



Bulletin 132-86
September 1986

State of California
The Resources Agency

Department of
Water Resources

Management of the California State Water Project



Gordon K. Van Vleck
Secretary for Resources
The Resources Agency

George Deukmejian
Governor
State of California

David N. Kennedy
Director
Department of Water Resources

**Department of
Water Resources
Bulletin 132-86**

Management of the California State Water Project

September 1986

Gordon K. Van Vleck
Secretary for Resources

George Deukmejian
Governor

David N. Kennedy
Director

**The Resources
Agency**

**State of
California**

**Department of
Water Resources**

Chapter I

OVERVIEW OF THE STATE WATER PROJECT

The Bulletin 132 series has documented State Water Project (SWP) management for 24 years. The format of Bulletin 132-86 varies only slightly from previous reports; some tables have been revised and a figure, B-3, has been added. These changes should improve the bulletin's readability and usability in providing information about SWP services and water deliveries.

The first four chapters in Bulletin 132-86 deal with SWP history, 1985 operations, Project administration, and design and construction. Complete analyses of present and future water and power supplies appear in Chapters V and VI, respectively. Chapter VII outlines future costs and financing. The contractor profiles are in Chapter VIII. Appendix B, documenting computation of contractor water charges for 1987, forms the second half of this bulletin.

The State Water Project

California is a land of contrasts. Within its boundaries are the highest and lowest elevations in the continental United States. The climate varies from subtropical to alpine, and regional rainfall ranges from less than 2 inches to more than 100 inches annually. Floods and droughts often occur, sometimes in the same year. Many large, heavily populated areas of the State are removed from abundant water supplies; conversely, areas of sparse population are often the locations of plentiful water supplies. The location of some of the State's most productive agricultural lands in arid or semiarid areas further illustrates California's geographical contrasts. Most of California's water problems result from these contrasts.

The need for water, and the ensuing challenges of storing and transporting it, gave rise to the SWP. More than 500 miles of water delivery canals, pipelines, and tunnels have been completed since the early 1960s. The SWP is one of the most ambitious water transfer systems ever constructed; furthermore, the road to SWP development has been as varied as the California terrain.

As early as 1919, the Marshall Plan, a blueprint for a statewide water conveyance system, was proposed for California. Although grandiose in design, the Marshall Plan was unable to muster large scale, statewide support and was rejected by the Legislature in 1926. Five years later, State Engineer Edward Hyatt completed a 10-year water development study, authorized by the Legislature. Hyatt's State Water Plan addressed the State's most critical water problems and provided for the exchange of water between the north and south portions of the Central Valley. In 1933, this plan evolved into the Central Valley Project (CVP). Because of the Depression, however, State funding for the CVP was not readily available, and the federal government took over the project.

Following World War II, the planning that eventually led to the SWP was stimulated by the unprecedented social and industrial development of California and the corresponding increase in the need for water. In 1951, State Engineer A. D. Edmonston presented to the Legislature a report that marked the beginning of the SWP. Edmonston's report outlined the Feather River Project, which included a multipurpose dam and reservoir on the Feather River near Oroville and an afterbay dam, both with power plants.

WATER SUPPLY CONTRACTING AGENCIES

Location No.	Contracting Agency	Total Cumulative Deliveries through 12/31/85 (acre-feet)(a)	Maximum Annual Entitlement (acre-feet)	Total Payments through 12/31/85 (dollars)	Gross Area as of 7/1/85 (acres)	Assessed Valuation 1985-86 (dollars)(b)	Estimated Population (7/1/85)
UPPER FEATHER AREA							
1.	City of Yuba City	0	9,600	61,000	3,650	550,976,000	21,100
2.	County of Butte	4,557	27,500	348,000	1,069,000	4,445,148,000	160,970
3.	Plumas County Flood Control and Water Conservation District	5,406	2,700	436,000	1,644,000(c)	1,197,777,000(c)	18,500(c)
	Subtotal	9,963	39,800	845,000	2,716,650	6,193,901,000	200,570
NORTH BAY AREA							
4.	Napa County Flood Control and Water Conservation District	83,302	25,000	6,010,000	508,000	3,883,218,000	104,000
5.	Solano County Flood Control and Water Conservation District	0	42,000	20,660,000	575,000	7,998,000,000	275,200
	Subtotal	83,302	67,000	26,670,000	1,083,000	11,881,218,000	379,200
SOUTH BAY AREA							
6.	Alameda County Flood Control and Water Conservation District, Zone 7	268,736	46,000	18,386,000	272,000	4,518,383,000	115,000
7.	Alameda County Water District	353,423	42,000	20,660,000	63,000	2,189,000,000	229,550
8.	Santa Clara Valley Water District	1,748,427	100,000	79,698,000	849,000	54,940,000,000	1,397,000
	Subtotal	2,370,586	188,000	118,744,000	1,184,000	61,647,383,000	1,740,550
SAN JOAQUIN VALLEY AREA							
9.	County of Kings	34,200	4,000	812,000	893,300(d)	2,266,773,000(d)	84,900(d)
10.	Devil's Den Water District	274,947	12,700	7,169,000	8,700	(e)	50
11.	Dudley Ridge Water District	983,358	57,700	16,526,000	29,970	(e)	50
12.	Empire West Side Irrigation District	61,796	3,000	1,054,000	7,400	(e)	50
13.	Kern County Water Agency	12,549,535	1,153,400	325,991,000	5,161,000(f)	30,197,536,000(f)	480,600(f)
14.	Oak Flat Water District	103,525	5,700	1,338,000	4,000	(e)	50
15.	Tulare Lake Basin Water Storage District	2,003,183(g)	118,500	29,927,000	189,200	(e)	50
	Subtotal	16,010,544	1,355,000	382,817,000	6,293,570	32,464,309,000	565,750
CENTRAL COASTAL AREA							
16.	San Luis Obispo County Flood Control and Water Conservation District	0	25,000	4,984,000	2,131,300	9,253,619,000	190,100
17.	Santa Barbara County Flood Control and Water Conservation District	0	45,486	8,914,000	1,756,900	13,734,978,000	334,600
	Subtotal	0	70,486	13,898,000	3,888,200	22,988,597,000	524,700
SOUTHERN CALIFORNIA AREA							
18.	Antelope Valley-East Kern Water Agency	479,826	138,400	72,532,000	1,524,000	4,627,210,000	117,000
19.	Castaic Lake Water Agency	49,848	41,500	26,824,000	125,000	3,769,160,000	91,000
20.	Coachella Valley Water District	130,566	23,100	21,261,000	637,600	7,417,437,000	111,800
21.	Crestline-Lake Arrowhead Water Agency	14,308	5,800	4,837,000	55,100	912,268,000	13,200
22.	Desert Water Agency	204,300	38,100	34,398,000	208,800	3,859,309,000	63,700
23.	Little Rock Creek Irrigation District	4,839	2,300	1,189,000	43,300	62,827,000	1,900
24.	Mojeve Water Agency	57,589	50,800	30,691,000	3,160,400	5,764,843,000	130,600
25.	Palmdale Water District	1,558	17,300	8,193,000	73,900	860,464,000	30,900
26.	San Bernardino Valley Municipal Water District	148,720	102,600	90,526,000	210,200	7,701,058,000	395,500
27.	San Gabriel Valley Municipal Water District	59,911	28,800	24,802,000	16,300	4,384,891,000	175,800
28.	San Geronimo Pass Water Agency	0	17,300	12,877,000	140,600	853,231,000	39,300
29.	The Metropolitan Water District of Southern California	6,459,467	2,011,500	1,562,839,000	3,281,000(h)	458,782,060,000(h)	13,015,400(h)
30.	Ventura County Flood Control District	0	20,000	10,094,000	1,179,500(i)	23,264,999,000(i)	600,200(i)
	Subtotal	7,610,932	2,497,500	1,901,063,000	10,655,700	522,265,397,000	14,771,200
	TOTAL STATE WATER PROJECT	26,085,327	4,217,786	2,444,037,000	25,821,120(j)	657,440,805,000(j)	18,181,970(j)
	NET TOTAL, STATE WATER PROJECT SERVICE AREA				24,502,204(k)	641,214,025,000(k)	17,869,371
	TOTAL, STATE OF CALIFORNIA				100,314,000	968,620,000,000	26,365,000
	PERCENT, NET SWP VS. TOTAL CALIFORNIA				24.4	66.2	67.8

- a) All water delivered to long-term SWP contractors, including current and deferred entitlement, surplus, unscheduled, emergency relief, exchange, and non-SWP water delivered through SWP facilities to Napa County FC&WCD.
- b) Statutes of 1978, Chapter 1207, added Section 135 to the Revenue and Taxation Code, requiring assessment at 100 percent of full value for the 1981-82 fiscal year and fiscal years thereafter.
- c) Total for all of Plumas County Flood Control and Water Conservation District, including Last Chance Creek Water District.
- d) Total for all of Kings County, including the following contracting agencies: County of Kings, Dudley Ridge Water District, Empire West Side Irrigation District, nearly all of Tulare Lake Basin Water Storage District, and about 40 percent of Devil's Den Water District.
- e) Assessed valuation not available on an agency area breakdown.
- f) Total for all of Kern County, including the following contracting agencies: Kern County Water Agency, about 60 percent of Devil's Den Water District, and about 50 percent of Antelope Valley-East Kern Water Agency.
- g) Includes 2,706 acre-feet of emergency relief water transferred to Tulare Lake Basin Water Storage District from Kern County Water Agency.
- h) Total for MWSDC including Calleguas Municipal Water District, which is common to MWSDC and Ventura County Flood Control District.
- i) Total for all of Ventura County, including the following contracting agencies: Ventura County Flood Control District and portions of Antelope Valley-East Kern Water Agency, Castaic Lake Water Agency, and MWSDC.
- j) Includes duplicate values. Some areas that are within two or more agencies are included in each agency's total.
- k) Excludes duplicate values where agencies have overlapping boundaries.

His proposal also included a Delta Cross Channel, an electric power transmission system, an aqueduct to transport water from the Sacramento-San Joaquin Delta to both Santa Clara and Alameda counties, and an aqueduct to transport water from the Delta to the San Joaquin Valley and Southern California. Later that year the Legislature authorized the Project, and gave the Division of Water Resources (reorganized as the Department of Water Resources in 1956) the authority to conduct future studies.

In 1959, the Legislature passed the Burns-Porter Act. This act provided the major financing for initial SWP facilities. The next year was a pivotal one for the SWP. In 1960, California's voters passed a \$1.75 billion bond issue under the Burns-Porter Act; a water contracting program was initiated; and more than a decade of intense construction activity was launched.

The Burns-Porter Act also authorized unspecified additional future storage facilities, facilities to transfer water across the Sacramento-San Joaquin Delta, and facilities to remove drainage water from the San Joaquin Valley. Studies are continuing for most of these features, as described in Chapters III and V.

In 1962, SWP water deliveries began to the South San Francisco Bay and Plumas County areas. Kern County first received SWP deliveries in 1968 and finally, in 1972, water reached Southern California. The 1973 dedication of Lake Perris, southern terminus of the California Aqueduct, marked the end of initial SWP construction. Present and future SWP facilities are shown in Figure 1. Phase II construction of the North Bay Aqueduct, begun in 1984, is scheduled for completion in late 1987. Enlargement of the East Branch of the California Aqueduct was approved in

1986, and the first stage of construction is scheduled for completion in the early 1990s. The only remaining major conveyance facility awaiting construction is Phase II of the California Aqueduct's Coastal Branch.

SWP Service Areas

After the 1960 bond issue passed, the State began signing water supply contracts with public agencies. Thirty original long-term contracts are still in effect; a thirty-first contractor, Hacienda Water District, merged with the Tulare Lake Basin Water Storage District in 1981. The long-term contracts require the recipients of Project services to repay all reimbursable Project costs. SWP entitlements, as outlined in the contracts, will eventually total 4.2 million acre-feet per year.

Figure 2 shows the boundaries of the 30 public agencies that have contracts with the SWP. Together they constitute 24 percent of the State's area and contain nearly 68 percent of the State's population.

Six contractors have yet to receive water from SWP facilities; their contracts specify initial deliveries to be made in 1980 or thereafter. A seventh contractor, Palmdale Water District, began taking delivery of SWP supplies in 1985. Napa County Flood Control and Water Conservation District has received only non-Project water pumped and delivered through SWP facilities.

As Figure 2 indicates, the 30 agencies represent a wide variety of size, location, climate, and prosperity. To aid in understanding the diverse nature of the SWP service areas, previous bulletins have included profiles of long-term contracting agencies. Bulletin 132-86 continues the series of contractor profiles in Chapter VIII.

SWP Accomplishments

The SWP's primary purpose is to conserve water originating in areas of surplus and transport water to areas of need for agricultural and municipal and industrial use. Additional Project purposes include flood control, hydroelectric power generation, salinity control, recreation, and fish and wildlife enhancement.

Table 1 summarizes SWP water deliveries, recreation, and energy generation accomplishments through 1985. (Table 1 water delivery totals exceed those in Figure 2 because Table 1 includes service to all customers, while Figure 2 shows deliveries to long-term contractors only.)

Figures for flood control accomplishments are not reflected in Table 1; however, Oroville Dam alone prevented millions of dollars of property damage from floods in 1964, 1967-68, 1970, 1974, 1980, 1982-83, and 1986. The SWP also helped to reduce flooding in the Tulare Lake Basin during 1978, 1980, 1982-84, and 1986. The latter was achieved by diverting floodwater into the California Aqueduct through the Kern River Intertie, built by the Corps of Engineers in 1976.

SWP 1985 Highlights

- o Alamo Powerplant began commercial operation on July 1, 1986. This 17-MW recovery facility, located on the East Branch of the California

TABLE 1: SWP ACCOMPLISHMENTS THROUGH 1985

Year	Water Delivered (Acre-Feet)						Total Delivery	Recreation Supported (Recreation Days)(b)	Hydro-electric Energy Generated (kilowatt-hours)(c)
	Entitlement Water			Other Deliveries					
	Municipal and Industrial Use	Agricultural Use	Total	Surplus		Other Water(a)			
				Municipal and Industrial	Agricultural				
1962						18,289	18,289	30,000	
1963						22,456	22,456	105,000	
1964						32,507	32,507	331,600	
1965						44,105	44,105	449,800	
1966						67,928	67,928	482,700	
1967	5,747	5,791	11,538	0	0	53,605	65,143	455,200	
1968	46,472	125,237	171,709	10,000	111,534	14,777	308,020	931,300	
1969	34,434	158,586	193,020	0	72,397	18,829	284,246	1,554,800	
1970	47,996	185,997	233,993	0	133,024	38,080	405,097	1,804,800	
1971	85,286	272,054	357,340	2,400	293,619	44,127	697,486	2,085,900	
1972	181,066	430,735	611,801	22,205	401,759	73,127	1,108,892	1,971,200	
1973	293,824	400,564	694,388	3,161	293,255	43,666	1,034,470	2,502,000	
1974	418,521	455,556	874,077	4,753	412,923	48,342	1,340,095	4,073,600	
1975	641,621	582,369	1,223,990	21,043	601,859	67,170	1,914,062	4,189,300	
1976	818,588	554,414	1,373,002	32,488	547,622	116,962	2,070,074	4,239,600	
1977	280,919	293,236	574,155	0	0	390,176	964,331	3,951,900	
1978	742,385	710,314	1,452,699	3,566	13,348	122,916	1,592,529	5,773,700	
1979	690,659	969,237	1,659,896	66,081	582,308	189,396	2,497,681	5,298,700	
1980	730,545	799,204	1,529,749	19,722	384,835	48,590	1,982,896	5,701,900	
1981	1,057,273	852,289	1,909,562	12,000	896,428	283,849	3,101,839	6,017,800	
1982	928,721(e)	821,303	1,750,024	0	215,873	155,820(e)	2,121,717	6,187,700	
1983	483,499	701,370	1,184,869	0	13,019	188,596	1,386,484	5,838,200	
1984	723,468(f)	865,043	1,588,511	3,663	259,254	387,505(f)	2,238,933	6,273,100	
1985	998,138	1,002,915	2,001,053	9,638	292,372	414,566	2,717,629	6,639,800	
Total(d)	9,209,162	10,186,214	19,395,376	210,720	5,525,429	2,885,384	28,016,909	76,939,600	
								54,187,000,000	

a) Includes preconsolidation repayment water, emergency relief water, exchange water, regulated delivery of local supply, non-SWP water delivered to Napa County FC&WCD through SWP facilities, conveyance of CVP water (including Decision 1485 water), recreation water, and demonstration ground water fill withdrawal.

b) A recreation day is the visit of one person to a recreation area for any part of one day.

c) Includes SWP share of generation from Hyatt-Thermalito, San Luis, Devil Canyon, Warner, and Castaic Powerplants.

d) In addition, SWP dams have prevented millions of dollars worth of flood damage.

e) Revised and corrected from Bulletin 132-85 to reflect 557 acre-feet of 1978 exchange water (MWDC Basin) changed from other water to municipal and industrial use entitlement water.

f) Revised and corrected from Bulletin 132-85 to reflect 126 acre-feet of 1982 exchange water (MWDC Basin) changed from other water to municipal and industrial use entitlement water.

Aqueduct, will recover energy formerly dissipated in the Cottonwood Chutes.

- o The 1984-85 water year was a "dry" year as classified by the SWRCB's Decision 1485 criteria. Like the year before, 1984-85 began with above normal precipitation, but below normal amounts of rain and snowfall after January resulted in a total water year precipitation of only 83 percent of normal.
- o Deliveries of SWP entitlement water topped the 2 million acre-foot mark in 1985. Entitlement water deliveries to long-term contractors totaled 2,001,053 acre-feet, the largest amount yet delivered by the SWP. This amount exceeds by about 100,000 acre-feet the initial fall 1984 requested deliveries and is about 26 percent higher than the previous year's entitlement deliveries.
- o Surplus water deliveries totaled 302,010 acre-feet. This represents an increase of approximately 15 percent over 1984.
- o For the second consecutive year, Decision 1485 requirements produced balanced water conditions in the Delta, as defined in the Coordinated Operation Agreement. The three periods of balanced water conditions during 1985 were: January 30 to February 7; February 17 to March 9; and April 12 to November 30. This was the sixth year, out of the last seven, in which balanced water conditions in the Delta were achieved.
- o The Coordinated Operation Agreement for the CVP and SWP is currently undergoing congressional approval. The draft agreement negotiated by DWR and the USBR includes provisions for conveyance of CVP water through SWP facilities and for SWP purchases of CVP water on an interim basis. Public review of the draft EIS-EIR took place between September and November 1985; a final EIS-EIR was written and published in early 1986, incorporating testimony from the review period.
- o Overall December 31, 1985 SWP reservoir storage was down by about 14 percent from 1984. Total reservoir storage was 3,644,000 acre-feet, down 589,000 acre-feet from the previous year. This was the lowest SWP storage since 1981. Lake Oroville, in November, dropped to the lowest storage level since the 1976-77 drought, but ended the year with storage of 2,098,000 acre-feet.
- o San Luis Dam again experienced a crack in the roadway in the same place as the 1981 slide. The discontinuous crack, although longer than the 1984 crack, was narrower, which could indicate stabilization of the slide area. Surveillance of the San Luis Dam will continue.
- o Units 10, 12, and 14 at the A. D. Edmonston Pumping Plant began operation, bringing the plant up to the full complement of 14 operational pumps. However, mechanical problems put Units 13 and 9 out of service, thereby delaying the scheduled outage of the west discharge line. At least six operational pumps were required to maintain pumping schedules.
- o Almost 44,500 acre-feet were delivered via the connection built in 1984 from the First Los Angeles Aqueduct to the East Branch of the California Aqueduct. The connection supplied 984 acre-feet of water to SWP contractor Antelope Valley-East Kern Water Agency in January and February

1985, while the East Branch was out of service to facilitate work on the Alamo Powerplant. Later in the year, the Los Angeles Department of Water and Power delivered 43,500 acre-feet of its water via the connection while its San Francisquito Powerplant No. 1 was out of service.

- o Bottle Rock Powerplant was shut down several weeks for maintenance and modifications to overcome problems with steam contamination, but returned to service August 1, 1985. However, the steam supplier experienced wellfield problems which created a steam supply reduction, resulting in the plant's inability to maintain full output.
- o On March 11, 1986, MWDSC's Board of Directors voted to authorize the General Manager to execute a contract amendment covering the enlargement of the East Branch, and to request DWR to proceed with final design and construction. The amendment was signed on April 8, 1986. As of June 30, 1986, five of the other six contractors participating in the enlargement had executed contract amendments.

- o Construction began on raising the lining of the Aqueduct's East Branch by four feet, between Alamo Powerplant and Pearblossom Pumping Plant. Final design work for enlarging Pearblossom Pumping Plant and other East Branch facilities has also started.
- o DWR awarded the license to build a new fiber optics communications system for the SWP to MCI Telecommunications, Inc. in October 1985. The new system will provide increased capacity and reliability to the SWP. The estimated cost of \$9 million will be offset by a \$7.4 million right-of-way agreement, along the California Aqueduct, between DWR and MCI. Work began on the new system in 1986.
- o Design is nearing completion for both the Cordelia and Barker Slough pumping plants. Of the five North Bay Aqueduct pipeline contracts: one is complete, two are under construction, and the two remaining contracts were awarded. Phase II of the North Bay Aqueduct is scheduled for completion in late 1987.

Water Service

The following sections summarize 1985 water conveyance and deliveries via SWP facilities.

Total Water Conveyed

A total of 2,629,493 acre-feet of water was conveyed through SWP facilities in 1985. Table 3 summarizes total water conveyance for the 24 years of SWP operation, and shows the disposition of that water under the headings discussed in the following paragraphs.

Entitlement Water. The SWP water supply contracts, executed in the early

1960s, establish specific annual entitlement water amounts each long-term water contractor may request. The initial "Table A" schedules reflected each contractor's estimate of future water needs at the time the contracts were signed; some have subsequently been revised. Table B-4 in Appendix B presents complete information on annual entitlements for each contractor, as set forth in Table A of each SWP water supply contract.

Columns (1) through (7) of Table 3 summarize annual contractual entitlements for the various SWP service areas for the 1962-85 period; actual entitlement deliveries by year are shown in Column (8).

DWR Is Helping To Alleviate Tom Paine Slough Problems

Water problems in Tom Paine Slough, in the South Delta, were exacerbated by the dry conditions during 1985. These dry conditions allowed for early planting and thereby promoted early diversions from the slough by South Delta agricultural users. At the same time, CVP and SWP diversions from the Delta were near maximum capacity, resulting in reduced water levels in the natural southern Delta channels. To reduce impacts on the southern Delta, SWP diversions to Clifton Court Forebay were limited to that portion of the tidal cycle with a minimal effect on the critical water levels.

SWP operations were not the only contributors to the Tom Paine water supply problems. Depth surveys of Tom Paine Slough and the natural channels leading to the control structure were conducted, and a diver inspected the inlet structure tide gates; investigations indicated that one of the two tide gates was operating incorrectly and that sedimentation restricted most of the channel. The local water district corrected the tide

gate operation and DWR dredged a blockage in Tom Paine Slough. These corrective actions were effective until mid-July, when the agricultural water demands again exceeded the slough's diversion capability.

In late July, DWR installed both an 11-cfs pump and a 100-kW engine generator at the control structure to augment the water flow. This single pump was insufficient; two additional 11-cfs pumps and a 400-kW engine generator were installed and began operation on August 1. The three pumps were operated until September 5, 1985, when enough water entered Tom Paine Slough through normal tide gate action. The pumps and engine generator set were removed by mid-September.

Plans were developed for facilities or actions that would eliminate the need to install the pumps in 1986. Options include dredging a portion of Tom Paine Slough and installing a siphon at the control structure to eliminate future agricultural water supply problems.

TABLE 3: HISTORICAL SUMMARY OF ENTITLEMENTS,

Calendar Year	Annual Entitlements Under Long-Term Water Supply Contracts (Acre-Feet)(a)							Entitlement Water
	Feather River Area	North Bay Area	South Bay Area	San Joaquin Valley Area	Central Coastal Area	Southern California Area	Total	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	11,538	0	0	0	11,538	11,538
1968	550	0	109,900	81,050	0	0	191,500	171,709
1969	620	0	98,700	168,075	0	0	267,395	193,020
1970	700	0	114,200	207,700	0	0	322,600	233,993
1971	890	0	116,200	258,500	0	0	375,590	357,340
1972	970	0	118,300	420,766	0	201,723	741,759	611,801
1973	1,100	0	120,400	392,352	0	472,400	986,252	694,388
1974	1,230	0	122,400	470,350	0	588,220	1,182,200	874,077
1975	1,610	0	124,500	556,509	0	704,250	1,386,869	1,223,990
1976	1,990	0	126,500	555,117	0	824,780	1,508,387	1,373,002
1977	2,420	0	128,600	594,100	0	942,201	1,667,321	574,155
1978	1,850	0	130,700	647,262	0	1,038,222	1,818,034	1,452,699
1979	2,130	0	132,700	715,385	0	1,177,873	2,028,088	1,659,896
1980	1,810	500	134,800	770,800	1,946	1,304,914	2,214,770	1,529,749
1981	1,940	650	137,000	830,700	2,813	1,419,365	2,392,468	1,909,562
1982	1,970	800	139,200	889,200	5,626	1,537,749	2,574,545	1,750,024(e)
1983	2,000	950	141,400	880,648	8,439	1,668,557	2,701,994	1,184,869
1984	3,630	1,100	143,600	991,911	12,698	1,731,398	2,884,337	1,588,511(f)
1985	3,760	1,250	145,800	1,031,749	21,138	1,852,149	3,055,846	2,001,053
Totals 1962-1985	31,170	5,250	2,296,438	10,462,174	52,660	15,463,801	28,311,493	19,395,376

a) From Table B-4.

b) Values include deliveries of SWP water to short-term contractors (Mustang Water District, 1970-1971; Tracy Golf and Country Club, 1974, 1979, and 1980; Green Valley Water District, 1974, 1975, 1978, 1979, 1980, and 1985; and Granite Construction Company, 1980).

c) Includes preconsolidation repayment water, 1977 emergency relief water, 1978 and 1982 exchange water, regulated delivery of local supply, non-SWP water delivered to Napa County FC&WCD through SWP facilities and conveyance of CVP water (including recreation water, fish and wildlife water, and Decision 1485 water).

In September of every year, each contractor furnishes an updated estimate of future requirements for SWP water. In the fall of 1984, 23 contractors requested delivery of 1,891,849 acre-feet of entitlement water in 1985 (including 29,140 acre-

feet deferred from prior years). On January 4, 1985, DWR approved the initial schedule for 1985 water deliveries, based upon the 1985 rule curve criteria and the December 1, 1984, water supply forecast. The initial approval was for delivery of

DELIVERIES, AND WATER CONVEYED

Water Conveyed (Acre-Feet)							Calendar Year
Deliveries			Initial Fill Water	Operational Losses and Storage Changes(d)	Recreation Water	Total	
Surplus and Unscheduled Water (b)	Other Water(c)	Subtotal					
(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
0	18,289	18,289	9	272	0	18,570	1962
0	22,456	22,456	71	185	0	22,712	1963
0	32,507	32,507	171	152	0	32,830	1964
0	44,105	44,105	93	729	0	44,927	1965
0	67,928	67,928	0	1,746	0	69,674	1966
0	53,605	65,143	8,328	4,212	0	77,683	1967
121,534	14,777	308,020	498,926	117,906	0	924,852	1968
72,397	18,829	284,246	510,614	72,196	0	867,056	1969
133,024	38,080	405,097	23,947	2,435	0	431,479	1970
269,019	44,119	697,478	7,853	5,812	8	711,151	1971
423,964	66,638	1,102,403	100,274	53,062	6,489	1,262,228	1972
296,416	42,511	1,033,315	204,638	53,798	1,155	1,292,906	1973
417,676	46,224	1,337,977	237,554	10,657	2,118	1,588,306	1974
622,902	63,793	1,910,685	103,352	- 94,606	3,377	1,922,808	1975
580,110	115,217	2,068,329	61,122	-681,025	1,745	1,450,171	1976
0	389,065	963,220	0	-131,151	1,111	833,180	1977
16,914	121,225	1,590,838	64,443	717,370	1,691	2,374,342	1978
648,389	187,630	2,495,915	12,302	- 83,401	1,766	2,426,582	1979
404,557	46,459	1,980,765	0	- 30,453	2,131	1,952,443	1980
908,428	279,161	3,097,151	0	126,180	4,688	3,228,019	1981
215,873	154,886(e)	2,120,783	0	136,555	4,646	2,261,984	1982
13,019	181,453	1,379,341	0	- 90,320	7,849	1,296,870	1983
262,917	380,591(f)	2,232,019	0	- 1,690	7,040	2,237,369	1984
302,010	410,504	2,713,567	0	- 88,136	4,062	2,629,493	1985
5,736,149	2,840,052	27,971,577	1,833,697	102,485	49,876	29,957,635	Totals 1962-1985

- d) Includes net effect of (1) operational losses from SWP transportation facilities, (2) changes in reservoir storage south of the Delta, (3) storable local inflows to SWP reservoirs, (4) side inflow to the San Luis Canal, and (5) diversions via the Kern River Intertie.
- e) Revised and corrected from Bulletin 132-85 to reflect 557 acre-feet of 1978 exchange water (MWDSC Basin) changed from other water to municipal and industrial entitlement water.
- f) Revised and corrected from Bulletin 132-85 to reflect 126 acre-feet of 1982 exchange water (MWDSC Basin) changed from other water to municipal and industrial entitlement water.

all requested 1985 entitlement water.

Actual entitlement water delivered in 1985 totaled 2,001,053 acre-feet to the 21 contractors accepting deliveries. (Two contractors took none of their scheduled water). Thirteen contractors

took less entitlement water than initially requested, and four contractors took the amounts initially requested (their full Table A entitlements). The other four contractors, Antelope Valley-East Kern Water Agency (AVEKWA), Crestline-Lake

Arrowhead Water Agency (CLAWA), MWDS, and San Gabriel Valley Municipal Water District (SGVMWD), increased their requested deliveries of entitlement water during the year. AVEKWA received 16 percent more than initially requested (5,235 acre-feet), CLAWA received 2 percent more (34 acre-feet), SGVMWD received 3 percent more (128 acre-feet), and MWDS took delivery of almost 30 percent more (162,473 acre-feet).

Surplus Water. In September 1984, seven contractors submitted estimates indicating they could use a total of 383,995 acre-feet of surplus water during 1985. In December 1984, DWR committed to deliver the full amount of surplus water requested, based upon the initial 1985 rule curve analysis. Later, the approved surplus deliveries for October, November, and December were withdrawn due to dry weather conditions during the spring and summer months of 1985. Some contractors rescheduled the undelivered portions of their surplus water approved for delivery during January through September 1985 into October through February 1986.

Surplus water deliveries in 1985 totaled 302,010 acre-feet; six SWP contractors received 301,844 acre-feet and 166 acre-feet went to Green Valley Water District, a non-SWP contractor. Alameda County Water District requested, but did not take, surplus water in 1985. Dudley Ridge Water District, Kern County Water Agency, and Tulare Lake Basin Water Storage District received carry-over credits for 12,270 acre-feet of surplus water to be delivered in 1986.

Unscheduled Water. For 1985, no unscheduled water deliveries were made because enough surplus water was available as of January 1985 to satisfy all requests.

Other Water. Column (10) of Table

3 summarizes deliveries of several other types of water, as defined in the accompanying footnote. These are shown in more detail (for 1985) in Table 5, and described in the accompanying text later in this chapter under the heading "Total 1985 Water Deliveries."

Initial Fill Water. The quantities shown in Column (12) of Table 3 are the amounts used for initially filling aqueducts and reservoir storage space south of the Delta to maximum operational capacities. Initial filling began in 1962 with the first filling of the South Bay Aqueduct and was completed in 1979, when Lake Perris reached its maximum operational capacity.

Operational Losses and Storage Changes. Column (13) of Table 3 shows the annual quantities of water conveyed to replenish losses through evaporation and seepage from SWP aqueducts and reservoirs south of the Delta, combined with corrections for changes in reservoir storage and for inflow from local drainage areas (including inflows from the Kern River Intertie and the First Los Angeles Aqueduct). Years with negative values are those in which storage withdrawals and storable local inflow exceed storage additions plus replenishment of evaporation and seepage losses.

Recreation Water. Column (14) of Table 3 summarizes historic deliveries of "recreation water," which actually includes both water for use at SWP recreation facilities and water used for fish and wildlife mitigation and enhancement. In 1985, a total of 4,194 acre-feet was conveyed under this category, as follows:

- o 1,910 acre-feet for public recreation facilities at Lake Del Valle, San Luis Reservoir, O'Neill Forebay, Silverwood, Pyramid, and Castaic lakes, and Lake Perris;

- o 1,465 acre-feet released to maintain a trout fishery in Piru Creek, in accordance with a condition of the Federal Energy Regulatory Commission license for power development at Pyramid Lake;
- o 334 acre-feet to replace water losses at Castaic Lagoon, an impoundment devoted entirely to recreation;
- o 485 acre-feet conveyed to about 830 acres of wildlife mitigation lands located below O'Neill Forebay and at the Pilibos Wildlife Area (30 miles south of Los Banos).

Water Deliveries and Credits to Long-Term Contractors

Table 4 summarizes 1985 water deliveries to each SWP long-term contractor that received water during the year. The table also shows future entitlement delivery and reduction credits, as explained in the following sections.

Future Entitlement Delivery Credits (Makeup Water). When the SWP is unable to deliver the requested entitlement water in any year, long-term contractors are afforded relief under Articles 12(d) and 14(b) of the water supply contract. Contractors may elect to receive the undelivered entitlement water at other times during the year, or in succeeding years, to the extent that the water and delivery capability are available. In 1977, as a result of the drought, quantities of initially-scheduled water were reduced. Through these reductions, 21 long-term contractors gained credits for future delivery totaling 457,066 acre-feet. These credits for undelivered entitlement water under Articles 12(d) and 14(b) have been reduced by delivery of "makeup" water over the years; now only 10 contractors have remaining rights. No

makeup water was delivered in 1985. As shown in Column (7) of Table 4, 128,116 acre-feet of credits for future deliveries remained available as of January 1, 1986 - 123,329 acre-feet under Article 12(d) and 4,787 acre-feet under Article 14(b).

Future Entitlement Delivery Credits (Wet-Weather Water). Under water supply contract Article 7 (South Bay contractors) or Article 45 (San Joaquin Valley contractors), SWP contractors can acquire credits for future deliveries when above-normal local water supplies reduce the need for SWP water. At the time of delivery, the sum of current annual entitlement, plus "wet-weather" water cannot, however, exceed a contractor's maximum annual entitlement.

Oak Flat Water District took delivery of its remaining 540 acre-feet of wet weather water in 1985. The District acquired the credit under Article 45 in 1982 and 1983. Tulare Lake Basin Water Storage District took 72,951 acre-feet of wet-weather water during 1985.

Also during 1985, two South Bay Aqueduct contractors acquired an additional 23,823 acre-feet of wet-weather credits under Article 7 of their water supply contracts. As of January 1, 1986, three contractors had credits totaling 273,759 acre-feet acquired under the wet-weather provisions of their contracts.

Future Entitlement Reduction Credits (Wet-Weather Water). The "wet-weather" contract provisions also allow a contractor to increase entitlement water deliveries in years of below-average local water supply and to decrease entitlement deliveries by an equal amount in later years. Oak Flat Water District made such an increase in 1972, and has retained its reduction credit of 2,466 acre-feet through 1985, as shown in Column (12) of Table 4.

TABLE 4: SUMMARY OF 1985 DELIVERIES AND CREDITS

Long-Term Water Supply Contractor	Water Deliveries in 1985 (acre-feet)						Future Entitlement Credits (acre-feet)					Future Entitlement Reduction Credit Articles 7 or 45 (12)
	Entitlement Water Deliveries			Surplus Water Deliveries (4)	Other Water Deliveries (5)	Total Deliveries (3+4+5=6) (6)	Future Entitlement Delivery Credit as of January 1, 1986					
	1985 Entitlement (1)	Entitlement Deferred from Prior Year (2)	Total Entitlement (1+2=3) (3)				Make-Up Water Per Articles 12(d) or 14(b) (7)	Wet Weather Water Per Articles 7 or 45 (8)	Carry-Over Water Per Ltr. Agrmts. Dated 10/1/79 (9)	1985 Carry-Over Entitlement (10)	Total Delivery Credit (7+8+9) (11)	
UPPER FEATHER RIVER AREA												
County of Butte	308	-	308	-	-	308	-	-	-	-	-	-
Plumas County FC&WCD	254	-	254	-	-	254	-	-	-	-	-	-
SOUTH BAY AREA												
Alameda County FC&WCD, Zn 7	15,072	-	15,072	-	-	15,072	2,438	84,996	-	-	-	87,434
Alameda County WD	19,016	-	19,016	-	-	19,016	2,220	134,655	-	-	-	136,875
Santa Clara Valley WD	88,000	-	88,000	9,638	4,300(a)	101,938	-	-	-	-	-	-
SAN JOAQUIN VALLEY AREA												
County of Kings	3,400	-	3,400	-	-	3,400	-	0	-	-	-	0
Devil's Den WD	12,099	-	12,099	6,095	-	18,194	-	0	0	-	601	0
Dudley Ridge WD	46,251	-	46,251	7,636	8,122(c)	62,009	-	-	-	-	949	-
Empire West Side ID	2,200	2,997(b)	5,197	-	-	5,197	-	-	0	-	800	0
Green Valley WD(d)	-	-	-	166	-	166	-	-	-	-	-	-
Kern County WA	888,896	-	888,896	180,824	14,029(e)	1,083,749	-	-	-	-	26,104	-
Oak Flat WD	4,893	540(f)	5,433	764	-	6,197	-	0	-	-	7	0
Tulare Lake Basin WSD	36,840	72,951	109,791	96,887	5,602(g)	206,678	-	54,108	-	-	8,709	54,108
SOUTHERN CALIFORNIA AREA												
Antelope Valley- East Kern WA	37,064	-	37,064	-	-	37,064	14,841(h)	-	-	-	-	14,841
Castaic Lake WA	12,401	-	12,401	-	-	12,401	500	-	-	-	-	500
Coachella Valley WD	16,989	-	16,989	-	-	16,989	-	-	-	-	-	-
Crestline- Lake Arrowhead WA	1,422	-	1,422	-	-	1,558	151	-	-	-	-	151
Desert WA	27,000	-	27,000	-	-	27,000	-	-	-	-	-	-
Little Rock Creek ID	0	-	0	-	-	0	438	-	-	-	-	438
Mojave WA	-	-	-	-	-	-	20	-	-	-	-	20
Palmdale WD	1,558	-	1,558	-	-	1,558	-	-	-	-	-	-
San Bernardino Valley MWD	7,390	-	7,390	-	-	7,390	4,269	-	-	-	-	4,269
San Gabriel Valley WD	5,028	-	5,028	-	-	5,028	1,000	-	-	-	-	1,000
The Metropolitan Water District of Southern California	698,484(i)	-	698,484	-	0	698,484	102,239	-	-	-	-	102,239
Subtotal	1,924,565	76,488	2,001,053	302,010	26,451	2,329,514	128,116	273,759	0	37,170	401,875	2,466
NORTH BAY AREA												
Napa County FC&WCD(j)	4,039	-	4,039	-	-	4,039	-	-	-	-	-	-
TOTAL ALL AREAS	1,928,604	76,488	2,005,092(k)	302,010	26,451	2,333,553	128,116	273,759	0	37,170	401,875	2,466

a) CVP exchange water.
 b) Carry-over storage of entitlement water under letter agreements dated October 1, 1979, with Devil's Den Water District and Empire West Side Irrigation District (EWSID). EWSID took 2,997 acre-feet during 1985, and was assessed an additional 3 acre-feet for its proportionate share of evaporation losses in Lake Oroville. As of January 1, 1986, neither contractor had storage credits available to them.
 c) Includes 1982 exchange water; 1,821 acre-feet from Lake Oroville storage and 1,301 acre-feet of MWDC exchange water. This also includes 5,000 acre-feet of 1978 MWDC exchange water.
 d) January and February 1985 delivery of surplus water to a non-long term contractor from unregulated flows in the Delta.
 e) Includes 5,471 acre-feet of 1977 emergency relief water, and 8,588 acre-feet of 1978 exchange water, including 2,706 acre-feet of 1977 emergency relief water and 2,896 acre-feet of 1978 exchange water transferred to Tulare Lake Basin Water Storage District.
 f) Article 45 wet-weather water.
 g) 1977 emergency relief and 1978 exchange water transferred from KCHA (not included in totals).
 h) Antelope Valley-East Kern Water Agency future entitlement delivery credits total 4,787 acre-feet under water supply contract Article 14(b) and 10,054 acre-feet under Article 12(d). Credits shown in this column for all other contractors are under Article 12(d) of their water supply contracts.
 i) Includes 14,859 acre-feet of 1978 and 1982 exchange water stored in MWDC's ground water basin for Dudley Ridge Water District and Kern County Water Agency and recaptured by MWDC in 1985.
 j) Non-SWP water delivered to Napa County FC&WCD through SWP facilities; included here to match treatment in Appendix B.
 k) Equals Table B5-B total for 1985 (plus 13,558 acre-feet of 1978 ground water exchange and 1,301 acre-feet of 1982 ground water exchange to MWDC).

Future Entitlement Delivery Credits (Carry-Over Water). Both Empire West Side Irrigation District (EWSID) and Devil's Den Water District (DDWD) have reached their maximum annual entitlements. Therefore, EWSID is no longer able to exercise the delivery provisions of Article 45, while DDWD had not amended the wet-weather provisions into its contract prior to reaching maximum annual entitlement. EWSID and DDWD do, however, have temporary "carry-over" storage rights in either Lake Oroville or San Luis Reservoir under letter agreements executed on October 1, 1979.

At EWSID's request, a total of 3,000 acre-feet of undelivered 1984 entitlement water was stored in Lake Oroville as shown in Column (9) of Table 4 in Bulletin 132-85. During 1985, 2,997 acre-feet of this water was delivered to EWSID. EWSID was assessed 3 acre-feet for its proportionate share of evaporation losses at Lake Oroville. No carriage water losses were assessed on deliveries of this water, as no additional releases were needed above those required for export deliveries, fish mitigation, and power generation at the time this water was transported across the Delta to Clifton Court Forebay.

Future Entitlement Delivery Credits (1985 Carry-Over Water). During spring 1985, the lack of sufficient rainfall prompted fears of a possible drought similar to that experienced during 1976-77. In accordance with rule curve procedures requiring a minimum carry-over storage, DWR canceled scheduled surplus water deliveries, approved as of May 31, 1985, for October through December 1985. Precipitation continued to be below-normal during the fall of 1985, and DWR imposed deficiencies on the 1986 agriculture entitlement requests.

The precipitation that fell during late 1985 delayed the harvesting of crops

and the application of pre-irrigation water from the contractors' remaining 1985 deliveries. Agreements executed in December allowed the carry over of 37,170 acre-feet of 1985 agricultural entitlement water and 12,270 acre-feet of 1985 agricultural surplus water for use during January and February 1986. Column (10) of Table 4 shows the delivery credits for entitlement water under these agreements. Surplus water carry-over credits were as follows:

	<u>Acre-Feet</u>
Dudley Ridge Water District	172
Kern County Water Agency	2,935
Tulare Lake Basin Water	
Storage District	<u>9,163</u>
Total	12,270

The agreements provided that the contractors receive delivery of this water on or before February 28, 1986. Carry-over surplus water was not to be delivered unless the contractor took the full approved amount of the 1985 carry-over entitlement and a minimum of 2 percent of the approved 1986 entitlement in January and 3 percent in February.

Also, both agreements provided for contractor payment of any identified cost increase that would otherwise be experienced by other SWP contractors or DWR as a result of activities under these agreements. All entitlement and surplus water carried over from 1985 was delivered during January and February of 1986.

Total 1985 Water Deliveries

During 1985, the SWP provided water service to 38 agencies. These included 22 long-term water contractors and 16 other agencies. Monthly deliveries to each of the 38 agencies, shown in Table 5, are summarized as follows:

- o 2,001,053 acre-feet of 1985 entitlement water to 21 long-term contractors, including 14,859 acre-feet recaptured by MWDSC from its

ground water system in exchange for water stored in 1978 and 1982 for Dudley Ridge Water District and Kern County Water Agency. Only ten contractors took their full contract entitlement. The twenty-second contractor, Napa County Flood Control and Water Conservation District, only received non-Project water delivered through SWP facilities;

- o 73,491 acre-feet of entitlement water to two long-term contractors deferred from 1983 under the wet-weather provisions (Article 45 of their contracts);
- o 2,997 acre-feet of entitlement water from carry-over storage to one long-term contractor;
- o 301,844 acre-feet of surplus water to six long-term contractors;
- o 166 acre-feet of surplus water to one noncontractor;
- o 5,471 acre-feet of 1977 emergency relief water to one long-term contractor;
- o 13,558 acre-feet of 1978 exchange water to three long-term contractors;
- o 3,122 acre-feet of 1982 exchange water to one long-term contractor;
- o 25,320 acre-feet of regulated local supply to two long-term contractors and two noncontractors;
- o 4,300 acre-feet of federal water transported to two long-term contractors;
- o 4,039 acre-feet of non-Project water to one long-term contractor;
- o 159,658 acre-feet of CVP water transported to nine Cross Valley Canal contractors and to four

annual contractors in the San Joaquin Valley; and

- o 195,036 acre-feet of CVP water conveyed to O'Neill Forebay to replace curtailed CVP pumping during May and June in accordance with SWRCB Decision 1485.

Table 5 shows monthly deliveries of each type of water conveyed in 1985, along with summaries of Table A entitlements and cumulative entitlements not delivered. The types of water service not described in preceding sections are covered in the following paragraphs.

1977 Emergency Relief Water. At the end of 1977, the SWP had 95,176 acre-feet of water in storage for emergency relief of drought conditions. In 1978, when it became apparent that the 1976-77 drought was over, the stored water was sold. Two non-SWP contractors, (Green Valley Water District and Tracy Golf and Country Club) purchased a total of 650 acre-feet and took delivery of the water in 1978 and 1979.

Kern County Water Agency (KCWA) purchased the remaining 94,526 acre-feet of stored water for delivery before December 31, 1983. At KCWA's request, the agreement was amended to extend the delivery deadline to December 31, 1986. On January 1, 1985, the balance was 13,421 acre-feet and during 1985 KCWA took delivery of 2,765 acre-feet of this water and transferred 2,706 acre-feet to Tulare Lake Basin Water Storage District (TLBWS). Thus, the total delivery of KCWA's 1977 emergency relief water during 1985 was 5,471 acre-feet, leaving a balance of 7,950 acre-feet as of January 1, 1986.

1978 Exchange Water. As described in Bulletin 132-84 (page 46), DWR acquired 30,000 acre-feet of water in 1978 through an exchange agreement with

MWDSC. Under subsequent agreements that water was sold; KCWA purchased 25,000 acre-feet and Dudley Ridge Water District (DRWD) purchased the remaining 5,000 acre-feet.

The original agreement required use of the 1978 exchange water prior to March 31, 1983. Under additional agreements, the delivery deadline was extended to July 31, 1986. During 1985, DRWD took delivery of all 5,000 acre-feet of its 1978 exchange water. KCWA took delivery of 5,662 acre-feet of its 1978 exchange water during 1985, and transferred an additional 2,896 acre-feet to TLBWS. As of January 1986, KCWA had a balance of 15,885 acre-feet of undelivered 1978 exchange water.

1982 Exchange Water. Under the 1982 exchange agreements described in Chapter III, Dudley Ridge Water District (DRWD) took delivery of all 3,122 acre-feet of its 1982 exchange water during 1985. DRWD took 1,821 acre-feet stored in Lake Oroville, and 1,301 acre-feet stored in a MWDSC ground water basin. To complete the exchange, MWDSC was billed for the 1,307 acre-feet of 1982 exchange water at the variable OMP&R rate charged at the time the water was stored.

Regulated Delivery of Local Supply. SWP facilities are also used to transport non-Project water for long-term SWP contractors and for other agencies under various agreements to honor local water rights. Some of this water simply passes through SWP transportation facilities; some is stored in SWP reservoirs for release later in the year, under agreements by which the water right holders pay storage fees. In 1985, a total of 25,320 acre-feet in this category was delivered to two long-term contractors and two other agencies.

Non-SWP Water to Napa County Flood Control and Water Conservation District (NCFC&WCD). Pending completion of

Phase II of the North Bay Aqueduct, NCFC&WCD receives interim water from the USBR's Solano Project, transported by Solano Irrigation District to Reach 3B of the North Bay Aqueduct. From there the water is pumped through interim pumping facilities near Cordelia and transported through SWP facilities to the terminus. During 1985, NCFC&WCD received 4,039 acre-feet of Solano Project water.

Preconsolidation Repayment Water. DWR entered into two contracts during 1964 to obtain water to preconsolidate land within the right of way of the California Aqueduct. This water was to be paid back upon request after the Aqueduct began service. The contracts, which have changed hands over the years, are currently held by Shell California Production, Inc. (Shell), and the J. G. Boswell Company (Boswell). The original contracts expired December 31, 1984. As described in Chapter III, agreements were completed in 1985 to extend the period for return of preconsolidation water through December 31, 1994. No preconsolidation repayment water was requested in 1985. The remaining balances are 23,689 acre-feet to Shell and 14,170 acre-feet to Boswell.

Conveyance and Transportation of CVP Water. During 1985, four arrangements for conveying CVP water through SWP facilities were in effect. In each arrangement the USBR provided the electrical energy required for moving the water through the Banks Delta Pumping Plant and, if needed, the Dos Amigos Pumping Plant.

- o An August 30, 1985 exchange agreement between DWR and the USBR provided for DWR to transport up to 12,800 acre-feet of CVP water to O'Neill Forebay in exchange for 12,000 acre-feet of CVP water delivered to Santa Clara Valley Water District (SCVWD). DWR ultimately transported 4,587 acre-

(in acre-feet)

TABLE 5: MONTHLY

Line No.	Contracting Agency and Type of Service	Month						
		JAN	FEB	MAR	APR	MAY	JUN	JUL
FEATHER RIVER AREA								
1.	City of Yuba City Entitlement Water	0	0	0	0	0	0	0
2.	County of Butte: Entitlement Water	0	21	151	60	7	26	11
3.	Last Chance Creek Water District: Regulated Delivery of Local Supply	0	0	0	0	3,120	3,656	3,094
4.	Plumas County Flood Control and Water Conservation District: Entitlement Water	0	0	1	1	57	58	58
5.	Thermalito Irrigation District: Regulated Delivery of Local Supply	83	79	86	173	291	331	350
6.	AREA TOTAL	83	100	238	234	3,475	4,071	3,513
NORTH BAY AREA								
7.	Napa County Flood Control and Water Conservation District: Non-SWP Water via SWP Facilities	665	345	147	222	271	283	287
8.	Solano County Flood Control and Water Conservation District: Entitlement Water	0	0	0	0	0	0	0
9.	AREA TOTAL	665	345	147	222	271	283	287
SOUTH BAY AREA								
10.	Alameda County Flood Control and Water Conservation District, Zone 7: Entitlement Water	259	2	6	571	990	2,372	2,932
11.	Regulated Delivery of Local Supply	672	1,039	1,208	1,228	1,223	325	0
12.	Agency Total	931	1,041	1,214	1,799	2,213	2,697	2,932
13.	Alameda County Water District: Entitlement Water	698	91	0	611	768	2,468	3,763
14.	Regulated Delivery of Local Supply	730	878	738	0	525	402	0
15.	Agency Total	1,428	969	738	611	1,293	2,870	3,763
16.	Santa Clara Valley Water District Entitlement Water	4,400	4,400	5,765	8,386	9,580	9,680	9,425
17.	Surplus Water	3,394	2,728	2,551	480	0	485	0
18.	Central Valley Project Exchange Water	0	0	0	0	0	0	0
19.	Agency Total	7,794	7,128	8,316	8,866	9,580	10,165	9,425
20.	Recreation/Fish and Wildlife Water	4	4	4	7	13	19	29
21.	AREA TOTAL	10,157	9,142	10,272	11,283	13,099	15,751	16,149
SAN JOAQUIN VALLEY AREA								
SWP Water								
22.	County of Kings: Entitlement Water	340	340	340	340	0	340	340
23.	Devil's Den Water District: Entitlement Water	254	381	762	1,016	1,270	2,032	2,286
24.	Surplus Water	769	2,100	253	728	822	307	925
25.	Agency Total	1,023	2,481	1,015	1,744	2,092	2,339	3,211
26.	Dudley Ridge Water District: Entitlement Water	944	1,416	2,832	2,799	6,285	8,496	8,496
27.	Surplus Water	594	391	104	0	1,864	212	3,466
28.	1978 Exchange Water	0	0	700	250	800	1,000	1,000
29.	1982 Exchange Water (Oroville Storage)	0	0	0	0	0	599	1,022
30.	1982 Exchange Water (MWDSC Basin)	0	0	0	0	500	801	0
31.	Agency Total	1,538	1,807	3,636	3,049	9,449	11,108	13,984
32.	Empire West Side Irrigation District: Entitlement Water	0	0	0	526	120	403	711
33.	Carry-over Water	277	1,189	782	749	0	0	0
34.	Agency Total	277	1,189	782	1,275	120	403	711

WATER DELIVERIES IN 1985 (in acre-feet)

Month							1985 Contract Entitlement	1985 Entitlement Not Delivered	Net Cumulative (a Entitlement Not Delivered Through		Line No.
AUG	SEP	OCT	NOV	DEC	TOTAL	1984			1985		
0	0	0	0	0	0	1,700	1,700	1,600	3,300	1.	
0	25	0	0	7	308	1,200	892	11,851	12,743	2.	
2,108	670	370	99	0	13,117					3.	
55	15	9	0	0	254	860	606	4,558	5,164	4.	
335	181	166	73	81	2,229					5.	
2,498	891	545	172	88	15,908	3,760	3,198	18,009	21,207	6.	
286	287	275	352	619	4,039					7.	
0	0	0	0	0	0	1,250	1,250	1,100	2,350	8.	
286	287	275	352	619	4,039	1,250	1,250	1,100	2,350	9.	
2,482	2,082	1,860	652	864	15,072	27,000	11,928	121,533	133,461	10.	
93	89	59	422	343	6,701					11.	
2,575	2,171	1,919	1,074	1,207	21,773					12.	
3,916	2,946	984	921	1,850	19,016	30,800	11,784	221,359	233,143	13.	
0	0	0	0	0	3,273					14.	
3,916	2,946	984	921	1,850	22,289					15.	
9,521	9,224	7,765	6,237	3,617	88,000	88,000	0	40,782	40,782	16.	
0	0	0	0	0	9,638					17.	
0	250	3,013	506	531	4,300					18.	
9,521	9,474	10,778	6,743	4,148	101,938					19.	
21	18	25	4	4	152					20.	
16,033	14,609	13,706	8,742	7,209	146,152	145,800	23,712	383,674	407,386	21.	
340	340	340	0	340	3,400	3,400	0	0	0	22.	
2,793	523	6	307	469	12,099	12,700	601 (b)	128 (c)	729	23.	
191	0	0	0	0	6,095					24.	
2,984	523	6	307	469	18,194					25.	
8,496	2,154	1,196	1,886	1,251	46,251	47,200	949 (b)	0	949	26.	
1,005	0	0	0	0	7,636					27.	
0	250	700	0	300	5,000					28.	
0	0	200	0	0	1,821					29.	
0	0	0	0	0	1,301					30.	
9,501	2,404	2,096	1,886	1,551	62,009					31.	
430	10	0	0	0	2,200	3,000	800 (b)	12,390 (c)	10,193	32.	
0	0	0	0	0	2,997					33.	
430	10	0	0	0	5,197					34.	

(in acre-feet) **TABLE 5: MONTHLY WATER**

Line No.	Contracting Agency and Type of Service	Month							
		JAN	FEB	MAR	APR	MAY	JUN	JUL	
35.	Kern County Water Agency: Entitlement Water	13,587	31,137	54,900	74,937	92,374	141,974	166,150	
36.	Surplus Water	0	36,898	38,597	8,653	18,770	25,890	51,868	
37.	1977 Emergency Relief Water	0	124	0	0	1,000	1,641	0	
38.	1977 Emergency Relief Transferred to TLBWS	0	0	0	0	0	0	0	
39.	1978 Exchange Water	0	0	0	1,000	1,000	1,596	2,000	
40.	1978 Exchange Water Transferred to TLBWS	0	0	0	0	0	0	0	
41.	Agency Total	13,587	68,159	93,497	84,590	113,144	171,101	220,018	
	Oak Flat Water District:								
42.	Entitlement Water	0	114	326	772	1,052	898	883	
43.	Article 45(e) Wet Weather Water	0	0	0	0	180	180	180	
44.	Surplus Water	0	0	476	288	0	0	0	
45.	Agency Total	0	114	802	1,060	1,232	1,078	1,063	
	Tulare Lake Basin Water Storage District:								
46.	Entitlement Water	2,370	0	0	0	0	519	21,330	
47.	Article 45(e) Wet Weather Water	0	3,555	7,110	9,480	11,850	18,441	0	
48.	Surplus Water	2,480	12,897	8,112	6,648	9,175	13,298	10,439	
49.	Water Transferred from KCWA	0	0	0	0	0	0	0	
50.	Agency Total (excludes transferred water)	4,850	16,452	15,222	16,128	21,025	32,258	31,769	
51.	Recreation/Fish and Wildlife Water	7	15	40	33	63	88	47	
52.	Green Valley Water District: Surplus Water	55	111	0	0	0	0	0	
53.	AREA SUBTOTAL (SWP Water)	21,677	90,668	115,334	108,219	147,125	218,715	271,143	
	SAN JOAQUIN VALLEY AREA CVP Water								
	Green Valley Water District								
54.	Conveying CVP Water--Annual Contract Musco Olive Products, Inc.:	0	0	324	227	24	301	658	
55.	Conveying CVP Water--Annual Contract Tracy Golf and Country Club:	3	1	1	4	0	4	1	
56.	Conveying CVP Water--Annual Contract U. S. Fish and Wildlife Service:	0	21	14	43	54	80	62	
57.	Conveying CVP Water--Annual Contract U. S. Bureau of Reclamation:	0	0	0	0	0	0	0	
58.	Conveying CVP Water--Cross Valley Canal	208	0	10,566	21,365	14,814	14,410	10,674	
59.	Conveying CVP Water--Decision 1485	1,446	0	26,154	0	0	0	97,523	
60.	Conveying CVP Water--California Department of Fish and Game	0	0	0	0	0	0	0	
61.	Conveying CVP Water--Recreation/U.S. Fish and Wildlife Service	4	13	34	28	51	70	46	
62.	AREA SUBTOTAL (CVP Water)	1,661	35	37,093	21,667	14,943	14,865	108,964	
63.	AREA SUBTOTAL (SWP Water)	21,677	90,668	115,334	108,219	147,125	218,715	271,143	
64.	AREA TOTAL (CVP Plus SWP Water)	23,338	90,703	152,427	129,886	162,068	233,580	380,107	
	CENTRAL COASTAL AREA								
	San Luis Obispo County Flood Control and Water Conservation District:								
65.	Entitlement Water	0	0	0	0	0	0	0	
	Santa Barbara County Flood Control and Water Conservation District:								
66.	Entitlement Water	0	0	0	0	0	0	0	
67.	AREA TOTAL	0	0	0	0	0	0	0	
	SOUTHERN CALIFORNIA AREA								
	Antelope Valley-East Kern Water Agency:								
68.	Entitlement Water	779	748	2,116	3,594	4,819	5,203	5,966	
	Castaic Lake Water Agency:								
69.	Entitlement Water	889	855	976	939	936	948	1,303	
	Coachella Valley Water District:								
70.	Entitlement Water	0	1,415	1,557	1,557	1,557	1,557	1,557	

DELIVERIES IN 1985 (continued) (in acre-feet)

Month							1985 Contract Entitlement	1985 Entitlement Not Delivered	Net Cumulative (a) Entitlement Not Delivered Through		Line No.
AUG	SEP	OCT	NOV	DEC	TOTAL	1984			1985		
161,905	49,487	37,638	32,783	32,024	888,896	915,000	26,104 (b)	239,293 (c)	265,397	35.	
148	0	0	0	0	180,824					36.	
0	0	0	0	0	2,765					37.	
0	0	0	0	2,706	2,706					38.	
66	0	0	0	0	5,662					39.	
0	0	0	1,669	1,227	2,896					40.	
162,119	49,487	37,638	34,452	35,957	1,083,749					41.	
590	105	130	23	0	4,893	4,900	7 (b)	1,180 (c)	647	42.	
0	0	0	0	0	540					43.	
0	0	0	0	0	764					44.	
590	105	130	23	0	6,197					45.	
12,621	0	0	0	0	36,840	45,549	8,709 (b)	127,059	62,817	46.	
8,709	10,665	3,141	0	0	72,951					47.	
3,204	9,769	0	5,679	15,186	96,887					48.	
0	0	0	1,669	3,933	5,602					49.	
24,534	20,434	3,141	5,679	15,186	206,678					50.	
83	26	49	26	18	495					51.	
0	0	0	0	0	166					52.	
200,581	73,329	43,400	42,373	53,521	1,386,085	1,031,749	37,170	380,050	340,732	53.	
614	18	9	0	0	2,175					54.	
0	1	2	1	0	18					55.	
72	49	45	15	8	463					56.	
0	0	1,266	1,834	0	3,100					57.	
21,936	8,436	6,395	6,880	9,804	125,488					58.	
69,913	0	0	0	0	195,036					59.	
0	0	0	14,382	13,618	28,000					60.	
68	24	40	24	12	414					61.	
92,603	8,528	7,757	23,136	23,442	354,694					62.	
200,581	73,329	43,400	42,373	53,521	1,386,085	1,031,749	37,170	380,050	340,732	63.	
293,184	81,857	51,157	65,509	76,963	1,740,779	1,031,749	37,170	380,050	340,732	64.	
0	0	0	0	0	0	7,500	7,500	11,500	19,000	65.	
0	0	0	0	0	0	13,638	13,638	20,022 (d)	33,660	66.	
0	0	0	0	0	0	21,138	21,138	31,522	52,660	67.	
5,827	3,960	2,168	994	890	37,064	40,000	2,936	251,490	254,426	68.	
1,316	1,223	1,154	938	924	12,401	29,100	16,699	141,689	158,388	69.	
1,557	1,557	1,557	1,557	1,561	16,989	16,989	0	5,200	5,200	70.	

(in acre-feet) **TABLE 5: MONTHLY WATER**

Line No.	Contracting Agency and Type of Service	Month							
		JAN	FEB	MAR	APR	MAY	JUN	JUL	
71.	Crestline-Lake Arrowhead Water Agency: Entitlement Water	99	93	81	75	103	134	163	
72.	Desert Water Agency: Entitlement Water	0	2,250	2,475	2,475	2,475	2,475	2,475	
73.	Littlerock Creek Irrigation District: Entitlement Water	0	0	0	0	0	0	0	
74.	Mojave Water Agency: Entitlement Water	0	0	0	0	0	0	0	
75.	Palmdale Water District: Entitlement Water	2	9	15	28	42	45	50	
76.	San Bernardino Valley Municipal Water District: Entitlement Water	238	373	104	5	5	382	1,923	
77.	San Gabriel Valley Municipal Water District: Entitlement Water	0	0	0	66	0	0	0	
78.	San Geronio Pass Water Agency: Entitlement Water	0	0	0	0	0	0	0	
79.	The Metropolitan Water District of Southern California: Entitlement Water	7,478	9,291	42,816	58,460	80,270	75,892	96,200	
80.	1978 Ground Water Exchange	0	0	700	1,250	1,800	2,596	3,000	
81.	1982 Ground Water Exchange	0	0	0	0	500	801	0	
82.	Agency Total	7,478	9,291	43,516	59,710	82,570	79,289	99,200	
83.	Ventura County Flood Control District: Entitlement Water	0	0	0	0	0	0	0	
84.	Recreation/Fish and Wildlife Water	100	142	162	210	146	255	397	
85.	AREA TOTAL	9,585	15,176	51,002	68,659	92,653	90,288	113,034	
ALL AGENCIES									
86.	Entitlement Water (1985)	32,337	52,936	115,223	157,218	202,710	255,902	326,022	
87.	Deliveries Under Wet Weather Provisions	0	3,555	7,110	9,480	12,030	18,621	180	
88.	Carry-over Water	277	1,189	782	749	0	0	0	
89.	1978 Ground Water Exchange	0	0	700	1,250	1,800	2,596	3,000	
90.	1982 Ground Water Exchange	0	0	0	0	500	801	0	
91.	SUBTOTAL (Entitlement Water Delivered)	32,614	57,680	123,815	168,697	217,040	277,920	329,202	
92.	Surplus Water	7,292	55,125	50,093	16,797	30,631	40,192	66,698	
93.	1977 Emergency Relief Water	0	124	0	0	1,000	1,641	0	
94.	1978 Exchange Water	0	0	700	1,250	1,800	2,596	3,000	
95.	1982 Exchange Water	0	0	0	0	500	1,400	1,022	
96.	Central Valley Project Exchange Water	0	0	0	0	0	0	0	
97.	1977 Emergency Relief Transferred to TLBWS	0	0	0	0	0	0	0	
98.	1978 Exchange Water Transferred to TLBWS	0	0	0	0	0	0	0	
99.	Recreation/Fish and Wildlife Water	111	161	206	250	222	362	473	
100.	SUBTOTAL (SWP WATER)	40,017	113,090	174,814	186,994	251,193	324,111	400,395	
101.	Regulated Delivery of Local Supply	1,485	1,996	2,032	1,401	5,159	4,714	3,444	
102.	Non-SWP Water to Napa County FC&WCD	665	345	147	222	271	283	287	
103.	Conveying CVP Water--Annual Contracts	3	22	339	274	78	385	721	
104.	Conveying CVP Water--Cross Valley Canal	208	0	10,566	21,365	14,814	14,410	10,674	
105.	Conveying CVP Water--Decision 1485	1,446	0	26,154	0	0	0	97,523	
106.	Conveying CVP Water--California Department of Fish and Game	0	0	0	0	0	0	0	
107.	Conveying CVP Water--Recreation/Fish and Wildlife Water	4	13	34	28	51	70	46	
108.	TOTAL WATER	43,828	115,466	214,086	210,284	271,566	343,973	513,090	

- a) This column includes entitlement not delivered, deferred or otherwise, whether or not the water contractor has received any remuneration.
- b) This amount was delivered as carry-over entitlement water in January/February 1986.
- c) Corrected from Bulletin 132-85 to compensate for entitlements not delivered prior to 1971, and which were omitted inadvertently in earlier bulletins.

DELIVERIES IN 1985 (continued) (in acre-feet)

	Month						1985 Contract Entitlement	1985 Entitlement Not Delivered	Net Cumulative (a Entitlement Not Delivered Through		Line No.
	AUG	SEP	OCT	NOV	DEC	TOTAL			1984	1985	
	180	143	130	110	111	1,422	4,350	2,928	17,220	20,148	71.
	2,475	2,475	2,475	2,475	2,475	27,000	27,000	0	8,000	8,000	72.
	0	0	0	0	0	0	1,730	1,730	7,699	9,429	73.
	0	0	0	0	0	0	39,000	39,000	231,994	270,994	74.
	343	292	285	295	152	1,558	14,180	12,622	110,820	123,442	75.
	2,085	1,436	506	297	36	7,390	81,500	74,110	587,847	661,957	76.
	0	0	1,183	2,101	1,678	5,028	21,800	16,772	138,639	155,411	77.
	0	0	0	0	0	0	11,800	11,800	44,000	55,800	78.
	97,096	80,727	67,135	45,865	22,395	683,625	1,558,700	860,216	4,972,149 (e)	5,832,365	79.
	66	250	700	1,669	1,527	13,558					80.
	0	0	0	0	0	1,301					81.
	97,162	80,977	67,835	47,534	23,922	698,484					82.
	0	0	0	0	0	0	6,000	6,000	15,000	21,000	83.
	905	527	459	69	43	3,415					84.
	111,850	92,590	77,752	56,370	31,792	810,751	1,852,149	1,044,813	6,531,747	7,576,560	85.
	314,028	158,724	126,521	97,441	70,644	1,909,706	3,055,846	1,131,281	7,346,102	8,400,895	86.
	8,709	10,665	3,141	0	0	73,491					87.
	0	0	0	0	0	2,997					88.
	66	250	700	1,669	1,527	13,558					89.
	0	0	0	0	0	1,301					90.
	322,803	169,639	130,362	99,110	72,171	2,001,053					91.
	4,548	9,769	0	5,679	15,186	302,010					92.
	0	0	0	0	0	2,765					93.
	66	250	700	0	300	10,662					94.
	0	0	200	0	0	3,122					95.
	0	250	3,013	506	531	4,300					96.
	0	0	0	0	2,706	2,706					97.
	0	0	0	1,669	1,227	2,896					98.
	1,009	571	533	99	65	4,062					99.
	328,426	180,479	134,808	107,063	92,186	2,333,576					100.
	2,536	940	595	594	424	25,320					101.
	286	287	275	352	619	4,039					102.
	686	68	1,322	1,850	8	5,756					103.
	21,936	8,436	6,395	6,880	9,804	125,488					104.
	69,913	0	0	0	0	195,036					105.
	0	0	0	14,382	13,618	28,000					106.
	68	24	40	24	12	414					107.
	423,851	190,234	143,435	131,145	116,671	2,717,629	3,055,846	1,131,281	7,346,102	8,400,895	108.

d) Revised and corrected from Bulletin 132-85 to reflect Amendment 9 (August 31, 1981) which changed Table A entitlements.

e) Revised and corrected from Bulletin 132-85 to reflect a total of 683 acre-feet of 1978 and 1982 Exchange Water (MWDSC basin) recaptured in 1982 and 1984.

feet to O'Neill Forebay in exchange for 4,300 acre-feet delivered to SCVWD. DWR transported more water than it received because the SWP transportation service charge is slightly less than the USBR's charge for the water. The water to SCVWD was used as a supplement to, not as a substitute for, SWP water. SCVWD paid for energy required to transport this water through the South Bay Pumping Plant (at the rates charged for pumping SWP surplus water).

- o The USBR and DWR have three-party contracts with nine local agencies; the contracts provide for transportation of CVP water through SWP facilities to KCWA's Cross Valley Canal through 1995. Another contract between DWR and the USBR provides that the USBR will furnish the electrical energy needed for pumping the CVP water at the Banks Delta Pumping Plant for these nine Cross Valley Canal contractors.

DWR's charges under the nine contracts are for use of SWP facilities to transport water from the Delta to O'Neill Forebay and from Reach 8C, the first repayment reach beyond the joint-use facilities, to the Cross Valley Canal in Reach 12E.

The SWP began transportation service for the Cross Valley Canal contractors in 1976; during 1985, 125,488 acre-feet of water was transported. Article 4(b) of the three-party contracts allows the contractors to request deliveries greater than what is provided in the contracts if additional supplies of water and delivery capacity are available. During 1985, DWR conveyed 38,102 acre-feet to Pixley Irrigation District, which exceeds its contractual limit by 7,000 acre-feet. Part of the water delivered to the Cross Valley Canal (39,105 acre-feet) was released from the State's



The California Aqueduct winds its way through a patchwork of California agricultural land.

share of San Luis Reservoir storage in accordance with April 24, 1985 letter agreements between DWR and three Cross Valley Canal contractors. The deliveries from storage were made during May, June, and July, when there was insufficient conveyance capacity available for transporting CVP water. This was due to curtailment of SWP pumping from the Delta in accordance with the SWRCB's Decision 1485. The USBR returned the water released from storage to the State later in the year.

- o Under the annual conveyance agreement executed February 20, 1985, DWR conveyed water to four USBR annual contractors. On August 9, 1985, this agreement was extended through February 28, 1986 (with new transportation service rates set for 1986). A total of 2,656 acre-feet was conveyed to Green Valley Water District, Musco Olive Products, Inc., and Tracy Golf and Country Club in 1985. This agreement was amended on October 11, 1985, to convey 3,100 acre-feet during November and December from O'Neill Forebay to Reach 10A for the U. S. Fish and Wildlife Service. The water was transported by Buena Vista Water Storage District to the Kern National Wildlife Refuge.

As part of this annual contract, the USBR agreed to provide its share of water to meet Delta water quality requirements and to curtail its Delta exports in accordance with Decision 1485. This agreement also provides that the SWP would furnish conveyance capacity from the Delta to replace the May and June curtailment of CVP pumping. (Decision 1485 curtails both CVP and SWP pumping from the Delta during May, June, and July to protect striped bass, but the July curtailment does not restrict

existing CVP pumping capability.) A total of 195,036 acre-feet of CVP water was conveyed in 1985 of which 27,600 acre-feet were to replace capacity foregone during May and June 1984, and 167,436 acre-feet during May and June 1985.

- o An agreement executed October 24, 1985, provided for the transporting of 28,000 acre-feet of CVP water from the Delta to O'Neill Forebay for the Department of Fish and Game/U. S. Fish and Wildlife Service for wildlife habitat purposes in the Grasslands area. This water, delivered in November and December 1985, is shown in Table 5, separate from the 3,100 acre-feet mentioned in the preceding description.

Power Operations

DWR began operation as a bulk power agency in April 1983. As such, DWR operates a mix of owned, contracted, and purchased power resources to meet SWP needs via contracted transmission capacity. This was DWR's second full year as a bulk power agency.

Energy Use

Table 6 summarizes monthly SWP energy use at SWP plants during 1985. Total energy use and losses for the year were 5.52 billion kWh, approximately 52 percent more than what was used in 1984. This increased energy use reflected increased water deliveries to SWP contractors. Total SWP water deliveries in 1985 increased about 22 percent over 1984; deliveries to Southern California (which require the greatest amount of energy) increased by nearly 44 percent. SWP energy use was nearly evenly distributed between the two major power service areas: Pacific Gas and Electric Company (PGandE) and Southern California Edison Company (SCE). About 2.68 billion kWh were