



# Memo

-GROWTH

To: Kennedy Jenks Consultants

*Project Manager: Tim Williams*

From: Tuolumne Utilities District

*District Engineer: Erik Johnson*

*Associate Engineer: Glen Nunnelley*

Date: 03/27/2018

Re: Treated Water Systems Optimization Plan

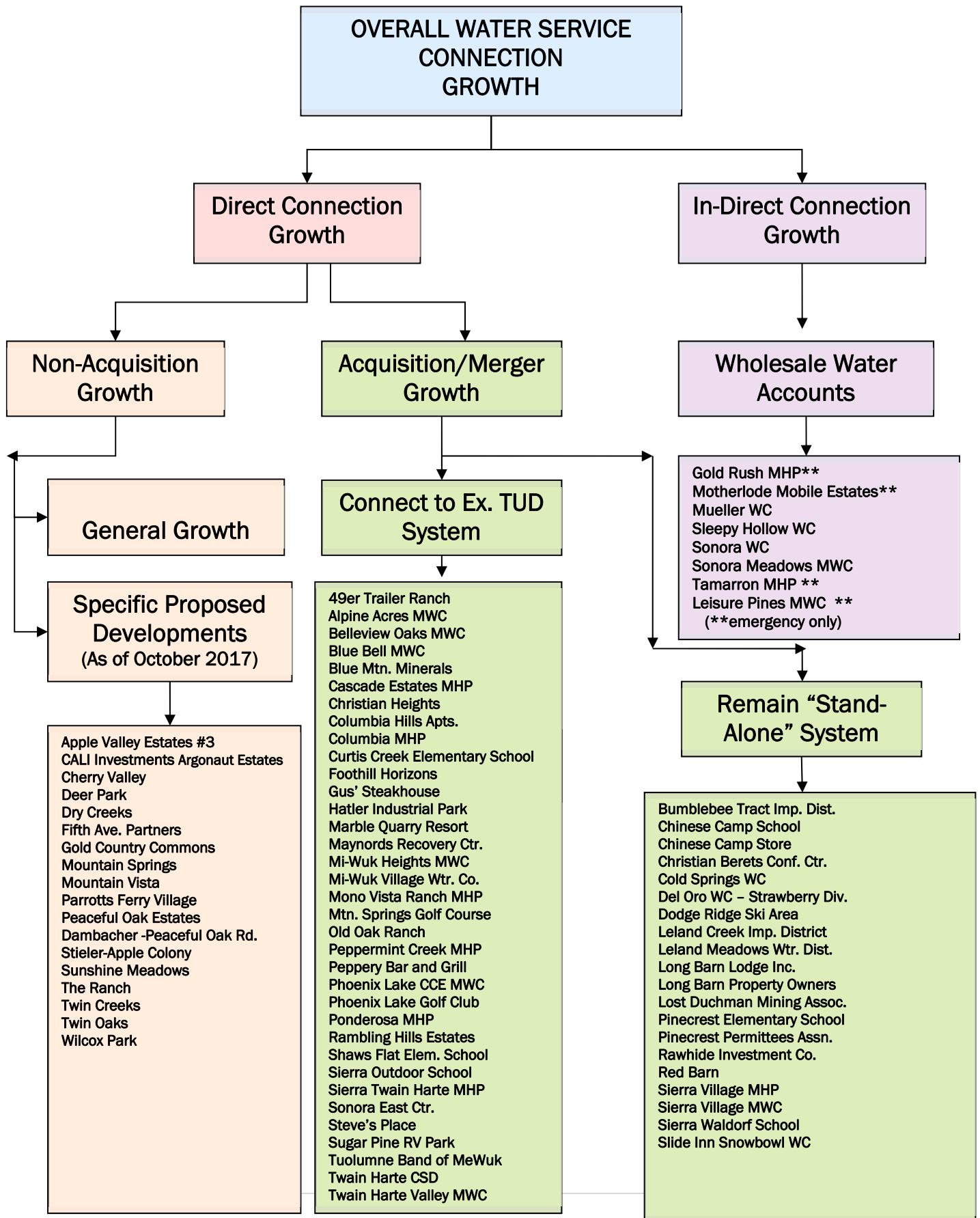
Projected 20- Year Growth Rates in Households and Commercial, Industrial, Institutional, and Irrigation Water Service Connections by Water Service Area

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This memorandum will identify historical and projected growth rates in households receiving treated water and in water service connections serving commercial, industrial, institutional, and irrigation (CII) accounts for the period of 2017 – 2037. The data contained in this memorandum shall serve as the basis for projecting the future water demands to be used in the Treated Water Systems Optimization Plan. Through the process detailed below, **it has been determined that the annual growth rate for the next 20 years (2017-2037) is assumed to be 2%.** Historic growth in TUD connections since 1992 has been about 1.58% and is a combination of both non-acquisition and acquisition growth as described herein. Assuming the same general growth and that all nearby private and mutual water systems are merged with TUD in the next 20 years, equates to about 2% total growth.

Population trends do not correlate well to growth in households receiving treated water. Since 1993, approximately 51% of the District's growth in households being served was associated with acquisition of existing private/mutual water companies. Increases in direct connections are categorized as: 1) Non-Acquisition Growth, which includes specific proposed developments and general growth resulting from population increases and hookups of parcels previously served by wells to the public water system; and 2) Acquisition/Merger Growth, which is associated with the acquisition/merger of discrete private and mutual water companies, as well as, any community service districts or water districts.

Water service connection growth is further separated into two categories: 1) Direct and 2) Indirect, which includes connections served through wholesale water accounts. Water to wholesale accounts is delivered through a master meter, which is technically counted as one-(1) service connection. Growth in areas that are served from a master meter will be assumed to match the growth rates that are proposed for the remainder of TUD's water systems.



## **Assumptions**

1. Although, this memo identifies growth in households receiving water service and growth in service connections specifically designated for commercial, industrial, institutional, or irrigation use; it does not attempt to distinguish between the water demands that result from varying types of use, as well as other factors such as elevation and parcel size. Water demand factors are addressed in a separate memorandum.
2. Any proposed development that currently has an approved Tentative Subdivision Map or a Recorded Map on file with Tuolumne County will be developed to buildout within the next 20 year time period and is assumed to be part of the non-acquisition growth.
3. Private and/or mutual water companies that are assumed acquired by the District are primarily residential water connections. However, there will be CII connections for some of the potential water systems acquired. The total CII connections for each system are listed at the bottom of the Potential Acquisitions Sheet Appendix C. Approximately 9% of of the total active connections are classified as CII accounts.
4. The overall growth rate for the entire District is calculated by summing the non-acquisition growth distributed amongst all systems and the acquisition/merger growth derived from private and public water systems.
5. Private and/or mutual water companies that are identified as candidates for acquisition by the District will be assigned to the District water system that is best suited to extending water service. For purposes of the Treated Water Systems Optimization Plan, a growth rate will be assigned that assumes that the District will provide water service to each of those private water companies by the Year 2037. Since, there is no way of knowing when those blocks of new connections will be added to the District, it is assumed that the growth will be spread out over a 20-year planning horizon.
6. The Black Oak Casino and associated improvements (Tuolumne Band of MeWuk) could possibly connect to the District's system sometime in the future. The impact of that connection has already been realized by the District when it constructed a new WTP (2010) in Tuolumne City and installed a new pressure filter dedicated solely for tribal development. The capacity of that filter is 432 gpm (MDD) and since the District is already prepared to serve this demand it is not included as future growth.

## **Historic Connection Growth**

*Appendix A* details historic growth statistics. From this table, growth in non-acquisition connections is found to be 0.84% and the growth in acquisition connections is 0.88% since 1993. The combined growth rate is 1.58% annually for 1993-2017 and is described further below.

The District added 4,352 connections between 1992-2017. Of those, 2,121 (49%) were categorized as non-acquisition growth and 2,231 (51%) were associated with

acquisition/merger growth. Non-Acquisition growth from 1992-2017 averaged 0.84% annually.

After factoring in acquisitions of Sugar Pine, Gibbs, Ponderosa, Mono Village, Big Hill, Monte Grande, Curtis Creek Ranches, and Wards Ferry Ranches Water Systems, the average growth rate from 1993-2017 increases to 1.58% annually.

Of mention, the Sonora/Jamestown and Crystal Falls systems accounted for over half, 52%, of the non-acquisition growth.

### **Recommended Growth Rate:**

For purposes of this Treated Water System Optimization Plan, the District will use a total acquisition and non-acquisition growth rate of **2.0% for systemwide annual growth for the next 20 years.**

The historic non-acquisition growth rate of 0.84% (1993-2017) is applied for the years 2017-2037. This growth rate is shown in the table presented in *Appendix D* and results in adding 2612 non-acquisition connections to the total TUD system in the next 20 years (2017-2037).

*Appendix B* identifies the proposed new developments (having an approved county tentative map) and number of connections that TUD would likely provide service. These connections make up part of the 0.88% acquisition growth assumed for the first 20 years (2017-2037).

Separately and additively, acquisition growth is based on assuming that all known potential (private, mutual and community service districts) water systems near TUD will be acquired over the next 20 years (2017-2037). There are 4402 known potential connections (as of 2017) assumed to be acquired in the next 20 years (2017-2037) due to acquisitions. The total number of acquisition and non-acquisition connections forecasted to be added in the next 20 years is 2612 + 4402 or 7014 total connections. This equates to the 2% growth total for the next 20 years (2017-2037).

Additionally, it is assumed that, of the total connections added in the next 20 years, 9% of those connections will be CII accounts or 365 CII accounts as shown in *Appendix D*. These CII connections are not additive but are handled separately to calculate growth in CII demand and described further in a separate demand memorandum.

*Appendix C* identifies all of the potential private, mutual, community services districts, and mobile home parks whose water systems could be acquired by the District at some time within the next 20 years. The table also distinguishes between those systems that are expected to remain as “stand-alone” service areas versus those systems that could connect to one of the District’s existing water systems.

### **Allocation of Growth looking forward the next 20 years**

Water systems are ranked by the projected share of **non-acquisition** growth: The Allocated Growth is depicted in *Appendix D* and shows the distribution of anticipated growth by water system including the growth in connections for the next 20 years (2017-2037). This allocation is derived by proximity of estimated known open parcels and known

developments in progress, and potential acquisitions. The allocation percentage is shown in descending order in Table A below for the first 20 years of growth.

**TABLE A**

***20-Yr. Non-Acquisition Growth***

	<b><u>%</u></b>	<b><u>(Connections)</u></b>
1. Sonora/Jamestown	40.00%	1097
2. Mono Village	12.86	336
3. Crystal Falls	10.00%	261
4. Upper Basin	9.00%	235
5. Columbia/Gibbs	7.64%	200
6. Cedar Ridge	5.00%	101
7. Tuolumne City	5.00%	131
8. Ponderosa Hills	3.75%	72
9. Cuesta Ctr./Lambert Lakes	2.25%	59
10. Apple Valley	1.50%	39
11. Big Hill	1.50%	39
12. Scenic View/Brook	0.66%	18
13. Monte Grande	0.40%	13
14. East Sonora	0.20%	5
15. Phoenix Lake Park	0.10%	3
16. Wards Ferry Ranches	0.10%	3
17. Peaceful Pines	0.05%	<u>1.</u>
	<b>Total</b>	<b>2612</b>

Water systems ranked by projected share of **acquisition** growth for the first 20 years of growth:

**TABLE B**

	<b>20-Yr. Acquisition Growth</b>	
	<b>%</b>	<b>(Connections)</b>
1. Upper Basin	62.83%	2752
2. Crystal Falls	16.29%	717
3. Columbia/Gibbs	8.77%	386
4. Cuesta Ctr/Lambert Lakes	6.84%	301
5. Sonora/Jamestown	2.75%	121
6. Scenic View/Brook	2.04%	90
7. Apple Valley	0.34%	15
8. Ponderosa Hills	0.34%	15
9. Mono Village	0.11%	<u>5</u>
	<b>Total</b>	<b>4402</b>

### **Growth in years 2037-2057**

The projected growth rate used for the second span of 20 years (2037-2057) is 0.84% total. This assumes that all acquisitions will have been acquired in the first 20 year time frame and that all growth following the first 20 years will be non-acquisition growth. From this, there are a total of 3897 connections (assumed all non-acquisition) forecasted to be added in 2037-2057 as depicted in *Appendix D*. The Twain Harte Community Services District (THCSD) is included as an acquisition in the next 20 years growth rate. The THCSD board however does not foresee this acquisition to take place in this time frame as noted in the letter included in *Appendix F*.

*Appendix A – HISTORIC GROWTH*

*Appendix B – PROPOSED DEVELOPMENTS*

*Appendix C – POTENTIAL ACQUISITIONS*

*Appendix D – GROWTH AND SYSTEM ALLOCATION*

*Appendix F – TWAIN HARTE COMMUNITY SERVICES LETTER MARCH 2018*

## APPENDIX A

## HISTORIC WATER CONNECTION GROWTH

Water System New Connection Growth 2001-2017							Water System Acquisition/Merger Growth 1993-2017																	1434 100.00%
Non-Acquisition Connection Growth 2001-2017							Acquisition																	
% of Total Non-Acquisition Growth																								
Acquisition Growth 1993-2017																								
Water System New Connection Growth 2001-2017							Water System Acquisition/Merger Growth 1993-2017																	
Non-Acquisition Connection Growth 2001-2017							Acquisition																	
% of Total Non-Acquisition Growth																								
Acquisition Growth 1993-2017																								

# New Connection Notices		Acquisitions	Yearly Total	Estimated Total Active Direct Connections includes Commercial, industrial, institutional, irrigation (not Wholesale)	Annual % Increase in Total Active Connections	Estimated Total Active and CII (Including Wholesale)	Apple Valley	Big Hill	Cedar Ridge	ColumbiaGibbs	Crystal Falls	Cuesta Ct - Lambert Lks	East Sonora	Mono Village	Monte Grande	Peaceful Pines	Phoenix Lake Park	Ponderosa Hills	Scenic View/Brook	Sonora/Jonestown	Tuolumne City	Upper Basin	Ward Ferry Ranches	
Year																								
1992				9,066		9,911																		
1993	73		73	9,139	0.81%	9,984																		
1994	54		54	9,193	0.59%	10,038																		
1995	58	349	407	9,600	4.43%	10,445															349			
1996	57	585	642	10,242	6.69%	11,087				585														
1997	81		81	10,323	0.79%	11,168																		
1998	104	536	640	10,963	6.20%	11,808											536							
1999	112		112	11,075	1.02%	11,920																		
2000	148		148	11,223	1.34%	12,068																		
2001	149	305	454	11,677	4.05%	12,522	12	235	0	16	28	7	3	0	70	0	0	10	4	52	6	11	0	149
2002	157		157	11,834	1.34%	12,679	4	0	5	20	36	16	0	0	0	0	2	12	2	47	2	11	0	157
2003	214		214	12,048	1.81%	12,893	2	0	8	18	86	14	1	0	0	0	2	6	2	53	3	19	0	214
2004	184	275	459	12,507	3.81%	13,352	3	0	14	8	56	6	2	275	0	0	3	5	6	59	11	11	0	184
2005	167		167	12,674	1.34%	13,519	1	0	12	28	31	5	1	1	0	0	1	6	1	63	5	12	0	167
2006	118	181	299	12,973	2.36%	13,818	3	0	6	20	20	7	0	2	158	0	1	7	2	34	2	14	23	141
2007	78		78	13,051	0.60%	13,896	1	0	4	12	17	10	0	1	1	1	1	2	0	16	1	11	0	78
2008	56		56	13,107	0.43%	13,952	0	0	3	11	10	5	0	0	0	0	0	6	0	18	0	3	0	56
2009	22		22	13,129	0.17%	13,974	0	1	0	4	5	4	2	0	0	0	0	2	1	3	0	0	0	22
2010	15		15	13,144	0.11%	13,989	1	0	0	1	1	1	0	1	1	0	0	1	1	5	0	2	0	15
2011	22		22	13,166	0.17%	14,011	0	0	0	10	0	0	0	1	0	0	0	0	0	6	0	5	0	22
2012	32		32	13,198	0.24%	14,043	0	0	0	13	3	0	0	1	1	0	0	0	0	11	3	0	0	32
2013	16		16	13,214	0.12%	14,059	0	0	0	10	0	2	0	0	0	0	0	2	0	1	0	1	0	16
2014	31		31	13,245	0.23%	14,090	0	2	0	9	2	2	0	0	1	0	0	1	0	10	2	2	0	31
2015	49		49	13,294	0.37%	14,139	0	3	2	10	5	0	5	0	0	0	0	1	1	18	2	2	0	49
2016	53		53	13,347	0.40%	14,192	0	0	1	8	0	0	0	0	0	1	0	6	0	25	1	11	0	53
2017	71		71	13,418	0.53%	14,263	1	0	1	6	0	0	0	0	0	0	0	2	2	47	4	8	0	71
2121		2231	Avg. Annual Non-Acquisition Growth Rate 1993-2017			0.84%																		1434 100.00%
49%		51%	Avg. Annual Acquisition Growth Rate 1993-2017			0.88%																		
4352		Avg. Annual Combined Growth Rate 1993-2017			1.58%																			
Water System New Connection Growth 2001-2017																								
Non-Acquisition Connection Growth 2001-2017							28	6	56	204	300	79	14	7	4	2	10	69	22	468	42	123	0	
% of Total Non-Acquisition Growth							1.95%	0.42%	3.91%	14.23%	20.92%	5.51%	0.98%	0.49%	0.28%	0.14%	0.70%	4.81%	1.53%	32.64%	2.93%	8.58%	0.00%	
Water System Acquisition/Merger Growth 1993-2017																								
Acquisition Growth 1993-2017							0	235	0	585	0	0	0	0	275	228	0	0	536	0	0	0	349	23

**APPENDIX B**

## PROPOSED NEW DEVELOPMENT

Proposed New Development		
System	# Svcs	Development Name
Apple Valley	8	Apple Valley Estates Unit #3
<i>Subtotal</i>	<b>8</b>	
Columbia/ Gibbs	19	Derby Court/Wilcox
	36	Parrotts Ferry Road
	14	Menelik Estates
<i>Subtotal</i>	<b>69</b>	
Crystal Falls	34	Sunshine Meadows
	6	Deer Park
	124	Oak View Estates
<i>Subtotal</i>	<b>164</b>	
Mono Village	306	Peaceful Oak Estates
	30	Brown
<i>Subtotal</i>	<b>336</b>	
Scenic View	18	Peaceful Oak Rd. - Dambacher
<i>Subtotal</i>	<b>18</b>	
Sonora Jamestown	45	The Ranch
	11	Mountain Vista
	218	Dry Creeks
	600	Mountain Springs
	20	CALI Investments (Argonaut Estates)
	61	Twin Creeks
	69	Fifth Ave. Partners
	41	Gold Country Commons
	19	KOR Investors
<i>Subtotal</i>	<b>1084</b>	
Tuolumne City	75	Cherry Valley
	9	Stieler-Apple Colony
<i>Subtotal</i>	<b>84</b>	
<i>TOTAL</i>	<b>1763</b>	



**APPENDIX C**  
POTENTIAL ACQUISITIONS/MERGERS

					Additional Connection Load by TUD System																	
Number of Connections MDD (gpm)	IS or assumed WILL BE Connected to TUD System within 30 Yrs.	Remain "Stand- Alone" Service Area	Ex. Wholesale Customer (Active)	Ex. Wholesale Customer (Emergency Only)	Apple Valley	Big Hill	Cedar Ridge	Columbus/Glenn	Crystal Falls	Cuesta Center/Lambert Lakes	East Sonoma	More Village	Monterey Grande	Peaceful Pines	Phoenix Lake Park	Ponderosa Hills	Scenic View/Brook	Sonoma-Jinnestown	Thurstone City	Upper Basin	Woods Ferry P	
					0.197 2.20	0.137 3.74	0.088 2.86	0.142 2.39	0.154 2.40	0.318 2.20	0.089 2.20	0.128 1.63	0.290 2.40	0.126 2.20	0.218 2.76	0.152 3.11	0.191 2.35	0.180 2.64	0.105 2.38	0.102 2.46	0.476 2.43	
34 12	✓				0	0	0	34 12	0	0	0	0	0	0	0	0	0	0	0	0	0	
58 21	✓				0	0	0	0	58 21	0	0	0	0	0	0	0	0	0	0	0	0	
168 62	✓				0	0	0	0	168 62	0	0	0	0	0	0	0	0	0	0	0	0	
4 1	✓				0	0	0	4 1	0	0	0	0	0	0	0	0	0	0	0	0	0	
90 63	✓				0	0	0	0	0	90 63	0	0	0	0	0	0	0	0	0	0	0	
22 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
113 79	✓			✓	0	0	0	0	0	113 79	0	0	0	0	0	0	0	0	0	0	0	
3 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10 7	✓				0	0	0	0	0	10 7	0	0	0	0	0	0	0	0	0	0	0	
522 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15 5	✓				0	0	0	15 5	0	0	0	0	0	0	0	0	0	0	0	0	0	
65 22	✓			✓	0	0	0	65 22	0	0	0	0	0	0	0	0	0	0	0	0	0	
1 1	✓				0	0	0	0	0	1 1	0	0	0	0	0	0	0	0	0	0	0	
383 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15 6	✓				15 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

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POTENTIAL ACQUISITIONS/MERGERS

Number of Connections MDD (gpm)	IS or assumed WILL BE Connected to TUD System within 30 Yrs.	Remain "Stand- Alone" Service Area	Ex. Wholesale Customer (Active)	Ex. Wholesale Customer (Emergency Only)	Additional Connection Load by TUD System																
					Apple Valley	Big Hill	Cedar Ridge	Columbus/Gibbs	Crystal Falls	Coastal Center/Lambert Lakes	East Solora	More Village	Monte Grande	Pleasant Plains	Phoenix Lake Park	Rockledge Hills	Scenic View/Brook	Sonoma-Lamontown	Thalmine City	Upper Basin	Wanda Ferry P
					0.197	0.137	0.088	0.142	0.154	0.318	0.089	0.128	0.290	0.126	0.218	0.152	0.191	0.180	0.105	0.102	0.476
					2.20	3.74	2.86	2.39	2.40	2.20	2.20	1.63	2.40	2.20	2.76	3.11	2.35	2.64	2.38	2.46	2.43
58 20	✓			✓	0	0	0	58 20	0	0	0	0	0	0	0	0	0	0	0	0	0
5 2	✓				0	0	0	0	0	0	0	0	0	0	0	0	0	5 2	0	0	0
10 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85 21	✓			✓	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85 21	0
22 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87 29	✓				0	0	0	87 29	0	0	0	0	0	0	0	0	0	0	0	0	0
15 7	✓				0	0	0	0	0	0	0	0	0	0	0	15 7	0	0	0	0	0
160 40	✓				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	160 40	0
768 193	✓				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	768 193	0
30 11	✓				0	0	0	0	30 11	0	0	0	0	0	0	0	0	0	0	0	0
76 53	✓			✓	0	0	0	0	0	76 53	0	0	0	0	0	0	0	0	0	0	0

APPENDIX C  
POTENTIAL ACQUISITIONS/MERGERS

Additional Connection Load by TUD System																					
Number of Connections MDD (gpm)	IS or assumed WILL BE Connected to TUD System within 30 Yrs.	Remain "Stand- Alone" Service Area	Ex. Wholesale Customer (Active)	Ex. Wholesale Customer (Emergency Only)	Apple Valley	Big Hill	Cedar Ridge	Columbia/Glenn	Crystal Falls	Coastal Center/Lambert Lakes	East Sonoma	Monro Village	Monterey Grande	Peaceful Pines	Phoenix Lake Park	Redwood Hills	Scenic View/Brook	Sonoma-Lamontown	Thibaultville City	Upper Basin	Woods Ferry P
					0.197	0.137	0.088	0.142	0.154	0.318	0.089	0.128	0.290	0.126	0.218	0.152	0.191	0.180	0.105	0.102	0.476
					2.20	3.74	2.86	2.39	2.40	2.20	2.20	1.63	2.40	2.20	2.76	3.11	2.35	2.64	2.38	2.46	2.43

15 7	✓				0	0	0	0	0	0	0	0	0	0	0	0	0	15 7	0	0	0
55 0	✓		✓		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100 48	✓				0	0	0	0	0	0	0	0	0	0	0	0	0	100 48	0	0	0
1 0	✓				0	0	0	0	0	0	0	0	0	0	0	0	0	1 0	0	0	0
351 130	✓				0	0	0	0	351 130	0	0	0	0	0	0	0	0	0	0	0	0
5 2	✓				0	0	0	0	5 2	0	0	0	0	0	0	0	0	0	0	0	0
10 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
384 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 23	✓				0	0	0	0	61 23	0	0	0	0	0	0	0	0	0	0	0	0
39 13	✓				0	0	0	39 13	0	0	0	0	0	0	0	0	0	0	0	0	0
96 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84 28	✓				0	0	0	84 28	0	0	0	0	0	0	0	0	0	0	0	0	0
1 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25 0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	✓								44												

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POTENTIAL ACQUISITIONS/MERGERS

					Additional Connection Load by TUD System																	
Number of Connections MDD (gpm)	IS or assumed WILL BE Connected to TUD System within 30 Yrs.	Remain "Stand- Alone" Service Area	Ex. Wholesale Customer (Active)	Ex. Wholesale Customer (Emergency Only)	Apple Valley	Big Hill	Cedar Ridge	Columbia/Globe	Crystal Falls	Cuesta Center/Lambert Lakes	East Sonora	More Village	Monterey Grande	Pleasant Pines	Phoenix Lake Park	Redwood Hills	Scenic View/Brook	Sonoma-Linnestown	Thalman City	Upper Basin	Wendy Ferry Park	
					0.197	0.137	0.088	0.142	0.154	0.318	0.089	0.128	0.290	0.126	0.218	0.152	0.191	0.180	0.105	0.102	0.476	
16					2.20	3.74	2.86	2.39	2.40	2.20	2.20	1.63	2.40	2.20	2.76	3.11	2.35	2.64	2.38	2.46	2.43	
0					0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	
30		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
156		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
100		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0		✓			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	1	✓			0	0	0	0	0	0	0	5	1	0	0	0	0	0	0	0	0	
430	✓		✓		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	✓		✓		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
359	✓				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	✓				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	✓				0	0	0	0	0	11	8	0	0	0	0	0	0	0	0	0	0	
8	✓				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	18	
70					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	
18	✓			✓	0	0	0	0	0	0	0	0	0	0	0	90	41	0	0	0	0	
90					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
41	✓				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1562	392	
1562					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	392	0	
392	✓				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0	
107	✓				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0	
27					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total # of Connections					15	0	0	386	717	301	0	5	0	0	0	15	90	121	0	2752	0	
Potential Acquisition Growth MDD (gpm)					6	0	0	131	265	211	0	1	0	0	0	7	41	57	0	690	0	
									5	12		5			15		6		86			
					PLG		curtis sch.		Son east		maynards		gus		THCSD							

**APPENDIX D**  
**20-YR. ALLOCATED GROWTH BY SYSTEM**

Non-Acquisition Growth Rate		# of (N) Svcs over 20 yrs. (RES & CII)	20 Year Water Service Growth Projections											
0.84%		2612	9% of 2612 = 236 growth in CII connections. (Applied for both 0-20 and 20-40 year forecast)---->						20 YEAR COMMERCIAL GROWTH			20-40 YEAR COMMERCIAL GROWTH		
System	% Allocation of Non-Acquisition Growth <sup>1</sup>	Non-Acquisition Growth		Total Non-Acquisition Growth	Total Acquisition/Merger Growth <sup>2</sup>	Total Combined Growth <sup>3</sup>	Total Existing Active Connections (incl. wholesale) (2017) <sup>4</sup>	Calculated Annual Growth Rate by System (Acq. & Non-Acq.) <sup>5</sup>	Growth in CII Connections by General Growth <sup>6</sup>	Growth in CII Connections by Acq.	Total Growth in CII by system	Growth in CII Connections by General Growth <sup>7</sup>	Growth in CII Connections by Acq.	Total Growth in CII by system <sup>8</sup>
		Proposed New Development	General Growth											
									236	See CII accounts from WS Potential tab	365	236	See CII from WS Potential	229
Apple Valley	1.50%	8	31	39	15	54	142	1.63%	4		4	0		0
Big Hill	1.50%		39	39	0	39	231	0.79%	4		4	0		0
Cedar Ridge	3.86%		101	101	0	101	675	0.70%	9		9	9		9
Columbia/Gibbs	7.64%	69	131	200	386	586	1670	1.51%	18		18	18		18
Crystal Falls	10.00%	164	97	261	717	978	2273	1.81%	24	5	29	24		24
Cuesta Ctr. - Lambert Lakes	2.25%		59	59	301	360	206	5.18%	5	12	17	5		5
East Sonora	0.20%		5	5	0	5	95	0.27%	0		0	0		0
Mono Village	12.86%	336	0	336	5	341	265	4.23%	30	5	35	30		30
Monte Grande	0.50%		13	13	0	13	234	0.27%	1		1	1		1
Peaceful Pines	0.05%		1	1	0	1	33	0.19%	0		0	0		0
Phoenix Lake Park	0.10%		3	3	0	3	56	0.23%	0		0	0		0
Ponderosa Hills	2.75%		72	72	15	87	691	0.59%	6	15	21	6		6
Scenic View/Brook	0.69%	18	0	18	90	108	273	1.68%	2		2	2		2
Sonora/Jamestown	42.00%	1084	13	1097	121	1218	4790	1.14%	99	6	105	99		99
Tuolumne City	5.00%	84	47	131	0	131	686	0.88%	12		12	12		12
Upper Basin	9.00%		235	235	2752	2987	1920	4.80%	21	86	107	21		21
Wards Ferry Ranches	0.10%		3	3	0	3	23	0.54%	0		0	0		0
Systemwide TOTAL		100.00%	1763	849	2612	4402	7014	14263	2.02%	236	365	229		229
					37%	63%	Total Est. Active Connections (2037)		21277					
				Non-Acq.	Acq.			Total						
		20 Yr. Growth Rate	0.84%		1.35%				2.02%					

### Notes:

Allocations were originally based upon historic growth from 2001-2010 and assuming future development will mimic that pattern. However several developments have been proposed that require the growth allocation to be adjusted. Most proposed developments fall within Sonora/Jamestown and Mono Village. These larger developments will result in a higher growth allocation being assigned to those areas and a smaller growth allocation being assigned to the remaining systems. Furthermore, projections required an iterative process to ensure that the projected in-fill growth did not exceed the current count on

<sup>2</sup> Based on most recent data from State Water Board regarding number of connections for regulated water systems in Tuolumne County. Excludes connections in systems where the District already wholesales water (ie. Sonora Meadows) and systems that would remain as isolated, discrete water service areas, and

<sup>3</sup> Total combined growth is growth in all classes of service connections (residential, commercial, industrial, and institutional).

<sup>4</sup> Existing services by system are based data from 2017 and include the number of active connections within wholesale accounts.

<sup>5</sup> Historically the District has experienced an overall annual growth rate of **1.58%** from 1993-2017. Approximately, **51%** of that growth has been associated with system acquisition. The District assumes to acquire all remaining in the next 20 years resulting in an estimated **63%** of the growth in the next 20 years.

<sup>6</sup> Total CII growth 0-20 years is (CII connections/total connections) \* total general growth in connections  $9\% * 2612 = 236$ . This growth in CII connections is distributed amongst each system by the 2017 distribution.

<sup>7</sup> Total CII growth for years 2037-2057 is assumed the same number of CII as 0-20. i.e.  $9\% * (2612) = 236$ . Additionally, some systems are assumed built out in terms of CII connections and reflect 0 growth in CII connections, thus the total is less at 229

<sup>8</sup> Growth in CII connections for some systems are assumed built out in the years 0-20 and assumed to have no new CII connections in the years 20-40

Note on modeling total WTP capacity when 2050 MDDs are less.

Note Mobile Home Parks are considered to have demands like regular residential.

APPENDIX D  
40-YR. ALLOCATED GROWTH BY SYSTEM

		40 Year Water Service Growth Projections *(Total Growth over a 40 yr. Period)							
Non-Acquisition Growth Rate	# of (N) Svcs over 40 yrs.								
0.84%	5703								
System	% Allocation of Non-Acquisition Growth <sup>1</sup>	Non-Acquisition Growth		Total Non-Acquisition Growth	Total Acquisition/Merger Growth <sup>2</sup>	General Growth within Acquired/Merged Systems (Yrs 21-40) <sup>3</sup>	Total Combined Growth <sup>4</sup>	Total Existing Active Connections (incl. wholesale) (2017) <sup>5</sup>	Calculated Annual Growth Rate by System <sup>6</sup>
		Proposed New Development	General Growth						
Apple Valley	1.50%	8	78	86	15	3	103	142	1.38%
Big Hill	1.50%		86	86	0	0	86	231	0.79%
Cedar Ridge	5.00%		285	285	0	0	285	675	0.88%
Columbia/Gibbs	8.00%	69	387	456	386	71	913	1670	1.10%
Crystal Falls	10.00%	164	406	570	717	131	1419	2273	1.22%
Cuesta Ctr. - Lambert Lakes	2.25%		128	128	301	55	484	206	3.07%
East Sonora	0.20%		11	11	0	0	11	95	0.28%
Mono Village	10.50%	336	263	599	5	1	605	265	3.02%
Monte Grande	0.50%		29	29	0	0	29	234	0.29%
Peaceful Pines	0.10%		6	6	0	0	6	33	0.40%
Phoenix Lake Park	0.10%		6	6	0	0	6	56	0.24%
Ponderosa Hills	3.75%		214	214	15	3	232	691	0.73%
Scenic View/Brook	0.50%	18	11	29	90	16	135	273	1.01%
Sonora/Jamestown	42.00%	1084	1311	2395	121	22	2538	4790	1.07%
Tuolumne City	5.00%	84	201	285	0	0	285	686	0.87%
Upper Basin	9.00%		513	513	2752	504	3769	1920	2.75%
Wards Ferry Ranches	0.10%		6	6	0	0	6	23	0.56%
Systemwide TOTAL	100.00%	1763	3940	5703	4402	806	10911	14263	1.43%
				52%	40%	7%			

		Growth	baseline conn.	Calc. Growth Rate
Annual Growth Rate by Time Range	(Yrs 0-40)	10911	14263	1.43%
	(Yrs 0-20)	7014	14263	2.02%
	(Yrs 21-40)	3897	21277	0.84%

Notes:

- <sup>1</sup> Allocations were originally based upon historic growth from 2001-2017 and assuming future development will mimic that pattern. The Proposed New Development category is based on current applications on file at the County. These developments are all assumed to buildout within the first 20 years. Over years 21-40, we assume that the % allocation of non-acquisition growth will remain the same by system but since we cannot predict how many connections will be associated with new developments we are lumping all non-acquisition growth into the "General Growth" category.
- <sup>2</sup> Based on most recent data from CDPH regarding number of connections for regulated water systems in Tuolumne County. Excludes connections in systems where the District already wholesales water (ie. Sonora Meadows) and systems that would remain as isolated, discrete water service areas, and would not likely connect to an existing TUD system.
- <sup>3</sup> Assumes areas within the systems that were acquired/merged in years 0-20 will grow at **0.84%** from years 21-40.
- <sup>4</sup> Total combined growth is growth in all classes of service connections (residential, commercial, industrial, institutional & irrigation). The District does not have growth numbers by customer class broken out by individual system. The reality is that most growth in commercial and institutional services will occur in the Sonora/Jamestown system which has been allocated 42% of all non-acquisition growth for the next 40 years.
- <sup>5</sup> Existing services by system are based on data from 2017 and include the number of active connections within wholesale accounts.
- <sup>6</sup> Historically the District has seen an overall annual growth rate of 1.58% from 1992-2017. Approximately, **51%** of that growth has been associated with system acquisition. The District would expect this trend to continue for the first 0-20 years or until all acquisitions and mergers have been exhausted. In years 21-40 there will essentially be no more systems left to acquire or merge with; therefore, the overall growth rate for years 21-40 will reflect the non-acquisition growth rate of **0.84%** only. The cumulative growth rate for 0-20 years is **2.02%**, 21-40 is **0.84%** and for the entire 40 year period the growth rate would be **1.43%**. Additionally, acquisitions and mergers will represent approximately **40%** of the overall growth over a 40 year time frame.



## APPENDIX F

# Twain Harte Community Services District

P. O. Box 649 ▪ Twain Harte, CA 95383  
Phone: (209) 586-3172 ▪ Fax: (209) 586-0424  
www.twainhartecsd.com

**Directors:** Gary Sipperley ▪ Bill McManus ▪ Jim Johnson ▪ Richard Knudson ▪ Eileen Mannix

March 30, 2018

Erik Johnson, District Engineer  
Tuolumne Utilities District  
18885 Nugget Blvd.  
Sonora, CA 95370

**SUBJECT: Treated Water System Optimization Plan - Projected 20-Year Demand and Acquisitions Growth  
Twain Harte Community Services District Comments**

Dear Mr. Johnson:

Thank you for including Twain Harte Community Services District (THCSD) in the review of the memorandum you prepared for Kennedy/Jenks Consultants on January 30, 2018, regarding projected 20-year water demand growth rates. The purpose of this letter is to provide comments on the memorandum's assumption that THCSD's water demands should be included in TUD's projected growth as a result of a future acquisition/merger.

The THCSD Board of Directors (Board) discussed this topic at their board meeting on March 14, 2018. **The Board does not foresee THCSD requiring or benefitting from an acquisition/merger in the next 20 to 40 years.** The Board noted, however, that there is not enough information available to thoroughly evaluate the possibility.

While the Board does not foresee a THCSD acquisition/merger within TUD's planning horizon, THCSD is not opposed to TUD continuing to include THCSD's water demands in its future growth projections for the purposes of the Treated Water Systems Optimization Plan (TWSOP). Any future proposal of an acquisition/merger will require additional information so that potential benefits can be fully evaluated by THCSD at that time.

Please include this letter in the appendix of the TWSOP for future reference.

Sincerely,

TOM C. TROTT  
General Manager