

Appendix M

Supporting Water Budget Tables C2VSimFG-Kern Model

TABLE 1 - Summary of C2VSimFG-Beta modifications in the Kern County Revision applied to C2VSimFG-Kern by IWFM model input file

File Name	Change to Model Input File
C2VSimFG.in	
*	Change simulation starting time to 09/30/1985_24:00
C2VSimFG_Unsat.dat	
*	Replaced initial condition values with more representative values for revised starting
C2VSimFG_SWatersheds.dat	
*	Modified parameters to improve stream discharge match to historical values
C2VSimFG_Groundwater1985.dat	
*	Added hydrologic flow barrier at White Wolf Fault
*	Set Corcoran Clay thickness to 0 ft in areas where it is not present
*	New 10/1/1985 initial condition
*	Modified hydraulic conductivity and specific storage in Layer 1 in the Kern Water Bank
*	Kern County observation wells
C2VSimFG_ElemPump.dat	
*	FRACSK and DSTSK modified for Kern County elements with limited pumping
C2VSimFG_WellSpec.dat	
*	Added Kern County groundwater water bank recovery wells
*	Added Kern County In-District and Urban wells
C2VSimFG_PumpRates.dat	
*	Added Kern County groundwater water bank recovery pumping
*	Added Kern County In-District and Urban pumping
C2VSimFG_StreamInflow.dat	
*	Extended Poso Creek inflow through WY2015
C2VSimFG_DiverionSpec.dat	
*	Removed all Kern County diversions and renumbered remaining diversions to 1-371
*	Added Kern County diersions 372-484
C2VSimFG_Diverions.dat	
*	Removed all Kern County diversions and renumbered remaining diversions to 1-371
*	Added Kern County diersions 372-484
*	Updated diversion data for all diversions to Kern County
C2VSimFG_BypassSpecs.dat	
*	Removed bypass #17
C2VSimFG_RootZone.dat	
*	Native return flow is sent to either nearby stream nodes as runoff or out-of-model as ET
C2VSimFG_IrrPeriod.dat	
*	Adjusted Kern County irrigation periods
C2VSimFG_ReturnFlowFrac.dat	
*	Modified Kern County Ag return flow fraction
C2VSimFG_Urban.dat	
*	Added zone 106 for Metro Bakersfield and adjusted other Kern County zone areas
*	Applied estimated September 1985 initial condition

TABLE 1 - Summary of C2VSimFG-Beta modifications in the Kern County Revision applied to C2VSimFG-Kern by IWFM model input file

File Name	Change to Model Input File
C2VSimFG_Urban_Area.dat	
	* Changed Kern County oil fields from urban to native vegetation
C2VSimFG_Urban_PerCapWaterUse.dat	
	* Updated population for Kern County Urban Zones based on 1990, 2000, 2010 Census
	* Developed demands from historical data and water management plans
C2VSimFG_Urban_Population.dat	
	* Updated population for Kern County Urban Zones based on 1990, 2000, 2010 Census
C2VSimFG_Urban_WaterUseSpecs.dat	
	* Set fractions for SRs 19-21 based on local info
C2VSimFG_NonPondedCrop.dat	
	* Return flow = 0 for Kern County
C2VSimFG_NonPondedCrop_Area.dat	
	* Revised crop distributions to match historical distribution
C2VSimFG_PondedCrop_Area.dat	
	* Modified distribution of rice to be limited to areas in northwest Kern County with
C2VSimFG_NativeVeg_Area.dat	
	* Rebalanced native veg distribution after redistribution of non-ponded crop area to

TABLE 2 - Summary of data input for surface water diversion to agriculture by water district applied to C2VSimFG-Kern Historical Simulation

Water Year	Arvin-Edison WSD	Belridge WSD	Berrenda Mesa WSD	Buena Vista WSD	Cawelo WD	Kern River Canal Co.	Henry Miller WD	Kern Delta WD	Kern-Tulare WD	Lost Hills WD	North Kern WSD	Rosedale Rio Brave WSD	Semi-tropic WSD	Shafter-Wasco ID	So. San Joaquin MUD	Wheeler Ridge - Maricopa WSD	Olcese WD	TOTAL
	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft
1986	144,722	106,293	90,909	162,444	78,084	11,017	43,242	183,471	27,131	103,268	198,865	0	149,252	74,487	112,888	177,348	1,493	1,664,914
1987	127,333	106,293	90,909	142,274	89,117	10,088	43,242	137,458	27,131	123,981	112,432	0	172,161	53,753	76,193	161,949	1,493	1,475,807
1988	114,321	106,293	90,909	141,152	77,106	2,132	43,242	135,078	27,131	111,872	81,580	0	164,192	47,071	71,243	154,030	1,417	1,368,769
1989	114,591	106,293	90,909	150,341	85,190	9,389	43,242	140,360	27,131	122,044	61,797	0	190,990	50,495	94,729	178,129	1,480	1,467,110
1990	70,816	106,293	90,909	124,845	67,867	13,016	43,242	114,531	27,131	88,963	51,926	0	49,992	34,381	73,000	170,693	1,480	1,129,085
1991	40,698	106,293	90,909	100,517	50,621	9,109	43,242	117,287	27,131	9,553	28,931	0	7,926	40,595	11,683	31,030	1,480	717,005
1992	52,839	106,293	90,909	108,874	54,406	8,624	43,242	118,190	27,131	52,853	34,291	0	94,467	45,851	65,310	96,514	1,480	1,001,274
1993	137,479	93,344	85,549	151,653	75,490	9,527	43,973	174,003	26,034	77,793	181,920	5,040	226,462	72,120	108,767	137,221	1,425	1,607,800
1994	171,856	110,017	93,092	125,084	62,968	12,437	53,471	132,865	28,017	87,636	117,580	2,362	110,951	47,111	83,680	151,368	1,685	1,392,181
1995	134,559	110,993	78,521	189,797	73,155	2,866	29,047	159,595	27,333	85,963	174,020	5,591	235,347	62,105	108,778	153,783	1,425	1,632,877
1996	166,288	112,412	115,132	184,597	90,229	8,162	39,539	179,052	28,749	145,349	202,199	5,722	313,420	72,231	128,865	189,454	1,987	1,983,387
1997	185,820	143,146	97,233	197,871	88,202	8,149	50,584	179,388	29,998	122,140	191,871	4,563	313,717	67,407	124,456	188,455	1,778	1,994,778
1998	120,808	79,387	85,885	152,455	69,758	2,567	30,260	124,464	24,422	80,845	153,662	4,756	240,072	53,064	89,373	148,174	849	1,460,802
1999	152,909	101,786	93,199	142,271	86,667	7,905	53,858	141,626	28,093	108,563	146,395	4,679	307,686	57,625	110,686	166,018	1,248	1,711,214
2000	158,008	111,057	87,200	135,689	87,894	10,902	44,302	152,338	29,948	119,828	133,872	3,920	315,833	61,358	119,597	179,278	1,382	1,752,406
2001	158,432	91,642	65,734	76,718	70,873	8,577	31,379	113,044	30,109	68,302	74,725	0	70,879	48,772	98,104	136,390	1,588	1,145,268
2002	158,197	107,617	63,705	78,735	75,042	7,781	31,724	116,181	25,443	67,574	62,006	0	165,448	55,121	103,849	133,652	1,702	1,253,777
2003	139,412	103,724	64,267	96,601	75,749	7,123	33,941	161,162	24,120	62,007	106,436	1,000	265,110	55,511	106,779	120,733	2,041	1,425,716
2004	155,531	118,543	68,902	86,119	78,558	8,037	39,101	138,664	25,541	67,607	99,610	1,739	174,605	58,351	106,537	138,771	1,637	1,367,853
2005	136,887	105,523	69,372	125,522	78,101	4,715	39,248	169,747	21,445	60,844	207,612	2,784	294,595	58,711	109,716	127,846	1,939	1,614,607
2006	140,411	115,146	84,869	149,851	96,249	3,594	46,538	172,882	22,525	73,422	199,626	0	332,115	68,468	120,106	150,416	2,048	1,778,265
2007	158,526	118,036	102,971	91,196	70,811	3,650	48,482	112,341	23,348	83,116	89,195	552	146,826	37,391	75,642	164,924	1,496	1,328,502
2008	157,604	114,525	86,217	70,032	62,437	3,565	18,156	145,633	22,788	74,554	86,051	0	29,675	47,623	87,776	168,211	1,700	1,176,546
2009	145,184	113,385	86,439	73,530	67,340	3,422	12,129	126,039	21,803	83,740	84,727	0	30,808	44,265	116,967	159,502	1,781	1,171,061
2010	132,462	117,589	88,556	102,109	76,351	2,930	29,694	166,787	19,272	88,191	171,744	1,543	168,870	65,238	120,394	159,162	1,756	1,512,648
2011	130,306	121,808	87,344	121,329	88,617	3,535	39,642	192,069	20,213	92,149	173,305	4,466	337,724	74,413	124,678	156,216	1,530	1,769,343
2012	148,146	130,559	87,953	96,407	89,745	3,302	41,553	195,763	21,682	91,720	81,584	1,329	227,901	35,369	81,602	168,753	1,783	1,505,151
2013	159,887	138,131	93,311	33,558	49,978	2,913	18,533	94,682	22,252	93,322	23,343	0	81,279	26,194	58,923	170,033	1,966	1,068,305
2014	144,605	123,390	82,731	410	41,223	1,962	2,246	70,367	14,067	82,546	11,290	0	5,748	8,303	14,249	152,372	1,238	756,746
2015	114,350	117,357	81,535	134	38,195	2,154	0	68,228	10,274	80,631	9,901	0	12,226	0	3,020	145,842	1,462	685,308
2016	130,405	103,032	88,053	52,717	48,753	784	2,135	98,731	18,393	80,573	50,023	0	112,969	29,704	62,934	162,845	1,440	1,043,491
2017	146,207	115,287	92,158	203,439	73,854	2,040	39,588	162,729	21,729	88,281	108,213	17,971	359,685	59,549	115,708	176,183	1,796	1,784,418
2018	143,046	112,857	91,890	78,882	54,972	1,244	3,423	125,207	22,551	87,221	121,012	4,790	154,719	47,048	98,761	167,550	1,370	1,316,542
2019	141,323	112,486	92,189	155,033	71,223	1,664	10,496	132,097	22,648	86,336	129,766	12,929	300,178	63,306	102,801	164,232	1,721	1,600,429
2020	135,800	102,243	90,691	43,792	44,337	654	2,712	106,406	19,543	85,788	45,689	2,541	73,613	51,269	83,676	145,373	1,774	1,035,900
2021	133,553	79,606	88,546	26,999	31,995	0	1,109	58,022	13,696	92,215	30,443	238	13,670	14,849	32,221	145,862	318	763,342
2022	131,503	113,516	92,132	8,919	20,899	2,368	2,130	81,566	18,578	79,465	47,729	0	4,831	22,962	44,055	95,883	11	766,547
2023	135,444	79,073	77,817	222,548	64,766	878	44,014	163,395	18,965	79,953	289,226	11,106	301,301	124,503	102,464	106,259	753	1,822,465
Max	185,820	143,146	115,132	222,548	96,249	13,016	53,858	195,763	30,109	145,349	289,226	17,971	359,685	124,503	128,865	189,454	2,048	1,994,778
Average	136,060	109,507	86,830	110,643	68,601	5,336	31,203	135,828	23,513	86,584	109,858	2,622	172,559	50,962	88,163	150,012	1,499	1,369,780
Max	40,698	79,073	63,705	134	20,899	0	0	58,022	10,274	9,553	9,901	0	4,831	0	3,020	31,030	11	685,308

TABLE 3 - Summary of data input for surface water diversion from Kern River at different diversion and turnouts applied to C2VSimFG-Kern Historical Simulation

Water Year	Kern River to Beardsley Canal	Kern River to Carrier Canal at Rocky Point	Kern River to Carrier Canal at Calloway Weir	Kern River to CVC at Turnout #4	Kern River to River Canal	Kern River to Rio Vista at River Walk	Kern River to Rosedale Channel	Kern River to North Lake	Kern River to Pioneer Canal	Kern River to Berrenda Mesa WSD	Kern River to Pioneer Project	Kern River to Kern Water Bank	Kern River to Kern Water Bank Canal	Kern River to 2800 Acre Facility	Kern River to Buena Vista WSD BSA	Kern River to Aqueduct at Intertie	TOTAL
	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft
1986	291,715	199,035	238,877	181,392	0	0	65,684	0	63,232	0	0	0	0	97,866	86,736	0	1,224,537
1987	190,539	76,888	179,876	58,811	0	0	19,893	0	756	0	0	0	0	21,592	86,736	0	635,091
1988	111,679	25,813	163,938	21,851	0	0	345	0	0	0	0	0	0	0	86,736	0	410,362
1989	98,796	28,696	168,926	23,291	0	0	0	0	0	0	0	0	0	0	86,736	0	406,445
1990	77,389	5,373	128,753	6,577	0	0	0	0	0	0	0	0	0	0	86,736	0	304,828
1991	69,736	180,189	56,331	13,944	0	0	5,869	0	0	0	0	0	0	0	86,736	0	412,805
1992	71,521	194,315	690	11,008	0	0	3,598	0	0	0	0	0	0	0	86,736	0	367,868
1993	213,099	241,104	43,555	59,099	50,897	0	54,936	0	27,803	0	0	0	0	64,852	64,488	0	819,833
1994	187,380	213,631	18,103	26,829	67	0	0	0	0	9,882	0	0	0	28,046	38,745	0	522,683
1995	256,234	248,113	65,360	144,230	136,516	0	91,721	0	40,366	23,822	45,284	0	0	60,476	103,429	11,850	1,227,401
1996	315,988	255,792	105,845	108,405	119,999	0	78,824	0	14,286	17,382	55,074	0	0	24,037	92,768	0	1,188,400
1997	288,746	280,471	123,771	130,336	123,333	0	62,841	0	23,271	14,977	45,600	0	0	27,212	134,320	52,848	1,307,726
1998	312,857	244,337	143,422	131,398	23,346	0	95,706	0	51,802	18,483	69,637	0	0	95,160	115,019	188,048	1,489,215
1999	214,847	180,856	71,974	46,274	58,082	0	33,938	0	839	6,915	21,343	0	0	17,891	77,220	0	730,179
2000	175,718	169,844	38,793	31,596	38,147	0	20,213	0	0	1,396	15,929	0	0	30,660	47,882	0	570,178
2001	130,052	188,404	23,762	14,050	4,631	0	3,177	0	2,179	0	0	0	0	0	32,686	0	398,941
2002	91,980	203,010	4,149	23,609	7,878	0	581	0	199	431	871	0	0	0	29,404	0	362,112
2003	164,112	206,448	15,893	14,088	31,451	0	12,306	0	0	1,045	0	0	0	0	38,307	0	483,650
2004	153,148	198,769	29,338	18,247	2,301	589	1,503	165	0	2,545	2,005	0	0	0	39,412	0	448,022
2005	236,776	228,885	73,215	62,146	60,019	0	141,022	1,442	1,942	39,702	102,111	21,548	23,125	77,127	72,865	0	1,141,925
2006	257,590	247,806	53,872	122,931	33,872	3,942	87,318	1,442	9,962	24,636	116,108	25,165	34,358	42,587	97,955	0	1,159,544
2007	135,525	189,169	1,049	10,483	7,752	2,746	0	0	0	13,099	17,809	7,507	0	4,568	47,914	0	437,621
2008	137,813	229,304	53,824	22,700	0	544	0	0	0	0	0	0	0	0	34,549	0	478,734
2009	139,246	238,103	31,342	28,635	115	712	109	0	0	0	0	0	0	0	18,418	0	456,680
2010	196,135	241,876	70,315	68,944	60,087	820	10,816	776	1,775	1,165	0	0	0	13,748	66,441	0	732,898
2011	298,003	266,684	75,784	160,243	90,048	1,752	101,209	787	20,479	26,223	121,857	23,951	47,187	84,876	98,416	0	1,417,499
2012	148,513	241,953	20,495	55,303	409	1,001	10,998	0	0	7,594	20,162	582	0	7,871	45,173	0	560,054
2013	45,141	153,474	706	25,758	0	247	0	0	0	3,529	0	0	0	155	0	0	229,010
2014	26,041	122,044	0	8,356	0	283	0	0	0	0	0	0	0	0	0	0	156,724
2015	16,883	104,841	0	0	0	195	0	0	0	0	0	0	0	0	0	0	121,919
2016	76,773	171,255	232	23,435	0	1,366	0	313	0	455	0	0	0	0	0	0	273,829
2017	311,274	290,759	111,390	138,597	106,982	1,247	167,843	1,392	84,243	30,338	200,910	41,961	133,963	88,869	98,240	0	1,808,008
2018	128,159	219,428	81,635	48,406	7,818	998	13,905	794	6,657	7,556	20,942	4,107	0	34,417	0	0	574,822
2019	221,659	248,247	120,475	99,046	65,987	905	22,942	1,871	46,472	19,100	122,757	18,251	46,124	73,268	13,948	0	1,121,052
2020	96,037	188,311	81,620	40,490	123	905	10,000	1,160	12,948	8,590	2,134	0	0	23,751	0	0	466,069
2021	29,389	133,827	0	20,910	0	28	0	0	0	0	0	0	0	0	0	0	184,154
2022	30,208	151,799	2,472	27,824	0	32	0	35	0	129	0	0	0	0	0	0	212,499
2023	250,229	226,044	174,907	183,535	123,114	1,800	97,161	1,647	86,147	22,321	163,577	40,299	188,021	114,446	236,128	0	1,909,376
Max	315,988	290,759	238,877	183,535	136,516	3,942	167,843	1,871	86,147	39,702	200,910	41,961	188,021	114,446	236,128	188,048	1,909,376
Average	163,077	190,392	67,755	58,231	30,341	529	31,959	311	13,036	7,929	30,108	4,826	12,442	27,197	59,234	6,651	704,018
Max	16,883	5,373	0	0	0	0	0	0	0	0	0	0	0	0	0	0	121,919

**TABLE 4 - Summary of data input for surface water diversions for various purposes
applied to C2VSimFG-Kern Historical Simulation**

Water Year	Metro Bakersfield Urban Surface Water Supply	Metro Bakersfield Wastewater Land Disposal	Kern Nat'l Wildlife Refuge SWP Supply	Kern Nat'l Wildlife Refuge Surface Water Inflows from Poso Creek	TOTAL
	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft
1986	24,416	29,235	0	1,611	30,846
1987	25,298	30,832	0	247	31,079
1988	28,563	32,304	0	65	32,369
1989	27,818	33,785	0	136	33,921
1990	27,426	35,756	0	0	35,756
1991	20,959	36,837	0	123	36,960
1992	25,867	37,801	0	10	37,811
1993	30,261	38,774	120	852	39,746
1994	29,111	39,684	16,861	95	56,640
1995	27,248	40,709	12,097	896	53,702
1996	28,261	41,667	12,776	4,536	58,979
1997	19,216	40,832	7,964	13,811	62,607
1998	11,036	40,355	12,268	90,926	143,549
1999	26,996	39,629	14,827	1,876	56,332
2000	30,963	41,497	7,489	58	49,044
2001	28,611	41,559	13,179	0	54,738
2002	30,185	42,043	19,299	1	61,343
2003	32,206	42,962	20,945	22	63,929
2004	56,861	43,735	23,461	0	67,196
2005	43,727	44,021	23,310	9,025	76,356
2006	40,294	44,614	21,829	11,734	78,177
2007	55,334	44,643	21,607	2,440	68,690
2008	56,335	44,936	17,728	18	62,682
2009	58,834	45,416	19,494	9	64,919
2010	61,314	45,527	21,808	536	67,871
2011	64,388	46,429	26,599	7,691	80,719
2012	68,013	46,666	18,451	9	65,126
2013	66,998	45,513	23,701	0	69,214
2014	55,692	44,645	13,877	0	58,522
2015	44,981	43,256	9,203	0	52,459
2016	55,334	44,643	21,607	2,440	68,690
2017	56,335	44,936	17,728	18	62,682
2018	58,834	45,416	19,494	9	64,919
2019	61,314	45,527	21,808	536	67,871
2020	64,388	46,429	26,599	7,691	80,719
2021	68,013	46,666	18,451	9	65,126
2022	66,998	45,513	23,701	0	69,214
2023	55,692	44,645	13,877	0	58,522
Max	68,013	46,666	26,599	90,926	143,549
Average	43,003	41,827	14,267	4,143	60,238
Max	11,036	29,235	0	0	30,846

TABLE 5 - Summary of data input for surface water diversion to groundwater banking and managed aquifer recharge for different facilities applied to C2VSimFG-Kern Historical Simulation

Water Year	Arvin-Edison WSD	Berrenda Mesa Project	Buena Vista WSD	Cawelo WD	Kern Delta WD	Kern River GSA	North Kern WSD	Rosedale-Rio Bravo WSD	Semi-tropic WSD	West Kern WD	City of Bakers-field	Pioneer Project	Kern Water Bank	Shafter-Wasco ID	Southern San Joaquin MUD	TOTAL
	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft			Acre-ft
1986	63,708	0	28,948	0	74,308	33,628	115,498	103,384	0	25,559	164,861	0	0	0	0	609,894
1987	18,800	0	7,487	0	49,387	12,697	47,206	47,731	0	23,249	50,585	0	0	0	0	257,142
1988	1,434	0	227	0	38,275	11,651	11,171	19,026	0	24,594	18,294	0	0	0	0	124,672
1989	3,358	0	3,532	0	47,315	11,325	804	27,984	0	28,604	14,148	0	0	0	0	137,070
1990	4,660	0	0	0	32,009	3,816	0	11,530	0	22,368	9,564	0	0	0	0	83,947
1991	2,404	0	0	0	43,724	10,853	1,224	5,931	0	14,754	19,768	0	0	0	0	98,658
1992	3,886	0	799	0	40,038	8,459	10,236	11,880	0	10,368	23,482	0	0	0	0	109,148
1993	99,714	0	19,229	0	55,596	27,876	25,220	88,065	0	24,420	126,544	0	0	0	0	466,664
1994	28,968	0	11,485	0	48,175	12,042	12,333	26,016	0	29,233	67,418	0	0	0	0	235,670
1995	87,910	17,808	49,623	0	62,561	35,561	149,948	119,339	0	28,201	143,019	62,274	121,465	0	0	877,709
1996	69,472	23,398	18,253	0	70,055	31,979	103,277	116,704	0	37,351	75,468	51,330	232,355	0	0	829,642
1997	58,069	9,801	38,015	7,524	75,768	27,810	102,050	108,711	0	18,555	53,470	38,169	132,457	0	0	670,399
1998	97,098	9,493	63,868	9,136	64,206	26,027	196,469	136,250	0	23,133	149,426	57,357	236,320	0	0	1,068,783
1999	81,398	11,489	8,904	6,110	56,201	27,657	69,080	78,941	0	29,249	41,516	21,884	116,663	0	0	549,092
2000	95,786	1,027	238	3,446	61,068	13,858	163	44,501	0	23,082	51,444	22,032	36,551	0	0	353,196
2001	38,774	0	99	2,683	49,509	9,902	0	5,653	0	8,747	22,005	1,253	10,029	0	0	148,654
2002	4,437	0	1,065	2,596	51,729	11,698	0	1,404	0	19,467	11,840	0	13,439	0	0	117,675
2003	44,030	0	424	3,314	69,470	8,069	367	27,154	0	17,766	20,133	0	5,369	0	0	196,096
2004	7,160	3,172	0	5,172	58,314	8,401	3,039	9,626	0	3,513	22,480	10,768	53,070	0	0	184,715
2005	100,311	19,663	33,153	7,882	71,867	33,881	74,241	151,136	0	29,552	164,991	93,466	308,092	0	0	1,088,235
2006	90,722	28,268	22,966	4,219	60,633	35,837	138,698	174,051	0	14,385	113,166	64,388	308,877	0	0	1,056,210
2007	20,012	15,292	0	5,241	44,774	7,392	80,467	20,348	0	4,209	31,534	19,386	70,553	0	0	319,208
2008	4,409	0	0	5,069	46,984	6,134	0	0	92	0	8,787	0	0	0	0	71,475
2009	34,000	0	3,000	5,239	38,150	10,067	2,596	2,354	0	5,075	18,730	0	0	0	0	119,211
2010	101,606	323	19,127	6,252	80,152	28,715	18,377	76,399	0	10,419	40,113	0	8,272	0	0	389,755
2011	99,559	19,373	73,880	29,630	152,586	52,798	147,576	227,775	17,276	24,880	144,869	132,320	397,029	0	0	1,519,551
2012	27,799	20,055	0	7,162	119,694	18,339	60,613	88,019	1,865	30,166	37,046	27,293	83,991	0	0	522,042
2013	3,947	5,750	0	9,345	56,095	4,929	5,078	5,622	22	2,500	11,518	0	0	0	0	104,806
2014	3,518	0	0	2,102	43,253	3,401	0	0	0	0	9,176	0	0	0	0	61,450
2015	401	0	0	5,893	35,241	5,127	4,768	0	22	0	18,840	0	0	0	0	70,292
2016	5,788	0	0	4,802	55,202	20,147	10,223	4,117	0	0	28,649	0	0	4,206	0	128,928
2017	133,006	32,939	76,292	36,035	134,613	129,534	164,466	284,021	11,421	33,227	198,638	202,515	492,750	42,296	1,091	1,929,457
2018	56,659	6,949	6,510	7,518	85,812	56,664	19,501	89,551	2,077	10,786	71,606	39,118	104,161	17,555	2,591	556,912
2019	85,193	18,936	22,450	39,289	112,549	89,729	139,897	167,392	6,208	15,290	142,758	122,252	302,045	35,384	2,018	1,263,988
2020	6,151	9,544	974	7,126	76,180	59,436	29,316	40,211	1,642	3,023	70,678	15,767	48,767	4,574	1,203	368,814
2021	1,773	0	974	2,770	29,991	8,771	4,875	13,081	0	2,226	10,378	15,767	3,803	1,510	8	94,410
2022	1,056	210	846	5,330	42,686	11,029	15,255	0	0	1,275	18,569	0	0	4,772	129	96,256
2023	138,289	27,605	221,767	26,493	128,329	31,108	163,461	261,670	3	14,108	162,971	216,990	493,722	86,366	15,986	1,886,515
Max	138,289	32,939	221,767	39,289	152,586	129,534	196,469	284,021	17,276	37,351	198,638	216,990	493,722			1,929,457
Average	45,402	7,397	19,319	6,773	64,803	24,904	50,724	68,305	1,069	16,140	62,855	31,956	94,205			493,851
Max	401	0	0	0	29,991	3,401	0	0	0	0	8,787	0	0			61,450

TABLE 6 - Summary of data input for groundwater recovery pumping for local water supply by water district applied to C2VSimFG-Kern Historical Simulation

Water Year	Arvin-Edison WSD	Berrenda Mesa Project	Buena Vista WSD	City of Bakers-field	Cawelo WD	KCWA ID4	Kern Delta WD	Kern Water Bank	Lost Hills UD	North Kern WSD	Olcese WD	Pioneer Project	Rosedale Rio Brave WSD	Semi-tropic WSD	West Kern WD	Wheeler Ridge Maricopa WSD	TOTAL
	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft
1986	1,955	0	0	0	0	0	0	0	274	0	101	0	0	0	12,073	0	14,403
1987	21,660	0	0	0	0	0	0	0	278	41,963	101	0	0	0	12,195	0	76,196
1988	27,486	0	960	0	0	0	0	0	281	67,609	138	0	0	0	12,316	0	108,790
1989	38,231	0	2,507	0	0	0	0	0	285	79,674	132	0	0	0	12,438	0	133,266
1990	78,769	0	2,605	0	957	0	0	0	292	73,635	132	0	0	0	12,560	0	168,949
1991	82,566	0	2,511	0	4,666	0	0	0	307	80,432	132	0	0	0	12,546	0	183,160
1992	94,444	0	4,146	0	7,124	0	0	0	306	72,926	132	0	0	0	12,533	5,419	197,029
1993	21,035	0	222	0	3,469	0	0	0	308	3,950	66	0	0	0	12,530	150	41,730
1994	67,679	0	1,732	0	7,805	0	0	0	321	37,251	123	0	0	0	12,078	2,705	129,693
1995	14,191	0	73	0	4,628	0	0	0	322	4,176	66	0	0	0	11,638	0	35,094
1996	1,095	0	175	0	2,475	0	0	0	322	4,726	143	0	0	2,373	13,642	0	24,950
1997	0	0	0	0	2,406	0	0	0	322	4,261	112	0	0	5,824	13,962	0	26,887
1998	245	0	0	0	1,008	0	0	0	307	318	232	0	0	1,499	13,404	76	17,089
1999	915	0	0	0	2,099	0	0	0	333	773	105	0	0	1,241	14,692	2,806	22,963
2000	2,119	0	855	0	6,406	0	0	0	336	15,864	81	0	0	689	17,125	0	43,475
2001	100,492	19,482	6,115	13,950	8,533	0	0	86,404	350	61,988	103	52,034	0	0	15,714	6,507	371,673
2002	86,809	3,436	4,453	13,972	10,047	0	0	24,664	360	70,804	94	9,578	0	2,082	16,247	0	242,545
2003	30,906	0	1,619	3,211	5,484	1,892	0	53,591	364	21,811	56	16,181	0	2,828	17,733	24	155,699
2004	75,399	0	3,848	7,147	8,920	3,345	0	27,736	393	49,888	120	1,985	0	2,879	20,809	41	202,510
2005	25,104	589	430	0	3,563	0	0	21,553	400	6,121	111	12,951	0	2,145	20,843	0	93,809
2006	174	0	228	0	4,202	0	0	0	416	2,645	77	0	0	156	22,108	0	30,007
2007	101,515	23,022	5,858	10,000	11,039	6,220	0	167,291	419	88,841	149	54,150	2,302	0	23,107	0	493,914
2008	141,081	27,850	6,066	13,400	12,222	9,478	9,744	246,249	423	100,465	115	77,533	7,470	0	22,340	0	674,436
2009	128,043	29,745	5,315	9,086	742	5,582	15,117	166,703	389	111,798	144	78,033	6,001	449	21,629	0	578,777
2010	37,081	15,117	841	3,896	2,078	1,886	4,466	97,576	362	20,897	112	41,021	0	375	21,334	0	247,041
2011	445	0	290	0	146	0	0	0	378	683	115	0	0	500	20,801	1,037	24,395
2012	43,589	6,362	1,835	3,960	2,058	1,319	3,148	94,381	393	103,236	107	14,257	0	0	21,107	14,579	310,330
2013	123,971	1,379	4,261	5,571	20,994	2,252	19,809	171,627	373	146,543	118	41,743	14,231	0	19,494	16,518	588,883
2014	146,319	23,891	3,269	7,997	18,120	30,884	34,160	183,235	359	133,769	472	78,603	21,604	0	33,129	16,020	731,830
2015	123,618	26,298	1,267	3,516	24,146	38,294	32,918	154,687	358	118,342	109	56,634	17,237	0	20,344	13,857	631,624
2016	81,182	18,461	2,609	2,259	17,334	6,069	23,429	60,440	376	94,855	121	35,524	9,351	4,192	24,381	12,648	393,229
2017	2,492	1,629	69	2,264	1,525	470	402	253	372	13,128	61	9,025	4,631	8,302	15,198	7	59,829
2018	17,917	8,835	945	3,053	13,261	0	1,624	40,279	372	62,130	108	20,537	1,378	1,086	17,343	10,218	199,086
2019	816	786	151	3,071	2,535	0	0	774	372	15,708	112	6,446	0	2,134	15,474	328	48,707
2020	56,992	8,679	2,830	10,397	19,382	5,900	13,629	108,653	372	94,145	154	55,962	15,442	0	24,503	7,041	424,082
2021	109,315	21,427	3,019	13,801	19,480	20,058	26,322	160,044	372	124,868	198	71,207	16,302	0	19,921	5,886	612,219
2022	70,875	26,906	436	14,887	26,591	34,866	19,495	201,954	372	147,693	601	68,069	20,540	0	27,859	8,388	669,533
2023	14,002	4,423	0	3,396	2,622	8,473	2,943	50,578	372	16,849	40	14,642	4,600	0	12,977	0	135,917
Max	146,319	29,745	6,115	14,887	26,591	38,294	34,160	246,249	423	147,693	601	78,603	21,604	8,302	33,129	16,518	731,830
Average	51,856	7,061	1,883	3,917	7,318	4,658	5,453	55,755	350	55,125	137	21,477	3,713	1,020	17,635	3,270	240,625
Max	0	0	0	0	0	0	0	0	274	0	40	0	0	0	11,638	0	14,403

**TABLE 7 - Summary of data input for groundwater pumping for basin export by water district
applied to C2VSimFG-Kern Historical Simulation**

Water Year	Arvin-Edison WSD to Aqueduct	DWR to Aqueduct	North Kern WSD to Friant-Kern Canal	Rosedale Rio Brave WSD to CVC	Semi-tropic WSD to Aqueduct	Wheeler Ridge - Maricopa WSD to Aqueduct	County of Kern to BVARA	TOTAL
	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	673	673
1988	0	0	0	0	0	0	6,301	6,301
1989	0	0	0	0	0	0	5,879	5,879
1990	0	0	0	0	0	0	8,836	8,836
1991	0	0	0	0	0	0	22,114	22,114
1992	0	0	0	0	0	0	25,025	25,025
1993	0	0	0	0	0	0	7,521	7,521
1994	0	0	0	0	0	0	3,261	3,261
1995	0	2,319	0	0	0	0	4,748	7,067
1996	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	56	56
2001	0	0	0	0	1,457	638	10,024	12,119
2002	0	0	0	0	21,819	0	22,402	44,221
2003	12,380	0	0	0	0	0	9,886	22,266
2004	11,573	0	0	0	8,965	0	13,643	34,181
2005	13,939	0	0	0	19,103	0	6,071	39,113
2006	0	0	0	0	0	0	0	0
2007	7,609	0	7,276	0	6,282	0	10,437	31,604
2008	42,615	0	4,612	0	92,169	0	17,351	156,747
2009	43,080	0	5,880	0	86,194	7,243	7,786	150,183
2010	56,229	0	73	0	37,995	12,404	7,019	113,720
2011	16,065	0	0	0	0	0	369	16,434
2012	10,010	0	6,803	0	0	1,340	1,889	20,042
2013	15,111	0	7,471	12,116	5,610	3,815	9,786	53,909
2014	45,195	0	12,071	28,818	95,611	18,236	21,567	221,498
2015	67,142	0	9,752	26,314	89,453	26,943	23,330	242,934
2016	53,134	0	2,993	10,822	89,371	20,333	10,809	187,462
2017	5,963	0	17,888	1,933	0	9,616	4,037	39,437
2018	13,893	0	3,823	8,045	0	12,910	8,844	47,515
2019	6,393	0	10,136	0	0	44	7,020	23,593
2020	0	0	14,172	37,509	0	17,096	8,079	76,856
2021	0	0	10,785	65,041	43,955	23,337	10,853	153,971
2022	3,574	0	7,034	51,684	130,892	25,367	9,847	228,398
2023	0	0	0	5,365	73,252	1,270	3,771	83,658
Max	67,142	2,319	17,888	65,041	130,892	26,943	25,025	242,934
Average	11,155	61	3,178	6,517	21,109	4,752	8,138	54,910
Max	0	0	0	0	0	0	0	0

TABLE 8 - Summary of population data input by urban zone applied to C2VSimFG-Kern Historical Simulation

Water Year	Urban Zone 97	Urban Zone 98	Urban Zone 99	Urban Zone 100	Urban Zone 102	Urban Zone 103	Urban Zone 104	Urban Zone 105	Urban Zone 106	Total	Annual Growth Rate
	Population	Population	Population	Population	Population	Population	Population	Population	Population	Population	percent
1985	18,266	4,545	54,766	199	11,589	1,845	15,756	443	229,085	336,493	
1986	18,506	4,565	56,021	184	11,631	1,868	16,127	443	245,095	354,441	5.3%
1987	18,747	4,586	57,277	170	11,673	1,892	16,498	443	261,105	372,389	5.1%
1988	18,987	4,607	58,532	155	11,715	1,915	16,869	442	277,114	390,337	4.8%
1989	19,227	4,627	59,788	141	11,758	1,939	17,240	442	293,124	408,285	4.6%
1990	19,467	4,648	61,043	126	11,800	1,962	17,611	442	309,134	426,233	4.4%
1991	19,808	4,662	64,110	132	12,190	2,023	17,570	475	316,532	437,502	2.6%
1992	20,150	4,676	67,178	138	12,581	2,084	17,528	507	323,930	448,771	2.6%
1993	20,491	4,690	70,245	144	12,971	2,145	17,487	540	331,328	460,041	2.5%
1994	20,832	4,704	73,313	150	13,362	2,206	17,445	572	338,726	471,310	2.4%
1995	21,174	4,718	76,380	156	13,752	2,268	17,404	605	346,124	482,579	2.4%
1996	21,515	4,732	79,447	161	14,142	2,329	17,363	637	353,522	493,848	2.3%
1997	21,856	4,746	82,515	167	14,533	2,390	17,321	670	360,920	505,117	2.3%
1998	22,197	4,760	85,582	173	14,923	2,451	17,280	702	368,318	516,387	2.2%
1999	22,539	4,774	88,650	179	15,314	2,512	17,238	735	375,716	527,656	2.2%
2000	22,880	4,788	91,717	185	15,704	2,573	17,197	767	383,114	538,925	2.1%
2001	23,154	4,887	94,141	193	16,313	2,601	17,609	742	395,409	555,047	3.0%
2002	23,429	4,985	96,564	200	16,922	2,628	18,020	717	407,703	571,169	2.9%
2003	23,703	5,084	98,988	208	17,532	2,656	18,432	692	419,998	587,291	2.8%
2004	23,977	5,182	101,412	215	18,141	2,683	18,844	667	432,292	603,413	2.7%
2005	24,252	5,281	103,836	223	18,750	2,711	19,256	643	444,587	619,536	2.7%
2006	24,526	5,379	106,259	230	19,359	2,738	19,667	618	456,882	635,658	2.6%
2007	24,800	5,478	108,683	238	19,968	2,766	20,079	593	469,176	651,780	2.5%
2008	25,074	5,576	111,107	245	20,578	2,793	20,491	568	481,471	667,902	2.5%
2009	25,349	5,675	113,530	253	21,187	2,821	20,902	543	493,765	684,024	2.4%
2010	25,623	5,773	115,954	260	21,796	2,848	21,314	518	506,060	700,146	2.4%
2011	25,815	5,802	117,403	261	21,959	2,862	21,474	519	512,386	708,482	1.2%
2012	26,009	5,831	118,871	261	22,124	2,877	21,635	521	518,791	716,919	1.2%
2013	26,204	5,860	120,357	262	22,290	2,891	21,797	522	525,275	725,458	1.2%
2014	26,400	5,889	121,861	263	22,457	2,905	21,961	523	531,841	734,102	1.2%
2015	26,598	5,919	123,385	263	22,626	2,920	22,125	525	538,489	742,850	1.2%
2016	27,224	5,966	127,867	264	23,159	2,932	22,302	527	551,163	761,404	2.5%
2017	27,543	5,990	130,168	265	23,430	2,938	22,392	528	557,612	770,866	1.2%
2018	27,865	6,014	132,511	265	23,704	2,943	22,481	529	564,136	780,448	1.2%
2019	28,191	6,038	134,897	266	23,981	2,949	22,571	530	570,736	790,159	1.2%
2020	28,521	6,062	137,325	266	24,262	2,955	22,661	531	577,414	799,997	1.2%
2021	28,854	6,087	139,797	267	24,545	2,961	22,752	532	584,170	809,965	1.2%
2022	29,192	6,111	142,313	267	24,833	2,967	22,843	533	591,005	820,064	1.2%
2023	29,533	6,136	144,875	268	25,123	2,973	22,934	535	597,919	830,296	1.2%
Max	29,533	6,136	144,875	268	25,123	2,973	22,934	767	597,919	830,296	5.3%
Average	23,953	5,297	100,366	212	18,239	2,576	19,545	568	437,160	607,916	2.4%
Max	18,506	4,565	56,021	126	11,631	1,868	16,127	442	245,095	354,441	1.2%

TABLE 9 - Summary of data input of per-capita water use by urban zone applied to C2VSimFG-Kern Historical simulation

Water Year	Urban Zone 97	Urban Zone 98	Urban Zone 99	Urban Zone 100	Urban Zone 102	Urban Zone 103	Urban Zone 104	Urban Zone 105	Urban Zone 106
	gdpc	gdpc	gdpc	gdpc	gdpc	gdpc	gdpc	gdpc	gdpc
1985	228	196	245	159	180	159	293	159	508
1986	228	196	245	159	180	159	293	159	478
1987	228	196	245	159	180	159	293	159	453
1988	228	196	245	159	180	159	293	159	440
1989	228	196	245	159	180	159	293	159	412
1990	228	196	245	159	180	159	293	159	421
1991	228	196	245	159	180	159	293	159	408
1992	228	196	245	159	180	159	293	159	413
1993	228	196	245	159	180	159	293	159	423
1994	228	196	245	159	180	159	293	159	413
1995	228	196	245	159	180	159	293	159	375
1996	228	196	245	159	180	159	293	159	405
1997	228	196	245	159	180	159	293	159	363
1998	228	196	245	159	180	159	293	159	287
1999	228	196	248	159	159	159	237	159	378
2000	228	196	248	159	159	159	237	159	382
2001	228	196	248	159	159	159	237	159	374
2002	228	196	248	159	159	159	237	159	374
2003	228	196	248	159	159	159	237	159	355
2004	228	196	248	159	159	159	237	159	400
2005	228	196	248	159	159	159	237	159	334
2006	228	196	248	159	159	159	237	159	330
2007	228	196	248	159	159	159	237	159	377
2008	228	196	248	159	159	159	237	159	378
2009	228	196	248	159	159	159	237	159	343
2010	228	196	248	159	159	159	237	159	330
2011	228	196	248	159	159	159	237	159	343
2012	228	196	248	159	159	159	237	159	379
2013	228	196	248	159	159	159	237	159	333
2014	228	196	248	159	159	159	237	159	329
2015	228	196	248	159	159	159	237	159	269
2016	228	196	248	159	159	159	237	159	263
2017	228	196	248	159	159	159	237	159	274
2018	228	196	248	159	159	159	237	159	261
2019	228	196	248	159	159	159	237	159	232
2020	228	196	248	159	159	159	237	159	231
2021	228	196	248	159	159	159	237	159	232
2022	228	196	248	159	159	159	237	159	226
2023	228	196	248	159	159	159	237	159	218
Max	228	196	248	159	180	159	293	159	478
Average	228	196	247	159	166	159	256	159	348
Max	228	196	245	159	159	159	237	159	218

TABLE 10 - Summary of data input for crop evapotranspiration (ET) by crop type based on METRIC satellite data applied to C2VSimFG-Kern Historical Simulation

Water Year	Grain	Cotton	Sugar Beets	Cotton	Dry Beans	Saf-flower	Other Field Crops	Alfalfa	Pasture	Tomato-Processed	Tomato-Fresh	Curcubits	Onions & Garlic	Potatoes	Other Truck	Almonds & Pistachios	Orchards	Citrus	Vineyards	Idle	Rice	Refuge	Urban	Native
Units	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr	in/yr
1985	30.0	31.6	34.6	35.4	30.8	28.0	27.9	38.9	35.8	28.8	27.3	24.9	28.7	27.6	29.3	31.6	29.7	36.5	25.0	27.4	35.8	31.6	28.1	27.5
1986	28.2	28.9	36.4	32.8	28.0	26.2	29.2	39.3	35.5	29.8	28.8	27.7	26.5	26.2	27.9	35.1	33.6	36.8	26.9	27.1	39.3	36.2	27.8	26.8
1987	33.8	35.2	39.5	33.3	31.0	26.3	31.4	44.5	33.2	34.2	28.3	27.2	31.3	30.9	31.2	41.4	37.1	43.4	32.1	30.6	40.7	32.2	32.3	33.0
1988	33.8	35.2	39.5	33.3	31.0	26.3	31.4	44.5	33.2	34.2	28.3	27.2	31.3	30.9	31.2	41.4	37.1	43.4	32.1	30.6	40.7	32.2	32.3	33.0
1989	33.8	35.2	39.5	33.3	31.0	26.3	31.4	44.5	33.2	34.2	28.3	27.2	31.3	30.9	31.2	41.4	37.1	43.4	32.1	30.6	40.7	32.2	32.3	33.0
1990	33.8	35.2	39.5	33.3	31.0	26.3	31.4	44.5	33.2	34.2	28.3	27.2	31.3	30.9	31.2	41.4	37.1	43.4	32.1	30.6	40.7	32.2	32.3	33.0
1991	30.0	31.6	34.6	35.4	30.8	28.0	27.9	38.9	35.8	28.8	27.3	24.9	28.7	27.6	29.3	31.6	29.7	36.5	25.0	27.4	35.8	31.6	28.1	27.5
1992	33.8	35.2	39.5	33.3	31.0	26.3	31.4	44.5	33.2	34.2	28.3	27.2	31.3	30.9	31.2	41.4	37.1	43.4	32.1	30.6	40.7	32.2	32.3	33.0
1993	28.2	28.9	36.4	32.8	28.0	26.2	29.2	39.3	35.5	29.8	28.8	27.7	26.5	26.2	27.9	35.1	33.6	36.8	26.9	27.1	39.3	36.2	27.8	26.8
1994	29.5	34.0	36.9	37.0	31.9	24.0	36.5	37.6	31.4	32.4	27.3	27.4	34.1	28.7	31.6	37.2	37.5	38.7	29.1	33.3	26.6	23.9	27.0	27.3
1995	30.1	32.4	35.8	34.4	30.7	26.6	30.7	36.6	32.6	29.4	29.0	28.1	33.1	27.4	30.2	35.8	35.5	35.8	28.7	32.2	31.6	36.3	27.5	29.6
1996	35.0	37.1	39.7	39.2	38.2	32.6	35.8	42.3	38.7	36.1	32.7	28.7	35.3	30.4	33.0	39.3	40.1	39.4	32.1	32.8	34.1	36.4	30.2	31.0
1997	31.3	35.5	39.1	37.7	33.9	29.3	37.2	43.5	36.0	33.2	28.1	28.8	29.7	28.8	30.1	33.7	34.0	38.1	26.1	30.6	34.1	34.0	28.1	31.1
1998	28.2	28.9	36.4	32.8	28.0	26.2	29.2	39.3	35.5	29.8	28.8	27.7	26.5	26.2	27.9	35.1	33.6	36.8	26.9	27.1	39.3	36.2	27.8	26.8
1999	30.0	31.6	34.6	35.4	30.8	28.0	27.9	38.9	35.8	28.8	27.3	24.9	28.7	27.6	29.3	31.6	29.7	36.5	25.0	27.4	35.8	31.6	28.1	27.5
2000	31.1	34.6	36.0	33.2	29.4	28.7	33.8	44.0	38.6	32.2	32.3	27.3	30.5	29.4	29.5	37.0	34.6	41.0	28.9	27.6	41.2	31.4	32.3	33.0
2001	31.9	33.4	36.3	32.0	29.3	27.2	32.1	44.5	33.8	30.2	29.9	26.5	28.8	28.1	28.8	39.9	36.0	40.7	29.7	28.0	41.7	30.8	30.5	31.6
2002	33.8	35.2	39.5	33.3	31.0	26.3	31.4	44.5	33.2	34.2	28.3	27.2	31.3	30.9	31.2	41.4	37.1	43.4	32.1	30.6	40.7	32.2	32.3	33.0
2003	33.0	35.5	35.6	33.2	33.5	28.0	31.7	42.9	30.6	31.0	26.2	27.8	29.7	27.2	28.4	39.6	32.8	38.8	30.4	29.7	37.0	32.1	28.5	30.4
2004	34.5	36.6	37.3	33.5	33.3	32.8	35.6	46.4	36.1	33.1	26.4	26.1	32.4	30.3	33.1	44.2	36.7	40.0	33.1	35.5	39.0	31.5	30.1	32.4
2005	31.8	35.4	40.6	30.5	31.8	27.8	33.0	40.7	32.3	28.4	23.7	26.8	29.6	28.4	28.0	35.1	30.2	34.8	28.0	29.6	37.3	34.1	28.2	30.0
2006	30.9	33.7	33.7	31.4	31.3	24.9	31.1	41.4	33.2	25.4	26.9	29.5	26.9	31.9	28.2	33.9	28.6	35.0	27.6	27.3	39.6	39.3	27.9	29.0
2007	34.3	36.5	33.9	36.1	31.6	28.9	35.3	44.1	35.3	29.4	24.4	26.7	29.1	27.8	32.5	34.5	29.6	37.6	29.6	29.7	38.0	34.0	27.7	31.5
2008	35.2	34.1	30.6	35.3	29.7	25.1	36.0	43.8	37.2	28.0	25.1	25.7	29.7	29.1	31.3	33.2	31.5	37.9	29.6	26.9	34.2	29.9	28.3	31.4
2009	35.3	34.1	25.1	34.2	32.4	32.6	33.9	42.2	30.9	26.5	24.4	24.9	27.1	29.3	29.6	34.5	31.9	37.8	30.4	28.9	35.8	30.5	27.9	32.0
2010	31.6	28.9	25.8	30.2	28.5	23.7	29.8	38.7	26.8	23.2	23.4	26.2	25.4	26.5	27.0	37.3	31.0	35.5	32.3	28.3	33.7	30.8	27.1	30.2
2011	30.1	28.2	23.9	28.3	27.0	21.8	29.6	36.0	25.1	22.6	27.0	24.4	25.5	25.8	25.2	36.2	32.0	33.6	30.9	26.6	38.1	33.6	26.9	32.7
2012	30.2	27.3	22.5	28.7	26.3	23.0	31.0	35.8	26.1	22.6	28.1	24.3	25.8	26.1	26.1	36.6	31.7	33.9	31.2	26.0	38.4	33.8	27.5	33.0
2013	35.7	35.5	28.0	34.7	32.7	33.2	36.4	44.0	33.1	27.2	30.7	29.1	32.4	30.1	30.1	43.6	35.5	39.9	38.6	29.5	36.3	36.8	29.1	35.2
2014	33.9	33.6	25.2	32.9	28.4	28.8	36.0	40.4	28.8	25.2	28.2	28.3	28.6	28.7	29.8	42.5	33.0	37.8	34.1	28.5	36.0	35.8	29.2	34.2
2015	33.4	34.2	28.3	36.3	31.9	33.9	37.0	43.2	29.0	24.0	26.4	27.1	34.8	27.5	30.7	38.8	31.8	38.3	31.0	28.1	29.6	32.2	27.9	32.4
2016	32.5	30.3	25.9	33.0	27.8	25.6	36.2	36.9	32.7	27.1	24.9	26.0	23.5	24.6	27.6	41.8	31.9	35.5	33.8	28.9	30.5	34.4	27.9	34.1
2017	35.6	32.4	27.2	35.1	33.4	27.1	37.6	36.6	36.7	32.5	24.5	29.8	27.2	31.8	31.7	48.5	35.9	39.3	39.2	34.5	41.2	41.8	29.7	35.0
2018	36.1	32.6	37.2	36.0	34.6	34.3	37.5	36.3	36.3	35.2	32.7	33.1	26.4	29.8	31.1	46.6	35.3	38.6	38.5	35.5	32.1	34.9	29.9	34.1
2019	37.2	33.4	43.2	37.2	35.0	33.2	36.5	37.0	36.7	37.0	28.0	31.6	29.0	30.9	31.4	46.5	34.8	38.1	37.3	37.1	37.0	38.1	29.3	34.1
2020	27.8	25.1	36.9	27.6	28.0	33.2	24.3	28.2	27.6	28.4	19.6	23.3	24.1	23.6	25.2	34.5	26.0	27.7	26.8	26.9	24.0	33.5	31.7	26.3
2021	34.5	31.7	43.4	33.9	35.6	41.0	30.1	35.6	36.0	36.2	14.6	28.5	29.3	27.6	30.4	40.9	33.3	33.2	31.8	30.2	28.6	38.7	32.3	22.9
2022	30.2	28.0	49.5	32.0	39.0	34.6	33.2	31.1	35.7	34.8	24.9	27.0	33.4	26.9	29.9	35.1	28.9	29.5	30.0	29.5	24.5	35.8	33.9	25.6
2023	29.9	33.0	20.5	31.8	20.5	20.5	26.1	35.5	27.6	29.3	29.3	25.3	22.7	21.5	23.9	36.6	25.6	34.3	30.0	29.5	24.5	35.8	33.9	25.7
Average	32.4	33.4	33.0	33.4	30.9	27.8	32.9	41.5	33.0	28.8	27.5	26.9	29.3	28.5	29.5	37.3	33.3	37.7	30.3	29.1	37.1	33.6	28.8	31.3

TABLE 12: Historical and Current Groundwater Recharge for WY1995 to WY2023

Water Year Units	Soil Moisture Percolation				Groundwater Recharge			
	Percolation from Agricultural Area Acre-ft	Percolation from Urban Area Acre-ft	Percolation from Native, Undeveloped or Fallow Areas Acre-ft	Percolation to Unsaturated Zone Acre-ft	GW Recharge from Unsaturated Zone Acre-ft	GW Banking, Conjunctive Use and Other Managed Recharge Acre-ft	Net GW/SW Interactions Acre-ft	Total GW Recharge Acre-ft
SUMMARY: WY1995 to WY2022 Simulation Period								
Total	15,754,960	1,507,151	2,588,815	19,850,927	19,241,188	18,254,872	2,830,842	40,326,902
Average	543,274	51,971	89,269	684,515	663,489	629,478	97,615	1,390,583
Use (ft/acre)	0.70	0.54	0.10	0.38				
Percent	79%	8%	13%	100%	48%	45%	7%	100%
SUMMARY: WY1995 to WY2014 Historical Period								
Total	10,840,033	989,312	1,624,558	13,453,903	13,366,806	11,671,966	1,972,014	27,010,786
Average	542,002	49,466	81,228	672,695	668,340	583,598	98,601	1,350,539
Use (ft/acre)	0.70	0.52	0.09	0.37				
Percent	81%	7%	12%	100%	49%	43%	7%	100%
SUMMARY: WY2016 to WY2022 Annual Report Period								
Total	4,914,927	517,839	964,257	6,397,023	5,874,382	6,582,905	858,828	13,316,115
Average	546,103	57,538	107,140	710,780	652,709	731,434	95,425	1,479,568
Use (ft/acre)	0.70	0.60	0.12	0.39				
Percent	77%	8%	15%	100%	44%	49%	6%	100%
Annual Simulation Results for WY2022 to WY2070 Simulation Period								
1995	622,877	51,743	184,664	859,285	880,433	944,800	185,777	2,011,011
1996	572,216	42,250	72,348	686,814	801,525	926,537	106,693	1,834,755
1997	615,748	49,378	100,568	765,693	766,620	771,510	126,405	1,664,534
1998	675,008	76,104	259,287	1,010,398	1,034,825	1,097,180	121,413	2,253,418
1999	559,254	48,475	82,918	690,647	755,543	633,676	39,705	1,428,924
2000	516,121	40,343	49,112	605,575	616,913	462,522	91,455	1,170,889
2001	522,620	46,161	57,907	626,689	551,581	222,131	66,647	840,359
2002	450,599	37,043	43,583	531,224	466,234	202,687	76,147	745,068
2003	470,394	52,083	58,799	581,277	502,293	297,019	118,149	917,461
2004	484,857	49,885	53,868	588,609	487,803	284,862	83,292	855,957
2005	559,713	61,040	107,289	728,043	798,245	1,147,287	132,781	2,078,314
2006	541,188	54,732	56,803	652,723	838,624	1,125,277	44,650	2,008,552
2007	506,798	37,562	31,184	575,543	560,409	403,611	26,256	990,276
2008	497,075	35,748	38,461	571,285	461,504	146,763	78,837	687,104
2009	504,450	41,539	43,124	589,113	485,046	186,548	73,844	745,438
2010	525,792	61,001	85,901	672,695	594,742	467,683	141,708	1,204,134
2011	690,946	76,143	190,426	957,515	1,073,691	1,530,123	259,377	2,863,191
2012	562,482	55,571	40,582	658,635	712,922	580,590	88,566	1,382,078
2013	490,189	39,469	35,779	565,437	536,928	156,704	59,470	753,102
2014	471,707	33,042	31,955	536,705	440,924	84,456	50,842	576,222
2015	508,357	46,568	56,187	611,112	427,452	89,744	42,671	559,867
2016	487,538	47,479	70,079	605,096	461,704	198,008	70,404	730,116
2017	654,882	58,316	148,266	861,465	958,482	1,879,808	216,262	3,054,552
2018	461,003	37,368	42,571	540,942	568,760	614,176	81,687	1,264,622
2019	503,130	49,206	88,940	641,276	766,599	1,291,624	80,305	2,138,528
2020	563,821	67,782	150,431	782,035	630,494	417,948	74,703	1,123,145
2021	466,009	59,024	47,326	572,358	485,299	122,423	48,451	656,174
2022	535,494	58,881	77,701	672,076	463,727	120,308	51,432	635,467
2023	734,692	93,214	282,758	1,110,664	1,111,864	1,848,866	192,914	3,153,644

NOTES:

Simulation of Recharge	IWFM applies two processes to simulate the movement of water from the surface to the groundwater. The root zone simulates calculates the volume of water that will percolate below the root zone based on local soil properties. This water bases to the unsaturated zone that applies a 1-D vadose zone flow that simulates the rate that water will reach the groundwater based on subsurface properties and soil moisture content.
Percolation from Agricultural Area	Total volume of rainfall and applied water calculated to meet the total agricultural demand that percolates below the root zone in irrigated agricultural areas based on C2VSim simulation.
Percolation from Urban Area	Total volume of rainfall and applied water calculated to meet urban outdoor use that percolates below the root zone in urban areas based on C2VSim simulation.
Percolation from Native, Undeveloped or Fallow Areas	Total volume of rainfall and applied water that percolates below the root zone in native, undeveloped and fallow areas based on C2VSim simulation.
Percolation to Unsaturated Zone	Total volume of rainfall and applied water that percolates below the root zone from all areas based on C2VSim simulation.
GW Recharge from Unsaturated Zone	Volume of water going from the unsaturated zone to groundwater
GW Banking, Managed Recharge and Canal Seepage	Managed aquifer recharge and groundwater banking is simulated in C2VSim by applying a high recoverable loss factor for surface water diversions. For Kern County, these operations generally assumes that 88% to 94% of surface water deliveries physically recharge groundwater. This recharge is applied directly to the groundwater without passing through the unsaturated zone.
Total GW-Surface Water Flow Interactions	Total of Net Stream GW/SW Interactions (from Kern River and Poso Creek) and Net Small Watershed recharge from surface water runoff surrounding Kern County Subbasin. A positive number is recharge, and a negative is groundwater discharge to the stream. This recharge is applied directly to the groundwater without passing through the unsaturated zone.
Total GW Recharge	Total volume to water reaching the groundwater as recharge

TABLE 13: Historical and Current Basin Boundary GW Flow for WY1995 to WY2023

Water Year	Net North Basin Boundary GW Flow	Net White Wolf GW Flow	Net Basin Boundary GW Flow	Net Stream GW/SW Interaction	Net Small Watershed Recharge	Total Stream Recharge
Units	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft
SUMMARY: WY1995 to WY2022 Simulation Period						
Total	-2,571,367	220,450	-2,350,917	2,830,842	1,533,153	4,363,995
Average	-88,668	7,602	-81,066	97,615	52,867	150,483
SUMMARY: WY1995 to WY2014 Historical Period						
Total	-1,865,112	123,509	-1,741,603	1,972,014	975,198	2,947,212
Average	-93,256	6,175	-87,080	98,601	48,760	147,361
SUMMARY: WY2016 to WY2022 Annual Report Period						
Total	-706,255	96,941	-609,314	858,828	557,955	1,416,783
Average	-78,473	10,771	-67,702	95,425	61,995	157,420
Annual Simulation Results for WY2022 to WY2070 Simulation Period						
1995	-76,200	897	-75,303	185,777	122,287	308,064
1996	-82,226	-2,462	-84,688	106,693	41,190	147,883
1997	-85,077	-2,325	-87,402	126,405	50,548	176,953
1998	-82,840	-4,720	-87,561	121,413	155,312	276,726
1999	-82,203	-3,070	-85,273	39,705	32,155	71,860
2000	-82,193	-1,621	-83,813	91,455	25,956	117,411
2001	-83,287	1,329	-81,958	66,647	24,633	91,280
2002	-90,844	6,901	-83,943	76,147	18,882	95,029
2003	-93,662	8,030	-85,633	118,149	34,003	152,152
2004	-96,834	7,571	-89,263	83,292	27,959	111,251
2005	-99,147	9,224	-89,923	132,781	93,557	226,339
2006	-102,065	5,445	-96,620	44,650	40,846	85,496
2007	-98,698	7,094	-91,605	26,256	17,882	44,138
2008	-100,626	14,338	-86,288	78,837	36,058	114,895
2009	-101,563	15,822	-85,741	73,844	21,586	95,430
2010	-110,388	15,808	-94,580	141,708	58,145	199,853
2011	-102,639	7,740	-94,899	259,377	118,303	377,679
2012	-101,707	8,745	-92,962	88,566	19,020	107,585
2013	-95,325	11,888	-83,437	59,470	19,043	78,513
2014	-97,588	16,876	-80,712	50,842	17,832	68,674
2015	-87,190	18,970	-68,221	42,671	21,338	64,008
2016	-78,823	20,246	-58,578	70,404	32,445	102,849
2017	-78,475	12,061	-66,413	216,262	85,850	302,112
2018	-75,800	6,642	-69,158	81,687	31,439	113,125
2019	-75,018	5,854	-69,164	80,305	67,452	147,758
2020	-74,163	6,716	-67,446	74,703	80,739	155,442
2021	-78,411	9,958	-68,453	48,451	65,814	114,264
2022	-77,685	10,081	-67,604	51,432	37,427	88,860
2023	-80,690	6,413	-74,277	192,914	135,451	328,365

NOTES:

Net North Basin Boundary GW Flow	Difference of simulated groundwater inflows and outflows along the northern Kern County Subbasin boundary with Kings and Tule Basins
Net White Wolf GW Flow	Difference of simulated groundwater inflows and outflows along the southern Kern County Subbasin boundary with White Wolf Basin
Net Basin Boundary GW Flow	Combined subsurface GW flow from Kern County Subbasin to Kings, Tule and White Wolf Basins
Net Stream GW/SW Interaction	Net volumetric exchange between surface water in Kern River or Poso Creek and the groundwater. A positive number is surface water to groundwater, and a negative is groundwater discharge to the stream.
Net Small Watershed Recharge	Groundwater recharge from surface water runoff from small watersheds surrounding the Kern County Subbasin
Total Stream Recharge	Total of Net Stream GW/SW Interactions and Net Small Watershed Recharge

TABLE 14: Historical and Current Land Use and Water Use for WY1995 to WY2023

Water Year Units	Land Use Summary				Groundwater Pumping Summary				Surface Water Use Summary			
	Irrigated Agricultural Area	Urban Area	Native, Undeveloped or Fallow Area	Total Area	Agricultural Pumping	Urban Pumping	GW Banking, Exchanges and "Pump-Ins"	Total Pumping	Agricultural Surface Water Deliveries	Urban Surface Water Deliveries	Other Surface Water Deliveries	Total Surface Water Deliveries
	Acres	Acres	Acres	Acres	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft
SUMMARY: WY1995 to WY2022 Simulation Period												
Total					36,928,465	4,941,154	6,219,654	48,089,274	33,971,251	1,232,941	489,705	35,693,898
Average	773,643	98,525	930,751	1,802,919	1,273,395	170,385	214,471	1,658,251	1,171,422	42,515	16,886	1,230,824
Use (ft/acre)					1.65	1.73		0.92	0.92	0.25	0.08	0.74
Percent	43%	5%	52%	100%	77%	10%	13%	100%	95%	3%	1%	100%
SUMMARY: WY1995 to WY2014 Historical Period												
Total					24,754,927	3,522,916	3,450,504	31,728,347	24,644,409	827,781	340,492	25,812,682
Average	779,822	95,537	927,546	1,802,905	1,237,746	176,146	172,525	1,586,417	1,232,220	41,389	17,025	1,290,634
Use (ft/acre)					1.59	1.84		0.88	1.00	0.23	0.10	0.81
Percent	43%	5%	51%	100%	78%	11%	11%	100%	95%	3%	1%	100%
SUMMARY: WY2016 to WY2022 Annual Report Period												
Total					12,173,538	1,418,239	2,769,150	16,360,927	9,326,843	405,160	149,213	9,881,215
Average	759,910	105,165	937,874	1,802,949	1,352,615	157,582	307,683	1,817,881	1,036,316	45,018	16,579	1,097,913
Use (ft/acre)					1.78	1.50		1.01	0.77	0.29	0.05	0.60
Percent	42%	6%	52%	100%	74%	9%	17%	100%	94%	4%	2%	100%
Annual Simulation Results for WY2022 to WY2070 Simulation Period												
1995	780,803	58,394	963,756	1,802,952	779,673	150,518	15,347	945,538	1,340,982	26,158	11,953	1,379,093
1996	798,735	71,339	931,951	1,802,025	1,080,675	153,880	11,378	1,245,932	1,647,976	27,131	14,181	1,689,287
1997	801,583	86,428	914,941	1,802,951	888,848	166,617	11,397	1,066,862	1,651,899	18,447	18,036	1,688,382
1998	799,230	94,070	909,652	1,802,951	694,893	178,371	9,704	882,967	1,201,751	10,595	41,846	1,254,192
1999	803,474	85,993	913,484	1,802,951	929,262	166,608	11,406	1,107,275	1,426,302	25,916	12,051	1,464,270
2000	835,206	85,863	881,882	1,802,951	1,192,285	166,512	14,958	1,373,755	1,463,158	29,713	6,073	1,498,944
2001	799,553	84,609	918,789	1,802,951	1,466,045	176,849	191,841	1,834,735	963,498	27,451	11,359	1,002,308
2002	738,420	87,611	976,921	1,802,951	1,473,084	180,772	103,649	1,757,505	1,058,519	28,964	16,859	1,104,341
2003	757,372	92,311	953,269	1,802,951	1,200,365	180,388	110,568	1,491,321	1,202,558	30,901	15,075	1,248,534
2004	769,162	95,981	937,809	1,802,951	1,590,873	176,146	90,059	1,857,078	1,148,879	54,569	19,412	1,222,859
2005	766,330	101,332	935,290	1,802,951	856,825	158,215	92,005	1,107,044	1,337,381	41,964	18,466	1,397,811
2006	816,721	112,056	874,174	1,802,951	950,585	179,565	18,933	1,149,083	1,470,354	38,666	18,441	1,527,461
2007	792,925	106,463	903,563	1,802,951	1,592,711	189,287	313,101	2,095,098	1,118,253	53,104	17,009	1,188,366
2008	762,593	103,540	936,819	1,802,951	1,580,999	189,648	565,412	2,336,059	993,550	54,064	14,880	1,062,494
2009	763,660	103,826	935,466	1,802,953	1,546,574	180,147	469,225	2,195,945	992,759	56,466	16,276	1,065,502
2010	755,415	106,423	941,113	1,802,951	1,003,190	174,610	281,975	1,459,775	1,267,222	58,848	19,425	1,345,495
2011	782,699	107,810	912,442	1,802,951	761,163	188,255	34,393	983,811	1,491,540	61,797	20,310	1,573,648
2012	790,395	110,511	902,046	1,802,951	1,216,581	203,122	160,629	1,580,331	1,280,456	65,278	15,464	1,361,197
2013	759,168	104,354	939,430	1,802,951	1,936,008	179,416	325,749	2,441,173	923,115	64,303	20,333	1,007,751
2014	723,000	111,830	968,121	1,802,951	2,014,288	183,992	618,777	2,817,057	664,254	53,448	13,044	730,747
2015	765,851	111,658	925,424	1,802,933	1,989,237	166,575	567,417	2,723,229	606,865	43,170	7,816	657,851
2016	759,168	104,354	939,430	1,802,951	1,418,158	152,484	344,495	1,915,137	896,642	50,305	15,789	962,736
2017	759,168	104,354	939,430	1,802,951	1,118,615	160,601	59,478	1,338,694	1,492,979	50,166	19,755	1,562,900
2018	759,168	104,354	939,430	1,802,951	1,569,420	157,246	130,355	1,857,022	1,117,016	52,284	22,523	1,191,824
2019	759,168	104,354	939,430	1,802,951	1,095,966	150,892	46,650	1,293,508	1,348,900	49,085	19,114	1,417,099
2020	759,168	104,354	939,430	1,802,951	1,048,690	143,180	337,327	1,529,196	875,658	57,246	18,728	951,631

TABLE 14: Historical and Current Land Use and Water Use for WY1995 to WY2023

Water Year	Land Use Summary				Groundwater Pumping Summary				Surface Water Use Summary			
	Irrigated Agricultural Area	Urban Area	Native, Undeveloped or Fallow Area	Total Area	Agricultural Pumping	Urban Pumping	GW Banking, Exchanges and "Pump-Ins"	Total Pumping	Agricultural Surface Water Deliveries	Urban Surface Water Deliveries	Other Surface Water Deliveries	Total Surface Water Deliveries
Units	Acres	Acres	Acres	Acres	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft	Acre-ft
2021	759,168	104,354	939,430	1,802,951	1,801,556	166,249	478,690	2,446,495	659,029	34,516	15,869	709,414
2022	759,168	104,354	939,430	1,802,951	1,542,728	163,032	626,422	2,332,183	706,200	33,942	13,279	753,422
2023	759,168	104,354	939,430	1,802,951	589,169	157,979	178,315	925,464	1,623,553	34,446	16,340	1,674,340

NOTES:

Land Use Summary	Total acreage assigned to irrigated agriculture, urban and native/riparian areas within the water budget area. Areas are based on Kern County land use data and mapped by DWR. Under future project scenarios, land use is modified to reflect demand reduction management actions.
Agricultural Pumping	Total agricultural pumping applied in C2VSim to meet irrigated agricultural demand
Urban Pumping	Total groundwater pumping applied to urban areas for municipal and industrial (M&I) use to meet the urban demand calculated by C2VSim
GW Banking, Exchanges and "Pump-Ins"	Total user-specified pumping for groundwater banking recovery operations, in-basin groundwater exchanges, aqueduct pump-ins, or specified urban pumping. A negative value represents an exchange where groundwater pumped from another area is applied within this area.
Agricultural Surface Water Deliveries	Amount of surface water delivered to meet crop water requirements for irrigated acreage after application of user define assumptions for canal seepage and evaporation loss
Urban Surface Water Deliveries	Amount of surface water delivered for urban (M&I) use after application of user-defined assumptions for canal seepage and evaporation loss
Other Surface Water Deliveries	Amount of surface water delivered for other uses (e.g. KNWR seasonal water supply) after application of user-defined assumptions for canal seepage and evaporation loss

TABLE 15: Historical and Current Agricultural Management Water Budget for WY1995 to WY2023

Water Year Units	Irrigated Ag. Area Acres	Water Supply					Water Demand				
		Precipitation to ET Acre-ft	Ag. Pumping Applied Water Acre-ft	Ag. Surface Water Deliveries Acre-ft	Precipitation to ET per Acre ft/acre	Total Applied Water Per Acre ft/acre	Crop Water Requirement Acre-ft	Percolation to Groundwater Acre-ft	Crop Water Demand Per Acre ft/acre	Percolation to Groundwater per Acre ft/acre	
SUMMARY: WY1995 to WY2022 Simulation Period											
Total	22,435,635	9,937,217	36,914,949	33,971,251			62,342,147	15,754,960			
Average	773,643	342,663	1,272,929	1,171,422	0.44	3.16	2,149,729	543,274	2.78	0.70	
Percent		12%	46%	42%			80%	20%			
SUMMARY: WY1995 to WY2014 Historical Period											
Total	15,596,443	6,837,516	24,742,130	24,644,409			43,148,864	10,840,033			
Average	779,822	341,876	1,237,106	1,232,220	0.44	3.17	2,157,443	542,002	2.77	0.69	
Percent		12%	44%	44%			80%	20%			
SUMMARY: WY2016 to WY2022 Annual Report Period											
Total	6,839,192	3,099,700	12,172,819	9,326,843			19,193,283	4,914,927			
Average	759,910	344,411	1,352,535	1,036,316	0.45	3.14	2,132,587	546,103	2.81	0.72	
Percent		13%	49%	38%			80%	20%			
Annual Simulation Results for WY2022 to WY2070 Simulation Period											
1995	780,803	522,058	779,191	1,340,982	0.67	2.72	2,032,198	622,877	2.60	0.80	
1996	798,735	351,541	1,079,730	1,647,976	0.44	3.42	2,333,516	572,216	2.92	0.72	
1997	801,583	356,655	888,253	1,651,899	0.44	3.17	2,204,198	615,748	2.75	0.77	
1998	799,230	663,771	694,449	1,201,751	0.83	2.37	2,019,673	675,008	2.53	0.84	
1999	803,474	400,739	928,706	1,426,302	0.50	2.93	2,030,935	559,254	2.53	0.70	
2000	835,206	357,513	1,191,773	1,463,158	0.43	3.18	2,307,050	516,121	2.76	0.62	
2001	799,553	354,066	1,465,657	963,498	0.44	3.04	2,183,365	522,620	2.73	0.65	
2002	738,420	227,944	1,472,518	1,058,519	0.31	3.43	2,167,372	450,599	2.94	0.61	
2003	757,372	331,344	1,199,815	1,202,558	0.44	3.17	2,143,211	470,394	2.83	0.62	
2004	769,162	275,311	1,590,290	1,148,879	0.36	3.56	2,336,680	484,857	3.04	0.63	
2005	766,330	486,190	856,207	1,337,381	0.63	2.86	2,099,682	559,713	2.74	0.73	
2006	816,721	447,335	949,943	1,470,354	0.55	2.96	2,155,061	541,188	2.64	0.66	
2007	792,925	227,795	1,592,012	1,118,253	0.29	3.42	2,219,410	506,798	2.80	0.64	
2008	762,593	170,753	1,580,341	993,550	0.22	3.38	2,099,516	497,075	2.75	0.65	
2009	763,660	221,537	1,545,851	992,759	0.29	3.32	2,119,774	504,450	2.78	0.66	
2010	755,415	346,164	1,002,454	1,267,222	0.46	3.00	2,030,802	525,792	2.69	0.70	
2011	782,699	441,708	760,475	1,491,540	0.56	2.88	2,029,584	690,946	2.59	0.88	
2012	790,395	299,286	1,215,834	1,280,456	0.38	3.16	2,054,929	562,482	2.60	0.71	
2013	759,168	203,135	1,935,161	923,115	0.27	3.77	2,387,228	490,189	3.14	0.65	
2014	723,000	152,673	2,013,469	664,254	0.21	3.70	2,194,681	471,707	3.04	0.65	
2015	765,851	253,389	1,988,524	606,865	0.33	3.39	2,229,085	508,357	2.91	0.66	
2016	759,168	367,342	1,418,151	896,642	0.48	3.05	2,155,481	487,538	2.84	0.64	
2017	759,168	402,750	1,118,615	1,492,979	0.53	3.44	2,369,543	654,882	3.12	0.86	
2018	759,168	241,214	1,569,420	1,117,016	0.32	3.54	2,305,588	461,003	3.04	0.61	
2019	759,168	432,798	1,095,966	1,348,900	0.57	3.22	2,338,252	503,130	3.08	0.66	
2020	759,168	435,183	1,048,690	875,658	0.57	2.53	1,821,644	563,821	2.40	0.74	
2021	759,168	220,670	1,801,556	659,029	0.29	3.24	2,089,943	466,009	2.75	0.61	
2022	759,168	235,251	1,542,728	706,200	0.31	2.96	1,895,235	535,494	2.50	0.71	
2023	759,168	511,102	589,169	1,623,553	0.67	2.91	1,988,513	734,692	2.62	0.97	

NOTES:

Irrigated Ag. Area	Total irrigated agricultural acreage within the water budget area input into C2VSim based on Kern County Agriculture Commission data and mapped by DWR
Precipitation to ET	Amount of precipitation that meets ET demand as calculated by C2VSim over the entire year. This includes ET losses that occur outside of normal growing season so differs from Effective Precipitation as commonly applied in Agriculture Management Plans.
Ag. Pumping Applied Water	Amount of pumped groundwater applied to total irrigated acreage to meet C2VSim calculated crop water and deep percolation demand after application of effective precipitation and surface water deliveries.
Ag. Surface Water Deliveries	Amount of surface water delivered to the total irrigated acreage to meet the C2VSim calculated crop water and deep percolation demand. Applied deliveries include recoverable loss (canal seepage) and non-recoverable loss (evaporation, other losses) factors, based on local conditions and applied consistently with DWR approach used in C2VSim, to the total surface water delivery input data.
Precipitation to ET per Acre	Ratio of precipitation to meet ET demand to the total irrigated agricultural area
Total Applied Water Per Acre	Ratio of applied pumped groundwater and surface water deliveries to the irrigated agricultural area

TABLE 15: Historical and Current Agricultural Management Water Budget for WY1995 to WY2023

		Water Supply					Water Demand			
Water Year	Irrigated Ag. Area	Precipitation to ET	Ag. Pumping Applied Water	Ag. Surface Water Deliveries	Precipitation to ET per Acre	Total Applied Water Per Acre	Crop Water Requirement	Percolation to Groundwater	Crop Water Demand Per Acre	Percolation to Groundwater per Acre
Units	Acres	Acre-ft	Acre-ft	Acre-ft	ft/acre	ft/acre	Acre-ft	Acre-ft	ft/acre	ft/acre
Crop Water Requirement		Volume of water needed to meet the C2VSim calculated crop demand based on application of METRIC ET data over the irrigated agricultural area								
Percolation to Groundwater		Total volume of rainfall and applied water that percolates below the root zone based on C2VSim simulation. This water then enters the unsaturated zone where the time to reach the groundwater is calculated.								
Crop Water Demand Per Acre		Ratio of the crop water requirement to the total irrigated agricultural area								
Percolation to Groundwater per Acre		Ratio of percolation to groundwater to the total irrigated agricultural area								

TABLE 16: Historical and Current Urban Water Budget for WY1995 to WY2023

Water Year Units	Urban Area Acres	Water Supply					Water Demand			
		Precipitation to ET Acre-ft	Urban Pumping Acre-ft	Urban Surface Water Deliveries Acre-ft	Precipitation to ET per Acre ft/acre	Total Urban Water ft/acre	Indoor Use Acre-ft	Outdoor Use Acre-ft	Runoff ft/acre	Percolation to Groundwater per Acre ft/acre
SUMMARY: WY1995 to WY2022 Simulation Period										
Total	2,857,232	1,664,480	4,941,154	1,232,941		7,838,575	2,963,593	4,168,464		
Average	98,525	57,396	170,385	42,515	0.59	270,296	102,193	143,740	24,362.71	270,295.71
Percent		21%	63%	16%			42%	58%		
SUMMARY: WY1995 to WY2014 Historical Period										
Total	1,910,744	1,067,687	3,522,916	827,781			2,088,556	2,875,610		
Average	95,537	53,384	176,146	41,389	0.57	270,919	104,428	143,780	22,710.92	270,919.21
Percent		20%	65%	15%			42%	58%		
SUMMARY: WY2016 to WY2022 Annual Report Period										
Total	946,488	596,793	1,418,239	405,160			875,037	1,292,854		
Average	105,165	66,310	157,582	45,018	0.63	268,910	97,226	143,650	28,033.34	268,910.15
Percent		25%	59%	17%			40%	60%		
Annual Simulation Results for WY2022 to WY2070 Simulation Period										
1995	58,394	55,288	150,518	26,158	0.95	231,964	84,694	122,429	24,840	231,964
1996	71,339	37,199	153,880	27,131	0.52	218,209	86,772	115,875	15,562	218,209
1997	86,428	54,682	166,617	18,447	0.63	239,746	88,716	127,843	23,188	239,746
1998	94,070	135,191	178,371	10,595	1.44	324,157	90,586	167,505	66,065	324,157
1999	85,993	49,179	166,608	25,916	0.57	241,703	92,291	128,353	21,059	241,703
2000	85,863	39,834	166,512	29,713	0.46	236,058	94,051	126,258	15,749	236,058
2001	84,609	46,629	176,849	27,451	0.55	250,929	99,017	132,780	19,133	250,929
2002	87,611	31,731	180,772	28,964	0.36	241,467	102,006	127,320	12,142	241,467
2003	92,311	47,646	180,388	30,901	0.52	258,936	101,561	138,871	18,504	258,936
2004	95,981	39,682	176,146	54,569	0.41	270,397	110,825	143,958	15,614	270,397
2005	101,332	88,860	158,215	41,964	0.88	289,038	95,953	156,283	36,802	289,038
2006	112,056	65,271	179,565	38,666	0.58	283,502	104,607	152,330	26,564	283,502
2007	106,463	30,955	189,287	53,104	0.29	273,346	116,192	145,343	11,810	273,346
2008	103,540	25,314	189,648	54,064	0.24	269,026	116,815	142,447	9,764	269,026
2009	103,826	38,910	180,147	56,466	0.37	275,523	113,421	147,203	14,899	275,523
2010	106,423	68,608	174,610	58,848	0.64	302,066	111,902	162,146	28,019	302,066
2011	107,810	104,506	188,255	61,797	0.97	354,559	119,859	181,928	52,772	354,559
2012	110,511	47,492	203,122	65,278	0.43	315,891	128,651	168,644	18,597	315,891
2013	104,354	32,230	179,416	64,303	0.31	275,948	116,820	146,849	12,279	275,948
2014	111,830	28,479	183,992	53,448	0.25	265,919	113,818	141,247	10,855	265,919
2015	111,658	51,792	166,575	43,170	0.46	261,537	100,535	140,445	20,556	261,537
2016	104,354	59,438	152,484	50,305	0.57	262,226	97,533	141,722	22,972	262,226
2017	104,354	86,197	160,601	50,166	0.83	296,965	101,073	157,367	38,525	296,965
2018	104,354	38,636	157,246	52,284	0.37	248,166	100,470	131,466	16,230	248,166
2019	104,354	77,523	150,892	49,085	0.74	277,500	95,855	149,894	31,751	277,500
2020	104,354	89,408	143,180	57,246	0.86	289,834	96,588	155,311	37,935	289,834
2021	104,354	29,391	166,249	34,516	0.28	230,155	96,328	122,623	11,204	230,155
2022	104,354	45,611	163,032	33,942	0.44	242,586	94,406	129,303	18,877	242,586
2023	104,354	118,797	157,979	34,446	1.14	311,223	92,249	164,724	54,250	311,223

NOTES:

Irrigated Ag. Area	Total irrigated agricultural acreage within the water budget area input into C2VSim based on Kern County Agriculture Commission data and mapped by DWR
Precipitation to ET	Amount of precipitation that meets ET demand as calculated by C2VSim over the entire year. This includes ET losses that occur outside of normal growing season so differs from Effective Precipitation as commonly applied in Agriculture Management Plans.
Ag. Pumping Applied Water	Amount of pumped groundwater applied to total irrigated acreage to meet C2VSim calculated crop water and deep percolation demand after application of effective precipitation and surface water deliveries.
Ag. Surface Water Deliveries	Amount of surface water delivered to the total irrigated acreage to meet the C2VSim calculated crop water and deep percolation demand. Applied deliveries include recoverable loss (canal seepage) and non-recoverable loss (evaporation, other losses) factors, based on local conditions and applied consistently with DWR approach used in C2VSim, to the total surface water delivery input data.
Precipitation to ET per Acre	Ratio of precipitation to meet ET demand to the total irrigated agricultural area

TABLE 16: Historical and Current Urban Water Budget for WY1995 to WY2023

		Water Supply					Water Demand			
Water Year	Urban Area	Precipitation to ET	Urban Pumping	Urban Surface Water Deliveries	Precipitation to ET per Acre	Total Urban Water	Indoor Use	Outdoor Use	Runoff	Percolation to Groundwater per Acre
Units	Acres	Acre-ft	Acre-ft	Acre-ft	ft/acre	ft/acre	Acre-ft	Acre-ft	ft/acre	ft/acre

Total Applied Water Per Acre	Ratio of applied pumped groundwater and surface water deliveries to the irrigated agricultural area
Crop Water Requirement	Volume of water needed to meet the C2VSim calculated crop demand based on application of METRIC ET data over the irrigated agricultural area
Percolation to Groundwater	Total volume of rainfall and applied water that percolates below the root zone based on C2VSim simulation. This water then enters the unsaturated zone where the time to reach the groundwater is calculated.
Crop Water Demand Per Acre	Ratio of the crop water requirement to the total irrigated agricultural area
Percolation to Groundwater per Acre	Ratio of percolation to groundwater to the total irrigated agricultural area

TABLE 17: Estimate of potential native yield for Kern County Subbasin for WY1995 to WY2023 based on C2VSimFG-Kern Historical Simulation

Water Year Units	Ag Precipitation Recharge			Other Area Precipitation Recharge			Small Watershed Inflows			Native Yield Acre-ft
	Precipitation in Agricultural Area Acre-ft	Precipitation to ET Demand Acre-ft	Precipitation to Groundwater in Agricultural Area Acre-ft	Precipitation in Other Areas Acre-ft	Precipitation to ET Demand Acre-ft	Precipitation to Groundwater in Other Areas Acre-ft	Small Watershed Subsurface Inflow Acre-ft	Small Watershed Runoff Percolation Acre-ft	Small Watershed Recharge to Groundwater Acre-ft	
SUMMARY: WY1995 to WY2022 Simulation Period										
Total	12,462,979	9,937,217	2,525,762	18,250,074	13,437,807	4,812,267	515,294	1,017,859	1,533,153	
Average	429,758	342,663	87,095	629,313	463,373	165,940	17,769	35,099	52,867	305,903
Use (ft/acre)	0.56	0.44	0.11	0.61	0.45	0.16	0.01	0.02	0.03	0.170
SUMMARY: WY1995 to WY2014 Historical Period										
Total	8,391,861	6,837,516	1,554,344	12,161,462	9,075,923	3,085,539	354,429	620,769	975,198	
Average	419,593	341,876	77,717	608,073	453,796	154,277	17,721	31,038	48,760	280,754
Percent	0.54	0.44	0.10	0.59	0.44	0.15	0.01	0.02	0.03	0.156
SUMMARY: WY2016 to WY2022 Current Period										
Total	4,071,118	3,099,700	971,418	6,088,612	4,361,885	1,726,727	160,865	397,090	557,955	
Average	452,346	344,411	107,935	676,512	484,654	191,859	17,874	44,121	61,995	361,789
Percent	0.60	0.45	0.14	0.65	0.46	0.18	0.01	0.02	0.03	0.201
Annual Simulation Results for WY2022 to WY2070 Simulation Period										
1995	702,840	522,058	180,783	1,108,386	801,551	306,835	17,540	104,746	122,287	592,364
1996	381,509	351,541	29,968	526,809	406,953	119,856	17,512	23,679	41,190	173,502
1997	482,141	356,655	125,486	637,266	466,082	171,184	17,524	33,024	50,548	329,693
1998	966,577	663,771	302,806	1,492,576	981,363	511,212	17,840	137,472	155,312	951,491
1999	433,488	400,739	32,750	589,454	443,615	145,839	17,812	14,343	32,155	192,931
2000	384,165	357,513	26,653	476,308	379,027	97,281	17,757	8,200	25,956	132,133
2001	431,785	354,066	77,719	579,440	467,082	112,358	17,722	6,911	24,633	196,988
2002	255,112	227,944	27,168	382,463	302,828	79,635	17,679	1,203	18,882	108,006
2003	400,954	331,344	69,610	599,314	487,243	112,071	17,683	16,320	34,003	198,002
2004	301,026	275,311	25,715	422,514	323,616	98,898	17,661	10,298	27,959	134,911
2005	653,857	486,190	167,667	964,382	750,845	213,537	17,808	75,750	93,557	456,954
2006	499,759	447,335	52,424	657,647	520,211	137,436	17,783	23,063	40,846	212,923
2007	216,658	227,795	-11,137	292,814	227,713	65,101	17,725	157	17,882	54,121
2008	189,038	170,753	18,285	305,703	236,546	69,158	17,697	18,361	36,058	105,804
2009	268,030	221,537	46,493	405,160	319,141	86,019	17,674	3,913	21,586	136,425
2010	457,048	346,164	110,884	683,456	517,797	165,659	17,731	40,414	58,145	316,956
2011	649,894	441,708	208,186	1,023,701	657,443	366,257	17,932	100,370	118,303	674,814
2012	335,229	299,286	35,943	446,686	353,433	93,253	17,851	1,169	19,020	130,365
2013	214,952	203,135	11,818	303,560	232,284	71,276	17,787	1,257	19,043	84,351
2014	167,797	152,673	15,124	263,824	201,150	62,674	17,713	120	17,832	77,917
2015	322,064	253,389	68,675	475,114	362,579	112,535	17,681	3,657	21,338	184,867
2016	451,531	367,342	84,189	631,136	494,509	136,627	17,714	14,732	32,445	235,548
2017	581,280	402,750	178,530	901,917	627,000	274,917	17,850	68,000	85,850	521,447
2018	258,498	241,214	17,283	380,004	291,885	88,120	17,762	13,677	31,439	119,079
2019	555,843	432,798	123,045	823,825	640,893	182,932	17,799	49,653	67,452	355,630
2020	600,038	435,183	164,855	893,992	636,897	257,095	17,895	62,844	80,739	484,794
2021	219,631	220,670	-1,039	331,802	251,357	80,445	17,940	47,874	65,814	127,279
2022	322,956	235,251	87,704	477,061	345,192	131,869	17,949	19,478	37,427	239,051
2023	759,278	511,102	248,175	1,173,761	711,573	462,189	18,274	117,177	135,451	827,541

NOTES:

Simulation of Recharge	IWFM applies two processes to simulate the movement of water from the surface to the groundwater. The root zone simulates calculates the volume of water that will percolate below the root zone based on local soil properties. This water bases to the unsaturated zone that applies a 1-D vadose zone flow that simulates the rate that water will reach the groundwater based on subsurface properties and soil moisture content.
Percolation from Agricultural Area	Total volume of rainfall and applied water calculated to meet the total agricultural demand that percolates below the root zone in irrigated agricultural areas based on C2VSim simulation.
Percolation from Urban Area	Total volume of rainfall and applied water calculated to meet urban outdoor use that percolates below the root zone in urban areas based on C2VSim simulation.
Percolation from Native, Undeveloped or Fallow Areas	Total volume of rainfall and applied water that percolates below the root zone in native, undeveloped and fallow areas based on C2VSim simulation.
Percolation to Unsaturated Zone	Total volume of rainfall and applied water that percolates below the root zone from all areas based on C2VSim simulation.
GW Recharge from Unsaturated Zone	Volume of water going from the unsaturated zone to groundwater
GW Banking, Managed Recharge and Canal Seepage	Managed aquifer recharge and groundwater banking is simulated in C2VSim by applying a high recoverable loss factor for surface water diversions. For Kern County, these operations generally assumes that 88% to 94% of surface water deliveries physically recharge groundwater. This recharge is applied directly to the groundwater without passing through the unsaturated zone.
Net GW/SW Interactions	Net volumetric exchange between surface water in Kern River or Poso Creek and the groundwater. A positive number is surface water to groundwater, and a negative is groundwater discharge to the stream. This recharge is applied directly to the groundwater without passing through the unsaturated zone.
Total GW Recharge	Total volume to water reaching the groundwater as recharge

**Table 18 - Hydrologic year correlation with relevant river indices
for projected-future simulation period**

Project Year	Hydrology Year	Annual Kern River Index	San Joaquin River Index
2021	2003	71	Below Normal
2022	2004	56	Dry
2023	2005	159	Wet
2024	2006	147	Wet
2025	2007	35	Critical
2026	2008	71	Critical
2027	2009	65	Below Normal
2028	2010	126	Above Normal
2029	2011	201	Wet
2030	2012	45	Dry
2031	2013	28	Critical
2032	2014	24	Critical
2033	1995	191	Wet
2034	1996	136	Wet
2035	1997	162	Wet
2036	1998	236	Wet
2037	1999	60	Above Normal
2038	2000	66	Above Normal
2039	2001	54	Dry
2040	2002	58	Dry
2041	2003	71	Below Normal
2042	2004	56	Dry
2043	2005	159	Wet
2044	2006	147	Wet
2045	2007	35	Critical
2046	2008	71	Critical
2047	2009	65	Below Normal
2048	2010	126	Above Normal
2049	2011	201	Wet
2050	2012	45	Dry
2051	2013	28	Critical
2052	2014	24	Critical
2053	1995	191	Wet
2054	1996	136	Wet
2055	1997	162	Wet
2056	1998	236	Wet
2057	1999	60	Above Normal
2058	2000	66	Above Normal
2059	2001	54	Dry
2060	2002	58	Dry
2061	2003	71	Below Normal
2062	2004	56	Dry
2063	2005	159	Wet
2064	2006	147	Wet
2065	2007	35	Critical
2066	2008	71	Critical
2067	2009	65	Below Normal
2068	2010	126	Above Normal
2069	2011	201	Wet
2070	2012	45	Dry

Table 19 - Projected Future Groundwater Budget for Kern County Subbasin under Baseline Conditions with NO SGMA Projects based on C2VSimFG-Kern Simulation

Water Year Units	Deep Percolation Acre-ft	Managed Recharge and Canal Seepage Acre-ft	Net Stream GW/SW Interaction Acre-ft	Net Small Watershed Recharge Acre-ft	GW Pumping Acre-ft	Subsurface Flow with Adjacent GW Basins Acre-ft	Change in Groundwater Storage Acre-ft
SUMMARY: WY2021 to WY2070 Simulation Period							
Total	31,276,668	27,591,218	6,284,636	2,457,805	-80,359,227	-3,647,996	-16,396,918
Average	625,533	551,824	125,693	49,156	-1,607,185	-72,960	-327,938
SUMMARY: WY2021 to WY2040 Implementation Period							
Total	12,059,157	10,900,930	2,570,048	948,239	-31,618,403	-1,527,102	-6,667,151
Average	602,958	545,046	128,502	47,412	-1,580,920	-76,355	-333,358
SUMMARY: WY2041 to WY2070 Sustainability Period							
Total	19,217,510	16,690,288	3,714,588	1,509,566	-48,740,823	-2,120,894	-9,729,767
Average	640,584	556,343	123,820	50,319	-1,624,694	-70,696	-324,326
Annual Simulation Results for WY2021 to WY2070 Simulation Period							
2021	421,248	253,922	124,080	38,770	-1,605,058	-83,845	-850,883
2022	466,065	311,661	80,807	28,596	-1,881,001	-79,540	-1,073,415
2023	670,267	894,337	186,631	97,803	-1,082,942	-77,289	688,801
2024	782,933	971,636	250,700	67,141	-1,004,008	-81,747	986,650
2025	487,829	334,264	74,696	18,060	-1,956,094	-78,483	-1,119,730
2026	440,342	154,936	78,551	36,473	-2,258,997	-69,511	-1,618,207
2027	522,430	255,426	73,629	21,942	-1,995,091	-69,397	-1,191,063
2028	569,509	496,227	141,957	35,496	-1,490,383	-70,383	-317,575
2029	1,025,597	1,528,921	110,823	119,558	-891,968	-80,187	1,812,744
2030	692,430	587,522	63,468	19,157	-1,382,783	-79,634	-99,841
2031	550,146	164,041	109,295	19,161	-2,366,434	-73,780	-1,597,574
2032	459,496	111,528	66,581	18,134	-2,763,485	-65,268	-2,173,015
2033	742,600	875,129	188,075	126,420	-1,059,514	-71,675	801,034
2034	617,059	786,754	201,477	42,156	-1,422,316	-78,762	146,370
2035	691,055	727,363	294,732	52,652	-1,120,121	-82,586	563,094
2036	848,018	1,151,100	175,108	103,683	-890,760	-84,597	1,302,552
2037	617,636	539,499	102,463	32,114	-1,230,808	-82,549	-21,645
2038	517,060	379,550	106,226	26,241	-1,390,747	-77,398	-439,070
2039	495,144	190,829	65,868	25,370	-1,883,912	-72,405	-1,179,106
2040	442,293	186,285	74,884	19,311	-1,941,979	-68,067	-1,287,273
2041	466,980	254,002	124,912	34,980	-1,621,935	-66,834	-807,894
2042	519,154	311,722	81,095	28,467	-1,928,066	-66,378	-1,054,007
2043	723,193	894,377	183,602	100,835	-1,131,893	-66,724	703,389
2044	829,429	971,656	217,998	68,630	-1,055,212	-73,234	959,267
2045	520,072	334,263	67,722	18,136	-2,005,971	-71,742	-1,137,519
2046	465,742	154,936	78,954	36,599	-2,308,492	-64,094	-1,636,355
2047	542,433	255,426	73,991	22,117	-2,044,767	-65,020	-1,215,821
2048	587,534	496,227	142,442	35,645	-1,539,937	-66,665	-344,754
2049	1,038,285	1,528,924	111,871	121,871	-940,873	-77,190	1,782,886
2050	704,906	587,522	63,577	19,216	-1,430,758	-77,175	-132,713
2051	567,160	164,041	109,977	19,218	-2,411,967	-71,447	-1,623,019
2052	480,958	111,528	66,775	18,007	-2,776,754	-63,069	-2,162,556
2053	756,460	875,129	189,903	127,393	-1,105,182	-69,591	774,112
2054	629,422	786,754	203,667	42,236	-1,466,597	-76,937	118,546
2055	697,412	727,363	297,238	52,738	-1,163,909	-81,081	529,760
2056	955,260	1,151,202	186,248	169,221	-887,932	-83,323	1,490,676
2057	663,489	539,499	104,143	33,376	-1,272,005	-81,579	-13,077
2058	543,714	379,550	107,428	26,454	-1,432,264	-76,504	-451,623
2059	516,904	190,829	65,982	25,586	-1,924,204	-71,122	-1,196,025
2060	461,832	186,285	75,033	19,353	-1,923,734	-66,838	-1,248,069
2061	483,873	254,002	125,183	34,990	-1,662,322	-65,509	-829,782
2062	535,495	311,722	81,199	28,658	-1,968,451	-64,883	-1,076,261
2063	747,374	894,377	185,862	103,344	-1,173,248	-65,287	692,423
2064	797,596	971,656	227,478	42,092	-1,131,322	-72,135	835,365
2065	518,644	334,263	69,814	18,276	-2,046,917	-70,907	-1,176,825
2066	472,700	154,936	79,262	36,483	-2,350,004	-63,321	-1,669,944
2067	550,095	255,426	74,266	22,151	-2,087,215	-64,426	-1,249,703
2068	654,126	496,227	142,653	60,396	-1,488,744	-65,173	-200,515
2069	1,067,944	1,528,924	112,385	123,705	-984,856	-76,302	1,771,799
2070	719,324	587,522	63,930	19,394	-1,475,294	-76,404	-161,529

Table 20 - Projected Future Groundwater Budget for Kern County Subbasin under Baseline Conditions WITH SGMA Projects based on C2VSimFG-Kern Simulation

Water Year Units	Deep Percolation Acre-ft	Managed Recharge and Canal Seepage Acre-ft	Net GW/SW Interactions Acre-ft	Small Watershed Inflow Acre-ft	GW Pumping Acre-ft	Subsurface Flow with Adjacent GW Basins Acre-ft	Change in Groundwater Storage Acre-ft
SUMMARY: WY2021 to WY2070 Simulation Period							
Total	33,771,527	32,630,931	5,233,643	2,457,805	-69,157,708	-5,025,601	-89,422
Average	675,431	652,619	104,673	49,156	-1,383,154	-100,512	-1,788
SUMMARY: WY2021 to WY2040 Implementation Period							
Total	13,100,548	12,612,730	2,239,160	948,239	-28,535,055	-1,719,340	-1,353,732
Average	655,027	630,637	111,958	47,412	-1,426,753	-85,967	-67,687
SUMMARY: WY2041 to WY2070 Sustainability Period							
Total	20,670,979	20,018,200	2,994,483	1,509,566	-40,622,653	-3,306,261	1,264,311
Average	689,033	667,273	99,816	50,319	-1,354,088	-110,209	42,144
Annual Simulation Results for WY2021 to WY2070 Simulation Period							
2021	430,153	302,373	123,650	38,770	-1,594,606	-83,189	-782,849
2022	475,303	349,553	80,614	28,596	-1,862,120	-78,565	-1,006,617
2023	770,374	1,002,929	168,647	97,803	-1,009,264	-78,404	952,085
2024	855,058	1,086,448	198,849	67,141	-944,665	-84,319	1,178,512
2025	503,643	350,298	70,663	18,060	-1,861,303	-81,925	-1,000,565
2026	440,243	214,542	77,894	36,473	-2,187,564	-73,190	-1,491,603
2027	518,989	316,584	73,092	21,942	-1,919,158	-73,183	-1,061,733
2028	578,749	623,230	137,529	35,496	-1,407,567	-75,335	-107,901
2029	1,194,895	1,696,947	83,255	119,558	-744,743	-87,273	2,262,638
2030	750,668	608,048	58,365	19,157	-1,257,759	-87,531	90,947
2031	555,404	180,833	107,613	19,161	-2,187,295	-83,584	-1,407,869
2032	453,293	125,476	66,634	18,134	-2,567,449	-76,460	-1,980,378
2033	824,902	1,059,059	172,274	126,420	-840,738	-84,135	1,257,782
2034	653,828	917,135	178,991	42,156	-1,197,621	-93,181	501,309
2035	827,370	931,556	238,868	52,652	-872,560	-98,679	1,079,205
2036	1,116,969	1,381,739	113,563	103,683	-633,072	-102,650	1,980,231
2037	725,584	594,384	63,749	32,114	-1,023,020	-100,141	292,669
2038	511,919	433,966	84,887	26,241	-1,154,051	-95,834	-192,873
2039	489,540	224,450	65,153	25,370	-1,627,860	-92,035	-915,382
2040	423,665	213,184	74,871	19,311	-1,642,642	-89,729	-1,001,340
2041	445,485	305,376	122,807	34,980	-1,354,885	-89,185	-535,423
2042	498,858	354,364	80,832	28,467	-1,639,112	-89,772	-766,363
2043	812,155	1,090,304	140,266	100,835	-882,848	-92,437	1,168,274
2044	892,628	1,153,766	138,151	68,630	-836,920	-100,949	1,315,306
2045	524,833	355,672	49,525	18,136	-1,730,147	-100,070	-882,051
2046	454,216	218,616	78,021	36,599	-2,055,875	-92,126	-1,360,549
2047	532,454	320,562	73,425	22,117	-1,809,154	-93,438	-954,033
2048	593,653	668,774	137,874	35,645	-1,324,186	-97,255	14,505
2049	1,234,198	1,750,812	79,492	121,871	-710,054	-110,080	2,366,239
2050	768,780	619,092	54,500	19,216	-1,197,582	-110,438	153,567
2051	578,825	192,400	107,098	19,218	-2,110,155	-106,461	-1,319,074
2052	479,637	135,929	66,695	18,007	-2,470,952	-99,536	-1,870,221
2053	850,038	1,095,469	170,484	127,393	-813,603	-107,867	1,321,915
2054	682,383	948,274	168,655	42,236	-1,143,633	-117,748	580,168
2055	858,469	966,141	223,989	52,738	-849,900	-123,451	1,127,986
2056	1,291,577	1,415,721	105,108	169,221	-638,704	-126,824	2,216,098
2057	807,949	600,599	52,465	33,376	-1,027,113	-123,865	343,411
2058	541,774	439,164	78,391	26,454	-1,146,168	-119,115	-179,499
2059	503,264	229,194	64,724	25,586	-1,627,673	-114,273	-919,179
2060	435,869	217,320	75,042	19,353	-1,597,610	-111,590	-961,617
2061	449,783	308,906	122,761	34,990	-1,363,117	-110,530	-557,207
2062	501,922	357,723	80,757	28,658	-1,643,414	-110,538	-784,892
2063	820,754	1,111,099	135,039	103,344	-898,437	-113,406	1,158,393
2064	871,279	1,174,447	124,818	42,092	-868,913	-122,551	1,221,172
2065	511,277	358,753	43,942	18,276	-1,750,481	-120,972	-939,204
2066	454,845	222,078	77,969	36,483	-2,077,330	-112,479	-1,398,433
2067	531,138	323,961	73,264	22,151	-1,832,363	-113,339	-995,189
2068	672,372	689,792	138,150	60,396	-1,265,870	-116,258	178,583
2069	1,286,647	1,771,462	77,455	123,705	-733,283	-129,909	2,396,076
2070	783,917	622,428	52,784	19,394	-1,223,170	-129,799	125,553

Table 21 - Projected Future Groundwater Budget for Kern County Subbasin under 2030 Climate Conditions with NO SGMA Projects based on C2VSimFG-Kern Simulation

Water Year Units	Deep Percolation Acre-ft	Managed Recharge and Canal Seepage Acre-ft	Net GW/SW Interactions Acre-ft	Small Watershed Inflow Acre-ft	GW Pumping Acre-ft	Subsurface Flow with Adjacent GW Basins Acre-ft	Change in Groundwater Storage Acre-ft
SUMMARY: WY2021 to WY2070 Simulation Period							
Total	30,885,159	30,404,998	6,083,382	2,517,393	-85,792,996	-3,318,618	-19,220,714
Average	617,703	608,100	121,668	50,348	-1,715,860	-66,372	-384,414
SUMMARY: WY2021 to WY2040 Implementation Period							
Total	11,956,360	12,006,382	2,488,942	967,011	-33,772,959	-1,439,420	-7,793,706
Average	597,818	600,319	124,447	48,351	-1,688,648	-71,971	-389,685
SUMMARY: WY2041 to WY2070 Sustainability Period							
Total	18,928,799	18,398,617	3,594,440	1,550,382	-52,020,037	-1,879,198	-11,427,008
Average	630,960	613,287	119,815	51,679	-1,734,001	-62,640	-380,900
Annual Simulation Results for WY2021 to WY2070 Simulation Period							
2021	422,205	264,773	147,393	42,134	-1,686,375	-82,161	-892,031
2022	486,382	352,708	97,994	31,229	-1,966,104	-77,718	-1,075,519
2023	670,731	968,807	192,300	100,122	-1,194,263	-75,163	662,531
2024	724,438	1,015,022	177,313	64,551	-1,153,552	-78,823	748,944
2025	451,579	327,176	67,822	18,068	-2,002,002	-75,206	-1,212,569
2026	443,127	213,524	132,483	37,800	-2,325,127	-67,041	-1,565,234
2027	508,495	246,268	115,977	23,732	-2,151,549	-65,434	-1,322,507
2028	572,490	566,005	191,408	39,445	-1,651,430	-65,956	-348,038
2029	1,218,648	1,901,727	112,842	122,295	-1,104,305	-76,600	2,174,607
2030	553,673	532,639	51,185	19,641	-1,476,524	-74,857	-394,243
2031	521,194	199,452	76,829	18,143	-2,339,207	-68,717	-1,592,305
2032	453,699	143,631	46,557	17,968	-2,788,464	-60,558	-2,187,167
2033	743,629	915,198	182,822	122,210	-1,190,116	-67,058	706,686
2034	615,276	872,000	147,377	45,764	-1,543,359	-73,439	63,619
2035	736,533	843,258	281,587	55,297	-1,297,450	-77,197	542,029
2036	863,933	1,264,065	123,884	102,926	-1,044,324	-79,069	1,231,416
2037	542,139	510,531	72,919	32,384	-1,342,279	-75,848	-260,154
2038	507,189	428,732	81,591	27,413	-1,503,202	-70,781	-529,059
2039	482,914	213,280	87,387	26,084	-2,017,703	-65,709	-1,273,748
2040	438,087	227,586	101,273	19,804	-1,995,626	-62,086	-1,270,964
2041	462,417	263,946	147,623	39,151	-1,702,404	-60,765	-850,032
2042	532,326	354,460	98,221	31,228	-2,012,621	-59,960	-1,056,345
2043	717,292	967,381	179,212	103,193	-1,243,088	-59,869	664,119
2044	766,402	1,015,346	117,742	65,724	-1,204,632	-65,643	694,939
2045	477,463	326,770	51,863	18,138	-2,051,621	-63,896	-1,241,282
2046	465,642	213,337	132,843	37,870	-2,374,509	-57,074	-1,581,891
2047	526,192	246,482	116,132	23,946	-2,201,023	-56,606	-1,344,877
2048	584,963	564,936	191,656	39,636	-1,700,745	-57,895	-377,449
2049	1,218,687	1,904,385	99,805	124,949	-1,152,654	-69,447	2,125,726
2050	560,761	533,577	47,140	19,693	-1,524,426	-68,362	-431,617
2051	531,733	199,452	76,920	18,193	-2,385,216	-62,565	-1,621,483
2052	469,853	139,904	46,651	17,931	-2,807,543	-54,827	-2,188,030
2053	748,982	916,702	183,503	123,682	-1,235,658	-61,582	675,628
2054	618,472	870,588	145,806	45,880	-1,587,472	-68,329	24,946
2055	736,517	843,485	279,382	55,392	-1,341,090	-72,519	501,167
2056	954,438	1,263,249	134,078	169,164	-1,037,331	-74,710	1,408,888
2057	579,927	508,121	73,014	33,640	-1,384,414	-71,487	-261,199
2058	532,403	431,547	81,726	27,628	-1,544,662	-66,368	-537,727
2059	503,820	214,669	87,386	26,299	-2,057,978	-61,126	-1,286,930
2060	456,299	228,154	101,178	19,792	-1,984,645	-57,872	-1,237,094
2061	478,968	264,126	147,695	39,158	-1,742,970	-56,708	-869,739
2062	546,856	353,554	98,263	31,426	-2,052,889	-55,984	-1,078,775
2063	740,448	969,075	181,599	104,939	-1,284,313	-56,141	655,606
2064	735,683	1,013,851	124,774	41,649	-1,277,235	-62,203	576,518
2065	478,349	327,088	54,630	18,289	-2,092,701	-60,730	-1,275,076
2066	473,836	213,074	132,845	37,782	-2,406,519	-57,164	-1,606,144
2067	537,374	246,454	116,277	23,923	-2,231,035	-58,641	-1,365,648
2068	660,267	565,258	192,661	65,542	-1,647,974	-59,014	-223,263
2069	1,254,195	1,903,367	104,892	126,664	-1,191,285	-71,013	2,126,821
2070	578,235	536,275	48,924	19,883	-1,559,383	-70,699	-446,765

Table 22 - Projected Future Groundwater Budget for Kern County Subbasin under 2030 Climate Conditions WITH SGMA Projects based on C2VSimFG-Kern Simulation

Water Year Units	Deep Percolation Acre-ft	Managed Recharge and Canal Seepage Acre-ft	Net GW/SW Interactions Acre-ft	Small Watershed Inflow Acre-ft	GW Pumping Acre-ft	Subsurface Flow with Adjacent GW Basins Acre-ft	Change in Groundwater Storage Acre-ft
SUMMARY: WY2021 to WY2070 Simulation Period							
Total	32,838,979	35,447,299	4,941,607	2,517,393	-73,869,518	-4,735,936	-2,860,202
Average	656,780	708,946	98,832	50,348	-1,477,390	-94,719	-57,204
SUMMARY: WY2021 to WY2040 Implementation Period							
Total	12,873,160	13,719,306	2,153,021	967,011	-30,545,188	-1,641,666	-2,474,378
Average	643,658	685,965	107,651	48,351	-1,527,259	-82,083	-123,719
SUMMARY: WY2041 to WY2070 Sustainability Period							
Total	19,965,818	21,727,994	2,788,586	1,550,382	-43,324,331	-3,094,271	-385,823
Average	665,527	724,266	92,953	51,679	-1,444,144	-103,142	-12,861
Annual Simulation Results for WY2021 to WY2070 Simulation Period							
2021	436,607	313,191	146,335	42,134	-1,676,044	-81,420	-819,196
2022	495,680	391,450	97,863	31,229	-1,947,388	-76,701	-1,007,874
2023	777,040	1,077,709	179,601	100,122	-1,117,722	-76,444	940,302
2024	808,215	1,130,101	141,980	64,551	-1,088,738	-81,861	974,238
2025	462,701	343,315	61,517	18,068	-1,906,220	-78,953	-1,099,574
2026	439,400	273,084	131,767	37,800	-2,253,887	-70,713	-1,442,550
2027	504,308	306,757	115,891	23,732	-2,068,551	-69,760	-1,187,619
2028	576,402	692,833	189,187	39,445	-1,565,005	-71,313	-138,447
2029	1,371,389	2,070,178	67,647	122,295	-932,879	-84,094	2,614,536
2030	584,511	553,212	37,888	19,641	-1,345,295	-83,321	-233,371
2031	528,715	216,234	76,879	18,143	-2,159,236	-78,674	-1,397,939
2032	447,278	157,578	46,694	17,968	-2,586,970	-72,132	-1,989,585
2033	822,633	1,099,092	179,078	122,210	-954,120	-79,949	1,188,943
2034	642,235	1,002,883	120,224	45,764	-1,314,339	-88,379	408,386
2035	882,067	1,046,864	225,239	55,297	-1,036,291	-94,244	1,078,932
2036	1,079,981	1,496,375	67,732	102,926	-748,234	-98,400	1,900,379
2037	618,298	565,459	31,639	32,384	-1,137,009	-94,427	16,344
2038	503,029	481,733	53,082	27,413	-1,262,856	-89,986	-287,584
2039	473,864	246,867	81,296	26,084	-1,751,020	-86,330	-1,009,239
2040	418,807	254,393	101,481	19,804	-1,693,383	-84,564	-983,462
2041	444,811	315,197	147,563	39,151	-1,429,438	-83,810	-566,526
2042	514,255	397,576	97,317	31,228	-1,723,016	-83,907	-766,546
2043	816,698	1,163,940	134,478	103,193	-969,015	-86,356	1,162,938
2044	847,571	1,197,675	50,668	65,724	-949,162	-94,611	1,117,864
2045	471,125	348,281	32,446	18,138	-1,769,470	-93,309	-992,789
2046	446,314	276,979	132,424	37,870	-2,116,321	-86,037	-1,308,771
2047	507,943	310,952	116,190	23,946	-1,951,408	-86,246	-1,078,625
2048	570,746	737,315	190,434	39,636	-1,454,664	-89,846	-6,380
2049	1,365,299	2,126,760	34,358	124,949	-846,645	-103,976	2,700,745
2050	579,883	565,192	23,802	19,693	-1,287,166	-103,007	-201,604
2051	538,250	227,799	76,822	18,193	-2,083,539	-98,472	-1,320,948
2052	464,011	164,305	46,977	17,931	-2,493,990	-92,183	-1,892,949
2053	839,476	1,136,728	177,834	123,682	-921,588	-100,638	1,255,494
2054	659,537	1,032,674	98,253	45,880	-1,258,249	-110,065	468,030
2055	903,882	1,081,677	208,421	55,392	-1,002,340	-116,311	1,130,721
2056	1,216,310	1,529,332	56,914	169,164	-718,274	-120,237	2,133,209
2057	673,501	569,268	16,245	33,640	-1,122,622	-115,686	54,346
2058	522,020	489,739	44,186	27,628	-1,253,276	-110,474	-280,179
2059	481,112	252,996	77,161	26,299	-1,749,204	-105,946	-1,017,581
2060	429,670	259,054	101,488	19,792	-1,652,713	-103,828	-946,537
2061	447,419	318,905	147,790	39,158	-1,437,034	-102,731	-586,494
2062	515,397	400,090	96,110	31,426	-1,726,653	-102,439	-786,068
2063	822,203	1,186,122	125,545	104,939	-982,407	-105,263	1,151,138
2064	812,383	1,217,000	39,194	41,649	-986,296	-114,017	1,009,913
2065	461,447	351,690	27,964	18,289	-1,789,318	-112,105	-1,042,033
2066	449,867	280,211	132,607	37,782	-2,125,316	-106,826	-1,331,675
2067	511,035	314,307	116,486	23,923	-1,960,796	-107,878	-1,102,923
2068	651,081	758,626	191,836	65,542	-1,393,447	-109,878	163,759
2069	1,417,188	2,146,388	28,009	126,664	-861,456	-124,760	2,732,032
2070	585,382	571,217	19,064	19,883	-1,309,505	-123,427	-237,386

Table 23 - Projected Future Groundwater Budget for Kern County Subbasin under 2070 Climate Conditions with NO SGMA Projects based on C2VSimFG-Kern Simulation

Water Year Units	Deep Percolation Acre-ft	Managed Recharge and Canal Seepage Acre-ft	Net GW/SW Interactions Acre-ft	Small Watershed Inflow Acre-ft	GW Pumping Acre-ft	Subsurface Flow with Adjacent GW Basins Acre-ft	Change in Groundwater Storage Acre-ft
SUMMARY: WY2021 to WY2070 Simulation Period							
Total	30,266,907	32,824,218	5,541,096	2,495,122	-92,372,522	-3,271,463	-24,516,680
Average	605,338	656,484	110,822	49,902	-1,847,450	-65,429	-490,334
SUMMARY: WY2021 to WY2040 Implementation Period							
Total	11,792,918	12,994,527	2,263,192	960,586	-36,385,358	-1,447,672	-9,821,843
Average	589,646	649,726	113,160	48,029	-1,819,268	-72,384	-491,092
SUMMARY: WY2041 to WY2070 Sustainability Period							
Total	18,473,988	19,829,691	3,277,904	1,534,536	-55,987,164	-1,823,791	-14,694,837
Average	615,800	660,990	109,263	51,151	-1,866,239	-60,793	-489,828
Annual Simulation Results for WY2021 to WY2070 Simulation Period							
2021	408,652	250,550	140,163	38,275	-1,842,475	-83,663	-1,088,499
2022	472,102	369,832	95,673	30,903	-2,096,387	-78,608	-1,206,496
2023	673,989	1,058,910	189,890	97,206	-1,367,109	-76,560	576,325
2024	744,177	1,122,749	154,523	64,640	-1,269,966	-81,123	734,995
2025	434,940	339,216	62,383	18,095	-2,093,637	-77,242	-1,316,253
2026	469,752	316,670	142,130	42,165	-2,392,400	-68,542	-1,490,227
2027	468,805	219,342	111,136	22,713	-2,302,101	-66,245	-1,546,351
2028	565,266	622,490	194,932	37,491	-1,777,664	-66,172	-423,661
2029	1,232,895	2,021,954	94,628	120,391	-1,272,882	-75,969	2,121,016
2030	512,383	510,545	46,067	18,406	-1,606,048	-73,952	-592,602
2031	514,885	217,243	80,080	18,510	-2,404,879	-69,108	-1,643,271
2032	420,919	109,243	41,157	17,864	-2,961,316	-59,737	-2,431,871
2033	717,704	983,283	185,465	124,666	-1,366,638	-66,770	577,711
2034	636,472	1,011,310	124,135	48,403	-1,629,020	-73,691	117,609
2035	742,442	926,830	240,059	52,829	-1,506,120	-76,785	379,255
2036	840,589	1,369,821	66,325	95,355	-1,236,377	-78,889	1,056,824
2037	511,349	550,855	51,377	33,462	-1,460,435	-75,693	-389,084
2038	525,422	516,749	68,512	30,839	-1,615,455	-70,944	-544,878
2039	486,185	261,453	84,925	29,526	-2,078,540	-66,064	-1,282,515
2040	413,990	215,482	89,632	18,846	-2,105,907	-61,915	-1,429,871
2041	434,872	249,759	141,456	34,801	-1,861,023	-59,685	-1,059,819
2042	506,082	371,490	95,431	30,811	-2,143,228	-58,424	-1,197,837
2043	701,042	1,057,536	164,332	99,819	-1,415,545	-58,898	548,287
2044	765,882	1,123,035	84,872	65,709	-1,321,033	-65,596	652,868
2045	457,199	338,796	43,022	18,140	-2,143,265	-63,760	-1,349,868
2046	491,322	316,422	142,576	42,210	-2,441,728	-56,475	-1,505,673
2047	486,516	219,663	111,300	22,758	-2,350,989	-55,383	-1,566,136
2048	575,922	621,390	195,292	37,553	-1,826,869	-56,367	-453,078
2049	1,207,108	2,024,646	76,576	122,702	-1,321,171	-67,189	2,042,673
2050	516,604	511,479	41,647	18,437	-1,653,603	-66,049	-631,485
2051	524,249	217,243	80,184	18,541	-2,450,881	-61,709	-1,672,374
2052	436,390	105,521	41,256	17,846	-2,980,914	-52,973	-2,432,875
2053	721,385	984,833	185,983	125,947	-1,412,037	-60,560	545,551
2054	637,035	1,010,015	122,314	48,546	-1,673,215	-67,888	76,808
2055	739,029	926,775	240,837	53,236	-1,549,608	-71,550	338,718
2056	916,865	1,369,239	78,789	163,750	-1,223,884	-73,970	1,230,789
2057	542,683	548,446	53,332	34,610	-1,503,509	-70,686	-395,124
2058	550,193	519,512	70,081	31,051	-1,656,729	-65,944	-551,837
2059	506,313	262,783	85,481	29,722	-2,118,584	-60,956	-1,295,243
2060	434,143	216,084	89,721	18,987	-2,098,596	-57,233	-1,396,893
2061	453,048	249,994	141,478	34,761	-1,901,319	-55,229	-1,077,267
2062	522,814	370,621	95,685	30,984	-2,183,537	-54,157	-1,217,590
2063	725,002	1,059,135	169,499	100,139	-1,456,460	-54,936	542,379
2064	737,845	1,121,596	96,738	41,720	-1,390,161	-62,039	545,700
2065	456,525	339,078	47,370	18,277	-2,183,880	-60,597	-1,383,226
2066	498,361	316,005	142,585	41,907	-2,483,011	-53,520	-1,537,673
2067	496,804	219,419	111,431	22,808	-2,393,461	-52,693	-1,595,690
2068	655,939	621,712	196,418	66,128	-1,787,044	-52,309	-299,157
2069	1,243,827	2,023,476	87,110	124,017	-1,364,360	-64,030	2,050,039
2070	532,988	513,990	45,107	18,619	-1,697,522	-62,987	-649,805

Table 24 - Projected Future Groundwater Budget for Kern County Subbasin under 2070 Climate Conditions WITH SGMA Projects based on C2VSimFG-Kern Simulation

Water Year Units	Deep Percolation Acre-ft	Managed Recharge and Canal Seepage Acre-ft	Net GW/SW Interactions Acre-ft	Small Watershed Inflow Acre-ft	GW Pumping Acre-ft	Subsurface Flow with Adjacent GW Basins Acre-ft	Change in Groundwater Storage Acre-ft
SUMMARY: WY2021 to WY2070 Simulation Period							
Total	31,799,129	37,863,262	4,293,932	2,495,122	-79,755,674	-4,729,641	-8,033,910
Average	635,983	757,265	85,879	49,902	-1,595,113	-94,593	-160,678
SUMMARY: WY2021 to WY2040 Implementation Period							
Total	12,589,633	14,705,737	1,891,043	960,586	-32,975,395	-1,657,287	-4,485,720
Average	629,482	735,287	94,552	48,029	-1,648,770	-82,864	-224,286
SUMMARY: WY2041 to WY2070 Sustainability Period							
Total	19,209,496	23,157,525	2,402,889	1,534,536	-46,780,279	-3,072,354	-3,548,190
Average	640,317	771,917	80,096	51,151	-1,559,343	-102,412	-118,273
Annual Simulation Results for WY2021 to WY2070 Simulation Period							
2021	416,859	299,174	140,033	38,275	-1,829,917	-83,068	-1,018,646
2022	482,771	408,716	95,545	30,903	-2,075,055	-77,724	-1,134,857
2023	778,119	1,167,829	176,974	97,206	-1,283,726	-78,065	858,337
2024	824,224	1,237,834	116,452	64,640	-1,201,267	-84,296	957,582
2025	444,081	355,471	55,004	18,095	-1,995,258	-81,218	-1,203,834
2026	466,475	376,346	141,087	42,165	-2,313,156	-72,774	-1,359,861
2027	464,976	279,425	111,024	22,713	-2,213,764	-70,681	-1,406,307
2028	569,538	749,332	192,740	37,491	-1,685,558	-71,949	-208,410
2029	1,366,993	2,190,420	41,284	120,391	-1,077,423	-84,620	2,557,045
2030	534,178	531,150	29,555	18,406	-1,464,690	-82,917	-434,320
2031	519,704	234,003	79,675	18,510	-2,224,205	-79,250	-1,451,562
2032	415,122	123,188	41,020	17,864	-2,750,519	-71,829	-2,225,156
2033	783,412	1,166,531	179,799	124,666	-1,109,329	-80,416	1,064,663
2034	658,731	1,142,196	88,031	48,403	-1,395,221	-89,128	453,011
2035	863,103	1,130,070	184,994	52,829	-1,232,204	-94,328	904,464
2036	1,029,800	1,602,138	12,470	95,355	-917,373	-98,485	1,723,905
2037	570,198	605,678	8,505	33,462	-1,243,785	-94,402	-120,345
2038	523,835	569,446	34,689	30,839	-1,363,512	-90,407	-295,110
2039	479,164	294,676	72,792	29,526	-1,805,973	-86,949	-1,016,764
2040	398,352	242,115	89,372	18,846	-1,793,459	-84,780	-1,129,554
2041	414,818	301,192	141,646	34,801	-1,568,913	-83,592	-760,049
2042	491,990	414,742	93,845	30,811	-1,840,528	-83,323	-892,462
2043	790,613	1,254,107	115,429	99,819	-1,116,588	-86,323	1,057,057
2044	836,403	1,305,369	17,905	65,709	-1,045,824	-95,401	1,084,162
2045	449,154	360,429	22,817	18,140	-1,852,116	-93,998	-1,095,574
2046	471,989	380,169	142,402	42,210	-2,176,184	-86,568	-1,225,983
2047	471,984	283,737	111,550	22,758	-2,085,163	-85,737	-1,280,870
2048	554,428	793,776	194,145	37,553	-1,568,985	-88,857	-77,939
2049	1,321,092	2,246,987	3,572	122,702	-987,606	-102,881	2,603,867
2050	524,857	543,145	12,030	18,437	-1,398,511	-101,367	-401,409
2051	526,155	245,563	79,307	18,541	-2,147,741	-98,008	-1,376,184
2052	430,658	129,919	41,236	17,846	-2,649,533	-91,211	-2,121,085
2053	792,109	1,204,216	177,747	125,947	-1,064,253	-100,431	1,135,335
2054	668,348	1,172,104	66,220	48,546	-1,336,993	-110,282	507,943
2055	860,469	1,164,599	170,576	53,236	-1,194,626	-115,992	938,261
2056	1,144,616	1,635,346	2,390	163,750	-873,811	-120,178	1,952,112
2057	610,598	609,490	-6,003	34,610	-1,226,393	-115,425	-93,124
2058	546,965	577,365	26,400	31,051	-1,353,145	-110,712	-282,076
2059	486,798	300,706	68,354	29,722	-1,802,615	-106,347	-1,023,382
2060	409,456	246,809	89,277	18,987	-1,751,495	-103,792	-1,090,757
2061	418,628	304,951	141,821	34,761	-1,574,579	-102,407	-776,824
2062	495,173	417,295	92,534	30,984	-1,842,095	-101,824	-907,934
2063	793,354	1,276,196	108,214	100,139	-1,128,328	-105,241	1,044,334
2064	805,281	1,324,749	9,903	41,720	-1,082,528	-114,909	984,217
2065	440,536	363,793	19,730	18,277	-1,870,357	-113,021	-1,141,042
2066	471,618	383,251	141,837	41,907	-2,193,139	-104,993	-1,259,519
2067	473,770	286,942	111,773	22,808	-2,105,041	-103,867	-1,313,616
2068	625,100	815,113	195,615	66,128	-1,516,065	-105,894	79,999
2069	1,353,276	2,266,438	1,701	124,017	-1,005,088	-121,015	2,619,328
2070	529,258	549,028	8,916	18,619	-1,422,036	-118,758	-434,973

TABLE 25: Assessment of change in groundwater storage from C2VSimFG-Kern model results for historical and future scenarios for the Kern County Subbasin

Scenario	Model Results 2041-2070 Sustainability Period		Adjustments to GW Storage Change 2041-2070 Sustainability Period		
	Change in Groundwater Storage	Change in Net Operational Budget	Adjustment for Excess Basin Outflows	Adjustment for Excess Kern River Outflow	Adjusted Change in GW Storage
units	AFY	AFY	AFY	AFY	AFY
Historic	-274,200	-187,118	0	0	-274,200
Current	-344,019	-276,317	0	0	-344,019
Baseline	-324,326	-253,629	0	0	-324,326
Base Projects	42,144	152,353	26,327	17,108	85,578
2030 Climate	-380,900	-318,260	0	8,780	-372,120
2030 Projects	-12,861	90,282	27,056	32,634	46,829
2070 Climate	-489,828	-429,035	0	17,492	-472,336
2070 Projects	-118,273	-15,861	28,077	44,227	-45,969

NOTE:

"Change in Groundwater Storage" DOES include subsurface flow with adjacent basins

"Operational Storage" DOES NOT include subsurface flow with adjacent basins

"Adjustment for Excess Basin Outflows" is the difference in simulated basin outflow that is attributed to addition of SGMA projects in Kern County without comparable SGMA projects added to adjacent basins. Adjustment assumes that this difference is due to limitation of simulation, and that this difference would remain in Kern County when SGMA projects from adjacent basin are included in simulation.

"Adjustment for Excess Kern River Outflow" is the increase in simulated groundwater outflows to Kern River relative to Baseline condition that are attributed to SGMA Projects and Climate Change. Model is not optimized for river management. Since the Kern River is a highly managed system, the assumption is that in practice this water would be recovered for beneficial use rather than be a loss of water from the basin.

"Adjusted Change in GW Storage" Change in GW Storage plus modifications listed as adjustments to provide a more realistic Change in GW Storage estimate for the simulation.

TABLE 26: Evaluation of Sustainable Yield for Projected-Future scenarios based on C2VSimFG-Kern Model Results for Kern County Subbasin

Scenario	C2VSimFG-Kern Model Results 2041-2070 Sustainability Period					
	Groundwater Pumping	Change in Groundwater in Storage	GW Storage Adjustments	Sustainable Yield	Average Annual Difference of Pumping to Yield	Percent Difference of Pumping to Sustainable Yield
	units	AFY	AFY	AFY	AFY	AFY
Historic	1,586,417	-274,200	0	1,312,218	-274,200	-21%
Baseline	1,624,694	-324,326	0	1,300,369	-324,326	-25%
Baseline Projects	1,354,088	42,144	43,434	1,439,666	85,578	6%
2030 Climate	1,734,001	-380,900	8,780	1,361,881	-372,120	-27%
2030 Projects	1,444,144	-12,861	59,690	1,490,974	46,829	3%
2070 Climate	1,866,239	-489,828	17,492	1,393,902	-472,336	-34%
2070 Projects	1,559,343	-118,273	72,304	1,513,373	-45,969	-3%

NOTES:

Current period is not considered to be hydrologically balanced, so it is not included in the sustainable yield analysis

Groundwater Pumping	Total groundwater pumping by wells. Groundwater banking recovery pumping is specified input whereas agricultural and municipal pumping is calculated by C2VSim based on demand
Change in Groundwater in Storage	Sum of the inflow components (positive numbers) plus the outflow components (negative numbers): positive is an increase in storage typified by a rise in GW levels whereas a negative is a decrease in storage typified by a decline in GW levels
Adjusted Banking GW Storage Adjustments	Adjustment that assumes that recharge operations are affected by reductions in imported water sources, but adjustment to GW Storage that reflect artifacts of the simulation. For Kern County, adjustments made to reflect no SGMA projects simulated north of Kern County, and that Kern River operations are not optimized to
Sustainable Yield	Sustainable yield is defined as the amount of pumping that can be sustained in the groundwater basin without the undesirable effect of a decline in groundwater storage that serves as a proxy for other undesirable effects
Average Annual Difference	The difference between the sustainable yield and the simulated groundwater pumping. A negative value is pumping in excess of the sustainable yield
Percent Difference	The percentage of the Average Annual Difference to the total groundwater pumping to provide context and a method to compare the significance of the difference in the pumping compared to the sustainable yield.

**TABLE 27: Summary of Statistical Analysis for Validation of
C2VSimFG-Kern Historical Simulation**

Validation Measure	C2VSimFG-Kern	C2VSimFG-Beta	Percent Change
Units	Feet	Feet	Percent
Residual Mean	17.3 ft	32.6 ft	47%
Residual Standard Deviation	45.5 ft	54.0 ft	16%
Absolute Residual Mean	37.4 ft	56.8 ft	34%
Root Mean Square (RMS) Error	50 ft	73.5 ft	32%
Scaled Absolute Residual Mean	0.061	0.092	34%
Correlation Coefficient	0.76	0.52	47%
Number of Monitor Wells	558	558	same
Number of Observations	42,075	42,075	same

Notes

Observation Point	Location in the model where measured data from well is compared to simulated model results
Residual	Difference between measured and simulated groundwater elevations at an observation point
Residual Mean	Statistical measure of fit of simulated to measured data using sum of the residuals divided by the number of residual data values
Residual Standard Deviation	Statistical evaluation of the scatter of the data by calculating standard deviation of residuals
Absolute Residual Mean	Statistical measure of fit of simulated to measured data using sum of the absolute value residuals divided by the number of residual data values
Root Mean Square (RMS) Error	Statistical measure of fit of simulated to measured data using square root of the quotient of sum of squares of residuals by the number of observations
Scaled Absolute Residual Mean	Statistical measure to provide scale of validation using ratio of the absolute residual mean divided by the range of observed groundwater elevations
Correlation Coefficient	Scaled measure of the closeness of fit of simulated to measured data from -1 to 1 correlation with 1.0 a perfect correlation
Number of Monitor Wells	Number of wells where measured groundwater level data was compared to C2VSimFG-Kern simulation results for model validation
Number of Observations	Number of groundwater level measurements that were compared to C2VSimFG-Kern simulation results for model validation