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RECLAMATION OF WATER FROM WASTES IN SOUTHERN CALIFORNIA

Appendixes

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STATE OF CALIFORNIA
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BULLETIN No. 80-5

RECLAMATION OF WATER FROM WASTES IN SOUTHERN CALIFORNIA

Appendixes

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MARCH 1976

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Department of Water Resources

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English to Metric System of Measurement

Quantity	English unit	Multiply by	To get metric equivalent
Length	inches (in)	25.4	millimetres (mm)
		.0254	metres (m)
	feet (ft)	.3048	metres (m)
	miles (mi)	1.6093	kilometres (km)
Area	square inches (in^2)	6.4516×10^{-4}	square metres (m^2)
	square feet (ft^2)	.092903	square metres (m^2)
	acres	4046.9	square metres (m^2)
		.40469	hectares (ha)
		.40469	square hectometres (hm^2)
		.0040469	square kilometres (km^2)
	square miles (mi^2)	2.590	square kilometres (km^2)
Volume	gallons (gal)	3.7854	litres (l)
		.0037854	cubic metres (m^3)
	million gallons (10^6 gal)	3785.4	cubic metres (m^3)
	cubic feet (ft^3)	.028317	cubic metres (m^3)
	cubic yards (yd^3)	.76455	cubic metres (m^3)
	acre-feet (ac-ft)	1233.5	cubic metres (m^3)
		.0012335	cubic hectometres (hm^3)
		1.233×10^{-6}	cubic kilometres (km^3)
Volume/Time (Flow)	cubic feet per second (ft^3/s)	28.317	litres per second (l/s)
		.028317	cubic metres per second (m^3/s)
	gallons per minute (gal/min)	.06309	litres per second (l/s)
		6.309×10^{-5}	cubic metres per second (m^3/s)
	million gallons per day (mgd)	.043813	cubic metres per second (m^3/s)
Mass	pounds (lb)	.45359	kilograms (kg)
	tons (short, 2,000 lb)	.90718	tonne (t)
		907.18	kilograms (kg)
Power	horsepower (hp)	0.7460	kilowatts (kW)
Pressure	pounds per square inch (psi)	6894.8	pascal (Pa)
Temperature	Degrees Fahrenheit (°F)	$\frac{tF - 32}{1.8} = tC$	Degrees Celsius (°C)

FOREWORD

One of the major programs conducted by the Department of Water Resources has been concerned with studying the practicability of increasing waste water reclamation in California.

From the study in Southern California has come an overview report, Bulletin No. 80-5 "Reclamation of Water from Wastes in Southern California," designed to provide concerned citizens, as well as water leaders, with the information needed to help determine the proper role of waste water reclamation in the management of Southern California's water resources.

To carry out the objective of Bulletin No. 80-5, a large amount of data was collected on waste water production, reclamation, and possible uses. For the bulletin, these data were summarized and interpreted.

We recognize, however, that some readers will want more than the summaries and interpretations. For those persons, these appendixes containing the more detailed information have been prepared.

Ronald B. Robie
Director
Department of Water Resources

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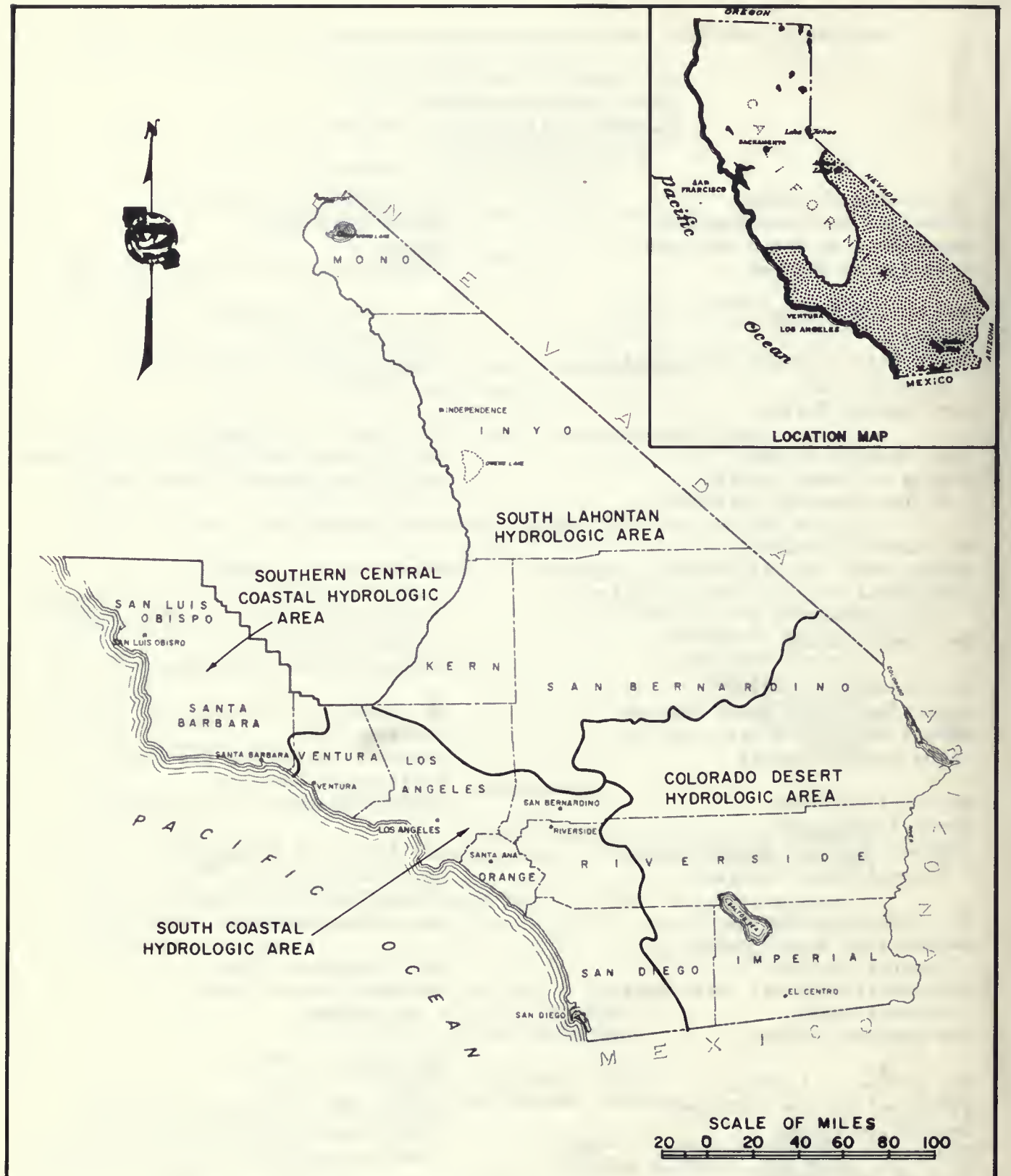

Figure I - AREA OF INVESTIGATION

Appendix A

WATER SUPPLY AND DEMAND IN AREA OF INVESTIGATION

The area of investigation encompasses six coastal counties (San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego) and six inland counties (Inyo, San Bernardino, Riverside, and Imperial and portions of Mono and Kern). This area (not including offshore islands, which are not covered in the study) contains approximately 63,500 square miles, or 41 million acres. (See Figure 1.)

Description of Area

The study area is divided into four hydrologic areas: Southern Central Coastal, South Coastal, South Lahontan, and Colorado Desert. This appendix includes a detailed description and the water supply and demand of each hydrologic area. Data on area, population, land use, and precipitation for each hydrologic area are given in Table 1.

Southern Central Coastal Hydrologic Area

The Southern Central Coastal Hydrologic Area encompasses San Luis Obispo and Santa Barbara Counties and a small portion of Ventura County.

The region is largely mountainous with small plains along the coast and the lower reaches of the main streams. The area is drained primarily by four major streams -- the Salinas, Santa Maria, and Santa Ynez Rivers and Arroyo Grande Creek. The major cities are San Luis Obispo, Santa Maria, Lompoc, and Santa Barbara. The economy is primarily based on agriculture, tourism, and recreation.

South Coastal Hydrologic Area

Within the South Coastal Hydrologic Area are Orange County, most of Ventura County, and those portions of Los Angeles, San Diego, Riverside, and San Bernardino Counties that are tributary to the ocean.

TABLE I
AREA, POPULATION, LAND USE, AND PRECIPITATION IN SOUTHERN CALIFORNIA

Hydrologic area	Area, square miles	Population, 1000's	Urban lands 1000 acres	Agricultural lands, 1000 acres	Average annual precipitation inches
Southern Central Coastal	6,100	370	70	130	21.7
South Coastal	11,000	11,000	1,050	480	14.6
South Lahontan	27,000	240	60	100	5.1
Colorado Desert	19,400	230	60	680	3.2
Totals	63,500	11,840	1,240	1,390	

The area is characterized by topographic extremes: beaches, coastal plains, fertile valleys, gently rolling foothills, and rugged mountain ranges. The mountains form a wall between the coastal drainage area and the desert regions to the east. Similarly, elevations run to extremes: from zero elevation along the coast to nearly 12,000 feet above sea level at Mt. San Gorgonio in San Bernardino County.

Climate likewise tends to run to extremes: it is greatly affected by the interplay of cool ocean air masses and dry continental, or desert, air. Along the coastal plain, temperatures and humidities usually vary within a comparatively narrow range. Inland valleys in Riverside and San Bernardino Counties tend to have somewhat hotter climates during the summer; the mountains have a four-season climate change. Temperatures throughout the study area range, as a rule, from an average 50°F. during the winter to an average 75°F. during the summer, although at the higher elevations the spread between the highs and lows is generally much greater.

Along the coastal plain annual precipitation averages 14 inches; it ranges from an average of 15 inches in Los Angeles County to 11 inches in San Diego County. In the inland valleys of San Bernardino and Riverside Counties it is about 14 inches, with as much as 10 feet of snow at Big Bear in the San Bernardino Mountains.

The major metropolitan areas are coastal Ventura County, Los Angeles Coastal Plain, Orange County, coastal San Diego County, and the Riverside-San Bernardino area.

The major streams draining the area are the Ventura and Santa Clara Rivers in Ventura County, the Los Angeles and San Gabriel Rivers in Los Angeles County, the Santa Ana River in Orange County, and the Santa Margarita, San Luis Rey, and San Diego Rivers in San Diego County.

South Lahontan Hydrologic Area

This hydrologic area includes Inyo County and portions of Mono, Kern, Los Angeles, and San Bernardino Counties. The area extends from the Mono drainage divide north of Mono Lake to the New York and Providence Mountains on the south.

Economic development includes the mining and processing of minerals at widely scattered locations, aerospace activities, and a limited amount of agriculture in the Antelope Valley.

The area encompasses the communities of Palmdale, Lancaster, Victorville, and Bishop.

Colorado Desert Hydrologic Area

The Colorado Desert Hydrologic Area includes Imperial County plus parts of San Bernardino, Riverside, and San Diego Counties. Its economy is chiefly agricultural: it ranks second in importance only to California's vast, rich Central Valley. Other significant elements in its economy are the many retirement communities and the recreational activities that make use of the Salton Sea and the Colorado River.

The principal communities in the area are Banning, Palm Springs, Needles, Blythe, Brawley, El Centro, and Calexico.

Water Supply and Demand

The water supply of an area is the supply from all sources, including ground, surface, imported, and reclaimed waters. The applied water demand is the gross amount of water needed to meet the intended uses. The quantities of supply and demand for each hydrologic area and the sources are presented in Table 2.

The approximate quality of the waters based on total dissolved solids (TDS) concentrations in milligrams per liter (mg/l) are:

Colorado River	750 mg/l
Owens River	250 mg/l
State Water Project	200 mg/l

The TDS content of the ground waters averages 200 - 1,400 mg/l except in the Imperial Valley where the TDS ranges from 500 to 13,000 mg/l and fluorides from 2 to 5.5 mg/l.

Southern Central Coastal Hydrologic Area

Ground water is the main source of supply in the southern portion of the Central Coastal Hydrologic Area. The water levels in most of the ground water basins are declining, and they will probably continue to do so until economic limits are reached, quality problems develop, and legal restrictions are imposed.

In San Luis Obispo County the TDS content of ground water averages approximately 890 mg/l, while in Santa Barbara County it is approximately 1,100 mg/l. Evidence of excessive chlorides (greater than 1,000 mg/l) has been found in several small basins along the coast in both counties.

These high chlorides, which indicate possible sea water intrusion, have been recorded during periods of extremely heavy pumping in wells; however, the wells do recover after a heavy pumping season.

Water demand for San Luis Obispo and Santa Barbara Counties has been projected to the year 2000. Local water districts have executed contracts with the State for delivery of more than 80,000 acre-feet from the State Water Project by 1990.

Although the needs of San Luis Obispo County as a whole will be satisfied from existing local water supplies and from its entitlement from the State Water Project until within the first decade of the 21st century, local areas along the central and southern coast may feel some shortages as early as 1980.

TABLE 2
PROJECTED WATER SUPPLY AND DEMAND IN SOUTHERN CALIFORNIA 1/
IN 1,000 ACRE-FEET

Hydrologic area	Year	Dependable Water Supplies								Total net water demand	Supplemental demand	Reserve supply 4/
		Local surface water developments	Imports by local water agencies	Ground water safe yield	Federal water developments 2/	State Water Project 3/	Waste water reclamation	Desalting	Total			
Southern	1972	33	–	190	55	0	5	–	280	310	50	20
Central	1990	33	–	190	55	87	5	–	370	420	50	0
Coastal	2020	33	–	190	55	87	5	–	370	550	180	0
South	1972	90	1,720	930	20	190	57	0	3,010	3,080	160	90
Coastal	1990	90	940	930	20	2,340	81	16	4,420	3,700	0	720
	2020	90	940	930	20	2,340	81	16	4,420	4,720	300	0
South	1972	30	–	120	–	34	7	–	190	280	120	30
Lahontan	1990	40	–	130	–	220	8	–	400	330	3	70
	2020	50	–	130	–	220	10	–	410	430	70	50
Colorado	1972	–	–	74	3,950	14	7	–	4,040	4,070	40	10
Desert	1990	–	–	85	3,970	85	9	–	4,150	4,180	30	0
	2020	–	–	90	3,970	91	12	–	4,160	4,300	140	0
Total	1972	153	1,720	1,314	4,025	238	76	0	7,520	7,740	370	150
Southern	1990	163	940	1,335	4,045	2,732	103	16	9,340	8,630	83	790
California	2020	173	940	1,340	4,045	2,738	108	16	9,360	10,000	690	50

1/ From Department of Water Resources Bulletin #160-74; Water Demands for D-150 Population Projections
2/ Facilities existing or under construction
3/ Facilities definitely planned for construction and additional conservation facilities authorized to meet contractual commitments
4/ Potential available to certain portions of the hydrologic study area to meet additional water demands; usually not available to other areas of supplemental demand because of a lack of physical facilities and/or institutional arrangements

Santa Barbara County is currently experiencing a deficiency in its water supplies to meet its apparent demand, as reflected by the overdrawing of its ground water. It will continue to do so until an imported supply can be brought in. Waste water reclamation is now meeting some of the deficiency.

South Coastal Hydrologic Area

The South Coastal Hydrologic Area is the most populous area and leading industrial and commercial center in the State. Less than 30 years ago its economy was primarily based on agriculture.

Reflecting the increasing urbanization, the total water demand of the South Coast Hydrologic Area, including that for agriculture, is projected to grow from approximately 3 million acre-feet per year at present to more than 4 million acre-feet in 2000.

To meet present demand, the South Coastal Hydrologic Area depends on (1) local surface and ground water supplies; (2) the Los Angeles Aqueduct, which supplies approximately 480,000 acre-feet annually to the City of Los Angeles from the Mono-Owens Valley; (3) the Colorado River Aqueduct, which is supplying more than 1 million acre-feet per year to The Metropolitan Water District of Southern California; and (4) the State Water Project with a total maximum entitlement of 2,204,000 acre-feet per year. By the mid-1980s, the water supply from the Colorado River is expected to be reduced to about 520,000 acre-feet. Even with this reduction, the total supply available to the South Coastal Hydrologic Area should be adequate to meet the water demand until beyond 2000.

However, in certain local areas ground water is being overdrawn. For example, ground water use in Ventura County is currently exceeding the safe yield.

The quality of the ground water ranges from excellent to extremely poor. The quality of that from San Gabriel Valley, the upper Santa Ana River watershed, and San Fernando Valley is generally excellent and the concentration of TDS is generally below 400 mg/l, reflecting the quality of the runoff from mountain ranges.

The quality of ground water in the Coastal Plains of Los Angeles and Orange Counties shows substantial influence of man, with mineral concentrations about 500 mg/l. Some isolated areas, however, have concentrations exceeding 1,000 mg/l, reflecting the quality degradation from sea water intrusion.

Ground water in portions of Ventura County contains more than 700 mg/l TDS. The quality of ground water in much of San Diego County is generally poor -- 700 to 1,400 mg/l of TDS concentration.

Sea water intrusion into the West Coast and Central Basins of Los Angeles County is being controlled by a subsurface pressure ridge created by injection of fresh water into the underlying aquifers. This pressure ridge is operated by the Central and West Basin Water Replenishment District. At present, the District is investigating the possiblity of using reclaimed waste water from the City of Los Angeles' Hyperion Treatment Plant for maintenance of the pressure ridge.

Although sea water is intruding in only the east Coastal Plain of Orange County, other small basins are threatened by intrusion if the pumping rate increases. The Orange County Water District is currently completing a project to use reclaimed waste water and desalinated sea water (Water Factory 21) for ground water replenishment by injection into 22 wells.

One of the major places where sea water intrusion has been found is the Oxnard Plain in Ventura County. Currently, salt water has advanced inland about two miles. If the current rate of advancement continues, by 1990 the

intrusion front may reach the El Rio spreading grounds in the Oxnard Forebay, which is seven miles inland.

In the Ventura River Valley, high chlorides (1,000 mg/l) are found. Only those in the immediate vicinity of the coast are believed to be caused by sea water intrusion. Those further inland are most likely caused by waste brine from oil fields, by agricultural return flows, and by contributions from saline mineral formations.

Along the San Diego Coast, sea water is intruding or is threatening to intrude in San Luis Rey Valley - Mission Basin and San Diego River Valley - Mission Valley Basin. In addition, there are about 15 small coastal basins where chlorides in the coastal segment of the valley exceed 100 mg/l. A positive determination that sea water intrusion is degrading these basins cannot be made at this time on the basis of data now available.

South Lahontan Hydrologic Area

More water is being extracted from the ground water basins in the South Lahontan Hydrologic Area than is being replenished. Treated waste water is now disposed of to land and does percolate to the ground water basins.

For discussion purposes, the area is divided into the Mono-Owens Valley, Antelope Valley-Mojave River, and Death Valley sections.

The Mono-Owens Valley has adequate water supplies to meet its demand, even during critically dry periods. The Antelope Valley-Mojave River section will continue to be water deficient even with the State Water Project and will probably have to depend on a depletion of ground water in storage for its water supply. Little is known of the safe yield of ground water in Death Valley; the assumption is that ground water extracted from storage will be used to meet the demand.

The quality of ground water in the South Lahontan Area averages approximately 500 mg/l TDS content except possibly in the vicinity of Death Valley.

Colorado Desert Hydrologic Area

The source of water for this area is primarily the Colorado River, where it is a local surface water supply. The use of ground water in Coachella Valley is exceeding the replenishment.

The quality of ground water in the Coachella Valley portion of the Colorado Desert Hydrologic Area is surprisingly good. Dissolved minerals are generally less than 200 mg/l.

The Coachella Valley County Water District, the Desert Water Agency, and the San Gorgonio Pass Water Agency have contracted for a maximum annual entitlement of almost 80,000 acre-feet of State Water Project water. The expectation is that by 2000 the demand will be great enough to require additional supplies. This will probably be met by pumping water that is in storage.

Currently, much of the waste water in the Coachella Valley is treated and used to irrigate crops or to recharge the ground water basin.

The quality of ground water in the Imperial Valley is considered to be unsuitable for domestic and irrigation purposes except for a few isolated places. Therefore, very little ground water is used.

Small amounts of ground water used in the Palo Verde Irrigation District have dissolved minerals in excess of 800 mg/l, reflecting the quality of Colorado River water used for irrigation in that portion.

Appendix B

WASTE WATER PRODUCTION AND RECLAMATION*

In this appendix are presented data on the quantity and quality of waste water produced, on waste water reclamation practices, and on waste water treatment facilities of the 110 major waste water treatment plants in Southern California currently having a design capacity of 1.0 million gallons per day (mgd) or greater. (Data are also given on five plants that are no longer in operation.) Figures 2-10 show locations of the major plants. Data on waste water production and reclamation have been gathered for 1967-73, while the data on the waste water treatment facilities are for the water year 1972-73. (A water year is October 1 through September 30.) Data on the quality of waste water are from the Bulletin No. 130 series or from the Department's files. These data were compiled by each county within the four hydrologic areas into which Southern California is divided and were totaled for each hydrologic area. Waste water production and reclamation data for each of the major waste water treatment plants have been compiled in Tables 3 through 6.

The data and information available on waste water treatment facilities at the major waste water treatment plants for the year 1972-73 are presented in Tables 7 through 10 for each of the four hydrologic areas. Table 11 summarizes information on the plants.

The comparison of the major waste water treatment plants with total treatment plants in Southern California is presented in Table 12.

The quality of the effluent from each major waste water treatment plant is presented in tables for each hydrologic area (Tables 13 through 16). Only the mineral parameters (sulfates (SO_4), chlorides (Cl), boron (B), total hardness (TH), total dissolved solids (TDS)), and sodium values -- percent sodium and sodium adsorption ratio (SAR) -- and nutrient parameters (nitrates (NO_3) and phosphate (PO_4)) that more or less control the reuse of waste water are reported.

The waste water quality data presented in these tables represent average values for all analyses available during the indicated water years. All values, except the sodium values, are based upon the weight of water, that is, milligrams of constituent to the weight of a liter of water. (In the English system, milligram per liter is synonymous with parts per million.) Percent sodium is the relationship between the amount of sodium and the amount of all the cations, namely, sodium, potassium, calcium, and magnesium, all of which are expressed in terms of milliequivalents per liter (a milliequivalent per liter is the milligram per liter of a substance divided by the molecular weight of the substance). The sodium adsorption ratio is the relationship between the amount of sodium and the square root of one-half the sum of the calcium and magnesium, expressed in milliequivalents per liter:

$$\left(SAR = \frac{Na}{\sqrt{1/2\ (Ca + Mg)}}\right)^{**}$$

---

*See Page 55 for a Glossary of Terms used in this report.

**This formula which was used in Tables 13 through 16, has been subsequently modified as shown in Table 17, page 50.

FIGURE 2 – LOCATIONS OF MAJOR WASTE WATER TREATMENT PLANTS IN SOUTHERN CENTRAL COASTAL HYDROLOGIC AREA

DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1978

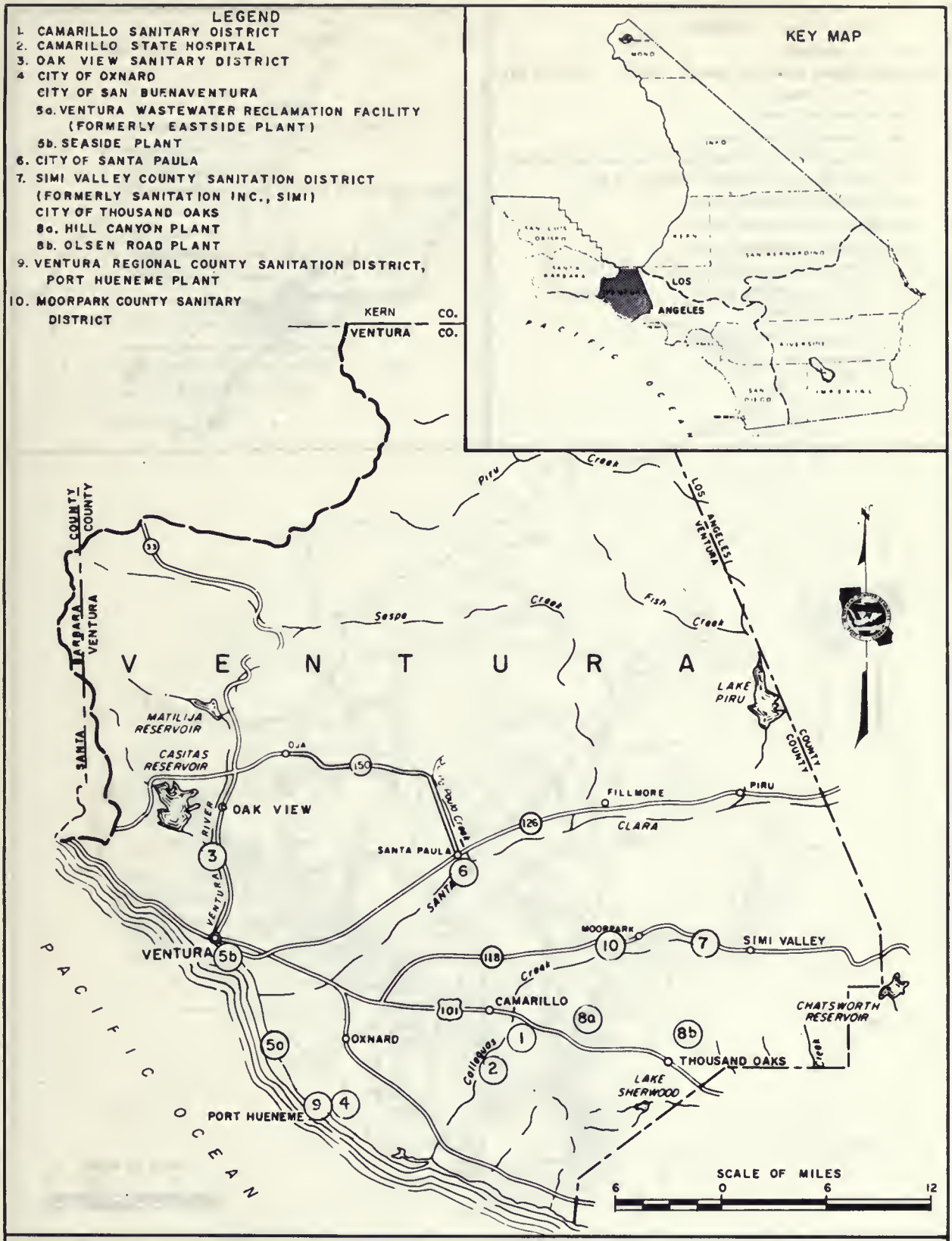

FIGURE 3 — LOCATIONS OF MAJOR WASTE WATER TREATMENT PLANTS IN VENTURA COUNTY PORTION OF SOUTH COASTAL HYDROLOGIC AREA

DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1975

FIGURE 4 — LOCATIONS OF MAJOR WASTE WATER TREATMENT PLANTS IN LOS ANGELES COUNTY PORTION OF SOUTH COASTAL HYDROLOGIC AREA

DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1975

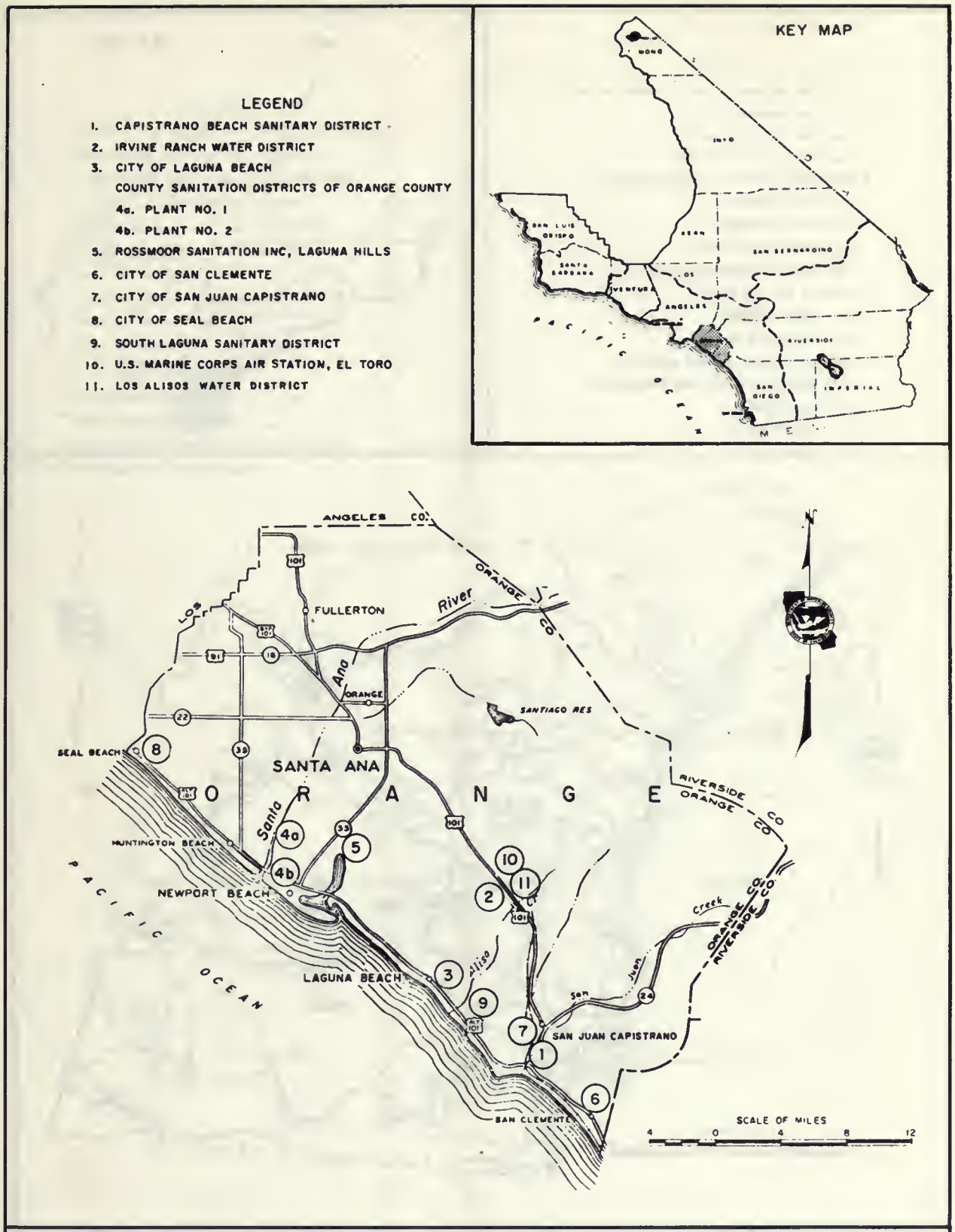

FIGURE 5 — LOCATIONS OF MAJOR WASTE WATER TREATMENT PLANTS IN ORANGE COUNTY PORTION OF SOUTH COASTAL HYDROLOGIC AREA

DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1975

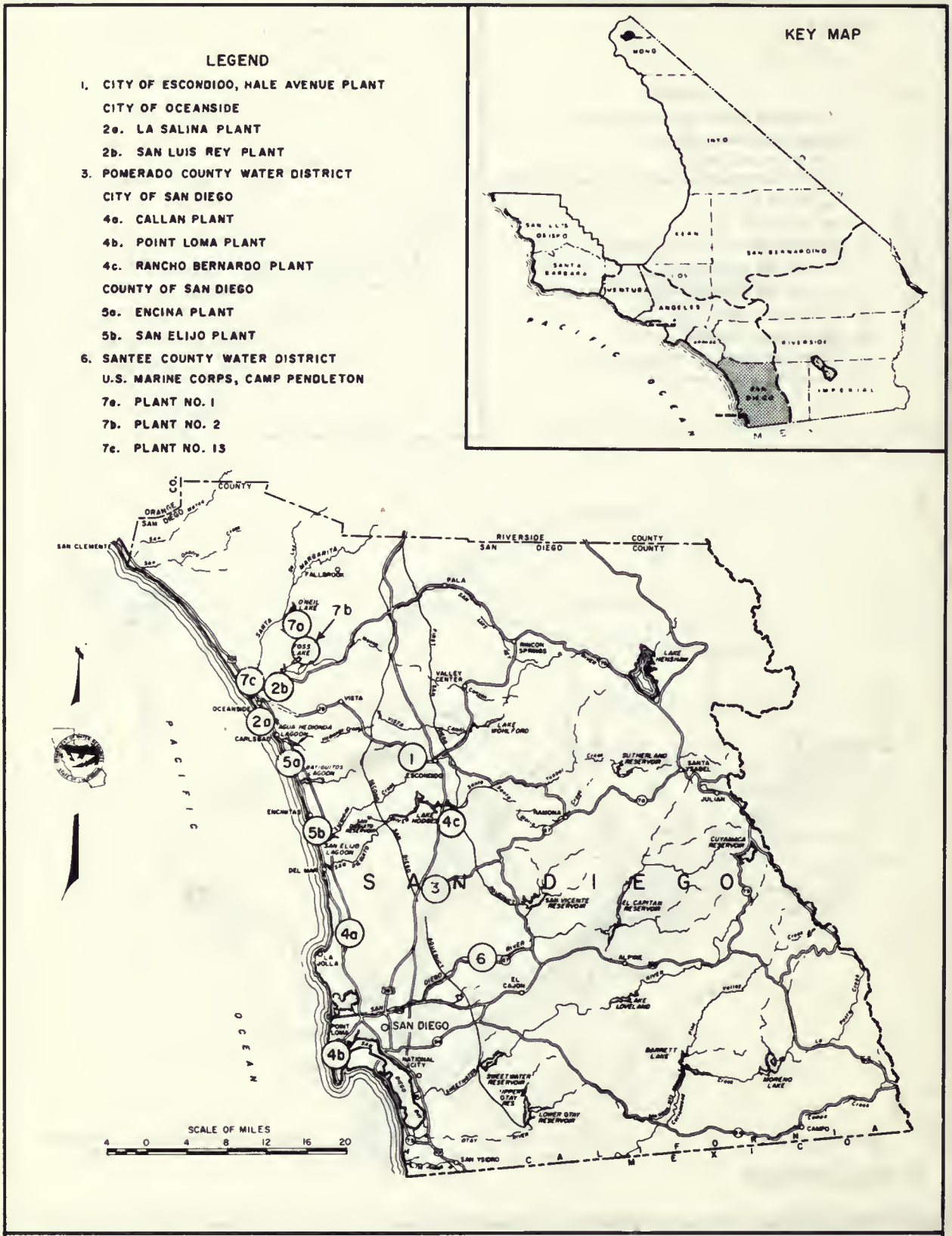

FIGURE 6 — LOCATIONS OF MAJOR WASTE WATER TREATMENT PLANTS IN SAN DIEGO COUNTY PORTION OF SOUTH COASTAL HYDROLOGIC AREA

DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1975

FIGURE 7 — LOCATIONS OF MAJOR WASTE WATER TREATMENT PLANTS IN SAN BERNARDINO COUNTY PORTION OF SOUTH COASTAL HYDROLOGIC AREA

DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1979

FIGURE 8 — LOCATIONS OF MAJOR WASTE WATER TREATMENT PLANTS IN RIVERSIDE COUNTY PORTION OF SOUTH COASTAL HYDROLOGIC AREA

DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1975

FIGURE 9 – LOCATIONS OF MAJOR WASTE WATER TREATMENT PLANTS IN THE SOUTH LAHONTAN HYDROLOGIC AREA

DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1975

FIGURE 10 – LOCATIONS OF MAJOR WASTE WATER TREATMENT PLANTS IN THE COLORADO DESERT HYDROLOGIC AREA

DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1975

TABLE 3
WASTE WATER PRODUCTION AND RECLAMATION[1]
SOUTHERN CENTRAL COASTAL HYDROLOGIC AREA

Treatment plant Water year	Waste water production Daily flow mgd	Waste water production Annual flow 1000 AF	Waste water reclaimed 1000 AF
San Luis Obispo County			
California Men's Colony			
1967-68	0.8	0.9	0
1968-69	0.9	1.0	0
1969-70	0.8	0.9	0
1970-71	0.6	0.6	0
1971-72	0.6	0.7	0
1972-73	0.6	0.7	0
City of Morro Bay[2]			
1967-68	0.9	1.0	0
1968-69	1.1	1.2	0
1969-70	1.0	1.1	0
1970-71	1.1	1.2	0
1971-72	1.1	1.2	0
1972-73	1.2	1.3	0
City of Paso Robles			
1967-68	0.9	1.0	0
1968-69	0.9	1.0	0
1969-70	0.9	1.0	0
1970-71	0.9	1.0	0
1971-72	1.0	1.1	0
1972-73	1.1	1.2	0
City of San Luis Obispo			
1967-68	3.9	4.4	0.9
1968-69	4.5	5.1	1.0
1969-70	3.8	4.3	1.8
1970-71	3.7	4.1	1.9
1971-72	3.5	3.9	1.7
1972-73	3.9	4.4	1.1
South San Luis Obispo County Sanitation District[3]			
1967-68	0.5	0.5	0
1968-69	0.7	0.8	0
1969-70	0.8	0.9	0
1970-71	1.0	1.1	0
1971-72	1.0	1.1	0
1972-73	1.0	1.2	0
Santa Barbara County			
Carpinteria Sanitary District			
1967-68	1.2	1.4	0
1968-69	1.3	1.4	0
1969-70	1.3	1.4	0
1970-71	1.3	1.4	0
1971-72	1.3	1.5	0
1972-73	1.3	1.5	0.3
Goleta Sanitary District			
1967-68	3.9	4.4	0
1968-69	5.0	5.6	0
1969-70	5.3	6.0	0
1970-71	5.5	6.2	0
1971-72	5.6	6.2	0
1972-73	6.0	6.7	0
Laguna County Sanitation District			
1967-68	0.9	1.1	0.8
1968-69	1.0	1.1	0.6
1969-70	1.1	1.2	0.8
1970-71	1.1	1.3	1.0
1971-72	1.2	1.4	1.0
1972-73	1.2	1.3	0
City of Lompoc			
1967-68	2.2	2.4	0
1968-69	2.0	2.2	0
1969-70	1.8	2.0	0
1970-71	2.0	2.3	0
1971-72	2.0	2.3	0
1972-73	2.1	2.4	0
City of Santa Barbara			
1967-68	6.9	7.7	0
1968-69	8.0	9.0	0
1969-70	7.8	8.8	0
1970-71	7.6	8.5	0
1971-72	7.3	8.2	0
1972-73	7.4	8.3	0
City of Santa Maria			
1967-68	3.7	4.1	0.8
1968-69	4.2	4.7	0.8
1969-70	4.5	5.0	0.5
1970-71	4.5	5.1	0.6
1971-72	4.5	5.0	1.0
1972-73	4.5	5.1	1.0
Santa Maria Airport			
1967-68	0.2	0.2	0.2
1968-69	0.3	0.3	0.3
1969-70	0.3	0.3	0.3
1970-71	0.3	0.3	0.3
1971-72	0.3	0.4	0.4
1972-73	0.4	0.4	0.4
Vandenberg Air Force Base			
1967-68	1.5	1.6	0
1968-69	1.6	1.8	0
1969-70	1.5	1.7	0
1970-71	1.4	1.6	0
1971-72	1.3	1.5	0
1972-73	1.3	1.5	0
Total Hydrologic Area			
1967-68	27.5	30.7	2.7
1968-69	31.5	35.2	2.7
1969-70	30.9	34.6	3.4
1970-71	31.0	34.7	3.8
1971-72	30.7	34.5	4.1
1972-73	32.0	36.0	2.8

1 At waste treatment plants with a design capacity of 1.0 mgd or greater
2 Includes Cayucos Sanitary District
3 Includes Grover City

TABLE 4
WASTE WATER PRODUCTION AND RECLAMATION [1]
SOUTH COASTAL HYDROLOGIC AREA

Treatment plant Water year	Waste water production Daily flow mgd	Waste water production Annual flow 1000 AF	Waste water reclaimed 1000 AF
Ventura County			
Camarillo Sanitary District			
1967-68	1.4	1.6	1.1
1968-69	1.5	1.6	1.1
1969-70	1.8	2.0	1.8
1970-71	2.0	2.3	1.8
1971-72	2.3	2.6	2.4
1972-73	2.6	2.8	2.2
Camarillo State Hospital			
1967-68	0.3	0.3	0
1968-69	0.3	0.3	0.3
1969-70	0.3	0.3	0.3
1970-71	0.2	0.3	0.3
1971-72	0.2	0.2	0.2
1972-73	0.2	0.2	0.2
Moorpark County Sanitation District			
1967-68 [2]	0.3	0.1	0
1968-69	0.3	0.3	0
1969-70	0.3	0.4	0
1970-71	0.4	0.4	0
1971-72	0.4	0.4	0
1972-73	0.4	0.4	0
Oak View Sanitary District			
1967-68	1.0	1.1	0
1968-69	0.9	1.0	0
1969-70	1.3	1.4	0
1970-71	1.4	1.6	0
1971-72	1.4	1.6	0
1972-73	1.6	1.7	0
City of Oxnard			
1967-68	9.6	10.7	0
1968-69	8.3	9.3	0
1969-70	9.6	10.7	0
1970-71	9.8	11.0	0
1971-72	10.2	11.5	0
1972-73	11.4	12.8	0
City of San Buenaventura			
Ventura Waste Water Reclamation Facility [3]			
1967-68	3.5	3.9	1.7
1968-69	3.6	4.0	0.1
1969-70	3.8	4.2	0.1
1970-71	2.9	3.3	1.2
1971-72	3.4	3.8	1.2
1972-73	4.1	4.6	1.1
Seaside Plant			
1967-68	1.6	1.8	0
1968-69	1.7	1.9	0
1969-70	1.8	2.0	0
1970-71	1.6	1.8	0
1971-72	1.7	1.9	0
1972-73 [4]	-	-	-
City of Santa Paula			
1967-68	0.9	1.0	0
1968-69	1.3	1.4	0
1969-70	1.2	1.4	0.1
1970-71	1.4	1.6	0
1971-72	1.7	1.9	0
1972-73	1.8	2.0	0
Simi Valley County Sanitation District [5]			
1967-68	1.6	1.8	0
1968-69	1.6	1.8	0
1969-70	2.3	2.6	0
1970-71	2.6	2.9	0
1971-72	2.5	2.8	0
1972-73	3.0	3.4	0.1
City of Thousand Oaks			
Hill Canyon Plant			
1967-68	3.7	4.2	0
1968-69	4.6	5.2	0
1969-70	3.7	4.1	0
1970-71	3.8	4.3	0
1971-72	4.5	5.0	0
1972-73	5.2	5.8	0
Olsen Road Plant [6]			
1967-68	0.1	0.1	0.1
1968-69	0.1	0.1	0.1
1969-70	0.1	0.1	0.1
1970-71	0.1	0.1	0.1
1971-72	0.1	0.1	0.1
1972-73	0.1	0.1	0.1
U. S. Naval Construction Battalion Center, Port Hueneme			
1967-68	0.8	0.9	0
1968-69	0.8	0.9	0
1969-70	0.5	0.6	0
1970-71 [7]	0.8	0.9	0
1971-72	-	-	-
1972-73	-	-	-
Ventura Regional County Sanitation District – Port Hueneme Plant [8]			
1967-68	2.2	2.4	0
1968-69	2.5	2.8	0
1969-70	2.3	2.6	0
1970-71	2.3	2.6	0
1971-72	3.2	3.6	0
1972-73	3.0	3.4	0
Los Angeles County			
City of Burbank			
1967-68	4.2	4.7	1.0
1968-69	5.2	5.8	1.8
1969-70	5.0	5.6	2.0
1970-71	4.9	5.5	2.1
1971-72	5.0	5.6	2.5
1972-73	4.8	5.4	2.6

1 At waste water treatment plants with a design capacity of 1.0 mgd or greater
2 Start-up date February 1968
3 Formerly Eastside Plant
4 Closed permanently January 31, 1974. All flows included in Ventura Waste Water Reclamation Facility.
5 Formerly Sanitation Inc., Simi
6 Formerly Ventura County Waterworks District No. 6
7 Since May 1971 part of Ventura Regional County Sanitation District, Port Hueneme Plant
8 Formerly City of Port Hueneme Plant

TABLE 4 (continued)
WASTE WATER PRODUCTION AND RECLAMATION [1]
SOUTH COASTAL HYDROLOGIC AREA

Treatment plant Water year	Waste water production Daily flow mgd	Waste water production Annual flow 1000 AF	Waste water reclaimed 1000 AF
Las Virgenes Municipal Water District Tapia Plant			
1967-68	0.6	0.7	0
1968-69	1.2	1.3	0
1969-70	1.4	1.6	1.6
1970-71	1.8	2.0	0
1971-72	2.1	2.4	0.4
1972-73 [9]	3.1	3.4	0.4
City of Los Angeles			
Hyperion Plant			
1967-68	325.0	365.0	1.8
1968-69	346.0	387.6	3.2
1969-70	330.1	369.8	0
1970-71	335.6	375.9	3.8
1971-72	332.0	372.9	5.6
1972-73	339.4	380.2	5.6
Terminal Island Plant			
1967-68	7.6	8.5	0
1968-69	8.1	9.1	0
1969-70	8.4	9.5	0
1970-71	9.1	10.2	0
1971-72	9.4	10.6	0
1972-73	10.2	11.5	0
County Sanitation Districts of Los Angeles County			
Joint Water Pollution Control Plant			
1967-68	345.0	386.5	0
1968-69	366.5	410.5	0
1969-70	377.1	422.4	0
1970-71	364.5	408.2	0
1971-72	356.4	400.3	0
1972-73	359.0	402.2	0
District 21 - Pomona Plant			
1967-68	6.2	6.9	6.9
1968-69	6.9	7.8	0.3
1969-70	9.1	10.1	0.4
1970-71	7.5	8.4	0.7
1971-72	7.9	8.9	0.2
1972-73	8.2	9.2	0.7
District 22 - Miller Plant			
1967-68	0.3	0.4	0.4
1968-69	0.4	0.5	0
1969-70	0.4	0.4	0
1970-71	0.5	0.6	0
1971-72 [10]	0.5	0.4	0
1972-73	-	-	-
District 26 - Saugus Plant			
1967-68	1.8	2.0	0
1968-69	2.7	3.1	0
1969-70	2.7	3.1	0
1970-71	3.0	3.3	0
1971-72	2.8	3.2	0
1972-73	3.0	3.4	0
District 32 - Valencia Plant			
1967-68	0.1	0.1	0
1968-69	0.4	0.4	0
1969-70	0.4	0.5	0
1970-71	0.6	0.7	0
1971-72	0.7	0.8	0
1972-73	1.0	1.1	0
Long Beach Plant			
1967-68	- -	-	-
1968-69	-	-	-
1969-70	-	-	-
1970-71	-	-	-
1971-72	-	-	-
1972-73 [11]	7.0	3.1	0
Whittier Narrows Plant			
1967-68	16.3	18.3	18.3
1968-69	15.3	17.1	13.9
1969-70	15.4	17.2	17.1
1970-71	17.5	19.6	19.5
1971-72	15.7	17.6	17.6
1972-73	12.6	14.1	14.1
Los Coyotes Plant			
1967-68	-	-	-
1968-69	-	-	-
1969-70 [12]	8.4	4.0	0
1970-71	8.6	9.7	0
1971-72	8.4	9.4	0
1972-73	8.3	9.3	0
San Jose Creek Plant			
1967-68	-	-	-
1968-69	-	-	-
1969-70	-	-	-
1970-71	-	-	-
1971-72	30.6	34.4	0
1972-73 [13]	28.1	31.5	8.3
Orange County			
Capistrano Beach Sanitary District			
1967-68	0.4	0.4	0
1968-69	0.5	0.6	0
1969-70	0.6	0.7	0
1970-71	0.6	0.7	0
1971-72	0.7	0.7	0
1972-73	0.4	0.5	0
Irvine Ranch Water District			
1967-68 [14]	0.3	0.4	0.4
1968-69	0.5	0.6	0.6
1969-70	0.7	0.8	0.8
1970-71	1.0	1.1	1.1
1971-72	1.5	1.7	1.5
1972-73	3.1	3.5	3.5

9 Includes flows from Mulwood Plant which was out of service during 1973
10 Permanently closed June 1972. Now part of San Jose Creek Plant
11 Start-up date May 10, 1973
12 Start-up date May 1970
13 Start-up date July 1, 1971
14 Start-up date October 1967

TABLE 4 (continued)
WASTE WATER PRODUCTION AND RECLAMATION [1]
SOUTH COASTAL HYDROLOGIC AREA

Treatment plant Water year	Waste water production Daily flow mgd	Waste water production Annual flow 1000 AF	Waste water reclaimed 1000 AF
City of Laguna Beach			
1967-68	1.8	2.0	0
1968-69	1.9	2.2	0
1969-70	2.1	2.4	0
1970-71	2.1	2.3	0
1971-72	1.8	2.0	0
1972-73	2.0	2.2	0
Los Alisos Water District			
1967-68	0.1	0.1	0
1968-69	0.1	0.1	0
1969-70	0.1	0.1	0
1970-71 [15]	0.2	0.2	0.2
1971-72	0.6	0.7	0.7
1972-73	0.8	0.8	0.8
County Sanitation Districts of Orange County			
Plant No. 1			
1967-68	42.6	47.9	0
1968-69	48.9	54.8	0.2
1969-70	50.1	56.1	1.3
1970-71	49.3	55.2	1.2
1971-72	48.6	54.6	1.3
1972-73	47.0	52.7	1.1
Plant No. 2			
1967-68	75.8	85.1	0
1968-69	75.7	84.8	0
1969-70	78.1	87.5	0
1970-71	86.2	96.6	0
1971-72	92.5	103.9	0
1972-73	102.6	115.0	2.2
Rossmoor Sanitation Inc., Laguna Hills			
1967-68	1.0	1.1	0
1968-69	1.0	1.2	0.3
1969-70	1.1	1.2	0.7
1970-71	1.4	1.5	1.5
1971-72	1.5	1.7	1.7
1972-73	1.8	2.0	1.9
City of San Clemente			
1967-68	1.8	2.0	0.3
1968-69	1.8	2.0	0.6
1969-70	1.7	1.9	0.9
1970-71	1.6	1.8	1.2
1971-72	1.6	1.8	1.6
1972-73	1.9	2.1	1.4
City of San Juan Capistrano [16]			
1967-68	0.2	0.2	0
1968-69	0.2	0.2	0
1969-70	0.3	0.3	0
1970-71	0.7	0.7	0
1971-72	0.8	0.9	0
1972-73	2.0	2.3	0
City of Seal Beach			
1967-68	1.1	1.2	0
1968-69	1.0	1.1	0
1969-70	1.0	1.1	0
1970-71	1.1	1.3	0
1971-72	1.1	1.3	0
1972-73	1.2	1.3	0
South Laguna Sanitary District			
1967-68	0.5	0.6	0
1968-69	0.9	1.0	0
1969-70 [17]	1.2	1.4	0
1970-71	2.1	2.4	0
1971-72	1.5	1.7	0
1972-73	1.6	1.8	0
U. S. Marine Corps Air Station, El Toro			
1967-68	1.0	1.1	0.6
1968-69	1.0	1.1	0.4
1969-70	1.2	1.3	0.4
1970-71	1.2	1.3	0.4
1971-72	1.1	1.3	0.4
1972-73 [18]	-	-	-
San Diego County			
City of Escondido, Hale Avenue Plant			
1967-68	2.9	3.3	0
1968-69	3.4	3.9	0
1969-70	3.3	3.7	0
1970-71	3.9	4.3	0
1971-72	3.5	4.0	0
1972-73	4.2	4.6	0
City of Oceanside			
La Salina Plant			
1967-68	2.8	3.1	3.1
1968-69	2.9	3.3	1.3
1969-70	2.8	3.2	0.4
1970-71	2.9	3.2	0.5
1971-72	3.2	3.5	0.5
1972-73	3.2	3.6	0.5
San Luis Rey Plant			
1967-68	0.8	0.9	0.9
1968-69	0.8	0.9	0.4
1969-70	0.8	0.9	0.1
1970-71	1.1	1.2	0.2
1971-72	1.3	1.5	0.2
1972-73	1.5	1.7	0.2
Pomerado County Water District			
1967-68	0.2	0.2	0
1968-69	0.8	0.9	0.4
1969-70	0.9	1.0	0
1970-71	0.9	1.0	1.9
1971-72 [19]	1.0	0.8	0.1
1972-73	-	-	-

15 Capacity enlarged to 1.0 mgd March 1971 and to 3.0 mgd June 1974
16 Since 1971 includes bypass of Moulton Niguel Water District Plant No. 3-A and since October 1972 all flows of Santa Margarita Water District
17 Capacity enlarged to 3.2 mgd April 1970. Includes since 1970 flows of Moulton Niguel Water District Plants 1-A and 2-A.
18 Since October 1972 part of Irvine Ranch Water District
19 Since July 1, 1972 part of San Diego Metropolitan System, Point Loma Plant

TABLE 4 (continued)
WASTE WATER PRODUCTION AND RECLAMATION [1]
SOUTH COASTAL HYDROLOGIC AREA

Treatment plant Water year	Waste water production Daily flow mgd	Waste water production Annual flow 1000 AF	Waste water reclaimed 1000 AF
City of San Diego			
Callan Plant			
1967-68	0.5	0.5	0.1
1968-69	0.5	0.6	0.1
1969-70	0.4	0.5	0.1
1970-71	0.4	0.4	0
1971-72 [20]	0.4	0.2	0.1
1972-73	-	-	-
Point Loma Plant			
1967-68	80.L	90.8	0
1968-69	82.6	92.6	0
1969-70	83.3	93.3	0
1970-71	88.8	99.4	0
1971-72	88.3	99.2	0
1972-73	99.4	111.3	0
Rancho Bernardo Plant			
1967-68	0.4	0.4	0.2
1968-69 [21]	0.6	0.7	0.5
1969-70	0.7	0.7	0.5
1970-71	0.9	1.1	0.6
1971-72	1.0	1.2	1.2
1972-73	1.0	1.2	1.2
County of San Diego			
Encina Plant			
1967-68	2.5	2.8	0
1968-69	2.9	3.3	0
1969-70	3.8	4.2	0
1970-71	4.5	5.0	0
1971-72	4.9	5.5	0
1972-73	6.0	6.8	0
San Elijo Plant			
1967-68	0.9	1.0	0
1968-69	1.0	1.1	0
1969-70	1.0	1.1	0
1970-71	1.1	1.3	0
1971-72	1.2	1.4	0
1972-73	1.4	1.6	0
Santee County Water District			
1967-68	1.3	1.5	1.5
1968-69	1.7	1.9	1.1
1969-70	1.3	1.5	0.3
1970-71	1.6	1.8	0.4
1971-72 [22]	2.0	2.2	0.7
1972-73	3.8	4.3	0.4
U. S. Marine Corps, Camp Pendleton			
Plant No. 1			
1967-68	0.8	0.9	0.9
1968-69	0.8	0.9	0.9
1969-70	0.7	0.8	0.8
1970-71	0.7	0.7	0.7
1971-72	0.7	0.8	0.8
1972-73	0.8	0.9	0.9
Plant No. 2			
1967-68	0.7	0.8	0.8
1968-69	0.6	0.7	0.7
1969-70	0.7	0.8	0.8
1970-71	0.6	0.6	0.6
1971-72	0.5	0.5	0.5
1972-73	0.5	0.6	0.6
Plant No. 13			
1967-68	0.5	0.6	0
1968-69	0.6	0.6	0.6
1969-70	0.6	0.6	0.7
1970-71	0.6	0.7	0.7
1971-72	0.7	0.8	0.8
1972-73	0.6	0.6	0.6
San Bernardino County			
Big Bear City Community Services District			
1967-68	-	-	-
1968-69	-	-	-
1969-70 [23]	0.2	0.2	0
1970-71	0.4	0.5	0
1971-72	0.5	0.5	0
1972-73	0.7	0.8	0
California Institution for Men			
1967-68	0.9	1.0	1.0
1968-69	0.8	0.9	0.9
1969-70	0.8	0.9	0.9
1970-71	0.7	0.8	0.8
1971-72	0.7	0.8	0.6
1972-73	0.6	0.7	0.3
Chino Basin Municipal Water District			
Carl B. Masingale Tertiary Plant, Ontario [24]			
1967-68	9.0	10.1	1.1
1968-69	9.9	11.2	0.9
1969-70	10.5	11.8	1.1
1970-71	11.2	12.6	1.0
1971-72	10.6	11.9	1.0
1972-73	10.1	11.3	11.3
Regional Plant No. 2, Chino [25]			
1967-68	1.3	1.5	1.2
1968-69	1.3	1.5	0.7
1969-70	2.0	2.2	0.8
1970-71	2.0	2.3	2.3
1971-72	2.2	2.5	1.1
1972-73	2.5	2.8	0.1
Regional Plant No. 3, Fontana [26]			
1967-68	2.0	2.2	0
1968-69	2.1	2.3	0
1969-70	2.1	2.3	0
1970-71	2.1	2.4	0.3
1971-72	2.2	2.5	1.1
1972-73	2.2	2.5	0.8

20 Permanently closed June 1972. Now part of Point Loma Plant
21 Capacity enlarged to 1.0 mgd July 1969
22 Since September 1972 bypass of Lakeside Sanitation District included
23 Plant construction completed October 1969; since June 17, 1970 the District receives pretreated effluent from Big Bear Lake Sanitation District
24 Start-up date January 1973; incorporates Regional Plant No. 1 (formerly Cities of Ontario and Upland)
25 Formerly City of Chino
26 Formerly City of Fontana

TABLE 4 (continued)
WASTE WATER PRODUCTION AND RECLAMATION [1]
SOUTH COASTAL HYDROLOGIC AREA

Treatment plant Water year	Waste water production Daily flow mgd	Waste water production Annual flow 1000 AF	Waste water reclaimed 1000 AF
City of Colton			
1967-68	2.3	2.5	2.4
1968-69	2.8	3.2	3.0
1969-70	2.1	2.3	2.1
1970-71	1.9	2.1	1.9
1971-72	2.2	2.4	0.8
1972-73	2.2	2.5	0
Cucamonga County Water District [27]			
1967-68	0.8	0.9	0
1968-69	2.1	2.4	0
1969-70	1.3	1.4	0
1970-71	2.0	2.2	2.2
1971-72	2.2	2.4	2.4
1972-73	2.3	2.6	2.6
Kaiser Steel Corporation, Fontana			
1967-68	0.5	0.5	0.5
1968-69	0.4	0.5	0.5
1969-70	0.3	0.4	0.4
1970-71	0.4	0.5	0.5
1971-72	0.4	0.5	0.4
1972-73	0.4	0.5	0.3
Norton Air Force Base, Plant 1264 [28]			
1967-68	0.1	0.1	0
1968-69	0.1	0.1	0
1969-70	0.1	0.1	0
1970-71	0.1	0.1	0
1971-72	0.1	0.1	0
1972-73	0.1	0.1	0
City of Redlands			
1967-68	2.1	2.3	0
1968-69	2.1	2.4	2.4
1969-70	2.2	2.5	0
1970-71	2.4	2.6	0
1971-72	2.5	2.8	0
1972-73	2.5	2.8	0
City of Rialto			
1967-68	1.7	1.9	0
1968-69	1.8	2.0	0
1969-70	2.0	2.2	0
1970-71	2.0	2.3	0
1971-72	2.1	2.4	0
1972-73	2.0	2.3	0
City of San Bernardino Plant No. 1			
1967-68	6.5	7.3	0.1
1968-69	7.3	8.1	0.2
1969-70	8.0	9.0	0.4
1970-71	8.5	9.3	0
1971-72	7.5	7.7	1.0
1972-73 [29]	7.5	1.4	0.2
Plant No. 2			
1967-68	8.1	9.1	0
1968-69	7.8	8.8	0
1969-70	8.5	9.5	0
1970-71	8.3	9.3	0
1971-72	8.3	9.3	1.1
1972-73	16.0	16.5	1.5
Riverside County			
City of Corona			
1967-68	2.3	2.6	0
1968-69	2.4	2.7	0
1969-70	2.7	3.0	0
1970-71	2.9	3.2	0
1971-72	2.9	3.2	0
1972-73 [30]	3.0	3.4	0
Eastern Municipal Water District Hemet-San Jacinto Plant			
1967-68	1.3	1.5	1.5
1968-69	1.5	1.7	1.7
1969-70	1.7	1.9	1.9
1970-71	1.9	2.1	2.1
1971-72	2.2	2.5	1.5
1972-73	3.0	3.4	1.1
Sun City Plant			
1967-68	0.3	0.3	0
1968-69	0.6	0.6	0
1969-70	0.8	0.9	0
1970-71	0.5	0.5	0
1971-72	0.4	0.5	0
1972-73	0.5	0.5	0
Sunnymead Plant			
1967-68 [31]	-	-	-
1968-69	0.2	0.2	0.2
1969-70	0.3	0.4	0
1970-71	0.4	0.5	0.5
1971-72	0.5	0.6	0.3
1972-73	0.6	0.6	0.6
Jurupa Community Services District			
1967-68	0.5	0.6	0
1968-69	0.7	0.8	0
1969-70	0.8	0.9	0
1970-71	0.9	1.0	0
1971-72	0.9	1.0	0
1972-73	1.0	1.2	0
March Air Force Base Main Plant			
1967-68	0.4	0.5	0.5
1968-69	0.4	0.4	0.4
1969-70	0.5	0.5	0.5
1970-71	0.3	0.4	0.4
1971-72	0.4	0.4	0.4
1972-73	0.4	0.4	0.4

27 Since July 1971 operated by Chino Basin Municipal Water District
28 Capacity enlarged to 1.1 mgd in 1972
29 Plant closed November 30, 1972; all flows now handled by Plant No. 2
30 Includes City of Norco since October 10, 1972
31 Start-up date December 1968

TABLE 4 (continued)
WASTE WATER PRODUCTION AND RECLAMATION [1]
SOUTH COASTAL HYDROLOGIC AREA

Treatment plant Water year	Waste water production Daily flow mgd	Waste water production Annual flow 1000 AF	Waste water reclaimed 1000 AF
West Plant			
1967-68	0.2	0.3	0.3
1968-69	0.2	0.3	0.3
1969-70	0.3	0.3	0.3
1970-71	0.2	0.2	0.2
1971-72	0.2	0.2	0.2
1972-73	0.2	0.2	0.2
City of Perris			
1967-68	0.2	0.2	0
1968-69	0.2	0.3	0
1969-70 [32]	0.3	0.3	0
1970-71	0.3	0.3	0
1971-72	0.4	0.4	0.1
1972-73	0.3	0.3	0
City of Riverside			
1967-68	15.4	17.3	0
1968-69	15.4	17.2	0
1969-70	17.6	19.8	0
1970-71	17.0	19.1	0
1971-72	17.7	19.9	0
1972-73	17.7	19.9	0
Rubidoux Community Services District			
1967-68 [33]	0.7	0.7	0.3
1968-69	0.9	1.0	0
1969-70	0.9	1.0	0.1
1970-71	1.1	1.2	0.6
1971-72	0.7	0.8	0.1
1972-73	0.9	1.0	0
Total Hydrologic Area			
1967-68	1,012.2	1,135.3	49.0
1968-69	1,073.9	1,203.5	40.1
1969-70	1,087.1	1,217.5	39.8
1970-71	1,105.9	1,238.5	53.5
1971-72	1,132.3	1,271.1	54.4
1972-73	1,169.9	1,310.7	70.1

32 Capacity enlarged to 1.0 mgd September 1970

33 Capacity enlarged to 1.2 mgd December 1967

TABLE 5
WASTE WATER PRODUCTION AND RECLAMATION [1]
SOUTH LAHONTAN HYDROLOGIC AREA

Treatment plant Water year	Waste water production Daily flow mgd	Waste water production Annual flow 1000 AF	Waste water reclaimed 1000 AF
Mono County			
Mammoth County Water District			
1967-68	0.3	0.3	0.3
1968-69	0.4	0.4	0.4
1969-70	0.4	0.4	0.4
1970-71	0.5	0.5	0
1971-72	0.5	0.5	0
1972-73 [2]	0.8	0.9	0
Inyo County			
City of Bishop			
1967-68	1.9	2.1	0
1968-69	1.7	1.9	1.1
1969-70	1.6	1.8	1.1
1970-71	1.8	2.0	1.0
1971-72	1.4	1.6	0.9
1972-73	1.0	1.2	0.6
Kern County			
Edwards Air Force Base			
1967-68	1.0	1.1	0
1968-69	1.0	1.1	0
1969-70	1.2	1.3	0
1970-71	1.2	1.3	0
1971-72	1.5	1.7	0
1972-73	1.3	1.5	0
Ridgecrest Sanitation District			
1967-68	0.6	0.7	0.7
1968-69	0.6	0.7	0.7
1969-70	0.7	0.8	0.8
1970-71	0.7	0.8	0.8
1971-72	0.8	0.9	0.9
1972-73	0.8	0.9	0.9
U. S. Naval Ordnance Test Station, China Lake			
1967-68	1.5	1.7	0.6
1968-69	1.7	1.9	0.7
1969-70	1.6	1.8	0.8
1970-71	1.6	1.8	0.7
1971-72	1.7	1.9	0.7
1972-73	1.6	1.8	0.6
Los Angeles County			
County Sanitation Districts of Los Angeles County District 14, Lancaster Plant			
1967-68	3.2	3.6	0
1968-69	3.4	3.8	0
1969-70	3.4	3.8	0.1
1970-71	3.4	3.9	0.3
1971-72	3.6	4.0	0.4
1972-73	4.0	4.4	0.5
District 20, Palmdale Plant			
1967-68	1.0	1.2	0.4
1968-69	1.1	1.2	0.3
1969-70	1.1	1.2	0.4
1970-71	1.3	1.4	0.4
1971-72	1.3	1.5	0.6
1972-73	1.6	1.7	0.6
U. S. Air Force Plant No. 42, Palmdale			
1967-68	0.2	0.2	0
1968-69	0.2	0.2	0
1969-70	0.1	0.2	0
1970-71	0.2	0.2	0
1971-72	0.8	0.9	0
1972-73	0.2	0.2	0
San Bernardino County			
City of Barstow			
1967-68	1.0	1.1	0
1968-69	1.5	1.7	0
1969-70	1.4	1.6	0
1970-71	1.8	2.0	0
1971-72	2.2	2.5	0
1972-73	1.7	1.9	0
George Air Force Base			
1967-68	0.8	0.9	0.3
1968-69	0.7	0.8	0.3
1969-70	1.0	1.1	0.4
1970-71	0.8	0.8	0.6
1971-72	0.8	0.9	0.6
1972-73	0.7	0.8	0.3
Lake Arrowhead Sanitation District			
1967-68	0.4	0.4	0
1968-69	0.6	0.6	0
1969-70	0.5	0.5	0
1970-71	0.5	0.5	0.1
1971-72	0.5	0.5	0
1972-73	0.6	0.7	0.2
U. S. Army, Fort Irwin			
1967-68	0.5	0.5	0.5
1968-69	0.4	0.4	0.4
1969-70	0.5	0.5	0.5
1970-71	0.3	0.3	0.3
1971-72	0.2	0.2	0
1972-73	0.1	0.1	0
U. S. Marine Corps Supply Center, Barstow			
Nebo Plant			
1967-68	0.3	0.4	0.1
1968-69	0.3	0.3	0.2
1969-70	0.3	0.4	0.2
1970-71	0.7	0.8	0.2
1971-72	0.4	0.5	0.1
1972-73	0.5	0.5	0
Yermo Plant			
1967-68	0.2	0.2	0
1968-69	0.2	0.2	0
1969-70	0.3	0.3	0
1970-71	0.2	0.2	0
1971-72	0.2	0.2	0
1972-73	0.1	0.1	0
Victorville Sanitary District			
1967-68	0.6	0.7	0
1968-69	0.7	0.7	0
1969-70	0.7	0.8	0
1970-71	0.7	0.8	0
1971-72	0.7	0.8	0
1972-73	0.8	0.9	0
Total Hydrologic Area			
1967-68	13.5	15.1	2.9
1968-69	14.5	15.9	4.1
1969-70	14.8	16.5	4.7
1970-71	15.7	17.3	4.4
1971-72	16.6	18.6	4.2
1972-73	15.8	17.6	3.7

1 At waste water treatment plants with a design capacity of 1.0 mgd or greater

2 Capacity enlarged to 1.5 mgd August 1973

TABLE 6
WASTE WATER PRODUCTION AND RECLAMATION [1]
COLORADO DESERT HYDROLOGIC AREA

Treatment plant Water year	Waste water production Daily flow mgd	Waste water production Annual flow 1000 AF	Waste water reclaimed 1000 AF
Imperial County			
City of Brawley			
1967-68	1.2	1.3	0
1968-69	1.3	1.4	0
1969-70	1.3	1.5	0
1970-71	1.2	1.4	0
1971-72	1.2	1.3	0
1972-73	1.3	1.5	0
City of Calexico			
1967-68	1.0	1.1	0
1968-69	0.6	0.7	0
1969-70	0.6	0.7	0
1970-71	0.5	0.6	0
1971-72	0.6	0.7	0
1972-73	0.4	0.5	0
City of El Centro			
1967-68	1.9	2.1	0
1968-69	2.0	2.3	0
1969-70	2.0	2.2	0
1970-71	2.7	3.0	0
1971-72	3.2	3.6	0
1972-73	3.4	3.8	0
City of Imperial			
1967-68	0.6	0.7	0
1968-69	0.7	0.7	0
1969-70	0.7	0.7	0
1970-71	0.6	0.7	0
1971-72	0.7	0.8	0
1972-73	0.6	0.6	0
U. S. Naval Air Facility, El Centro			
1967-68	0.2	0.2	0
1968-69	0.2	0.2	0
1969-70	0.3	0.3	0
1970-71 [2]	0.6	0.7	0
1971-72	0.3	0.3	0
1972-73	0.3	0.3	0
San Bernardino County			
City of Needles			
1967-68	0.6	0.7	0
1968-69	0.8	0.9	0
1969-70	1.0	1.1	0
1970-71	0.6	0.6	0
1971-72	0.6	0.7	0
1972-73	0.9	1.0	0
U. S. Marine Corps Base, Twentynine Palms Plant			
1967-68	1.2	1.3	0.6
1968-69	1.3	1.4	0.4
1969-70	1.2	1.3	0.9
1970-71	1.2	1.3	0.9
1971-72	0.6	0.7	0.3
1972-73	0.3	0.3	0
Riverside County			
City of Banning			
1967-68	0.4	0.5	0
1968-69	0.5	0.5	0
1969-70	0.5	0.6	0
1970-71	0.6	0.6	0
1971-72	0.6	0.7	0
1972-73	0.5	0.6	0
City of Blythe			
1967-68	0.6	0.6	0
1968-69	0.9	1.0	0
1969-70	0.9	1.0	0
1970-71	0.9	1.0	0
1971-72	0.8	0.9	0
1972-73	0.7	0.7	0
Coachella Sanitary District			
1967-68	0.8	0.9	0.8
1968-69	0.7	0.8	0.8
1969-70	0.7	0.8	0.8
1970-71	0.7	0.8	0.8
1971-72	0.7	0.8	0.6
1972-73 [3]	0.8	0.9	0.2
East Blythe County Water District			
1967-68	0.2	0.2	0.1
1968-69	0.3	0.3	0.2
1969-70	0.4	0.4	0
1970-71	0.4	0.4	0
1971-72	0.3	0.3	0
1972-73 [4]	0.2	0.3	0
Kaiser Steel Corporation, Eagle Mountain			
1967-68	0.5	0.5	0.5
1968-69	1.6	1.8	0.7
1969-70	1.6	1.8	0.7
1970-71	1.3	1.5	0.5
1971-72	1.4	1.6	0.8
1972-73	2.3	2.6	1.6
City of Palm Springs			
1967-68	2.2	2.5	0.9
1968-69	2.4	2.7	0.9
1969-70	2.4	2.7	0.9
1970-71	2.5	2.8	1.0
1971-72	2.8	3.1	1.5
1972-73	3.0	3.4	0.6
Valley Sanitary District			
1967-68	2.7	3.1	0.9
1968-69	2.7	3.0	0.4
1969-70	3.5	3.9	1.0
1970-71	3.0	3.4	1.5
1971-72	3.3	3.8	1.5
1972-73	3.6	4.0	1.0
Total Hydrologic Area			
1967-68	14.1	15.7	3.8
1968-69	16.0	17.7	3.4
1969-70	17.1	19.0	4.3
1970-71	16.8	18.8	4.7
1971-72	17.1	19.3	4.7
1972-73	18.3	20.5	3.4

1 At waste water treatment plants with a design capacity of 1.0 mgd or greater
2 Capacity enlarged to 1.0 mgd during 1970
3 Capacity enlarged to 1.5 mgd January 1973
4 Capacity enlarged to 1.5 mgd September 1967

TABLE 7
WASTE WATER TREATMENT FACILITIES*
SOUTHERN CENTRAL COASTAL HYDROLOGIC AREA

Discharger	Population served (1000's)	Design capacity (mgd)	Type of waste water	Treatment facilities	Place of discharge	Uses of reclaimed waste water
San Luis Obispo County						
California Men's Colony	10.3	2.5	Municipal, industrial	Secondary: bar screen, comminutor, primary clarifier, trickling filters, grit chamber, final clarifier, chlorination facilities, and digester.	Chorro Creek	Crop irrigation
Morro Bay, City of (1)	10.0	1.7	Municipal, industrial	Secondary: bar screen, primary clarifiers, trickling filters, final clarifiers, chlorination facilities, digesters, and sludge beds.	Pacific Ocean	None
Paso Robles, City of	7.5	2.2	Municipal, industrial	Secondary: bar screen, comminutor, pre-chlorination facilities, pre-aeration tank, primary clarifier, trickling filter, final clarifier, oxidation ponds, chlorination facilities, digester, and sludge beds.	Salinas River	None
San Luis Obispo City of	44.5	5.0	Municipal, industrial	Secondary: barminutor, grit chamber, primary clarifiers, trickling filters, final clarifier, oxidation ponds, chlorination facilities, digesters, and sludge beds.	San Luis Obispo Creek	Crop irrigation
South San Luis (2) Obispo County Sanitation District	14.5	2.5	Municipal	Secondary: comminutor, primary clarifier, aeration tanks, final clarifier, chlorination facilities, digester, and sludge beds.	Pacific Ocean	None
Santa Barbara County						
Carpinteria Sanitary District	9.0	2.0	Municipal	Secondary: comminutor, primary clarifier, trickling filters, final clarifiers, chlorination facilities, digesters, and sludge beds.	Pacific Ocean	Industrial use within plant
Goleta Sanitary District	62.0	10.5	Municipal	Primary: bar screen, comminutor, aerated grit chamber, sedimentation tanks, chlorination facilities, digesters, and sludge beds.	Pacific Ocean	Landscape irrigation
Laguna County Sanitation District	6.6	1.4	Municipal	Secondary: barminutor, primary clarifier, trickling filter, final clarifier, oxidation ponds, digester, and sludge beds.	Pacific Ocean	None
Lompoc, City of	26.0	1.8	Municipal	Secondary: barminutor, primary clarifier, trickling filters, final clarifier, oxidation pond, chlorination facilities, digesters, and sludge beds.	Santa Ynez River	None
Santa Barbara City of	71.4	8.0	Municipal	Primary: barminutor, sedimentation tanks, chlorination facilities, digesters, and sludge centrifuge.	Pacific Ocean	None
Santa Maria, City of	35.0	6.5	Municipal, industrial	Secondary: pre-chlorination facilities, bar screen, primary clarifiers, trickling filters, final clarifiers, chlorination facilities, percolation ponds, digesters, and sludge beds.	Land	Crop irrigation
Santa Maria Airport	5.0	1.0	Municipal, industrial	Secondary: bar screen, grit chamber, primary clarifier, trickling filters, final clarifier, chlorination facilities, digester, and sludge beds	Land	Crop irrigation
Vandenberg Air Force Base	14.0	3.5	Municipal	Secondary: barminutor, grit chamber, primary clarifier, trickling filters, final clarifier, digesters, and sludge beds.	Pacific Ocean	None

* Plants with a design capacity of 1.0 mgd or greater
(1) Includes Cayucos Sanitary District
(2) Includes Grover City

TABLE 8
WASTE WATER TREATMENT FACILITIES *
SOUTH COASTAL HYDROLOGIC AREA

Discharger	Population served (1000's)	Design capacity (mgd)	Type of waste water	Treatment facilities	Place of discharge	Uses of reclaimed waste water
Ventura County						
Camarillo Sanitary District	29.0	4.8	Municipal	Secondary: comminutor, primary clarifiers, aeration tanks, final clarifiers, holding ponds, sand filter, chlorination facilities, digesters, and sludge beds.	Conejo Creek	Crop and landscape irrigation
Camarillo State Hospital	4.0	3.0	Municipal	Secondary: bar screen, comminutors, grit chamber, primary clarifiers, trickling filters, final clarifiers, holding pond, chlorination facilities, digesters, and sludge beds.	Land	Crop irrigation
Moorpark County Sanitation District	5.0	1.0	Municipal industrial	Secondary: septic tank, aerators, oxidation ponds, air flotation tank, multi-media filters, chlorination facilities, and sludge beds.	Arroyo Simi	None
Oak View Sanitary District	23.0	3.0	Municipal	Secondary: barminutor, primary clarifiers, trickling filters, aeration tank, final clarifiers, holding pond, chlorination facilities, digesters, and sludge beds.	Ventura River	Landscape irrigation, industrial
Oxnard, City of	84.0	25.0	Municipal, industrial	Primary: communitor, aerated grit chamber, sedimentation tanks, chlorination facilities vacuum filters, and incinerator	Pacific Ocean	None
San Buenaventura, City of						
Ventura Wastewater Reclamation Facility (1)	54.0	14.0	Municipal	Secondary: barminutor, degritter, primary clarifier, trickling filters, aeration tank, final clarifiers, surge ponds, chlorination facilities, and mixed-media filters	Land	Landscape and golf course irrigation, recreation
Seaside Plant	(2)	2.2	Municipal industrial	Primary: bar screen, comminutor, sedimentation tanks, chlorination facilities, digesters, and sludge beds.	Pacific Ocean	None
Santa Paula, City of	18.6	2.4	Municipal	Secondary: comminutors, grit chamber, primary clarifiers, trickling filters, final clarifier, chlorination facilities, digesters, and sludge beds.	Santa Clara River	Crop and landscape irrigatinn, industrial
Simi Valley (3) County Sanitation District	43.6	4.4	Municipal	Secondary: bar screen, comminutor, primary clarifier, aeration tank, final clarifier, holding tank, chlorination facilities, digester, and sludge beds.	Arroyo Simi	None
Thousand Oaks, City of						
Hill Canyon Plant	60.0	10.0	Municipal industrial	Secondary: bar screen, comminutors, grit chamber, primary clarifiers, aeration tanks, final clarifiers, holding pond, chlorination facilities, digesters, and sludge beds.	Conejo Creek	None
Olsan Road (4) Plant	0.7	1.5	Municipal	Secondary bar screen, comminutor, aeration tank, final clarifier, holding tank, chlorination facilities, digester, and sludge beds.	Land	Golf course irrigation
U. S. Navel Construction Battalion Center, Port Huenema	(5)	3.0	Municipal	Primary: bar screens, grit chambers, Imhoff tanks, sedimentation tank, and sludge beds.	Pacific Ocean	None

* Plants with a design capacity of 1.0 or greater
(1) Formerly: Eastside Plant
(2) Closed permanently January 31, 1974. All flows being handled by Ventura Wastewater Reclamation Facility
(3) Formerly: Sanitation Inc., Simi
(4) Formerly: Ventura County Waterworks District No. 6
(5) Since May 1971 part of Ventura Regional County Sanitation District, Port Huaneme Plant

TABLE 8 (Continued)
WASTE WATER TREATMENT FACILITIES
SOUTH COASTAL HYDROLOGIC AREA

Discharger	Population served (1000's)	Design capacity (mgd)	Type of waste water	Treatment facilities	Place of discharge	Uses of reclaimed waste water
Ventura County (Continued)						
Ventura Regional County Sanitation District						
Port Huename Plant (6)	23.0	4.0	Municipal, industrial	Primary: barminutor, grit chamber, sedimentation tank, chlorination facilities, digester, and incinerator.	Pacific Ocean	None
Los Angeles County						
Burbank, City of	48.0	6.0	Municipal, industrial	Secondary: bar screen, comminutor, primary clarifiers, aeration tanks, final clarifiers, and chlorination facilities	Burbank Western Channel	Municipal steam generating station cooling water
Las Virgenes Municipal Water District						
Tapia Plant	40.0	8.0	Municipal	Secondary: comminutor, primary clarifier, aeration tanks, final clarifiers, storage pond, chlorination facilities, digesters, and sludge beds.	Land	Crop and landscape irrigation
Los Angeles, City of						
Hyperion Plant	3,000.0	420.0	Municipal, industrial	Primary: bar screens, comminutors, aerated grit chambers, sedimentation tanks, chlorination facilities, and digesters.	Santa Monica Bay	Landscape irrigation and industrial use within plant
		150.0	Municipal	Secondary: bar screens, comminutors, aerated grit chambers, primary clarifiers, aeration tanks, final clarifiers, chlorination facilities, and digesters.		
Terminal Island Plant	110.0	14.0	Municipal, industrial	Primary: bar screens, aerated grit chambers, sedimentation tanks, digesters, and sludge beds.	Pacific Ocean	None
Los Angeles County, County Sanitation Districts of						
Joint Water Pollution Control Plant	2,821.6	450.0	Municipal, industrial	Primary: bar screens, comminutors, aerated grit chambers, sedimentation tanks, chlorination facilities, digesters, and sludge beds.	Pacific Ocean	None
District 21 Pomona Plant	74.9	9.5	Municipal	Secondary: primary clarifiers, aeration tanks, final clarifiers, holding pond, and chlorination facilities.	San Jose Creek	Crop and landscape irrigation, advanced treatment research
District 22-Milter Plant (7)	(7)	1.0	Industrial	Secondary: bar screen, primary clarifiers, trickling filters, and final clarifiers.	Pacific Ocean	None
District 26-Saugus Plant	31.7	5.0	Municipal, industrial	Secondary: bar screen, comminutor, primary clarifiers, aeration tanks, final clarifiers, chlorination facilities, and digesters.	Santa Clara River	None
District 32 Valencia Plant	5.0	1.5	Municipal	Secondary: bar screen, comminutor, primary clarifiers, aeration tanks, final clarifiers, chlorination facilities, and digesters.	Santa Clara River	None
Long Beach Plant	118.4	12.5	Municipal, industrial	Secondary: primary clarifiers, aeration tanks, final clarifiers, and chlorination facilities.	Pacific Ocean	None

(6) Formerly: City of Port Huename
(7) Permanently closed June 1972. Now part of San Jose Creek Plant

TABLE 8 (Continued)
WASTE WATER TREATMENT FACILITIES
SOUTH COASTAL HYDROLOGIC AREA

Discharger	Population served (1000's)	Design capacity (mgd)	Type of waste water	Treatment facilities	Place of discharge	Uses of reclaimed waste water
Los Angeles County (Continued)						
Los Angeles County, County Sanitation Districts of (continued)						
Los Coyotes Plant	94.8	12.5	Municipal, industrial	Secondary: primary clarifiers, aeration tanks, final clarifiers, and chlorination facilities.	San Gabriel River	None
San Jose Creek Plant	294.0	37.5	Municipal, industrial	Secondary: primary clarifiers, aeration tanks, final clarifiers, and chlorination facilities.	San Gabriel River	Ground water recharge
Whittier Narrows Plant	133.1	12.5	Municipal, industrial	Secondary: primary clarifiers, aeration tanks, final clarifiers, and chlorination facilities.	Land	Ground water recharge
Orange County						
Capistrano Beach (8) Sanitary District	5.0	1.0	Municipal, industrial	Secondary: primary clarifiers, trickling filter, final clarifier, chlorination facilities, digester, and sludge beds.	Pacific Ocean	None
Irvine Ranch Water (9) District	25.0	5.0	Municipal, industrial	Secondary: bar screen, barminutor, aerated grit chamber, primary clarifiers, aeration tanks, final clarifiers, chlorination facilities, and sludge beds.	Sand Canyon Reservoir	Crop, landscape and golf course irrigation
Laguna Beach, City of	24.0	5.0	Municipal	Primary: comminutor, pre-aeration tank, sedimentation tanks, aeration tanks, chlorination facilities, and digesters.	Pacific Ocean	None
Los Alisos Water District	8.0	3.0	Municipal	Secondary: Bar screen, comminutor, aerated grit chamber, surge basin, aeration basin, sedimentation basin, oxidation ponds, chlorination facilities, digesters and sludge beds.	Land	Crop irrigation
Orange County, County Sanitation Districts of						
Plant No. 1	500.0	46.0	Municipal, industrial	Primary: bar screens, aerated grit chambers, primary clarifiers, chlorination facilities (at Plant No. 2), digesters, and sludge beds.	Pacific Ocean	Landscape irrigation and industrial use within plant
		15.0		Secondary: (in addition to primary) trickling filters and final clarifiers.		
Plant No. 2	900.0	126.0	Municipal, industrial	Primary: bar screens, aerated grit chambers, sedimentation tanks, chlorination facilities, digesters, and sludge beds.	Pacific Ocean	Landscape irrigation and industrial use within plant
Rossmoor Sanitation, Inc., Laguna Hills	32.9	2.2	Municipal	Secondary: bar screen, comminutor, primary clarifier, aeration tank, final clarifiers, holding pond, chlorination facilities, digesters, and sludge beds.	Land	Crop and golf course irrigation
San Clemente, City of	19.5	4.0	Municipal, industrial	Secondary: comminutor, grit chamber, primary clarifiers, aeration tanks, trickling filter, final clarifiers, holding pond, chlorination facilities, digesters, and sludge beds.	Pacific Ocean	Landscape and golf course irrigation
San Juan (10) Capistrano, City of	30.0	8.0	Municipal	Secondary: bar screen, barminutor, aeration tanks, final clarifiers, chlorination facilities, digesters, and sludge beds.	Pacific Ocean	None

(8) Handles City of San Clemente's overflow
(9) Tertiary demonstration project recently successfully completed
(10) Includes since 1971 bypass of Moulton Niguel Water District Plant No. 3-A and since and October 1972 all flows of Santa Margarita Water District

TABLE 8 (Continued)
WASTE WATER TREATMENT FACILITIES
SOUTH COASTAL HYDROLOGIC AREA

Discharger	Population served (1000's)	Design capacity (mgd)	Type of waste water	Treatment facilities	Place of discharge	Uses of reclaimed waste water
Orange County (Continued)						
Seal Beach, City of	10.0	1.5	Municipal	Secondary: barminutor, pre-aeration tank, primary clerifier, trickling filter, final clarifier, chlorination facilities, digesters, and sludge beds.	San Gebriel River estuary	None
South Laguna (11) Sanitary District	22.1	3.2	Municipal	Secondary: bar screen, comminutor, primary clarifiers, aeretion tanks, final clerifiers, chlorination facilities, digesters, and sludge beds.	Pacific Ocean	None
U. S. Marine (12) Corps Air Station, El Toro	(12)	1.5	Municipal	Secondary: bar screen, comminutor primary clarifier, trickling filters, final clerifiers, chlorination facilities, digester, and sludge beds.	San Diego Creek	Golf course irrigation
San Diego County						
Escondido, City of						
Hale Avenue Plant	44.8	4.0	Municipal	Secondary: ber screen, barminutor, primary clerifiers, aeration tanks, final clarifiers, chlorination facilities, digester, and sludge beds.	Pacific Oceen	None
Oceanside, City of						
Le Saline Plant	31.4	5.5	Municipal, industrial	Secondary: bar screen, comminutor, primary clarifiers, aeration tenks, final clarifier, chlorination facilities, and digesters.	San Luis Rey River	Crop irrigation, ground water recharge
San Luis Rey Plant	13.3	1.8	Municipal	Secondary: bar screen, comminutor, eerated grit chamber, sedimentation tanks, oxidation ponds, chlorination facilities, end digester.	San Luis Rey River	Crop irrigation, ground water recharge
Pomerado County Water District (13)		1.1	Municipal	Secondary: bar screens, comminutor, primary clarifiers, trickling filters, final clerifier, chlorination facilities, digesters, and sludge beds.	Los Penasquitos Creek	Crop irrigation
San Diego, City of						
Callan Plant	(14)	1.0	Municipal, industrial	Secondary: bar screen, primary clarifier, trickling filter, final clarifier, oxidation ponds, chlorination facilities, and digesters.	Land	Landscape irrigation
Point Loma Plent	1,000.0	88.0	Municipal, industrial	Primary: bar screen, aerated grit chambers, sedimentation tanks, and digesters.	Pacific Ocean	None
Rancho Bernardo Plant	12.0	1.0	Municipal	Secondary: bar screen, comminutor, aeration tanks, sedimentation tank, oxidation ponds, chlorination facilities, digester, and sludge beds.	Land	Crop irrigation
San Diego, County of						
Encina Plant	74.0	6.8	Municipal, industrial	Primary: bar screen, comminutor, eerated grit chamber, sedimentation tank, chlorination facilities, digesters, and sludge beds.	Pacific Ocean	None

(11) Includes since 1970 flows of Moulton Niguel Water District Plants Nos. 1-A and 2-A.
(12) Since October 1972 part of Irvine Ranch Water District
(13) Since July 1972 part of San Diego Metropolitan System, Point Loma Plent
(14) Permanently closed June 1972. Now part of Point Loma Plant

TABLE 8 (Continued)
WASTE WATER TREATMENT FACILITIES
SOUTH COASTAL HYDROLOGIC AREA

Discharger	Population served (1000's)	Design capacity (mgd)	Type of waste water	Treatment facilities	Place of discharge	Uses of reclaimed waste water
San Diego County (Continued)						
San Diego, County of (continued)						
San Elijo Plant	17.0	2.0	Municipal	**Primary:** communitor, aerated grit chamber, sedimentation tank, chlorination facilities, digesters, and sludge centrifuge.	Pacific Ocean	None
Santee County Water District	36.0	4.0	Municipal	**Secondary:** barminutor, primary clarifiers, aeration tanks, final clarifiers, oxidation pond, percolation beds, lakes, chlorination facilities, digester, and sludge beds.	Sycamore Canyon Creek	Recreation, landscape irrigation, ornamental lakes
U. S. Marine Corps, Camp Pendleton						
Plant No. 1	6.8	1.0	Municipal	**Secondary:** bar screen, grit chamber, primary clarifier, trickling filters, final clarifier, holding pond, chlorination facilities, digester, and sludge beds.	Land	Recreation, ground water recharge
Plant No. 2	4.7	1.2	Municipal	**Secondary:** bar screen, grit chamber, primary clarifier, trickling filters, final clarifier, holding ponds, chlorination facilities, digester, and sludge beds.	Land	Recreation, golf course, irrigation, ground water recharge
Plant No. 13	6.5	1.2	Municipal	**Secondary:** bar screen, grit chamber, sedimentation tanks, oxidation ponds, chlorination facilities, digester, and sludge beds.	Land	Ground water recharge
San Bernardino County						
Big Bear City Community Services District	4.0	1.3	Municipal, industrial	**Secondary:** bar screen, barminutor, aerated grit chamber, aeration tank, sedimentation tank, oxidation pond, and chlorination facilities.	Land	None
California Institution for Men	4.5	1.3	Municipal, industrial	**Secondary:** bar screen, comminutor, pre-aeration tank, primary clarifier, aeration tanks, final clarifier, oxidation ponds, chlorination facilities, digesters, and sludge beds.	Land	Crop irrigation
Chino Basin Municipal Water District						
Carl B. Masingale Tertiary Plant Ontario (15)	100.0	16.0	Municipal, industrial	**Tertiary:** comminutors, grit chambers, primary clarifiers, pre-aeration tank, trickling filters, secondary clarifiers, flow stabilization ponds, chlorination facilities, digesters, sludge beds, bar screen, flocculation tanks, final clarifiers, and gravity filters.	Santa Ana River	Ground water recharge, golf course irrigation industrial, recreation
Regional Plant No. 2, Chino (16)	25.0	3.0	Municipal	**Secondary:** bar screen, barminutor, primary clarifiers, aeration tanks, final clarifiers, oxidation pond, percolation beds, chlorination facilities, digesters, sludge thickener, and sludge beds.	Land	Crop irrigation
Regional Plant No. 3, Fontana (17)	22.0	2.5	Municipal	**Primary:** bar screen, primary clarifier, oxidation ponds, digester, sludge thickener and sludge beds.	Land	Crop irrigation

(15) Incorporates Regional Plant No. 1 (formerly Cities of Ontario and Upland)
(16) Formerly City of Chino
(17) Formerly City of Fontana

TABLE 8 (Continued)
WASTE WATER TREATMENT FACILITIES
SOUTH COASTAL HYDROLOGIC AREA

Discharger	Population served (1000's)	Design capacity (mgd)	Type of waste water	Treatment facilities	Place of discharge	Uses of reclaimed waste water
San Bernardino County (Continued)						
Colton, City of	22.0	5.4	Municipal, industrial	Secondary: primary clarifier, aeration tank, final clarifier, chlorination facilities, digesters, and sludge beds.	Santa Ana River	None
Cucamonga County Water District (18)	20.0	2.0	Municipal	Primary: stabilization ponds.	Land	None
Kaiser Steel Corporation, Fontana	9.0	1.0	Municipal, industrial	Secondary: bar screen, comminutors, primary clarifier, trickling filters, final clarifier, chlorination facilities, digesters, and sludge beds.	Land	Industrial
Norton Air Force Base Plant 1264	1.5	1.1	Industrial	Secondary: bar screen, primary clarifier, surge tank, aeration tanks, final clarifier, neutralization chamber, waste storage tank, sludge beds, and evaporation pond.	Land	None
Redlands, City of	30.7	5.0	Municipal, industrial	Secondary: bar screen, barminutor, primary clarifiers, aeration tanks, final clarifiers, chlorination facilities, digesters, and sludge beds.	Santa Ana River	None
Rialto, City of	32.0	4.0	Municipal	Secondary: bar screen, aerated grit chamber, primary clarifiers, aeration tanks, final clarifiers, chlorination facilities, digesters, and sludge beds.	Santa Ana River	None
San Bernardino, City of						
Plant No. 1 (19)	75.0	8.0	Municipal, industrial	Secondary: bar screen, aerated grit chamber, primary clarifiers, trickling filters, final clarifier, sand filters, chlorination facilities, digesters, and sludge beds.	Warm Creek	Golf course and landscape irrigation
Plant No. 2	85.0	28.0	Municipal, industrial	Secondary: comminutor, pre-aerated grit chamber, primary clarifier, aeration tank, final clarifier, chlorination facilities, digesters, and sludge beds.	Santa Ana River	Golf course and landscape irrigation
Riverside County						
Corona, City of (20)	32.0	5.5	Municipal	Secondary: barminutor, grit chamber, primary clarifiers, aeration tanks, final clarifiers, percolation beds, chlorination facilities, digesters, and sludge beds.	Land	None
Eastern Municipal Water District						
Hemet-San Jacinto Plant	25.0	5.0	Municipal	Secondary: barminutors, aerated grit chamber, primary clarifier, aeration tanks final clarifiers, holding ponds, percolation beds, chlorination facilities, digesters, and sludge beds.	Land	Crop irrigation ground water recharge, recreation
Sun City Plant	5.0	1.0	Municipal	Secondary: barminutor, aeration tanks, sedimentation tanks, percolation beds, chlorination facilities, digesters, and sludge beds.	Land	None
Sunnymead Plant	5.0	1.0	Municipal	Secondary: barminutor, aeration tanks, sedimentation tanks, percolation beds, chlorination facilities, digesters, and sludge beds.	Land	Crop irrigation

(18) Since July 1971 operated by Chino Municipal Water District
(19) Plant closed November 30, 1972. All flows ere handled by Plant No. 2.
(20) Includes City of Norco since October 10, 1972.

TABLE 8 (Continued)
WASTE WATER TREATMENT FACILITIES
SOUTH COASTAL HYDROLOGIC AREA

Discharger	Population served (1000's)	Design capacity (mgd)	Type of waste water	Treatment facilities	Place of discharge	Uses of reclaimed waste water
Riverside County (Continued)						
Jurupa Community Services District	14.0	1.0	Municipal	Secondary: primary clarifier, trickling filter, final clarifier, chlorination facilities, percolation beds, digester, and sludge beds.	Santa Ana River	None
March Air Force Base						
Main Plant	4.7	1.0	Municipal, industrial	Secondary: comminutor primary clarifiers, trickling filters, final clarifiers, holding tank, chlorination facilities, digesters and sludge beds.	Land	Crop irrigation
West Plant	2.6	1.0	Municipal	Secondary: bar screens, comminutor, grit chamber, primary clarifier, trickling filters final clarifier, holding tank, chlorination facilities, digester, and sludge beds.	Land	Crop irrigation
Perris, City of	5.2	1.0	Municipal	Secondary: Imhoff tanks and oxidation ponds.	Land	None
Riverside, City of	140.0	25.0	Municipal, industrial	Secondary: bar screens, grit chambers, primary clarifiers, trickling filters (15 mgd), aeration tanks (10 mgd), final clarifiers, chlorination facilities, digesters, and sludge beds.	Santa Ana River	None
Rubidoux Community Services District	18.3	1.2	Municipal	Secondary: grit chamber, primary clarifier, trickling filters, final clarifiers, chlorination facilities, digesters, and sludge beds.	Santa Ana River	None

TABLE 9
WASTE WATER TREATMENT FACILITIES*
SOUTH LAHONTAN HYDROLOGIC AREA

Discharger	Population served (1000's)	Design capacity (mgd)	Type of waste water	Treatment facilities	Place of discharge	Uses of reclaimed waste water
Mono County						
Mammoth County Water District	10.0	1.5	Municipal	Secondary: barminutor, primary clarifiers, aeration tanks, final clarifiers, sand filters, chlorination facilities, digester, and sludge beds.	Land	None
Inyo County						
Bishop, City of	3.5	2.0	Municipal	Secondary: barminutor, grit chamber, sedimentation tanks, oxidation ponds, digesters, and sludge beds.	Land	Crop irrigation
Kern County						
Edwards Air Force Base	16.0	1.5	Municipal	Primary: bar screen, comminutor, grit chamber, sedimentation tank, oxidation pond, digesters, and sludge beds.	Land	None
Ridgecrest Sanitation District	13.0	1.0	Municipal	Secondary: bar screen, comminutor, sedimentation tank, oxidation ponds, digesters, and sludge beds.	Land	Crop irrigation
U. S. Naval Weapons Center, China Lake	12.0	3.0	Municipal	Secondary: comminutors, grit chamber, primary clarifiers, eeration tank, final clarifier, oxidation ponds, chlorination facilities, digesters, and sludge beds.	Land	Golf course irrigation
Los Angeles County						
Los Angeles County, County Sanitation Districts of						
District 14-Lancaster Plant	35.2	4.5	Municipal, industrial	Secondary: (1) comminutor, sedimentation tanks, oxidation ponds, chlorination facilities, digesters, and sludge beds.	Land	Landscape irrigation, recreation
District 20-Palmdale Plant	18.5	3.1	Municipel	Secondary: comminutor, sedimentation tanks, oxidation ponds, chlorination facilities, digesters, and sludge beds.	Land	Crop irrigation
U. S. Air Force Plant No. 42, Palmdale	2.4	1.0	Municipel, industrial	Secondary: sedimentation tank, oxidation pond, digester, and sludge beds.	Land	None

* Plants with a design capacity of 1.0 mgd or greater

(1) Has since June 1969 an advanced treatment design capacity of 0.5 mgd

TABLE 9 (Continued)
WASTE WATER TREATMENT FACILITIES
SOUTH LAHONTAN HYDROLOGIC AREA

Discharger	Population served (1000's)	Design capacity (mgd)	Type of waste water	Treatment facilities	Place of discharge	Uses of reclaimed waste water
San Bernardino County (Continued)						
Barstow, City of	18.0	4.5	Municipal	Secondary: comminutor, sedimentation tanks, aeration pond, oxidation ponds, chlorination facilities, digester, and incinerator.	Land	Recreation, ornamental lakes, landscape irrigation and industrial use within plant
George Air Force Base	10.0	1.5	Municipal	Secondary: comminutor, grit chamber, primary clarifier, trickling filter, final clarifiers, oxidation ponds, chlorination facilities, digesters, and sludge beds.	Land	Golf course irrigation
Lake Arrowhead Sanitation District	6.5	1.7	Municipal	Secondary: comminutor, grit chamber, primary clarifiers, aeration tanks, final clarifiers, oxidation ponds, chlorination facilities, digester, and incinerator.	Land	Crop irrigation
U. S. Army, Fort Irwin	0.8	1.0	Municipal	Secondary: comminutor, primary clarifiers, oxidation ponds, chlorination facilities, digester, and sludge beds.	Land	None
U. S. Marine Corps Supply Center, Barstow						
Nebo Plant	4.6	1.0	Municipal, industrial	Secondary: comminutor, Imhoff tanks, oxidation ponds, chlorination facilities, and sludge beds.	Land	None
Yermo Plant	2.5	1.0	Municipal	Secondary: bar screen, Imhoff tanks, trickling filter, sedimentation tank, oxidation ponds, and sludge beds.	Land	None
Victorville Sanitary District	12.0	1.0 (2)	Municipal	Secondary: oxidation ponds.	Land	None

(2) Estimate

TABLE 10
WASTE WATER TREATMENT FACILITIES*
COLORADO DESERT HYDROLOGIC AREA

Discharger	Population served (1000's)	Design capacity (mgd)	Type of waste water	Treatment facilities.	Place of discharge	Uses of reclaimed waste water
Imperial County						
Brawley, City of	15.8	4.0	Municipal	Primary: bar screens, comminutor, sedimentation tanks, digester, and sludge beds.	New River	None
Calexico, City of	12.8	2.0	Municipal	Secondary: primary clarifiers, aeration tank, final clarifier, digester, and sludge beds.	New River	None
El Centro, City of	22.0	5.0	Municipal	Secondary: comminutors, sedimentation tanks, oxidation ponds, digesters, and sludge beds.	Alamo River via Central Main Drainage Canal	None
Imperial, City of	3.2	1.6	Municipal	Secondary: bar screen, sedimentation tanks, oxidation ponds, digesters, and sludge beds.	Land	None
U. S. Naval Air Facilities, El Centro	1.0	1.0	Municipal	Primary: raw sewage lagoons.	New River	None
San Bernardino County						
Needles, City of	4.5	2.0	Municipal	Secondary: bar screen, primary clarifiers, trickling filter, final clarifier, oxidation ponds, chlorination facilities, digesters, and sludge beds.	Colorado River	Landscape irrigation and industrial use within plant
U. S. Marine Corps Base, Twentynine Palms Twentynine Palms Plant	5.0	2.5	Municipal	Secondary: bar screen, grit chamber, sedimentation tanks, oxidation ponds, chlorination facilities, digesters, and sludge beds.	Land	None
Riverside County						
Banning, City of	12.0	2.2	Municipal	Secondary: bar screen, comminutor, grit chamber, primary clarifiers, trickling filter, final clarifier, oxidation ponds, chlorination facilities, digesters, and sludge beds.	Land	None
Blythe, City of	7.2	2.5	Municipal	Secondary: bar screen, sedimentation tank, oxidation ponds, digester, and sludge beds.	Land	None
Coachella Sanitary District	8.0	1.5	Municipal, industrial	Secondary: bar screen, comminutor, aeration tank, oxidation ponds, digesters, chlorination facilities, and sludge beds.	Land	Crop irrigation

* Plants with a design capacity of 1.0 or greater

TABLE 10 (Continued)
WASTE WATER TREATMENT FACILITIES
COLORADO DESERT HYDROLOGIC AREA

Discharger	Population served (1000's)	Design capacity (mgd)	Type of waste water	Treatment facilities	Place of discharge	Uses of reclaimed waste water
Riverside County (Continued)						
East Blythe County Water District	3.0	1.5	Municipal	Secondary: oxidation ponds	Land	None
Kaiser Steel Corporation, Eagle Mountain	N/A	2.0	Industrial	Secondary: oxidation ponds and sludge beds.	Land	Process water
Palm Springs, City of	32.0	4.2	Municipal, industrial	Secondary: bar screen, baminutors, primary clarifiers, trickling filters, digesters, oxidation ponds, chlorination facilities, digester, and sludge beds.	Land	Golf course and landscape irrigation, recreation, ornamental lakes, ground water recharge
Valley Sanitary District	20.0	5.0	Municipal,	Secondary: bar screen, grit chamber, primary clarifiers, aeration tanks, final clarifiers, oxidation and holding ponds, chlorination facilities, and sludge vacuum filter.	Salton Sea	Crop irrigation

TABLE 11

SUMMARY

WASTE WATER TREATMENT FACILITIES*

Place of discharge	Facilities											
	Primary treatment				Secondary treatment				Total			
	Number of plants	Population served (1000's)	Waste water produced in W.Y. 1972-73 (1000 AF)	Number of plants with reuse	Number of plants	Population served (1000's)	Waste water produced in W.Y. 1972-73 (1000 AF)	Number of plants with reuse	Number of plants	Population served (1000's)	Waste water produced in W.Y. 1972-73 (1000 AF)	Number of plants with reuse
Southern Central Coastal Hydrologic Area												
Saline water	2	133	15	1	5	64	7	1	7	197	22	2
Surface water	0	0	0	0	4	88	9	2	4	88	9	2
Land disposal	0	0	0	0	2	40	5	2	2	40	5	2
Total	2	133	15	1	11	192	21	5	13	325	36	6
South Coastal Hydrologic Area												
Saline water	11	8,554	962	3	9	3,750	153	3	18 (b)	8,804 (b)	1,115	4 (b)
Surface water	0	0	0	0	25 (a)	1,350	149	12 (a)	25	1,350	149	12
Land disposal	2	42	5	1	23	426	42	18	25	468	47	19
Total	13	8,596	967	4	57 (a)	5,526	344	33 (a)	68 (b)	10,622 (b)	1,311	35 (b)
South Lahontan Hydrologic Area												
Saline water	0	0	0	0	0	0	0	0	0	0	0	0
Surface water	0	0	0	0	0	0	0	0	0	0	0	0
Land disposal	1	16	2	0	14 (c)	149	16	8 (c)	15	165	18	8
Total	1	16	2	0	14 (c)	149	16	8 (c)	15	165	18	8
Colorado Desert Hydrologic Area												
Saline water (d)	2	17	2	0	3	55	8	1	5	72	10	1
Surface water	0	0	0	0	1	5	1	1	1	5	1	1
Land disposal	0	0	0	0	8	70	10	3	8	70	10	3
Total	2	17	2	0	12	130	19	5	14	147	21	5
Total Southern California												
Saline water (d)	15	8,704	979	4	17	3,869	168	5	30 (b)	9,073	1,147	7 (b)
Surface water	0	0	0	0	30 (a)	1,443	159	15 (a)	30	1,443	159	15
Land disposal	3	58	7	1	47 (c)	685	73	31 (c)	50	743	80	32
Total	18	8,762	986	5	94 (c)	5,997	400	51 (a)(c)	110 (b)	11,259	1,386	54 (b)

* Waste water treatment plants with design capacity of 1.0 mgd or greater
(a) Includes plant with tertiary treatment
(b) Sum of primary and secondary treatment columns do not equal total column because two plants provide primary treatment only to a part of their waste water
(c) Includes plant with partial tertiary treatment
(d) Includes Salton Sea, Alamo River and New River

TABLE 12
COMPARISON OF THE MAJOR WASTE WATER TREATMENT PLANTS [a] WITH THE TOTAL TREATMENT PLANTS IN SOUTHERN CALIFORNIA [b]
1972-73

Hydrologic area	Number of treatment plants			Population served			Average daily flow			Waste water production			Amount reclaimed		
	Total plants	Major plants		Total plants	Major plants		Total plants	Major plants		Total plants	Major plants		Total plants	Major plants	
	No.	No.	%c/	1000's	1000's	%c/	mgd	mgd	%c/	1000 AF	1000 AF	%c/	1000 AF	1000 AF	%c/
Southern Central Coastal	42	13	31	387	325	84	37	32	86	42	36	86	5	3	60
South Coastal	160	68	43	10,819	10,622	98	1,189	1,170	98	1,332	1,311	98	77	70	91
South Lahontan	39	15	38	199	165	83	21	16	76	23	18	78	4	4	100
Colorado Desert	31	14	45	187	147	79	20	18	90	22	21	95	4	3	75
Total Southern California	272	110	40	11,592	11,259	97	1,267	1,236	98	1,419	1,386	98	90	80	89

a/ With design capacity of 1.0 or greater

b/ The 272 treatment plants producing 10,000 gallons per day or more during 1972 as reported in DWR Bulletin 68-73 "Inventory of Waste Water Production and Waste Water Reclamation Practices in California, 1973.

c/ Total within the hydrologic area.

TABLE 13
QUALITY OF WASTE WATER TREATMENT PLANT EFFLUENTS*
SOUTHERN CENTRAL COASTAL HYDROLOGIC AREA

Waste water treatment plant	Water year(s)	Average values in mg/l							Sodium values	
		SO_4	Cl	NO_3	PO_4	B	TH	TDS	Percent	SAR
San Luis Obispo County										
California Men's Colony	65/67	70	420	18	19	0.3	440	1190	54	3.8
Morro Bay, City of	65/67	100	290	8	27	0.4	520	1040	39	3.8
Paso Robles, City of	65/67	130	320	16	25	1.2	250	1200	72	8.8
San Luis Obispo, City of	65/67	150	170	64	36	0.5	270	850	52	3.9
South San Luis Obispo County Sanitation District	66/67	180	190	5	56	0.6	380	1000	49	3.9
Santa Barbara County										
Carpinteria Sanitary District	65/67	300	400	80	28	1.6	480	1570	61	7.1
Goleta Sanitary District	65/67	220	270	6	44	1.1	370	1110	56	5.3
Laguna County Sanitation District	65/67	250	210	8	56	0.6	350	1110	51	5.1
Lompoc, City of	65/67	440	330	56	35	0.8	230	1440	73	9.4
Santa Barbara, City of	65/67	290	540	5	20	1.3	510	1700	63	7.9
Santa Maria, City of	65/67	430	210	10	-	0.4	570	1220	36	3.4
Santa Maria Airport	65/67	250	180	50	-	0.4	360	980	46	3.8
Vandenberg Air Force Baae	63/64	310	220	4	36	0.6	160	970	73	9.1

* Plants with a design capacity of 1.0 mgd or greater

TABLE 14
QUALITY OF WASTE WATER TREATMENT PLANT EFFLUENTS*
SOUTH COASTAL HYDROLOGIC AREA

Waste water treatment plant	Water year(s)	Average values in mg/l							Sodium values	
		SO_4	Cl	NO_3	PO_4	B	TH	TDS	Percent	SAR
Ventura County										
Camarillo Sanitary District	67/68	360	240	13	51	1.0	280	1320	67	7.8
Camarillo State Hospital	67/68	390	280	39	16	0.4	410	1370	58	6.2
Moorpark County Sanitation District	68/69	330	140	1	-	1.1	330	1080	51	5.1
Oak View Sanitary District	67/68	290	170	20	49	0.9	400	1070	45	3.7
Oxnard, City of	65/66	500	940	1	29	3.3	740	2690	62	9.4
San Buenaventura, City of										
Ventura Wastewater Reclamation Facility (1)	64/65	590	380	40	37	1.2	530	1760	58	7.2
Seaside Plant (2)	64/65	320	370	2	32	1.3	450	1740	57	6.1
Santa Paula, City of	67/68	390	280	49	28	0.8	460	1530	57	6.2
Simi Valley County Sanitation District (3)	67/68	360	180	33	77	0.8	140	1040	73	11.1
Thousand Oaks, City of										
Hill Canyon Plant	67/68	320	170	0	41	0.8	180	1100	57	8.2
Olsen Road Plant (4)	66/67	350	140	1	-	0.2	160	890	76	8.0

* Plants with a design capacity of 1.0 mgd or greater
(1) Formerly: Eastside Plant
(2) Closed permanently January 31, 1974; all flows being handled by Ventura Wastewater Reclamation Facility
(3) Formerly: Sanitation Inc., Simi
(4) Formerly: Ventura County Waterworks District No. 6

TABLE 14 (Continued)
QUALITY OF WASTE WATER TREATMENT PLANT EFFLUENTS
SOUTH COASTAL HYDROLOGIC AREA

Waste water treatment plant	Water year(s)	Average values in mg/l							Sodium values	
		SO_4	Cl	NO_3	PO_4	B	TH	TDS	Percent	SAR
Ventura County (Continued)										
U. S. Naval Construction Battalion Center, Port Hueneme (5)	62/63	1130	1060	0	0	1.5	1080	3620	65	12.7
Ventura Regional County Sanitation District										
Port Hueneme Plant (6)	65/67	720	190	5	38	1.3	870	1800	37	3.3
Los Angeles County										
Burbank, City of	70/71	180	100	3	4	0	200	690	56	-
Las Virgenes Municipal Water District										
Tapia Plant	67/68	490	130	20	30	0.7	470	1260	50	4.3
Los Angeles, City of										
Hyperion Plant	65/66	200	230	0	20	0.9	240	930	-	-
Terminal Island	60/61	380	1070	4	30	1.7	500	2650	-	-
Los Angeles County, County Sanitation Districts of										
Joint Water Pollution Control Plant	70/71	350	540	0	52	1.0	460	1700	71	7.1
District 21-Pomona Plant	68/69	100	120	6	34	0.8	210	630	51	3.3

(5) Since May 1971 part of Ventura Regional County Sanitation District, Port Hueneme
(6) Formerly: City of Port Hueneme

TABLE 14 (Continued)
QUALITY OF WASTE WATER TREATMENT PLANT EFFLUENTS
SOUTH COASTAL HYDROLOGIC AREA

Waste water treatment plant	Water year(s)	Average values in mg/l							Sodium values	
		SO_4	Cl	NO_3	PO_4	B	TH	TDS	Percent	SAR
Los Angeles County (Continued)										
Los Angeles County, County Sanitation Districts of (Continued)										
District 22-Miller Plant (7)	70/71	30	10	0	5	0.2	20	320	89	11.8
District 26-Saugus Plant	68/69	170	110	20	49	1.5	300	860	50	3.7
District 32-Valencia Plant	69/70	280	80	18	50	1.1	280	930	53	4.1
Long Beach Plant	72/73	190	190	7	47	0.6	230	900	65	6.2
Los Coyotes Plant	70/71	340	240	6	28	0.6	280	1200	65	7.0
San Jose Creek Plant	71/72	90	140	5	33	0.6	230	680	56	4.1
Whittier Narrows Plant	68/69	110	100	7	31	0.7	180	590	55	3.8
Orange County										
Capistrano Beach Sanitary District	67/68	370	340	25	28	0.8	400	1470	63	7.1
Irvine Ranch Water District	68/69	590	220	59	31	0.3	540	1540	53	4.6
Laguna Beach, City of	65/66	300	190	0	52	1.0	330	1220	63	6.1
Los Alisos Water District	69/70	340	180	5	-	0.7	350	1010	51	4.7

(7) Permanently closed June 1972. Now part of San Jose Creek Plant.

TABLE 14 (Continued)

QUALITY OF WASTE WATER TREATMENT PLANT EFFLUENTS

SOUTH COASTAL HYDROLOGIC AREA

Waste water treatment plant	Water year(s)	Average values in mg/l							Sodium values	
		SO_4	Cl	NO_3	PO_4	B	TH	TDS	Percent	SAR
Orange County (Continued)										
Orange County, County Sanitation Districts of										
Plant No. 1	63/64	230	230	0	44	1.1	210	850	59	6.8
Plant No. 2	63/64	70	470	0	55	1.0	220	990	57	8.1
Rossmoor Sanitation, Inc., Laguna Hills	65/67	360	200	39	30	0.5	400	1000	47	3.8
San Clemente, City of	70/71	320	220	117	28	0.5	300	1060	33	3.3
San Juan Capistrano, City of	65/66	310	280	1	29	0.7	400	1260	58	5.5
Seal Beach, City of	61/62	60	290	50	48	0.8	140	990	48	9.0
South Laguna Sanitary District	65/66	270	180	0	36	0.6	330	1160	61	5.5
U. S. Marine Corps Air Station, El Toro (8)	70/71	350	180	19	15	0.4	350	930	45	3.6
San Diego County										
Escondido, City of										
Hale Avenue Plant	70/71	340	250	0	21	0.7	350	1160	58	5.6

(8) Since October 1972 part of Irvine Ranch Water District

TABLE 14 (Continued)
QUALITY OF WASTE WATER TREATMENT PLANT EFFLUENTS
SOUTH COASTAL HYDROLOGIC AREA

Waste water treatment plant	Water year(s)	Average values in mg/l							Sodium values	
		SO_4	Cl	NO_3	PO_4	B	TH	TDS	Percent	SAR
San Diego County (Continued)										
Oceanside, City of										
La Salina Plant	65/66	400	380	15	24	0.5	460	1200	54	5.3
San Luis Rey Plant	67/68	370	330	5	23	0.8	420	1260	54	5.3
Pomerado County Water District (9)	66/67	370	430	56	20	0.8	530	1560	56	5.7
San Diego, City of										
Callan Plant (10)	65/66	330	200	12	6	0.6	370	1010	49	3.8
Point Loma Plant	63/64	380	660	0	32	0.6	510	1940	62	8.9
Rancho Bernardo Plant	70/71	410	420	11	24	0.6	460	1490	57	5.9
San Diego, County of										
Encina Plant	70/71	270	340	0	27	0.6	330	1110	54	6.0
San Elijo Plant	70/71	-	-	-	-	-	-	1600	-	-
Santee County Water District	65/67	290	160	7	35	1.0	640	950	39	3.0
U. S. Marine Corps, Camp Pendleton										
Plant No. 1	61/62	130	210	41	33	0.6	190	950	57	4.8
Plant No. 2	61/62	110	200	10	10	0.3	260	750	54	4.2
Plant No. 13	61/62	150	280	0	24	0.6	260	1090	55	6.3

(9) Since July 1, 1972 part of San Diego Metropolitan System, Point Loma Plant
(10) Permanently closed June 1972. Now part of Point Loma Plant

TABLE 14 (Continued)

QUALITY OF WASTE WATER TREATMENT PLANT EFFLUENTS

SOUTH COASTAL HYDROLOGIC AREA

Waste water treatment plant	Water year(s)	Average values in mg/l							Sodium values	
		SO_4	Cl	NO_3	PO_4	B	TH	TDS	Percent	SAR
San Bernardino County										
Big Bear City Community Services District	69/71	40	30	4	18	0.2	200	570	23	1.3
California Institution for Men	69/70	40	40	5	19	0.3	140	430	41	2.5
Chino Basin Municipal Water District										
Carl B. Masingale Tertiary Plant, Ontario (11)	69/70	50	70	1	30	0.7	170	460	43	3.1
Regional Plant No. 2, Chino (12)	69/70	70	90	10	45	0.4	200	570	41	3.1
Regional Plant No. 3, Fontana (13)	70/71	50	50	4	28	0.5	160	360	33	2.2
Colton, City of	67/68	70	60	3	54	0.5	200	510	36	2.4
Cucamonga County Water District	69/70	30	70	9	15	0.9	160	550	46	3.2
Kaiser Steel Corporation, Fontana	69/70	30	50	30	3	0.6	120	260	29	0.9
Norton Air Force Base	67/68	230	10	2	-	0.2	190	410	25	1.2
Redlands, City of	69/70	60	90	1	21	0.7	160	510	51	3.4
Rialto, City of	70/71	60	50	14	23	1.0	150	420	44	2.7

(11) Incorporates Regional Plant No. 1 (formerly Cities of Ontario and Upland)
(12) Formerly: City of Chino
(13) Formerly: City of Fontana

TABLE 14 (Continued)
QUALITY OF WASTE WATER TREATMENT PLANT EFFLUENTS
SOUTH COASTAL HYDROLOGIC AREA

Waste water treatment plant	Water year(s)	Average values in mg/l							Sodium values	
		SO_4	Cl	NO_3	PO_4	B	TH	TDS	Percent	SAR
San Bernardino County (Continued)										
San Bernardino, City of										
Plant No. 1 (14)	69/70	80	90	19	24	0.5	180	540	44	2.7
Plant No. 2	69/70	80	70	7	48	0.6	180	520	41	2.9
Riverside County										
Corona, City of	67/68	210	340	6	25	1.9	370	1230	53	5.9
Eastern Municipal Water District										
Hemet-San Jacinto Plant	67/68	130	130	37	39	0.6	230	730	52	4.1
Sun City Plant	67/68	310	170	37	25	0.7	320	950	52	4.4
Sunnymead Plant	70/71	260	160	44	0	0.7	300	920	53	9.9
Jurupa Community Services District	67/68	120	170	7	75	0.6	310	800	40	3.3
March Air Force Base										
Main Plant	65/67	330	180	28	15	0.7	190	970	70	7.3
West Plant	65/67	340	200	38	40	0.3	180	1020	73	8.1
Perris, City of	63/64	270	200	0	-	0.4	350	1080	40	4.5
Riverside, City of	67/68	100	180	5	19	0.8	230	720	48	4.0
Rubidoux Community Services District	67/68	110	130	18	39	0.6	350	690	31	2.1

(14) Plant closed November 30, 1972. All flows handled by Plant No. 2.

TABLE 15
QUALITY OF WASTE WATER TREATMENT PLANT EFFLUENTS*
SOUTH LAHONTAN HYDROLOGIC AREA

Waste water treatment plant	Water year(s)	Average values in mg/l							Sodium values	
		SO_4	Cl	NO_3	PO_4	B	TH	TDS	Percent	SAR
Mono County										
Mammoth County Water District	N/A									
Inyo County										
Bishop, City of	64/65	10	20	0	17	0.3	60	200	46	2.1
Kern County										
Edwards Air Force Base	64/65	20	200	0	79	1.3	120	1060	82	13.0
Ridgecrest Sanitation District	64/65	20	110	0	39	1.1	80	580	73	7.7
U. S. Naval Ordnance Test Station, China Lake	64/65	60	130	0	17	0.8	150	500	60	4.5
Los Angeles County										
Los Angeles County, County Sanitation Districts of										
District 14-Lancaster Plant	68/69	70	90	1	11	1.0	200	610	77	4.4
District 20-Palmdale Plant	66/67	60	60	5	40	0.7	100	530	43	4.6
U. S. Air Force Plant No. 42, Palmdale	N/A									
San Bernardino County										
Barstow, City of	70/71	250	200	3	35	0.9	240	1120	60	6.4
George Air Force Base	70/71	70	40	4	15	0.4	140	470	48	2.9
Lake Arrowhead Sanitation District	64/65	20	70	0	23	0.6	80	320	44	2.7
U. S. Army, Fort Irwin	64/65	140	120	0	33	1.7	60	820	80	12.9
U. S. Marine Corps Supply Center, Barstow										
Nebo Plant	69/70	270	260	5	9	1.6	240	1110	71	8.4
Yermo Plant	70/71	80	80	77	15	2.0	150	510	56	3.3
Victorville Sanitary District	70/71	10	40	11	38	0.6	50	360	57	5.6

* Plants with a design capacity of 1.0 mgd or greater

TABLE 16

QUALITY OF WASTE WATER TREATMENT PLANT EFFLUENTS

COLORADO DESERT HYDROLOGIC AREA

Waste water treatment plant	Water year(s)	Average values in mg/l							Sodium values	
		SO_4	Cl	NO_3	PO_4	B	TH	TDS	Percent	SAR
Imperial County										
Brawley, City of	65/66	340	240	12	31	0.5	350	1020	61	6.2
Calexico, City of	65/66	80	150	13	58	0.7	260	980	66	6.9
El Centro, City of	65/66	500	1380	3	14	1.0	1030	3510	62	10.8
Imperial, City of	63/64	360	320	1	20	0.4	480	1220	50	4.6
U. S. Naval Air Station, El Centro	65/67	330	360	13	14	0.9	480	1390	54	5.5
San Bernardino County										
Needles, City of	65/66	530	430	17	16	0.7	500	1710	62	7.7
U. S. Marine Corps Base, Twentynine Palms Twentynine Palms Plant	65/66	60	70	17	19	0.3	30	340	85	8.7
Riverside County										
Banning, City of	65/67	20	10	1	37	0	150	180	10	0.3
Blythe, City of	65/67	190	260	3	23	0.5	300	1070	66	6.7
Coachella Sanitary District	65/66	100	100	2	31	0.3	100	540	77	8.7
East Blythe County Water District	65/66	120	190	4	22	0.6	300	870	57	5.0
Kaiser Steel Corporation, Eagle Mountain	64/65	110	110	0	-	-	60	890	70	11.8
Palm Springs, City of	65/66	40	90	28	38	0.4	110	440	57	5.2
Valley Sanitary District	65/66	10	70	3	27	0.4	120	430	64	4.4

* Plants with a design capacity of 1.0 or greater

Appendix C

CRITERIA FOR USE OF RECLAIMED WATER

In the determination of an appropriate use for reclaimed waste water, the water quality criteria count heavily. Criteria for the most part are similar to those for fresh water and vary widely depending on the particular beneficial use. They are available for domestic, agricultural, industrial, landscape irrigation, recreational, and aquatic habitat uses, and they are couched in terms of mineral, nutrient, and public health (which includes bacterial and toxic substances) parameters.

Quality criteria are expressed in terms of mineral and bacterial content. Mineral criteria are generally permissive or guideline values, while bacterial criteria established to protect the public health are mandatory. The State Department of Health is now developing reliability criteria as well.

Domestic Water Use

The use of reclaimed waste water for domestic purposes is under the jurisdiction of the public health agencies. Within California, these responsibilities reside in the State Department of Health. It has been the consistent position of health authorities to require the use of protected water sources and the best available quality of water for domestic purposes and to regard the use of reclaimed waste water for domestic purposes as not a safe or acceptable practice. There are a number of water quality factors involved, including pathogenic organisms, heavy metal toxicants, and stable organics, along with other considerations such as public acceptance, which make the use unacceptable. A principal concern is the lack of information on the long-term effects on human health of stable organic material in waste water.

Although the State Department of Health has established no reclaimed waste water criteria for domestic uses, it has prepared and circulated a policy statement which declares the direct mingling of reclaimed waste water into a domestic water system and the direct injection of reclaimed waste water into aquifers used for domestic purposes as unacceptable.

Ground water recharge by surface spreading is proceeding on a case by case basis. Generally, if the amount of reclaimed waste water to be spread is a small fraction of the water in the ground water basin, the projects proceed.

Agricultural Water Use

Criteria for agricultural water use have been established for mineral content and for protection of public health. The mineral quality criteria were promulgated from work performed by the University of California - Committee of Consultants. The criteria presented in Table 17 set guidelines for permissible limits for total dissolved solids (TDS), chlorides, sodium (as evaluated by the sodium adsorption ratio (SAR)), boron, nitrate-nitrogren, bicarbonate, and pH.

Care should be exercised in using these values, because they vary widely depending upon the crops, soils, and climatic conditions. Generally, as the concentration of TDS in irrigation water increases (provided the amount of water applied remains constant), crop yields become less until plants

TABLE 17
GUIDELINES FOR INTERPRETATION OF QUALITY OF WATER FOR IRRIGATION*

Interpretations are based on possible effects of constituents on crops and/or soils. Guidelines are flexible and should be modified when warranted by local experience or special conditions of crop, soil, and method of irrigation.

PROBLEM AND RELATED CONSTITUENT	WATER QUALITY GUIDELINES		
	No Problem	Increasing Problems	Severe
Salinity 1/			
EC_w of irrigation water, in millimhos/cm	<0.75	0.75 - 3.0	>3.0
Permeability			
EC_w of irrigation water, in mmho/cm	>0.5	<0.5	<0.2
SAR 2/	<6.0	6.0 - 9.0	>9.0
Specific Ion Toxicity 3/			
from ROOT absorption			
Sodium (evaluate by SAR)	<3	3.0 - 9.0	>9.0
Chloride (me/l)	<4	4.0 - 10	>10
(mg/l)	<142	142 - 355	>355
Boron (mg/l)	<0.5	0.5 - 2.0	2.0 - 10.0
from FOLIAR absorption 4/ (sprinklers)			
Sodium (me/l)	<3.0	>3.0	----
(mg/l)	<69	>69	----
Chloride (me/l)	<3.0	>3.0	----
(mg/l)	<106	>106	----
Miscellaneous 5/			
NH_4-N, NO_3-N (mg/l) for sensitive crops	<5	5 - 30	>30
HCO_3 (me/l) [only with overhead sprinklers]	<1.5	1.5 - 8.5	>8.5
(mg/l)	<90	90 - 520	>520
pH	normal range =	6.5 - 8.4	----

1/ Assumes water for crop plus needed water for leaching requirement (LR) will be applied. Crops vary in tolerance to salinity. Refer to tables for crop tolerance and LR. mmho/cm X 640 = approximate total dissolved solids (TDS) in mg/l or ppm; mmho X 1000 = micromhos.

2/ SAR (Sodium Adsorption Ratio) is calculated from a modified equation developed by U. S. Salinity Laboratory to include added effects of precipitation and dissolution of calcium in soils and related to CO_3+ HCO_3 concentrations.

To evaluate sodium (permeability) hazard: $$SAR = \frac{Na}{\sqrt{\frac{Ca + Mg}{2}}} \left[1 + (8.4 - pHc)\right]$$

pHc is a calculated value based on total cations, Ca+Mg, and CO_3+HCO_3. Calculating and reporting will be done by reporting laboratory. NOTE: Na, Ca+Mg, CO_3+HCO_3 should be in me/l.

Permeability problems, related to low EC or high SAR of water, can be reduced if necessary by adding gypsum. Usual application rate per acre foot of applied water is from 200 to about 1000 lbs. (234 lbs. of 100% gypsum added to 1 acre foot of water will supply 1 me/l of calcium and raised the ECw about 0.1 mmho). In many cases a soil application may be needed.

3/ Most tree crops and woody ornamentals are sensitive to sodium and chloride (use values shown). Most annual crops are not sensitive (use salinity tolerance tables). For boron sensitivity, refer to boron tolerance tables.

4/ Leaf areas wet by sprinklers (rotating heads) may show a leaf burn due to sodium or chloride absorption under low-humidity, high-evaporation conditions. (Evaporation increases ion concentration in water films on leaves between rotations of sprinkler heads.)

5/ Excess N may effect production or quality of certain crops, e.g. sugar beets, citrus, avocados, apricots, grapes, etc. (1 mg/l NO_3-N = 2.72 lbs. N/acre foot of applied water).
HCO_3 with overhead sprinkler irrigation may cause a white carbonate deposit to form on fruit and leaves.

Symbol	Name	Symbol	Name	Equiv. Wt.
EC_w	Electrical Conductivity	Na	Sodium	23.00
mmho/cm	Millimhos per centimeter	Ca	Calcium	20.04
<	less than	Mg	Magnesium	12.16
>	more than	CO_3	Carbonate	30.00
mg/l	milligrams per liter	HCO_3	Bicarbonate	61.00
ppm	parts per million	NO_3-N	Nitrate-nitrogen	14.00
LR	Leaching Requirement	Cl	Chloride	35.45
meq/l	milliequivalents per liter			
TDS	Total Dissolved Solids			

* From the University of California - Committee of Consultants

can no longer tolerate the salinity and they die.

In addition to the mineral criteria, the Department of Health has established criteria for irrigating produce, fodder, fiber, seed, processed food crops, and pasture for milking animals. These standards are contained in Table 17, Public Health, of the State Administrative Code, Sections 8041-8045 and are summarized in Table 18*.

Industrial Water Use

Water quality criteria for the different industrial uses are diversified, because of the numerous processes within the various types of industries. Some of

*Currently under revision as "Statewide Reclamation Criteria for Irrigation and Recreational Impoundment". This revision will also include reliability criteria against which waste water reclamation projects will be judged for acceptability.

TABLE 18
RECLAMATION CRITERIA FOR IRRIGATION USE*

Crop	Type of irrigation	Effluent requirements	Coliform count MPN per 100 ml**
Produce	Spray	Adequately disinfected, oxidized, coagulated filtered waste water	2.2
	Surface	Adequately disinfected oxidized waste water	2.2
Orchards and vineyards	Surface	At least primary effluent	Not set
	Spray	Adequately disinfected, oxidized, coagulated filtered waste water	2.2
Fodder, fiber and seed	Surface and spray	At least primary effluent	Not set
Food (processed)	Surface	At least primary effluent	Not set
	Spray	Adequately disinfected oxidized waste water	23
Pasture (for milking animals)	Surface and spray	Adequately disinfected oxidized waste water	23

* From California Administrative Code, Title 17, Sections 8041–8045

** MPN per 100 ml--most probable number of coliform organisms per 100 milliliter. Bacteriological standards are median values not to be exceeded.

the industrial uses for which reclaimed waste water is being used are described below.

Cooling Water

Water is increasingly being used in industry for cooling purposes, especially for generating plants. The standard method employed has been to return the water to river, lake, or ocean, or waste it after its use for cooling. But thermal pollution and shortage of water supply have made other methods necessary. One is utilization of a closed circuit system - in one portion absorbing heat, thereby cooling part of the process or product, and in the other portion discharging heat through the use of cooling towers, spray, or cooling ponds. In such a system, only the amount of water lost by evaporation during the cycle has to be replaced. Some of the problems connected with cooling systems using reclaimed waste water, such as corrosion, scaling, sludge deposits, microbial and algal growth, wood delignification, and excessive foaming, can be controlled by advanced waste water treatment. Limits on turbidity and mineral constituents in cooling water have been suggested by McKee and Wolf in a study for the State Water Resources Control Board (Table 19).

Boiler Water

For use of reclaimed waste water in boilers the criteria are intricate with mainly the boiler pressure determining the quality (especially TDS) of water needed. The greater the pressure, the lower the TDS content should be. Scale forming constituents, like silica and aluminum, should also be minimal.

Process Water

Experience has demonstrated that reclaimed waste water can be successfully utilized in industrial plant processing. For example, Baltimore's reclaimed waste water has been used for process purposes by Bethlehem Steel Corp. for more than 20 years. Also, at the Kaiser Steel Corp. Fontana Plant, reclaimed waste water is being utilized for cooling and process water.

Allowable limits for mineral concentrations and physical properties for steel and textile manufacturing and for paper production are given in Table 19. Reclaimed waste water would also be suitable for several steps of the processes in the copper and aluminum industries.

Landscape Irrigation Water Use

The mineral criteria for landscape irrigation are the same as those for agricultural use (Table 18). However, the mandatory health standards require that the effluent be an adequately disinfected, oxidized waste water with a median coliform count not to exceed 23 MPN per 100 ml (Section 8046, Title 17, Public Health, State Administrative Code).

Recreational Water Use

Only mandatory health criteria apply to reclaimed water to be used for recreational pursuits. These are specified, in Sections 8047-8049, Title 17, Public Health, State Administrative Code (Table 20).

Aquatic Habitat Water Use

When waste water is adequately treated it may be used to augment streamflows to protect fish and other aquatic organisms. The Department of Fish and Game has suggested the water quality criteria contained in Table 21.

TABLE 19 [a]
LIMITS OF MINERAL CONCENTRATIONS AND PHYSICAL PROPERTIES OF WATER FOR VARIOUS INDUSTRIAL USES
(Allowable limits, in parts per million except as noted)

Constituent or property	Boiler feed water, boiler pressure in pounds per square inch			Cooling water	Manufacturing		Production of paper	
	0 – 150	150 – 250	250 – 400		Steel	Textile	Ground wood [f]	Soda and sulfate pulp [g]
Total solids	3000–500 [b]	2500–500 [b]	1500–100 [b]	--	--	--	--	--
pH value	8.0 [c]	8.4 [c]	9.0 [c]	7–9	6.8–7.0	7.8–8.3	--	--
Chlorides (Cl)	--	--	--	--	175	100	75	75
Iron (Fe)	--	--	--	0.5	--	--	0.3	0.1
Manganese (Mn)	--	--	--	0.5	--	0	0.1	0.05
Iron and manganese (Fe + Mn)	--	--	--	0.5	--	0	--	--
Suspended matter	--	--	--	--	25	--	--	--
Temperature, °F	--	--	--	--	75	--	--	--
Turbidity	20	10	5	50	--	--	--	--
Color	80	40	5	--	--	--	30 [h]	5 [h]
Dissolved oxygen	1.4 [d]	0.14 [d]	0.0 [d]	--	--	--	--	--
Hydrogen sulfide (H_2S)	5 [e]	3 [e]	0 [e]	--	--	--	--	--
Total hardness ($CaCO_3$)	80	40	10	50	50	55	200	100
Sulfate – carbonate ratio (ASME) (Na_2SO_4 : Na_2CO_3)	1:1	2:1	3:1	--	--	--	--	--
Aluminum oxide (Al_2O_3)	5	0.5	0.05	--	--	--	--	--
Silica (SiO_2)	40	20	5	--	--	--	--	--
Bicarbonate (HCO_3)	50 [d]	30 [d]	5 [d]	--	--	--	50	20
Carbonate (CO_3)	200	100	40	--	--	--	--	--
Hydroxide (OH)	50	40	30	--	--	--	--	--
Chemical oxygen demand	15	10	4	--	--		--	--
Total dissolved solids	--	--	--	--	--	--	500	250
Free carbon dioxide (CO_2)	--	--	--	--	--	--	10	10
Sulfite (SO_3)	--	--	--	--	--	--	--	--
Alkalinity	--	--	--	--	--	--	150	75
Heavy metals	--	--	--	--	--	--	--	--
Calcium (Ca)	--	--	--	--	--	--	--	--
Magnesium (Mg)	--	--	--	--	--	--	--	--
Sulfate (SO4)	--	--	--	--	--	--	--	--
Turbidity as SiO_2	--	--	--	50	--	--	50 [j]	25 [j]
Silica (soluble as SiO_2)	--	--	--	--	--	--	50	20
Calcium hardness as $CaCO_3$	--	--	--	--	--	--	--	50
Magnesium hardness as $CaCO_3$	--	--	--	--	--	--	--	50
Corrosion potential	--	--	--	--	Low as possible	--	--	--

a. California State Water Resources Control Board. "Water Quality Criteria". Publication No. 3-A, April 1971.
b. Depends on design of boiler.
c. Minimum
d. Limits applicable only to feed water entering boiler, not to original supply.
e. Except where odor in live steam would be objectionable.
f. Groundwood papers are coarse papers composed primarily of groundwood fibers such as used for newspapers, telephone directories, cheaper grades of catalogues, and pulp magazines.
g. Pulps produced by chemical cooking processes known as the soda process and the sulfate or kraft process are also known as alkaline pulps.
h. Color in platinum units.
j. Materials causing turbidity shall not be gritty.

TABLE 20
RECLAMATION CRITERIA FOR RECREATION WATER*

Type of impoundment	Reclaimed water	Disinfection requirements in MPN of coliform per 100 ml
Nonrestricted recreational**	Adequately disinfected, oxidized, coagulated, filtered waste water	2.2
Restricted recreational	Adequately disinfected oxidized waste water	2.2
Landscape	Adequately disinfected, oxidized waste water	23.0

* From California Administrative Code, Title 17, Sections 8047–8049
** Nonrestricted recreation involves water-contact activities

TABLE 21
SUMMARY OF EFFLUENT AND RECEIVING WATER LIMITATIONS FOR PROTECTION OF FISH AND AQUATIC RESOURCES*

Constituent	Recommended limitation	Degree of protection
Toxicity concentration (Tc)	0.64 TU**	90% survival of test species in 100% (undiluted) effluent
Total residual chlorine	0.002 mg/l	Receiving water limit - protect salmanoid and sensitive food organisms
Undissociated ammonia	0.2 mg/l	Receiving water limit
pH value	6.5 to 8.0	Effluent limit
Turbidity	20% increase over background level	
Settleable solids	20% increase over background level, or 0.2 mg/l	
Temperature	Maximum 5° F change	
Dissolved oxygen	Warmwater fishery 5.0 mg/l Coldwater fishery 7.0 mg/l	
Toxicants	No pesticides, radioactive material	

* From California Department of Fish and Game
** TU = toxicity unit

GLOSSARY OF TERMS

Activated sludge process is a treatment process that removes (by biological assimilation and decomposition) organic matter from waste water using a biologic floc in an aerobic environment.

Advanced treatment processes remove or reduce nutrients, dissolved solids, suspended or colloidal solids, toxic matter, and other constituents, using any physical, chemical, or biological process. Advanced treatment has come to mean any process added to the traditional primary-secondary treatment plant or to recently developed innovative processes not characteristic of recent practice.

Aeration tank is a chamber in which air is injected into waste water.

Algae are microscopic plants that grow in sunlit water that contains phosphates, nitrates, and other nutrients. Algae are food for small aquatic animals and, like all plants, add oxygen to the water. They are important in the fish-food chain in some instances.

Bacteria are microscopic unicellular organisms which consume organic constituents in waste water.

BOD (biochemical oxygen demand) is the dissolved oxygen required by organisms for the aerobic decomposition of organic matter in a standard laboratory test.

Chlorinator is a device for adding chlorine gas to waste water to kill pathogenic organisms.

Clarifiers are sedimentation tanks used to remove settleable solids in waste water treatment. They are used to partially clarify raw sewage following biological treatment.

Coagulation is the clumping together of solids to force them to settle out of waste water more quickly. Coagulation of solids is brought about through the use of certain chemicals, e.g., lime, alum, and iron salts. Coagulation is also brought about in biological treatment.

Comminutor is a device for shredding heavy solid matter in the pretreatment stage of waste treatment.

Controlled reuse is the use of reclaimed water under legal and physical control or restraint.

Degrees of treatment refer to the reduction and removal of undesirable constituents in waste water. In general, the degrees are termed primary, secondary, and tertiary.

Direct reuse is use of reclaimed waste water directly from a reclamation facility without passing through a natural body of either surface or ground water.

Disinfection is the destruction of most disease-causing (i.e., infectious) organisms, as contrasted with sterilization, which is the destruction of all living organisms.

Dissolved solids in waste water are the minerals, salts and other chemicals which are dissolved in water as it passes through the air, over and underground, and through municipal, industrial, agricultural and other uses.

Effluent is the liquid product of a treatment unit, plant, or facility.

Imhoff tank is a two-story tank for clarification of sewage, consisting of an upper sedimentation chamber with a sloping floor leading to slots through which solids settle to a lower digestion chamber.

Indirect reuse is the use of treated water after it has been discharged to a body of natural water.

Industrial wastes are liquid or solid waste substances, not sewage, from any producing, manufacturing, or processing operation.

Influent is the waste entering a waste water treatment plant or treatment unit.

Interceptor sewers are used in separate sewage systems to collect the flows from main and trunk sewers and carry them to the point of treatment. In a combined system they also may restrict or limit the flow of waste water to the treatment plant. In case of a sudden surge of water into the sewers, some of the waste water may be diverted directly into a receiving stream, thus protecting the treatment plant from overload.

Most probable number per 100 milliliters is the statistically determined estimate of the number of organisms present in 100 milliliters of sample.

Organic wastes are wastes derived from plant or animal matter originating from domestic or industrial sources.

Oxidation is the breakdown of organic wastes or chemicals in waste water by bacterial or chemical processes in the presence of oxygen.

Oxidation ponds are manmade bodies of water in which wastes are consumed by bacteria as well as by oxygen from the atmosphere, generally with the aid of algae.

Planned reclaimed water use is the deliberate direct or indirect use of treated waste water.

Pollution, according to California Water Code, Section 13050 (1), "means an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects: (1) such waters for beneficial uses or (2) facilities which serve such beneficial uses. 'Pollution' may include 'contamination.'"

Primary treatment involves physical processes for removal of settleable solids and floating matter by screening, skimming, and sedimentation.

Reclaimed water is water that, "as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur." (California Water Code, Section 13050 (n).)

Recycling is the direct reuse of water, without treatment, at the same general location or for the same purpose.

Reuse means the additional use of once-used water.

Reverse osmosis is the process of demineralization using a semipermeable osmotic membrane under pressure.

Salts are the minerals which water picks up as it passes through the air, over and underground, and through municipal, industrial, agricultural and other uses.

Sand filters remove suspended solids from waste water as it filters through the sand to produce clarified water which drains from the sand bed. Bacteria may develop in some types of sand filters and aid in the clarification process.

Secondary treatment is the biological process of reducing suspended, colloidal, and dissolved organic matter from the effluent from primary treatment systems. Secondary treatment is usually carried out through the use of trickling filters or by the activated sludge process.

Sedimentation tanks are used to remove a portion of the solids from waste water where the solids settle to the bottom or float on top. The floatables are skimmed off the top, while the solids on the bottom are collected and pumped to digestion tanks, following which they may be processed by filtration, and sometimes incineration, before final disposal.

Sewage includes all substances, liquid or solid, associated with human activities, domestic, commercial, and industrial. For this report, the term sewage applies to waterborne wastes collected and treated by communities.

Sewerage is the apparatus for the collection, transportation and pumping of waste water.

Sludge is the semi-solid matter that settles to the bottom of sedimentation tanks or clarifiers. It is sufficiently liquid in character to be pumped.

Stabilization ponds are man-made bodies of water which provide the removal and digestion of settleable solids and floating matter.

Stable organics are organic compounds which remain in waste water, generally in minute quantity, after presently used treatment processes and which may pose a threat to health.

Suspended solids are small particles of solid pollutants that are present in waste waters and may be separated by sedimentation aided by chemical and biological treatment and sometimes filtration.

Tertiary treatment is additional treatment to improve the quality of the effluent from secondary treatment systems.

Trickling filter, usually a bed of stones, is a support medium for bacterial growth. Waste water is trickled over the bed so that the bacteria can break down and assimilate the organic wastes.

Virus is the smallest known form of microorganism capable of causing disease.

Waste water is the used water, liquid waste, and drainage of a community, industry, or institution.

Waste water reclamation is the process of treating waste water to produce water for beneficial uses, its transportation to the place of use and its actual use.

Water year is in California a year beginning October 1 and ending September 30 of the next year. For example, water year 1966-67 begins October 1, 1966, and ends September 30, 1967.

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