

January 15, 2019 Technical Working Group – Documentation of Common Chapter Structure and Assignments

Common Chapter Outline

ES-1 Introduction – Woodard & Curran will prepare

ES-2 Subbasin Governance – Woodard & Curran will prepare

- Description of basin coordination and governance, include Coordination Committee, Technical Working Group, and Communications Working Group

ES-3 Subbasin Setting – stamped by Woodard & Curran with disclaimer

- HCM – Woodard & Curran will prepare independent of individual GSPs
- Groundwater conditions – Woodard & Curran will prepare independent of individual GSPs
- Water budget: sum of parts (table and graph)
- Cross-sections (at least two required): pull from USGS (Page and Croft) – Woodard & Curran will prepare from USGS documents
- Management actions: sum of parts
- Hydrographs – sum of the parts. Individual GSP hydrographs provided by GSP groups and summed for representative monitoring points once available
- Basin contour maps using 2013 seasonal high and low by principal aquifer
 - Seasonal high: spring 2013 (February – April 2013)
 - Seasonal low: fall 2013 (September – October 2013)
 - Principal aquifers: upper aquifer and lower aquifer
- GDE mapping: Use basin level mapping; to be finalized
- Change in storage calculation
 - Upper aquifer: calculated from 2013-2003 WSE maps x Specific yield as provided by GSP region x area. Compare against change in storage provided by GSP in historic-current water budgets
 - Lower aquifer: calculated from change in land surface (inelastic land subsidence) and local subsidence values x areas
- Gains and losses along San Joaquin River: sum of parts

ES-4 Subbasin-wide Monitoring Program: sum of parts

ES-5 Subbasin Data Management System: sum of parts

ES-6 The GSPs: Executive summary from each GSP group – extracted from each GSP and stamped/signed by respective GSP group preparer

Appendices: Common TMs and signed coordination agreement

Notes: Sum of the parts = compilation of individual GSP sections to the subbasin level

Groundwater Budget (AFY)

Row	Year	Representative Year	Year Type	Inflow																			Inflow Subtotal		
				Deep Percolation	Upper Aquifer Underflows ^s	Tracy	Modesto	Turlock	SJREC	Grassland	Fresno County	Kings	Westside	Foothills	Lower Aquifer Underflows ^s	Tracy	Modesto	Turlock	SJREC	Grassland	Fresno County	Kings		Westside	Foothills
01	2014	2014	Shasta Critical	70,497	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	139,957
02	2015	2015	Shasta Critical	68,527	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	137,987
03	2016	2016	Dry	81,334	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	150,794
04	2017	2017	Wet	81,622	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	193,159
05	2018	1979	Average	74,545	51,467	-	-	-	2,418	-	262	-	8,272	40,515	27,123	-	-	-	1,274	-	138	-	4,360	21,352	153,135
06	2019	1980	Wet	86,605	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	198,142
07	2020	1981	Dry	73,902	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	143,362
08	2021	1982	Wet	86,605	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	198,142
09	2022	1983	Wet	89,839	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	201,376
10	2023	1984	Average	76,921	51,467	-	-	-	2,418	-	262	-	8,272	40,515	27,123	-	-	-	1,274	-	138	-	4,360	21,352	155,511
11	2024	1985	Dry	76,224	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	145,684
12	2025	1986	Wet	92,226	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	203,763
13	2026	1987	Dry	81,533	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	150,993
14	2027	1988	Dry	78,410	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	147,870
15	2028	1989	Dry	73,852	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	143,312
16	2029	1990	Dry	71,785	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	141,245
17	2030	1991	Shasta Critical	72,067	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	141,527
18	2031	1992	Shasta Critical	73,081	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	142,541
19	2032	1993	Wet	85,593	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	197,130
20	2033	1994	Dry	70,834	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	140,293
21	2034	1995	Wet	86,531	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	198,068
22	2035	1996	Wet	113,162	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	224,699
23	2036	1997	Wet	83,462	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	194,999
24	2037	1998	Wet	94,445	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	205,982
25	2038	1999	Average	78,009	51,467	-	-	-	2,418	-	262	-	8,272	40,515	27,123	-	-	-	1,274	-	138	-	4,360	21,352	156,600
26	2039	2000	Average	71,178	51,467	-	-	-	2,418	-	262	-	8,272	40,515	27,123	-	-	-	1,274	-	138	-	4,360	21,352	149,769

Groundwater Budget (AFY)

Row	Year	Representative Year	Year Type	Inflow																			Inflow Subtotal		
				Deep Percolation	Upper Aquifer Underflows ^s	Tracy	Modesto	Turlock	SJREC	Grassland	Fresno County	Kings	Westside	Foothills	Lower Aquifer Underflows ^s	Tracy	Modesto	Turlock	SJREC	Grassland	Fresno County	Kings		Westside	Foothills
27	2040	2001	Dry	77,860	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	147,320
28	2041	2002	Dry	72,409	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	141,869
29	2042	2003	Average	74,366	51,467	-	-	-	2,418	-	262	-	8,272	40,515	27,123	-	-	-	1,274	-	138	-	4,360	21,352	152,957
30	2043	2004	Dry	72,438	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	141,898
31	2044	2005	Wet	80,852	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	192,389
32	2045	2006	Wet	77,099	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	188,636
33	2046	2007	Dry	67,438	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	136,898
34	2047	2008	Dry	74,581	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	144,041
35	2048	2009	Average	71,432	51,467	-	-	-	2,418	-	262	-	8,272	40,515	27,123	-	-	-	1,274	-	138	-	4,360	21,352	150,023
36	2049	2010	Average	77,378	51,467	-	-	-	2,418	-	262	-	8,272	40,515	27,123	-	-	-	1,274	-	138	-	4,360	21,352	155,969
37	2050	2011	Wet	76,022	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	187,559
38	2051	2012	Dry	68,890	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	138,349
39	2052	2013	Dry	69,700	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	139,160
40	2053	2014	Shasta Critical	70,497	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	139,957
41	2054	2015	Shasta Critical	68,527	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	137,987
42	2055	2016	Dry	81,334	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	150,794
43	2056	2017	Wet	81,622	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	193,159
44	2057	1965	Wet	86,605	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	198,142
45	2058	1966	Average	74,545	51,467	-	-	-	2,418	-	262	-	8,272	40,515	27,123	-	-	-	1,274	-	138	-	4,360	21,352	153,135
46	2059	1967	Wet	86,605	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	198,142
47	2060	1968	Dry	73,902	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	143,362
48	2061	1969	Wet	86,605	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	198,142
49	2062	1970	Average	74,545	51,467	-	-	-	2,418	-	262	-	8,272	40,515	27,123	-	-	-	1,274	-	138	-	4,360	21,352	153,135
50	2063	1971	Average	74,545	51,467	-	-	-	2,418	-	262	-	8,272	40,515	27,123	-	-	-	1,274	-	138	-	4,360	21,352	153,135
51	2064	1972	Dry	73,902	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	143,362
52	2065	1973	Average	74,545	51,467	-	-	-	2,418	-	262	-	8,272	40,515	27,123	-	-	-	1,274	-	138	-	4,360	21,352	153,135
53	2066	1974	Wet	86,605	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	198,142
54	2067	1975	Wet	86,605	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	198,142
55	2068	1976	Dry	73,902	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	143,362
56	2069	1977	Shasta Critical	73,902	45,488	-	-	-	4,200	-	262	-	9,911	31,115	23,972	-	-	-	2,213	-	138	-	5,223	16,398	143,362
57	2070	1978	Wet	86,605	73,043	-	-	-	2,591	-	262	-	8,272	61,918	38,494	-	-	-	1,365	-	138	-	4,360	32,631	198,142
Average				78,397	56,310	-	-	-	3,291	-	262	-	9,020	43,737	29,676	-	-	-	1,735	-	138	-	4,753	23,049	164,383

Groundwater Budget (AFY)

ROW	Year	Representative Year	Year Type	Outflow																			Outflow Subtotal		
				Pumping	Upper Aquifer Underflows ⁵	Tracy	Modesto	Turlock	SJREC	Grassland	Fresno County	Kings	Westside	Foothills	Lower Aquifer Underflows ⁵	Tracy	Modesto	Turlock	SJREC	Grassland	Fresno County	Kings		Westside	Foothills
01	2014	2014	Shasta Critical	601,013	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	700,614
02	2015	2015	Shasta Critical	516,931	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	616,533
03	2016	2016	Dry	392,238	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	491,840
04	2017	2017	Wet	308,214	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	394,402
05	2018	1979	Average	221,779	62,169	3,784	-	-	42,477	-	-	15,908	-	-	32,763	1,994	-	-	22,385	-	-	8,383	-	-	316,711
06	2019	1980	Wet	-	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	86,189
07	2020	1981	Dry	211,121	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	310,722
08	2021	1982	Wet	-	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	86,189
09	2022	1983	Wet	-	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	86,189
10	2023	1984	Average	151,231	62,169	3,784	-	-	42,477	-	-	15,908	-	-	32,763	1,994	-	-	22,385	-	-	8,383	-	-	246,162
11	2024	1985	Dry	142,114	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	241,716
12	2025	1986	Wet	-	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	86,189
13	2026	1987	Dry	228,511	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	328,112
14	2027	1988	Dry	155,530	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	255,132
15	2028	1989	Dry	204,376	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	303,978
16	2029	1990	Dry	178,899	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	278,500
17	2030	1991	Shasta Critical	539,882	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	639,484
18	2031	1992	Shasta Critical	535,719	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	635,320
19	2032	1993	Wet	-	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	86,189
20	2033	1994	Dry	199,238	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	298,839
21	2034	1995	Wet	-	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	86,189
22	2035	1996	Wet	-	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	86,189
23	2036	1997	Wet	39,807	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	125,996
24	2037	1998	Wet	-	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	86,189
25	2038	1999	Average	250,475	62,169	3,784	-	-	42,477	-	-	15,908	-	-	32,763	1,994	-	-	22,385	-	-	8,383	-	-	345,407
26	2039	2000	Average	217,803	62,169	3,784	-	-	42,477	-	-	15,908	-	-	32,763	1,994	-	-	22,385	-	-	8,383	-	-	312,734

Groundwater Budget (AFY)

ROW	Year	Representative Year	Year Type	Outflow																			Outflow Subtotal		
				Pumping	Upper Aquifer Underflows ⁵	Tracy	Modesto	Turlock	SJREC	Grassland	Fresno County	Kings	Westside	Foothills	Lower Aquifer Underflows ⁵	Tracy	Modesto	Turlock	SJREC	Grassland	Fresno County	Kings		Westside	Foothills
27	2040	2001	Dry	194,496	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	294,097
28	2041	2002	Dry	239,371	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	338,972
29	2042	2003	Average	193,661	62,169	3,784	-	-	42,477	-	-	15,908	-	-	32,763	1,994	-	-	22,385	-	-	8,383	-	-	288,592
30	2043	2004	Dry	233,110	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	332,711
31	2044	2005	Wet	-	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	86,189
32	2045	2006	Wet	21,337	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	107,526
33	2046	2007	Dry	257,382	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	356,983
34	2047	2008	Dry	279,200	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	378,802
35	2048	2009	Average	325,538	62,169	3,784	-	-	42,477	-	-	15,908	-	-	32,763	1,994	-	-	22,385	-	-	8,383	-	-	420,469
36	2049	2010	Average	156,294	62,169	3,784	-	-	42,477	-	-	15,908	-	-	32,763	1,994	-	-	22,385	-	-	8,383	-	-	251,225
37	2050	2011	Wet	44,157	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	130,346
38	2051	2012	Dry	283,523	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	383,125
39	2052	2013	Dry	229,025	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	328,627
40	2053	2014	Shasta Critical	601,013	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	700,614
41	2054	2015	Shasta Critical	516,931	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	616,533
42	2055	2016	Dry	392,238	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	491,840
43	2056	2017	Wet	308,214	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	394,402
44	2057	1965	Wet	-	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	86,189
45	2058	1966	Average	221,779	62,169	3,784	-	-	42,477	-	-	15,908	-	-	32,763	1,994	-	-	22,385	-	-	8,383	-	-	316,711
46	2059	1967	Wet	-	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	86,189
47	2060	1968	Dry	211,121	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	310,722
48	2061	1969	Wet	-	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	86,189
49	2062	1970	Average	221,779	62,169	3,784	-	-	42,477	-	-	15,908	-	-	32,763	1,994	-	-	22,385	-	-	8,383	-	-	316,711
50	2063	1971	Average	221,779	62,169	3,784	-	-	42,477	-	-	15,908	-	-	32,763	1,994	-	-	22,385	-	-	8,383	-	-	316,711
51	2064	1972	Dry	211,121	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	310,722
52	2065	1973	Average	221,779	62,169	3,784	-	-	42,477	-	-	15,908	-	-	32,763	1,994	-	-	22,385	-	-	8,383	-	-	316,711
53	2066	1974	Wet	-	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	86,189
54	2067	1975	Wet	-	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	86,189
55	2068	1976	Dry	211,121	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	310,722
56	2069	1977	Dry	211,121	65,227	3,784	-	-	45,535	-	-	15,908	-	-	34,375	1,994	-	-	23,997	-	-	8,383	-	-	310,722
57	2070	1978	Wet	-	56,443	3,784	-	-	36,751	-	-	15,908	-	-	29,746	1,994	-	-	19,368	-	-	8,383	-	-	86,189
58	Average			194,771	61,555	3,784	-	-	41,863	-	-	15,908	-	-	32,439	1,994	-	-	22,062	-	-	8,383	-	-	288,765

Groundwater Budget (AFY)																
Row	Year	Representative Year	Year Type	Inflow			Outflow				Change in Storage			Total		
				Deep Percolation	Upper Aquifer Underflows ⁵	Lower Aquifer Underflows ⁵	Inflow Subtotal	Pumping	Upper Aquifer Underflows ⁵	Lower Aquifer Underflows ⁵	Outflow Subtotal	Upper Aquifer	Lower Aquifer	Change in Storage Subtotal	Groundwater Budget Balance	(% of Inflow)
01	2014	2014	Shasta Critical	70,497	45,488	23,972	139,957	601,013	65,227	34,375	700,614	(122,430)	(24,486)	(146,916)	(413,742)	-296%
02	2015	2015	Shasta Critical	68,527	45,488	23,972	137,987	516,931	65,227	34,375	616,533	(122,430)	(24,486)	(146,916)	(331,630)	-240%
03	2016	2016	Dry	81,334	45,488	23,972	150,794	392,238	65,227	34,375	491,840	(122,430)	(24,486)	(146,916)	(194,130)	-129%
04	2017	2017	Wet	81,622	73,043	38,494	193,159	308,214	56,443	29,746	394,402	(2,607)	(521)	(3,129)	(198,115)	-103%
05	2018	1979	Average	74,545	51,467	27,123	153,135	221,779	62,169	32,763	316,711	41,971	8,394	50,365	(213,941)	-140%
06	2019	1980	Wet	86,605	73,043	38,494	198,142	-	56,443	29,746	86,189	(2,607)	(521)	(3,129)	115,082	58%
07	2020	1981	Dry	73,902	45,488	23,972	143,362	211,121	65,227	34,375	310,722	(122,430)	(24,486)	(146,916)	(20,445)	-14%
08	2021	1982	Wet	86,605	73,043	38,494	198,142	-	56,443	29,746	86,189	(2,607)	(521)	(3,129)	115,082	58%
09	2022	1983	Wet	89,839	73,043	38,494	201,376	-	56,443	29,746	86,189	(2,607)	(521)	(3,129)	118,316	59%
10	2023	1984	Average	76,921	51,467	27,123	155,511	151,231	62,169	32,763	246,162	41,971	8,394	50,365	(141,016)	-91%
11	2024	1985	Dry	76,224	45,488	23,972	145,684	142,114	65,227	34,375	241,716	(122,430)	(24,486)	(146,916)	50,884	35%
12	2025	1986	Wet	92,226	73,043	38,494	203,763	-	56,443	29,746	86,189	(2,607)	(521)	(3,129)	120,703	59%
13	2026	1987	Dry	81,533	45,488	23,972	150,993	228,511	65,227	34,375	328,112	(122,430)	(24,486)	(146,916)	(30,204)	-20%
14	2027	1988	Dry	78,410	45,488	23,972	147,870	155,530	65,227	34,375	255,132	(122,430)	(24,486)	(146,916)	39,654	27%
15	2028	1989	Dry	73,852	45,488	23,972	143,312	204,376	65,227	34,375	303,978	(122,430)	(24,486)	(146,916)	(13,750)	-10%
16	2029	1990	Dry	71,785	45,488	23,972	141,245	178,899	65,227	34,375	278,500	(122,430)	(24,486)	(146,916)	9,660	7%
17	2030	1991	Shasta Critical	72,067	45,488	23,972	141,527	539,882	65,227	34,375	639,484	(122,430)	(24,486)	(146,916)	(351,041)	-248%
18	2031	1992	Shasta Critical	73,081	45,488	23,972	142,541	535,719	65,227	34,375	635,320	(122,430)	(24,486)	(146,916)	(345,864)	-243%
19	2032	1993	Wet	85,593	73,043	38,494	197,130	-	56,443	29,746	86,189	(2,607)	(521)	(3,129)	114,070	58%
20	2033	1994	Dry	70,834	45,488	23,972	140,293	199,238	65,227	34,375	298,839	(122,430)	(24,486)	(146,916)	(11,630)	-8%
21	2034	1995	Wet	86,531	73,043	38,494	198,068	-	56,443	29,746	86,189	(2,607)	(521)	(3,129)	115,008	58%
22	2035	1996	Wet	113,162	73,043	38,494	224,699	-	56,443	29,746	86,189	(2,607)	(521)	(3,129)	141,639	63%
23	2036	1997	Wet	83,462	73,043	38,494	194,999	39,807	56,443	29,746	125,996	(2,607)	(521)	(3,129)	72,132	37%
24	2037	1998	Wet	94,445	73,043	38,494	205,982	-	56,443	29,746	86,189	(2,607)	(521)	(3,129)	122,922	60%
25	2038	1999	Average	78,009	51,467	27,123	156,600	250,475	62,169	32,763	345,407	41,971	8,394	50,365	(239,173)	-153%
26	2039	2000	Average	71,178	51,467	27,123	149,769	217,803	62,169	32,763	312,734	41,971	8,394	50,365	(213,330)	-142%

Groundwater Budget (AFY)																
ROW	Year	Representative Year	Year Type	Inflow			Outflow				Change in Storage			Total		
				Deep Percolation	Upper Aquifer Underflows ⁵	Lower Aquifer Underflows ⁵	Inflow Subtotal	Pumping	Upper Aquifer Underflows ⁵	Lower Aquifer Underflows ⁵	Outflow Subtotal	Upper Aquifer	Lower Aquifer	Change in Storage Subtotal	Groundwater Budget Balance	(% of Inflow)
27	2040	2001	Dry	77,860	45,488	23,972	147,320	194,496	65,227	34,375	294,097	(122,430)	(24,486)	(146,916)	138	0%
28	2041	2002	Dry	72,409	45,488	23,972	141,869	239,371	65,227	34,375	338,972	(122,430)	(24,486)	(146,916)	(50,188)	-35%
29	2042	2003	Average	74,366	51,467	27,123	152,957	193,661	62,169	32,763	288,592	41,971	8,394	50,365	(186,001)	-122%
30	2043	2004	Dry	72,438	45,488	23,972	141,898	233,110	65,227	34,375	332,711	(122,430)	(24,486)	(146,916)	(43,898)	-31%
31	2044	2005	Wet	80,852	73,043	38,494	192,389	-	56,443	29,746	86,189	(2,607)	(521)	(3,129)	109,329	57%
32	2045	2006	Wet	77,099	73,043	38,494	188,636	21,337	56,443	29,746	107,526	(2,607)	(521)	(3,129)	84,239	45%
33	2046	2007	Dry	67,438	45,488	23,972	136,898	257,382	65,227	34,375	356,983	(122,430)	(24,486)	(146,916)	(73,170)	-53%
34	2047	2008	Dry	74,581	45,488	23,972	144,041	279,200	65,227	34,375	378,802	(122,430)	(24,486)	(146,916)	(87,845)	-61%
35	2048	2009	Average	71,432	51,467	27,123	150,023	325,538	62,169	32,763	420,469	41,971	8,394	50,365	(320,812)	-214%
36	2049	2010	Average	77,378	51,467	27,123	155,969	156,294	62,169	32,763	251,225	41,971	8,394	50,365	(145,622)	-93%
37	2050	2011	Wet	76,022	73,043	38,494	187,559	44,157	56,443	29,746	130,346	(2,607)	(521)	(3,129)	60,343	32%
38	2051	2012	Dry	68,890	45,488	23,972	138,349	283,523	65,227	34,375	383,125	(122,430)	(24,486)	(146,916)	(97,860)	-71%
39	2052	2013	Dry	69,700	45,488	23,972	139,160	229,025	65,227	34,375	328,627	(122,430)	(24,486)	(146,916)	(42,551)	-31%
40	2053	2014	Shasta Critical	70,497	45,488	23,972	139,957	601,013	65,227	34,375	700,614	(122,430)	(24,486)	(146,916)	(413,742)	-296%
41	2054	2015	Shasta Critical	68,527	45,488	23,972	137,987	516,931	65,227	34,375	616,533	(122,430)	(24,486)	(146,916)	(331,630)	-240%
42	2055	2016	Dry	81,334	45,488	23,972	150,794	392,238	65,227	34,375	491,840	(122,430)	(24,486)	(146,916)	(194,130)	-129%
43	2056	2017	Wet	81,622	73,043	38,494	193,159	308,214	56,443	29,746	394,402	(2,607)	(521)	(3,129)	(198,115)	-103%
44	2057	1965	Wet	86,605	73,043	38,494	198,142	-	56,443	29,746	86,189	(2,607)	(521)	(3,129)	115,082	58%
45	2058	1966	Average	74,545	51,467	27,123	153,135	221,779	62,169	32,763	316,711	41,971	8,394	50,365	(213,941)	-140%
46	2059	1967	Wet	86,605	73,043	38,494	198,142	-	56,443	29,746	86,189	(2,607)	(521)	(3,129)	115,082	58%
47	2060	1968	Dry	73,902	45,488	23,972	143,362	211,121	65,227	34,375	310,722	(122,430)	(24,486)	(146,916)	(20,445)	-14%
48	2061	1969	Wet	86,605	73,043	38,494	198,142	-	56,443	29,746	86,189	(2,607)	(521)	(3,129)	115,082	58%
49	2062	1970	Average	74,545	51,467	27,123	153,135	221,779	62,169	32,763	316,711	41,971	8,394	50,365	(213,941)	-140%
50	2063	1971	Average	74,545	51,467	27,123	153,135	221,779	62,169	32,763	316,711	41,971	8,394	50,365	(213,941)	-140%
51	2064	1972	Dry	73,902	45,488	23,972	143,362	211,121	65,227	34,375	310,722	(122,430)	(24,486)	(146,916)	(20,445)	-14%
52	2065	1973	Average	74,545	51,467	27,123	153,135	221,779	62,169	32,763	316,711	41,971	8,394	50,365	(213,941)	-140%
53	2066	1974	Wet	86,605	73,043	38,494	198,142	-	56,443	29,746	86,189	(2,607)	(521)	(3,129)	115,082	58%
54	2067	1975	Wet	86,605	73,043	38,494	198,142	-	56,443	29,746	86,189	(2,607)	(521)	(3,129)	115,082	58%
55	2068	1976	Dry	73,902	45,488	23,972	143,362	211,121	65,227	34,375	310,722	(122,430)	(24,486)	(146,916)	(20,445)	-14%
56	2069	1977	Dry	73,902	45,488	23,972	143,362	211,121	65,227	34,375	310,722	(122,430)	(24,486)	(146,916)	(20,445)	-14%
57	2070	1978	Wet	86,605	73,043	38,494	198,142	-	56,443	29,746	86,189	(2,607)	(521)	(3,129)	115,082	58%
58	Average			78,397	56,310	29,676	164,383	194,771	61,555	32,439	288,765	(48,660)	(9,732)	(58,392)	(65,990)	-50%

Land Surface Budget (AFY)

Row	Year	Representative Year	Year Type	Inflow				Outflow				Total	
				Surface Water Deliveries	Pumping	Precipitation	<i>Inflow Subtotal</i>	Runoff	Deep Percolation	Evapotranspiration	<i>Outflow Subtotal</i>	Land Surface Water Budget Balance	(% of inflow)
01	2014	2014	Shasta Critical	147,781	601,013	121,695	870,489	57,676	70,497	842,063	970,236	(99,747)	-11%
02	2015	2015	Shasta Critical	123,697	516,931	160,669	801,298	53,092	68,527	768,956	890,575	(89,277)	-11%
03	2016	2016	Dry	147,119	392,238	305,754	845,111	55,995	81,334	791,234	928,562	(83,451)	-10%
04	2017	2017	Wet	181,408	308,214	314,881	804,503	53,304	81,622	744,456	879,382	(74,879)	-9%
05	2018	1979	Average	395,838	221,779	202,911	820,529	54,366	74,545	761,509	890,419	(69,890)	-9%
06	2019	1980	Wet	442,680	-	437,659	880,340	58,329	86,605	721,614	866,547	13,792	2%
07	2020	1981	Dry	424,069	211,121	212,075	847,264	56,137	73,902	788,141	918,180	(70,916)	-8%
08	2021	1982	Wet	442,680	-	437,659	880,340	58,329	86,605	721,614	866,547	13,792	2%
09	2022	1983	Wet	442,680	-	477,813	920,493	60,989	89,839	725,541	876,369	44,124	5%
10	2023	1984	Average	395,838	151,231	281,503	828,572	54,899	76,921	762,237	894,056	(65,485)	-8%
11	2024	1985	Dry	424,069	142,114	288,628	854,811	56,637	76,224	788,534	921,396	(66,585)	-8%
12	2025	1986	Wet	442,680	-	508,973	951,653	63,054	92,226	722,107	877,386	74,267	8%
13	2026	1987	Dry	424,069	228,511	255,412	907,991	60,161	81,533	842,454	984,148	(76,157)	-8%
14	2027	1988	Dry	424,069	155,530	288,625	868,224	57,526	78,410	800,701	936,637	(68,413)	-8%
15	2028	1989	Dry	424,069	204,376	219,986	848,431	56,215	73,852	788,885	918,952	(70,521)	-8%
16	2029	1990	Dry	424,069	178,899	222,202	825,170	54,673	71,785	765,908	892,366	(67,196)	-8%
17	2030	1991	Shasta Critical	135,739	539,882	169,265	844,887	55,980	72,067	810,611	938,658	(93,771)	-11%
18	2031	1992	Shasta Critical	135,739	535,719	173,978	845,436	56,016	73,081	809,856	938,953	(93,516)	-11%
19	2032	1993	Wet	442,680	-	431,806	874,486	57,941	85,593	730,278	873,812	674	0%
20	2033	1994	Dry	424,069	199,238	200,072	823,379	54,555	70,834	766,492	891,880	(68,501)	-8%
21	2034	1995	Wet	442,680	-	772,506	1,215,186	80,515	86,531	748,565	915,611	299,575	25%
22	2035	1996	Wet	442,680	-	579,691	1,022,371	67,739	113,162	727,996	908,896	113,475	11%
23	2036	1997	Wet	442,680	39,807	340,884	823,371	54,554	83,462	742,696	880,712	(57,341)	-7%
24	2037	1998	Wet	442,680	-	438,288	880,968	58,370	94,445	691,981	844,796	36,172	4%
25	2038	1999	Average	395,838	250,475	136,015	782,328	51,835	78,009	721,852	851,696	(69,368)	-9%
26	2039	2000	Average	395,838	217,803	205,224	818,864	54,256	71,178	762,932	888,366	(69,502)	-8%

Land Surface Budget (AFY)

Row	Year	Representative Year	Year Type	Inflow				Outflow				Total	
				Surface Water Deliveries	Pumping	Precipitation	Inflow Subtotal	Runoff	Deep Percolation	Evapotranspiration	Outflow Subtotal	Land Surface Water Budget Balance	(% of inflow)
27	2040	2001	Dry	424,069	194,496	233,118	851,683	56,430	77,860	787,438	921,728	(70,045)	-8%
28	2041	2002	Dry	424,069	239,371	175,097	838,537	55,559	72,409	782,884	910,852	(72,315)	-9%
29	2042	2003	Average	395,838	193,661	229,174	818,674	54,243	74,366	757,864	886,473	(67,799)	-8%
30	2043	2004	Dry	424,069	233,110	178,404	835,583	55,363	72,438	779,462	907,264	(71,681)	-9%
31	2044	2005	Wet	442,680	-	344,285	786,965	52,142	80,852	696,686	829,680	(42,715)	-5%
32	2045	2006	Wet	442,680	21,337	307,174	771,192	51,097	77,099	695,587	823,782	(52,590)	-7%
33	2046	2007	Dry	424,069	257,382	136,846	818,297	54,218	67,438	768,875	890,531	(72,235)	-9%
34	2047	2008	Dry	424,069	279,200	170,737	874,006	57,909	74,581	818,968	951,459	(77,453)	-9%
35	2048	2009	Average	395,838	325,538	144,352	865,728	57,361	71,432	817,084	945,876	(80,148)	-9%
36	2049	2010	Average	395,838	156,294	261,390	813,521	53,902	77,378	747,084	878,363	(64,842)	-8%
37	2050	2011	Wet	442,680	44,157	297,953	784,790	51,998	76,022	711,859	839,879	(55,089)	-7%
38	2051	2012	Dry	424,069	283,523	130,768	838,360	55,547	68,890	789,317	913,754	(75,394)	-9%
39	2052	2013	Dry	424,069	229,025	163,396	816,490	54,098	69,700	762,822	886,620	(70,130)	-9%
40	2053	2014	Shasta Critical	135,739	601,013	121,695	858,447	56,878	70,497	842,063	969,438	(110,991)	-13%
41	2054	2015	Shasta Critical	135,739	516,931	160,669	813,340	53,890	68,527	768,956	891,372	(78,033)	-10%
42	2055	2016	Dry	424,069	392,238	305,754	1,122,061	74,344	81,334	791,234	946,912	175,149	16%
43	2056	2017	Wet	442,680	308,214	314,881	1,065,775	70,615	81,622	744,456	896,693	169,082	16%
44	2057	1965	Wet	442,680	-	437,659	880,340	58,329	86,605	721,614	866,547	13,792	2%
45	2058	1966	Average	395,838	221,779	202,911	820,529	54,366	74,545	761,509	890,419	(69,890)	-9%
46	2059	1967	Wet	442,680	-	437,659	880,340	58,329	86,605	721,614	866,547	13,792	2%
47	2060	1968	Dry	424,069	211,121	212,075	847,264	56,137	73,902	788,141	918,180	(70,916)	-8%
48	2061	1969	Wet	442,680	-	437,659	880,340	58,329	86,605	721,614	866,547	13,792	2%
49	2062	1970	Average	395,838	221,779	202,911	820,529	54,366	74,545	761,509	890,419	(69,890)	-9%
50	2063	1971	Average	395,838	221,779	202,911	820,529	54,366	74,545	761,509	890,419	(69,890)	-9%
51	2064	1972	Dry	424,069	211,121	212,075	847,264	56,137	73,902	788,141	918,180	(70,916)	-8%
52	2065	1973	Average	395,838	221,779	202,911	820,529	54,366	74,545	761,509	890,419	(69,890)	-9%
53	2066	1974	Wet	442,680	-	437,659	880,340	58,329	86,605	721,614	866,547	13,792	2%
54	2067	1975	Wet	442,680	-	437,659	880,340	58,329	86,605	721,614	866,547	13,792	2%
55	2068	1976	Dry	424,069	211,121	212,075	847,264	56,137	73,902	788,141	918,180	(70,916)	-8%
56	2069	1977	Dry	424,069	211,121	212,075	847,264	56,137	73,902	788,141	918,180	(70,916)	-8%
57	2070	1978	Wet	442,680	-	437,659	880,340	58,329	86,605	721,614	866,547	13,792	2%
Average				385,358	194,771	283,259	863,389	57,206	78,397	762,108	897,710	(34,322)	(0)