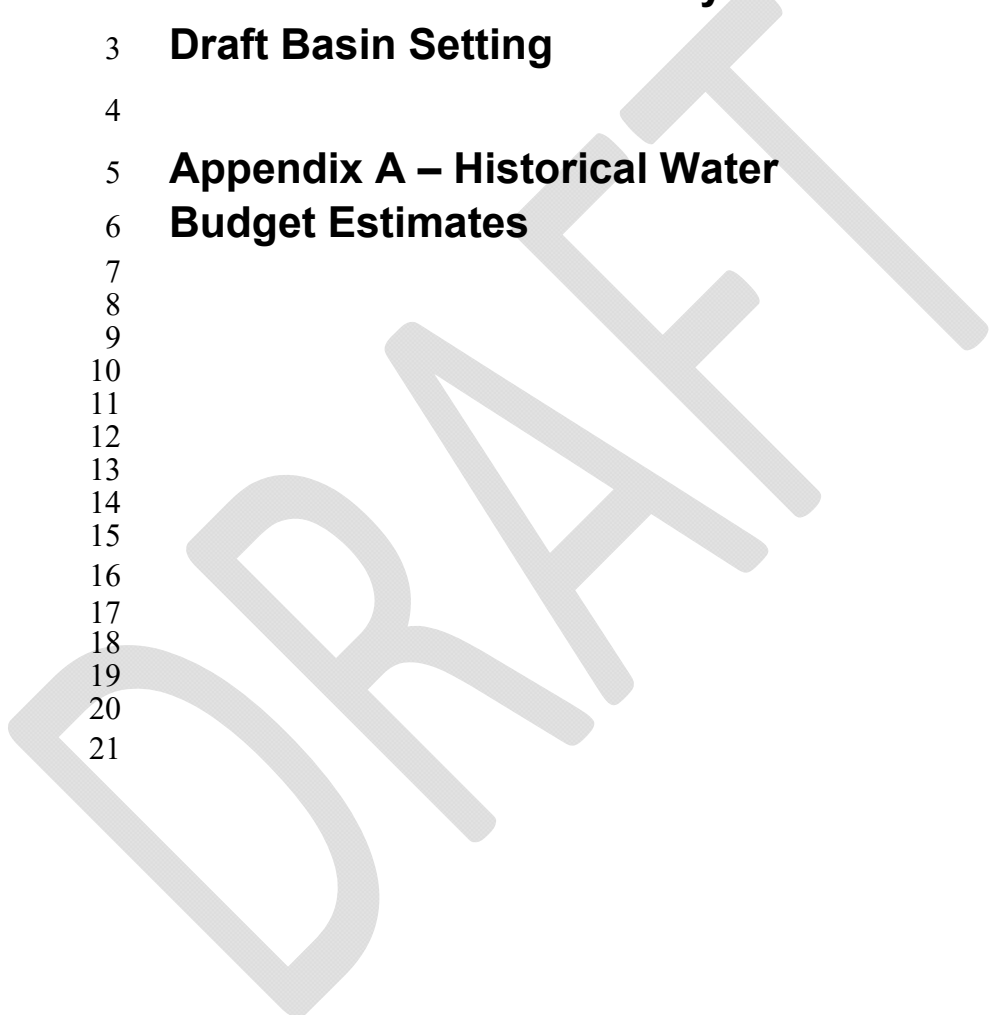


1 **Vina Subbasin**
2 **Groundwater Sustainability Plan**
3 **Draft Basin Setting**

4
5 **Appendix A – Historical Water**
6 **Budget Estimates**

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Appendix A – Historical Water Budget Estimates

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45 **Basin Setting Appendix A – Historical Annual Water**
46 **Budget Estimates**

47 This appendix contains detailed annual water budget results for the land and surface water
48 system (**Table A-1**) and for the groundwater system (**Table A-2**).

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Table A-1. Historical Land and Surface Water System Water Budget, 2000-2018.

Component	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Inflows (AFY)																			
Surface Water Inflows	593,800	321,200	464,700	845,000	571,000	545,700	1,185,700	324,000	309,300	434,300	532,900	770,800	390,700	438,700	260,400	304,400	550,000	1,268,300	429,400
<i>Outside Diversions</i>	1,400	800	300	400	400	400	400	500	500	500	400	500	500	500	300	300	200	0	300
<i>Butte Creek</i>	343,400	183,600	253,600	426,800	320,100	302,900	652,500	184,500	161,600	226,000	289,300	439,300	208,400	238,300	133,200	145,900	285,500	629,900	238,700
<i>Big Chico Creek</i>	103,800	57,400	87,100	214,100	108,400	107,500	261,100	48,700	60,500	85,700	102,700	159,300	67,100	65,700	32,700	37,800	91,800	351,100	69,400
<i>Pine Creek</i>	13,800	7,500	11,800	20,100	12,000	12,800	23,600	7,700	7,300	12,100	12,600	17,700	10,500	12,700	8,100	9,300	16,500	27,200	11,200
<i>Dry Creek</i>	14,200	7,500	13,300	18,100	13,100	14,900	23,900	10,100	8,300	11,600	13,800	15,600	12,500	10,600	10,300	10,900	15,400	26,800	14,000
<i>Rock Creek</i>	18,000	14,100	16,300	20,400	16,200	16,900	23,100	14,100	13,200	15,500	15,800	19,400	14,800	15,600	12,500	12,600	17,000	24,000	15,300
<i>Little Chico Creek</i>	17,600	12,000	15,800	22,200	17,600	18,200	28,500	13,100	12,300	15,700	18,000	23,500	15,000	15,500	12,100	13,200	19,900	31,500	16,300
<i>Mud Creek</i>	12,800	8,700	12,000	17,600	13,600	14,800	22,900	10,400	10,100	12,900	14,700	19,000	12,400	13,400	10,500	11,400	16,900	25,700	13,700
<i>Singer Creek</i>	1,600	800	1,100	2,300	1,500	1,300	3,000	900	800	1,200	1,300	1,900	1,100	1,500	1,000	1,200	1,900	3,300	1,200
<i>Little Dry Creek</i>	2,700	1,800	2,700	3,300	2,800	2,900	4,300	2,100	2,300	2,700	3,200	4,300	2,900	3,100	2,700	3,000	4,100	6,400	3,600
<i>Precipitation Runoff from Upslope Lands</i>	62,200	24,800	49,000	96,100	62,100	50,400	137,700	29,000	30,400	47,800	57,700	66,500	43,700	58,300	35,700	57,700	79,700	137,800	43,400
<i>Applied Water Return Flows from Upslope Lands</i>	2,400	2,100	1,700	3,500	3,300	2,800	4,600	2,900	1,900	2,700	3,200	3,800	1,800	3,400	1,300	1,100	1,000	4,600	2,400
Precipitation	418,400	325,600	382,800	506,200	415,600	521,800	652,400	275,500	301,000	342,300	470,800	562,700	339,900	338,900	250,000	326,800	433,300	647,900	295,500
Groundwater Pumping	246,600	245,200	248,900	223,500	267,200	198,400	214,400	288,400	297,100	263,000	232,700	196,500	261,000	287,600	293,000	260,900	205,100	185,000	211,400
<i>Agricultural</i>	210,500	209,300	211,800	186,700	227,100	161,100	175,700	248,300	257,300	224,500	196,800	162,400	224,400	251,600	257,600	235,300	182,800	161,800	187,400
<i>Urban and Industrial</i>	27,700	28,000	29,000	28,300	31,700	29,000	30,000	30,700	30,500	29,300	26,700	25,700	26,900	27,000	24,800	18,800	18,700	19,600	20,100
<i>Managed Wetlands</i>	8,400	7,900	8,000	8,500	8,400	8,300	8,700	9,300	9,300	9,100	9,300	8,500	9,700	9,100	10,600	6,800	3,600	3,600	3,900
Stream Gains from Groundwater	8,600	5,200	4,900	5,000	5,900	6,300	10,400	3,500	2,600	1,800	2,700	4,100	2,400	1,500	500	800	1,200	2,500	700
Total Inflow	1,267,400	897,200	1,101,300	1,579,700	1,259,800	1,272,100	2,062,900	891,400	910,000	1,041,300	1,239,100	1,534,100	994,000	1,066,700	804,000	892,800	1,189,600	2,103,800	937,000
Outflows (AFY)																			
Evapotranspiration	357,500	354,500	342,800	354,700	345,300	364,000	353,200	401,200	371,500	374,800	361,300	370,700	389,500	371,400	380,700	341,600	352,100	352,500	356,400
<i>Agricultural</i>	245,200	244,400	239,500	238,500	251,400	232,200	237,800	279,600	272,800	264,000	247,700	244,300	272,800	280,300	280,700	254,500	245,600	239,900	245,200
<i>Urban and Industrial</i>	21,400	21,200	21,200	21,800	21,200	23,200	22,200	24,900	22,300	22,900	22,600	23,300	22,200	20,700	21,300	17,600	21,100	21,700	21,600
<i>Managed Wetlands</i>	6,300	5,800	6,000	6,800	6,200	6,900	6,700	7,400	6,400	6,900	7,100	7,300	7,100	6,600	7,600	4,200	2,800	3,000	3,100
<i>Native Vegetation</i>	84,200	82,700	75,900	87,300	66,100	101,100	85,900	89,000	69,700	80,700	83,500	95,300	86,900	63,500	70,900	65,100	82,000	87,400	86,100
<i>Canal Evaporation</i>	400	400	400	500	400	500	500	400	300	400	400	500	400	400	300	100	500	500	500
Deep Percolation	218,600	158,300	203,500	229,900	235,800	248,300	315,100	100,500	156,100	141,900	221,300	265,600	130,900	155,000	104,700	152,100	205,800	321,000	96,500
<i>Precipitation</i>	133,600	88,300	123,700	154,000	144,600	173,900	226,700	46,100	80,900	76,200	143,900	187,800	70,100	81,200	46,300	83,000	133,900	234,800	55,900
<i>Applied Surface Water</i>	5,400	4,500	4,500	5,500	5,400	6,300	7,000	3,000	3,600	4,100	5,600	7,400	4,000	3,800	2,400	1,800	5,800	7,700	4,100
<i>Applied Groundwater</i>	79,600	65,500	75,300	70,400	85,800	68,100	81,400	51,400	71,600	61,600	71,900	70,400	56,800	70,000	56,000	67,300	66,100	78,400	36,500
Seepage	23,800	19,000	22,500	29,000	24,000	26,000	33,400	19,300	19,100	22,000	25,600	31,900	21,200	22,000	16,500	16,500	24,200	37,800	23,100
<i>Streams</i>	20,500	15,900	19,600	25,500	20,900	22,200	29,600	16,400	16,300	18,700	22,500	28,000	17,900	19,100	14,300	15,000	20,700	33,800	19,300
<i>Canals and Drains</i>	3,400	3,100	2,900	3,500	3,100	3,700	3,800	2,900	2,800	3,300	3,100	4,000	3,300	2,900	2,200	1,500	3,600	4,000	3,800
Surface Water Outflows	668,400	367,100	536,500	961,000	656,700	631,100	1,359,800	366,400	370,700	499,500	626,700	865,000	457,200	508,700	304,900	387,400	611,700	1,391,600	462,600
<i>Precipitation Runoff</i>	52,600	32,800	51,700	84,500	59,600	65,300	119,700	29,800	40,200	46,200	67,000	81,400	46,500	47,900	27,700	51,400	55,600	103,100	37,500
<i>Applied Surface Water Return Flows</i>	2,400	1,900	1,700	2,700	1,900	3,200	3,300	1,600	1,600	1,900	2,800	3,600	2,200	1,700	1,100	100	1,800	3,700	3,000
<i>Applied Groundwater Return Flows</i>	21,300	21,300	21,200	19,800	22,300	20,700	21,300	24,400	24,600	23,400	23,400	19,800	23,100	22,600	23,000	12,600	12,500	12,600	13,100
<i>Streams</i>	567,100	279,800	432,200	817,800	539,600	513,200	1,185,800	284,700	280,800	401,300	498,600	728,800	358,200	421,400	240,600	299,300	512,700	1,243,100	379,900
<i>Butte Creek Diversions to Butte Subbasin</i>	25,000	31,300	29,600	36,300	33,300	28,800	29,700	25,900	23,600	26,700	34,900	31,300	27,200	15,100	12,600	23,900	29,100	29,100	29,100
Total Outflow	1,268,400	898,700	1,105,200	1,574,700	1,261,800	1,269,300	2,061,400	887,400	917,400	1,038,100	1,235,000	1,533,300	998,800	1,057,100	806,800	897,600	1,193,800	2,102,800	938,600
Change in Storage (Inflow - Outflow)	-1,000	-1,500	-3,900	5,000	-2,000	2,800	1,500	4,000	-7,400	3,200	4,100	800	-4,800	9,600	-2,800	-4,800	-4,200	1,000	-1,600

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Table A-2. Historical Groundwater System Water Budget, 2000-2018.

Component	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Inflows (AFY)																			
Subsurface Inflows	146,300	140,400	136,000	132,900	138,800	134,300	140,200	147,200	142,300	135,300	131,500	131,600	139,000	139,100	136,800	130,900	131,100	136,500	141,000
<i>Foothill Area</i>	49,700	47,100	46,100	45,400	46,800	47,000	50,400	51,200	46,800	44,100	42,800	45,800	46,100	44,300	41,600	39,100	38,900	45,300	48,800
<i>Los Molinos Subbasin</i>	66,600	64,600	62,400	60,700	62,200	61,800	63,100	66,000	64,600	61,000	60,000	60,900	63,200	64,000	62,500	61,800	61,800	63,600	65,600
<i>Butte Subbasin</i>	29,800	28,400	27,300	26,500	29,600	25,300	26,400	29,800	30,700	29,900	28,400	24,500	29,400	30,500	32,500	29,800	30,000	27,300	26,400
<i>Wyandotte Creek Subbasin</i>	200	200	200	200	200	200	300	200	200	200	200	200	200	200	200	200	300	300	200
Deep Percolation	218,600	158,300	203,500	229,900	235,800	248,300	315,100	100,500	156,100	141,900	221,300	265,600	130,900	155,000	104,700	152,100	205,800	321,000	96,500
<i>Precipitation</i>	133,600	88,300	123,700	154,000	144,600	173,900	226,700	46,100	80,900	76,200	143,900	187,800	70,100	81,200	46,300	83,000	133,900	234,800	55,900
<i>Applied Surface Water</i>	5,400	4,500	4,500	5,500	5,400	6,300	7,000	3,000	3,600	4,100	5,600	7,400	4,000	3,800	2,400	1,800	5,800	7,700	4,100
<i>Applied Groundwater</i>	79,600	65,500	75,300	70,400	85,800	68,100	81,400	51,400	71,600	61,600	71,900	70,400	56,800	70,000	56,000	67,300	66,100	78,400	36,500
Seepage	23,800	19,000	22,500	29,000	24,000	26,000	33,400	19,300	19,100	22,000	25,600	31,900	21,200	22,000	16,500	16,500	24,200	37,800	23,100
<i>Streams</i>	20,500	15,900	19,600	25,500	20,900	22,200	29,600	16,400	16,300	18,700	22,500	28,000	17,900	19,100	14,300	15,000	20,700	33,800	19,300
<i>Canals and Drains</i>	3,400	3,100	2,900	3,500	3,100	3,700	3,800	2,900	2,800	3,300	3,100	4,000	3,300	2,900	2,200	1,500	3,600	4,000	3,800
Total Inflow	388,700	317,700	362,000	391,800	398,600	408,600	488,700	267,000	317,500	299,200	378,400	429,100	291,100	316,100	258,000	299,500	361,100	495,300	260,600
Outflows (AFY)																			
Subsurface Outflows	92,000	84,700	81,400	82,500	80,200	86,200	92,300	80,300	67,900	58,800	62,000	71,300	66,400	55,800	46,200	50,000	50,800	65,000	64,400
<i>Foothill Area</i>	300	300	300	300	300	300	400	300	300	300	300	300	300	200	200	200	200	400	200
<i>Los Molinos Subbasin</i>	5,700	5,900	5,700	5,200	5,400	5,900	5,200	6,100	5,600	5,200	5,000	4,800	5,800	4,800	4,200	3,000	2,200	2,000	2,400
<i>Butte Subbasin</i>	86,000	78,500	75,400	77,000	74,400	80,000	86,700	73,900	62,000	53,400	56,700	66,100	60,400	50,700	41,800	46,700	48,500	62,700	61,800
<i>Wyandotte Creek Subbasin</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Groundwater Pumping	246,600	245,200	248,900	223,500	267,200	198,400	214,400	288,400	297,100	263,000	232,700	196,500	261,000	287,600	293,000	260,900	205,100	185,000	211,400
<i>Agricultural</i>	210,500	209,300	211,800	186,700	227,100	161,100	175,700	248,300	257,300	224,500	196,800	162,400	224,400	251,600	257,600	235,300	182,800	161,800	187,400
<i>Urban and Industrial</i>	27,700	28,000	29,000	28,300	31,700	29,000	30,000	30,700	30,500	29,300	26,700	25,700	26,900	27,000	24,800	18,800	18,700	19,600	20,100
<i>Managed Wetlands</i>	8,400	7,900	8,000	8,500	8,400	8,300	8,700	9,300	9,300	9,100	9,300	8,500	9,700	9,100	10,600	6,800	3,600	3,600	3,900
Stream Gains from Groundwater	8,600	5,200	4,900	5,000	5,900	6,300	10,400	3,500	2,600	1,800	2,700	4,100	2,400	1,500	500	800	1,200	2,500	700
Western Boundary Net Outflows	72,200	65,100	61,600	63,200	61,200	72,300	77,100	49,600	43,900	37,700	55,400	68,600	49,300	46,200	26,200	39,100	52,300	72,000	53,300
Total Outflow	419,400	400,200	396,800	374,200	414,500	363,200	394,200	421,800	411,500	361,300	352,800	340,500	379,100	391,100	365,900	350,800	309,400	324,500	329,800
Change in Storage (Inflow - Outflow)	-30,700	-82,500	-34,800	17,600	-15,900	45,400	94,500	-154,800	-94,000	-62,100	25,600	88,600	-88,000	-75,000	-107,900	-51,300	51,700	170,800	-69,200

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