

PRECAUTIONARY CONSIDERATIONS REGARDING THE UNUSED EXPORT CAPACITIES
 AT SWP BANKS AND CVP TRACY PUMPING PLANTS
 RESULTING FROM THIS DWRSIM STUDY 1995C6B-SWRCB-409.MONT

DWRSIM Study 1995C6B-SWRCB-409.MONT is a preliminary Operation Study completed to assess the water supply impacts of the State Water Resources Control Board Draft Water Quality Control Plan of December 15, 1994. Not all of the criteria required in the Plan are modeled in this DWRSIM study. The modeled criteria and the excluded criteria have been summarized in a separate document. In addition, the following modeling assumptions/limitations should be particularly noted, because alternative assumptions could change the amount of unused export capacities at SWP Banks and CVP Tracy Pumping Plants:

- o CVP/SWP System is used as surrogate to estimate water supply impacts and meet draft plan standards. The actual allocation of impacts during water rights proceedings is yet to be determined.
- o Combined CVP plus SWP Delta export demand ranges between 5.9 MAF/yr and 6.9 MAF/yr in this study, depending on Southern California wetness indexes. If projected future CVP plus SWP demands (up to 7.4 MAF/yr) were modeled, then the resulting amount of unused export capacity would be smaller.
- o The model uses existing COA percentages for sharing surplus flows and storage withdrawals for in-basin use (55/45 and 75/25), including X2 requirements. However, export limitations due to export/inflow ratio requirements are not specified under the present COA. An arbitrary sharing ratio of 50/50 (SWP/CVP) was used in this Model Study whenever the export/inflow ratio controlled operations. The actual allocation of impacts will depend upon re-negotiation of project responsibilities and rights under the COA.
- o For the proposed Delta inflow/export ratio criteria, Total Delta Exports are modeled as the sum of pumping at the SWP Banks and CVP Tracy Pumping Plants. Contra Costa Canal and North Bay Aqueduct diversions are not included in this this DWRSIM study.
- o Wheeling of CVP water through the SWP Banks Pumping Plant is allowed in this Operation Study to meet the CVP Cross Valley Canal demands; only when there is unused capacity available at the Banks Pumping Plant and if CVP needs the wheeling help.
- o The SWRCB's four-page "Errata to the December 1994 Draft Bay-Delta Plan" are not modeled in this DWRSIM study. The inclusion of these changes and corrections could alter the DWRSIM model results, including the unused Delta export capacity.
- o The DWRSIM model simulates the operation of CVP and SWP system reservoirs and conveyance facilities on a monthly basis. It is necessary to make simplifying assumptions to translate proposed standards for portions of a month into average full-month requirements for use in the model.

DESCRIPTION OF ENCLOSED TABLES

TABLES 1 and 2 provide information on the pumping plant capacities, as modeled on a monthly basis in DWRSIM. The unused capacities in these two tables are calculated as capacity at the pumping plant minus actual monthly pumping; without considering the limitations of proposed Bay-Delta Plan standards.

TABLE 3 (FINAL RESULT) represents the calculated estimate of combined unused capacity for SWP Banks plus CVP Tracy Pumping Plants, after reductions to account for the limitations imposed by Draft Bay-Delta Plan criteria. The specific criteria which affect the unused capacity calculation are the Delta Inflow/Export Ratio criteria, and the April/May export limitation as a function of San Joaquin River flow at Vernalis.

TABLE 1: SWP BANKS PUMPING PLANT (STUDY 1995C6B-SWRCB-409.MONT)

(TAF UNITS)

USCE PERMIT CAPACITY:	OCT 409	NOV 397	DEC 467*	JAN 523*	FEB 472*	MAR 467*	APR 394	MAY 411	JUN 397	JUL 411	AUG 403	SEP 392	TOTAL 5143
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/ * For Dec15-Mar15, USCE Permit capacity varies by year as a function of flow at \ Vernalis. Maximum value is capped at 8500 cfs, as indicated above. /

BANKS PP UNUSED CAPACITY (UNADJUSTED - BASED ONLY ON USCE PERMIT CAPACITY)

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1922	263	237	0	0	0	145	156	142	0	392	384	282	2002
1923	0	0	0	202	441	259	165	218	203	0	0	290	1777
1924	182	205	20	0	184	242	311	320	267	264	396	349	2741
1925	155	248	145	251	0	190	195	252	203	0	197	308	2143
1926	113	238	227	0	0	242	215	253	233	0	261	314	2096
1927	130	0	0	0	53	198	153	164	205	240	337	278	1759
1928	101	0	0	0	208	176	175	232	209	0	229	294	1624
1929	232	135	53	119	182	229	304	312	227	106	395	320	2615
1930	192	282	127	0	201	0	286	302	177	55	328	289	2240
1931	271	259	237	110	241	300	300	329	299	357	399	345	3449
1932	290	298	0	0	214	243	210	328	389	402	395	307	3076
1933	301	302	260	15	220	147	315	304	207	328	397	339	3134
1934	300	288	87	0	241	253	285	319	264	349	397	348	3130
1935	312	176	194	0	242	80	153	154	182	0	123	270	1886
1936	228	244	223	0	0	20	180	224	204	0	247	279	1849
1937	265	268	88	52	0	0	155	205	252	275	347	288	2194
1938	218	0	0	0	243	228	197	161	61	392	384	0	1884
1939	0	12	229	280	271	264	270	292	230	0	232	353	2432
1940	174	275	233	0	0	0	153	201	209	0	57	297	1600
1941	182	212	0	0	0	59	159	181	160	392	384	92	1822
1942	0	0	241	318	280	238	158	142	1	392	384	34	2189
1943	0	0	183	314	266	257	159	241	229	279	349	305	2582
1944	81	32	208	21	0	189	274	289	200	0	278	308	1879
1945	127	0	0	51	105	197	219	256	175	135	332	291	1887
1946	29	0	0	0	256	160	219	246	188	0	257	286	1641
1947	172	152	12	38	84	181	265	291	236	0	0	277	1708
1948	114	175	204	22	221	244	201	174	151	0	0	0	1506
1949	0	155	159	170	211	0	247	262	213	89	335	280	2120
1950	130	228	272	0	0	154	218	245	189	0	34	291	1761
1951	0	0	0	0	209	178	208	197	210	0	138	276	1415
1952	119	0	0	0	8	216	167	151	85	174	335	0	1255
1953	66	182	231	357	272	235	217	181	43	222	333	145	2484
1954	0	0	37	177	201	167	175	203	211	0	104	269	1545
1955	195	0	0	0	126	286	289	290	202	0	0	206	1595
1956	208	173	0	0	0	147	168	142	75	100	308	0	1322
1957	0	10	215	22	184	165	222	239	196	0	0	250	1504
1958	0	0	0	0	88	224	114	123	30	332	253	0	1164
1959	0	176	217	277	244	235	282	290	221	0	206	255	2402
1960	125	246	0	128	0	190	281	307	230	0	32	279	1818
1961	141	151	0	136	0	201	288	306	232	0	95	275	1826
1962	163	229	35	229	0	58	269	260	221	0	224	260	1948
1963	0	0	0	0	195	188	153	154	188	99	321	178	1476
1964	0	0	66	25	252	270	286	290	230	0	0	215	1634
1965	252	18	0	0	0	136	140	123	209	0	265	272	1415
1966	0	0	0	8	206	176	243	262	221	0	40	274	1431
1967	142	16	0	0	113	249	144	161	61	31	330	0	1247
1968	104	196	275	326	271	235	255	292	221	0	230	271	2677
1969	120	142	0	0	66	276	199	188	100	290	364	0	1746
1970	0	182	259	350	320	246	216	266	211	0	305	281	2634
1971	121	0	0	0	152	83	212	174	128	0	286	70	1226
1972	0	0	0	44	183	167	258	290	222	0	0	235	1399
1973	55	0	0	0	2	207	193	198	165	11	317	232	1380
1974	12	0	0	60	212	188	140	137	133	198	269	0	1349
1975	0	0	88	230	249	179	148	142	50	99	310	0	1495
1976	0	0	44	160	161	225	303	311	261	335	330	291	2421
1977	252	315	89	22	203	387	353	349	377	411	403	341	3503
1978	323	317	21	228	373	273	224	249	277	383	384	180	3231
1979	0	0	260	73	277	227	198	211	156	149	340	256	2147
1980	196	0	0	7	263	282	227	203	305	392	360	47	2281
1981	0	0	141	280	239	223	244	292	232	0	230	312	2192
1982	163	0	0	0	61	204	102	62	0	166	195	0	952
1983	0	157	241	339	304	312	207	275	214	215	68	170	2503
1984	244	256	346	414	333	276	207	254	199	48	334	63	2975
1985	0	0	0	256	215	207	284	275	234	0	63	286	1820
1986	141	172	0	0	0	0	109	190	209	272	350	189	1631
1987	0	123	217	140	100	0	281	305	233	0	137	310	1845
1988	278	287	0	0	59	280	306	315	226	213	397	344	2704
1989	334	249	264	159	212	0	231	287	234	0	0	219	2189
1990	255	329	203	0	221	287	286	325	319	249	385	313	3172
1991	332	341	367	292	265	13	281	323	292	230	399	336	3469
1992	296	336	296	216	0	180	288	319	225	118	389	322	2985
AVG.	130	127	103	97	158	185	221	239	195	129	249	224	2058

TABLE 2: CVP TRACY PUMPING PLANT (STUDY 1995C6B-SWRCB-409.MONT)

(TAF UNITS)

CAPACITY:	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	269	254	262	260	240	275	274	283	274	283	291	277	3242
TRACY PP UNUSED CAPACITY (UNADJUSTED - BASED ONLY ON PLANT CAPACITY)													
YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1922	10	0	0	0	0	0	36	14	0	96	35	0	190
1923	0	0	0	0	40	88	45	90	80	0	0	0	343
1924	0	0	0	0	17	216	191	192	144	0	0	116	876
1925	0	7	0	0	0	31	75	124	80	0	0	0	316
1926	0	0	0	0	0	83	95	125	110	0	0	0	412
1927	0	0	0	0	0	34	33	36	82	0	0	27	212
1928	0	0	0	0	0	6	55	104	86	0	0	0	251
1929	24	0	0	0	5	224	184	184	104	0	127	180	1033
1930	0	14	0	0	77	10	168	174	165	23	158	85	875
1931	114	122	64	0	63	144	180	201	118	15	286	161	1467
1932	0	38	0	0	39	275	155	102	145	101	97	43	994
1933	69	31	59	0	30	258	141	176	137	96	246	134	1377
1934	122	145	51	0	62	36	165	191	81	96	256	150	1356
1935	96	15	0	0	64	0	33	26	59	0	0	49	342
1936	1	0	0	0	0	2	60	96	81	0	0	35	275
1937	1	0	0	0	0	2	35	77	70	0	35	22	241
1938	27	0	0	0	0	72	69	33	0	0	19	0	220
1939	0	0	0	43	125	109	150	164	107	0	0	0	697
1940	0	0	0	0	0	0	33	73	86	0	0	0	192
1941	0	0	0	0	0	40	31	33	8	114	35	0	260
1942	0	0	0	0	0	42	1	14	0	112	35	0	204
1943	0	0	0	0	0	42	0	38	83	0	35	7	204
1944	0	0	33	0	0	6	154	161	77	0	0	0	432
1945	0	0	0	0	0	0	99	128	52	0	0	0	278
1946	0	0	0	0	12	6	99	118	65	0	0	0	301
1947	0	0	0	0	0	23	145	163	113	0	0	0	444
1948	0	9	9	3	62	90	81	46	28	0	0	0	328
1949	0	0	0	0	44	0	127	134	90	0	0	0	395
1950	0	9	9	0	0	23	98	117	66	0	0	0	322
1951	0	0	0	0	0	28	88	69	87	0	0	0	272
1952	0	0	0	0	0	46	69	33	0	0	0	0	148
1953	0	0	0	104	125	72	97	53	0	0	0	0	451
1954	0	0	0	0	0	27	55	75	88	0	0	0	245
1955	0	0	0	0	0	136	169	162	79	0	0	0	546
1956	0	16	0	0	12	72	48	14	0	74	0	0	236
1957	0	0	19	0	23	72	102	111	73	0	0	0	401
1958	0	0	0	0	0	22	27	33	0	0	0	0	82
1959	0	0	0	13	125	80	162	162	98	0	0	0	640
1960	0	0	0	0	0	31	161	179	107	0	0	0	477
1961	0	14	16	6	0	51	168	178	109	0	0	0	541
1962	0	12	15	6	0	25	149	132	98	0	0	0	438
1963	0	0	0	0	0	0	33	26	65	0	0	0	124
1964	0	0	0	0	33	119	166	162	107	0	0	0	588
1965	0	17	0	0	13	73	20	38	86	0	0	9	256
1966	0	0	0	0	0	54	123	134	98	0	0	0	409
1967	0	0	0	0	0	82	69	33	0	0	0	0	183
1968	0	0	0	135	125	76	135	164	98	0	0	0	733
1969	0	0	0	0	0	57	69	33	0	0	0	0	159
1970	0	0	0	144	125	72	96	138	88	0	0	0	663
1971	0	0	0	0	0	0	92	46	5	0	0	0	144
1972	0	0	0	0	0	23	138	162	99	0	0	0	423
1973	0	0	0	0	0	53	73	70	42	0	0	29	267
1974	0	0	0	0	0	11	20	22	10	0	0	0	63
1975	0	0	0	3	125	72	28	14	0	0	0	0	242
1976	0	0	0	11	0	119	183	183	60	0	148	137	841
1977	91	12	6	165	105	103	145	198	230	172	234	151	1610
1978	115	109	0	0	23	125	69	33	0	136	35	0	645
1979	0	0	40	0	0	6	78	83	33	0	35	49	324
1980	1	0	0	0	0	85	69	75	28	103	35	0	395
1981	0	0	0	0	0	46	124	164	109	0	0	0	444
1982	0	0	0	0	0	0	54	33	0	0	0	0	87
1983	0	0	0	68	151	125	69	33	0	0	0	0	446
1984	0	79	61	170	149	76	87	126	76	0	0	0	825
1985	0	0	0	0	0	47	164	147	111	0	0	0	470
1986	0	8	0	0	0	112	69	62	86	23	35	0	394
1987	0	0	12	0	0	40	161	177	110	0	0	0	500
1988	0	0	0	0	199	130	186	187	103	0	0	122	926
1989	89	73	0	0	19	0	111	159	111	0	0	63	624
1990	117	80	0	0	71	138	166	197	6	0	0	146	922
1991	88	67	0	0	10	0	161	195	47	0	145	106	819
1992	101	124	0	0	0	53	168	191	102	0	97	163	999
AVG.	15	14	6	12	29	62	101	107	70	16	30	28	490

TABLE 3: FINAL COMBINED UNUSED CAPACITY (SWP BANKS + CVP TRACY) (TAF UNITS)

PHYSICAL PUMPING CAPACITIES HAVE BEEN REDUCED TO ACCOUNT FOR SWRCB BAY-DELTA PLAN PUMPING LIMITATIONS DUE TO INFLOW/EXPORT RATIOS, AND DUE TO APRIL/MAY EXPORT LIMITS AS A FUNCTION OF SAN JOAQUIN RIVER FLOW AT VERNALIS.

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1922	75	83	0	0	0	145	0	2	0	429	247	88	1069
1923	0	0	0	202	289	1	1	0	1	0	0	84	578
1924	53	94	20	0	0	86	0	0	0	252	159	128	792
1925	64	93	46	62	0	1	1	1	1	0	167	99	535
1926	77	86	90	0	0	1	1	0	1	0	171	101	528
1927	64	0	0	0	53	232	0	1	0	240	235	83	908
1928	55	0	0	0	167	182	0	1	0	0	218	104	727
1929	76	67	48	11	0	68	1	0	0	106	203	141	721
1930	89	114	101	0	1	4	0	0	0	78	219	93	699
1931	110	118	121	0	1	0	0	0	0	236	259	143	988
1932	72	89	0	0	0	140	0	35	216	313	219	100	1184
1933	117	104	98	0	0	0	31	1	15	245	246	132	989
1934	85	108	85	0	0	0	0	0	14	252	250	136	930
1935	85	87	66	0	0	1	0	1	0	0	123	80	443
1936	66	101	87	0	0	22	0	0	0	0	173	79	528
1937	73	103	69	0	0	2	0	1	93	275	209	78	903
1938	66	0	0	0	243	300	155	194	61	392	259	0	1670
1939	0	12	229	272	147	0	0	0	0	0	169	94	923
1940	73	115	108	0	0	0	0	0	0	0	57	82	435
1941	60	102	0	0	0	99	190	60	0	435	265	92	1303
1942	0	0	241	318	280	255	0	2	0	434	265	34	1829
1943	0	0	183	314	266	299	0	49	11	279	253	82	1736
1944	69	32	88	1	0	68	0	0	0	0	169	94	521
1945	72	0	0	0	105	195	0	1	1	135	191	82	782
1946	19	0	0	0	169	0	0	0	0	0	179	90	457
1947	71	65	12	12	0	0	0	0	1	0	0	107	268
1948	50	93	110	25	1	0	0	1	0	0	0	0	280
1949	0	96	78	24	0	0	0	0	1	89	166	104	558
1950	73	94	106	0	0	0	1	0	1	0	34	102	411
1951	0	0	0	0	209	206	0	1	1	0	138	106	661
1952	66	0	0	0	8	262	76	74	85	174	235	0	980
1953	66	182	231	461	337	132	0	1	0	222	232	118	1982
1954	0	0	37	177	201	194	0	0	0	0	104	107	820
1955	63	0	0	0	0	0	0	0	0	0	0	101	164
1956	63	97	0	0	12	219	0	2	0	174	226	0	793
1957	0	10	101	22	207	237	0	0	0	0	0	100	677
1958	0	0	0	0	88	246	141	2	30	332	204	0	1043
1959	0	176	121	290	369	112	0	0	0	0	189	75	1332
1960	63	115	0	8	0	1	0	1	0	0	32	103	323
1961	73	78	16	0	0	1	0	0	1	0	95	89	353
1962	72	85	50	75	0	0	0	0	0	0	178	103	563
1963	0	0	0	0	195	188	0	1	1	99	230	113	827
1964	0	0	66	25	0	0	0	0	0	0	0	106	197
1965	58	35	0	0	13	13	0	0	0	0	202	90	411
1966	0	0	0	8	148	169	0	1	0	0	40	107	473
1967	62	16	0	0	113	331	53	40	61	31	233	0	940
1968	104	196	275	461	396	311	0	0	0	0	163	106	2012
1969	75	75	0	0	66	333	169	0	100	290	245	0	1353
1970	0	182	259	494	445	318	0	0	1	0	225	98	2022
1971	70	0	0	0	127	83	0	1	0	0	218	70	569
1972	0	0	0	44	83	190	0	0	0	0	0	76	393
1973	50	0	0	0	2	260	1	0	0	11	211	100	635
1974	12	0	0	60	212	199	0	0	0	198	212	0	893
1975	0	0	88	233	374	251	0	2	0	99	219	0	1266
1976	0	0	44	61	40	11	0	1	0	242	171	105	675
1977	60	108	95	58	34	31	7	14	126	300	243	127	1203
1978	98	112	21	228	396	398	133	67	13	439	247	113	2265
1979	0	0	106	73	277	233	1	0	0	149	206	89	1134
1980	38	0	0	7	263	367	57	1	24	423	239	47	1466
1981	0	0	141	280	193	269	0	0	0	0	168	90	1141
1982	64	0	0	0	61	204	156	95	0	166	189	0	935
1983	0	157	241	407	455	437	276	308	214	215	68	170	2948
1984	244	335	407	584	482	352	0	0	1	48	234	63	2750
1985	0	0	0	242	142	0	0	0	0	0	63	91	538
1986	62	64	0	0	0	112	178	0	0	295	253	63	1027
1987	0	73	57	31	0	40	0	0	1	0	137	95	434
1988	76	96	0	0	1	0	0	0	1	213	163	129	679
1989	92	111	98	51	0	0	0	1	1	0	0	63	417
1990	102	127	133	0	0	1	0	0	0	249	156	126	894
1991	90	122	115	77	19	0	0	1	0	230	208	121	983
1992	65	126	126	46	0	1	1	1	0	118	190	135	809
AVG	51	64	68	81	108	124	23	14	15	125	167	85	925