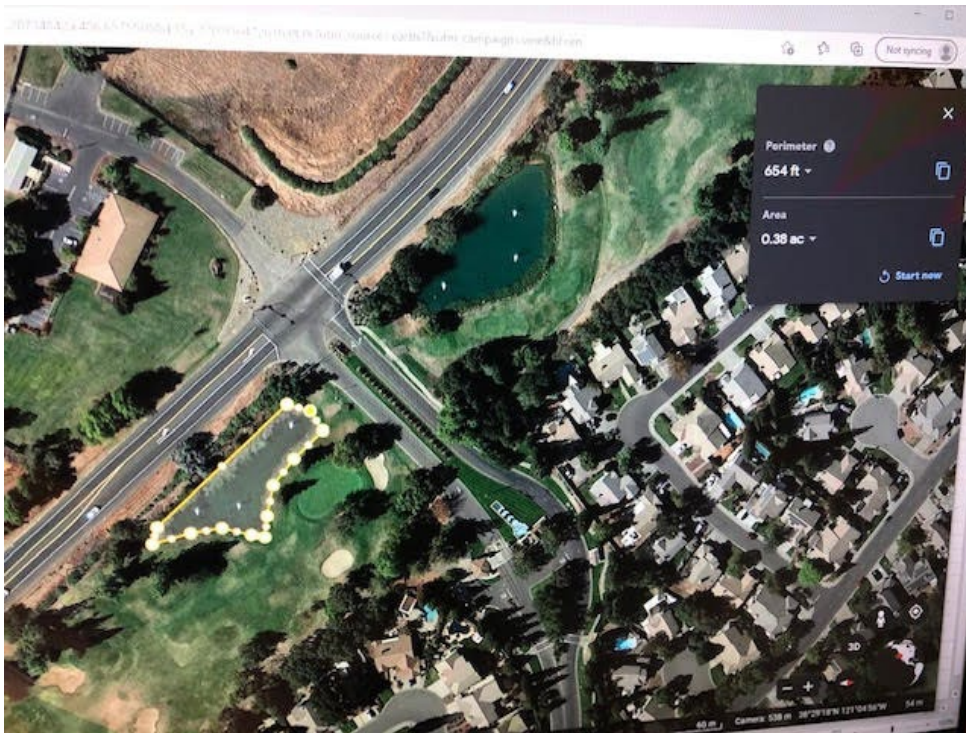
The annual pan evaporation for Folsom Lake is calculated at 66.18 inches. The summertime evaporation is around 40 inches. The surface acres of all irrigation lakes for the golf course total 48.33 Acres. Therefore over 160 ac. ft. of RW is evaporated from the 7 lakes, ponds and reservoirs during the summer irrigation season.

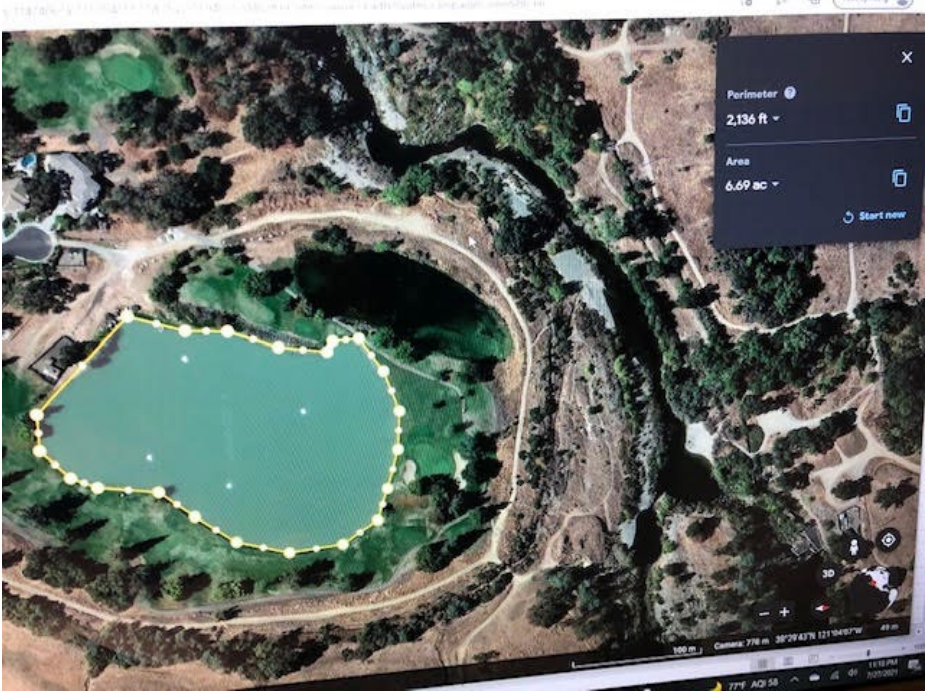
The VanVleck irrigation easement ergonomic irrigation application rate is 215 ac.ft.

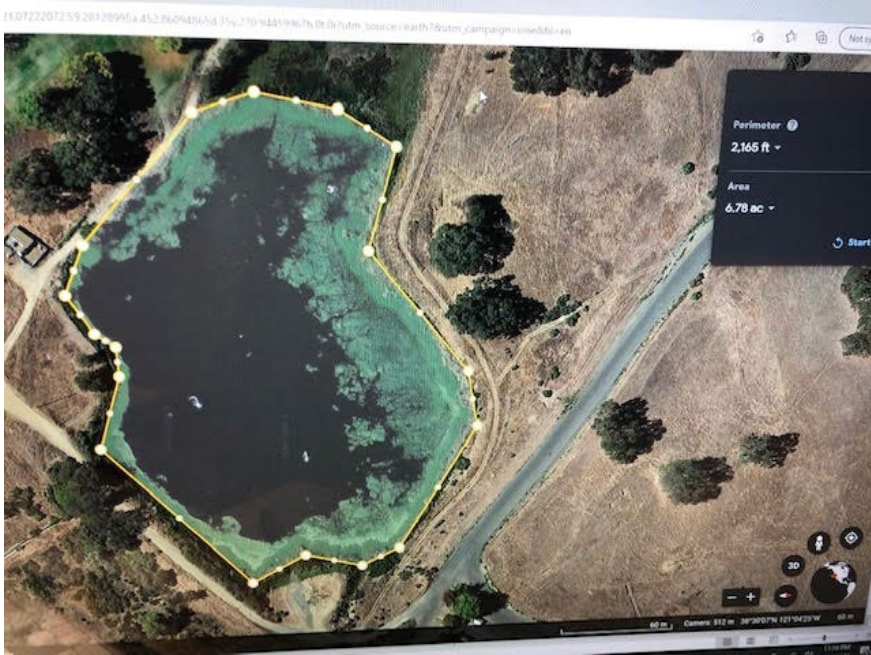


“WWTP Secondary Storage Reservoirs”

Ponds #16/#17 and Lake #10/#11 and Bass Lake







Publications Reviewed:

Acquisition and Services Agreements

20x2020

Agreement for the Availability and Use of Recycled Water 1988

Planning for Future Droughts 1990

Integrated Water Master Plan 2006

HDR Sewer Study 2009

Integrated Water Master Plan Update 2010

Recycle Water Standards 2013

Title 22 Engineering Report 2013

Title XVI Recycle Water Feasibility Report

Recycle Water System Expansion MND

Waste Discharge Requirements and Master Reclamation Permit RWQCB

Water Supply Assessment 2016

Recycle Water Modeling Study 2016

Recycle Water Preliminary Design Report

RMCC – BUILD OUT - 4490 USERS RMCS D

GOLF COURSE ANNUAL IRRIGATION CYCLE: ASSUME 50 AF CARRYOVER AT OCT 15

OCTOBER 15TH THROUGH MARCH 31 INFLOW		365.73 AF
19.59 " OF RAINFALL (NORMAL YEAR) = 1.54'	+	<u>53.13</u>
		468.86 AF
EVAPORATION	-	<u>25.76</u>
*****100 YR. RETURN EVENT 17.79" 1.48'		47.74
10% INFILTRATION INTO SYSTEM I/I	+	<u>36.50</u>
		527.34 AF
DAF (AVAILABLE FOR ONLINE SERVICE)		
APRIL RAIN LESS APRIL EVAPORATION	-	13.17
APRIL INFLOW TO WWTP	+	<u>65.70</u>
		579.53
MAY RAIN LESS MAY EVAPORATION	-	20.48
MAY INFLOW TO WWTP	+	<u>67.89</u>
		626.94 AF
JUNE + JULY + AUGUST + SEPTMBER RAINFALL	+	4.27
LESS EVAPORATION	-	154.00
JUNE-SEPTEMBER INFLOW TO WWTP	+	267.18
RMCC GOLF COURSE USAGE 100% RECYCLE	-	<u>637.05</u>
		107.34 AF
OCTOBER 1-15 INFLOW	+	32.85
OCTOBER 1.15 RMCC GOLF COURSE USE		<u>40.20</u>
OCTOBER 15 SECONDARY STORAGE		99.99 AF

HOW CAN 2021 CALCULATION BE 375-580 AF DIFFERENT THAN PREVIOUS STUDIES?

USING 4490 CONNECTIONS:

159 GPD = 713,910

VS.

210 GPD = 942,900

Δ 228,990 X 365 =

83,581,350 gal. =

256 ac. ft.

IWMP 2010

∞∞

HDR REPORT SHOWED

276 GPD = 1,239,240

VS.

159 GPD = 713,910

Δ 525,330 X 365 =

191,745,450 gal.=

588 ac.ft.

HDR SEWER STUDY

∞∞

HDR 2006

310 GPD = 1,391,900

VS.

159 GPD = 713,910

Δ 677,990 X 365 =

247,466.350 gal.=

759 ac.ft.

IWMP 2006

**Other users of Tertiary Treated Recycle Water from WWRP:
Purple pipe installed and/or meter(s) set.**

Van Vleck Sprayfield	215 ac.ft.
Murieta Gardens Residential	13.8 ac. ft.
Murieta Gardens Commercial	12.0 **** Not Completed
Retreats West	5.7 ac. ft.
Retreats North / East	9.9 ac. ft. 2021-2023
<u>Others</u>	<u>250 + ac.ft.</u>

Currently, only the VanVleck Sprayfield is permitted to accept Tertiary Treated Recycle Water from the WWRP.

**NOTE: H1 (a) Master Reclamation Permit (page 33)
RMCS D must provide information to RWQCB and details of others users before District may apply RW to Other Users Listed above.**

My conclusion is that in most years there will not be enough RW available to satisfy RMCC and the already installed RW needs of Gardens and Retreats. The District is contractually committed to serve some volume to VVleck via the Sprayfield every other year.

**Attached Normal Year
RMCC Irrigation**

**Respectfully submitted
John M. Sullivan/Murieta Club Properties, LLC**