1984 Varmin Report

TABLE B-3: POWER COSTS AND CREDITS AND ANNUAL REPLACEMENT DEPOSITS FOR EACH AQUEDUCT PUMPING AND POWER RECOVERY PLANT (a

(in dollars)

Calendar Year	NORTH BAY AQUEDUCT Reach 1 Calhoun and Travis Pumping Plants	NORTH BAY AQUEDUCT Reach 3 Cordelia Pumping Plant (b	SOUTH BAY AQUEDUCT Reach 1 South Bay and Del Valle Pumping Plants (c	CALIFORNIA AQUEDUCT Reach 1 Delta Pumping Plant	Reach 4 Dos Amigos Pumping Plant	Reach 14A Buena Vista Pumping Plant	Reach 15A Wheeler Ridge Pumping Plant	Reach 16A Wind Gap Pumping Plant	Reach 17E A.D. Edmonston Pumping Plant
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1952	0	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0	0
1955	0	0	0	0	0	0	0	0	0
1956	0	0	0	0	0	0	0	0	0
1957	0	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0	0
1962	0	0	38,130	0	0	0	0	0	0
1963	0	0	58,871	0	0	0	0	0	0
1964	0	0	75,239	0	0	0	0	0	0
1965	0	0	146,297	0	0	0	0	0	0
1966	0	0	198,643	0	0	0	0	0	0
1967	0	0	229,629	26,982	0	0	0	0	0
1968	0	7,128	342,761	1,324,777	239,505	0	0	0	0
1969	0	8,557	279,751	855,304	143,403	0	0	0	0
1970	0	13,666	448,383	368,508	217,820	2,940	0	0	0
1971	0	10,626	422,057	597,946	229,306	156,540	23,021	18,577	29,067
1972	0	14,430	623,564	1,110,833	575,291	348,668	187,825	385,935	1,263,087
1973	0	14,453	485,534	918,234	493,776	511,904	514,487	883,725	3,139,297
1974	0	17,508	510,873	997,269	560,461	556,968	595,585	1,048,196	3,700,573
1975	0	14,801	387,106	1,353,916	561,089	650,781	707,038	1,394,918	4,853,538
1976	0	20,867	589,007	916,728	596,426	701,061	687,677	1,414,902	4,917,776
1977	0	22,640	541,803	653,304	191,906	170,689	173,496	337,890	1,130,422
1978	0	21,701	569,046	4,138,817	839,257	1,094,676	1,056,850	1,993,335	7,061,284
1979	0	16,249	621,602	3,421,367	1,019,385	849,644	832,056	1,669,651	5,751,042
1980	0	19,961	523,756	2,462,139	1,160,206	1,018,905	1,008,746	2,058,353	6,842,479
1981	0	21,711	607,892	2,170,078	1,318,352	1,301,307	1,281,282	2,570,724	9,021,773
1982	0	12,230	650,434	3,585,099	1,630,852	1,763,698	1,783,526	3,466,047	11,664,808
1983	0	15,204	1,716,927	9,629,081	4,195,822	3,470,596	3,426,266	6,978,450	23,368,746
1984	0	15,000	2,290,716	11,636,077	5,527,846	5,052,220	5,142,430	10,782,150	36,348,716
1985	0	18,231	2,390,405	16,084,295	7,534,177	8,388,900	9,366,510	19,337,742	65,746,100
1986	0	39,064	2,461,492	17,379,416	7,797,052	8,540,340	9,454,057	19,515,921	66,297,010
1987	65,744	40,972	2,425,438	16,963,328	7,811,218	8,432,576	9,253,443	19,095,513	64,829,099
1988	74,673	44,284	2,462,737	17,836,816	8,144,611	8,771,203	9,573,431	19,801,201	67,295,139
1989	134,621	57,139	2,547,208	18,169,263	8,692,899	9,595,000	10,557,068	21,821,522	73,390,581
1990	163,209	64,361	2,688,552	22,251,856	9,315,828	10,324,382	11,383,697	23,553,329	79,116,364
1991	169,073	74,982	2,820,892	20,404,508	9,661,286	10,638,406	11,743,494	24,323,814	81,854,747
1992	174,613	85,922	2,958,824	21,751,023	9,920,680	10,753,356	11,869,737	24,589,130	82,852,819
1993	179,428	96,397	3,074,386	22,641,788	10,367,222	11,377,564	12,621,323	26,189,489	88,652,419
1994	182,890	106,298	3,155,302	22,695,053	10,416,162	11,350,660	12,588,106	26,142,614	88,550,895
1995	188,577	113,977	3,131,261	22,727,607	10,354,935	11,274,287	12,524,498	26,020,212	88,170,489
1996	193,099	124,150	3,184,489	23,304,874	10,688,367	11,760,200	13,095,620	27,180,262	92,226,734
1997	200,432	133,733	3,225,451	23,641,376	11,165,454	12,247,785	13,669,014	28,458,933	96,259,751
1998	207,331	145,650	3,278,975	23,923,085	11,531,064	12,528,675	13,949,588	29,217,430	98,414,001
1999	210,043	154,492	3,266,238	24,009,876	11,617,276	12,442,165	13,852,571	29,076,519	97,398,176
2000	217,662	167,210	3,329,650	24,683,277	12,110,966	13,048,059	14,570,244	30,735,603	102,330,975
2001	221,608	174,938	3,352,751	25,176,620	12,371,506	13,350,370	14,897,900	31,390,225	104,382,762
2002	227,025	184,405	3,397,361	25,613,675	12,543,007	13,503,065	15,060,828	31,707,871	105,022,763
2003	241,735	201,252	3,578,580	27,088,865	13,532,859	14,932,522	16,726,316	35,115,902	116,708,394
2004	252,775	210,396	3,609,609	27,506,840	13,564,582	15,012,891	16,805,885	35,132,295	116,720,217
2005	303,383	251,960	4,181,244	31,975,320	15,525,436	17,481,257	19,603,950	40,909,998	136,413,297
2006	309,410	258,697	4,253,668	32,744,495	15,766,361	17,831,736	19,999,717	41,627,317	138,731,066
2007	322,027	271,075	4,412,942	34,091,173	16,662,441	19,005,107	21,372,932	44,699,748	149,280,503
2008	329,566	278,881	4,501,054	35,194,684	16,809,644	19,120,335	21,483,805	44,915,291	149,987,990
2009	332,249	283,040	4,526,472	35,400,920	17,127,827	19,608,644	22,067,687	46,161,988	154,181,527
2010	344,299	294,966	4,677,409	36,411,784	17,824,206	20,538,778	23,146,314	48,455,275	162,023,096
2011	341,089	295,801	4,605,392	35,973,748	17,349,542	19,859,037	22,345,578	46,748,698	156,148,977
2012	362,620	314,474	4,896,103	42,304,864	18,658,511	21,599,901	24,361,670	51,035,285	170,844,217
2013	376,106	326,169	5,078,192	40,242,399	19,596,341	22,887,339	25,863,806	54,233,999	181,731,550
2014	386,261	334,976	5,215,303	40,951,680	19,989,866	23,338,856	26,366,700	55,296,894	185,337,227
2015	405,968	354,637	5,465,121	41,984,370	21,051,041	24,733,143	27,976,450	58,720,156	197,063,177
2016	419,714	366,645	5,650,168	48,406,770	21,824,274	25,745,698	29,144,558	61,203,869	205,561,239
2017	427,105	396,629	5,566,888	44,463,532	21,305,485	25,250,038	28,570,168	59,981,950	201,362,846
2018	437,917	410,685	5,673,278	47,012,912	21,889,533	26,328,454	29,844,280	62,702,150	210,711,698
2019	439,348	413,264	5,616,300	43,788,533	21,503,889	26,038,896	29,511,566	61,901,639	208,281,233
2020	450,419	427,843	5,724,603	49,149,109	21,956,317	26,794,827	30,393,505	63,683,700	214,623,345
2021	443,669	421,430	5,638,802	45,118,553	21,461,591	26,139,988	29,654,518	62,247,479	209,897,703
2022	450,583	427,998	5,726,678	47,363,730	21,559,252	26,734,504	30,383,190	63,656,597	215,800,582
2023	445,350	423,028	5,660,176	47,811,722	20,823,061	26,103,874	29,639,081	61,691,613	210,033,833
2024	445,932	423,580	5,667,573	46,986,521	20,700,129	26,419,925	30,020,715	62,120,101	212,734,062
2025	445,106	422,796	5,657,077	48,120,850	20,659,852	26,367,955	29,961,082	61,614,809	212,247,912
2026	435,585	413,752	5,536,061	44,203,137	20,227,564	25,827,159	29,344,613	60,052,961	207,699,138
2027	439,294	417,275	5,583,199	45,396,777	20,511,581	26,244,639	29,836,246	60,836,232	211,310,078
2028	439,409	417,385	5,584,671	46,695,585	20,404,772	25,958,081	29,600,126	60,345,228	209,564,302
2029	439,693	417,654	5,588,270	46,103,246	20,485,192	26,001,571	29,635,849	60,689,999	210,784,170
2030	439,678	417,640	5,588,083	45,996,191	20,262,498	25,812,546	29,389,635	60,443,403	209,672,550
2031	439,261	417,244	5,582,784	45,895,538	20,136,413	25,738,174	29,365,958	60,661,223	210,013,128
2032	438,284	416,315	5,570,364	44,797,664	19,867,846	25,423,150	28,994,372	60,217,700	208,143,587
2033	442,258	420,090	5,620,875	46,950,979	20,183,606	25,734,931	29,365,167	61,348,347	211,400,024
2034	431,818	410,173	5,488,185	41,970,246	19,460,600	24,546,607	27,971,377	58,718,107	201,977,483
2035	448,380	425,906	5,698,684	51,867,141	20,566,224	25,959,085	29,628,027	62,590,433	215,335,532

Calendar Year	CALIFORNIA AQUEDUCT Reach 18A Cottonwood Powerplant	Reach 22B Pearblossom Pumping Plant	Reach 23 Mojave Siphon	Reach 26A Devil Canyon Powerplant	Reach 29A Oso Pumping Plant	Reach 29G Pyramid Powerplant	Reach 29J Castaic Powerplant	Reach 31A Las Perillas and Badger Hill Pumping Plants	Reach 33A Devil's Den Sawtooth and Polonio PP's and San Luis Obispo Pwp.	GRAND TOTAL
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1952	0	0	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0	0	0
1955	0	0	0	0	0	0	0	0	0	0
1956	0	0	0	0	0	0	0	0	0	0
1957	0	0	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	38,130
1963	0	0	0	0	0	0	0	0	0	58,871
1964	0	0	0	0	0	0	0	0	0	75,239
1965	0	0	0	0	0	0	0	0	0	146,297
1966	0	0	0	0	0	0	0	0	0	198,643
1967	0	0	0	0	0	0	0	6,517	0	263,128
1968	0	0	0	0	0	0	0	120,278	0	2,034,449
1969	0	0	0	0	0	0	0	79,620	0	1,366,635
1970	0	0	0	0	0	0	0	137,449	0	1,188,766
1971	0	64,807	0	0	1,696	0	0	171,389	0	1,725,032
1972	0	103,584	0	-3,112	180,005	0	-385,696	240,651	0	4,645,065
1973	0	615,309	0	-931,697	274,450	0	-1,193,216	128,730	0	5,854,986
1974	0	595,646	0	-939,072	322,440	0	-1,823,397	129,345	0	6,272,395
1975	0	616,327	0	-1,101,445	457,487	0	-2,835,302	101,109	0	7,156,363
1976	0	914,440	0	-1,520,412	314,669	0	-2,512,021	151,211	0	7,192,331
1977	0	318,880	0	-1,216,060	53,119	0	-1,233,043	85,538	0	1,230,584
1978	0	1,783,155	0	-3,298,247	355,285	0	-3,828,774	197,521	0	11,983,906
1979	0	1,807,731	0	-3,335,069	158,795	0	-2,642,118	208,639	0	10,378,974
1980	0	1,850,905	0	-3,508,195	169,185	0	-3,211,549	183,228	0	10,578,119
1981	0	2,012,938	0	-2,417,354	435,742	0	-4,065,927	178,894	0	14,437,412
1982	0	2,563,761	0	-3,537,234	657,732	-973,609	-3,474,627	245,406	0	20,038,123
1983	0	5,659,946	0	-12,867,434	471,362	-1,165,429	-1,514,693	558,802	0	43,943,646
1984	0	5,781,328	0	-12,220,125	2,158,308	-5,298,875	-10,000,900	713,442	0	57,928,333
1985	-1,458,076	10,621,113	0	-21,865,325	4,236,260	-9,665,375	-17,466,275	745,603	0	94,014,285
1986	-4,035,522	9,726,477	-986,080	-20,274,600	4,632,927	-10,486,850	-18,683,650	782,938	0	92,159,992
1987	-3,993,005	9,352,370	-3,028,830	-20,152,850	4,604,402	-10,697,300	-18,761,375	790,387	0	87,031,130
1988	-4,049,376	9,435,981	-3,136,662	-19,966,700	4,876,450	-11,249,725	-19,600,100	814,634	0	91,128,597
1989	-4,263,395	10,017,645	-3,160,652	-19,992,500	5,450,982	-12,594,075	-21,739,550	797,460	0	99,481,216
1990	-4,411,832	10,655,119	-3,526,393	-19,958,825	5,933,816	-13,291,800	-22,803,700	820,781	0	112,278,744
1991	-6,351,486	15,869,207	-6,063,898	-31,050,900	3,949,442	-8,727,400	-15,227,050	1,037,359	0	115,126,476
1992	-6,128,988	15,456,136	-5,988,365	-29,304,000	4,241,555	-9,253,575	-16,063,475	1,255,690	0	119,171,082
1993	-5,916,102	15,000,577	-5,589,630	-28,348,750	5,205,569	-11,313,225	-19,423,500	1,265,977	0	126,080,932
1994	-5,765,145	14,568,575	-5,515,038	-27,099,600	5,342,734	-11,576,850	-19,889,350	1,266,521	0	126,519,827
1995	-5,695,022	14,192,948	-5,434,783	-27,150,025	5,558,201	-12,252,525	-20,973,700	1,243,199	0	123,994,136
1996	-5,746,512	14,392,831	-5,661,299	-27,832,150	5,996,520	-13,185,250	-22,450,650	1,250,695	0	128,521,980
1997	-5,872,641	14,705,758	-5,732,348	-27,888,450	6,385,028	-13,964,750	-23,763,925	1,252,386	0	134,122,987
1998	-5,879,436	14,922,252	-5,721,740	-27,487,350	6,578,684	-14,078,050	-23,953,650	1,273,169	0	138,849,678
1999	-5,903,375	14,889,824	-5,996,448	-27,894,925	6,477,553	-13,794,900	-23,500,350	1,268,223	0	137,572,958
2000	-5,870,589	15,041,999	-5,678,034	-27,323,200	7,075,024	-14,800,975	-25,145,325	1,292,845	0	145,785,391
2001	-5,761,423	14,802,019	-5,496,414	-26,992,275	7,460,340	-15,397,275	-26,245,900	1,301,815	0	148,989,567
2002	-5,472,364	14,198,239	-5,133,847	-25,612,900	7,828,367	-15,863,400	-27,119,300	1,319,136	0	151,403,931
2003	-5,392,564	14,703,833	-5,353,270	-24,758,425	9,180,231	-16,072,475	-30,171,525	1,389,500	0	171,651,730
2004	-5,236,156	14,386,921	-4,918,682	-23,929,575	9,396,305	-16,096,325	-30,369,300	1,401,548	0	173,450,226
2005	-5,109,981	16,166,710	-4,948,342	-22,974,000	11,196,158	-16,911,950	-31,614,900	1,623,504	0	214,073,044
2006	-5,040,532	16,193,218	-4,912,705	-22,923,225	11,464,688	-17,047,975	-31,929,650	1,651,625	0	218,977,911
2007	-5,265,067	17,480,086	-4,972,697	-23,398,350	12,231,152	-17,656,250	-32,991,775	1,713,469	0	237,258,516
2008	-5,279,932	17,794,944	-4,940,348	-23,578,650	12,125,184	-17,133,000	-32,170,225	1,747,682	0	241,186,905
2009	-5,266,116	17,770,972	-4,956,336	-23,927,100	12,687,573	-17,777,150	-33,422,375	1,757,550	0	246,557,372
2010	-5,510,896	19,216,890	-5,300,151	-24,308,625	13,037,907	-17,708,700	-33,364,850	1,816,157	0	261,593,859
2011	-5,327,904	18,159,762	-4,914,423	-24,188,175	12,692,899	-17,504,200	-32,949,350	1,788,194	0	251,424,665
2012	-5,662,015	20,539,167	-5,779,416	-25,103,325	13,503,400	-17,646,425	-33,215,450	1,901,072	0	282,914,653
2013	-5,649,292	21,143,488	-5,217,671	-24,928,225	14,599,721	-18,354,950	-34,723,550	1,971,775	0	299,177,197
2014	-5,627,678	21,520,181	-5,052,039	-25,027,900	14,812,064	-18,217,175	-34,462,700	2,025,012	0	307,187,528
2015	-5,595,028	22,287,199	-5,310,237	-24,856,575	15,926,508	-18,678,450	-35,466,950	2,122,012	0	328,182,542
2016	-5,814,684	23,933,591	-5,419,762	-25,500,475	16,242,078	-18,573,325	-35,135,450	2,193,862	0	350,248,770
2017	-5,701,094	22,966,617	-5,292,157	-25,208,000	16,083,839	-18,625,250	-35,253,800	2,161,526	0	338,456,322
2018	-5,917,648	24,295,283	-5,549,757	-25,627,600	16,684,029	-18,955,625	-35,912,650	2,202,835	0	356,229,774
2019	-5,853,672	23,657,950	-5,224,096	-25,449,325	16,612,253	-18,963,275	-36,061,975	2,180,712	0	348,393,240
2020	-5,879,618	24,116,702	-5,206,988	-25,348,500	17,190,810	-19,257,025	-36,648,950	2,222,764	0	364,392,863
2021	-5,816,690	23,360,044	-5,319,352	-25,454,200	16,886,776	-19,246,375	-36,513,550	2,189,449	0	351,109,835
2022	-5,984,316	24,386,250	-5,485,507	-25,610,450	17,187,833	-19,274,150	-36,636,575	2,223,570	0	362,909,769
2023	-3,240,775	23,657,105	-5,216,401	-25,489,825	16,743,331	-18,933,225	-36,082,125	2,197,748	0	356,267,571
2024	-3,244,875	23,607,540	-5,378,671	-25,472,950	17,096,893	-19,263,325	-36,763,475	2,200,620	0	358,300,295
2025	-3,333,900	24,176,982	-5,422,601	-25,495,800	16,736,943	-19,020,775	-36,104,000	2,196,545	0	359,230,833
2026	-3,277,325	23,127,816	-1,774,950	-25,424,600	16,613,510	-19,186,075	-36,511,450	2,149,557	0	349,456,453
2027	-3,318,875	23,590,026	-1,807,950	-25,571,600	16,846,721	-19,214,800	-36,715,675	2,167,860	0	356,551,028
2028	-3,307,775	23,503,728	-1,811,625	-25,546,275	16,334,300	-19,111,750	-36,307,850	2,168,431	0	354,930,743
2029	-3,288,450	23,356,101	-1,813,750	-25,453,825	16,247,265	-19,264,000	-36,747,675	2,169,828	0	355,351,138
2030	-3,336,000	23,753,241	-1,843,100	-25,633,000	15,874,812	-18,997,050	-36,152,800	2,169,756	0	353,858,083
2031	-3,293,225	23,374,457	-1,800,925	-25,443,275	16,043,684	-19,273,825	-36,743,975	2,167,698	0	353,280,337
2032	-3,326,875	23,477,938	-1,827,275	-25,593,950	15,630,407	-19,085,025	-36,237,100	2,162,875	0	349,070,277
2033	-3,311,075	23,430,231	-1,788,875	-25,562,875	15,965,596	-19,345,650	-36,963,225	2,182,489	0	356,072,893
2034	-3,263,900	22,385,591	-1,770,375	-25,464,875	14,948,590	-18,979,400	-36,148,650	2,130,968	0	334,812,545
2035	-3,349,875	23,835,588	-1,904,500	-25,407,225	15,670,810	-19,483,925	-37,156,425	2,212,700	0	366,936,560

a) *Includes the costs of electric capacity and energy used by pumping plants, exclusive of associated power transmission and station service charges; the value of electric capacity and energy produced by power recovery plants (treated as negative costs); the payments to sinking fund reserves that will finance periodic replacement of electromechanical equipment; and the plant capacity and energy costs associated with surplus water service prior to May 1, 1973.*

b) *Power costs for the period 1968 through 1986 are for an interim facility.*

c) *The estimated costs of Del Valle Pumping Plant are combined with those of South Bay Pumping Plant to simplify the cost allocations.*

1984

C-111286

C—111286

[illegible]

Lawrence E. Swenson, Chief
State Water Project
Analysis Office
Room 215-13

Date : December 23, 1983

File No.:

Subject: Resources and Costs for Bulletin 132-84

Frank J. Hahn, Chief
Energy Division
: Department of Water Resources

Attached is detailed information regarding power resources and transmission facilities necessary in the development of Bulletin 132-84. These data include monthly operating data (Appendix A) for all off-aqueduct resources included in the current resource base and requested cost data (Appendix B and C, respectively). These data do not include operating data for on-aqueduct resources or construction and operations and maintenance cost data for any resources except those specifically requested in your memorandum of November 21 on the subject. We would appreciate it if you could provide the characteristics of Hyatt-Thermalito, Southern California Edison Company power contracts, Northwest purchases and limited purchases that would be assumed in development of Bulletin 132-84 to insure consistency in planning assumptions.

Current power sources contained in the Energy Division's mix of resources include the existing supply base, generation currently under construction or contracted for and executed power agreements.

Specifically, these resources include:

Existing Resources

Hyatt-Thermalito
Devil Canyon Phase I
San Luis Phase I
Castaic
William E. Warne Phase I (Units 1 and 2)
Metropolitan Water District Hydro Phase I
TERA Phase I
Northwest Power
Southern California Edison Power Contract
Southern California Edison Capacity Exchange Agreement
Reid Gardner Unit No. 4

Resources Under Construction

Alamo Phase I
Bottle Rock
South Geysers
Pine Flat
TERA Wind Phases II-IV
Thermalito [illegible]

SURNAME

C—111287

Resources which were previously considered but which have now been deferred pending future power supply decisions include:

Thermalito Afterbay
Mojave Siphon Phase I and II (Units 1, 2, and 3)
Castaic Outlet
Pyramid Outlet
San Luis Obispo
Lake Isabella

We anticipate that the current resources may not be sufficient to meet all the power requirements of the State Water Project during the entire 50-year Bulletin 132-84 study period. Therefore, we recommend that Southern California Edison Company contracts be assumed as renewed beyond 2004, Northwest resources will also be available beyond 2004. If the shortage of resources still persists, then add generic coal plants in increments of 100 MW.

If you have any questions regarding the information presented, please call Sherry Musgrove at 3-4032.

Attachment

APPENDIX A

REID WRITING PAPER NO. 4

Annual Capacity Factors:	1984	50 percent
	1985	60 percent
	1986	65 percent

State's share of Station Service: 30,500 kW (67.8 percent of 45,000 kW)

NPC Interruptions	hours*
1984 - 1989	0
1990 - 1994	750
1995 and therefore	1,500

*hours times 226 MW

C—111290

C-111290

FORT GARDNER

1984

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	56,099	56,099	112,198
Feb	50,670	56,670	101,340
Mar	56,099	56,099	112,198
Apr	27,145	27,145	54,290
May	56,099	56,099	112,198
Jun	54,290	54,290	108,580
Jul	56,099	56,099	112,198
Aug	0	0	0
Sep	0	0	0
Oct	28,050	28,050	56,100
Nov	54,290	54,290	108,580
Dec	56,099	56,099	112,198
TOTAL	494,940	494,940	989,880

1985

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	60,665	60,665	121,330
Feb	54,794	54,794	109,588
Mar	0	0	0
Apr	29,354	29,354	58,708
May	60,665	60,665	121,330
Jun	58,708	58,708	117,416
Jul	60,665	60,665	121,330
Aug	60,665	60,665	121,330
Sep	58,708	58,708	117,416
Oct	30,332	30,332	60,664
Nov	58,708	58,708	117,416
Dec	60,665	60,665	121,330
TOTAL	593,929	593,929	1,187,858

1994-1999

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	65,720	65,720	131,440
Feb	59,360	59,360	118,720
Mar	0	0	0
Apr	31,800	31,800	63,600
May	65,720	65,720	131,440
Jun	63,600	63,600	127,200
Jul	65,720	65,720	131,440
Aug	65,720	65,720	131,440
Sep	63,600	63,600	127,200
Oct	32,860	32,860	65,720
Nov	63,600	63,600	127,200
Dec	65,720	65,720	131,440
TOTAL	643,420	643,420	1,286,840

1990-1994

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	65,720	65,720	131,440
Feb	59,360	59,360	118,720
Mar	0	0	0
Apr	31,800	31,800	63,600
May	65,720	65,720	131,440
Jun	29,700	63,600	93,300
Jul	9,220	65,720	74,940
Aug	9,220	65,720	74,940
Sep	41,000	63,600	104,600
Oct	32,860	32,860	65,720
Nov	63,600	63,600	127,200
Dec	65,720	65,720	131,440
TOTAL	473,920	643,420	1,117,340

1995-1997

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	9,200	65,720	74,940
Feb	59,360	59,360	118,720
Mar	0	0	0
Apr	31,800	31,800	63,600
May	65,720	65,720	131,440
Jun	0	63,600	63,600
Jul	0	65,720	65,720
Aug	0	65,720	65,720
Sep	41,000	63,600	104,600
Oct	32,860	32,860	65,720
Nov	63,600	63,600	127,200
Dec	9,220	65,720	74,940
TOTAL	312,760	643,440	956,200

REID GARDNER (cont'd)

1998

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	9,220	65,720	74,940
Feb	59,360	59,360	118,720
Mar	0	0	0
Apr	31,800	31,800	63,600
May	65,720	65,720	131,440
Jun	0	63,600	63,600
Jul	0	65,720	65,720
Aug	0	61,765	61,765
Sep	38,533	59,773	98,306
Oct	30,883	30,883	61,766
Nov	59,773	59,773	119,546
Dec	8,665	61,765	70,430
TOTAL	303,954	625,879	929,833

1999

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	8,665	61,765	70,430
Feb	55,788	55,788	111,576
Mar	0	0	0
Apr	29,886	29,886	59,772
May	61,765	61,765	123,530
Jun	0	59,773	59,773
Jul	0	61,765	61,765
Aug	0	57,811	57,811
Sep	36,066	55,946	92,012
Oct	28,905	28,905	57,810
Nov	55,946	55,946	111,892
Dec	8,111	57,811	65,922
TOTAL	285,132	587,161	872,293

2000

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	8,111	57,811	65,922
Feb	52,216	52,216	104,432
Mar	0	0	0
Apr	27,973	27,973	55,946
May	57,811	57,811	115,622
Jun	0	55,946	55,946
Jul	0	57,811	57,811
Aug	0	53,885	53,885
Sep	33,617	52,147	85,764
Oct	26,942	26,942	53,884
Nov	52,147	52,147	104,294
Dec	7,560	53,885	61,445
TOTAL	266,377	548,574	814,951

2001

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	7,560	53,885	61,445
Feb	48,670	48,670	97,340
Mar	0	0	0
Apr	26,073	26,073	52,146
May	53,885	53,885	107,770
Jun	0	52,147	52,147
Jul	0	53,885	53,885
Aug	0	49,930	49,930
Sep	31,149	48,319	79,468
Oct	24,965	24,965	49,930
Nov	48,319	48,319	96,638
Dec	7,005	49,930	56,935
TOTAL	247,626	510,008	757,634

2002

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	7,005	49,930	56,935
Feb	45,098	45,098	90,196
Mar	0	0	0
Apr	24,160	24,160	48,320
May	49,930	49,930	99,860
Jun	0	48,319	48,319
Jul	0	49,930	49,930
Aug	0	46,004	46,004
Sep	28,700	44,520	73,220
Oct	23,002	23,002	46,004
Nov	44,520	44,520	89,040
Dec	6,454	46,004	52,458
TOTAL	228,869	471,417	700,286

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2003

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	6,454	46,004	52,458
Feb	41,552	41,552	83,104
Mar	0	0	0
Apr	22,260	22,260	44,520
May	46,004	46,004	92,008
Jun	0	44,520	44,520
Jul	0	46,004	46,004
Aug	0	42,049	42,049
Sep	26,233	40,693	66,926
Oct	21,025	21,025	42,050
Nov	40,693	40,693	81,386
Dec	5,899	42,049	47,948
TOTAL	210,120	432,853	642,973

2004

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	5,899	42,049	47,948
Feb	37,980	37,980	75,960
Mar	0	0	0
Apr	20,346	20,346	40,692
May	42,049	42,049	84,098
Jun	0	40,693	40,693
Jul	0	42,049	42,049
Aug	0	38,094	38,094
Sep	23,766	36,866	60,632
Oct	19,047	19,047	38,094
Nov	36,866	36,866	73,732
Dec	5,344	38,094	43,438
TOTAL	191,297	394,133	585,430

2005

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	5,344	38,094	43,438
Feb	34,408	34,408	68,816
Mar	0	0	0
Apr	18,433	18,433	36,866
May	38,094	38,094	76,188
Jun	0	36,866	36,866
Jul	0	38,094	38,094
Aug	0	34,169	34,169
Sep	21,316	33,066	54,382
Oct	17,084	17,084	34,168
Nov	33,066	33,066	66,132
Dec	4,794	34,169	38,963
TOTAL	172,539	355,543	528,082

[illegible]

2006

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	4,794	34,169	38,963
Feb	30,862	30,862	61,724
Mar	0	0	0
Apr	16,533	16,533	33,066
May	34,169	34,169	68,338
Jun	0	33,066	33,066
Jul	0	34,169	34,169
Aug	0	30,214	30,214
Sep	18,849	29,239	48,088
Oct	15,107	15,107	30,214
Nov	29,239	29,239	58,478
Dec	4,239	30,214	34,453
TOTAL	153,792	316,981	470,773

2007

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	4,239	30,214	34,453
Feb	27,290	27,290	54,580
Mar	0	0	0
Apr	14,620	14,620	29,240
May	30,214	30,214	60,428
Jun	0	29,239	29,239
Jul	0	30,214	30,214
Aug	0	26,288	26,288
Sep	16,400	25,440	41,840
Oct	13,144	13,144	26,288
Nov	25,440	25,440	50,880
Dec	3,688	26,288	29,976
TOTAL	135,035	278,391	413,426

2008

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	3,688	26,288	29,976
Feb	23,744	23,744	47,488
Mar	0	0	0
Apr	12,720	12,720	25,440
May	26,288	26,288	52,576
Jun	0	25,440	25,440
Jul	0	26,288	26,288
Aug	0	22,333	22,333
Sep	13,933	21,613	35,546
Oct	11,167	11,167	22,334
Nov	21,613	21,613	43,226
Dec	3,133	22,333	25,466
TOTAL	116,286	239,827	356,113

C-111296

REID GARDNER (con't)

2009

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	3,133	22,333	25,466
Feb	20,172	20,172	40,344
Mar	0	0	0
Apr	10,806	10,806	21,612
May	22,333	22,333	44,666
Jun	0	21,613	21,613
Jul	0	22,333	22,333
Aug	0	18,378	18,378
Sep	11,466	17,786	29,252
Oct	9,189	9,189	18,378
Nov	17,786	17,786	35,572
Dec	2,578	18,378	20,956
TOTAL	97,463	201,107	298,570

2010

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	2,578	18,378	20,956
Feb	16,600	16,600	33,200
Mar	0	0	0
Apr	8,893	8,893	17,786
May	18,378	18,378	36,756
Jun	0	17,786	17,786
Jul	0	18,378	18,378
Aug	0	14,453	14,453
Sep	9,016	13,986	23,002
Oct	7,226	7,226	14,452
Nov	13,986	13,986	27,972
Dec	2,028	14,453	16,481
TOTAL	78,705	162,517	241,222

2011

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	2,028	14,453	16,481
Feb	13,054	13,054	26,108
Mar	0	0	0
Apr	6,993	6,993	13,986
May	14,453	14,453	28,906
Jun	0	13,986	13,986
Jul	0	14,453	14,453
Aug	0	10,498	10,498
Sep	6,549	10,159	16,708
Oct	5,249	5,249	10,498
Nov	10,159	10,159	20,318
Dec	[illegible]	[illegible]	11,971
TOTAL	59,958	123,955	183,913

[illegible]

2012

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	1,473	10,498	11,971
Feb	9,482	9,482	18,964
Mar	0	0	0
Apr	5,080	5,080	10,160
May	10,498	10,498	20,996
Jun	0	10,159	10,159
Jul	0	10,498	10,498
Aug	0	6,572	6,572
Sep	4,100	6,360	10,460
Oct	3,286	3,286	6,572
Nov	6,360	6,360	12,720
Dec	922	6,572	7,494
TOTAL	41,201	85,365	126,566

2013

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	922	6,572	7,494
Feb	5,936	5,936	11,872
Mar	0	0	0
Apr	3,180	3,180	6,360
May	6,572	6,572	13,144
Jun	0	6,360	6,360
Jul	0	6,572	6,572
Aug	0	0	0
Sep	0	0	0
Oct	0	0	0
Nov	0	0	0
Dec	0	0	0
TOTAL	16,610	35,192	51,802

TEGA -- [illegible]

Unit installation schedule of 50 kW units

Phase	Commercial Operating Date	Installed Units	Cumulative Installed Capacity (MW)
1	Aug 82	10	0.5
2	Dec 83	60	3.0
3	Jan 85	200	10.0

1984

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	18	18	36
Feb	18	18	36
Mar	222	222	444
Apr	270	270	540
May	384	384	768
Jun	462	462	924
Jul	443	443	886
Aug	524	524	1,048
Sep	376	376	752
Oct	318	318	636
Nov	36	36	72
Dec	56	56	112
TOTAL	3,129	3,129	6,258

1985 and Thereafter

	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan	66	66	132
Feb	60	60	120
Mar	750	750	1,500
Apr	1,082	1,082	2,164
May	1,280	1,280	2,560
Jun	1,541	1,541	3,082
Jul	1,477	1,477	2,954
Aug	1,748	1,748	3,496
Sep	1,251	1,251	2,502
Oct	1,062	1,062	2,124
Nov	121	121	242
Dec	63	63	126
TOTAL	10,501	10,501	21,002

NOTE: 1. Annual capacity factor of 24 percent (1985 and thereafter)
2. [illegible]

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C-111299

LITTLE ROCK

1984

	On (kW)	Off (kW)	On (MWh)	Off (MWh)	Total (MWh)
Jan	0	0	0	0	0
Feb	0	0	0	0	0
Mar	0	0	0	0	0
Apr	0	0	0	0	0
May	0	0	0	0	0
Jun	0	0	0	0	0
Jul	0	0	0	0	0
Aug	0	0	0	0	0
Sep	0	0	0	0	0
Oct	51,500	51,500	11,495	11,495	22,990
Nov	51,500	51,500	11,124	11,124	22,248
Dec	51,000	51,500	11,495	11,495	22,990
TOTAL	-	-	34,114	34,114	68,228

1985

	On (kW)	Off (kW)	On (MWh)	Off (MWh)	Total (MWh)
Jan	51,500	51,500	14,525	14,525	29,050
Feb	51,500	51,500	13,119	13,119	26,238
Mar	51,500	51,500	14,525	14,525	29,050
Apr	51,500	51,500	14,057	14,057	28,114
May	0*	0*	1,406	1,406	2,812
Jun	51,500	51,500	14,057	14,057	28,114
Jul	51,500	51,500	14,525	14,525	29,050
Aug	51,500	51,500	14,525	14,525	29,050
Sep	51,500	51,500	14,057	14,057	28,114
Oct	51,500	51,500	14,525	14,525	29,050
Nov	51,500	51,500	14,057	14,057	28,114
Dec	51,500	51,500	14,525	14,525	29,050
TOTAL	-	-	157,903	157,903	315,806

*Four week normal maintenance outage

NOTE: Capacity reduced by Station Service of 3,500 kW

1986 and all even years thereafter

	On (kW)	Off (kW)	On (MWh)	Off (MWh)	Total (MWh)
Jan	51,500	51,500	16,600	16,600	33,200
Feb	51,500	51,500	14,993	14,993	29,986
Mar	51,500	51,500	16,600	16,600	33,200
Apr	0 1/	0 1/	10,174	10,174	20,348
May	0 1/	0 1/	0	0	0
Jun	51,500	51,500	16,064	16,064	32,128
Jul	51,500	51,500	16,600	16,600	33,200
Aug	51,500	51,500	16,600	16,600	33,200
Sep	51,500	51,500	16,064	16,064	32,128
Oct	51,500	51,500	16,600	16,600	33,200
Nov	51,500	51,500	16,064	16,064	33,128
Dec	51,500	51,500	16,600	16,600	33,200
TOTAL			172,959	172,959	345,718

1987 and all odd years thereafter

	On (kW)	Off (kW)	On (MWh)	Off (KWh)	Total (MWh)
Jan	51,500	51,500	16,599	16,599	33,199
Feb	51,500	51,500	14,993	14,993	29,986
Mar	51,500	51,500	16,599	16,599	33,198
Apr	51,500	51,500	16,064	16,064	32,128
May	0 2/	0 2/	1,606	1,606	3,212
Jun	51,500	51,500	16,064	16,064	32,128
Jul	51,500	51,500	16,599	16,599	33,198
Aug	51,500	51,500	16,599	16,599	33,198
Sep	51,500	51,500	16,064	16,064	32,128
Oct	51,500	51,500	16,599	16,599	33,198
Nov	51,500	51,500	16,064	16,064	32,128
Dec	51,500	51,500	16,599	16,599	33,198
TOTAL	-	-	180,449	180,449	360,898

1/ Six week extended maintenance outage (every other year as follows)

2/ Four week normal maintenance outage (every other year as follows)

C-111301

POWER DEVICES

1986

	On (kW)	Off (kW)	On (MWh)	Off (MWh)	Total (MWh)
Jan					
Feb					
Mar	51,500	51,500	11,495	11,495	22,990
Apr	51,500	51,500	11,124	11,124	22,248
May	51,500	51,500	11,495	11,495	22,990
Jun	51,500	51,500	11,124	11,124	22,248
Jul	51,500	51,500	11,495	11,495	22,990
Aug	51,500	51,500	11,495	11,495	22,990
Sep	51,500	51,500	11,124	11,124	22,248
Oct	51,500	51,500	11,495	11,495	22,990
Nov	51,500	51,500	11,124	11,124	22,248
Dec	51,500	51,500	11,495	11,495	22,990
TOTAL	-	-	113,466	113,466	226,932

1987

	On (kW)	Off (kW)	On (MWh)	Off (MWh)	Total (MWh)
Jan	51,500	51,500	14,525	14,525	29,050
Feb	51,500	51,500	13,118	13,118	26,236
Mar	0*	0*	1,406	1,406	2,812
Apr	51,500	51,500	14,057	14,057	28,114
May	51,500	51,500	14,525	14,525	29,050
Jun	51,500	51,500	14,057	14,057	28,114
Jul	51,500	51,500	14,525	14,525	29,050
Aug	51,500	51,500	14,525	14,525	29,050
Sep	51,500	51,500	14,057	14,057	28,114
Oct	51,500	51,500	14,525	14,525	29,050
Nov	51,500	51,500	14,057	14,057	28,114
Dec	51,500	51,500	14,525	14,525	29,050
TOTAL	-	-	157,902	157,902	315,804

*Four week normal maintenance outage

NOTE: Capacity reduced by Station Service of 3,500 MW

C—111302

C-111302

1988 and all even years thereafter

	On (kW)	Off (kW)	On (MWh)	Off (MWh)	Total (MWh)
Jan	51,500	51,500	16,599	16,599	33,198
Feb	0 1/	0 1/	9,103	9,103	18,206
Mar	0 1/	0 1/	0	0	0
Apr	51,500	51,500	16,064	16,064	32,128
May	51,500	51,500	16,599	16,599	33,198
Jun	51,500	51,500	16,064	16,064	32,128
Jul	51,500	51,500	16,599	16,599	33,198
Aug	51,500	51,500	16,599	16,599	33,198
Sep	51,500	51,500	16,064	16,064	32,128
Oct	51,500	51,500	16,599	16,599	33,198
Nov	51,500	51,500	16,064	16,064	32,128
Dec	51,500	51,500	16,599	16,599	33,198
TOTAL	-	-	172,953	172,953	345,906

1989 and all odd years thereafter

	On (kW)	Off (kW)	On (MWh)	Off (MWh)	Total (MWh)
Jan	51,500	51,500	16,599	16,599	33,198
Feb	51,500	51,500	14,993	14,993	29,986
Mar	0 2/	0 2/	1,606	1,606	3,212
Apr	51,500	51,500	16,064	16,064	32,128
May	51,500	51,500	16,600	16,600	33,200
Jun	51,500	51,500	16,064	16,064	32,128
Jul	51,500	51,500	16,600	16,600	33,200
Aug	51,500	51,500	16,600	16,600	33,200
Sep	51,500	51,500	16,064	16,064	32,128
Oct	51,500	51,500	16,600	16,600	33,200
Nov	51,500	51,500	16,064	16,064	32,128
Dec	51,500	51,500	16,600	16,600	33,200
TOTAL	-	-	180,454	180,454	360,908

1/ Six week extended maintenance outage (every other year as follows)

2/ Four week normal maintenance outage (every other year as follows)

11% PLANT

1984 and Thereafter

	ON (MW)	OFF (MW)	ON (MWh)	OFF (MWh)	TOTAL (MWh)
Jan*	0	0	3,650	3,650	7,300
Feb	44,792	44,792	15,050	15,050	30,100
Mar	31,183	31,183	11,600	11,600	23,200
Apr	50,833	50,833	18,300	18,300	36,600
May	80,242	80,242	29,850	29,850	59,700
Jun	120,555	120,555	43,400	43,400	86,800
Jul	108,602	108,602	40,400	40,400	80,800
Aug	78,629	78,629	29,250	29,250	58,500
Sep	41,944	41,944	15,100	15,100	30,200
Oct	0	0	0	0	0
Nov*	0	0	1,850	1,850	3,700
Dec*	0	0	3,050	3,050	6,100
TOTAL	-	-	211,500	211,500	423,000

Capacity Factor = 29.3%

*Continuous capacity below minimum output rating of a single unit.

MWD PHASE I

Operating procedures for MWD Hydro Phase I are contained in letters dated April 1, 1982, and November 9, 1983, from Robert Thompson of MWD to Frank Hahn regarding District - State Hydroelectric Power Sale Contract, which have been previously transmitted. The April 1, 1982 and November 9, 1983 letters contain operating data covering the years 1993 - 2020 and 1984 - 1992, respectively. The MWD Contractual Costs are based on exchange with SCE of energy produced under this MWD schedule for an amount of energy equal to 95 percent of off-peak energy produced; and 110 percent of on-peak energy produced prior to January 1, 1985; and 120 percent of on-peak energy produced after January 1, 1985, as per Section 12 of the Power Contract between SCE and DWR. November 9, 1983 letter attached.

The Metropolitan Water District of Southern California

November 9, 1983

Mr. F. Hahn, Chief
Energy Division
Department of Water Resources
State of California
P.O. Box 388
Sacramento, California 95802

Dear Mr. Hahn:

District-State Hydroelectric Power Sale Contract

Pursuant to the scheduling provisions of the "District-State Hydroelectric Power Sales Contract," enclosed are our monthly estimates from 1984 through 1993 of hydroelectric capacity and energy for each Project Plant under the contract. There has been no change in the monthly estimates for 1993 through 2020, which were last forwarded to you by letter dated April 1, 1982.

If we can be of further assistance in this matter, please call Mr. R. W. Schempp of my staff at (213) 250-6000, extension 226.

Very truly yours,

Robert W. Thompson, Manager
Power Contracts Administration

RWS:eak

Enclosures

Mailing address: Los Angeles, Calif. [illegible]

APPENDIX B

Resource cost data are provided for the following:

Reid Gardner fuel
Bottle Rock steam costs
South Geysers steam costs
Pine Flat contractual cost
MWD Hydro Phase I contractual cost
TERA contractual cost

C—111308

C-111308

REID GARDNER UNIT No. 4
FUEL COSTS*
(Nominal Dollars)

Year	mills/kWh
1984	26.30
1985	28.15
1986	28.24
1987	30.78
1988	33.56
1989	36.58
1990	39.87
1991	43.45
1992	47.36
1993	51.63
1994	56.28
1995	61.34
1996	66.85
1997	72.87
1998	79.44
1999	86.59
2000	94.38
2001	102.87
2002	112.13
2003	122.22
2004	133.23
2005	145.21
2006	158.28
2007	172.53
2008	188.06
2009	204.98
2010	223.44
2011	243.55
2012	265.47
2013	289.36

*Fuel costs are based on weighted average cost ($27.23/ton + 5.75 percent tax + $13.19/ton rail freight) of five coal contracts negotiated by NPC for Reid Gardner Unit No. 4.

BOTTLE ROCK AND SOUTH GEYSERS
GEOTHERMAL COSTS*

FUEL COSTS
(Nominal Dollars)

Year	Bottle Rock mills/kWh	South Geysers mills/kWh
1983	-	-
1984	38.5	-
1985	34.5	34.5
1986	32.0	32.0
1987	35.0	35.0
1988	39.0	39.0
1989	42.5	42.5
1990	47.0	47.0
1991	51.5	51.5
1992	57.0	57.0
1993	62.5	62.5
1994	68.5	68.5
1995	75.5	75.5
1996	80.0	80.0
1997	85.0	85.0
1998	90.5	90.5
1999	96.0	96.0
2000	101.5	101.5
2001	108.0	108.0
2002	114.5	114.5
2003	121.5	121.5
2004	129.0	129.0
2005	136.5	136.5
2006	145.0	145.0
2007	154.0	154.0
2008	163.0	163.0
2009	173.0	173.0
2010	184.0	184.0
2011	195.0	195.0
2012	207.0	207.0
2013	219.5	219.5
2014	233.0	233.0

*Geothermal steam price and average annual escalation rates are based upon written estimates provided by PGandE on June 16, 1983 and reflect PGandE's current 1983 resource plan, revised Diablo Canyon I and II start dates, and average hydroelectric conditions: 1984 - 2014. Updates of these estimates will be obtained from PGandE during the second quarter of 1984.

C—111310

C-111310

PINE DAM
CONTRACTUAL COST
(Nominal Dollars)

Year	mills/KWh
1984	26.5
1985	29.0
1986	29.5
1987	30.0
1988	30.0
1989	30.5
1990	31.0
1991	31.0
1992	31.5
1993	32.0
1994	32.0
1995	32.5
1996	33.0
1997	33.5
1998	34.0
1999	34.5
2000	35.0
2001	35.5
2002	36.0
2003	37.0
2004	37.5

*Revised mill rate includes annual fixed charge required to return to KRCD, the cost of bond repayment (both Series A and Series B), plus a royalty payment of 7.6 mills/kWh in the first year of operation (escalation at a rate equal to one-half the increase in SCE fuel cost index), plus all O&M costs (per May 10, 1983 O&M budget submitted by KRCD escalation at 6 percent), and an annual FERC charge of $1.43 million (based on annual generation of 423,000 MWh the FERC charge would equal 3.4 mills). Cost does not include interconnection cost.

MWD HYDRO PLANT I
CONTINUAL COST
(Nominal Dollars)

Year	mills/kWh
1984	49.0
1985	49.5
1986	52.0
1987	54.5
1988	57.5
1989	60.0
1990	62.0
1991	66.5
1992	69.5
1993	73.0
1994	76.5
1995	80.5
1996	84.5
1997	89.0
1998	93.5
1999	98.0
2000	103.0
2001	108.0
2002	113.5
2003	119.0
2004	125.0

*Based on current negotiations with MWD, the Energy Division estimates that cost of MWD Hydro is 49 mills/kWh in 1984, with resulting effective costs based on exchange of MWD energy with SCE. Negotiations are continuing with MWD to develop a basis for estimating the purchase price and escalation rate; however, pending culmination of negotiations, we used 5 percent/year escalation rate beginning in 1985. This 5 percent represents current best estimate of the average rate of change in the SWP's related cost of energy.

C-111312

TERA WIND PROJECTS I-IV
CONTRACT PRICE*
(Nominal Dollars)

55.0 mills/kWh -- first 10 years

68.0 mills/kWh -- second 10 years

68.0 mills/kWh -- third 10 years
or 80 percent of
Department of
Water Resources'
Avoided Cost

*Under an agreement between TERA and DWR, DWR would pay TERA 87.5 mills/kWh for 97.5 percent of the net energy output for the first 10 years and at least 70 mills/kWh for 97.5 percent of the net energy output for the second 10 years.

C—111313

C-111313

APPENDIX C

Transmission Service and Costs

A. PGandE Service Area

	April 1983 $/month	January 1984 $/month
Buena Vista		
Wheeler Ridge	83,646	83,646 1/
Wind Gap		
Las Perillas	273	273
Badger Hill		
Cordelia	460	460
Del Valle	652	652
Banks	0	0
Dos Amigos	0	0
South Bay	4,237	4,237
San Luis	4,832	4,832
Pine Flat	0	0
Backbone 2/	688,200 @ 1100 MW	806,000 @ 1290 MW
EHV Transmission Service	125,000	125,000
EHV Penalty	177,246	177,246
TOTAL	1,084,546	1,239,006

1/ DWR is negotiating with PGandE for the purchase of the transmission facilities serving Buena Vista, Wheeler Ridge, and Wind Gap pumping plants. DWR will be paying an annual charge for operation and maintenance only after the purchase is executed.

2/ Backbone transmission charges will increase at the rate of $0.62/kW-month for projected generation of 55 MW at Bottle Rock ($34,100/month and 55 MW at South Geysers ($34,100/month).

The transmission charges between point of receipt and backbone will increase by an additional $34,650/month for Bottle Rock now estimated to become operational in October of 1984. These are PGandE System Average Transmission Rates with Castle Rock - Lakeville line operational. If DWR elects to participate as covenant in the above line by making a capital contribution to PGandE, then the monthly

payment will be reduced. Wheeling charges will be incurred by South Geysers when it becomes operational.

There are two options under consideration for providing transmission service for the Thermalito Diversion Dam Powerplant. In the first case, PGandE would require DWR to prepay the cost of additional facilities which may be needed to accommodate the transmission of Thermalito Diversion Dam generation of $58,300 (1982 $) and pay the transmission service charge between point of interconnection and backbone of $1.21/kW-month. The other option is to build a 13.8 kV or 33.0 kV line to Oroville Switchyard in place of the PGandE connection and pay no transmission service charge to PGandE.

B. SCE Service Area

	April 1983 $/month	January 1984 1/ $/month
Edmonston	517,066.00	531,362.00
Oso	60,862.50	62,970.00
Pearblossom	28,061.80	28,733.00
Warne	45,550.00	47,083.00
Castaic - Sylmar to Vincent	33,512.00	34,522.00
Reid Gardner - Vincent to Midway	114,233.50	116,795.00 2/
Reid Gardner - Eldorado to Vincent	185,650.00	190,350.00 2/
Alamo - made available to SCE	0	0
Devil Canyon - made available to SCE	0	0
Firm Transmission Dispatching	6,615.00	6,615.00
TOTAL	991,440.80	1,018,430.00

1/ Based on SCE's filing of November 10, 1983 with FERC for a change of rates for transmission service according to contract provisions.

2/ SCE will waive 75 percent of these transmission service charges after the second Hyatt-Thermalito capacity exchange agreement becomes operational.

C. Total Charges for Transmission Service

	April 1983 $/month	January 1984 $/month
PGandE	1,084,546	1,239,[illegible]06
SCE	991,441	1,018,430
NPC	0	72,419
WAPA	0	94,[illegible] 1/
MONTHLY TOTAL	2,075,987	2,424,355
	x 12	x 12
ANNUAL TOTAL	24,911,844	29,092,260

1/ This payment will stop after PGandE upgrades the 500 kV Backbone between Table Mountain and Tesla and the emergency interconnection with WAPA's Cottonwood - Elverta 230 kV line is disconnected about September 1984.

II. Construction and Annual Operation Costs of Bottle Rock and South Geysers 230 kV Tie Lines

Bottle Rock -- 1.023 miles

Survey and Acquire Right-of-Way	$ 26,000
Design and Construction	$550,000
Estimated annual ownership, which includes O&M and taxes	$ 25,000

South Geysers 1/ -- 1.585 miles

Survey and Acquire Right-of-Way	$ 46,000
Design and Construction	$800,000
Annual O&M and taxes	$ 45,000

1/ South Geysers' costs based on Bottle Rock cost estimates furnished by PGandE.

HYDROELECTRIC GENERATION FORECAST (DWR)

Hydro Plant — Calendar Year 1984

	JAN		FEB		MAR		APR		MAY		JUN	
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH
Greg Avenue	0	0	0	0	0	0	0	0	.85	600	.85	600
Lake Mathews	3.70	2,800	3.70	2,600	3.70	2,800	3.70	2,700	3.70	2,800	3.70	2,700
Foothill Feeder	0	0	0	0	2.72	2,000	3.33	2,400	4.74	3,500	5.78	4,200
San Dim[illegible]	0	0	0	0	0	0	0	0	5.18	3,900	7.42	5,300
Yorba Linda	4.80	3,600	4.80	3,400	4.80	3,600	4.80	3,500	4.80	3,600	4.80	3,500
Totals		6,400		6,000		8,400		8,600		14,400		16,300

	JUL		AUG		SEP		OCT		NOV		DEC		[illegible]
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	Total [illegible]
Greg Avenue	.85	600	.85	600	.85	600	.85	600	.85	600	.85	600	4,600
Lake Mathews	3.70	2,800	3.70	2,800	3.70	2,700	3.7	2,800	3.4	2,500	3.2	2,400	32,400
Foothill Feeder	5.78	4,300	5.78	4,300	4.79	3,500	4.79	3,600	4.79	3,500	4.91	3,700	35,000
San Dim[illegible]	7.86	5,800	7.65	5,700	5.93	4,300	0	0	0	0	0	0	25,000
Yorba Linda	4.80	3,600	4.80	3,600	4.80	3,500	4.8	3,600	4.8	3,500	4.8	3,600	42,600
Totals		17,100		17,000		14,600		10,000		10,100		10,300	139,000

C—111318

C-111318

Hydro Plant

Calendar Year 1985

	JAN		FEB		MAR		APR		MAY		JUN	
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH
Greg Avenue	.85	600	.85	600	.85	600	.85	600	.85	600	.85	600
Lake Mathews	0	0	0	0	0	0	0	0	3.70	2,800	3.70	2,700
Foothill Feeder	5.78	4,300	5.78	3,900	6.11	4,500	6.11	4,400	6.78	5,000	8.07	5,800
San Dimas	7.16	5,300	7.65	5,100	7.42	5,500	6.21	5,900	8.70	6,500	8.70	6,300
Yorba Linda	4.80	3,600	4.80	3,200	4.80	3,600	4.80	3,500	4.80	3,600	4.80	3,500
Totals		13,800		12,800		14,200		14,400		18,500		18,900

	JUL		AUG		SEP		OCT		NOV		DEC		MWH
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	Total [illegible]
Greg Avenue	.85	600	.85	600	.85	600	.85	600	.85	600	.85	600	7,[illegible]
Lake Mathews	3.70	2,800	3.70	2,800	3.70	2,700	0	0	0	0	0	0	13,[illegible]
Foothill Feeder	8.07	6,000	8.07	6,000	6.78	4,900	5.89	4,400	5.89	4,200	5.89	4,400	57,[illegible]
San Dimas	8.70	6,500	8.70	6,500	8.70	6,300	8.70	6,500	8.74	6,300	7.16	5,300	72,[illegible]
Yorba Linda	4.80	3,600	4.80	3,600	4.80	3,500	4.80	3,600	4.80	3,500	4.80	3,600	42,400
Totals		19,500		19,500		18,000		15,100		14,600		13,900	193,200

C—111319

C-111319

Hydro Plant

Calendar Year 1986

	JAN		FEB		MAR		APR		MAY		JUN	
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH
Greg Avenue	.85	600	.85	600	.85	600	.85	600	.85	600	.85	600
Lake Mathews	0	0	0	0	0	0	0	0	3.70	2,500	3.70	2,700
Foothill Feeder	7.92	5,900	7.92	5,300	8.29	6,200	9.26	6,700	9.26	6,200	10.31	7,400
San Dimas	8.70	6,500	8.70	5,800	8.70	6,500	8.70	6,300	8.70	5,800	8.70	6,300
Yorba Linda	4.80	3,600	4.80	3,200	4.80	3,600	4.80	3,500	4.80	3,200	4.80	3,500
Totals		14,900		14,900		16,900		17,100		20,400		20,500

	JUL		AUG		SEP		OCT		NOV		DEC		MWH
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	Total
Greg Avenue	.85	600	.85	600	.85	600	.85	600	.85	600	.85	600	7,20
Lake Mathews	3.70	2,800	3.70	2,800	3.70	2,700	0	0	0	0	0	0	13,5
Foothill Feeder	10.31	7,700	10.31	7,700	10.31	7,400	8.83	6,600	8.83	6,400	8.83	6,600	80,1
San Dimas	8.70	6,500	8.70	6,500	8.70	6,300	8.70	6,500	8.70	6,300	8.70	6,500	75,8
Yorba Linda	4.80	3,600	4.80	3,600	4.80	3,500	4.80	3,600	4.80	3,500	4.80	3,600	42,9
Totals		21,200		21,200		20,500		17,300		16,800		17,300	218,6

C—111320

Hydro Plant

Calendar Year 1987

	JAN		FEB		MAR		APR		MAY		JUN	
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH
Greg Avenue	.85	600	.85	600	.85	600	.85	600	.85	600	.85	600
Lake Mathews	0	0	0	0	0	0	0	0	3.70	2,800	3.70	2,700
Foothill Feeder	6.90	5,100	7.02	4,700	7.52	5,600	7.85	5,700	10.73	8,000	12.43	8,900
San Dimas	8.70	6,500	8.70	5,800	8.70	6,500	8.70	6,300	8.70	6,500	8.70	6,300
Yorba Linda	4.80	3,600	4.80	3,200	4.80	3,600	4.80	3,500	4.80	3,600	4.80	3,500
Totals		15,800		14,300		16,300		16,100		21,500		22,000

	JUL		AUG		SEP		OCT		NOV		DEC		TOTAL
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	Total MWH
Greg Avenue	.85	600	.85	600	.85	600	.85	600	.85	600	.85	600	7,200
Lake Mathews	3.70	2,800	3.70	2,800	3.70	2,700	0	0	0	0	0	0	13,800
Foothill Feeder	10.73	8,000	10.73	8,000	10.73	7,700	11.30	8,400	9.53	6,900	6.90	5,100	82,100
San Dimas	8.70	6,500	8.70	6,500	8.70	6,300	8.70	6,500	8.70	6,300	8.70	6,500	76,500
Yorba Linda	4.80	3,600	4.80	3,600	4.80	3,500	4.80	3,600	4.80	3,500	4.80	3,600	42,400
Totals		21,500		21,500		20,800		19,100		17,300		15,800	222,000

C—111321

C-111321

Hydro Plant

Calendar Year 1988

	JAN		FEB		MAR		APR		MAY		JUN	
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH
Greg Avenue	.85	600	.85	600	.85	600	.85	600	.85	600	.85	600
Lake Mathews	0	0	0	0	0	0	0	0	3.70	2,800	3.70	2,700
Foothill Feeder	7.02	5,200	7.02	4,700	7.58	5,600	7.58	5,500	10.73	8,000	12.43	8,900
San Dimas	8.70	6,500	8.70	5,800	8.70	6,500	8.70	6,300	8.70	6,500	8.70	6,300
Yorba Linda	4.80	3,600	4.80	3,200	4.80	3,600	4.80	3,500	4.80	3,600	4.80	3,500
Totals		15,900		14,300		16,300		15,900		21,500		22,000

	JUL		AUG		SEP		OCT		NOV		DEC		[illegible]
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	Total MW
Greg Avenue	.85	600	.85	600	.85	600	.85	600	.85	600	.85	600	7,200
Lake Mathews	3.70	2,800	3.70	2,800	3.70	2,700	0	0	0	0	0	0	13,800
Foothill Feeder	11.07	8,200	11.07	8,200	11.07	8,000	11.66	8,700	10.31	7,400	7.02	5,200	83,600
San Dimas	8.70	6,500	8.70	6,500	8.70	6,300	8.70	6,500	8.70	6,300	8.70	6,500	76,500
Yorba Linda	4.80	3,600	4.80	3,600	4.80	3,500	4.80	3,600	4.80	3,500	4.80	3,600	42,400
Totals		21,700		21,700		21,100		19,400		17,800		15,900	233,700

C-111322

Hydro Plant

Calendar Year 1989

	JAN		FEB		MAR		APR		MAY		JUN	
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH
Greg Avenue	.85	600	.85	600	.85	600	.85	600	.85	600	.85	600
Lake Mathews	0	0	0	0	0	0	0	0	3.70	2,800	3.70	2,700
Foothill Feeder	7.02	5,200	7.02	4,700	7.58	5,600	7.58	5,500	10.73	8,000	12.43	8,900
San Dimas	8.70	6,500	8.70	5,800	8.70	6,500	8.70	6,300	8.70	6,500	8.70	6,300
Yorba Linda	4.80	3,600	4.80	3,200	4.80	3,600	4.80	3,500	4.80	3,600	4.80	3,500
Totals		15,900		14,300		16,300		15,900		21,500		22,000

	JUL		AUG		SEP		OCT		NOV		DEC		MGD
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	Total MWH
Greg Avenue	.85	600	.85	600	.85	600	.85	600	.85	600	.85	600	7,200
Lake Mathews	3.70	2,800	3.70	2,800	3.70	2,700	0	0	0	0	0	0	13,800
Foothill Feeder	12.43	9,200	11.07	8,200	11.07	8,000	11.66	8,700	10.31	7,400	7.02	5,200	83,600
San Dimas	8.70	6,500	8.70	6,500	8.70	6,300	8.70	6,500	8.70	6,300	8.70	6,500	76,500
Yorba Linda	4.80	3,600	4.80	3,600	4.80	3,500	4.90	3,600	4.80	3,500	4.80	3,600	42,400
Totals		22,700		21,700		21,100		19,400		17,900		13,900	224,500

C-111323

Hydro Plant .

Calendar Year 1990

	JAN		FEB		MAR		APR		MAY		JUN	
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH
Greg Avenue	.85	600	.85	600	.85	600	.85	600	.85	600	.85	600
Lake Mathews	0	0	0	0	0	0	0	0	3.70	2,800	3.70	2,700
Foothill Feeder	7.58	5,600	7.58	5,100	10.31	7,700	10.31	7,400	11.07	8,200	12.43	8,900
San Dimas	8.70	6,500	8.70	5,800	8.70	6,500	8.70	6,300	8.70	6,500	8.70	6,300
Yorba Linda	4.80	3,600	4.80	3,200	4.80	3,600	4.80	3,500	4.80	3,600	4.80	3,500
Totals		16,300		14,700		18,400		17,800		21,700		22,000

	JUL		AUG		SEP		OCT		NOV		DEC		(MW)
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	Total MWH
Greg Avenue	.85	600	.85	600	.85	600	.85	600	.85	600	.85	600	7,200
Lake Mathews	3.70	2,800	3.70	2,800	3.70	2,700	0	0	0	0	0	0	13,800
Foothill Feeder	12.43	9,200	12.43	9,200	11.66	8,400	11.66	8,700	10.73	7,700	10.31	7,700	93,800
San Dimas	8.70	6,500	8.70	6,500	8.70	6,300	8.70	6,500	8.70	6,300	8.70	6,500	76,500
Yorba Linda	4.80	3,600	4.80	3,600	4.80	3,500	4.80	3,600	4.80	3,500	4.80	3,600	42,400
Totals		22,700		22,700		21,500		19,400		18,100		18,400	223,700

Hydro Plant

Calendar Year 1991

	JAN		FEB		MAR		APR		MAY		JUN	
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH
Greg Avenue	.85	600	.85	600	.85	600	.85	600	.85	600	.85	600
Lake Mathews	0	0	0	0	0	0	0	0	3.70	2,800	3.70	2,700
Foothill Feeder	10.31	7,700	10.31	7,000	10.31	7,700	10.73	7,700	11.07	8,200	12.43	8,900
San Dimas	8.70	6,500	8.70	5,800	8.70	6,500	8.70	6,300	8.70	6,500	8.70	6,300
Yorba Linda	4.80	3,600	4.80	3,200	4.80	3,600	4.80	3,500	4.80	3,600	4.80	3,500
Totals		10,400		16,600		18,400		18,100		21,700		22,000

	JUL		AUG		SEP		OCT		NOV		DEC		MWH
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	Total MW
Greg Avenue	.85	600	.85	600	.85	600	.85	600	.85	600	.85	600	7,200
Lake Mathews	3.70	2,800	3.70	2,800	3.70	2,700	0	0	0	0	0	0	13,800
Foothill Feeder	12.43	9,200	12.43	9,200	11.66	8,400	11.66	8,700	10.73	7,700	10.31	7,700	98,100
San Dimas	8.70	6,500	8.70	6,500	8.70	6,300	8.70	6,500	8.70	6,300	8.70	6,500	76,500
Yorba Linda	4.80	3,600	4.80	3,600	4.80	3,500	4.80	3,600	4.80	3,500	4.80	3,600	42,400
Totals		22,700		22,700		21,500		19,400		18,100		18,400	238,000

Hydro Plant | Calendar Year 1992 |

	JAN		FEB		MAR		APR		MAY		JUN	
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH
Greg Avenue	.85	600	.85	600	.85	600	.85	600	.85	600	.85	600
Lake Mathews	0	0	0	0	0	0	0	0	3.70	2,800	3.70	2,700
Foothill Feeder	10.31	7,700	10.31	7,000	10.31	7,700	10.73	7,700	11.07	8,200	12.43	8,900
San Dimas	8.70	6,500	8.70	5,800	8.70	6,500	8.70	6,300	8.70	6,500	8.70	6,300
Yorba Linda	4.80	3,600	4.80	3,200	4.80	3,600	4.80	3,500	4.80	3,600	4.80	3,500
Totals		18,400		16,600		18,400		18,100		21,700		22,000

	JUL		AUG		SEP		OCT		NOV		DEC		MWD
	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	MW	MWH	Total MWH
Greg Avenue	.85	600	.85	600	.85	600	.85	600	.85	600	.85	600	7,200
Lake Mathews	3.70	2,800	3.70	2,800	3.70	2,700	0	0	0	0	0	0	11,900
Foothill Feeder	12.43	9,200	12.43	9,200	11.66	8,400	11.66	8,700	10.73	7,700	10.31	7,700	98,100
San Dimas	8.70	6,500	8.70	6,500	8.70	6,300	8.70	6,500	8.70	6,300	8.70	6,500	76,500
Yorba Linda	4.80	3,600	4.80	3,600	4.80	3,500	4.80	3,600	4.80	3,500	4.80	3,600	42,400
Totals		22,700		22,700		21,500		19,400		18,100		18,400	236,000

C—111326

C-111326

1986
THERMALITO DIVERSION DAM

	On (kW)	Off (kW)	On (MWh)	Off (MWh)	Total (MWh)
Jan	0	0	0	0	0
Feb	0	0	0	0	0
Mar	0	0	0	0	0
Apr	0	0	0	0	0
May	0	0	0	0	0
Jun	0	0	0	0	0
Jul	0	0	0	0	0
Aug	2,000	2,000	744	744	1,488
Sep	2,000	2,000	720	720	1,440
Oct	2,175	2,175	810	810	1,620
Nov	2,000	2,000	720	720	1,440
Dec	2,350	2,350	874	874	1,748
TOTAL	-	-	3,868	3,868	7,736

Capacity Factor based on installed = 70.2%

1987 and Thereafter
THERMALITO DIVERSION DAM

	On (kW)	Off (kW)	On (MWh)	Off (MWh)	Total (MWh)
Jan	2,057	2,057	765	765	1,530
Feb	2,000	2,000	672	672	1,342
Mar	2,000	2,000	744	744	1,488
Apr	2,000	2,000	720	720	1,440
May	2,000	2,000	744	744	1,488
Jun	2,000	2,000	720	720	1,440
Jul	2,000	2,000	744	744	1,488
Aug	2,000	2,000	744	744	1,488
Sep	2,000	2,000	720	720	1,440
Oct	2,175	2,175	810	810	1,620
Nov	2,000	2,000	720	720	1,440
Dec	2,350	2,350	874	874	1,748
TOTAL	-	-	8,977	8,977	17,954

Annual Capacity Factor = 68.3%

MAINE PUMPING PLANT

This plant is presently under consideration pending the enlargement of the East Branch. If the East Branch is enlarged, then it would be economically feasible to construct the power plant. Without the enlargement, the power plant would not be economically feasible. If constructed, the power plant would become operational with the East Branch enlargement some time in the 1990's. Monthly operating data will be shown in the output of the Aqueduct Simulation Model.

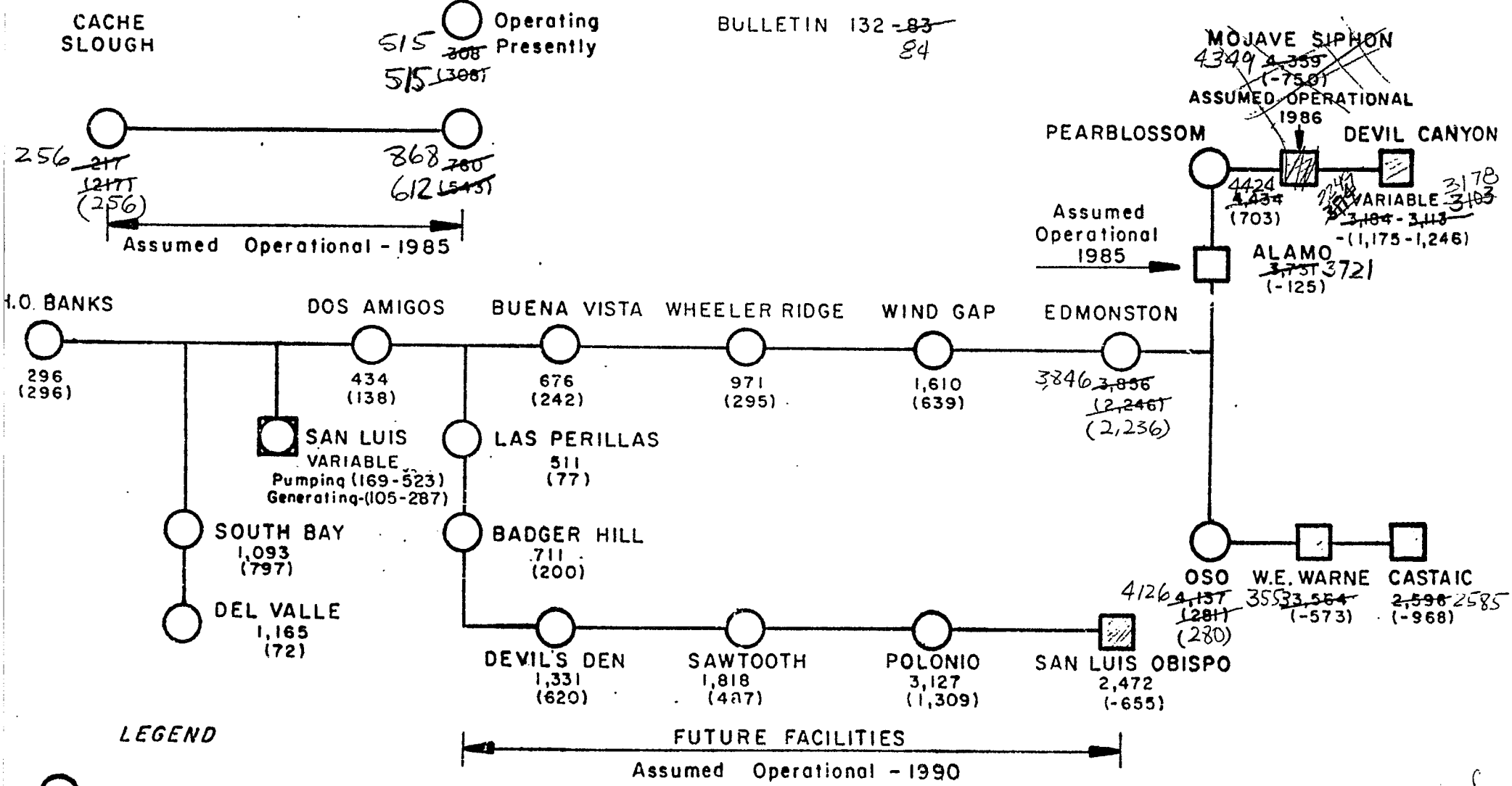
C—111328

C-111328

STATE WATER PROJECT

KILOWATT-HOURS PER ACRE-FOOT REQUIRED
(INCLUDES TRANSMISSION LOSSES)

BULLETIN 132 ~~-83~~ 84



From Wathen Yanitor

1-20-84

SWPAO ~~3-28-83~~

C-111329

C-111329