LONG BEACH WATER DEPARTMENT

Leader in Environmental Stewardship and Water Conservation

2005 Urban Water Management Plan

Long Beach Board of Water Commissioners

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Long Beach Water Department
2005 Urban Water Management Plan

Executive Summary 4

Introduction 8

Long Beach Water Department 8

Section 1 – Agency Coordination 10

Coordination with Appropriate Agencies (§ 10620 (d)) 10

UWMP preparation (§ 10620 (e)) 10

Resource maximization / import minimization plan (§10620 (f)) 10

City and County Notification and Participation (§ 10621(b)) 12

Supplier will periodically review and adopt any changes or amendments (§ 10621(c)) 12

Section 2 - Contents of UWMP 13

2.1 Appropriate level of planning for size of agency 13

2.2 Service Area Information with 25-year Projections 13

Demographics 13

Climate and ETo 13

Other Factors Influencing Water Demand 14

2.3 Water Sources 15

Groundwater 16

2.4 Reliability of Supply 18

2.5 Transfer and Exchange Opportunities 21

2.6 Water Use by Customer-type - Past, Current and Future 21

Agricultural Sales 22

Sales to other agencies 22

Additional Water Uses and Losses – AF/Year 22

Total Water Use – AF/Year 23

2.7 Demand Management Measures 23
2.8 Evaluation of DDMs Not Implemented 25
2.9 Planned Water Supply Projects and Programs 26
Expanded Reclaimed Water Infrastructure 26
Reclaimed Water Barrier Injection Phase I & II 26
Seawater Desalination 27
2.10 Opportunities for Desalinated Water 27
2.11 Current or Projected Supply Includes Wholesale Water 28

Section 3 – Determination of DDM Implementation 30

Section 4 – Water Shortage Contingency Plan 31
4.1 Stages of Action 31
4.2 Estimate of Minimum Supply for Next Three Years 33
4.3 Catastrophic Supply Interruption Plan 33
4.4 Prohibitions, Penalties and Consumption Reduction Methods 34
4.5 Analysis of Revenue Impacts of Reduced Sales During Shortages 35
4.6 Draft Ordinance and use Monitoring Procedures 35

Section 5 – Recycled Water Plan 36
5.1 Coordination 36
5.2 Wastewater Quality, Quantity and Current Uses 36
5.3 Potential and Projected Use, Optimization Plan with Incentives 37

Section 6 – Water Quality Impacts on Reliability 39

Section 7 – Water Service Reliability 40
7.1 Projected Normal Water Year Supply and Demand 40
7.2 Projected Single Dry-year Supply and Demand Comparison 40
7.3 Projected Multiple Dry-year Supply and Demand Comparison – 2006-2030 41

Section 8 – Adoption and Implementation of UWMP 42

List of Attachments 43

Executive Summary

The Long Beach Water Department (LBWD) provides an uninterrupted supply of quality water through economically efficient and environmentally responsible means to the half-million people and the business community of the City of Long Beach, California.

We have fulfilled this tremendous responsibility for the last ninety-four years and fully expect to keep this promise to our community far into the future. This document, the 2005 Urban Water Management Plan (UWMP), articulates how this responsibility will be fulfilled in the years to come.

Sixty-five years ago water demands were met by simply pumping water from the local groundwater basin. Today's water demands are met by means of a very complex and tightly integrated mix of aqueducts hundreds of miles long, water stored in Long Beach, in the greater Long Beach region, throughout the Central Valley of California and even outside of California, by ever expanding uses of reclaimed water for irrigation and industrial purposes, and more innovative and aggressive forms of water conservation.

Future water demands will be met by all these means plus expanded use of reclaimed water and water conservation, conjunctive use and groundwater storage, plus other cost-effective and environmentally responsible means we are actively pursuing. An example being seawater desalination. The focus of the UWMP is on the future, on the next twenty-five years.

The LBWD has met past challenges for reliability, affordability, and environmental stewardship. The new, complex reality which is today's water industry and LBWD's effective response are borne out by a simple comparison: the population of Long Beach has *increased* 25-percent since the mid-1980's, yet LBWD's reliance on imported water has *decreased* by ten-percent. The LBWD met these challenges in several ways.

- Expanded use of reclaimed water: the LBWD has aggressively expanded its reclaimed water distribution system. Most of the larger irrigation users have been converted from potable (imported) water to reclaimed water. The LBWD now serves about 6,000 acre-feet[1] of reclaimed water to its customers each year.
- Aggressive water conservation: the LBWD has maintained aggressive water conservation for the last decade and a half. If per capita water use remained the same as it had in the fourteen years leading up to the drought of the early

[1] An acre-foot of water equals the amount of water needed to cover one acre of land with one foot of water; which equals about 43,560 cubic feet or 325,851 gallons.

1990's, Long Beach would be consuming about 17,000 acre-feet more imported water than it does at the present time.

- Greater reliance on local groundwater supplies: LBWD has annual pumping rights of less than 27,000 acre-feet of water in the 1960's; today it has over 32,000 acre-feet of rights.

Several factors will drive future water demands, including population growth, housing density, employment, and household income. More people means more demand for water. The population of Long Beach is expected to increase fifteen-percent from today's 490,100 to approximately 564,900 by 2030.

Per capita water use in single family housing is higher than in multi-family units, in large part because of the former's greater use of water outdoors. The number of single family units is expected to increase twelve-percent from today's 77,000 to 86,000 by 2030; while multi-family units increase 26-percent from 90,000 to about 113,000 over the same period. The higher rate of growth in multi-family units portends higher density and lower overall per capita water use.

Increased employment indicates greater economic activity, which in turn portends increased demand for water in the commercial, industrial, and institutional sectors. Employment in Long Beach is expected to increase 23-percent from today's 200,000 to 244,000 in 2030.

Water use tends to increase and decrease along with incomes. As incomes increase households tend to consume more water in any number of ways, from purchasing spas to installing more water-intensive landscapes. Incomes in Long Beach are expected to increase very little over the next twenty-five years, from about $37,000 to $40,000 (both numbers are in year 2000 dollars), for an increase of just eight-percent.

These factors are expected to have the following impact on domestic demand for water in Long Beach over the next twenty-five years:

	2005*	**2030**
Potable Water	69,894 af	72,200 af
Reclaimed Water	5,210 af	14,400 af
Total	75,104 af	86,600 af

**These numbers are estimates.*

This represents a total increase of fifteen-percent, with potable demand increasing just three-percent.

In addition to normal municipal and industrial demands, the LBWD has created an innovative partnership with the Water Replenishment District of Southern California (WRDSC) to annually inject 4,200 acre-feet of highly treated reclaimed water into the seawater barrier in place of the imported drinking water previously utilized. That project is currently in operation, replacing half the annual imported drinking water. By 2015, one hundred percent of the injected water is expected to be reclaimed water.

The LBWD will meet most of these future demands with highly reliable, cost effective, and environmentally responsible groundwater, reclaimed, and conserved water supplies. All three of these sources are environmentally responsible. Because water extractions from the groundwater basin are highly regulated, impermeable layers of clay protect the groundwater from surface contamination, and a mandated fee structure exists to generate revenues required to keep the water table at desirable levels, the groundwater is very reliable. Groundwater is the least expensive source of potable water, costing approximately half that of imported drinking water. Reclaimed water is highly reliable as well, given that neither adverse hydrologic conditions nor other factors such as growth in other parts of southern California significantly affect the availability of reclaimed water to the LBWD. Economically, the operating cost of reclaimed water is very low. And although the capital cost of installing new reclaimed water mains for new customers is very expensive, the LBWD offsets these costs with state and federal funding. The LBWD can expect to conserve more than 21,000 acre-feet of water per year by 2030, an amount equal to 29-percent of the potable demand at that time.

A fourth source of local supply by 2030 could well be desalinated seawater. The LBWD has partnered with the U.S. Bureau of Reclamation and the Los Angeles Department of Water and Power to construct and operate the largest and most significant seawater desalination research facility in the United States. Experts are using this facility to research the economic, technical, and environmental feasibility of what is known as the "Long Beach Method" of seawater desalination, an innovative approach that is anticipated to reduce the amount of energy needed to desalinate seawater by twenty- to thirty-percent. The LBWD will commit to what would be an extremely reliable water supply if it proves to be technically, economically, and environmentally feasible.

The imported drinking water purchased by the LBWD will remain an important supply. The LBWD purchases this water wholesale from the Metropolitan Water District of Southern California (MWD), an agency which is essentially a cooperative of the major water agencies in southern California. Working with its member agencies, the MWD has established itself as a leader in innovative water planning, establishing an array of storage programs throughout southern California, the Central Valley, and along the Colorado River. Through the MWD leadership, southern California has, in turn, become a national leader in urban use of reclaimed water and water conservation. Through its collaborative and exhaustive planning process, the MWD has established a high level of confidence in the long-term reliability of its supplies through a continuation and expansion of the programs such as those mentioned above: reclaimed water, conservation, and water storage programs.

The LBWD provided copies of the draft plan to the City's elected officials as well as the city manager, city advanced planner, city librarian, and city clerk, and solicited their input. The LBWD developed the UWMP in concert with other water agencies including the largest urban water agency in the United States, the MWD, from whom the LBWD purchases half its water wholesale. Eight cities in the greater Long Beach area, as well as the county of Los Angeles, were invited to participate in the development of the UWMP and were provided with draft copies for their review and comments. Finally, several community organizations were also provided with copies of the draft and invited to submit comments.

The LBWD has positioned itself to continue its stellar record of reliability, quality, cost effectiveness, and environmental stewardship well into the first half of the 21st Century.

Introduction

The Urban Water Management Planning Act (Act) requires urban water suppliers to describe and evaluate, every five years, sources of water supply, demand management measures, implementation strategies and schedules, and other relevant information and programs.

In compliance with the Act, the Board of Water Commissioners of the City of Long Beach prepared and adopted Urban Water Management Plans in 1985, 1990, 1995 and 2000, and filed those plans with the California Department of Water Resources, and has now prepared and adopted this document, the Long Beach Water Department's (LBWD) 2005 Urban Water Management Plan ("Plan").

The Act requires a public involvement process in the development of the UWMP. As shown on Table 1, a draft of the Plan was made available for review at the LBWD and distributed to, among others, the Mayor and Members of the City Council, the City Manager, the City Librarian, and the City Clerk. On December 1, 2005, the City of Long Beach Board of Water Commissioners conducted a noticed Public Hearing on the draft to receive public input prior to the adoption of the Plan. Upon closing the Public Hearing, the Board of Water Commissioners adopted the 2005 Plan on December 1, 2005.

This report was developed using the DWR's recommended guidelines.

Long Beach Water Department

The LBWD was established July 1, 1911, by the City Charter to regulate and control the use, sale and distribution of water owned or controlled by the City of Long Beach. On June 27, 1911, the voters approved the issuance of an $850,000.00 bond to purchase the two companies serving the City and on July 1st of that year, the City's Municipal Water Department began operations.

At a special election on February 17, 1931, the voters of Long Beach approved the City's membership in the MWD, establishing Long Beach as one of the original 13 Cities in what is now the largest urban water agency in the U.S., providing about ½ of all potable water consumed in the southern California coastal plain – serving approximately 18 million people from Ventura county in the north to the Mexican boarder in the south.

At the same election in 1931, the voters also approved a City Charter amendment creating the Board of Water Commissioners. The Board is comprised of five member of the Long Beach community, each serving up to two 5-year terms. Members of the commission are nominated by the Mayor and approved by the City Council.

The City Charter entrusts the Board with significant responsibility and authority. The Board is charged with full jurisdiction over all water works necessary to the acquisition, treatment, sale, and distribution of water served to the City and the City's sewer system. Among other duties, the Board has authority to acquire or sell real property, to construct and operate water facilities, to purchase equipment and to make contracts. Additionally, the Board is responsible for establishing the LBWD missions and goals, and adopting policies and strategies to meet these ends.

The Board-adopted mission of the LBWD incorporates the water and sewer systems operations and maintenance, reclaimed water, and embraces customer-centered, efficient, and environmental sensitive operations:

- to deliver an uninterrupted supply of quality water to our customers;
- to effectively dispose of, or reclaim, sewage and runoff waters; and
- to operate in an economically efficient and environmentally responsible manner.

The Board also adopted a set of 'Values' to support the mission:

- a proactive mindset, anticipation of future needs;
- effective communication within the LBWD and the community at large;
- enthusiastic support of water education programs; and
- responsible support of water conservation activities.

Each year the Board adopts a set of specific, actionable Critical Objectives that focus the LBWD activities. The Critical Objectives cover infrastructure, water supply, service areas and offerings, economic and capital resources, human resources, stakeholder/constituency involvement, performance measurement/outcomes, and governance issues.

For more information on the LBWD, please visit our web site at www.lbwater.org; for more information on the City of Long Beach, please visit www.longbeach.gov.

Section 1 – Agency Coordination

The Long Beach Water Department (LBWD) is an urban water supplier as defined by Water Code section 10617, annually providing approximately 75,000 acre-feet, or roughly 24.5 billion gallons, of potable and reclaimed water to roughly 90,000 accounts that serve over 480,000 people. Therefore, LBWD is required to prepare and adopt this Urban Water Management Plan (Plan) by December 31, 2005.

Coordination with Appropriate Agencies (§ 10620 (d))

Table 1 - Coordination with Appropriate Agencies shows the level of coordination between LBWD and other agencies. The LBWD primarily serves the community of Long Beach. As shown in Table 1, small parts of other communities are also served. Those other communities were notified of the development of the UWMP and encouraged to participate and comment.

Approximately 50-percent of the drinking water served by LBWD is purchased wholesale. The wholesale provider is the MWD. As a wholesale agency, the MWD must, and has, prepared a Regional UWMP. This Regional UWMP was developed in very close cooperation with the agencies, such as LBWD, which purchase the wholesale water. The MWD was notified of the development of the Plan and encouraged to participate and comment.

UWMP preparation (§ 10620 (e))

This LBWD Plan was prepared by LBWD staff.

Resource maximization / import minimization plan (§10620 (f))

LBWD uses several water management tools and options to maximize local resources and minimize the need to import water. Approximately ½ of the potable water served by the LBWD is imported by the MWD, the balance being water pumped from the local groundwater basin. Firm imported water is more expensive than extracting and treating local groundwater; therefore, LBWD defaults to local groundwater production, all else being equal. So when LBWD reduces potable-water use through greater use of reclaimed water or conservation, the need for firm imported water is reduce by an equal amount.

- Reclaimed Water: LBWD has aggressively expanded its reclaimed water distribution system. Most of the larger irrigation users have been converted from potable (imported) water to reclaimed water. The LBWD now serves about 6,000 acre-feet of reclaimed water to its customers each year.

- Seawater Intrusion Barrier: LBWD has worked closely with the Water Replenishment District of Southern California (WRDSC) to develop a facility for treating reclaimed water to drinking water standards, and injecting that water into the seawater intrusion barrier in southeastern Long Beach. The project is now complete and in operation. Up until this point in time, water injected into the barrier has been imported drinking water. This project will initially substitute the treated reclaimed water for up to one-half of the imported water; project plans call for replacement of 100-percent of imported drinking water.
- Conjunctive Use: the LBWD, working with the MWD and the WRDSC, has created a new storage program in the groundwater basin. Under this conjunctive use program, water is stored in the groundwater basin during wet years, and extracted during dry years, or when it is called by the MWD. The conjunctive use program reduces demand for imported water during dry years, the most important time for these reductions.
- Conservation: the LBWD has maintained aggressive water conservation for the last decade and a half. If per-capital water use remained the same as it had in the fourteen years leading up the drought of the early 1990's, Long Beach would be consuming about 17,000 acre-feet more imported water than it does at the present time. A description of the LBWD demand management program is included in this UWMP.
- Seawater Desalination: the LBWD has been conducting leading-edge research on seawater desalination, with an eye towards creating a technologically-, environmentally-, and cost-effective alternative to imported drinking water.
- Regional Planning: the LBWD has worked closely with the MWD on the development of the latter's Integrated Resource Plan, integrating regional demand projections and supply planning. This IRP includes regional targets for expanded water conservation and use of recycled water, minimizing the need for imported water.
- Groundwater Management: the local groundwater basin is managed by the WRDSC; the LBWD works closely with the WRDSC to maximize the value of the basin for the public good, maintaining the health of the basin and maximizing its safe yield. The LBWD also participates in groundwater advisory board to the WRDSC, and participates in the association of groundwater agencies. Protecting the health of the groundwater basin and maximizing its safe yield are essential tools for minimizing imported water, particularly during dry-year events.

City and County Notification and Participation (§ 10621(b))

The LBWD was required to notify cities and counties in its service area of the opportunity to submit comments regarding the Plan during the update process. As shown in Table 1, these entities were notified and their comments solicited. Ninety-nine percent of LBWD's accounts are located in City of Long Beach; the balance located in an unincorporated area within the county of Los Angeles and seven other cities.

Supplier will periodically review and adopt any changes or amendments (§ 10621(c))

The LBWD will periodically review and adopt any changes or amendments to the Plan in accordance with the procedure set forth in Water Code sections 10640 through 10645.

Section 2 - Contents of UWMP

2.1 Appropriate level of planning for size of agency

The level of detail provided in this Plan reflects the size and complexity of the LBWD. However, all elements required by the Urban Water Management Planning Act are discussed. Historic information has been included when available.

2.2 Service Area Information with 25-year Projections

Demographics

Table 2 - Population: Current and Projected projects the City's population from 2005 through 2030. This estimate was developed by the Southern California Association of Government (SCAG) and used by the MWD and LBWD in their projection of water demand.

Projecting population twenty-five years into the future is a business ripe with uncertainty. Therefore, a sensitivity analysis was conducted on the projection to assess whether the impact on demand for water would change significantly if these estimates were off by what could be considered maximum realistic amount, namely, that the population grows at twice the rate estimated by SCAG. Because the overall population increase is very small, Long Beach being an older built-out community, the net effect of population grown at twice the rate estimated by SCAG has only the slightest impact on demand for water in Long Beach: doubling the annual population rate used by SCAG only increases the demand for potable and reclaimed water by roughly nine-percent by the year 2020. Given the lack of precise knowledge about the future, and the outcome if the sensitivity analysis, the SCAG estimates appear reasonable and were, therefore, used in the Plan.

Climate and ETo

Weather impacts how much water people use and how much is needed for landscape irrigation. **Table 3A - Average Climate in Long Beach** shows 47 years of weather data for the Long Beach area, providing information on the average maximum and minimum temperatures for each month.

The first chart on Table 3A show that the average annual temperature has increased about one degrees over the last 45 years but that annual average temperatures can fluctuation by as much as about three degrees over a one-year period and up to six degrees over this entire period. This great variation calls into question the statistical significance of the one-degree increase over the same period.

The second chart shows the annual rainfall for this same period. The annual rainfall has averaged about 12 inches per year; but this average appears to mask a slight increase in the average annual rainfall. But, like the temperature increase noted above, this average and this increases are overwhelmed by year-to-year fluctuations. For example, there was a difference of 18 inches of rainfall between 1983 and 1984 (26.7 in vs. 8.5 inches, respectively). The total rainfall can fluctuate from a low of 2.6 inches (2002) to a high of about 38 inches in this past winter (2004-05).

Rainfall in Long Beach impacts demand, but not supply. Demand for water goes down as rainfall increases. LBWD's supply of water comes from the groundwater basin, which is fed, in part, by precipitation in the San Gabriel Mountains but not from rainfall in Long Beach (layers of impermeable clays and silt lay between the surface and the aquifer that water is drawn from). The precipitation in the San Gabriel Mountains does not affect the supply to Long Beach in the short term because the water percolates over many decades from the spreading grounds to where it is extracted in Long Beach. In that sense, what is important are changes in the long-term average rainfall. It is important to note that this precipitation is only one of three sources of water percolated into the groundwater basin; the other two are MWD wet-year replenishment supplies and treated recycled water.

Table 3B - CIMIS Information shows CIMIS evapotranspiration (ETo) information for the Long Beach area for the period between 1991 and 2004. As shown, the average annual ETo during this period is about 45 inches, but, like rainfall, the annual ETo fluctuates quite a bit: from a low of 38.9 inches (2001) to a high of 51.8 inches (1997). ETo is an indication of the amount of water lost through evaporation and plant transpiration. Higher ETo means more water is needed for a particular landscape; lower ETo, less water. The chart on Table 3B shows the annual ETo decreased in the last few years, but it can be assumed this decrease is nothing more than a fluctuation around a mean, just like rainfall and temperature, as noted above. In other words, it is reasonable to assume that, based just on trends in ETo, the amount of water needed for landscape irrigation in Long Beach will not change significantly over time.

Other Factors Influencing Water Demand

The demand projections for Long Beach were first developed by the MWD, using input from LBWD and the Southern California Association of Governments, a regional planning agency. MWD used this data as input into it econometric demand-projection model. The model takes many factors into consideration including expected changes in

population, density, employment and incomes. The LBWD reviewed and concurred with the values input into the econometric model as well as the model's output. The following are major inputs used in the econometric model.

HOUSING: **Table 3C - Other Factors Influencing Water Demand** projects an increase of 32,599 housing units over the 25-year period between 2005 and 2030; this represents an increase of just 0.7-percent per year. This is consistent with the projections of a slow increase in population. Currently about 54-percent of the housing units are multi-family; this percentage is expected to increase slightly because Long Beach is a built-out community with very little open space for new single-family units. Table 3C shows the number of people per household is about 30-percent greater in single family housing, but the density of housing per acre is much greater for multi-family: about 6 units per acre and 27 units, respectively. Therefore, the density of people per acre in multi-family housing is about three times that of single-family housing. The higher concentration of housing units and people per acre necessarily means less water use per capita.

In summary: the rate of new housing created over this period will be very low and most of this new housing will be multi-family units. With the higher density will come lower per capita water use for new residents, lower than would be expected in a community in which most new housing units are single-family.

EMPLOYMENT: Water use will increase as more people work, consuming water on the job for personal use and in the process of performing their duties. Table 3C shows the estimated increase of 44,904 jobs over the 25-year period; from 199,473 jobs to 244,377, in 2005 and 2030, respectively. This represents an increase of just 0.8-percent per year, which is roughly similar to the overall population growth estimates. These low employment-growth estimates point towards slow growth in demand for water within the commercial, industrial, institutional sector (CII).

INCOME: Water use and household incomes tend to rise and fall together. As a household's disposable income increases it will have less financial incentive to conserve water and may have more money to invest in a water-consuming device such as a Jacuzzi or swimming pool. Rising household incomes, then, put upward pressure on the demand for water. Table 3C projects the average household income in Long Beach to increase by just 0.3-percent per year, adjust for inflation. This limited increase will have a negligible impact on the demand for water over the same period.

2.3 Water Sources

Water supply projections are show on **Table 4 - Current and Planned Water Supplies – AF/Y**. The major sources are water purchased wholesale from the MWD,

groundwater pumped and treated by the LBWD, recycled water and, possibly beginning as early as 2010, desalinated seawater.

Groundwater

LBWD has the right to pump 32,684 acre-feet per year of groundwater from the Central Basin and 0.7 acre-feet from the West Coast Basin. LBWD has no wells in the West Coast Basin and, therefore, does not pump those water rights, but does, from time to time, use those rights for the in-lieu replenishment of that basin.

The Central Basin is a groundwater aquifer under 277 square miles in mostly urbanized southern Los Angeles County. The basin was seriously over-drafted by the mid-1900's. The basin was adjudicated in Superior Court in the early 1960's, strictly limiting extractions to apportioned rights, and apportioning the pumping rights to certain parties; the judgment, therefore, provides the framework for groundwater management of this basin. A copy of the judgment, an 91-page document, is enclosed as an attachment and is also available at the LBWD web site:

- www.lbwater.org

or more specifically,

- http://www.lbwater.org/pdf/CentralBasinJdgmnt.pdf

The judgment is monitored by the court-appointed Watermaster, the Department of Water Resources. The Watermaster publishes a comprehensive annual report documenting many aspects of the basin, including the exact location of the basin, the amount of replenishment taking place and replenishment operations, the number of active and inactive wells, water quality information, the sale and lease of water rights, how much water was extracted and by who, the seawater barrier operations, 55 years of data tracking groundwater levels at key monitoring sites, water imported into the Central Basin area for use by local water agencies, a complete history of the Watermaster services and the successful efforts to keep the Central Basin safe yield in tact. A copy of the most current report available at the time of the development of this Plan, the 82-page report for FY 2003-04, is included as an attachment. Copies of this and previous annual reports are available from the watermaster at:

- http://wwwdpla.water.ca.gov/sd/watermaster/central_basin_reports.html

The annual pumping rights allocated in the judgment exceeds the natural yield of the basin. Therefore, in addition to restricting water production, the judgment charges the Water Replenishment District of Southern California (WRDSC) with the replenishment of the basin. Parties extracting water from the basin pay an assessment, to the WRDSC, per acre-foot extracted. This assessment is used by the WRDSC to purchase replenishment water and to fund other programs for the replenishment and protection of the basin. For more information on the WRDSC, go to http://www.wrd.org. The

WRDSC publishes a comprehensive Engineers Survey and Report each year, the 62-page report for 2005 is enclosed as an attachment and can also be found at:

- http://www.wrd.org/documents/2005%20Final_Report_March2.pdf

This report goes into great detail regarding groundwater production, groundwater conditions, the quantity and availability and cost of groundwater replenishment, and groundwater projects and programs.

Table 5 - Groundwater Pumping Rights - AF/ Fiscal Year (July-June) shows the LBWD groundwater pumping rights in the Central and West Coast groundwater basins.

Table 6 - Amount of Groundwater Pumped - AF/ Fiscal Year (July-June) shows the annual production from each groundwater basin for the years 2000 through 2004. The groundwater production was less than the adjudicated rights of 32,684 acre-feet in each of these years. During this period of time, LBWD worked with the MWD and the WRDSC to replenish the groundwater basin through in-lieu means. This was accomplished by the MDWSC selling surplus wet-year water to the LBWD who, in turn, retired its right to pump its full complement of water rights.

The location and monthly production of each well is identified in the annual Watermaster reports referenced above; this report for 2003-04 identifies 41 wells, 31 of which produced water that year. Six years' of monthly production from the wells is available at the Watermaster's web site:

- http://wwwdpla.water.ca.gov/sd/watermaster/monthly_extraction.html

Table 7 - Amount of Groundwater Projected to be Pumped - AF/Year shows the expected production from each basin for the years 2010, 2015, 2020, 2025, and 2030. The expected production equals the expected annual extraction rights. This amount could increase in dry years if the MWD "calls" its water stored in the conjunctive use account or when water shortages required the LBWD to extract additional water from storage, as allowed and constrained by judgment. This amount could also increase if the LBWD were to purchase or lease additional water production rights at a cost-effective price from an owner of water production rights. This amount could decrease in wet when the MWD and the WRDSC both participate in the in-lieu replenishment program, as in the past.

It is not anticipated that production will change as a result of cones of depression, changes in direction and amount of groundwater flow, movement and levels of contaminants, projected average annual recharge, salinity/ TDS levels or for other factors exclusive of the ones noted above. The LBWD has a very long history of successfully operating at this level of production in the Central Basin without developing significant cones of depression or changing the direction and amount of groundwater flow. The portion of the basin used by the LBWD is free of contaminants, in large part because that part of the basin is isolated from surface contamination by several layers

of impermeable clay. Production is not anticipated to change as a result of average annual recharge because the recharge is managed by the WRDSC for the expressed purpose of maintaining a proper level of recharge and the revenue required to fund this recharge operation will be available because the revenue is generated from a tax on the extraction of the groundwater. Production is not anticipated to be impacted by increased salinity because the source of salinity, namely the Pacific Ocean, is prevented from entering the groundwater basin by an artificial seawater barrier created by the WRDSC's barrier injection program.

2.4 Reliability of Supply

Annual precipitation patterns within individual watersheds may vary substantially from one year to the next. Climate-induced shortages are typically based upon known factors such as El Nino, the Pacific Decadal Oscillation, and Jet Stream variations. These factors have a greater impact on the demand for water in Long Beach than on the supply. Please see **Table 8 - Supply Reliability - AF/Year**, **Table 9 - Basis of Water Year Data**, and **Table 10 - Factors Resulting in Inconsistency of Supply**.

The LBWD has three major sources of water: treated water imported by and purchased wholesale from the MWD, groundwater extracted and treated by the LBWD, and tertiary-treated reclaimed water provided by the Los Angeles County Sanitation Districts. The following discusses the reliability of these supplies and their vulnerability to seasonal or climatic shortage. The LBWD is researching the technological, environmental, and financial feasibility of seawater desalination as a source of potable water. If feasible, this source could come into production as early as 2010. If feasible, this would be a very reliable supply of water impervious to fluctuations in weather and climate. This supply would be used in-lieu of MWD imported water.

Imported Water

The MWD makes several types of water available to its member agencies, including "interruptible" water for replenishment and for agricultural use, and "firm" water for M&I (municipal and industrial) demands. LBWD relies on MWD's firm supplies for approximately ½ of its total water supply, or about 36,000 acre-feet. MWD, in its draft 2005 Regional Urban Water Management Plan, projects that it will meet all requests for firm supplies for the next 25 years, during average water years, and during single-year and, with the possible exception of demands in the year 2030, multiple dry-years (based on 1990-92 hydrology). The MWD can accommodate seasonal and year-to-year fluctuations in precipitation due to the flexibility built into its water supply programs and the storage on and off its major aqueducts. The supply programs include interruptible programs such as replenishment and certain agricultural water supplies. The storage programs include storage along the Colorado River, the California Aqueduct, groundwater banking programs in places such as Arizona and California's Central

Valley, MWD's own Diamond Valley Lake, and MWD's conjunctive use programs with its member agencies such as the LBWD. Additionally, the LBWD enjoys preferential rights to an amount of MWD's firm supplies sufficient to meet its need for MWD water.

Groundwater

The LBWD groundwater supply is extracted from the Central Basin aquifers. As noted above, extractions from this basin are limited by order of the Superior Court and a mechanism, i.e., the WRDSC, has been in place for the last 40 years to ensure that these limited extractions do not exceed the basin's natural and artificial replenishment. The water stored in the Central and West Coast basin has increased since 1962 by 165,700 acre-feet.

There are several programs to keep the basin replenished, these include the following:

- To the extent possible, San Gabriel River stream flows are used for replenishing the groundwater basin. The quantity of water from this source fluctuates with changes in weather patters.
- The Long Beach Judgment ensures that actual or replacement flows within and below the San Gabriel River, used for replenishment of the Central Basin, continue to meet historic averages or that replacement water is provided. On a long-term basis this flow is required, by the judgment, to meet fixed minimum benchmarks.
- Reclaimed water is mixed with other waters and allowed to percolate into the groundwater basin. Because this is a reclaimed water supply, it is very reliable, even during fluctuations in weather patters, including multiple dry years.
- MWD's imported replenishment water is purchased for replenishment in the years MWD has this water available. This source can only be interrupted on a temporary basis by MWD, for a maximum of just two years, according the MWD Board-adopted Water Surplus and Drought Management Plan.

Because sufficient storage is maintained in the Central Basin, because non-MWD sources are available for replenishment, and because extractions from the Central Basin are restricted, groundwater supplies from the aquifer are very reliable, even during multi-year droughts.

The following table shows the annual mean stream flow of the San Gabriel River near the Central Basin aquifers spreading ground, USGS 11087020 SAN GABRIEL R AB WHITTIER NARROWS DAM CA. This table is shown for informational purposes only, it does not indicate fluctuations in the reliability of groundwater basin for the reasons stated above.

Annual mean streamflow at , USGS 11087020 SAN GABRIEL R AB WHITTIER NARROWS DAM, CA.

Year	Annual mean streamflow, in ft^3/s	Year	Annual mean streamflow, in ft^3/s	Year	Annual mean streamflow, in ft^3/s	Year	Annual mean streamflow, in ft^3/s
1956	64.1	**1973**	175	**1983**	362	**1993**	783
1964	71.3	**1974**	157	**1984**	89.3	**1994**	108
1965	180	**1975**	104	**1985**	64.4	**1995**	307
1966	138	**1976**	66.3	**1986**	124	**1996**	145
1967	65.4	**1977**	39.9	**1987**	121	**1997**	137
1968	45.8	**1978**	630	**1988**	108	**1998**	350
1969	686	**1979**	143	**1989**	122	**1999**	68
1970	96.8	**1980**	537	**1990**	177	**2000**	158
1971	110	**1981**	135	**1991**	133	**2001**	148
1972	50.6	**1982**	127	**1992**	163	**2002**	124

Reclaimed Water

LBWD receives reclaimed water from the Long Beach Reclamation Plant. This plant is not owned nor operated by the City of Long Beach. However, LBWD has rights to the tertiary water produced by the plant. The plant produces about 22,000 acre-feet of reclaimed water annually. The LBWD currently uses about 6,000 acre-feet and expects to ramp up to approximately 18,600 acre-feet by the year 2030. Because the output of the reclamation plant is basically not impacted by weather or climate change, and because the output of the plant exceeds current and expected demand for reclaimed water, this supply is considered very reliable. The LBWD reclaimed water program is discussed in more detail below.

Table 8 shows the supply reliability of the LBWD water resources. The wholesale purchases, groundwater, and recycled water supplies are available at a consistent level of use, for the reasons stated above. Therefore, no plans need be developed to supplement or replace those sources with more reliable alternative sources or water demand management measures. The LBWD is researching the technological, environmental, and economic feasibility of seawater desalination and LBWD continues to pursue new demand management measures for the purpose of reducing demand for imported supplies.

As a back-up supply in addition to the above, the LBWD also has the right, under the Central Basin judgment, to extract groundwater it has stored in the aquifers, up to 20-percent of its water rights (20% of 32,684 af), and to extract in emergencies up to another 20-percent. Also, LBWD will extract, when called to, the 13,000 acre-feet of MWD conjunctive use water stored in the Central Basin aquifers.

Table 9 shows the base water year data. As shown in Table 10, there are no legal, environmental, water quality, or climatic factors posing a meaningful threat to the reliability of the supplies to the LBWD.

2.5 Transfer and Exchange Opportunities

The UWMP Act encourages water agencies to explore how transfers and/or exchanges would improve the reliability, quality, financial health, or other factors of their water supply. The LBWD is not considering transfers and exchange opportunities because its short-term and long-term water supply portfolios are reliable, as explained above, for the next 25 years and the growth in demand for water has remained flat for the last several years and is expected to grow very slowly in the future. Transfers and exchanges are not necessary to improve the quality of groundwater or reclaimed water; if transfers/ exchanges become necessary to improve the quality of imported water, the LBWD will rely on MWD to make that determination and pursuing the transfers/ exchanges.

2.6 Water Use by Customer-type - Past, Current and Future

Showing the past, current and projected water use by sector is an effective way to show growth patterns and may improve the accuracy of demand projections. While projecting future demand by using General Plan land-use zoning designations and projected build out by water use sector may provide accurate demand projections, that type of information is not available from the City of Long Beach.

The LBWD billing and customer information is managed through the City of Long Beach utility billing department, a department which bills and collects customer information for a number of services provided by the City, such as refuse and natural gas services. For data on past and current water use, this Plan provides a level of information limited by that collected and made available by the City's utility billing system. Future water use projections were based on estimates developed in cooperation with the MWD, which used input from the LBWD and the SCAG and fed that information into the MWD econometric model.

Table 12 - Past, Current and Projected M&I Water Deliveries shows estimates of water use and the number of accounts by customer type. Water use in Long Beach is metered, therefore the values in Table 12 related to unmetered accounts are zero. Table 12 shows M&I demand; that is, it includes all demand, such as the use of reclaimed water for landscape irrigation, except for water used for seawater barrier injection.

The total water demand estimates are based on those in Table 4, which are the numbers developed by the MWD econometric model. The total, because it is a product of the very comprehensive and complex econometric model, is the important number. The numbers in Table 12 are rough estimates of how those totals might be allocated among the different customer classes based on the same proportion of water use as in 2003 and 2004.

It is important to note that the total water use in 2005, as shown in Table 12, is less than would be expected during years of normal weather. Because the balance of the table assumes normal years, there is a jump between the estimate for 2005 and that of 2010.

Table 12 demand estimates do not include the water demand of the Alamitos Seawater Barrier, a barrier preventing seawater from intruding into the Central Basin's fresh water aquifers. Historically, the Central Basin Municipal Water District purchased this imported injection water from the MWD. Between 2000 and 2005, the LBWD took responsibility for supplying water to the barrier; therefore, demand on LBWD increased and demand on Central Basin MWD decreased accordingly. The LBWD expects to shift ½ of this potable demand to reclaimed water within the in fiscal year 2006 and shift the remaining potable demand to reclaimed water in subsequent years.

Agricultural Sales

The LBWD has no agricultural accounts.

Sales to other agencies

As shown in **Table 13 - Sales to Other Water Agencies**, there are no water sales to other retail water agencies. As noted, there were and will be water sales to the WRDSC for injection into the seawater barrier. Those sales are shown in Table 14.

Additional Water Uses and Losses – AF/Year

Shown in **Table 14 - Additional Water Uses and Loses - AF/Year** are the sales of barrier water to the WRDSC and an estimate of the system losses. Not show in Table 14 is the work associated with conjunctive use. Over the last few years, the LBWD, working with the MWD and the WRDSC, and with funding from the California Department of Water Resources, created and filled a 13,000 acre-foot conjunctive use storage project in the Central Basin. The water stored belongs to the MWD; it was put into storage though in-lieu means in cooperation with the LBWD. The LBWD will extract the MWD water when, during shortages, the MWD calls the water as a source of firm M&I sales to the LBWD. Because the conjunctive use water was neither sold by the LBWD to the MWD nor a loss of local water, it is not accounted for on Table 14.

Total Water Use – AF/Year

Shown in **Table 15 - Total Water Use** is the total actual and estimated water demands for the LBWD, including M&I, barrier, unaccounted for, and reclaimed water.

2.7 Demand Management Measures

The LBWD is a member of the California Urban Water Conservation Council (CUWCC), with whom which it consistently files annual Best Management Practices reports. The reports document the LBWD demand management measures. A copy of the 2003 and 2004 reports are enclosed in the Attachments.

The LBWD demand management measures include the installation of water conserving devices. California Water Code Section 375 provides the authority for these actions:

> **375**. (a) Notwithstanding any other provision of the law…, any public entity which supplies water at retail or wholesale for the benefit of…persons within the service area or area of jurisdiction of the public entity may, by ordinance or resolution adopted by a majority of the members of the governing body…after holding a public hearing upon notice…and making appropriate findings of necessity…for the adoption of a water conservation program, adopt and enforce a water conservation program to reduce the quantity of water used by … those persons for the purpose of conserving the water supplies of the public entity.
>
> (b) With regard to water delivered for other than agricultural uses, the ordinance or resolution may…specifically require the installation of water-saving devices which are designed to reduce water consumption. The ordinance or resolution may also encourage water conservation through rate structure design.
>
> (c) For the purposes of this section, "public entity" means a city, whether general law or chartered, county, city and county, special district, agency, authority, any other municipal public corporation or district, or any other political subdivision of the State.

The LBWD has a very aggressive water conservation program that will be carried forward and expanded. Conservation begins when the water is still in the water mains by keeping the whole water distribution system as leak-free as possible. The LBWD has over 900 miles of water mains, keeping them absolutely leak-free at all times is impossible. However, the LBWD has maintained very low "unaccounted for water"[2]

[2] "Unaccounted for water" is the difference between the amount of water put into the distribution system minus the amount leaving the system as measured by water meters and minus other water uses

losses over the years, usually only about one-half of the industry standard. The LBWD maintains this highly effective water-main conservation program through a proactive strategy that includes, among other things, repairing all water mains and water meters and other equipment as soon as leaks are identified, driving the streets looking for evidence of leaks from its largest water mains, and earmarking the replacement of the oldest water mains in its inventory. This water main replacement program has consistently been one of the most expensive capital projects for the LBWD for approximately the last ten years.

Water "purposefully" leaves the water mains through the LBWD water meters. Some communities provide water without metering the use and/or bill all customers the same based on average water use by all customers, as opposed to billing each customer based on that customer's water use. The later system always results in lower water demands. People tend to conserve even more water when they are charged a higher price as their water use increases. The LBWD strongly encourages water conservation when it bills its customers for water use and has a water-conserving increasing rate structure for residential properties.

Single-family and multi-family customers together are responsible for approximately two-thirds of the City's demand for water. Several of the LBWD programs promote conservation in residential settings, and several of these programs are expected to be expanded in the future. The LBWD's financial billing system automatically checks whether a customer's water use has increased significantly from the past, and when a large increase is observed the customer is offered a free home water-use inspection. In another program, the LBWD contacts the residential water customers with the highest water use and offers, again, the free home water-use inspection. The LBWD continues to provide generous rebates to residential customers against the purchase of water-efficient toilets and washing machines.

Because most residential water use appears to be for landscape irrigation, the LBWD provides, at no cost to the customer, very well attended and received classroom instruction on the design, installation, and maintenance of California-friendly landscape. Innovative conservation programs created by the LBWD include the comprehensive landscape audits for those using the most water; audits that conclude with a comprehensive report detailing landscape and irrigation system issues and provide recommendations on repairs, maintenance, and other improvements.

Another innovative program is the LBWD direct installation of weather-based irrigation controllers, a program under which the LBWD identifies landscape accounts, offering free water-use studies and free installation of weather-based irrigation controllers.

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accounted for by such things as water meter inaccuracy (meters record less and less of the water that flows through them as they age), water used by fire fighters during emergencies and when testing hydrants to verify adequate water pressure, and estimates of the water lost when the water mains break.

Finally, the LBWD is in the process of designing and building a demonstration garden that will highlight low water-using landscapes for residential properties, focusing on issues such as design principles, plant material, non-plant material, creating habitats, storm water capture, and other environmentally beneficial topics.

In addition to spreading conservation to residential accounts and dedicated landscape accounts, the LBWD works closely with its commercial, industrial, and institutional customers to help them conserve water. The LBWD has formed a partnership with the Long Beach Chamber of Commerce to more effectively encourage conservation in the business community. The LBWD has encouraged conservation through targeted direct marketing, through rebates for water conserving devices, and has consistently promoted conservation in the business community through advertisements and other promotional means.

The LBWD actively promotes conservation through its work in the classrooms of the Long Beach Unified School District, the Miller Children's Hospital, and the Long Beach Aquarium of the Pacific. The LBWD promotes conservation by supporting community functions and making presentations at local and regional events, including advertising inserts with utility bills, and purchasing advertising space in environmental publications and the newspaper of general local circulation.

The LBWD encourages conservation through its leak-detection program, metered water program, its rate structure, its work with landscape irrigators and homeowners that use large quantities of water, its rebate programs, and water education programs. However, behind these incentives and education programs is the LBWD prohibition against certain uses of water. Adopted by the City of Long Beach Board of Water Commissioners are prohibitions against leaks in private plumbing systems, watering landscape beyond saturation, operating fountain or other water features that do not recirculate the water, allowing the hose run while washing a car, and other prohibitions. These prohibitions are described in the LBWD Water Conservation and Water Supply Shortage Plan, incorporated into this UWMP, and available from the LBWD upon request.

2.8 Evaluation of DDMs Not Implemented

As shown in **Table 16 - Evaluation of Unit Cost of Water related to Demand Management Measures**, the LBWD is implementing the DDMs recommended in the CUWCC BMPs. Therefore, no evaluation of DDMs not implemented is warranted or required.

2.9 Planned Water Supply Projects and Programs

Shown in **Table 17 - Future Water Supply Projects** are the planned water supply projects and programs that may be undertaken by the LBWD, as identified in its water supply and demand assessment. The following describe those projects.

Expanded Reclaimed Water Infrastructure

The LBWD has a very successful reclaimed water program, utilizing the water for irrigation and for two very innovative programs: the use of reclaimed water for subsidence mitigation and for seawater barrier injection.

Although LBWD has access to reclaimed water, it lacks the distribution system needed to bring reclaimed water to all potential users. Expanding the distribution system has been very expensive, and would be cost-prohibitive were it not for funding from the U.S. Bureau of Reclamation, the State of California, and the MWD.

Expanding the reclaimed water system is expensive, in part, because the City of Long Beach is a built-out, older community (Long Beach was incorporated more than 100 years ago). For example, trenching for new pipelines must take into consideration 100 years of previous pipeline installations, including pipelines for sewer systems, potable water systems, oil production, and natural gas distribution. This construction must also consider other factors which can drive up the cost of the project such as soil contamination and previous street construction (some Long Beach streets are made of 18 inches of steel reinforced concrete, for example) and long abandoned and buried railway lines.

Nevertheless, LBWD expects to continue to expand its reclaimed water system in order to make reclaimed water available to additional customers.

The supply of reclaimed water is not affected by single or multi-year droughts. The production of the reclaimed water plant exceeds the current or project use of reclaimed water; so even drought conditions should not impact the LBWD ability to meet demand.

Reclaimed Water Barrier Injection Phase I & II

Imported drinking water has been injected into a seawater barrier in southeast Long Beach for several decades. The barrier prevents the seawater from intruding into the fresh-water aquifers.

The WRDSC, in partnership with the LBWD and with funding, in part, from the U.S. Bureau of Reclamation, has constructed a facility to polish reclaimed water using reverse osmosis and ultraviolet light. The plant will use reclaimed water from the

LBWD, polish the reclaimed water, and inject the polished water into the seawater barrier.

In Phase I of the project, approximately one-half of imported drinking water is being saved each year, by replacing the potable water with the polished reclaimed water. In Phase II of the project, the balance of the imported drinking water will be saved, each year, by replacing the remaining potable water with polished reclaimed water.

Phase I came on-line in October 2005; Phase II is expected to come on-line several years later.

Both Phase I and Phase II production are drought-proof; that is, the production is expected to continue unimpeded even during multiple, consecutive dry-year events.

Seawater Desalination

The LBWD, in partnership with the U.S. Bureau of Reclamation and the Los Angeles Department of Water and Power, is conducting research on the technical, environmental, and financial feasibility of seawater desalination as a source of potable water. The research is expected to conclude in approximately 2007. A decision, based on the research data, whether to proceed with a production facility is expected to be made at that time.

If and when the decision is made to proceed with a production facility, it is anticipated that:

- it would take from two to four year to permit, design, and construct the facility;
- the plant would produce about 10,000 acre-feet of potable water per year;
- the plant would not utilize a power plant's cooling water as its source water;
- the plant would be located in Long Beach;
- 100-percent of the product water would be used within the City; and
- demand for imported drinking water would be reduced by an equal amount.

Production of potable water from a seawater desalination plant would not be impacted by single-year or multi-year droughts.

2.10 Opportunities for Desalinated Water

Shown in **Table 18 - Opportunities for Desalinated Water** are the opportunities for desalinated water. As described above, the LBWD is conducting research to determine the technical, environmental and financial feasibility of seawater desalination in Long Beach. If this research shows that seawater desalination is technologically,

environmentally, and economically feasible in Long Beach, a project will likely go forward.

2.11 Current or Projected Supply Includes Wholesale Water

Shown in **Table 19 - Agency demand projections provided to wholesale suppliers - AF/Year** are the LBWD demand projections on its wholesale water agency, the MWD. This information has been communicated to the MWD; in fact, it was developed in concert with the MWD.

Shown in **Table 20 - Wholesaler identified & quantified the existing and planned sources of water available to LBWD - AF/Year** are the written information provided by the LBWD wholesaler that quantifies water availability to the LBWD for the next twenty-five years. Table 20 assumes normal year hydrology. Please see the Attachments for additional written material from the wholesalers concerning supplies during single and multiple dry-year events.

It is important to note that for the purpose of the RUWMP, the MWD's supplies are pooled supplies, that is, a specific supply is no set aside for each of the 26 MWD member agencies.

The wholesales water agency provided the information required to complete Tables 20 through 22, attached. This includes information on the existing and planned sources of supply, the supply reliability as a percent of normal supply, and factors resulting in inconsistency with the wholesaler's supply.

As shown in **Table 21 - Wholesale supply reliability - % of normal supply**, the MWD is 100-percent reliable under the single and multiple dry-year events. As shown in the attachment related to MWD's supplies, MWD does not expect to be able to supply the same amount of water during different hydrologic cycles. Table 21A shows that firm demand on the MWD is different during single dry-year events and multiple dry-year events (firm demands are non-interruptible demand, which excludes demand for interruptible agriculture water sales and replenishment water sales), and that MWD supply capability changes as well. But in all cases, the MWD has supplies in excess of demands. Table 21A shows that capability of the MWD supplies and that demand is less than supply in both single dry-year as well as multiple dry-year events. Materials in the Attachment show that as one supply become less consistent, the MWD begins drawing water from other sources in its portfolio. For example, in a single dry-year scenario, MWD projects significant decrease in supply availability on the California Aqueduct, but a corresponding increase in the taking of water from storage.

As shown in **Table 22 - Factors resulting in inconsistency of wholesaler's supply**, any legal, environmental, water quality, or climatic factors posing significant risk to the reliability of the MWD supplies are discussed in the MWD's RUWMP.

Section 3 – Determination of DDM Implementation

The LBWD has included copies of its CUWCC 2003 and 2004 Annual Report as an attachment to this UWMP.

Section 4 – Water Shortage Contingency Plan

4.1 Stages of Action

The issue of water shortages for the LBWD revolves around the reliability of the water purchased wholesale from the MWD. The LBWD's water supplies include recycled water, groundwater, and MWD wholesale supplies, and potentially, desalinated seawater.

- Recycled water is very reliable because the production of recycled water will not decrease significantly in drought conditions and because the recycled water plant produces water significantly in excess of demand (that is, even with a slight decrease in production, the plant's production will still significantly exceed demand).
- Groundwater is very reliable because production of groundwater from the Central Basin aquifer, the source of the LBWD groundwater, is not dependent on favorable single-year or multi-year hydrology. Extractions from the groundwater basin are limited as a result of the basin's adjudication; and the capacity of the basin greatly exceeds the annual extraction rights (see the attached documents addressing groundwater management and the adjudication for more detailed information on capacity, storage, and actual extractions and extraction rights).
- Seawater desalination, if developed in Long Beach, will be very reliable because it will not depend on hydrology. Therefore, its production will not be impacted by drought-induced shortages.

The MWD referenced and summarized a well-articulated Water Surplus and Drought Management plan in its Regional Urban Water Management Plan. This WSDM Plan articulates different stages of shortages and different actions based on those stages. However, the 'shortages' envisioned in the plan have more to do with years in which normal imported deliveries are less than demand on MWD; these 'shortages' do not lead to an allocation of water but are mitigated by drawing down stored water, curtailing interruptible deliveries, acquiring additional supplies from, for example, the spot market, and by taking similar types of actions. A shortage that results in allocation of M&I supplies (municipal and industrial) is called an *Extreme Shortage* by the MWD. It is MWD's objective to avoid an Extreme Shortage that leads to the allocation of M&I supplies and the MWD is not anticipating a shortage of this kind for at least the next 25 years.

If MWD enters an Extreme Shortage, it intends to develop an allocation plan at that time, a plan based on its Board-adopted allocation principles. However, state law appears to provide for two phases of supply allocation. The first phase requires the MWD to allocate water based on Preferential Rights; the second, very extreme shortages, allows the MWD Board to allocate water as it deems best. The California Water Code, Section 350, states that the MWD cannot allocate water outside of Preferential Rights except under the most dire conditions:

> **350**. The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, may declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be *satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection. (Emphasis added).*

The above describes the second phase of the extreme water shortage emergency. Section 135, of the Metropolitan Water District Act describe how water will be allocated in the absence of a Section 350 shortage:

> [e]ach member public agency shall have a preferential right to purchase from [MWD] … a portion of the water served by [MWD] which shall from time to time bear the same ratio to all of the water supply of [MWD] as the total accumulation of amounts paid by such agency to [MWD] on tax assessments and otherwise, excepting purchase of water, toward the capital costs and operating expenses of [MWD's] works shall bear to the total payments received by [MWD] on account of taxes assessments and otherwise, excepting purchase of water, toward such capital cost and operating expense.

Table 23A - Water Supply Shortage and Conditions lists the different stages of a shortage of wholesale supplies, the water supply conditions describing each stage, and the water supply, as a percent of the shortage, represented by each stage. The Stages shown on the table are based in the MWDCS WSDM Plan (Water Surplus & Drought Management Plan). These stages reflect a condition in which demand exceeds current-year core supplies, forcing the MWD to remove water from storage, reduce or eliminate certain non-firm water sales, purchase water from the spot market or exercise purchase options, and call for extraordinary conservation. It is not until Stage 7 that an allocation takes place. As mentioned above, the MWD does not have an allocation plan in place but does have Board-adopted principles for establishing such a plan and commitment to avoid allocation to the extent possible.

Table 23B - Water Supply Shortage and Conditions shows that Long Beach could be expected to suffer an extreme supply shortage, potentially prompting a retail-level

allocation, when LBWD receives just 74-percent of its firm demands on MWD. LBWD could mitigate the initial reduction in MWD firm supplies through extraordinary water conservation and additional groundwater production.

During the shortage in the early 1990's, the City of Long Beach reduced firm demand through extraordinary conservation by nearly 18-percent; Table 23B assumes a reduction of just 10-percent. Additionally, per the provisions in the Central Basin judgment, the LBWD is allowed to exceed its annual allowable pumping allocation by extracting "carryover" water and emergency supplies, each equal to 20-percent of the annual allowable pumping allocation. If these additional rights are exercised over the course of four years, the annual additional groundwater production offsetting a loss of wholesale supplies would be about 3,260 acre-feet.

Table 23C - Water Supply Shortage and Conditions shows retail water supply conditions in Long Beach during several Phases of a shortage at the retail level. The supply conditions and degree of retail shortages in Table 23C are for illustration only. Causes, conditions and their timing during extreme shortages can be unpredictable; therefore, the Board of Water Commissioners reserves the discretion to move from one Phase of a shortage to another as events inform its judgment.

That being said, the actions to be taken by LBWD within each Phase are prescribe in the Board-adopted resolution describing actions to be taken during a water supply shortage. A copy of this resolution is attached.

4.2 Estimate of Minimum Supply for Next Three Years

Shown in **Table 24 - Estimated Minimum Water Supply Over the Next Three Years - AF/Year** is the three-year estimated minimum supply of water, in acre-feet per year. The three sources of water are reclaimed water, ground water, and wholesale purchases. Recycled water is very reliable irrespective of hydrology because supply will exceed feasible uses during this three-year period. There is sufficient storage in the groundwater basin to ensure the normal annual allowable extractions during the next three years irrespective of hydrology, in part because the groundwater basin is not significantly impacted by hydrology over periods of time as short as three years. The wholesale water provider, the MWD, is affected by hydrology, but has reported that it too can provide for all firm demands over this time period, given the MWD's core supplies, stored water, and other water resources and arrangements.

4.3 Catastrophic Supply Interruption Plan

Three possible catastrophes and the actions the LBWD would take to mitigate the impacts they would have on the LBWD customers are shown in **Table 25 - Preparation**

Actions for a Catastrophe. Given the critical nature of the services provided by the LBWD to public health, and recent security considerations, emergency conditions and responses are no longer explored in public forums such as the 2005 UWMP or the actions to be taken by the LBWD to mitigate the impacts of the emergency and catastrophic events. The LBWD has a confidential, comprehensive study of its vulnerabilities, a study developed in cooperation with federal authorities, regional and local first-responders, and other experts, and has completed or is working to complete the necessary measures to mitigate the impacts of catastrophic events. Describing events, describing impacts on the LBWD's ability to successfully perform its services, and the LBWD's responses would be inappropriate. Suffice it to say that in the event that it could not meet 100-percent of the City's demand for water, the LBWD would declare a water emergency and take appropriate actions as outlined in its water conservation and water supply shortage plan.

4.4 Prohibitions, Penalties and Consumption Reduction Methods

The LBWD water conservation and water supply shortage plan, attached, lists the prohibitions against specific water uses both when water supplies are sufficient to meet normal demands, as well as prohibitions when water supplies are less than normal demands. **Table 26 - Mandatory Prohibitions - Examples** summarizes these prohibitions. These include prohibitions against excessive run-off, cleaning paved surfaces with potable water, failure to repair leaks, surface irrigation during restricted hours, and so on.

Table 27 - Consumption Reduction Methods provides a list the consumption reduction methods the LBWD will use to reduce water use in the most restrictive stages with up to a 50-percent reduction. In addition to the restrictions listed in Table 26, the LBWD will increase public education, increase water rates, increase the kinds of prohibitions, and increase the water use charge imposed when in violation of a prohibition. For detailed information please find the attached water conservation and water supply shortage plan.

Penalties are charges for excessive-use are shown in **Table 28 - Penalties and Charges**. These include the following: water-use charges for violation of prohibited uses of water restrictions, these charges increase with every warning and with the severity of the shortage. The LBWD also imposes tiered water rates on residential accounts; the price of the water in the different tiers increase with the severity of the shortage. LBWD also reserves the right to install flow restrictors or terminate water service after repeated violations.

4.5 Analysis of Revenue Impacts of Reduced Sales During Shortages

Tables 29A-B, and Tables 30A-B, show the anticipated impact of a severe water shortage on the LBWD revenues and expenditures. Determining the actual impact prior to the event is very difficult, given the number and unpredictable nature of the variables involved. With that qualifier, however, it is likely that the change in net revenue and the change in net expenses will be roughly equal. Revenues will be supported by expected rate increase while expenses for water will fall as the total cost of water decreases. Furthermore, staff will likely be pulled from high-cost capital projects to work in conservation services, delaying high capital equipment expenditures, while additional expenses will be incurred in the form of extraordinary water conservation actions.

4.6 Draft Ordinance and use Monitoring Procedures

The LBWD water conservation and water supply shortage plan, attached, lists the mandatory prohibitions against specific water use practices during water shortages during the various phases of an emergency. These prohibitions include excessive run-off, cleaning paved surfaces with potable water, failure to repair leaks, surface irrigation during restricted hours, and so on. Please see the attachment for specifics.

Table 31 – Water use Monitoring Mechanisms shows the mechanisms for determining water-demand reductions will be the monitoring of groundwater production and the purchase of wholesale water, both done on a daily basis, using very high quality data collected and stored electronically using systems currently in operation. That is, demand reduction will be monitored by closely tracking the quantity of water put into the distribution system.

Section 5 – Recycled Water Plan

5.1 Coordination

Reclaimed water used in Long Beach is domestic wastewater that has been fully treated by a primary, secondary (biological), and tertiary (filtration) process. The Long Beach Water Reclamation Plant, operated by the Sanitation Districts of Los Angeles County, treats up to 25 million gallons of wastewater each day. This high quality water is suitable for irrigation purposes in accordance with the California Code of Regulations, Title 22, for Disinfected Tertiary Treated Reclaimed Water, meets all State standards for such reuse, and is environmentally safe.

The constraint to putting more of the reclamation plant's output to beneficial municipal and industrial (M&I) use is the high cost of extending the distribution system to new customers. The existing reclaimed water distribution would not have been possible without the generous and significant financial support of the U.S. Bureau of Reclamation, the California Department of Water Resources, and the MWD.

Responsibility for planning for the future use and distribution of reclaimed water in the City of Long Beach falls under the LBWD. Each year, as part of its capital improvement program and budget process, the LBWD develops a capital plan for the reclaimed water. When developing the plan, the LBWD considers the cost of extending different branches of the reclaimed water distribution system, considers input from its partners such as the WRDSC and other local agencies, and ultimately determines which capital projects are feasible to undertake and when.

Table 32 - Participating Agencies identifies the local water, wastewater, groundwater and planning agencies and how each participated in developing a plan for the use of recycled water in the LBWD service area.

5.2 Wastewater Quality, Quantity and Current Uses

Table 33 - Wastewater Collected and Treated - AF/ Yr shows the wastewater influent and effluent from the recycled water plant that generates the recycled water put to beneficial use by the LBWD. This plant's influent is about 10-percent greater than its effluent, the difference being sludge which gets transported to the region's sewer treatment plant. Maximum effluent of the plant is approximately 25 MGD (million gallons per day); but the plant current operates at a daily average of about 19 MGD. Over the next 25 years the plant may reach capacity. The Long Beach plant is not

expected to be enlarged in the future as there is no open space on site in which to expand. All treated water is treated to tertiary standards. This plant services many communities in addition to Long Beach, such as the cities of Lakewood and Cerritos. Only about 10-percent of the plant's influent is from the City of Long Beach. Much of the wastewater collected from Long Beach is treated in Carson; the influent streams of the sanitation districts' plants are interconnected, making it possible to divert influent from one plant to another.

Table 34 - Disposal of Wastewater (non-recycled) - AF/ Yr shows the projections of the amount of reclaimed water generated and discharged from the Long Beach facility into Coyote Creek. These values are the difference between the effluent of the plant and the recycled water put to beneficial use by LBWD.

Table 35A - Recycled Water Uses - Actual AF/ Yr estimates how much of the recycled water will be put to beneficial use in Long Beach in 2005. Normally landscape use is about twice the industrial use; but the record rainfall in the winter of 2004-2005 significantly depressed irrigation usage until it is roughly equal that of industrial use. The primary industrial use at this time is for subsidence mitigation in the oil extraction enterprise in Long Beach.

5.3 Potential and Projected Use, Optimization Plan with Incentives

Table 35B - Recycled Water Uses - Potential AF/ Yr and **Table 36 - Projected Future Use of Recycled Water in Service Area - AF/Yr** basically show the same information because the "potential" future use is what the LBWD expects the actual future use to be.

Table 37 - Recycled Water Uses -- 2000 Projection compared with 2005 actuals - AF/Yr shows that recycled water use in 2005 is not going to meet the expectations estimated in the LBWD 2000 UWMP. The discrepancy has two primary causes: first, the very wet winter of 2004-05 depressed landscape irrigation use; and, second, the use of recycled water for injection into the seawater barrier was postponed due to permitting issues. The permitting issues have been resolved and the plant came on-line October 2005.

Table 38 - Methods to Encourage Recycled Water Use shows the increase in use of recycled water over the next 25 years. This increase results from three major causes: a financial incentive in the formed of recycled water rates being as low as 50-percent of potable water rates; cooperation between the WRDSC and the LBWD in the planning, construction, and operation of the seawater barrier injection plant; and the expansion of the reclaimed water distribution system within the LBWD service area. This table assumes one-half of the increase in use of recycled water, excluding the water to be

used at the seawater barrier, results from the financial incentives and one-half from expansion of the recycled water system.

Section 6 – Water Quality Impacts on Reliability

Water quality is not anticipated to affect water management strategies or supply reliability any more or less than it currently does, for each of the existing sources of water, through the year 2030.

As shown in **Table 39 - Current & Projected Water Supply Changes Due to Water Quality,** water quality of recycled water is not expected to change, the water quality of groundwater is not expected to change, and the water quality of water purchased wholesale is not expected to change.

Section 7 – Water Service Reliability

7.1 Projected Normal Water Year Supply and Demand

Table 40 through Table 42 project and compare normal water-year supply and demand. These tables show that normal demands from 2010 through 2030 can be expected to be met with projected supplies. **Table 41 - Projected Normal Water Year Demand - AF/Yr** shows the increase in demand in subsequent years compared to the year 2005; this increase is large because demand in 2005 was suppressed by the record rainfall; that is, 2005 was not a "normal" year but it is assumed the subsequent years will be.

7.2 Projected Single Dry-year Supply and Demand Comparison

Table 43A - Minimal Impact of Dry-year on Demand graphs both per capita water use and rainfall in Long Beach. The big dip in per capita use came from the water shortage emergency in the early 1990's. Since that time, Long Beach has experienced as much as 25 inches of rain and as little as 2.6 inches, but with little impact on demand. The year in which weather appears to have played a roll in depressing water use, 2005, was not complete at the time of this writing so a comparison between use and rainfall was not possible.

For the purpose of these tables, demand is assumed to be unchanged from "normal" years because not only is there no evidence that demand jumps up during dry years, as noted above, but demand could go down as a result of increased awareness of the need to conserve, particularly during multiple dry-years, as was the case in the early 1990's. For these reasons, for the purpose of this analysis, it is assumed that dry-year demand is the same as normal demand.

Table 43 through Table 45 projects and compares single dry-year supply and demand for the years 2010, 2015, 2020, 2025, and 2030. As shown in Table 8 and Table 17, and in the discussions about these tables, supply is expected to meet demand for water in single dry-year scenarios.

7.3 Projected Multiple Dry-year Supply and Demand Comparison – 2006-2030

Table 46 through Table 60 projects and compares multiple dry-year supply and demand, per year, for the year 2006 through 2030. As mentioned in section 7.2, supply is expected to meet demand even in multiple dry-year events, as shown in Table 8 and Table 17, and in the discussions related to these tables and topics.

For the purpose of these tables, demand is assumed to be unchanged from “normal” years because demand could go down as a result of increased awareness of the need to conserve, but demand could be driven up if the dry conditions extend to the LBWD service area.

Section 8 – Adoption and Implementation of UWMP

A copy of the City of Long Beach Board of Water Commissioners' resolution adopting the LBWD 2005 UWMP is attached.

The LBWD has reviewed the Demand Management Measures (DMM) implementation plan and the recycled water plan contained in its 2000 UWMP. Key within the 2000 DMM plan is the system maintenance capital project expected to replace old cast iron water mains that are most susceptible to breakage; when these lines break a great deal of water is lost. In the last five years over 400,000 linear feet of old cast iron water main has been replaced. As assumed in the 2000 UWMP, the LBWD continued its "High Bill Investigation" program, which uses automated technology to identify unusually high water use amount its 90,000 customers and, when this high use is noted, offers to perform a water-use investigation at no cost to the customer. During this same period of time, the LBWD continued to participate, as projected in the 2000 UWMP, in the conservation rebate programs for residential and CII devices, as noted in the CUWCC reportings, continued its increasing block rate structure for residential customers, and aggressively pursued other projects such as the public education program.

Refer to Section 5 and Table 37 for a discussion on the LBWD progress towards meeting its 2000 UWMP projections of the use of reclaimed water.

Refer to Section 2.7 for a discussion of the CUWCC BMP Annual Reporting. The LBWD had submitted annual reports to the CUWCC and the BMPs are being implemented as planned.

List of Attachments

Because most of the attachments are very large documents and because most of them can be found on the internet (links are provided in this document), and because they are all available for review, by appointment, during normal business hours, at the LBWD administration offices, located at 1800 East Wardlow Road, copies of these attachments, other than the tables referenced in the body of the UWMP, are only provided with the official, adopted version sent to the California Department of Water Resources. Photocopies of the attachments are available at cost.

A. Board of Water Commissioners resolution adopting *2005 UWMP*

B. Tables 1 through 60, referenced in the body of the UWMP.

C. Central Basin Judgment

D. Watermaster's Central Basin Report, FY 2003-04

E. WRDSC's 2005 Engineering Survey and Report

F. LBWD Water Conservation and Water Supply Shortage Plan

G. CUWCC BMP Reports for 2003 and 2004

H. MWD Water Supply Projections

Attachment A

Board of Water Commissioners
Resolution adopting
2005 UWMP

LONG BEACH WATER DEPARTMENT
A Class 1 Water Utility

Board of Water Commissioners

December 1, 2005, Board Meeting

KEVIN L. WATTIER, General Manager

Subject:

Adoption of the Long Beach Water Department 2005 Urban Water Management Plan (UWMP).

Executive Summary:

The State of California requires that the Board of Water Commissioners (Commission) adopt an Urban Water Management Plan once every five years. The Commission adopted UWMPs in 1985, 1990, 1995, and 2000. By adopting the UWMP, the LBWD qualifies to apply for certain funding as the funds becomes available. The UWMP makes 25-year water supply and demand projections and describes the LBWD's efforts to promote the efficient use and management of its water resources in normal and dry years.

The LBWD provided copies of the draft UWMP to the City's elected officials as well as the City Manager, City Advance Planning Officer, Director of Library Services, and City Clerk, and solicited their input. The LBWD developed the UWMP in concert with other water agencies including the largest urban water agency in the United States, the Metropolitan Water District of Southern California, from whom the LBWD purchases half of its water wholesale. Eight cities in the greater Long Beach area, as well as the county of Los Angeles, were invited to participate in the development of the Plan and were provided with draft copies of the Plan for their review and comments. Finally, several community organizations were also provided with copies of the draft and invited to submit comments.

Board Options/Fiscal Impacts

Option #1: That the Board adopt the Long Beach Water Department 2005 UWMP.

Fiscal Impact: The LBWD will not qualify to apply for certain funds from the State of California unless the Commission adopts the 2005 UWMP.

Option #2: Postpone adoption of the UWMP

Fiscal Impact: If not adopted by December 31, 2005, the LBWD would be disqualified to apply for certain funding from the State of California.

Staff Recommendation

Option #1.

Matthew P. Lyons — Date
Director of Conservation & Planning

Kevin L. Wattier — 11/23/05 Date
General Manager

APPROVED 12-1-2005
BOARD OF WATER COMMISSIONERS

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Attachment B

Tables 1 through 60, referenced in the body of the UWMP

Table 1 - Coordination with Appropriate Agencies

Check at least one box per row	*Agency(s)*	Received Noticication of Preparation of UWMP and Encouraged to Participate	Participate in UWMP Development	Commented on Draft	Attended Public Meeting	Contacted for Assistance	Received Copy of Draft	Sent notice of intention to adopt
Other water suppliers	MWDSC		X			X	X	
Water management agencies	WRDSC						X	
Relevent public agencies	Mayor, City of Long Beach						X	
	City Council, City of Long Beach						X	
	City Manager, City of Long Beach						X	
	Advanced Planner, City of Long Beach	X					X	
	City Libriarian, City of Long Beach						X	
	City Clerk, City of Long Beach						X	

Location of Accounts served by LBWD	*# of Accounts*	*% of Total*							
								X	
Bellflower	*2*	*0%*	X					X	
Compton	*2*	*0%*	X					X	
County of Los Angeles, Unincorporated	*516*	*1%*	X					X	
Hawaiian Gardens	*7*	*0%*	X					X	
Long Beach	*88,847*	*99%*	X					X	
Lakewood	*11*	*0%*	X					X	
Los Alamitos	*74*	*0%*	X					X	
Paramount	*6*	*0%*	X					X	
Signal Hill	*3*	*0%*	X					X	
Total:	*89,468*	*100%*							

Other	Environment Now (?)						X	
	Eco-Link (?)						X	
	Chamber of Commerse, Long Beach						X	
	Environmental Groups?						X	

Table 2 - Population Current and Projected

Year	MWDSC 2005 R-UWMP Estimate*	
		Yrly % Inc
2005	490,100	
2006	493,259	0.64%
2007	496,438	0.64%
2008	499,638	0.64%
2009	502,859	0.64%
2010	506,100	0.64%
2011	509,143	0.60%
2012	512,205	0.60%
2013	515,285	0.60%
2014	518,383	0.60%
2015	521,500	0.60%
2016	524,486	0.57%
2017	527,488	0.57%
2018	530,508	0.57%
2019	533,545	0.57%
2020	536,600	0.57%
2021	539,450	0.53%
2022	542,314	0.53%
2023	545,194	0.53%
2024	548,089	0.53%
2025	551,000	0.53%
2026	553,752	0.50%
2027	556,518	0.50%
2028	559,298	0.50%
2029	562,092	0.50%
2030	564,900	0.50%

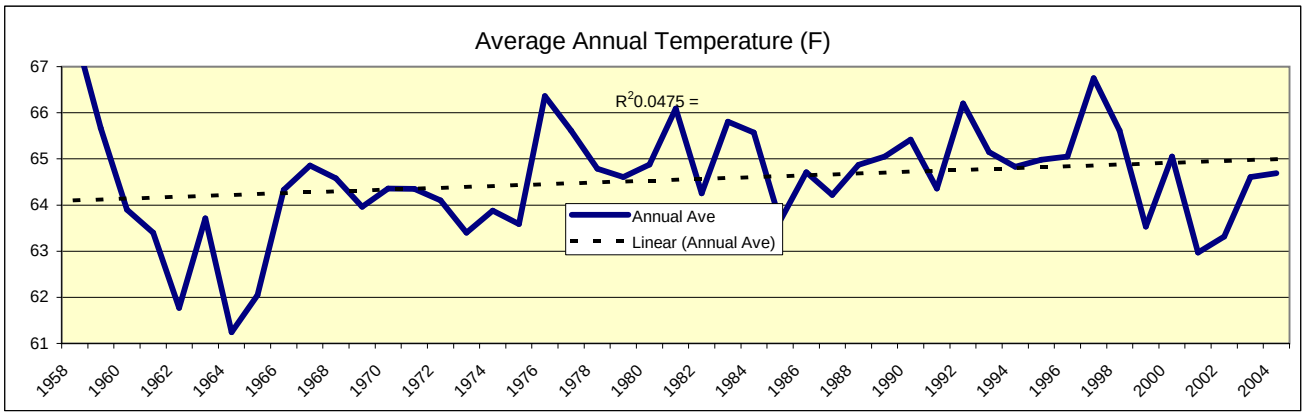
* Projections: SCAG RTP-04.

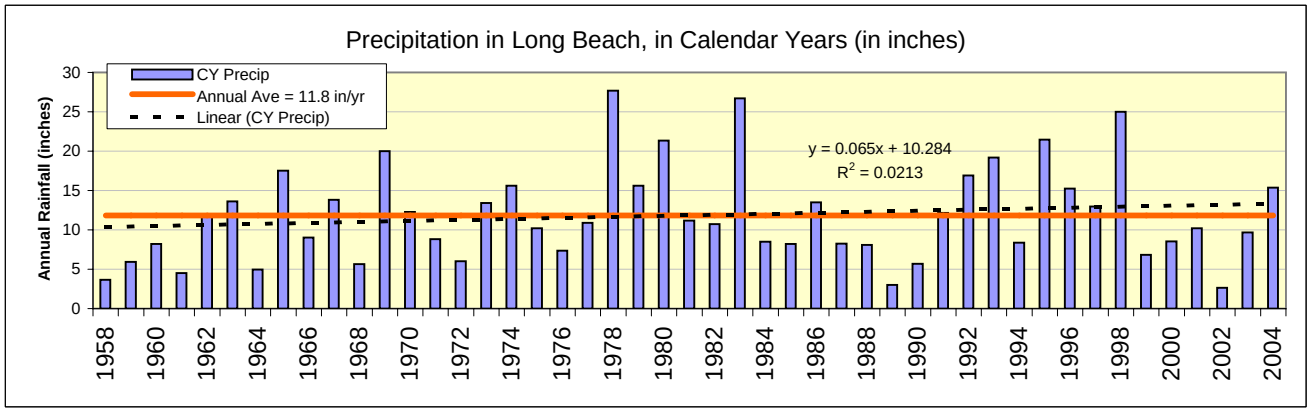
Table 3A - Average Climate in Long Beach

Period of Record : 4/ 1/1958 to 9/30/2004

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	66.9	67.3	68.4	71.8	73.6	77.1	82.4	84	82.4	78.1	72.2	67.2	74.3
Average Min. Temperature (F)	45.5	47.3	49.7	52.3	56.7	60.2	63.6	64.9	62.9	58	50.4	45.2	54.7
Average Total Precipitation (in.)	2.56	2.87	1.96	0.7	0.2	0.07	0.02	0.07	0.2	0.39	1.3	1.62	11.97
Average Total Snowfall (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

From http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?calong





http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?calong

Table 3B - CIMIS ETo Information

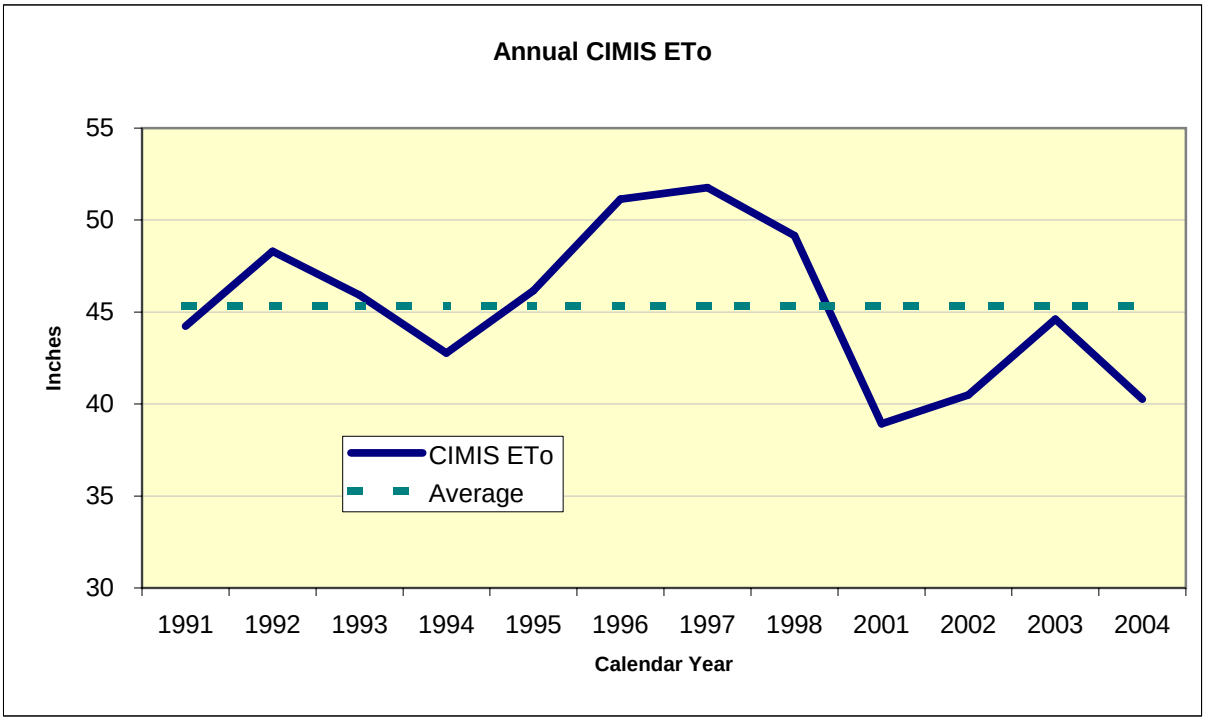
ETo = evapotranspiration.

Monthly CIMIS ETo Averages, Long Beach, CA
Period of Record: September 1990 to January 2005

Monthly Average	CIMIS ETo
Jan	1.83
Feb	2.22
Mar	3.55
Apr	4.58
May	5.14
Jun	5.41
Jul	5.78
Aug	5.63
Sep	4.02
Oct	3.11
Nov	2.13
Dec	1.70
Annual	**45.11**

Annual CY Average	CIMIS ETo
1991	44.23
1992	48.30
1993	45.91
1994	42.77
1995	46.16
1996	51.13
1997	51.76
1998	49.16
2001	38.93
2002	40.49
2003	44.62
2004	40.27
Average	**45.31**

From http://wwwcimis.water.ca.gov/cimis/



* CIMIS system in Long Beach, station #174, is missing data for large parts of CYs 1999 and 2000; therefore, those years were excluded from this analysis.

Table 3.C: Other Factors Influencing Water Demand

	2005	2010	2015	2020	2025	2030	Increase	Annual % Inc
Density								
Occupied Housing Units	166,439	172,479	179,100	185,783	192,408	199,038	32,599	0.7%
SF-Units	76,736	78,271	79,384	82,343	85,209	86,322		
MF-Units	89,703	94,208	99,716	103,440	107,199	112,716		
Persons per Household	2.87	2.87	2.85	2.83	2.81	2.78		
Single-Family Household Size	3.28	3.29	3.28	3.26	3.23	3.21		
Multifamily Household Size	2.52	2.52	2.52	2.49	2.47	2.45		
Density - Units per Acre								
SF Housing Density (Units/Acre)	6.2	6.2	6.2	6.2	6.2	6.2		
MF Housing Density (Units/Acre)	27.0	27.0	27.0	27.0	27.0	27.0		
Density - People per Acre								
SF Housing Density (Units/Acre)	20.3	20.4	20.3	20.2	20.0	19.9		
MF Housing Density (Units/Acre)	68.2	68.2	67.9	67.3	66.7	66.2		
							Increase	Annual % Inc
Employment	199,473	212,604	221,287	229,441	237,049	244,377	44,904	0.8%
							Increase	Annual % Inc
Median Household Income (2000 $s)*	$ 37,200	$ 37,742	$ 38,293	$ 38,851	$ 39,417	$ 39,992	$ 2,792	0.3%

* The base values were provided by the MWDSC, some of which came first from the SCAG. The base values were approximately $8,500 greater than those of the 2000 census and ere, therfore, scaled back. The City of Long Beach participated in the SCAG estimates but has not generated estimates of its own.

Long Beach Water Department

Water Demand Projections

March 23, 2005

	2000	2001	2002	2003		2005	2010	2015	2020	2025	2030
Occupied Housing											
	162,689	**162,884**	**163,255**	**164,070**		**166,500**	**172,479**	**179,101**	**185,784**	**192,408**	**199,038**
Occupied Single-Family Housing (includes duplex & townhouses)	76,211	76,064	75,998	76,131		76,736	78,271	79,384	82,343	85,209	86,322
Occupied Multifamily Housing	86,478	86,820	87,257	87,939		89,703	94,208	99,716	103,440	107,199	112,716

** These estimates are very close to the 2000 census: the total occupied housing 163,107; SFR attch & detached = 79,107; MFR: 90,022; mobiil homes: 2,178.*

	53%	53%	53%	54%	#DIV/0!	54%	55%	56%	56%	56%	57%

Persons per Household

The estimate of "Persons per Household", multiplied by "Occupied Housing" results in a population estimate of about 10,000 less than "Populaiton", above. This difference are people in institutional settings.

	2.77	**2.81**	**2.84**	**2.87**		**2.87**	**2.87**	**2.85**	**2.83**	**2.81**	**2.78**
Single-Family Household Size	*3.18*	*3.22*	*3.25*	*3.28*		*3.28*	*3.29*	*3.28*	*3.26*	*3.23*	*3.21*
Multifamily Household Size	*2.41*	*2.45*	*2.49*	*2.52*		*2.52*	*2.52*	*2.52*	*2.49*	*2.47*	*2.45*
SF Housing Density (Units/Acre)	6.2	6.2	6.2	6.2		6.2	6.2	6.2	6.2	6.2	6.2
MF Housing Density (Units/Acre)	27.0	27.0	27.0	27.0		27.0	27.0	27.0	27.0	27.0	27.0

Total Urban Employment

The estimate for the year 2000 is fairly consistant with the 2000 US Census, as shown below.

	191,755	**192,753**	**192,832**	**195,303**		**199,473**	**212,604**	**221,287**	**229,441**	**237,049**	**244,377**
Construction	4,905	4,975	4,828	4,882		4,952	5,257	5,530	5,737	5,924	6,152
Manufacturing & Agg, forestry, fishing, mining, etc	30,437	29,402	27,999	27,938		27,354	27,516	27,767	28,773	29,706	29,925
Transportation, Utilities & Communication	15,346	15,498	15,534	15,178		14,646	12,685	12,806	13,268	13,703	13,747
Wholesale Trade	9,462	9,207	9,176	9,196		9,171	9,336	9,612	9,961	10,286	10,492
Retail Trade	24,958	25,235	25,868	26,136		26,747	28,013	29,790	30,900	31,940	32,973
Financial, Insurance & Real Estate	7,434	7,513	7,586	7,625		7,718	7,898	8,324	8,626	8,912	9,288
Service:Info, Professional, sci, mgnt, Educ, Health, Arts, etc.	80,969	82,148	82,598	85,190		89,662	103,329	107,850	111,854	115,606	119,933
Government & Other Services	18,243	18,776	19,243	19,159		19,224	18,570	19,608	20,322	20,972	21,867

** total for 2000 ~ that of census: 189,487*

		0.0000%	-0.4376%	0.0000%							
Median Household Income* (2000 $s)*	$45,700	$45,700	$45,500	$45,500		$45,672	$46,100	$46,900	$47,600	$48,400	$49,100

**** very diff from census: 2000 census median household inc = $37,270***

Median household income: 2000 census VERY different from MWD estimate.

Long Beach Water Department

Water Demand Projections

March 23, 2005

	2000	2001	2002	2003	2005	2010	2015	2020	2025	2030
Marginal Price ($/CCF - 2000$'s)	**$1.97**	**$1.95**	**$2.07**	**$2.19**	**$2.25**	**$2.41**	**$2.59**	**$2.77**	**$2.97**	**$3.19**
System Losses / Other	**7.8%**	**7.8%**	**7.8%**	**7.8%**	**7.8%**	**7.8%**	**7.8%**	**7.8%**	**7.8%**	**7.8%**

**** this number is very different than the one we use at LBWD***

Model Outputs

	Average Daily Water Use (in gallons)									
Base Water Use by Sector (with price savings)	**2000**	**2001**	**2002**	**2003**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Single Family (Gallons per Occupied Unit)	346	340	348	345	347	351	356	361	359	358
Multifamily (Gallons per Occupied Unit)	238	241	244	239	241	244	248	250	250	249
Non-Residential (Gallons per Employee)	102	100	98	95	94	92	91	92	91	90
System Losses / Other (Gallons per person)	12	12	12	12	12	12	12	12	12	12
Water Use (with active and passive cons.)										
Single Family (Gallons per Occupied Unit)	318	312	319	314	313	310	309	308	302	297
Multifamily (Gallons per Occupied Unit)	222	219	219	211	209	205	201	198	193	189
Non-Residential (Gallons per Employee)	100	98	95	91	90	87	85	85	84	82
System Losses / Other (Gallons per person)	11	11	11	11	11	10	10	10	10	10
"System loss/ other" includes irrigation acnts, firelines, etc.										
Conservation by Sector (exc. Price savings)										
Single Family (Gallons per Occupied Unit)	28	28.3	29.7	31.2	33.9	40.7	47.1	53.0	57.7	61.0
Multifamily (Gallons per Occupied Unit)	16	22.0	25.5	28.4	31.4	39.1	46.5	51.9	56.1	59.8
Non-Residential (Gallons per Employee)	2	2.5	2.9	3.3	3.7	5.0	5.9	6.6	7.2	7.7
System Losses / Other (Gallons per person)	1	0.8	0.9	1.0	1.1	1.3	1.6	1.8	1.9	2.1
(Note: Savings due to price changes is included in the base water use projection and not counted in this table)										
Per-Capita Use (gpcd)										
Base Per-Capita Use (with price savings)	157	153	152	148	149	150	152	155	156	155
Per-Capita Use with Conservation	147	143	141	136	135	133	132	132	131	129
Per-Capita Conservation Savings (exc. Price savings)	9	10.5	11.5	12.4	13.7	17.0	20.1	22.7	24.9	26.7
Per-Capita Percent Saved		7%	8%	8%	9%	11%	13%	15%	16%	17%
Per-Capita Components (gpcd)										
Residential Use (per person)	**94**	**91**	**91**	**88**	**88**	**86**	**85**	**85**	**84**	**83**
Single Family (per person)	*53*	*51*	*51*	*50*	*49*	*48*	*47*	*47*	*47*	*45*
Multifamily (per person)	*42*	*41*	*40*	*39*	*38*	*38*	*38*	*38*	*38*	*38*
Non-Residential (per person)	42	40	39	37	37	37	36	36	36	36
System Losses / Other (per person)	11	11	11	11	11	10	10	10	10	10
Total	147	143	141	136	135	133	132	132	131	129
	Acre-Feet per Year									
Base Water Use Projections (with price savings)										
All Sectors	**80,894**	**80,295**	**80,924**	**79,974**	**81,433**	**85,082**	**88,746**	**93,128**	**96,007**	**98,272**
Single Family	29,564	29,003	29,644	29,454	29,823	30,744	31,654	33,269	34,282	34,616
Multifamily	23,084	23,408	23,852	23,589	24,213	25,770	27,646	29,005	29,961	31,429

Long Beach Water Department

Water Demand Projections

March 23, 2005

	2000	2001	2002	2003	2005	2010	2015	2020	2025	2030
Non-Residential	21,936	21,621	21,116	20,692	21,046	21,932	22,523	23,590	24,274	24,561
System Losses / Other	6,310	6,263	6,312	6,238	6,352	6,636	6,922	7,264	7,489	7,665

Water Use Projections with Conservation - includes reclaimed water

All Sectors	**76,069**	**74,780**	**74,789**	**73,285**	**73,906**	**75,460**	**76,991**	**79,464**	**80,663**	**81,411**
Single Family	27,184	26,590	27,116	26,796	26,905	27,178	27,465	28,376	28,778	28,719
Multifamily	21,497	21,266	21,358	20,795	21,038	21,645	22,450	22,991	23,224	23,878
Non-Residential	21,455	21,091	20,482	19,978	20,199	20,751	21,071	21,899	22,369	22,465
System Losses / Other	5,933	5,833	5,834	5,716	5,765	5,886	6,005	6,198	6,292	6,350
Plus Seawater Barrier Demand					**6,000**	**6,000**	**6,000**	**6,000**	**6,000**	**6,000**
Potable water					3,000	3,000	3,000	3,000	3,000	3,000
Reclaimed water					3,000	3,000	3,000	3,000	3,000	3,000
Total including Seawater Barrier					**79,906**	**81,460**	**82,991**	**85,464**	**86,663**	**87,411**
LBWD's 1995 UWMP Projections - w/ Reclaim but Not Barrier	**82,997**	**83,615**	**84,247**	**84,898**	**85,347**	**92,474**	**96,489**	**100,702**		
LBWD's 2000 UWMP Projections - w/ Reclaim but Not Barrier	**76,452**	**75,401**	**77,722**	**79,757**	**81,214**	**83,928**	**88,618**	**93,371**		

Conservation Savings by Sector - excluding Seawater Barrier

Total Conservation (exc. Price savings)	**4,825**	**5,515**	**6,135**	**6,689**	**7,527**	**9,622**	**11,754**	**13,664**	**15,344**	**16,860**
Single Family	2,380	2,413	2,528	2,658	2,917	3,565	4,189	4,893	5,505	5,897
Multifamily	1,587	2,142	2,494	2,795	3,175	4,125	5,197	6,014	6,738	7,552
Non-Residential	481	531	634	714	847	1,181	1,452	1,691	1,905	2,096
System Losses / Other	376	430	478	522	587	750	917	1,066	1,197	1,315

Conservation Savings by Source - excluding Seawater Barrier**

Total Conservation - Including Other	4,825	5,515	6,135	6,689	7,527	9,622	11,754	13,664	15,344	16,860
Active Programs	867	1,035	1,279	1,522	1,513	1,489	1,241	599	2	0
Passive	3,582	4,050	4,377	4,645	5,427	7,382	9,597	11,999	14,146	15,545
System Losses / Other	376	430	478	522	587	750	917	1,066	1,197	1,315

** Does not include price savings

These conservation savings numbers do not reflect the conservation that has been done sinse the 1980's. These numbers should be increased.

Table 4 - Current and Planned Water Supplies – AF/Y

M&I	2005	2010	2015	2020	2025	2030
Potable Water						
Wholesale Purchases: MWDSC	47,961	33,816	30,516	33,216	34,616	35,616
Groundwater: LBWD Central Basin Aquifer rights	18,714	32,684	32,684	32,684	32,684	32,684
Supplier surface diversions	-	-	-	-	-	-
Transfers in or out	-	-	-	-	-	-
Exchanges in or out	-	-	-	-	-	-
Seawater Desalination	-	5,000	10,000	10,000	10,000	10,000
Total Potable Water	66,675	71,500	73,200	75,900	77,300	78,300
Recycled water	4,685	6,500	6,500	6,500	6,500	6,500
Total M&I (see Note b)	71,360	78,000	79,700	82,400	83,800	84,800
Seawater Barrier						
Potable Water						
Wholesale Purchases: MWDSC	4,672	3,000	-	-	-	-
Recycled water	-	3,000	6,000	6,000	6,000	6,000
Total Seawater Barrier	4,672	6,000	6,000	6,000	6,000	6,000
Total M&I and Seawater Barrier	76,032	84,000	85,700	88,400	89,800	90,800

Notes

a. The MWDSC, using its econometric model, with model inputs derived from SCAG and reviewed by the LBWD, projected future water demand on the LBWD.
This table, Table 4, reflects ajustments to those projections according to the following:
1. Added demand for the Seawater Barrier.
2. Split the recycling between M&I and the Seawater Barrier.
3. Assumed all groundwater would be produced (typically the LBWD's least expensive source of potable water), reducing demand on MWD accordingly.
4. Added production from the Seawater Desalination Project.

b. Estimating M&I demand before and after additional, future conservation.

	2005	2010	2015	2020	2025	2030
MWDSC est. after additional, 'new' conservation	71,347	84,000	85,700	88,400	89,800	90,800
Less Seawater Barrier	(4,672)	(6,000)	(6,000)	(6,000)	(6,000)	(6,000)
Balance: M&I	66,675	78,000	79,700	82,400	83,800	84,800

* 2005 are LBWD estimates based on actual water use.

Growth Rates Between the Periods		17%	2%	3%	2%	1%
Conservation embedded in MWDSC demand estimates	*13,800*	*16,200*	*17,600*	*18,800*	*21,000*	*23,100*
Annual conservation in excess of that in 2005		2,400	3,800	5,000	7,200	9,300
Demand before this 'new' conservation:	66,675	80,400	83,500	87,400	91,000	94,100
Growth Rates Between the Periods		21%	4%	5%	4%	3%

Table 5 - Groundwater Pumping Rights - AF/ Fiscal Year (July-June)

Basin Name	Pumping Rights – AF/Year
Central Basin	32,684.0
West Coast Basin	0.7
Total	32,684.7

Table 6 - Amount of Groundwater Pumped - AF/ Fiscal Year (July-June)**

Basin Name	2000	2001*	2002*	2003*	2004*
Central Basin	24,710	25,342	24,789	27,751	21,173
West Coast Basin	-	-	-	-	-
% of Total Water Supply	24,710	25,342	24,789	27,751	21,173

* From watermaster reports.

** These figures include about 200 af/yr of "micelaneous well" production used for park irrigation.

Table 7 - Amount of Groundwater Projected to be Pumped - AF/Year

Basin Name	2010	2015	2020	2025	2030
Central Basin	32,684	32,684	32,684	32,684	32,684
West Coast Basin	-	-	-	-	-
% of Total Water Supply	32,684	32,684	32,684	32,684	32,684

Table 8 - Supply Reliability - AF/Year

Using Table 4 data for Year 1010; and looking at M&I demands.

Source	Normal Water Year	Single Dry Water Year	Multiple Dry Water Years			
			Year 1	Year 2	Year 3	Year 4
Potable						
Wholesale Purchases	33,816	33,816	33,816	33,816	33,816	33,816
Groundwater	32,684	32,684	32,684	32,684	32,684	32,684
Supplier surface diversions	-	-	-	-	-	-
Transfers in or out	-	-	-	-	-	-
Exchanges in or out	-	-	-	-	-	-
Seawater Desalination	5,000	5,000	5,000	5,000	5,000	5,000
Recycled water	6,500	6,500	6,500	6,500	6,500	6,500
Total	78,000	78,000	78,000	78,000	78,000	78,000
% of Normal:		100%	100%	100%	100%	100%

Table 9 - Basis of Water Year Data

Water Year Type	Base Years
Normal Water Year	average 2000 - 2004
Single Dry Water Year*	1977
Multiple Dry Water Years*	1990-92

** Same as used by MWDSC in its Regional-UWMP.*

Table 10 - Factors Resulting in Inconsistency of Supply

Name of Supply	Legal	Environmental	Water Quality	Climatic
Imported Water	n/a	n/a	n/a	n/a
Groundwater	n/a	n/a	n/a	n/a
Reclaimed Water	n/a	n/a	n/a	n/a
Seawater Desalination**	n/a	n/a	n/a	n/a

*** If developed and put into production, this source is expected to be very consistant.*
If it is not brought into production, the water it accounts for in Table 8 would be replaced by MWDSC supplies.
This transfer of about 5,000 acre-feet to MWDSC will have no impact on the MWDSC ability to supply reliable water to the region, due to the relative miniscual amount of water involved compared to the total MWDSC supply and the supply buffer created by MWDSC.

Table 11 - Transfer and Exchange Opportunities

LBWD does not anticipate participating in transers or exchanges.

Table 12 - Past, Current and Projected M&I Water Deliveries

This includes reclaimed water but excludes water used for seawater barrier injection.

Year		Water Use Sectors	Single Family	Multi Family	Com-mercial	Industrial	Instit /gov	Land-scape	Agric	Total
2000	**Metered**	*# of Accounts*	59,155	19,502	6,310	711	1,033	963	-	87,674
		Deliveries - AF/Yr	24,268	25,351	11,595	3,428	3,898	3,118	-	71,658
	Unmetered	*# of Accounts*	0	0	0	0	0	0	0	-
		Deliveries - AF/Yr	0	0	0	0	0	0	0	-
2005	**Metered***	*# of Accounts***	60,253	19,864	6,427	724	1,052	981	-	89,301
		Deliveries - AF/Yr	24,167	25,245	11,547	3,414	3,882	3,105	-	71,360
	Unmetered	*# of Accounts*	0	0	0	0	0	0	0	-
		Deliveries - AF/Yr	0	0	0	0	0	0	0	-
2010	**Metered***	*# of Accounts^*	61,458	20,862	6,850	772	1,121	1,046	-	92,108
		Deliveries - AF/Yr	26,416	27,594	12,621	3,732	4,243	3,394	-	78,000
	Unmetered	*# of Accounts*	0	0	0	0	0	0	0	-
		Deliveries - AF/Yr	0	0	0	0	0	0	0	-
2015	**Metered**	*# of Accounts*	62,332	22,081	7,130	803	1,167	1,088	-	94,602
		Deliveries - AF/Yr	26,992	28,196	12,896	3,813	4,336	3,468	-	79,700
	Unmetered	*# of Accounts*	0	0	0	0	0	0	0	-
		Deliveries - AF/Yr	0	0	0	0	0	0	0	-
2020	**Metered**	*# of Accounts*	64,656	22,906	7,393	833	1,210	1,128	-	98,125
		Deliveries - AF/Yr	27,906	29,151	13,333	3,942	4,482	3,586	-	82,400
	Unmetered	*# of Accounts*	0	0	0	0	0	0	0	-
		Deliveries - AF/Yr	0	0	0	0	0	0	0	-
2025	**Metered**	*# of Accounts*	66,906	23,738	7,638	860	1,250	1,166	-	101,558
		Deliveries - AF/Yr	28,380	29,646	13,560	4,009	4,559	3,646	-	83,800
	Unmetered	*# of Accounts*	0	0	0	0	0	0	0	-
		Deliveries - AF/Yr	0	0	0	0	0	0	0	-
2030	**Metered**	*# of Accounts*	67,780	24,960	7,874	887	1,289	1,202	-	103,991
		Deliveries - AF/Yr	28,719	30,000	13,721	4,057	4,613	3,690	-	84,800
	Unmetered	*# of Accounts*	0	0	0	0	0	0	0	-
		Deliveries - AF/Yr	0	0	0	0	0	0	0	-

* 2005 water use shows basically no increase over 2000, as a result of the historic rainfall in winter of 04-05. 2010 shows large increase over 2005 only because, again, demand in 2005 was suppressed as a result of very heavy rainfall.

** Based on 2004 estimate.

^ Number of SF and MF accounts estimated based on expected number of units (Table 3C) divided by the current average number of units per accout for SF and MF, respectively. The number of units per account for MF will probably increase with time, but the approach used in this analysis is adequate for these purposes.

Projections of the number of CII accounts use 2005 as a base and increase the number of accounts by the same percent as employment is expected to increase.

Table 13 - Sales to Other Water Agencies

Water Distributed	2000	2005	2010	2015	2020	2025	2030
n/a	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0

Table 14 - Additional Water Uses and Loses - AF/Year

Water Use	2000	2005	2010	2015	2020	2025	2030
Saline Barrier	-	4,672	6,000	6,000	6,000	6,000	6,000
Groundwater recharge	-	-	-	-	-	-	-
Conjunctive use*	-	-	-	-	-	-	-
Raw water	-	-	-	-	-	-	-
Recycled	-	-	-	-	-	-	-
Other (define)	-	-	-	-	-	-	-
Unaccounted-for system loss^	4,480	3,100	3,575	3,660	3,795	3,865	3,915
Total	4,480	7,772	9,575	9,660	9,795	9,865	9,915

* See discussion.

^ Estimate for 2005 = potable demand estimate x's UFSL through 3rd Qtr of FY05 = 66,675*4.6% = 3,100
Estimate for 2010 and beyond: assume loss equal to 5% of potable M&I demand.

Table 15 - Total Water Use (sum of Tables 12-14)

Water Use	2000	2005	2010	2015	2020	2025	2030
Total	76,138	79,132	87,575	89,360	92,195	93,665	94,715

Table 16 - Evaluation of Unit Cost of Water related to Demand Management Measures

Non-implemented & not scheduled DMM/ Planned Water Supply Project Name	per Acre-foot Cost ($)
None	na/

Table 17 - Future Water Supply Projects

Project Name	Project Schedule Planning Start Date	Project Schedule Production Start Date	Normal-year AF to Agency	Single-dry AF/Year to Agency	Multiple-dry Years -- AF/Year to Agency Year 1	Year 2	Year 3	Year 4
Expand Reclaimed Water Infrastructure	on-going	on-going	2,000	2,000	2,000	2,000	2,000	2,000
Reclaimed Water Barrier Injection - Phase I	Complete	2006	3,000	3,000	3,000	3,000	3,000	3,000
Reclaimed Water Barrier Injection - Phase II	Complete	2010	3,000	3,000	3,000	3,000	3,000	3,000
Possible Project: Seawater Desalination	Possible: 2007	2010	10,000	10,000	10,000	10,000	10,000	10,000
Total			18,000	18,000	18,000	18,000	18,000	18,000

Table 18 - Opportunities for Desalinated Water

Sources of Water	Yield AF/Y	Start Date	Type of use	Other
Ocean Water (see Section 2.9)	10,000	2010	Potable Retail	
Brackish Ocean Water	0	n/a	n/a	n/a
Brackish Groundwater	0	n/a	n/a	n/a
Other (such as impaired groundwater)	0	n/a	n/a	n/a
Other	0	n/a	n/a	n/a

Table 19 - Agency demand projections provided to wholesale suppliers - AF/Year

Wholesalers	2010	2015	2020	2025	2030
Metropolitan Water District of Southern California (MWDSC)	33,816	30,516	33,216	34,616	35,616
Total	33,816	30,516	33,216	34,616	35,616

Table 20 - Wholesaler identified & quantified the existing and planned sources of water available to LBWD - AF/Year

MWDSC's supplies are pooled supplies, that is, a specific amount is no set aside for each of the 26 MWDSC member agencies. Potentially all of MWDSC's supplies are available to LBWD either through direct delivery or indirectly.

The following are the "normal year" supply projections from the MWDSC RUWMP. Please see the LBWD UWMP attachment for MWDSC projections for single and multiply dry-years.

	2010		2015		2020		2025		2030	
Wholesaler Sources	Existing	Planned	Existing	Planned	Existing	Planned	Existing	Planned	Existing	Planned
Colorado River	711,000	-	678,000	(35,000)	67,000	(35,000)	677,000	(35,000)	677,000	(35,000)
California Aqueduct	1,772,000	185,000	1,772,000	185,000	1,772,000	240,000	1,772,000	240,000	1,772,000	240,000
In-Basin Storage*	-	-	-	-	-	-	-	-		

* In-Basin Storage shown as "0" because the storage is for use during dry years, not "normal" years, which is the subject of this table.

Table 21 - Wholesale supply reliability - % of normal supply

	Single-dry	Multiple-dry Years -- AF/Year to Agency			
Wholesaler	AF/Year to	Year 1	Year 2	Year 3	Year 4
MWDSC	100%	100%	100%	100%	100%
Total	100%	100%	100%	100%	100%

Table 21A - MWDSC supply and demand projections under different hydrologies

Single Dry-Year	2010	2015	2020	2025	2030
MWDSC Supply Capability	2,842,000	3,056,300	3,021,400	2,997,800	2,997,800
Demand	(2,326,000)	(2,342,000)	(2,377,000)	(2,504,000)	(2,631,000)
Surplus	516,000	714,300	644,400	493,800	366,800

Multiple Dry-Year	2010	2015	2020	2025	2030
MWDSC Supply Capability	2,618,100	2,833,300	2,810,900	2,797,100	2,797,100
Demand	(2,410,000)	(2,431,000)	(2,459,000)	(2,596,000)	(2,729,000)
Surplus	208,100	402,300	351,900	201,100	68,100

Table 22 - Factors resulting in inconsistency of wholesaler's supply

Name of supply	Legal	Environmental	Water Quality	Climatic
MWDSC	None	None	None	None

Table 23A - Water Supply Shortage and Conditions

A - Wholesale Supply Shortage Prior to Allocation

The following Stages are based in the MWDCS WSDM Plan (Water Surplus & Drought Management Plan). These stages reflect a condition in which demand exceeds current-year core supplies, forcing the MWDSC to remove water from storage, reduce or eliminate certain non-firm water sales, purchase water from the spot market or exercise purchase options, and calls for extraordinary conservation.

The focus of this table is on imported supplies which, although extremely reliable, are the least reliable of the LBWD supplies.

MWDSC Shortage Stage	Water Supply Conditions: When Demand Exceeds Core Supplies for Imports	% Wholesale Shortage
Stage 1	MWDSC takes water from Eastside Reservior	0%
Stage 2	MWDSC takes water from Semitropic and Arvin-Edison	0%
Stage 3	MWDSC cuts long-term storage and replenishment deliveries to its member agencies	0%
Stage 4	MWDSC takes contractual groundwater supplies and takes water from the Monterey Reservoir	0%
Stage 5	MWDSC Calls for extraordinary conservation and reduces Interim Agricultural Water Program delilveries	0%
Stage 6	MWDSC calls options contracts and buys spot-market water	0%
Stage 7	MWDSC begin allocating water supplies	?

Table 23B - Water Supply Shortage and Conditions

B - Cut in Wholesale Supplies Prior to Retail Allocation

This table estimates how deeply imported water supplies would have to be cut before water had to be allocated on the retail level. The allocation could take the form of quantity per customer and/or increase in water rates to decrease demand.

Potable Demand		70,000
- Groundwater Supplies		(32,684)
= Demand subject to Imported Water Shortage		37,316
- Extraordinary Conservation during Extreme Shortages		
Demand Reducion as % of total Potable *	10%	
AF of 'Extraordinary' Conservation		(7,000)
= Demand subject to Imported Water Shortage		30,316
+ Over Production from Groundwater Basin		
Groundwater Rights	32,600	
Over Production re: Carryover	20%	
Over Production re: Emergency Provisions	20%	
Total Over Production	13,040	
Years of Over Production	4	
Over Production per Year		(3,260)
= Demand subject to Imported Water Shortage		27,056
Demand Reduction Prior to Allocation		
Demand for Imports Prior to Actions		37,316
Demand for Imports After Actions		27,056
Difference		10,260
Original Demand		70,000
Demand Reduction Prior to Retail Allocation		15%
Net Demand Prior to Retail Allocation		59,740
Reduction in Imported Supplies Prior to Retail Allocation		27%

Table 23C - Water Supply Shortage and Conditions

C - Retail Supply Shortage and Conditions.

LBWD Shortage Phase	Water Supply Conditions*	Approx. % Retail Shortage*
Initial Shortage	MWDSC Shortage Stages 1 through 4	0%
Phase I	MWDSC Shortage Stages 5 though 6 - Extraordinary Conservation	0%
Phase II	26% Reduction in Firm, Wholesale Water Supplies	0%
Phase III	42% Reduction in Firm, Wholesale Water Supplies	10%
Phase IV	58% Reduction in Firm, Wholesale Water Supplies	20%
Phase V	74% Reduction in Firm, Wholesale Water Supplies	30%
Phase VI	90% Reduction in Firm, Wholesale Water Supplies	40%
Phase VII	106% Reduction in Firm, Wholesale Water Supplies**	50%

* These "Water Supply Conditions" and "Approximate % Retail Shortage" are estimates. The LBWD has not adopted specific numberic targets that would trigger a particular Shortage Phase.

** Being "106%" reduction means wholesale water supplies are eliminated plus an amount of local supplies equal to 6% of the firm demand for wholesale supplies.

Table 24 - Estimated Mimimum Water Supply Over the Next Three Years - AF/Year

Based on driest historic sequence for the water supply.
The total available significantly exceeds expected demand

Sources of Water	2006	2007	2008	Normal
Recycled Water*	21,000	21,000	21,000	21,000
Groundwater**	32,684	32,684	32,684	32,684
Imported Water***	37,316	37,316	37,316	37,316
Total	91,000	91,000	91,000	91,000

* Demand for reclaimed water is roughly 9,000 af/year, or just a fraction of the available supply.

** This number only includes the annual production rights of the LBWD. Actual extraction rights increase during shortage conditions, meaning actual minimum production LBWD would expect, if seeking the maximum possible under the most extreme conditions over

*** It is difficult to estimate the minimum supply of imported water available to the LBWD because it is a shared water supply allocated to member agencies based on need. The reasonable estimate of the miniumum under difficult hydrolic conditions, within the next three years, is the minimum needed to meet firm demand, i.e., an amount roughly equal to firm potable retail demand in Long Beach less estimated groundwater production. MWD has projected that it can meet these types of demands under even the most extreme hydrologic conditions for the next three years. Therefore, this assumption is reasonable.

Table 25 - Preparation Actions for a Catastrophe^

Possible Catastrophe	Summary of Action
Regional power outage	Call for extraordinary conservation and take further actions as is necessary, including those outlined in the Water Conservation and Water-shortage Emergency Plan
Earthquake - Imported Supply System	Call for extraordinary conservation and take further actions as is necessary, including those outlined in the Water Conservation and Water-shortage Emergency Plan
	Increase production of groundwater.
Earthquake - Local	Call for extraordinary conservation and take further actions as is necessary, including those outlined in the Water Conservation and Water-shortage Emergency Plan.
	Isolate and repair damanged infrastructure as quickly as possible.
	If necessary, call for mutual aid.
	Depending on conditions, take more or less imported water to met water demands.

^ Given additional security concerns over the last few years, additional measures could be taken but these measures are not described in public forums.

Table 26 - Mandatory Prohibitions

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory

Table 27 - Consumption Reduction Methods

Consumption Reduction Method	Stage When Method Takes Effect	Projected Reduction (%)

Table 28 - Penalties and Charges

Penalty or Charge	Stage when Penalty Takes Effect

Table 29A - Water-shortage Actions and Conditions that Impact Revenues

Type	Anticipated Revenue Reduction
Reduced sales.	Revenue from the sale of water, depending on account type, is about 65- to 75-percent of total revenue. A reduction in sales of from 0- to 50-percent would mean a reduction in revenue of from 0- to about 35-percent if there were no rate increase during the emergency.

Table 29B - Proposed Measures to Overcome Revenue Impacts

Name of Measure	Summary of Effects
Water rate increase.	The LBWD Water Conservation and Water-shortage Emergency Plan envisions implementing several measures during extreme shortages. One of those measures is a rate increase. For example, the increase of the non-life-line rate in a Stage I shortage could be about 50-percent; and in Stage II 100-percent. If then, in the most severe shortage, water demand is cut by 50-percent but water rates double, total revenue generated nearly double as well.
Reduce cost of production.	As the demand for water decreases, the total cost of producing the water also decreases. For example, if the demand for water decreases by 50-percent, then the LBWD must purchase that much less water. The cost of producing water is the greatest single driver with respect to the total cost of water. Therefore, in the extreme case in which demand is cut by 50-percent, but the water rate increases by 100-percent (doubles), very little of the revenue generated by the 100-percent increase goes towards the cost of water, but will be available to cover additional costs such as shown below.

Table 30A - Water-shortage Actions and Conditions that Impact Expenditures

Category	Anticipated Cost
Increase staff cost	Minor increase, if any. Staff will be focused away from their normal duties to the emergency work that needs be done. After the emergency, the staff will be refocused on their "normal" duties. The exception to this generalization would be in the event of a prolonged shortage such as might be caused by a multi-year drought.
Increase O&M Cost	O&M cost should either stay the same or decrease, even after excluding the dramatic reduction in costs associated with the reduced need to purchase and/or produce potable water. Many staff that could be shifted to conservation during emergencies normally work in cost-intensive areas such as the replacement of water mains, an activity with very high capital costs.
Increased cost of supply & treatment	The cost of wholesale water could be expected to increase, but not dramatically, this is the same water that the LBWD would be acquiring less of during the most likely shortages. The cost of pumping and treating groundwater would not change significantly, if at all.

Table 30B - Proposed Measures to overcome Expenditure Impacts

Name of Measure	Summary of Effects
n/a	With the reduction in sales comes a significant reduction in the cost of water and a compensating increase in the water rate. Additionally, because staff will likely be pulled, temporarily at least, from high-capital-cost activities such as capital improvement projects, staffing cost will not increase but capital equipment costs will decreases. For these reasons, the effect of a shortage on expenditures will be minimal, if at all.

Table 31 - Water Use Monitoring Mechanisms

Mechanisms for determining actual reductions	Type and quality of data expected
Groundwater Treatment Plant produciton.	Production records to be made on daily basis and tracked as necessary. The quality of the data from these records is very high; the data is collected and stored electronically, utilizing systems currently in operation.
Purchase of water wholesale.	Water purchase records to be made on daily basis and tracked as necessary. The quality of the data from these records is very high; the data is collected and stored electronically, utilizing systems currently in operation.

Table 32 - Participating Agencies in Recycled Water Programs

Participating Agencies	Role in Plan Development
Water Agencies	MWDSC: provider of significant financial support.
Wastewater Agencies	Sanitation Districts of Los Angeles County – Long Beach Water Reclamation Plant: treats the waste water to Title 22 standards.
Groundwater Agencies	Water Replenishment District of Southern California: conceptualize and partnered with LBWD in the development of a reverse osmosis and Ultra Violet light treatment plant that transforms the reclaimed water to a level that allows it to be injected into the groundwater basin for the purpose of creating a seawater intrusion barrier.
Planning Agencies	City of Long Beach Community Development Department: looking for opportunities to use reclaimed water in new developments when practical.
Other	U.S. Bureau of Reclamation: provider of significant financial support.
	City of Long Beach: Parks, Recreation & Marine Department: looking for new opportunities to use reclaimed water in new developments or to replacement potable water in existing uses, when practical.
	California Department of Water Resources: provider of significant financial support.

Table 33 - Wastewater Collected and Treated - AF/ Yr

Maximum plant effluent capacity: 25 mgd; plant expansion not expected.

	2000	2005	2010	2015	2020	2025	2030
Wastewater Influent	23,466	23,393	24,953	26,512	28,072	29,631	31,191
Wastewater Effluent	21,068	21,003	22,403	23,803	25,203	26,603	28,004
Quantity that neets recycled water standard	21,068	21,003	22,403	23,803	25,203	26,603	28,004

Table 34 - Disposal of Wastewater (non-recycled) - AF/ Yr

Treated wastewater that is not recycled is discharged into the Coyote Creek.

Method of Disposal	Treatment Level	2005	2010	2015	2020	2025	2030
Discharge	Title 22	16,318	12,903	11,303	12,703	14,103	15,504

Table 35A - Recycled Water Uses - Actual AF/ Yr

These numbers are for FY ending Sept '05; the months of Aug & Sept are estimates.

Type of User	Treatment Level	2005 AF/Yr*
Agriculture	Title 22	-
Landscape	Title 22	2,585
Wildlife Habitat	Title 22	-
Wetlands	Title 22	-
Industrial	Title 22	2,100
Groundwater Recharge	Title 22 and advanced treatment using RO and UV.	-
Other (type of use)	Title 22	-
Total		4,685

Table 35B - Recycled Water Uses - Potential AF/ Yr

Type of User	Treatment Level	2010	2015	2020	2025	2030
Agriculture	Title 22	-	-	-	-	-
Landscape	Title 22	2,585	5,000	5,000	5,000	5,000
Wildlife Habitat	Title 22	-	-	-	-	-
Wetlands	Title 22	-	-	-	-	-
Industrial	Title 22	2,100	1,500	1,500	1,500	1,500
Groundwater Recharge	Title 23	-	-	-	-	-
Seawater Barrier Injection	Title 22 and advanced treatment using RO and UV.	-	3,000	6,000	6,000	6,000
Other (type of use)	Title 22	-	-	-	-	-
Total		4,685	9,500	12,500	12,500	12,500

Table 36 - Projected Future Use of Recycled Water in Service Area - AF/Yr

ERIC

Type of User	2005	2010	2015	2020	2025	2030
Agriculture	-					
Landscape	2,585	5,000	5,000	5,000	5,000	5,000
Wildlife Habitat	-					
Wetlands	-					
Industrial	2,100	1,500	1,500	1,500	1,500	1,500
Groundwater Reclarge	-					
Seawater Barrier Injection	-	3,000	6,000	6,000	6,000	6,000
Other (type of use)	-					
Total	4,685	9,500	12,500	12,500	12,500	12,500

Table 37 - Recycled Water Uses -- 2000 Projection compared with 2005 actuals - AF/Yr

Increased industrial use did not materialize; landscape use depressed in 2005 as a result of record winter rains.

Type of User	2000 Projection for FY 2005	FY 2005 Atucal Use (est. as of Sept '05)
Agriculture	-	-
Landscape	4,510	2,585
Wildlife Habitat	-	-
Wetlands	-	-
Industrial	6,138	2,100
Groundwater Recharge	-	-
Other (type of use)	-	-
Total	10,648	4,685

Table 38 - Methods to Encourage Recycled Water Use

Action	AF of use projected to result from this action				
	2010	2015	2020	2025	2030
Financial incentives	908	908	908	908	908
Cooperation in development & operation of seawater barrier project	3,000	6,000	6,000	6,000	6,000
Expansion of reclaimed water infrastructure	908	908	908	908	908
Total	4,815	7,815	7,815	7,815	7,815

Table 39 - Current & Projected Water Supply Changes Due To Water Quality - percentage

Water Source	2005	2010	2015	2020	2025	2030
Recycled water	0%	0%	0%	0%	0%	0%
Groundwater	0%	0%	0%	0%	0%	0%
Water purchased wholesale	0%	0%	0%	0%	0%	0%
Total	0%	0%	0%	0%	0%	0%

Table 40 - Projected Normal Water Year Supply - AF/Yr

	2010	2015	2020	2025	2030
Supply Total	84,000	85,700	88,400	89,800	90,800
% of Normal Year*	100%	100%	100%	100%	100%

* from Table 4, Projected Supplies during normal hydrology.

Table 41 - Projected Normal Water Year Demand - AF/Yr

	2010	2015	2020	2025	2030
Demand Total (Table 4 & 12)	84,000	85,700	88,400	89,800	90,800
% of Year 2005**	110%	113%	116%	118%	119%

** The percent increase over 2005 is high because record rainfall in 2005 suppressed demand. That is, 2005 was not a "normal year" but this table assumes 2010, 2015, 2020, 2025, and 2030 will be.

Table 42 - Projected Normal Year Supply and Demand Comparision - AF/Y

	2010	2015	2020	2025	2030
Supply Total	84,000	85,700	88,400	89,800	90,800
Demand Total	84,000	85,700	88,400	89,800	90,800
Difference (Supply - Demand)	-	-	-	-	-
Difference as % of Supply	0%	0%	0%	0%	0%
Difference as % of Demand	0%	0%	0%	0%	0%

Table 43 - Projected Single Dry-year Water Supply - AF/Yr

	2010	2015	2020	2025	2030
Supply Total	84,000	85,700	88,400	89,800	90,800
% of Normal Year Demand	100%	100%	100%	100%	100%

Table 44 - Projected Single Dry-year Water Demand - AF/Yr

	2010	2015	2020	2025	2030
Demand Total	84,000	85,700	88,400	89,800	90,800
% of Normal Year Demand	100%	100%	100%	100%	100%

Table 45 - Projected Single Dry-year Water Supply and Demand Comparison - AF/Yr

	2010	2015	2020	2025	2030
Supply Total	84,000	85,700	88,400	89,800	90,800
Demand Total	84,000	85,700	88,400	89,800	90,800
Difference (Supply - Demand)	-	-	-	-	-
Difference as % of Supply	0%	0%	0%	0%	0%
Difference as % of Demand	0%	0%	0%	0%	0%

Table 46: Projected Supply During Multiple Dry-year Period Ending in 2010 - AF/Yr

	2006	2007	2008	2009	2010
Supply Total	77,626	79,219	80,813	82,406	84,000
% of Normal Year	100%	100%	100%	100%	100%

Table 47: Projected Demand Multiple Dry-year Period Ending in 2010 - AF/Yr

	2006	2007	2008	2009	2010
Demand Total	77,626	79,219	80,813	82,406	84,000
% of Normal Year	100%	100%	100%	100%	100%

Table 48: Projected Supply & Demand Comparison During Multiple Dry-year Period Ending in 2010 - AF/Yr

	2006	2007	2008	2009	2010
Supply Total	77,626	79,219	80,813	82,406	84,000
Demand Total	77,626	79,219	80,813	82,406	84,000
Difference (Supply - Demand)	-	-	-	-	-
Difference as % of Supply	0%	0%	0%	0%	0%
Difference as % of Demand	0%	0%	0%	0%	0%

Table 49: Projected Supply During Multiple Dry-year Period Ending in 2015 - AF/Yr

	2011	2012	2013	2014	2015
Supply Total	84,340	84,680	85,020	85,360	85,700
% of Normal Year	100%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Table 50: Projected Demand Multiple Dry-year Period Ending in 2015 - AF/Yr

	2011	2012	2013	2014	2015
Demand Total	84,340	84,680	85,020	85,360	85,700
% of Normal Year	100%	100%	100%	100%	100%

Table 51: Projected Supply & Demand Comparison During Multiple Dry-year Period Ending in 2015 - AF/Yr

	2011	2012	2013	2014	2015
Supply Total	84,340	84,680	85,020	85,360	85,700
Demand Total	84,340	84,680	85,020	85,360	85,700
Difference (Supply - Demand)	-	-	-	-	-
Difference as % of Supply	0%	0%	0%	0%	0%
Difference as % of Demand	0%	0%	0%	0%	0%

Table 52 - Projected Supply During Multiple Dry-year Period Ending in 2020 - AF/Yr

	2016	2017	2018	2019	2020
Supply Total	86,240	86,780	87,320	87,860	88,400
% of Normal Year*	100%	100%	100%	100%	100%

* For projected normal use Table 40.

Table 53 - Projected Demand Multiple Dry-year Period Ending in 2020 - AF/Yr

	2016	2017	2018	2019	2020
Demand Total	86,240	86,780	87,320	87,860	88,400
% of Normal Year*	100%	100%	100%	100%	100%

* For projected normal use Table 41.

Table 54 - Projected Supply & Demand Comparison During Multiple Dry-year Period Ending in 2020 - AF/Yr

	2016	2017	2018	2019	2020
Supply Total	86,240	86,780	87,320	87,860	88,400
Demand Total	86,240	86,780	87,320	87,860	88,400
Difference (Supply - Demand)	-	-	-	-	-
Difference as % of Supply	0%	0%	0%	0%	0%
Difference as % of Demand	0%	0%	0%	0%	0%

Table 55 - Projected Supply During Multiple Dry-year Period Ending in 2025 - AF/Yr

	2021	2022	2023	2024	2025
Supply Total	88,680	88,960	89,240	89,520	89,800
% of Normal Year*	100%	100%	100%	100%	100%

* For projected normal use Table 40.

Table 56 - Projected Demand Multiple Dry-year Period Ending in 2025 - AF/Yr

	2021	2022	2023	2024	2025
Demand Total	88,680	88,960	89,240	89,520	89,800
% of Normal Year*	100%	100%	100%	100%	100%

* For projected normal use Table 41.

Table 57 - Projected Supply & Demand Comparison During Multiple Dry-year Period Ending in 2025 - AF/Yr

	2021	2022	2023	2024	2025
Supply Total	88,680	88,960	89,240	89,520	89,800
Demand Total	88,680	88,960	89,240	89,520	89,800
Difference (Supply - Demand)	-	-	-	-	-
Difference as % of Supply	0%	0%	0%	0%	0%
Difference as % of Demand	0%	0%	0%	0%	0%

Table 58 - Projected Supply During Multiple Dry-year Period Ending in 2030 - AF/Yr

	2026	2027	2028	2029	2030
Supply Total	90,000	90,200	90,400	90,600	90,800
% of Normal Year*	100%	100%	100%	100%	100%

* For projected normal use Table 40.

Table 59 - Projected Demand Multiple Dry-year Period Ending in 2030 - AF/Yr

	2026	2027	2028	2029	2030
Demand Total	90,000	90,200	90,400	90,600	90,800
% of Normal Year*	100%	100%	100%	100%	100%

* For projected normal use Table 41.

Table 60 - Projected Supply & Demand Comparison During Multiple Dry-year Period Ending in 2030 - AF/

	2026	2027	2028	2029	2030
Supply Total	90,000	90,200	90,400	90,600	90,800
Demand Total	90,000	90,200	90,400	90,600	90,800
Difference (Supply - Demand)	-	-	-	-	-
Difference as % of Supply	0%	0%	0%	0%	0%
Difference as % of Demand	0%	0%	0%	0%	0%

Attachment C

Central Basin Judgment

CENTRAL BASIN JUDGEMENT
(Table of Contents)

I. Declaration and Determination of Water Rights of Parties; Restriction on the Exercise Thereof p. 7

1. Determination of Rights of Parties p. 7
2. Parties Enjoined as Regards Quantities of Extraction p. 9
3. None
4. Transition in Administrative Year - Application p. 52

II. Appointment of Watermaster; Watermaster Administrative Provisions p. 52

1. Duties, Powers and Responsibilities of Watermaster p.52
2. Use of Facilities and Data Collected by Other Governmental Agencies p. 56
3. Appeal from Watermaster Decisions Other Than with Respect to Budget p. 57

III. Provisions for Physical Solution to Meet the Water Requirements in Central Basin p. 58

A. Carryover of Portion of Allowed Pumping Allocation p. 58
B. When Over-extractions May Be Permitted p. 60
C. Exchange Pool Provisions p. 70

IV. Continuing Jurisdiction of the Court p. 82

V. General Provisions p. 84

1. Judgment Constitutes Inter Se Adjudication p. 84
2. Assignment, Transfer, Etc. of Rights p. 85
3. Service Upon and Delivery to Parties of Various Papers p. 85
4. Judgment Does Not Affect Rights, Powers, Etc., of Plaintiff District p. 86
5. Continuation of Order Under Interim Agreement p. 86
6. Effect of: Extractions by Exchangees; Reductions in Extractions p. 86
7. Judgment Binding on Successors, Etc. p. 87
8. Costs p. 87
9. Intervention of Successors in Interest and New Parties p. 88
10. Effect of this Amended Judgment On Orders Filed Herein p. 88

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PLEASE REPLY TO

Pasadena
Office

May 9, 1991

Mr. John Norman
Central & West Basin
Water Replenishment District
12621 166th Street
Cerritos, California 90701

Re: Second Amended Judgment

Dear John:

Enclosed is a copy of the Second Amended Judgment as executed by Judge Pickard on May 6, 1991. The Judgment Amendment is effective immediately.

Very truly yours,

William F. Kruse

William F. Kruse
of
LAGERLOF, SENECAL, DRESCHER & SWIFT

WFK/pc
Enclosure

cc: Richard A. Rhone, w/enc.
Thomas Salzano, w/enc.
Chris Nagler, w/enc.

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SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

CENTRAL AND WEST BASIN WATER REPLENISHMENT DISTRICT, etc., Plaintiff, v. CHARLES E. ADAMS, et al., Defendants.	No. 786,656 SECOND AMENDED JUDGMENT (Declaring and establishing water rights in Central Basin and enjoining extractions therefrom in excess of specified quantities.)
CITY OF LAKEWOOD, a municipal corporation, Cross-Complainant, v. CHARLES E. ADAMS, et al., Cross-Defendants.	

The above-entitled matter duly and regularly came on for trial in Department 73 of the above-entitled Court (having been transferred thereto from Department 75 by order of the presiding Judge), before the Honorable Edmund M. Moor, specially assigned Judge, on May 17, 1965, at 10:00 a.m. Plaintiff was represented by its attorneys BEWLEY, KNOOP, LASSLEBEN & WHELAN,

MARTIN E. WHELAN, JR., and EDWIN H. VAIL, JR., and cross-complainant was represented by its attorney JOHN S. TODD. Various defendants and cross-defendants were also represented at the trial. Evidence both oral and documentary was introduced. The trial continued from day to day on May 17, 18, 19, 20, 21 and 24, 1965, at which time it was continued by order of Court for further trial on August 25, 1965, at 10:00 a.m. in Department 73 of the above-entitled Court; whereupon, having then been transferred to Department 74, trial was resumed in Department 74 on August 25, 1965, and then continued to August 27, 1965 at 10:00 a.m. in the same Department. On the latter date, trial was concluded and the matter submitted. Findings of fact and conclusions of law have heretofore been signed and filed. Pursuant to the reserved and continuing jurisdiction of the court under the judgment herein, certain amendments to said judgment and temporary orders have heretofore been made and entered. Continuing jurisdiction of the court for this action is currently assigned to HON. FLORENCE T. PICKARD. Motion of Plaintiff herein for further amendments to the judgment, notice thereof and of the hearing thereon having been duly and regularly given to all parties, came on for hearing in Department 38 of the above-entitled court on MAY 6, 1991 at 8:45 a.m. before said HONORABLE PICKARD. Plaintiff was represented by its attorneys LAGERLOF, SENECAL, DRESCHER & SWIFT, by William F. Kruse. Various defendants were represented by counsel of record appearing on the Clerk's records. Hearing thereon was concluded on that date. The within "Second Amended Judgment" incorporates amendments and orders heretofore made to the extent presently operable and

amendments pursuant to said last mentioned motion. To the extent this Amended Judgment is a restatement of the judgment as heretofore amended, it is for convenience in incorporating all matters in one document, is not a readjudication of such matters and is not intended to reopen any such matters. As used hereinafter the word "judgment" shall include the original judgment as amended to date. In connection with the following judgment, the following terms, words, phrases and clauses are used by the Court with the following meanings:

"Administrative Year" means the water year until operation under the judgment is converted to a fiscal year pursuant to Paragraph 4, Part I, p. 53 hereof, whereupon it shall mean a fiscal year, including the initial 'short fiscal year' therein provided.

"Allowed Pumping Allocation" is that quantity in acre feet which the Court adjudges to be the maximum quantity which a party should be allowed to extract annually from Central Basin as set forth in Part I hereof, which constitutes 80% of such party's Total Water Right.

"Allowed Pumping Allocation for a particular Administrative year" and "Allowed Pumping Allocation in the following Administrative year" and similar clauses, mean the Allowed Pumping Allocation as increased in a particular Administrative year by any authorized carryovers pursuant to Part III, Subpart A of this judgment and as reduced by reason of any over-extractions in a previous Administrative year.

"Artificial Replenishment" is the replenishment of Central Basin achieved through the spreading of imported or reclaimed

water for percolation thereof into Central Basin by a governmental agency.

"Base Water Right" is the highest continuous extractions of water by a party from Central Basin for a beneficial use in any period of five consecutive years after the commencement of overdraft in Central Basin and prior to the commencement of this action, as to which there has been no cessation of use by that party during any subsequent period of five consecutive years. As employed in the above definition, the words "extractions of water by a party" and "cessation of use by that party" include such extractions and cessations by any predecessor or predecessors in interest.

"Calendar Year" is the twelve month period commencing January 1 of each year and ending December 31 of each year.

"Central Basin" is the underground water basin or reservoir underlying Central Basin Area, the exterior boundaries of which Central Basin are the same as the exterior boundaries of Central Basin Area.

"Central Basin Area" is the territory described in Appendix "1" to this judgment, and is a segment of the territory comprising Plaintiff District.

"Declared water emergency" shall mean a period commencing with the adoption of a resolution of the Board of Directors of the Central and West Basin Water Replenishment District declaring that conditions within the Central Basin relating to natural and imported supplies of water are such that, without implementation of the water emergency provisions of this Judgment, the water resources of the Central Basin risk degradation. In making such

declaration, the Board of Directors shall consider any information and requests provided by water producers, purveyors and other affected entities and may, for that purpose, hold a public hearing in advance of such declaration. A Declared Water Emergency shall extend for one (1) year following such resolution, unless sooner ended by similar resolution.

"Extraction", "extractions", "extracting", "extracted", and other variations of the same noun and verb, mean pumping, taking, diverting or withdrawing ground water by any manner or means whatsoever from Central Basin.

"Fiscal Year" is the twelve (12) month period July 1 through June 30 following.

"Imported Water" means water brought into Central Basin Area from a non-tributary source by a party and any predecessors in interest, either through purchase directly from The Metropolitan Water District of Southern California or by direct purchase from a member agency thereof, and additionally as to the Department of Water and Power of the City of Los Angeles, water brought into Central Basin Area by that party by means of the Owens River Aqueduct.

"Imported Water Use Credit" is the annual amount, computed on a calendar year basis, of imported water which any party and any predecessors in interest, who have timely made the required filings under Water Code Section 1005.1, have imported into Central Basin Area in any calendar year and subsequent to July 9, 1951, for beneficial use therein, but not exceeding the amount by which that party and any predecessors in interest reduces his or their extractions of ground water from Central Basin in that

calendar year from the level of his or their extractions in the preceding calendar year, or in any prior calendar year not earlier than the calendar year 1950, whichever is the greater.

"Natural Replenishment" means and includes all processes other than "Artificial Replenishment" by which water may become a part of the ground water supply of Central Basin.

"Natural Safe Yield" is the maximum quantity of ground water, not in excess of the long term average annual quantity of Natural Replenishment, which may be extracted annually from Central Basin without eventual depletion thereof or without otherwise causing eventual permanent damage to Central Basin as a source of ground water for beneficial use, said maximum quantity being determined without reference to Artificial Replenishment.

"Overdraft" is that condition of a ground water basin resulting from extractions in any given annual period or periods in excess of the long term average annual quantity of Natural Replenishment, or in excess of that quantity which may be extracted annually without otherwise causing eventual permanent damage to the basin.

"Party" means a party to this action. Whenever the term "party" is used in connection with a quantitative water right, or any quantitative right, privilege or obligation, or in connection with the assessment for the budget of the Watermaster, it shall be deemed to refer collectively to those parties to whom are attributed a Total Water Right in Part I of this judgment.

"Person" or "persons" include individuals, partnerships, associations, governmental agencies and corporations, and any and all types of entities.

"Total Water Right" is the quantity arrived at in the same manner as in the computation of "Base Water Right", but including as if extracted in any particular year the Imported Water Use Credit, if any, to which a particular party may be entitled.

"Water" includes only non-saline water, which is that having less than 1,000 parts of chlorides to 1,000,000 parts of water.

"Water Year" is the 12-month period commencing October 1 of each year and ending September 30th of the following year.

In those instances where any of the above-defined words, terms, phrases or clauses are utilized in the definition of any of the other above-defined words, terms, phrases and clauses, such use is with the same meaning as is above set forth.

NOW THEREFORE, IT IS ORDERED, DECLARED, ADJUDGED AND DECREED WITH RESPECT TO THE ACTION AND CROSS-ACTION AS FOLLOWS:

I. DECLARATION AND DETERMINATION OF WATER RIGHTS OF PARTIES; RESTRICTION ON THE EXERCISE THEREOF.[1]

1. Determination of Rights of Parties.

(a) Each party, except defendants, The City of Los Angeles and Department of Water and Power of the City of Los Angeles, whose name is hereinafter set forth in the tabulation at the conclusion of Subpart 3 of Part 1, and after whose name there

[1]Headings in the judgment are for purposes of reference and the language of said headings do not constitute, other than for such purpose, a portion of this judgment.

appears under the column "Total Water Right" a figure other than "0", was the owner of and had the right to extract annually groundwater from Central Basin for beneficial use in the quantity set forth after that party's name under said column "Total Water Right" pursuant to the Judgment as originally entered herein. Attached hereto as Appendix "2" and by this reference made a part hereof as though fully set forth are the water rights of parties and successors in interest as they existed as of the close of the water year ending September 30, 1978 in accordance with the Watermaster Reports on file with this Court and the records of the Plaintiff. This tabulation does not take into account additions or subtractions from any Allowed Pumping Allocation of a producer for the 1978-79 water year, nor other adjustments not representing change in fee title to water rights, such as leases of water rights, nor does it include the names of lessees of landowners where the lessees are exercising the water rights. The exercise of all water rights is subject, however, to the provisions of this Judgment as hereinafter contained. All of said rights are of the same legal force and effect and are without priority with reference to each other. Each party whose name is hereinafter set forth in the tabulation set forth in Appendix "2" of this judgment, and after whose name there appears under the column "Total Water Right" the figure "0" owns no rights to extract any ground water from Central Basin, and has no right to extract any ground water from Central Basin.

(b) Defendant The City of Los Angeles is the owner of the right to extract fifteen thousand (15,000) acre feet per annum of ground water from Central Basin. Defendant Department

of Water and Power of the City of Los Angeles has no right to extract ground water from Central Basin except insofar as it has the right, power, duty or obligation on behalf of defendant The City of Los Angeles to exercise the water rights in Central Basin of defendant The City of Los Angeles. The exercise of said rights are subject, however, to the provisions of this judgment hereafter contained, including but not limited to, sharing with other parties in any subsequent decreases or increases in the quantity of extractions permitted from Central Basin, pursuant to continuing jurisdiction of the Court, on the basis that fifteen thousand (15,000) acre feet bears to the Allowed Pumping Allocations of the other parties.

(c) No party to this action is the owner of or has any right to extract ground water from Central Basin except as herein affirmatively determined.

2. Parties Enjoined as Regards Quantities of Extractions.

(a) Each party, other than The State of California and The City of Los Angeles and Department of Water and Power of The City of Los Angeles, is enjoined and restrained in any Administrative year commencing after the date this judgment becomes final from extracting from Central Basin any quantity of Water greater than the party's Allowed Pumping Allocation as hereinafter set forth next to the name of the party in the tabulation appearing in Appendix 2 at the end of this Judgment, subject to further provisions of this judgment. Subject to such further provisions, the officials, agents and employees of The State of California are enjoined and restrained in any such Administrative year from extracting from Central Basin collectively any quantity of water

greater than the Allowed Pumping Allocation of The State of California as hereinafter set forth next to the name of that party in the same tabulation. Each party adjudged and declared above not to be the owner of and not to have the right to extract ground water from Central Basin is enjoined and restrained in any Administrative year commencing after the date this judgment becomes final from extracting any ground water from Central Basin, except as may be hereinafter permitted to any such party under the Exchange Pool provisions of this judgment.

(b) Defendant The City of Los Angeles is enjoined and restrained in any Administrative year commencing after the date this judgment becomes final from extracting from Central Basin any quantity of water greater than fifteen thousand (15,000) acre feet, subject to further provisions of this judgment, including but not limited to, sharing with other parties in any subsequent decreases or increases in the quantity of extractions permitted from Central Basin by parties, pursuant to continuing jurisdiction of the Court, on the basis that fifteen thousand (15,000) acre feet bears to the Allowed Pumping Allocations of the other parties. Defendant Department of Water and Power of The City of Los Angeles is enjoined and restrained in any Administrative year commencing after the date this judgment becomes final from extracting from Central Basin any quantity of water other than such as it may extract on behalf of defendant The City of Los Angeles, and which extractions, along with any extractions by said City, shall not exceed that quantity permitted by this judgment to that City in any Administrative year. Whenever in this judgment the term "Allowed Pumping

Allocation" appears, it shall be deemed to mean as to defendant The City of Los Angeles the quantity of fifteen thousand (15,000) acre feet.

Name [2]	Total Water Right	Allowed Pumping Allocation
P. Abbott, Inc.	21	17
Charles E. Adams (Corty Van Dyke, tenant) (see additional listing below for Charles E. Adams)	8	6
Charles E. Adams and Rhoda E. Adams	5	4
Juan Aguayo and Salome Y. Aguayo	1	1
Aguiar Dairy, Inc.	33	26
Airfloor Company of California, Inc.	1	1
N. Albers and Nellie Albers	98	78
Jake J. Alewyn and Mrs. Jake J. Alewyn aka Normalie May Alewyn (see listing under name of Victor E. Gamboni)		
Tom Alger and Hilda Alger	9	7
Clarence M. Alvis and Doris M. Alvis	0	0
American Brake Shoe Company	52	42

[2]Parties and Rights as originally adjudicated

Name	Total Water Right	Allowed Pumping Allocation
American Pipe and Construction Co.	188	150
Anaconda American Brass Company	0	0
Gerrit Anker (see listing under name of Agnes De Vries		
Archdiocese of Los Angeles Education & Welfare Corporation	8	6
George W. Armstrong and Ruth H. Armstrong (Armstrong Poultry Ranch, tenant)	28	22
Artesia Cemetery District	30	24
Artesia Milling Company (see listing under name of Dick Zuidervaart)		
Artesia School District	51	
Arthur Land Co., Inc.	13	10
Charles Arzouman and Neuart Arzouman	1	
Associated Southern Investment Company (William R. Morris, George V. Gutierrez and Mrs. Socorro Gutierrez, tenants and licensees)	16	13
The Atchison, Topeka and Santa Fe Railway Co.	124	99
Atkinson Brick Company	11	9
Arthur Atsma (see listing under name of Andrew De Voss)		
B.F.S. Mutual Water Company	183	146
Henry Baar (see listing under name of Steve Stefani, Sr.)		
Vernon E. Bacon (see listing under name of Southern California Edison Company)		

Name	Total Water Right	Allowed Pumping Allocation
Adolph Bader and Gesine Bader (Fred Bader, tenant)		11
K. R. Bailey and Virginia R. Bailey		1
Dave Bajema (see listing under name of Peter Dotinga)		
Donald L. Baker and Patsy Ruth Baker	5	4
Allen Bakker	0	0
Sam Bangma and Ida Bangma	17	14
Bank of America National Trust and Savings Association, as Trustee of Trust created by Will of Tony V. Freitas, Deceased (Frank A. Gonsalves, tenant)	29	23
Emma Barbaria, as to undivided 1/2 interest; John Barbaria, Jr. and Lorraine Barbaria as to undivided 1/4 interest; and Frank Barbaria as to undivided 1/4 interest (John Barbaria & Sons Dairy, tenant)	27	22
Antonio B. Barcellos and Manuel B. Barcellos	12	10
John Barcelos and Guilhermina Barcelos	16	13
Sam Bartsma and Birdie Bartsma	34	27
Bateson's School of Horticulture, Inc. (see listing under name of John Brown Schools of California, Inc.)		
Bechard Mutual Water Corporation	4	4
Beck Tract Water Company, Inc.	29	23
Iver F. Becklund	1	1
Margaret E. Becklund	1	1
P. T. Beeghly (International Carbonic, Inc., tenant)	1	1
Doutzen Bekendam and Hank Bekendam	0	0
John Bekendam	0	0
Tillie Bekendam	0	0

Name	Total Water Right	Allowed Pumping Allocation
Bell Trailer City (see listing under name of Bennett E. Simmons)	1	1
E. F. Bellenbaum and Marie P. Bellenbaum	32	26
Bellflower Christian School	243	194
Bellflower Home Garden Water Company	111	89
Bellflower Unified School District	2,109	1,687
Bellflower Water Company	11	9
Belmont Water Association	0	0
Tony Beltman	0	0
Berlu Water Company, Inc.	32	26
Jack R. Bettencourt and Bella Bettencourt	151	121
Bigby Townsite Water Co.		
Siegfried Binggeli and Trina L. Binggeli (see listing under name of Paul H. Lussman, Jr.)	0	0
Fred H. Bixby Ranch Company		
Delbert G. Black and Lennie O. Black as to undivided one-half; and Harley Lee, as to undivided one-half	40	32
Bloomfield School District	11	9
Adrian Boer and Julia Boer	5	4
Gerard Boere and Rosalyn Boer		
Henry Boer and Annie Boer (William Offinga & Son, including Sidney Offinga, tenants as to 33 acre feet of water right and 26 acre feet of allowed pumping allocation)	34 30	27 24
John Boere, Jr. and Mary J. Boere	30	24
John Boere, Sr. and Edna Boere (John Boere, Jr., tenant)	30	24
John Boere, Jr. (see also listing under name of Leonard A. Grenier)		

Name	Total Water Right	Allowed Pumping Allocation
Frank Boersma and Angie Boersma	31	25
Gerrit Boersma and Jennie Boersma (George Boersma, tenant)	8	6
Jack Boersma	0	0
Sam Boersma and Berdina Boersma	42	34
Jan Bokma (see listing under name of August Vandenberg)		
Jacob Bollema		
James C. Boogerd (see listing under name of Jake Van Leeuwen, Jr.)		
Bernard William Bootsma, Carrie Agnes Van Dam and Gladys Marie Romberg	12	10
Michel Bordato and Anna M. Bordato (Charlie Vander Kooi, tenant)	12	10
John Borges and Mary Borges, aka Mrs. John Borges (Manuel B. Ourique, tenant)		
Mary Borges, widow of Manuel Borges (Manuel Borges, Jr., tenant)	7	6
Gerrit Bos and Margaret Bos	88	70
Jacob J. Bosma (see listing under name of Sieger Vierstra)		
Peter Bothof	6	5
William Bothof and Antonette Bothof	7	6
Frank Bouma and Myron D. Kolstad	3	3
Ted Bouma and Jeanette Bouma	21	17
Sam Bouman (Arie C. Van Leeuwen, tenant)	8	6
John Brown Schools of California, Inc. (Bateson's School of Horticulture, Inc., tenant)	2	2
M. J. Brown, Jr. and Margaret Brown	0	0
Adrian Bulk and Alice Bulk	20	16

Name	Total Water Right	Allowed Pumping Allocation
Duke Buma and Martha Buma	8	6
Miles A. Burson and Rose Burson	7	6
Calavar Corporation (see listing under name of H R M Land Company)		
California Cotton Oil Corporation	101	81
California Portland Cement Company	0	0
California Rendering Company, Ltd.	149	119
California Water and Telephone Company	2,584	2,067
California Water Service Company (Base Water Right - 13,477)	14, 717	11,774
Candlewood Country Club	184	147
V. Capovilla and Mary Capovilla	0	0
Carmenita School District	9	7
Carson Estate Company	139	111
Paul Carver	0	0
Catalin Corporation of America	13	10
Center City Water Co.	86	69
Central Manufacturing District, Inc. (Louis Guglielmana and Richard Wigboly, tenants)	825	660
Century Center Mutual Water Association	317	254
Century City Mutual Water Company, Ltd.	62	50
Cerritos Junior College District	119	95
Cerritos Park Mutual Water Company	77	62
Challenge Cream & Butter Association	146	117
Chansall Mutual Water Company	101	81
Maynard W. Chapin, as Executor of the Estate of Hugh L. Chapin, deceased	36	29

Name	Total Water Right	Allowed Pumping Allocation
Cherryvale Water Users' Association	14	11
Shigeru Chikami and Jack Chikami doing business as Chikami Bros. Farming (see also listing under name of Southern California Edison Company)	10	8
John Christoffels and Effie Christoffels	14	11
Citrus Grove Heights Water Company	277	222
City Farms Mutual Water Company No. 1	37	30
City Farms Mutual Water Company No. 2	15	12
City of Artesia	30	24
City of Bellflower	60	48
City of Compton	6,511	5,209
City of Downey	5,713	4,570
City of Huntington Park	4,788	3,830
City of Inglewood (Base Water Right - 629)	1,118	894
City of Lakewood	10,631	8,505
City of Long Beach (Base Water Right - 29,876)	33,538	26,830
City of Los Angeles (see paragraph 2 above of this Part I for water rights and restrictions on the exercise thereof of said defendant. See also such reference with respect to Department of Water and Power of the City of Los Angeles.)		
City of Lynwood	6,238	4,990
City of Montebello	260	208
City of Norwalk	613	490
City of Santa Fe Springs	505	404
City of Signal Hill	1,675	1,340

Name	Total Water Right	Allowed Pumping Allocation
City of South Gate	9,942	7,954
City of Vernon	9,008	7,206
City of Whittier	776	621
Allan Clanton and Ina Clanton	80	64
Claretian Jr. Seminary (see listing under name of Dominguez Seminary)		
Dr. Russell B. Clark (see listing under name of Research Building Corporation)		
Jacob Cloo and Grace Cloo	16	13
Clougherty Packing Company	80	64
Coast Packing Company	426	341
Coast Water Company	588	470
Joe A. Coelho, Jr. and Isabel Coelho	5	4
J. H. Coito, Jr.	0	0
John H. Coito and Guilhermina Coito (Zylstra Bros., a partnership consisting of Lammert Zylstra and William Zylstra, tenant)	17	14
J. E. Collinsworth	15	12
Compton Union High School District	48	38
Conservative Water Company (Base Water Right - 4,101)	133	3,306
Container Corporation of America	323	1,058
Nicholas C. Contoas and P. Basil Lambros (Vehicle Maintenance & Painting Corporation, tenant)	1	1
Continental Can Company, Inc.	946	757
Contractors Asphalt Products Company, Inc.	16	13
R. M. Contreras	8	6

Name	Total Water Right	Allowed Pumping Allocation
Copp Equipment Company, Inc. and Humphries Investments Incorporated	7	6
Mary Cordeiro and First Western Bank & Trust Company, as Trustee pursuant to last will and testament of Tony Cordeiro, deceased	46	37
Corporation of the Presiding Bishop of the Church of Jesus Christ of Latter Day Saints (Ray Mitchell, tenant)	39	31
Harry Lee Cotton and Doris L. Cotton	5	4
County of Los Angeles	737	590
County Water Company	280	224
Cowlitz Amusements, Inc. (La Mirada Drive-In Theater, tenant)	4	4
Pete Coy	28	22
Crest Holding Corporation	20	16
Katherine M. Culbertson	2	2
Orlyn L. Culp and Garnetle Culp	21	17
Everett Curry and Marguerite Curry	2	2
D. V. Dairy (see listing under name of Frank C. Leal)		
Dairymen's Fertilizer Co-op, Inc.	1	1
Noble G. Daniels (see listing under name of Harold Marcroft)		
John A. Davis	0	0
Henry De Bie, Jr. and Jessie De Bie	17	14
Clifford S. Deeth	0	0
Ernest De Groot and Dorothy De Groot	81	65
Pete de Groot	15	12
Pier De Groot and Fay De Groot	21	17

Name	Total Water Right	Allowed Pumping Allocation
Martin De Hoog and Adriana De Hoog	12	10
Edward De Jager and Alice De Jager	37	30
Cornelius De Jong and Grace De Jong	13	10
Jake De Jong and Lena De Jong (Frank A. Gonsalves, tenant as to 8 acre-feet of water right)	21	17
William De Kriek (see listing under name of Gerrit Van Dam)		
Del Amo Dairy (see listing under name of Ed Haakma)		
Del Amo Estate Company	0	0
Joe De Marco and Concetta De Marco	1	1
Louis F. De Martini (see listing under name of Southern California Edison Company)		
Mary A. De Mello	16	13
John Den Hollander (see listing under name of James Dykstra)		
Department of Water and Power of The City of Los Angeles, by reason of charter provisions, has the management and control of water rights owned by the City of Los Angeles (see listing under name of City of Los Angeles)		
Ruth E Dever (Orange County Nursery, Inc., tenant)	0	0
Andrew De Voss and Alice De Voss (Arthur De Voss and Arthur Atsma, tenants)	36	29
Agnes De Vries (Gerrit Anker, tenant)	16	13
Dick De Vries and Theresa De Vries	10	8
Gerrit De Vries and Claziena De Vries	18	14
Gerrit Deyager and Dena Deyager	0	0

Name	Total Water Right	Allowed Pumping Allocation
Lloyd W. Dinkelspiel, Jr. (see listing under name of Florence Hellman Ehrman)		
District VII, Division of Highways of the State of California Department of Public Works (see listing under name of State of California)		
Dominguez Estate Company	0	0
Dominguez Seminary and Claretian Jr. Seminary	111	89
Dominguez Water Corporation	8,012	6,410
Peter Dotinga and Tena Dotinga (Dave Bajema, tenant)	9	7
Robert L. Dougherty	0	0
Downey Cemetery District	21	17
Downey Fertilizer Co. (see listing under name of Downey Land Company)		
Downey Land Company (Downey Fertilizer Co., tenant)	101	81
Downey Valley Water Company	87	70
Jim Drost	0	0
James Dykstra and Dora Dykstra (John Den Hollander, tenant)	6	5
John Dykstra and Wilma Dykstra	52	42
Cor Dyt and Andy Dyt	6	5
Eagle Picher Company	141	113
Gail H. Eagleton	67	54
Florence Hellman Ehrman; I. W. Hellman, Jr.; Frederick J. Hellman; Marco F. Hellman; Clarence E. Heller; Alfred Heller, Elizabeth Heller; Clarence E. Heller, Elinor R. Heller and Wells Fargo Bank, as co-executors of the Estate of Edward H. Heller, deceased; Lloyd W. Dinkelspiel, Jr., William H.		

Name	Total Water Right	Allowed Pumping Allocation
Green and Wells Fargo Bank, as co-executors of the Estate of Lloyd W. Dinkelspiel, deceased; Wells Fargo Bank, as Trustee under the trust created by the Will of Florence H. Dinkelspiel, deceased. (Union Oil Company of California, Lessee as to 190 acre-feet of right and as to 152 acre-feet of allowed pumping allocation)	555	444
El Rancho Unified School District	69	55
Berton Elson (see listing under name of D. P. Winslow)		
John H. Emoto and Shizuko Emoto	0	0
Addie L. Enfield (see listing under name of James L. Stamps)		
John W. England and Consuello England (see listing under name of Jenkins Realty Mutual Water Co.)		
Emma Engler (Morris Weiss, tenant)	10	8
Anthony F. Escobar and Eva M. Escobar (Henry Kampen, tenant)	14	11
Excelsior Union High School District	381	305
Kenneth A. Farris and Wanda Farris	1	1
Federal Ice and Cold Storage Company	92	74
Fred Fekkes (see listing under name of Steve Stefani, Sr.)		
Julius Felsenthal and Mrs. Julius Felsenthal, aka Marga Felsenthal	1	1
Tony Fernandes (see listing under name of U. Stewart Jones)		
Joe C. Ferreira and Carolina Ferreira (Joe C. Ferreira and Joe C. Ferreira, Jr., operators of well facility)	37	30

Name	Total Water Right	Allowed Pumping Allocation
Mary A. Ferreira (Joe Lucas, tenant) (see also listing under name of Jack Gonsalves)	1	1
John Feuz, Jr.	0	0
Fibreboard Paper Products Corporation	1,521	1,217
Abe Fien	0	0
Alfred Fikse, Jr. and Aggie Fikse	2	2
Henry Fikse and Jennie Fikse	4	4
Filtrol Corporation	570	456
The Firestone Tire & Rubber Co.	1,536	1,229
First Western Bank & Trust Co. (see listing under name of Mary Cordeiro)		
Clare Fisher	0	0
Elizabeth Flesch, James Flesch, Margaret Flesch, Theodore Flesch, Ernest D. Roth and Eva Roth, doing business as Norwalk Mobile Lodge	18	14
The Flintkote Company	2,567	2,054
Ford Motor Company	11	9
Robert G. Foreman (see listing under name of Lakewood Pipe Co.)		
Guiseppi Franciosi and Alice Franciosi	2	2
Tony V. Freitas (see listing under name of Bank of America, etc.)		
S. Fujita	0	0
Jun Fukushima (see listing under name of Chige Kawaguchi)		
Paul Fultheim and Helga Fultheim	5	4
Fumi Garden Farms, Inc. (see listing under name of Southern California Edison Company and also under name of George Yamamoto)		

Name	Total Water Right	Allowed Pumping Allocation
Gabby Louise, Inc. (Arthur Gilbert & Associates, tenant)	58	46
Victor E. Gamboni and Barbara H. Gamboni (Jake J. Alewyn and Mrs. Jake J. Alewyn also known as Normalie May Alewyn, tenants as to 13 acre feet of water right and 10 acre feet of allowed pumping allocation)	27	22
Nick Gandolfo and Palmera Gandolfo	5	4
Freddie A. Garrett and Vivian Marie Garrett	6	5
Martha Gatz	15	12
General Dynamics Corporation	675	540
General Telephone Company of California	2	2
Alfred Giacomi and Jennie Giacomi	58	46
Arthur Gilbert & Associates (see listing under name of Gabby Louise Inc.)		
Mary Godinho	0	0
Pauline Godinho (Joe C. Godinho and John C. Godinho, Jr., doing business as Godinho Bros. Dairy, tenants)	31	25
Harry N. Goedhart, Henry Otto Goedhart, Hilbrand John Goedhart, John Goedhart, Otto Goedhart, Jr., Peter Goedhart, and Helen Goedhart Van Eik (Paramount Farms, tenant)	21	17
Reimer Goedhart	12	10
Golden Wool Company	223	178
Albert S. Gonsalves and Caroline D. Gonsalves	10	8
Frank A. Gonsalves (see listing under name of Bank of America National Trust and Savings Association, etc.; and also under name of Jake De Jong)		

Name	Total Water Right	Allowed Pumping Allocation
Jack Gonsalves, Joe Lucas, Pete Koopmans, Manuel M. Souza, Sr., Manuel M. Souza, Jr., Frank M. Souza, Louie J. Souza, and Mary A. Ferreira	55	44
Jack Gonsalves and Mary Gonsalves	31	25
Joaquin Gonsalves and Elvira Gonsalves	27	22
Joe A. Gonsalves and Virginia Gonsalves	12	10
The B. F. Goodrich Company	519	415
The Goodyear Tire & Rubber Company	1,141	913
Eric Gorden and Hilde Gorden	2	2
Fern Ethyl Gordon as to an undivided 1/2 interest; Fay G. Tawzer and Lawrence R. Tawzer, as to an undivided 1/2 interest	17	
Huntley L. Gordon (appearing by and through United California Bank, as Conservator of the Estate of Huntley L. Gordon)	41	33
Robert E. Gordon	5	4
Joe Gorzeman and Elsie Gorzeman	13	10
Florence M. Graham	7	6
Marie Granger	0	0
Great Western Malting Company	448	358
William H. Green (see listing under name of Florence Hellman Ehrman)		
Greene-Howard Petroleum Corporation (see listing under name of Hathaway Company)		
John H. Gremmius and Henry W. Gremmius dba Henry and John Gremmius	0	
Leonard A. Grenier and Marie Louise Grenier (John Boere, Jr., tenant)	10	8
Florence Guerrero	2	2

Name	Total Water Right	Allowed Pumping Allocation
Louis Guglielmana (see listing under name of Central Manufacturing District, Inc.)		
George V. Gutierrez and Mrs. Socorro Gutierrez (see listing under name of Associated Southern Investment Company)		
Salvatore Gutierrez (see listing under name of Southern California Edison Company)		
H. J. S. M	63	50
H R M Land company (Harron, Rickard & McCone Company of Southern California and Calavar Corporation, tenants)	3	3
Gerrit Haagsma and Mary Haagsma	10	8
Ed Haakma and Sjana Haakma (Del Amo Dairy, tenant; Ed Haakma and Pete Vander Kooi, being partners of said Del Amo Dairy)	28	22
Verney Haas and Adelyne Haas	4	4
William J Hadley and Grace Hadley	4	4
Henry C. Haflinger and Emily Haflinger	10	8
Clarence Theodore Halburg	3	3
Fred Hambarian	2	2
Henry Hamstra and Nelly Hamstra	33	26
Raymond Hansen and Mary Hansen	12	10
Earl Haringa; Evert Veenendaal and Gertrude Veenendaal	22	18
Antoine Harismendy and Claire Harismendy	0	0
Harron, Rickard & McCone Company of Southern California (see listing under name of H R M Land Company)		
Jack D. Hastings	0	0
Kameko Hatanaka	9	7

Name	Total Water Right	Allowed Pumping Allocation
Kazuo Hatanaka (Minoru Yoshijima, tenant)	10	8
Masakazu Hatanaka, Isao Hatanaka, and Kenichi Hatanaka	5	4
Mrs. Motoye Hatanaka	0	0
Hathaway Company, Richard F. Hathaway, Julian I. Hathaway, and J. Elwood Hathaway (Greene-Howard Petroleum Corporation, tenant utilizing less than 1 acre foot per year)	70	56
Clarence E. Heller; Alfred Heller; Elizabeth Heller; Clarence E. Heller; Elinor R. Heller, as co-executors of the Estate of Edward H. Heller, deceased (see listing under name of Florence Hellman Ehrman)		
I. W. Hellman, Jr.; Frederick J. Hellman; Marco F. Hellman (see listing under name of Florence Hellman Ehrman)		
Ralph Hicks	0	0
Alfred V. Highstreet and Evada V. Highstreet	10	8
John Highstreet and Eileen M. Highstreet	9	7
Bob Hilarides and Maaike Hilarides (Frank Hilarides, tenant)	51	41
John Hilarides and Maria Hilarides	26	21
Hajime Hirashima (see listing under name of Masaru Uyeda)		
Willis G. Hix	1	1
Henry H. Hoffman and Apolonia Hoffman	12	10
Dick Hofstra	0	0
Andrew V. Hohn and Mary G. Hohn	1	1
Kyle R. Holmes and Grace Ellen Holmes	20	16
Home Water Company	35	28

Name	Total Water Right	Allowed Pumping Allocation
Manuel L. Homen		
Mrs. Paul Y. Homer (see listing under name of Mrs. Paul Y. Homer (King).)		
Cornelis Hoogland and Alice Hoogland	15	12
Art Hop, Jr.		0
Art Hop, Sr. and Johanna Hop (G. A. Van Beek, tenant)	5	4
Andrew Hop, Jr. and Muriel Hop	33	26
Theodore R. Houseman and Leona M. Houseman		
Humphries Investments Incorporated (see listing under name of Copp Equipment Company, Inc.)		
Albert Huyg and Marie Huyg	22	18
Hygenic Dairy Farms, Inc.	0	0
Pete W. Idsinga and Annie Idsinga	13	10
Miss Alice M. Imbert	1	1
Industrial Asphalt of California, Inc.	116	93
Inglewood Park Cemetery Association	285	228
International Carbonic, Inc. (see listing under name of P. T. Beeghly)		
Jugora Ishii and Mumeno Ishii (Ishii Brothers, tenant)	10	8
Robert J. Jamison and Betty Jamison	7	6
Jenkins Realty Mutual Water Co. (Clyde H. Jenkins, Minnie R. Jenkins, Mary Wilcox, Ruby F. Marchbank, Robert B. Marchbank, John W. England, and Consuello England, shareholders	10	8
John-Wade Co.	1	1
Henry S. Jones and Madelynne Jones	1	1

Name	Total Water Right	Allowed Pumping Allocation
U. Stewart Jones and Dorothy E. Jones (Tony Fernandes, tenant)	1	1
Harold Jongsma and Mary N. Jongsma	65	52
W. P. Jordan (see listing under name of Henry Van Ruiten)		
Dave Jorritsma and Elizabeth Jorritsma	27	22
Christine Joseph (see listing under name of Helen Wolfsberger)		
Junior Water Co., Inc.	737	590
Kal Kan Foods, Inc.	120	96
Kalico, Inc.	4	4
Hagop Kalustian (11 acre feet of total water right attributable to well located at 6629 South Street, Lakewood and reported to plaintiff under Producer No. 3925. 2 acre feet of total water right attributable to portion of property not sold to State of California formerly served by well located at 10755 Artesia Blvd., Artesia, the production of which well was reported to plaintiff under Producer No. 4030)	13	10
Fritz Kampen and Clare Kampen	14	11
William Kamstra and Bertha Kamstra	35	28
Henry Kampen (see listing under name of Anthony Escobar)		
L. Kauffman Company, Inc. (see listing under name of Lorraine K. Meyberg)		
Chige Kawaguchi and Masao Kawaguchi (Jun Fukushima, tenant)	4	4
King Kelley Marmalade Co. (see listing under name of Roberta M. Magnusson)		
Mrs. Paul Y. Homer (King)	17	14
Jacob R. Kimm and Bonnie Kimm	36	29

Name	Total Water Right	Allowed Pumping Allocation
Mrs. Oraan Kinne (Nicholaas J. Moons, tenant)	11	9
Morris P. Kirk & Son, Inc.	77	62
Jake Knevelbaard and Anna Knevelbaard	50	40
Willie Knevelbaard and Joreen Knevelbaard	1	1
Simon Knorringa	12	10
John Koetsier, Jr.	0	0
Myron D. Kolstad (see listing under name of Frank Bouma)		
Yoshio Kono and Barbara Kono (see listing under name of George Mimaki)		
Louis Koolhaas	13	10
Simon Koolhaas and Sophie Grace Koolhaas	9	7
Pete Koopmans (see listing under name of Jack Gonsalves)		
Nick P. Koot (see listing under name of Mary Myrndahl)		
Kotake, Inc. (Masao Kotake, Seigo Kotake, William Kotake, dba Kotake Bros., tenants)	83	66
Masao Kotake		0
Walter G. Kruse and Mrs. Walter G. Kruse, aka Vera M. Kruse		9
Laguna-Maywood Mutual Water Company No. 1	1,604	1,283
La Habra Heights Mutual Water Company	3,044	2,435
La Hacienda Water Company	46	37
Lakewood Pipe Co., a partnership composed of Robert G. Foreman, Frank W. Tybus and June E. Tybus (Lakewood Pipe Service Co., tenant)	12	10

Name	Total Water Right	Allowed Pumping Allocation
P. Basil Lambros (see listing under name of Nicholas C. Conteas)		
La Mirada Drive-in Theater (see listing under name of Cowlitz Amusements, Inc.)		
La Mirada Water Company	0	0
Calvin E. Langston and Edith Langston	1	1
S. M. Lanting and Alice Lanting	15	12
Henry Lautenbach and Nellie H. Lautenbach	16	13
Norman Lautrup, as Executor of the Estate of Nels Lautrup, deceased; and Minnie Margaret Lautrup	30	24
Frank C. Leal and Lois L. Leal (D. V. Dairy, tenant)	15	12
Eugene O. LeChasseur and Lillian P. LeChasseur (R. A. LeChasseur, tenant)	2	2
Lee Deane Products, Inc.	0	0
Harley Lee (see listing under name of Delbert G. Black)		
Le Fiell Manufacturing Company	0	0
Armand Lescoulie (see listing under name of Southern California Edison Company)		
Liberty Vegetable Oil Company	14	11
Little Lake Cemetery District	17	14
Little Lake School District	0	0
Loma Floral Company (see listing under name of George Mimaki)		
Melvin L. Long and Stella M. Long	2	2
Nick J. Loogman (see listing under name of William Smoorenburg)		
Frank Lorenz (see listing under name of Ralph Oosten)		

Name	Total Water Right	Allowed Pumping Allocation
Los Angeles County Waterworks District No. 1 (Base Water Right 22)	113	90
Los Angeles County Waterworks District No. 10	842	674
Los Angeles County Waterworks District No. 16	412	330
Los Angeles Paper Box and Board Mills	321	257
Los Angeles Union Stockyards Company	0	0
Los Nietos Tract 6192 Water Co.	49	39
Alden Lourenco (see listing under name of A. C. Pinheiro)		
Lowell Joint School District	0	0
Joe Lucas (see listings under names of Mary A. Ferreira and Jack Gonsalves)		
Luer Packing Co. (see listing under name of Sam Perricone)		
Jake J. Luetto (Orange County Nursery, Inc., tenant)	13	10
Lunday-Thagard Oil Co.	265	212
Joe Luond (Frieda Roethlisberger, tenant as to portion of rights)	7	6
John Luscher and Frieda Luscher	13	10
Paul H. Lussman, Jr. and Ann Lussman, Siegfried Binggeli and Trina L. Binggeli (Paul's Dairy, tenant)	8	6
Lynwood Gardens Mutual Water Company	205	164
Lynwood Park Mutual Water Company	278	222
Jerome D. Mack and Joyce Mack (see listing under name of D. S. Moss)		
Roberta M. Magnusson (King Kelly Marmalade Co., tenant)	15	12
Anthony Mancebo	0	0

Name	Total Water Right	Allowed Pumping Allocation
Robert B. Marchbank and Ruby F. Marchbank (see listing under name of Jenkins Realty Mutual Water Co.)		
Harold Marcroft and Marjorie Marcroft (Noble G. Daniels, tenant)	7	6
Floyd G. Marcusson (see listing under name of Sykes Realty Co.)		
Walter Marlowe and Edna Marlowe	1	1
Marshburn, Inc. (see listing under name of Mel, Inc.)		
The Martin Bros. Container & Timber Products Corp.	7	6
Mary Martin	35	28
Antonio Mathias and Mary Mathias	16	13
Mausoleum Park, Inc. and Sun Holding Corporation	4	4
Maywood Mutual Water Company No. 1	926	741
Maywood Mutual Water company No. 2	1,007	806
Maywood Mutual Water Company No. 3	1,407	1,126
Mel, Inc. (Marshburn, Inc., tenant)	67	54
G. Mellano	12	10
Wilbur Mellema and Mary Mellema (see listing under name of Elmo D. Murphy)		
Wilbur Mellema (see listing under name of Morris Weiss)		
Memorial Parks, Inc.	42	34
Lyman B. Merrick and Gladys L. Merrick	17	24
Metropolitan State Hospital of the State of California Department of Mental Hygiene (see listing under name of State of California)		
F. N. Metzger	0	0

Name	Total Water Right	Allowed Pumping Allocation
Lorraine K. Meyberg (L. Kauffman Company, Inc., tenant)	81	65
Midland Park Water trust	71	57
Midway Gardens Mutual Association	59	47
Harry C. Miersma and Dorothy L. Miersma	12	10
Henry Miersma and Susan M. Miersma	7	6
Willis L. Miller	0	0
George Mimaki, Mitsuko Mimaki, Yoshio Kono and Barbara Kono (Loma Floral Company, tenant)	2	2
Ray Mitchell (see listing under name of Corporation of the Presiding Bishop of the Church of Jesus Christ of Latter Day Saints; and also l ing under name of Frank Ruggieri)		
Fumiko Mitsuuchi, aka Mary Mitsuuchi (Z. Van Spanje, tenant as to one acre foot)	14	11
Yoneichi Miyasaki	0	0
Glenn Miyoshi, Yosaku Miyoshi, Masayo Miyoshi, Haruo Miyoshi, and Masaru Miyoshi, dba Miyoshi Bros.	10	8
Jean Mocho and Michel Plaa	11	9
Modern Imperial Company	71	57
Montebello Land and Water Company	1,990	1,592
Monterey Acres Mutual Water Company	128	102
Nicholaas J. Moons (see listing under name of Mrs. Oraan Kinne)		
Alexander Moore and Betty L. Moore	16	13
Neal Moore	0	0
Alyce Mooschekian	0	0
Reuben Mooschekian	15	12

Name	Total Water Right	Allowed Pumping Allocation
William R. Morris (see also listing under name of Associated Southern Investment Company)	1	1
D. S. Moss, Lillian Moss, Jerome D. Mack, and Joyce Mack	5	4
Mountain View Dairies, Inc.	68	54
Kiyoshi Murakawa and Shizuko Murakawa	0	0
Daisaku Murata, Fui Murata, Hatsuye Murata, Kenji Murata, Setsuko Murata, and Takeo Murata	15	12
Kenji Murata (see listing under name of Southern California Edison Company)		
Elmo D. Murphy and Evelene B. Murphy (Morris Weiss, Bessie Weiss, Wilbur Mellema, and Mary Mellema, tenants)	23	18
Murphy Ranch Mutual water company	576	461
Etta Murr	3	3
R. B. Murray and Gladys J. Murray	0	0
Tony G. Mussachia and Anna M. Mussachia	10	8
Mary Myrndahl (Nick P. Koot, tenant)	11	9
Sam Nakamura and Tokiko Nakamura	2	2
Leo Nauta (see listing under name of John Osinga)		
Pete Nauta (see listing under name of Jacob Vandenberg)		
Fred C. Nelles School for Boys of the State of California Department of the Youth Authority (see listing under name of State of California)		
Otelia Nelson and Robert Nelson (Shelter Superior Dairy, tenant)	14	11
Simon S. Niekerk and Rose Niekerk (Niekerk Hay Company, tenant)	3	3

Name	Total Water Right	Allowed Pumping Allocation
Norris-Thermador Corporation	172	138
North Gate Gardens Water Co.	60	48
Norwalk-La Mirada City School District	360	288
Norwalk Mobile Lodge (see listing under name of Elizabeth Flesch)		
Mabel E. Nottingham (Leslie Nottingham, tenant)	25	20
William Offinga & Son, including Sidney Offinga (see listing under name of Henry Boer)		
Olive Lawn Memorial Park, Inc.	14	11
John Oord	0	0
Marinus Oosten and Anthonia Oosten	16	13
Ralph Oosten and Caroline Oosten (Frank Lorenz, tenant as to 13 acre feet of water right and 10 acre feet of allowed pumping allocation)	51	41
Orange County Nursery, Inc. (see also: listing under name of Ruth E. Dever; listing under name of Jake J. Luetto; and listing under name of Mary Ravera)	16	13
Orchard Dale County Water District (Base Water Right - 1,382)	1,384	1,107
Orchard Park Water Club, Inc.	50	40
Oriental Foods, Inc.	34	27
Orla Company (John D. Westra, tenant)	7	6
Viva Ormonde (see listing under name of Hank Van Dam)		
Pablo Oropeza and Aurelia G. Oropeza (Pablo Oropeza, Jr., tenant) (see also listing under name of Tarr and McComb Oil Company, Ltd.)		
John Osinga (Leo Nauta, tenant)	6	5

Name	Total Water Right	Allowed Pumping Allocation
Manuel B. Ourique (see listing under name of John Borges)		
Owl Constructors	20	16
Pacific Electric Railway Company (Gerrit Van Leeuwen of 15405 Shoemaker Road, Norwalk, tenant as to 11 acre feet of right and 9 acre feet of allowed pumping allocation)	15	12
Packers Mutual Water Company	43	34
Edward G. Paddison and Grace M. Paddison	17	14
Paramount Farms (see listing under name of Harry N. Goedhart)		
Paramount County Water District	2,967	2,374
Paramount Unified School District	58	46
Park Water Company	24,592	19,674
W. J. Parsonson	0	0
Rudolph Pasma and Frances C. Pasma	10	8
Paul's Dairy (see listing under name of Paul H. Lussman, Jr.)		
Mrs. La Verne Payton	1	1
Peerless Land & Water Co., Inc.	1,232	986
J. C. Pereira, Jr. and Ezaura Pereira	34	27
Sam Perricone and Louis Romoff (Luer Packing Co., tenant)	107	86
Peterson Manufacturing Co., Inc.	73	58
Phelps Dodge Copper Products Corporation	390	312
Pico County Water District	3,741	2.993
Piedmont Heights Water Club	7	6
Lucille C. Pimental (Richard Pimental and Pimental Dairy, tenants)	16	13

Name	Total Water Right	Allowed Pumping Allocation
Joe Pine (see listing under name of A. C. Pinheiro)		
A. C. Pinheiro and Mary M. Pinheiro (Alden Lourenco, tenant as to 9 acre feet of water right and 7 acre feet of allowed pumping right; and Joe Pine, tenant as to 13 acre feet of water right and 10 acre feet of allowed pumping right)	128	102
Fred Pinto and Mary Pinto	5	4
Frank Pires (see listing under name of Frank Simas)		
Tony C. Pires and Laura C. Pires	31	25
Michel Plaa (see listing under name of Jean Mocho)		
Donald R. Plunkett	53	42
Pomering Tract Water Association	32	26
Clarence Pool	24	19
Garret Porte and Cecelia Porte	35	28
Veronica Postma	16	13
C. H. Powell	1	1
Powerine Oil Company	784	627
John Preem	0	0
Ralph Pylman and Ida Pylman	13	10
Quality Meat Packing Company	38	30
Ralphs Grocery Company	0	0
Arthur D. Ramsey and James A. Ramsey	5	4
Rancho Santa Gertrudes Mutual Water System	48	38
Mary Ravera (Orange County Nursery, Inc., tenant	39	31

Name	Total Water Right	Allowed Pumping Allocation
Zelma Ravera	2	2
Rawlins Investment Corporation (Rockview Milk Farms, Inc., tenant)	66	53
Hal Rees	0	0
Reeves Tract Water Company	36	29
Clarence Reinalda	0	0
Reliance Dairy Farms	122	98
Research Building Corporation (Dr. Russell B. Clark, tenant)	11	9
Richfield Oil Corporation	71	57
Richland Farm Water Company	216	173
George Rietkerk and Cornelia Rietkerk	7	6
Rio Hondo Country Club (see listing under name of James L. Stamps)		
Erasmo Rios (see listing under name of Esther Salcido)		
Jesus Rios (see listing under name of Esther Salcido)		
Frank J. Rocha, Jr. and Elsie M. Rocha	13	10
Rockview Milk Farms, Inc. (see listing under name of Rawlins Investment Corporation)		
John Rodrigues, Emily S. Rodrigues, and John Rodrigues, Jr. (see also below)	5	4
John Rodrigues and John Rodrigues Jr.	1	1
Frieda Roethlisberger (see listing under name of Joe Luond)		
Patricia L. Davis Rogers, aka Patricia L. Davis	2	2
The Roman Catholic Archbishop of Los Angeles, a corporation sole	426	341

Name	Total Water Right	Allowed Pumping Allocation
Gladys Marie Romberg (see listing under name of Bernard William Bootsma)		
Alois M. Rombout	0	0
Louis Romoff (see listing under name of Sam Perricone)		
Elvira C. Rosales	3	3
Frank [illegible] Ross	2	2
Ernest D. Roth and Eva Roth (see listing under name of Elizabeth Flesch)		
Ed Roukema	0	0
Herbert N. Royden	31	25
Ruchti Brothers	31	25
Frank Ruggieri and Vada Ruggieri (see additional listing below)	1	1
Frank Ruggieri and Vada Ruggieri; David Seldeen and Fay Seldeen (Ray Mitchell, tenant)	23	18
Thomas S. Ryan and Dorothy J. Ryan	19	15
Sam Rypkema and Tena Rypkema	8	6
St. John Bosco School	53	42
James H. Saito and Yoshino Saito	2	2
Esther Salcido and Jesus Rios (Erasmo Rios, tenant)	3	3
San Gabriel Valley Water Company	6,828	5,462
Joe Santana and Palmira Santana	10	8
Sasaki Bros. Ranch, Inc.	32	26
Sativa L. A. County Water District	592	474
Ben Schilder, Jr. and Anna Schilder	28	22
Carl Schmid and Olga Schmid	18	14

Name	Total Water Right	Allowed Pumping Allocation
Mrs. A. Schuur	0	0
John Schuurman and Isabel Schuurman (James Sieperda, tenant)	15	12
David Seldeen and Fay Seldeen (see listing under name of Frank Ruggieri)		
Maurice I. Sessler	8	6
Chris Shaffer and Celia I. Shaffer	8	6
Shayman & Wharram, a partnership, consisting of John W. Shayman and Francis O. Wharram	2	2
Shell Oil Company (see listing under name of Margaret F. Slusher)		
Shelter Superior Dairy (see listing under name of Otelia Nelson)		
Tadao Shiba and Harume Shiba, Susumu Shiba, and Mitsuko Shiba	7	6
Yahiko Shiozaki and Kiyoko Shiozaki; Ken Shiozaki and Grace Shiozaki	6	5
Shore-Plotkin Enterprises, Inc. (Shore-Calnevar, Inc., tenant)	0	0
J. E. Siemon	15	12
James Sieperda (see listing under name of John Schuurman)		
Sierra Restaurant Corporation	0	0
Frank Simas and Mabel Simas (Frank Pires, tenant)	11	9
Bennett E. Simmons and Alice Lorraine Simmons, George K. Simmons and Doris June Simmons (Bell Trailer City, tenant)	41	33
Margaret F. Slusher (Shell Oil Company, tenant)	7	6
Lester W. Smith and Donald E. Smith (Lester W. Smith Dairy, tenant)	20	16

Name	Total Water Right	Allowed Pumping Allocation
Wirt Smith		
William Smoorenburg and Nick J. Loogman (Smoorenburg & Loogman, a partnership of William Smoorenburg and Nick J. Loogman, operating well facility)	21	17
Leo Snozzi and Sylvia Snozzi	52	42
Socony Mobil Oil Company, Inc.	172	138
Somerset Mutual Water Company	2,744	2,195
South Montebello Irrigation District	1,238	990
Southern California Edison Company (Vernon Bacon; Chikami Bros. Farming, consisting of Jack Chikami and Shigeru Chikami; Louis F. De Martini; Armand Lescoulie; C. D. Webster; Kenji Murata; Glenn F. Spiller and Jean H. Spiller; George Yamamoto and Alice Yamamoto, conducting business as Fumi Garden Farms, Inc.; and Salvatore Gutierrez, tenants and licenses)	816	653
Southern California Water Company	18,937	15,150
Southern Service Company, Ltd.	81	65
Henrietta Southfield	4	4
John Southfield	0	0
Southwest Water Company	2,895	2,316
Manuel M. Souza, Sr.; Manuel M. Souza, Jr.; Frank M. Souza and Louie J. Souza (see listing under name of Jack Gonsalves)		
Nelson Souza and Mary Souza	12	10
Glenn F. Spiller and Jean H. Spiller (see also listing under name of Southern California Edison company)	24	19
Farah Sprague	3	

Name	Total Water Right	Allowed Pumping Allocation
Herman F. Staat and Charlotte H. Staat	2	2
James L. Stamps, as to an undivided 80% interest; Addie L. Enfield, as to an undivided 20% interest (Rio Hondo Country Club, tenant)	443	354
Standard Oil Company of California	118	94
J. F. Standley and Myrtle M. Standley	1	1
Star Dust Lands, Inc.	85	68
State of California (included herein are water rights of Fred C. Nelles School for Boys of the State of California Department of the Youth Authority; Metropolitan State Hospital of the State of California Department of Mental Hygiene; and District VII, Division of Highways of the State of California Department of Public Works)	757	606
Stauffer Chemical Company	181	145
John Steele and Clara D. Steele	4	4
Steve Stefani, Jr.	0	0
Steve Stefani, Sr., and Dora Stefani (Henry Baar and Fred Fekkes, tenants)	38	30
Andrew Stellingwerf	0	0
Henry Stellingwerf and Jeanette Stellingwerf	14	11
Henry Sterk and Betty S. Sterk	114	91
V. C. Stiefel	3	3
Sophia J. Stockmal and John F. Stockmal	3	3
William Thomas Stover and Gertrude D. Stover	3	3
Louis Struikman and Alice Struikman (Louis Struikman and Pete Struikman dba Louis Struikman and Son, tenants as to 43 acre feet of water right and 34 acre feet of allowed pumping allocation; and Sidney		

Name	Total Water Right	Allowed Pumping Allocation
Van Dyke, tenant as to 10 acre feet of water right and 8 acre feet of allowed pumping allocation) (see also below)	53	42
Louis Struikman and Peter Struikman	3	3
Cornelius Struikmans and Ida Struikmans	9	7
Henry Struikmans and Nellie Struikmans	13	10
Henry Struikmans, Jr.	0	0
Suburban Mutual Water Co.	0	0
Suburban Water Systems	3,666	2,933
Kazuo Sumida	2	2
Sun Coast Development Company	0	0
Sun Holding Corporation (see listing under name of Mausoleum Park, Inc.)		
Sunnyside Mausoleum Company	60	48
Sunset Cemetery Association	26	21
E. A. Sutton and Ramona Sutton	39	31
Swift & Company	2,047	1,638
Roy Sybrandy and Anne Sybrandy	29	23
Sykes Realty Co., Floyd G. Marcusson and Albert C. Sykes	2	2
Andy Sytsma and Dorothy Sytsma (Albert Sytsma and Robert Sytsma, doing business as Sytsma Bros., tenants)	20	16
Tarr and McComb Oil Company, Ltd. (Pablo Oropeza, tenant)	86	69
Roy Tashima and Shigeo Tashima	1	1
Fay G. Tawzer and Lawrence R. Tawzer (see listing under name of Fern Ethyl Gordon)		
Dorothy Taylor	0	0
Quentin D. Taylor	0	0

Name	Total Water Right	Allowed Pumping Allocation
Carl Teixeira and Evelyn Teixeira	11	9
George S. Teixeira and Laura L. Teixeira	17	14
Harm Te Velde and Zwaantina Te Velde	253	202
Theo Hamm Brewing Co.	150	120
Thirty-Three Forty-Five East Forty-Fifth Street, Inc.	17	14
O. T. Thompson and Drusilla Thompson	20	16
Tract Number One Hundred and Eighty Water Company	1,526	1,221
Tract 349 Mutual Water Company	529	423
Fred Troost and Annie Troost	53	42
Frank W. Tybus and June E. Tybus (see listing under name of Lakewood Pipe Co.)		
Uehling Water Company, Inc.	846	677
Union Development Co., Inc.	12	10
Union Oil Company of California (see listing under name of Florence Hellman Ehrman)		
Union Pacific Railroad Company	656	525
Union Packing Company	100	80
United California Bank (see listing under name of Huntley L. Gordon)		
United Dairymen's Association	1	1
United States Gypsum Company	1,581	1,265
United States Rubber Company	820	656
United States Steel Corporation	176	141
Masaru Uyeda, Hajime Hirashima, and Tadashi Uyeda	12	10
G. A. Van Beek (see listing under name of Art Hop, Sr.)		

Name	Total Water Right	Allowed Pumping Allocation
Bas Van Dam (see listing under name of Gertrude Van Dam)		
Carrie Agnes Van Dam (see listing under name of Bernard William Bootsma)		
Cornelius A. Van Dam and Florence Van Dam	24	19
Dick Van Dam, Jr.	0	0
Gerrit Van Dam and Grace Van Dam (William De Kriek, tenant)	13	10
Gertrude Van Dam (Bas Van Dam, tenant as to 29 acre feet of water right and 23 acre feet of allowed pumping right; and Henry Van Dam, tenant as to 19 acre feet of water right and 15 acre feet of allowed pumping right)	48	38
Hank Van Dam and Jessie Van Dam (Viva Ormonde, tenant)	22	18
Henry Van Dam (see listing under name of Gertrude Van Dam)		
Jacob Vandenberg and Anna Vandenberg (Pete Nauta, tenant)	8	6
August Vandenburg, Ben W. Vandenburg, and Andrew W. Vandenburg (Jan Bokma, tenant)	6	5
John Van Den Raadt	4	4
M. Vander Dussen and Aletta C. Vander Dussen	12	10
Sybrand Vander Dussen and Johanna Vander Dussen	23	18
Helen Goedhart Van Eik (see listing under name of Harry N. Goedhart)		
Cornelius Vander Eyk, aka Case Vander Eyk, and Nelly Vander Eyk, aka Nellie Vander Eyk	7	6
George Van Der Ham and Alice Van Der Ham	10	8

Name	Total Water Right	Allowed Pumping Allocation
Huibert Vander Ham and Henrietta Vander Ham	33	26
Joe Vanderham and Cornelia Vanderham	13	10
John Vanderham and Nell M. Vanderham	20	16
Charlie Vander Kooi and Lena Mae Vander Kooi (see also listing under name of Michel Bordato)	13	10
Pete Vander Kooi (see listing under name of Ed Haakma)		
Bert Vander Laan and Stella Vander Laan	10	8
Matt Vander Sys and Johanna Vander Sys	13	10
Bill Vander Vegt and Henny Vander Vegt	18	14
George Vander Veg	12	10
Harry J. Vander W and Marian E. Vander Wall	12	10
Bert Vande Vegte Lillian Vande Vegte	1	1
Anthony Van Diest	0	0
Jennie Van Diest, as to undivided 1/3 interest; Ernest Van Diest and Rena Van Diest, as to undivided 1/3 interest; and Cornelius Van Diest and Anna Van Diest, as to undivided 1/3 interest. (Van Diest Dairy, tenant)	20	16
Katrena Van Diest and/or Margaret Van Diest	92	74
Henry W. Van Dyk (see listing under name of Henrietta Veenendaal)		
Wiechert Van Dyk and Jennie Van Dyk	13	10
Corty Van Dyke (see listing under name of Charles E. Adams)		
Sidney Van Dyke (see listing under name of Louis Struickman)		

Name	Total Water Right	Allowed Pumping Allocation
William Van Foeken	0	0
Jake Van Haaster and Gerarda Van Haaster	0	0
Arie C. Van Leeuwen (see listing under name of Sam Bouman)		
Gerrit Van Leeuwen of 15405 Shoemaker Road, Norwalk (see listing under name of Pacific Electric Railway Company)		
Henry Van Leeuwen and Caroline P. Van Leeuwen; Gerrit Van Leeuwen of 5948 Lorelei Street, Bellflower, and Ellen Van Leeuwen	1	1
Jake Van Leeuwen, Jr. and Cornelia J. Van Leeuwen (James C. Boogerd and Jake Van Leeuwen, Jr. dba Van Leeuwen & Boogerd, tenants)	9	7
Anthony R. Van Loon (see listing under name of Henry Van Ruiten)		
John Van Nierop and Lily E. Van Nierop	0	0
Henry Van Ruiten and Mary A. Van Ruiten, as to undivided 1/2 interest; and Jake Van Ruiten and Jacoba Van Ruiten, as to undivided 1/2 interest (W. P. Jordan, Anthony R. Van Loon, and Jules Wesselink, tenants)	88	70
Pete Van Ruiten and Mary Van Ruiten (for purposes of clarification, this Mary Van Ruiten is also known as Mrs. Pete Van Ruiten and is not the same individual as sued herein as Mary A. Van Ruiten, who is also known as Mrs. Henry G. Van Ruiten)	38	30
Z. Van Spanje (see listing under name of Fumiko Mitsuuchi)		
Evert Veenendaal and Gertrude Veenendaal (see listing under name of Earl Haringa)		
Henrietta Veenendaal (Henry W. Van Dyk, tenant)	10	8

Name	Total Water Right	Allowed Pumping Allocation
Henry Veenendaal and Henrietta Veenendaal	8	6
Joe H. Veenendaal and Margie Veenendaal	34	27
John Veenendaal	0	0
Vehicle Maintenance & Painting Corporation (see listing under name of Nicholas C. Conteas)		
Salvador Velasco	16	13
Mike Veldhuis	0	0
Albert Veldhuizen and Helen Veldhuizen	23	18
Jack Verbree	0	0
Mrs. Klaasje Verburg (Leon Verburg to extent of interest under contract to purchase)	12	10
John C. Verhoeven and Sadie Verhoeven	25	20
Joseph C. Vierra and Caroline Vierra (Joseph C. Vierra and William J. Vierra, doing business as Vierra & Vierra, tenants)	13	10
Sieger Vierstra and Nellie G. Vierstra (Jacob J. Bosma, tenant)	12	10
Virginia Country Club of Long Beach	340	272
Roy Visbeek	0	0
Louis Visser	9	7
Vista Hill Psychiatric Foundation	39	31
Louie Von Ah	0	0
Walnut Irrigation District	154	123
Walnut Park Mutual Water Co.	1,245	996
C. D. Webster (see also listing under name of Southern California Edison Company)	1	1

Name	Total Water Right	Allowed Pumping Allocation
Morris Weiss and Bessie Weiss (Wilbur Mellema, tenant) (also see listings under names of Elmo D. Murphy and Emma Engler)	20	16
Wells Fargo Bank as Executor of Estate of Edward H. Heller, Deceased, and as Executor of Estate of Lloyd W. Dinkelspiel, Deceased, and as Trustee under Trust created by the Will of Florence H. Dinkelspiel, Deceased (see listing under name of Florence Hellman Ehrman)		
Jules Wesselink (see listing under name of Henry Van Ruiten)		
West Gateway Mutual Water Co.	105	84
Henry Westra and Hilda Westra	40	32
John D. Westra (see listing under name of Orla Company)		
Francis O. Wharram (see listing under name of Shayman & Wharram)		
Whittier Union High School District	125	100
Arend Z. Wier		
H. Wiersema, aka Harm Wiersema and Pearl Wiersema	16	13
William Wiersma and Elbra Wiersma		6
Richard Wigboly (see listing under name of Central Manufacturing District, Inc.)		
Mary Wilcox (see listing under name of Jenkins Realty Mutual Water Co.)		
Ralph Williams and Mary Williams		
Wilshire Oil Company of California	1,795	1,436
Melvin L Wilson and Marie Wilson		
D. P. Winslow and Dorothy C. Winslow (Berton Elson, tenant)	15	12

Name	Total Water Right	Allowed Pumping Allocation
Helene K. Winters	1	1
Fred E. Wiseman and Grayce Anna Wiseman	2	2
Helen Wolfsberger and Christine Joseph	2	2
Volney Womack	0	0
Cho Shee Woo (Hong Woo and Ngorn Seung Woo, as agents of property for Cho Shee Woo)	20	16
Gerrit Wybenga and Rena Wybenga	10	8
George Yamamoto and Alice Yamamoto, also known as Fumi Yamamoto (Fumi Garden Farms, Inc., tenant) (see also listing under name of Southern California Edison Company)	17	14
Paul N. Yokota and Miyo Yokota	4	4
Minoru Yoshijima (see listing under name of Kazuo Hatanaka)		
Frank Yoshioka	0	0
Maxine Young	3	3
Mrs. A. Zandvliet also known as Anna A. Zandvliet	8	6
Arnold Zeilstra and Nellie Zeilstra	6	5
George Zivelonghi and Antonio Zivelonghi	121	97
Dick Zuidervaart and Janna Zuidervaart (Artesia Milling Company, tenant)	1	1
Andy Zylstra	0	0
Zylstra Bros. a partnership consisting of Lammert Zylstra and William Zylstra (see listing under name of John H. Coito)		
John Zylstra and Leonard J. Zylstra, doing business as The Zylstra Dairy	22	18
Leonard Zylstra (not the same person as Leonard J. Zylstra	0	0

4. Transition in Administrative Year - Application. "Year" and "Administrative Year" as used throughout this judgment shall mean the water year; provided that with the first fiscal year (July 1 - June 30) commencing at least four months after the "Amended Judgment" became final, and thereafter, said words shall mean the fiscal year. Since this will provide a transitional Administrative year of nine months, October 1 - June 30, ("short year" hereafter), notwithstanding the finding and determinations in the annual Watermaster report for the then last preceding water year, the Allowed Pumping Allocations of the parties and the quantity which Defendant City of Los Angeles is annually permitted to extract from Central Basin for said short year shall be based on three-quarters of the otherwise allowable quantity. During said short year, because of hardships that might otherwise result, any overextractions by a party shall be deemed pursuant to paragraph 2, Subpart B of Part III of this judgment (p. 61), and it shall be deemed that the Watermaster has made the determination of unreasonable hardship to which reference is therein made.

II. APPOINTMENT OF WATERMASTER; WATERMASTER ADMINISTRATION PROVISIONS. Department of Water Resources of the State of California is hereby appointed Watermaster, for an indefinite term, but subject to removal by the Court, to administer this judgment and shall have the following powers, duties and responsibilities:

1. Duties, Powers and Responsibilities of Watermaster. In order to assist the Court in the administration and enforcement of the provisions of this judgment and to keep the Court

fully advised in the premises, the Watermaster shall have the following duties, powers and responsibilities in addition to those before or hereafter provided in this judgment:

(a) Watermaster May Require Reports, Information and Records. To require of parties the furnishing of such reports, information and records as may be reasonably necessary to determine compliance or lack of compliance by any party with the provisions of this judgment.

(b) Requirement of Measuring Devices. To require all parties or any reasonable classification of parties owning or operating any facilities for the extraction of ground water from Central Basin to install and maintain at all times in good working order at such party's own expense, appropriate measuring devices at such times and as often as may be reasonable under the circumstances and to calibrate or test such devices.

(c) Inspections by Watermaster. To make inspections of ground water production facilities and measuring devices at such times and as often as may be reasonable under the circumstances and to calibrate or test such devices.

(d) Annual Report. The Watermaster shall prepare, file with the Court and mail to each of the parties on or before the 15th day of the fourth month following the end of the preceding Administrative year, an annual report for such year, the scope of which shall include but not be limited to the following:

Ground Water Extractions

Exchange Pool Operation

Use of Imported Water

4. Violations of Judgment and Corrective Action Taken

5. Change of Ownership of Total Water Rights

6. Watermaster Administration Costs

7. Recommendations, if any.

(e) Annual Budget and Appeal Procedure in Relation Thereto. The Watermaster shall annually prepare a tentative budget for each Administrative year stating the anticipated expense for administering the provisions of this judgment. The Watermaster shall mail a copy of said tentative budget to each of the parties hereto at least 60 days before the beginning of each Administrative year. For the first Administrative year of operation under this judgment, if the Watermaster is unable to meet the above time requirement, the Watermaster shall mail said copies as soon as possible. If any party hereto has any objection to said tentative budget, it shall present the same in writing to the Watermaster within 15 days after the date of mailing of said tentative budget by the Watermaster. If no objections are received within said period, the tentative budget shall become the final budget. If objections are received, the Watermaster shall, within 10 days thereafter, consider such objections, prepare a final budget and mail a copy thereof to each party hereto, together with a statement of the amount assessed to each party. Any party may apply to the Court within 15 days after the mailing of such final budget for a revision thereof based on specific objections thereto. The parties hereto shall make the payments otherwise required of them to the Watermaster even though such a request for revision has been filed with the Court. Upon any revision by the Court the

Watermaster shall either remit to the parties their prorata portions of any reduction in the budget, or credit their accounts with respect to their budget assessments for the next ensuing Administrative year, as the Court shall direct.

The amount to be assessed to each party shall be determined as follows: If that portion of the final budget to be assessed to the parties is equal to or less than $20.00 per party then the cost shall be equally apportioned among the parties. If that portion of the final budget to be assessed to parties is greater than $20.00 per party then each party shall be assessed a minimum of $20.00. The amount of revenue expected to be received through the foregoing minimum assessments shall be deducted from that portion of the final budget to be assessed to the parties and the balance shall be assessed to the parties having Allowed Pumping Allocations, such balance being divided among them proportionately in accordance with their respective Allowed Pumping Allocations.

Payment of the assessment provided for herein, subject to adjustment by the Court as provided, shall be made by each such party prior to beginning of the Administrative year to which the assessment relates, or within 40 days after the mailing of the tentative budget, whichever is later. If such payment by any party is not made on or before said date, the Watermaster shall add a penalty of 5% thereof to such party's statement. Payment required of any party hereunder may be enforced by execution issued out of the Court, or as may be provided by order hereinafter made by the Court, or by other proceedings by the Watermaster or by any party hereto on the Watermaster's behalf.

Any money unexpended at the end of any Administrative year shall be applied to the budget of the next succeeding Administrative year.

Notwithstanding the above, no part of the budget of the Watermaster shall be assessed to the Plaintiff District or to any party who has not extracted water from Central Basin for a period of two successive Administrative years prior to the Administrative year in which the tentative budget should be mailed by the Watermaster under the provisions of this subparagraph (e).

(f) Rules. The Watermaster may adopt and amend from time to time such rules as may be reasonably necessary to carry out its duties, powers and responsibilities under the provisions of this judgment. The rules shall be effective on such date after the mailing thereof to the parties as is specified by the Watermaster, but not sooner than 30 days after such mailing.

2. Use of Facilities and Data Collected by Other Governmental Agencies. The Watermaster is directed not to duplicate the collection of data relative to conditions of the Central Basin which is then being collected by one or more governmental agencies, but where necessary the Watermaster may collect supplemental data. Where it appears more economical to do so, the Watermaster is directed to use such facilities of other governmental agencies as are available to it under either no cost or cost agreements with respect to the receipt of reports, billings to parties, mailings to parties, and similar matters.

3. Appeal from Watermaster Decisions Other Than With Respect to Budget. Any party interested therein who has objection to any rule, determination, order or finding made by the Watermaster, may make objection thereto in writing delivered to the Watermaster within 30 days after the date the Watermaster mails written notice of the making of such rule, determination, order or finding, and within 30 days after such delivery the Watermaster shall consider said objection and shall amend or affirm his rule, determination, order or finding and shall give notice thereof to all parties. Any such party may file with the Court within 30 days from the date of said notice any objection to such rule, determination, order or finding of the Watermaster and bring the same on for hearing before the Court at such time as the Court may direct, after first having served said objection upon all other parties. The Court may affirm, modify, amend or overrule any such rule, determination, order or finding of the Watermaster. The provisions of this paragraph shall not apply to budgetary matters, as to which the appellate procedure has heretofore been set forth. Any objection under this paragraph shall not stay the rule, determination, order or finding of the Watermaster. However, the Court, by ex parte order, may provide for a stay thereof on application of any interested party on or after the date that any such party delivers to the Watermaster any written objection.

4. Effect of Non-Compliance by Watermaster With Time Provisions. Failure of the Watermaster to perform any duty, power or responsibility set forth in this judgment within the time limitation herein set forth shall not deprive the

Watermaster of authority to subsequently discharge such duty, power or responsibility, except to the extent that any such failure by the Watermaster may have rendered some otherwise required act by a party impossible.

III. PROVISIONS FOR PHYSICAL SOLUTION TO MEET THE WATER REQUIREMENTS IN CENTRAL BASIN. In order to provide flexibility to the injunction set forth in Part I of the judgment, and to assist in a physical solution to meet water requirements in Central Basin, the injunction so set forth is subject to the following provisions.

A. Carryover of Portion of Allowed Pumping Allocation.

(1) Each party adjudged to have a Total Water Right or water rights and who, during a particular Administrative year, does not extract from Central Basin a total quantity equal to such party's Allowed Pumping Allocation for the particular Administrative year, less any allocated subscriptions by such party to the Exchange Pool, or plus any allocated requests by such party for purchase of Exchange Pool water, is permitted to carry over (the "One Year Carryover") from such Administrative year the right to extract from Central Basin in the next succeeding Administrative year so much of said total quantity as it did not extract in the particular Administrative year, not to exceed 20% of such party's Allowed Pumping Allocation, or 20 acre feet, whichever of said 20% or 20 acre feet is the larger.

(2) Following the declaration of a Declared Water Emergency and until the Declared Water Emergency ends either

by expiration or by resolution of the Board of Directors of the Central and West Basin Water Replenishment District, each party adjudged to have a Total Water Right or water rights and who, during a particular Administrative year, does not extract from Central Basin a total quantity equal to such party's Allowed Pumping Allocation for the particular Administrative year, less any allocated subscriptions by such party to the Exchange Pool, or plus any allocated requests by such party for purchase of Exchange Pool water, is permitted to carry over (the "Drought Carryover") from such Administrative year the right to extract from Central Basin so much of said total quantity as it did not extract during the period of the Declared Water Emergency, to the extent such quantity exceeds the One Year Carryover, not to exceed an additional 35% of such party's Allowed Pumping Allocation, or additional 35 acre feet, whichever of said 35% or 35 acre feet is the larger. Carryover amounts shall first be allocated to the One Year Carryover and any remaining carryover amount for that year shall be allocated to the Drought Carryover.

(3) No further amounts shall be added to the Drought Carryover following the end of the Declared Water Emergency, provided however that in the event another Declared Water Emergency is declared, additional Drought Carryover may be added, to the extent such additional Drought Carryover would not cause the total Drought Carryover to exceed the limits set forth above.

(4) The Drought Carryover shall be supplemental to and shall not affect any previous drought carryover acquired by a party pursuant to previous order of the court.

B. When Over-extractions May be Permitted.

1. Underestimation of Requirements for Water. Any party hereto having an Allowed Pumping Allocation and not in violation of any provision of this judgment may extract in an Administrative year an additional quantity of water not to exceed: (a) 20% of such party's Allowed Pumping Allocation or 20 acre feet, whichever is greater, and (b) any amount in addition thereto which may be approved in advance by the Watermaster.

2. Reductions in Allowed Pumping Allocations in Succeeding Years to Compensate for Permissible Overextractions. Any such party's Allowed Pumping Allocation for the following Administrative year shall be reduced by the amount over-extracted pursuant to paragraph 1 above, provided that if the Watermaster determines that such reduction in the party's Allowed Pumping Allocation in one Administrative year will impose upon such a party an unreasonable hardship, the said reduction in said party's Allowed Pumping Allocation shall be prorated over a period of five (5) Administrative years succeeding that in which the excessive extractions by the party occurred. Application for such relief to the Watermaster must be made not later than the 40th day after the end of the Administrative year in which such excessive pumping occurred. Watermaster shall grant such relief if such over-extraction, or any portion thereof, occurred during a period of Declared Water Emergency.

3. Reductions in Allowed Pumping Allocations for the Next Succeeding Administrative Year to Compensate for Overpumping. Whenever a party over-extracts in excess of 20% of such party's Allowed Pumping Allocation, or 20 acre feet, whichever is greater, and such excess has not been approved in advance by the Watermaster, then such party's Allowed Pumping Allocation for the following Administrative year shall be reduced by an amount equivalent to its total over-extractions in the particular Administrative year in which it occurred.

4. Reports of Certain Over-extractions to the Court. Whenever a party over-extracts in excess of 20% of such party's Allowed Pumping Allocation, or 20 acre feet, whichever is greater, without having obtained prior approval of the Watermaster, such shall constitute a violation of the judgment and the Watermaster shall make a written report to the Court for such action as the Court may deem necessary. Such party shall be subject to such injunctive and other processes and action as the Court might otherwise take with regard to any other violation of such judgment.

5. Effect of Over-extractions on Rights. Any party who over-extracts from Central Basin in any Administrative year shall not acquire any additional rights by reason of such over-extractions; nor, shall any required reductions in extractions during any subsequent years reduce the Total Water Right or water rights of any party to the extent said over-extractions are in compliance with paragraph 1 above.

6. Pumping Under Agreement With Plaintiff During Periods of Emergency. Plaintiff overlies Central Basin and

engages in activities of replenishing the ground waters thereof. Plaintiff by resolution has appropriated for use during emergencies the quantity of 17,000 acre feet of imported and reclaimed water replenished by it into Central Basin, and pursuant to such resolution Plaintiff reserves the right to use or cause the use of such quantity during such emergency periods.

(a) Notwithstanding any other provision of this judgment, parties who are water purveyors (including successors in interest) are authorized to enter into agreements with Plaintiff under which such water purveyors may exceed their respective Allowed Pumping Allocations for the particular administrative year when the following conditions are met:

(1) Plaintiff is in receipt of a resolution of the Board of Directors of the Metropolitan Water District of Southern California ("MWD") that there is an actual or immediately threatened temporary shortage of MWD's imported water supply compared to MWD's needs, or a temporary inability to deliver MWD's imported water supply throughout its area, which will be alleviated by overpumping from Central Basin.

(2) The Board of Directors of both Plaintiff and Central Basin Municipal Water District by resolutions concur in the resolution of MWD's Board of Directors, and the Board of Directors of Plaintiff finds in its resolution that the average minimum elevation of water surface among those wells in the Montebello Forebay of the Central Basin designated as Los Angeles County Flood Control District Wells Nos. 1601T, 1564P, 1615P,

and 1626L, is at least 43.7 feet above sea level. This computation shall be based upon the most recent "static readings" taken, which shall have been taken not more than four weeks prior. Should any of the wells designated above become destroyed or otherwise be in a condition so that readings cannot be made, or the owner prevent their use for such readings the Board of Directors of the Plaintiff may, upon appropriate engineering recommendation substitute such other well or wells as it may deem appropriate.

(3) In said resolution, Plaintiff's Board of Directors sets a public hearing, and notice of the time, place and date thereof (which may be continued from time to time without further notice) is given by First Class Mail to the current designees of the parties, filed and served in accordance with Part V, paragraph 3 of this Judgment. Said notice shall be mailed at least five (5) days before the scheduled hearing date.

(4) At said public hearing, parties (including successors in interest) are given full opportunity to be heard, and at the conclusion thereof the Board of Directors of Plaintiff by resolution decides to proceed with agreements under this Part III-B.

(5) For purposes of this Part III-B, "water purveyors" mean those parties (and successors in interest) which sell water to the public whether regulated public utilities, mutual water companies or public entities, which have a connection or connections for the taking

of imported water of MWD, or access to imported water of MWD through a connection, and which normally supply part of their customer's needs with such imported water.

(b) All such agreements shall be subject to the following requirements, and such others as Plaintiff's Board of Directors shall require:

(1) They shall be of uniform content except as to quantity involved, and any special provisions considered necessary or desirable with respect to local hydrological conditions or good hydrologic practice.

(2) They shall be offered to all water purveyors, excepting those which Plaintiff's Board of Directors determine should not over pump because such over pumping would occur in undesirable proximity to a sea water barrier project designed to forestall sea water intrusion, or within or in undesirable proximity to an area within Central Basin wherein groundwater levels are at an elevation where over pumping is under all the circumstances then undesirable.

(3) The maximum terms for the agreements shall be four months, which agreements shall commence on the same date and end on the same date (and which may be executed at any time within the four month period), unless an extension thereof is authorized by the Court, under Part IV of this judgment.

(4) They shall contain provisions that the water purveyor executing the agreement pay to the Plaintiff a

price in addition to the applicable replenishment assessment determined on the following formula. The normal price per acre-foot of Central Basin Municipal Water District's (CBMWD) treated domestic and municipal water, as "normal" price of such category of water is defined in Part C, paragraph 10 (price to be paid for Exchange Pool Water) as of the beginning of the contract term less the deductions set forth in said paragraph 10 for the administrative year in which the contract term commences. The agreement shall provide for adjustments in the first of said components for any proportional period of the contract term during which the CBMWD said normal price is changed, and if the agreement straddles two administrative years, the said deductions shall be adjusted for any proportionate period of the contract term in which the amount thereof or of either subcomponent changes for purposes of said paragraph 10. Any price for a partial acre-foot shall be computed prorata. Payments shall be due and payable on the principle that over extractions under the agreement are of the last water pumped in the fiscal year, and shall be payable as the agreement shall provide.

(5) They shall contain provisions that:

(a) All of such agreements (but not less than all) shall be subject to termination by Plaintiff if, in the Judgment of Plaintiff's Board of Directors, the conditions or threatened conditions upon which they

were based have abated to the extent over extractions are no longer considered necessary; and (b) that any individual agreement or agreements may be terminated if the Plaintiff's Board of Directors finds that adverse hydrologic circumstances have developed as a result of over extractions by any water purveyor or purveyors which have executed said agreements, or for any other reason that Plaintiff's Board of Directors finds good and sufficient.

(c) Other matters applicable to such agreements and over pumping thereunder are as follows, without need for express provisions in the agreements;

(1) The quantity of over pumping permitted shall be additional to that which the water purveyor could otherwise over pump under this Judgment.

(2) The total quantity of permitted over pumping under all said agreements during said four months shall not exceed Seventeen thousand (17,000) acre feet, but the individual water purveyor shall not be responsible or affected by any violation of this requirement. That total is additional to over extractions otherwise permitted under this Judgment.

(3) Only one four month period may be utilized by Plaintiff in entering into such agreements, as to any one emergency or continuation thereof declared by MWD's Board of Directors under paragraph 6(a).

(4) Plaintiff may utilize the ex parte provisions of Part IV of this Judgment in lieu of the authority

contained herein (which ex parte provisions are not limited as to time, nature of relief, or terms of any agreements), but neither Plaintiff nor any other party shall utilize both as to any one such emergency or continuation thereof.

(5) If any party claims it is being damaged or threatened with damage by the over extractions by any party to such an agreement, the first party or the Watermaster may seek appropriate action of the Court for termination of any such agreement upon notice of hearing to the party complaining, to the party to said agreement, to the plaintiff, and to any parties who have filed a request for special notice. Any termination shall not affect the obligation of the party to make payments under the agreement for over extractions which did occur thereunder.

(6) Plaintiff shall maintain separate accounting of the proceeds from payments made pursuant to agreements entered into under this part. Said fund shall be utilized solely for purposes of replenishment in replacement of waters in Central Basin and West Basin. Plaintiff shall as soon as practicable cause replenishment in Central Basin by the amounts to be overproduced pursuant to this Paragraph 6 commencing at Page 63, whether through spreading, injection, or in lieu agreements.

(7) Over extractions pursuant to the agreements shall not be subject to the "make up" provisions of the

Judgment as amended, provided that if any party fails to make payments as required by the agreement, Plaintiff may require such "make up" under Paragraph 3, Subpart B, Part III of the Judgment (Page 62).

(8) Water Purveyor under any such agreement may, and is encouraged to enter into appropriate arrangements with customers who have water rights in Central Basin under or pursuant to this Judgment whereby the Water Purveyor will be assisted in meeting the objectives of the agreement.

(9) Nothing in this Paragraph 6 limits the exercise of the reserved jurisdiction of the court except as provided in subparagraph (c) (4) above.

7. Exemption for Extractors of Contaminated Groundwater. Any party herein may petition the Replenishment District for a Non-consumptive Water Use Permit as part of a project to remedy or ameliorate groundwater contamination. If the petition is granted as set forth in this part, the petitioner may extract the groundwater as permitted hereinafter, without the production counting against the petitioner's production rights.

(a) If the Board of the Replenishment District determines by Resolution that there is a problem of groundwater contamination that a proposed program will remedy or ameliorate, an operator may make extractions of groundwater to remedy or ameliorate that problem without the production counting against the petitioner's production rights if the water is not applied to beneficial surface use, its extractions are made in compliance with all the terms and conditions of the Board Resolution, and

the Board has determined in the Resolution either of the following:

(1) The groundwater to be extracted is unusable and cannot be economically treated or blended for use with other water.

(2) The proposed program involves extraction of usable water in the same quantity as will be returned to the underground without degradation of quality.

(b) The Resolution may provide those terms and conditions the Board deems appropriate, including, but not limited to, restrictions on the quantity of the extractions to be so exempted, limitations on time, periodic reviews, requirement of submission of test results from a Board-approved laboratory, and any other relevant terms or conditions.

(c) Upon written notice to the operator involved, the Board may rescind or modify its Resolution. The rescission or modification of the Resolution shall apply to groundwater extractions occurring more than ten days after the rescission or modification. Notice of rescission or modification shall be either mailed first class mail, postage prepaid, at least two weeks prior to the meeting of the Board at which the rescission or modification will be made to the address of record of the operator or personally delivered two weeks prior to the meeting.

(d) The Board's decision to grant, deny, modify or revoke a permit or to interrupt or stop a permitted project may be appealed to this court within thirty days of the notice thereof to the applicant and upon thirty days notice to the designees of all parties herein.

(e) The Replenishment District shall monitor and periodically inspect the project for compliance with the terms and conditions for any permit issued pursuant to these provisions.

(f) No party shall recover costs from any other party herein ~~on~~ in connection with ~~determinators~~ determinations made with respect to this part.

C. Exchange Pool Provisions.

(1) Definitions.

For purposes of these Exchange Pool provisions, the following words and terms have the following meanings:

(a) "Exchange Pool" is the arrangement hereinafter set forth whereby certain of the parties, ("Exchangees") may, notwithstanding the other provisions of the judgment, extract additional water from Central Basin to meet their needs, and certain other of the parties ("Exchangors"), reduce their extractions below their Allowed Pumping Allocations in order to permit such additional extractions by others.

(b) "Exchangor" is one who offers, voluntarily or otherwise, pursuant to subsequent provisions, to reduce its extractions below its Allowed Pumping Allocation in order to permit such additional extractions by others.

(c) "Exchangee" is one who requests permission to extract additional water from Central Basin.

(d) "Undue hardship" means unusual and severe economic or operational hardship, other than that arising (i) by reason of any differential in quality that might exist between water extracted from Central Basin and water available for importation

or (ii) by reason of any difference in cost to a party in subscribing to the Exchange Pool and reducing its extractions of water from Central Basin in an equivalent amount as opposed to extracting any such quantity itself.

2. Parties Who May Purchase Water Through the Exchange Pool. Any party not having existing facilities for the taking of imported water as of the beginning of any Administrative year, and any party having such facilities as of the beginning of any Administrative year who is unable, without undue hardship, to obtain, take, and put to beneficial use, through its distribution system or systems existing as of the beginning of the particular Administrative year, imported water in a quantity which, when added to its Allowed Pumping Allocation for that particular Administrative year, will meet its estimated needs for that particular Administrative year, may purchase water from the Exchange Pool, subject to the limitations contained in this Subpart C of this Part III (Subpart "C" hereinafter).

3. Procedure for Purchasing Exchange Pool Water. Not later than the 40th day following the commencement of each Administrative year, each such party desiring to purchase water from the Exchange Pool shall file with the Watermaster a request to so purchase, setting forth the amount of water in acre feet that such party estimates that it will require during the then current Administrative year in excess of the total of:

(a) Its Allowed Pumping Allocation for that particular Administrative year; and

(b) The imported water, if any, which it estimates it will be able, without undue hardship, to obtain, take and put to

beneficial use, through its distribution system or systems existing as of the beginning of that particular Administrative year.

Any party who as of the beginning of any Administrative year has existing facilities for the taking of imported water and who makes a request to purchase from the Exchange Pool must provide with such request substantiating data and other proof which, together with any further data and other proof requested by the Watermaster, establishes that such party is unable without undue hardship, to obtain, take and put to beneficial use through its said distribution system or systems a sufficient quantity of imported water which, when added to its said Allowed Pumping Allocation for the particular Administrative year, will meet its estimated needs. As to any such party, the Watermaster shall make a determination whether the party has so established such inability, which determination shall be subject to review by the court under the procedure set forth in Part II of this judgment. Any party making a request to purchase from the Exchange Pool shall either furnish such substantiating data and other proof, or a statement that such party had no existing facilities for the taking of imported water as of the beginning of that Administrative year, and in either event a statement of the basis for the quantity requested to be purchased.

4. Subscriptions to Exchange Pool.

(a) Required Subscription. Each party having existing facilities for the taking of imported water as of the beginning of any Administrative year hereby subscribed to the Exchange Pool for purposes of meeting Category (a) requests thereon, as more

particularly defined in paragraph 5 of this Subpart C, twenty percent (20%) of its Allowed Pumping Allocation, or the quantity of imported water which it is able, without undue hardship, to obtain, take and put to beneficial use through its distribution system or systems existing as of the beginning of the particular Administrative year in addition to such party's own estimated needs for imported water during that water year, whichever is the lesser. A party's subscription under this subparagraph (a) and subparagraph (b) of this paragraph 4 is sometimes hereinafter referred to as a 'required subscription'.

(b) Report to Watermaster by Parties with Connections and Unable to Subscribe 20%. Any party having existing facilities for the taking of imported water and estimating that it will be unable, without undue hardship, in that Administrative year to obtain, take and put to beneficial use through its distribution system or systems existing as of the beginning of that Administrative year, sufficient imported water to further reduce its extractions from the Central Basin by twenty percent (20%) of its Allowed Pumping Allocation for purposes of providing water to the Exchange Pool must furnish not later than the 40th day following the commencement of such Administrative year substantiating data and other proof which, together with any further data and other proof requested by the Watermaster, establishes said inability or such party shall be deemed to have subscribed twenty percent (20%) of its Allowed Pumping Allocation for the purpose of providing water to the Exchange Pool. As to any such party so contending such inability, the Watermaster shall make a determination whether the party has so established such

inability, which determination shall be subject to review by the Court under the procedure set forth in Part II of this judgment.

(c) Voluntary Subscriptions. Any party, whether or not having facilities for the taking of imported water, who desires to subscribe to the Exchange Pool a quantity or further quantity of its Allowed Pumping Allocation, may so notify the Watermaster in writing of the quantity of such offer on or prior to the 40th day following the commencement of the particular Administrative year. Such subscriptions are referred to hereinafter as "voluntary subscriptions." Any Exchangor who desires that any part of its otherwise required subscription not needed to fill Category (a) requests shall be available for Category (b) requests may so notify the Watermaster in writing on or prior to said 40th day. If all of that Exchangor's otherwise required subscription is not needed in order to fill Category (a) requests, the remainder of such required subscription not so used, or such part thereof as such Exchangor may designate, shall be deemed to be a voluntary subscription.

5. Limitations on Purchases of Exchange Pool Water and Allocation of Requests to Purchase Exchange Pool Water Among Exchangors.

(a) Categories of Requests. Two categories of Exchange Pool requests are established as follows:

(1) Category (a) requests. The quantity requested by each Exchangee, whether or not that Exchangee has an Allowed Pumping Allocation, which quantity is not in excess of 150% of its Allowed Pumping Allocation, if any, or 100 acre feet, whichever is greater. Requests or portions thereof within the

above criteria are sometimes hereinafter referred to as "Category (a) requests."

(2) Category (b) requests. The quantity requested by each Exchangee having an Allowed Pumping Allocation to the extent the request is in excess of 150% of that Allowed Pumping Allocation or 100 acre feet, whichever is greater, and the quantity requested by each Exchangee having no Allowed Pumping Allocation to the extent the request is in excess of 100 acre feet. Portions of requests within the above criteria are sometimes hereinafter referred to as "Category (b) requests."

(b) Filling of Category (a) Requests. All Exchange Pool subscriptions, required and voluntary, shall be available to fill Category (a) requests. Category (a) requests shall be filled first from voluntary subscriptions, and if voluntary subscriptions should be insufficient to fill all Category (a) requests required subscriptions shall be then utilized to fill Category (a) requests. All Category (a) requests shall be first filled before any Category (b) requests are filled.

(c) Filling of Category (b) Requests. To the extent that voluntary subscriptions have not been utilized in filling Category (a) requests, Category (b) requests shall be filled only out of any remaining voluntary subscriptions. Required subscriptions will then be utilized for the filling of any remaining Category (b) requests.

(d) Allocation of Requests to Subscriptions When Available Subscriptions Exceed Requests. In the event the quantity of subscriptions available for any category of requests exceeds those requests in that category, or exceeds the remainder

of those requests in that category, such requests shall be filled out of such subscriptions proportionately in relation to the quantity of each subscription.

(e) Allocation of Subscriptions to Category (b) Requests in the Event of Shortage of Subscriptions. In the event available subscriptions are insufficient to meet Category (b) requests, available subscriptions shall be allocated to each request in the proportion that the particular request bears to the total requests of the particular category.

6. Additional Voluntary Subscriptions. If subscriptions available to meet the requests of Exchangees are insufficient to meet all requests, additional voluntary subscriptions may be solicited and received from parties by the Watermaster. Such additional subscriptions shall be allocated first to Category (a) requests to the extent unfilled, and next to Category (b) requests to the extent unfilled. All allocations are to be otherwise in the same manner as earlier provided in paragraph 5 (a) through 5 (e) inclusive.

7. Effect if Category (a) Requests Exceed Available Subscriptions, Both Required and Voluntary. In the event that the quantity of subscriptions available to fill Category (a) requests is less than the total quantity of such requests, the Exchangees may, nonetheless, extract the full amount of their Category (a) requests otherwise approved by the Watermaster as if sufficient subscriptions were available. The amounts received by the Watermaster on account of that portion of the approved requests in excess of the total quantities available from Exchangors shall either be paid by the Watermaster to Central &

West Basin Water Replenishment District in trust for the purpose of purchasing imported water and spreading the same in Central Basin for replenishment thereof, or credited to an account of said Plaintiff District on the books of the Watermaster, at the option of said Plaintiff District. Thereafter said Plaintiff District may, at any time, withdraw said funds or any part thereof so credited in trust for the aforesaid purpose, or may by the 40th day of any Administrative year notify the Watermaster that it desires all or any portion of said funds to be expended by the Watermaster for the purchase of water available from subscriptions by Exchangors in the event the total quantity of such subscriptions exceeds the total quantity of approved requests by parties to purchase Exchange Pool water. To the extent that there is such an excess of available subscriptions over requests and to the extent that the existing credit in favor of Plaintiff District is sufficient to purchase such excess quantity at the price established for Exchange Pool purchases during that Administrative year, the account of the Plaintiff District shall be debited and the money shall be paid to the Exchangors in the same manner as if another party had made such purchase as an Exchangee. The Plaintiff District shall not extract any such Exchange Pool water so purchased.

8. Additional Pumping by Exchangees Pursuant to Exchange Pool Provisions. An Exchangee may extract from Central Basin in addition to its Allowed Pumping Allocation for a particular Administrative year that quantity of water which it has requested to purchase from the Exchange Pool during that Administrative year and which has been allocated to it pursuant

to the provisions of paragraphs 5, 6 and 7. The first pumping by an Exchangee in any Administrative year shall be deemed to be pumping of the party's allocation of Exchange Pool water.

9. Reduction in Pumping by Exchangors. Each Exchangor shall in each Administrative year reduce its extractions of water from Central Basin below its Allowed Pumping Allocation for the particular year in a quantity equal to the quantity of Exchange Pool requests allocated to it pursuant to the provisions of paragraphs 4, 5, 6 and 7 of this Subpart C.

10. Price to be Paid for Exchange Pool Water. The price to be paid by Exchangees and to be paid to Exchangors per acre foot for required and voluntary subscriptions of Exchangors utilized to fill requests on the Exchange Pool by Exchangees shall be the dollar amount computed as follows by the Watermaster for each Administrative year. The "normal" price as of the beginning of the Administrative year charged by Central Basin Municipal Water District (CBMWD) for treated MWD (Metropolitan Water District of Southern California) water used for domestic and municipal purposes shall be determined, and if on that date there are any changes scheduled during that Administrative year in CBMWD's "normal" price for such category of water, the weighted daily "normal" CBMWD price shall be determined and used in lieu of the beginning such price; and there shall be deducted from such beginning or weighted price, as the case may be, the "incremental cost of pumping water in Central Basin" at the beginning of the Administrative year and any then current rate or rates, of assessments levied on the pumping of ground water in Central Basin by Plaintiff District and any other governmental

agency. The "normal" price charged by CBMWD shall be the highest price of CBMWD for normal service excluding any surcharge or higher rate for emergency deliveries or otherwise failing to comply with CBMWD rates and regulations relating to earlier deliveries. The "incremental cost of pumping water in Central Basin" as of the beginning of the Administrative year shall be deemed to be the Southern California Edison Company Schedule No. PA-1 rate per kilowatt-hour, including all adjustments and all uniform authorized additions to the basic rate, multiplied by 560 kilowatt-hours per acre-foot, rounded to the nearest dollar (which number of kilowatt-hours has been determined to represent the average energy consumption to pump an acre-foot of water in Central Basin). In applying said PA-1 rate the charge per kilowatt-hour under the schedule shall be employed and if there are any rate blocks then the last rate block shall be employed. Should a change occur in Edison schedule designations, the Watermaster shall employ that applicable to motors used for pumping water by municipal utilities.

11. Carry-over of Exchange Pool Purchases by Exchangees. An Exchangee who does not extract from Central Basin in a particular Administrative year a quantity of water equal to the total of (a) its Allowed Pumping Allocation for that particular Administrative year, reduced by any authorized amount of carry-over into the next succeeding Administrative year pursuant to the provisions of Subpart A of Part III of this judgment, and (b) the quantity that it purchased from the Exchange Pool for that particular Administrative year, may carry over into the next succeeding Administrative year the right to

extract from Central Basin a quantity equal to the difference between said total and the quantity actually extracted in that Administrative year, but not exceeding the quantity purchased from the Exchange Pool for that Administrative year. Any such carry-over shall be in addition to that provided in said Subpart A of Part III.

If the 'Basinwide Average Exchange Pool Price' in the next succeeding Administrative year exceeds the 'Exchange Pool Price' in the previous Administrative year any such Exchangee exercising such carry-over rights hereinabove provided shall pay to the Watermaster, forthwith upon the determination of the 'Exchange Pool Price' in said succeeding Administrative year, and as a condition to such carry-over rights, an additional amount determined by multiplying the number of acre feet of carry-over by the difference in 'Exchange Pool Price' as between the two Administrative years. Such additional payment shall be miscellaneous income to the Watermaster which shall be applied by him against that share of the Watermaster's budget to be paid by the parties to this Agreement for the second Administrative year succeeding that in which the Exchange Pool water was so purchased.

12. Notification by Watermaster to Exchangors and Exchangees of Exchange Pool Requests and Allocations Thereof and Price of Exchange Pool Water. Not later than the 65th day after the commencement of each Administrative year, the Watermaster shall determine and notify all Exchangors and Exchangees of the total of the allocated requests for Exchange Pool water and shall provide a schedule divided into categories of requests showing

the quantity allocated to each Exchangee and a schedule of the allocation of the total Exchange Pool requirements among the Exchangors. Such notification shall also advise Exchangors and Exchangees of the prices to be paid to Exchangors for subscriptions utilized and the Exchange Pool Price for that Administrative year as determined by the Watermaster. The determinations of the Watermaster in this regard shall be subject to review by the Court in accordance with the procedure set forth in Part II of this judgment.

13. Payment by Exchangees. Each Exchangee shall, on or prior to last day of the third month of each Administrative year, pay to the Watermaster one-quarter of said price per acre-foot multiplied by the number of acre feet of such party's approved request and shall, on or before the last day of each of the next succeeding three months, pay a like sum to the Watermaster. Such amounts must be paid by each Exchangee regardless of whether or not it in fact extracts or uses any of the water it has requested to purchase from the Exchange Pool.

14. Payments to Exchangors. As soon as possible after receipt of moneys from Exchangees, the Watermaster shall remit to the Exchangors their prorata portions of the amount so received in accordance with the provisions of paragraph 10 above.

15. Delinquent Payments. Any amounts not paid on or prior to any due date above shall carry interest at the rate of 1% per month or any part of a month. Any amounts required to be so paid may be enforced by the equitable powers of the Court, including, but not limited to, the injunctive process of the Court. In addition thereto, the Watermaster, as Trustee for the

Exchangors, may enforce such payment by any appropriate legal action, and shall be entitled to recover as additional damages reasonable attorneys' fees incurred in connection therewith. If any Exchangee shall fail to make any payments required of it on or before 30 days after the last payment is due, including any accrued interest, said party shall thenceforward not be entitled to purchase water from the Exchange Pool in any succeeding Administrative year except upon order of the Court, upon such conditions as the Court may impose.

IV. CONTINUING JURISDICTION OF THE COURT.

The Court hereby reserves continuing jurisdiction and upon application of any interested party, or upon its own motion, may review and redetermine the following matters and any matters incident thereto:

(a) Its determination of the permissible level of extractions from Central Basin in relation to achieving a balanced basin and an economic utilization of Central Basin for ground water storage, taking into account any then anticipated artificial replenishment of Central Basin by governmental agencies for the purpose of alleviating what would otherwise be annual overdrafts upon Central Basin and all other relevant factors.

(b) Whether in accordance with applicable law any party has lost all or any portion of his rights to extract ground water from Central Basin and, if so, to ratably adjust the Allowed Pumping Allocations of the other parties and ratably thereto any remaining Allowed Pumping Allocation of such party.

(c) To remove any Watermaster appointed from time to time and appoint a new Watermaster; and to review and revise the duties, powers and responsibilities of the Watermaster and to make such other and further provisions and orders of the Court that may be necessary or desirable for the adequate administration and enforcement of the judgment.

(d) To revise the price to be paid by Exchangees and to Exchangors for Exchange Pool purchases and subscriptions.

(e) In case of emergency or necessity, to permit extractions from Central Basin for such periods as the Court may determine: (i) ratably in excess of the Allowed Pumping Allocations of the parties; or (ii) on a non-ratable basis by certain parties if either compensation or other equitable adjustment for the benefit of the other parties is provided. Such overextractions may be permitted not only for emergency and necessity arising within Central Basin area, but to assist the remainder of the areas within The Metropolitan Water District of Southern California in the event of temporary shortage or threatened temporary shortage of its imported water supply, or temporary inability to deliver the same throughout its area, but only if the court is reasonably satisfied that no party will be irreparably damaged thereby. Increased energy cost for pumping shall not be deemed irreparable damage. Provided, however, that the provisions of this subparagraph will apply only if the temporary shortage, threatened temporary shortage, or temporary inability to deliver was either not reasonably avoidable by the Metropolitan Water District, or if reasonably avoidable, good reason existed for not taking the steps necessary to avoid it.

(f) To review actions of the Watermaster.

(g) To assist the remainder of the areas within The Metropolitan Water District of Southern California within the parameter set forth in subparagraph (e) above.

(h) To provide for such other matters as are not contemplated by the judgment and which might occur in the future, and which if not provided for would defeat any or all of the purposes of this judgment to assure a balanced Central Basin subject to the requirements of Central Basin Area for water required for its needs, growth and development.

The exercise of such continuing jurisdiction shall be after 30 days notice to the parties, with the exception of the exercise of such continuing jurisdiction in relation to subparagraphs (e) and (g) above, which may be ex parte, in which event the matter shall be forthwith reviewed either upon the Court's own motion or the motion of any party upon which 30 days notice shall be so given. Within ten (10) days of obtaining any ex parte order, the party so obtaining the same shall mail notice thereof to the other parties. If any other party desires Court review thereof, the party obtaining the ex parte order shall bear the reasonable expenses of mailing notice of the proceedings, or may in lieu thereof undertake the mailing. Any contrary or modified decision upon such review shall not prejudice any party who relied on said ex parte order.

V. GENERAL PROVISIONS.

1. Judgment Constitutes Inter Se Adjudication. This judgment constitutes an inter se adjudication of the respective rights of all parties, except as may be otherwise specifically

indicated in the listing of the rights of the parties at pages 12 through 52 of this judgment, or in Appendix "2" hereof.

2. Assignment, Transfer, Etc., of Rights. Subject to the other provision of this judgment, and any rules and regulations of the Watermaster requiring reports relative thereto, nothing herein contained shall be deemed to prevent any party hereto from assigning, transferring, licensing or leasing all or any portion of such water rights as it may have with the same force and effect as would otherwise be permissible under applicable rules of law as exist from time to time.

3. Service Upon and Delivery to Parties of Various Papers. Service of the judgment on those parties who have executed that certain Stipulation and Agreement for Judgment or who have filed a notice of election to be bound by the Exchange Pool provisions shall be made by first class mail, postage prepaid, addressed to the designee and at the address designated for that purpose in the executed and filed Counterpart of the Stipulation and Agreement for Judgment or in the executed and filed "Notice of Election to be Bound by Exchange Pool Provisions", as the case may be, or in any substitute designation filed with the Court.

Each party who has not heretofore made such a designation shall, within 30 days after the judgment shall have been served upon that party, file with the Court, with proof of service of a copy upon the Watermaster, a written designation of the person to whom and the address at which all future notices, determinations, requests, demands, objections, reports and other

papers and processes to be served upon that party or delivered to that party are to be so served or delivered.

A later substitute designation filed and served in the same manner by any party shall be effective from the date of filing as to the then future notices, determinations, requests, demands, objections, reports and other papers and processes to be served upon or delivered to that party.

Delivery to or service upon any party by the Watermaster, by any other party, or by the Court, or any item required to be served upon or delivered to a party under or pursuant to the judgment may be by deposit in the mail, first class, postage prepaid, addressed to the designee and at the address in the latest designation filed by that party.

4. Judgment Does Not Affect Rights, Powers, Etc., of Plaintiff District. Nothing herein constitutes a determination or adjudication which shall foreclose Plaintiff District from exercising such rights, powers, privileges and prerogatives as it may now have or may hereafter have by reason of provisions of law.

5. Continuation of Order Under Interim Agreement. The order of Court made pursuant to the "Stipulation and Interim Agreement and Petition for Order" shall remain in effect through the water year in which this judgment shall become final (subject to the reserved jurisdiction of the Court).

6. Effect of: Extractions by Exchangees; Reductions in Extractions. With regard to Exchange Pool purchases, the first extractions by each Exchangee shall be deemed the extractions of the quantities of water which that party is

entitled to extract pursuant to his allocation from the Exchange Pool for that Administrative year. Each Exchangee shall be deemed to have pumped his Exchange Pool request so allocated for and on behalf of each Exchangor in proportion to each Exchangor's subscription to the Exchange Pool which is utilized to meet Exchange Pool requests. No Exchangor shall ever be deemed to have relinquished or lost any of its rights determined in this judgment by reason of allocated subscriptions to the Exchange Pool. Each Exchangee shall be responsible as between Exchangors and that Exchangee, for any tax or assessment upon the production of ground water levied for replenishment purposes by the Central and West Basin Water Replenishment District or by any other governmental agency with respect to water extracted by such Exchangee by reason of Exchange Pool allocations and purchases. No Exchangor or Exchangee shall acquire any additional rights, with respect to any party to this action, to extract waters from Central Basin pursuant to Water Code Section 1005.1 by reason of the obligations pursuant to and the operation of the Exchange Pool.

7. Judgment Binding on Successors, Etc. This judgment and all provisions thereof are applicable to and binding upon not only the parties to this action, but as well to their respective heirs, executors, administrators, successors, assigns, lessees, licensees and to the agents, employees and attorneys in fact of any such persons.

8. Costs. No party shall recover its costs herein as against any other party.

9. Intervention of Successors in Interest and New Parties. Any person who is not a party (including but not limited to successors or parties who are bound by this judgment) and who proposes to produce water from the basin or exercise water rights of a predecessor may seek to become a party to this Judgment through a Stipulation in Intervention entered into with the Plaintiff. Plaintiff may execute said Stipulation on behalf of the other parties herein, but such Stipulation shall not preclude a party from opposing such intervention at the time of the court hearing thereon. Said Stipulation for Intervention must thereupon be filed with the Court, which will consider an order confirming said intervention following thirty (30) days notice to the parties. Thereafter, if approved by the Court, such intervenor shall be a party bound by this Judgment and entitled to the rights and privileges accorded under the physical solution herein.

10. Effect of this Amended Judgment on Orders Filed Herein. This Second Amended Judgment shall not abrogate such rights of additional carry-over of unused water rights as may otherwise exist pursuant to orders herein filed June 2, 1977 and September 29, 1977.

THE CLERK WILL ENTER THIS SECOND AMENDED JUDGMENT FORTHWITH.

TED: May 6, 1991

/s/ Florence T. Pickard
Judge of the Superior Court

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PLEASE REPLY TO

Pasadena
Office

May 9, 1991

Mr. John Norman
Central & West Basin
Water Replenishment District
12621 166th Street
Cerritos, California 90701

Re: Second Amended Judgment

Dear John:

Enclosed is a copy of the Second Amended Judgment as executed by Judge Pickard on May 6, 1991. The Judgment Amendment is effective immediately.

Very truly yours,

William F. Kruse

William F. Kruse
of
LAGERLOF, SENECAL, DRESCHER & SWIFT

WFK/pc
Enclosure

cc: Richard A. Rhone, w/enc.
Thomas Salzano, w/enc.
Chris Nagler, w/enc.

Attachment D

Watermaster's Central Basin Report
FY 2003-04

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
SOUTHERN DISTRICT

WATERMASTER SERVICE
in the
CENTRAL BASIN
Los Angeles County

July 1, 2003 - June 30, 2004

Copies of this report, either paper or CD, are available at the cost of production. Send requests to:

State of California
DEPARTMENT OF WATER RESOURCES
770 Fairmont Avenue, Suite 102
Glendale, CA 91203-1035

This Report is available online at: wwwdpla.water.ca.gov/sd/

October 2004

ARNOLD SCHWARZENEGGER
Governor
State of California

MIKE CHRISMAN
Secretary for Resources
The Resources Agency

LESTER A. SNOW
Director
Department of Water Resources

FOREWORD

The Department of Water Resources, as Watermaster, is pleased to submit this report on water supply conditions in the Central Basin during the 2003-2004 fiscal year. The report is prepared annually in accordance with the provisions of the Los Angeles County Superior Court Judgment in the Central Basin. The Judgment, together with Part 4, Division 2, of the California Water Code, authorizes this publication and the Department's administration of the Watermaster Service Area.

In 2003-2004, the Parties pumped 195,901of their 241,457 acre-feet of "Allowable Extractions"; 24,128 acre-feet was kept as carryover.

The report includes information on groundwater extractions, use of imported water and recycled water, replenishment operations, and administration of the Water Exchange Pool, and a financial report on Watermaster Service during the 2003-2004 fiscal year.

The Watermaster wishes to acknowledge and express appreciation for the assistance and support received from the many public and private organizations and individuals whose contributions were essential to this report.

The success of Watermaster Service is dependent on continued cooperation and communication between the Watermaster and the water users.

Mark Stuart, Chief
Southern District
and Deputy Watermaster

CONTENTS

FOREWORD iii

ORGANIZATION, DEPARTMENT OF WATER RESOURCES vii

I. INTRODUCTION 1

II. SUMMARY OF WATER CONDITIONS AND OPERATIONS 3

III. DETAILS OF WATER USE AND OPERATIONS 17

APPENDIXES

A Continuing History of Watermaster Service 35
B Succession of Allowed Pumping Allocation in Central Basin, June 2004 47
C Groundwater Extractions: Parties Reporting Monthly and Parties Reporting Quarterly 49
D Changes in Well Status 71

TABLES

1 Summary of Operations 7
2 Allowed Pumping Allocation Accounting, 2003-2004 8
3 Overextractions 13
4 Statement of Income and Expenditures 14
5 Replenishment Operations 19
6 Alamitos Barrier Project Operations 20
7 Exchange Pool (2003-2004) 21
8 Extractions by Nonparties and Parties with Zero Adjudicated Rights 21
9 Water Replenishment District In-Lieu Program 21
10 Imported Water and Recycled Water Use 24
11 Transfers of Adjudicated Rights 26
12 Approved Budget 31
13 Apportionment of Parties' Share of Budget 2003-2004 32

FIGURES

1 Central Basin 2
2 Basin Monthly Rainfall and Water Demand, FY 2003-2004 15
3 Precipitation Stations 19
4 Location of Water Reclamation Plants, Spreading Grounds, and Los Alamitos Barrier Project 20
5 Pattern of Groundwater Production for July 2003 through June 2004 22
6 Fluctuations of Water Level Elevations in Principal Aquifers in April 23
7 Historical Groundwater Extractions and Use of Imported Water by Parties, Central Basin 45
8 State Well Number System 46

PLATES
(Bound at back of report)

1 Active Wells in Central Basin

STATE OF CALIFORNIA
Arnold Schwarzenegger, Governor

THE RESOURCES AGENCY
Mike Chrisman, Secretary for Resources

DEPARTMENT OF WATER RESOURCES
Lester A. Snow, Director

P. Joseph Grindstaff
Chief Deputy Director

Vernon T. Glover Deputy Director	Gerald E. Johns Deputy Director	Vacant Deputy Director	Peter S. Garris Deputy Director
Brian E. White Assistant Director Legislative Affairs		Nancy Saracino Chief Counsel	Susan Sims-Teixeira Assistant Director Public Affairs

Southern District

Mark Stuart, P. E. ..... Chief and Deputy Watermaster

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I. INTRODUCTION

The Central Basin is a large groundwater basin underlying the southeastern part of the Los Angeles Coastal Plain. It is bounded on the north by the hills separating it from the San Gabriel Valley, on the east by Orange County, and on the southwest by the West Coast Basin (Figure 1).

Most of the 277-square-mile Basin is urban-suburban, consisting of 23 incorporated cities. A substantial portion of the water used on the overlying land is pumped directly from the Basin.

Over 50 years ago, overdraft of the groundwater basin and declining water levels caused sea water intrusion and threatened the groundwater supply. However, timely legal action and adjudication of the water rights halted the overdraft and prevented serious damage to the Basin. Today, groundwater use in the Central Basin is restricted to the adjudicated rights by a Superior Court Judgment and monitored by a court-appointed Watermaster. The Watermaster's primary duty is to administer the controls prescribed by the Judgment and report annually to the Court and Parties on significant groundwater-related events that occur in the Basin. The Basin has been under the Watermaster since 1962.

Appendix A contains the continuing history of Watermaster Service operations and the duties and functions of the Watermaster.

This report summarizes the Watermaster's work, conditions of groundwater supply, water use, and groundwater replenishment and includes a financial report for the 2003-2004 fiscal year.

There are three parts to the report: (1) Introduction, (2) Summary of Water Conditions and Operations, and (3) Details of Water Use and Operations. This third section contains the figures and tables on water supply, water use, replenishment, and administration costs. The appendixes contain backup data for these tables.

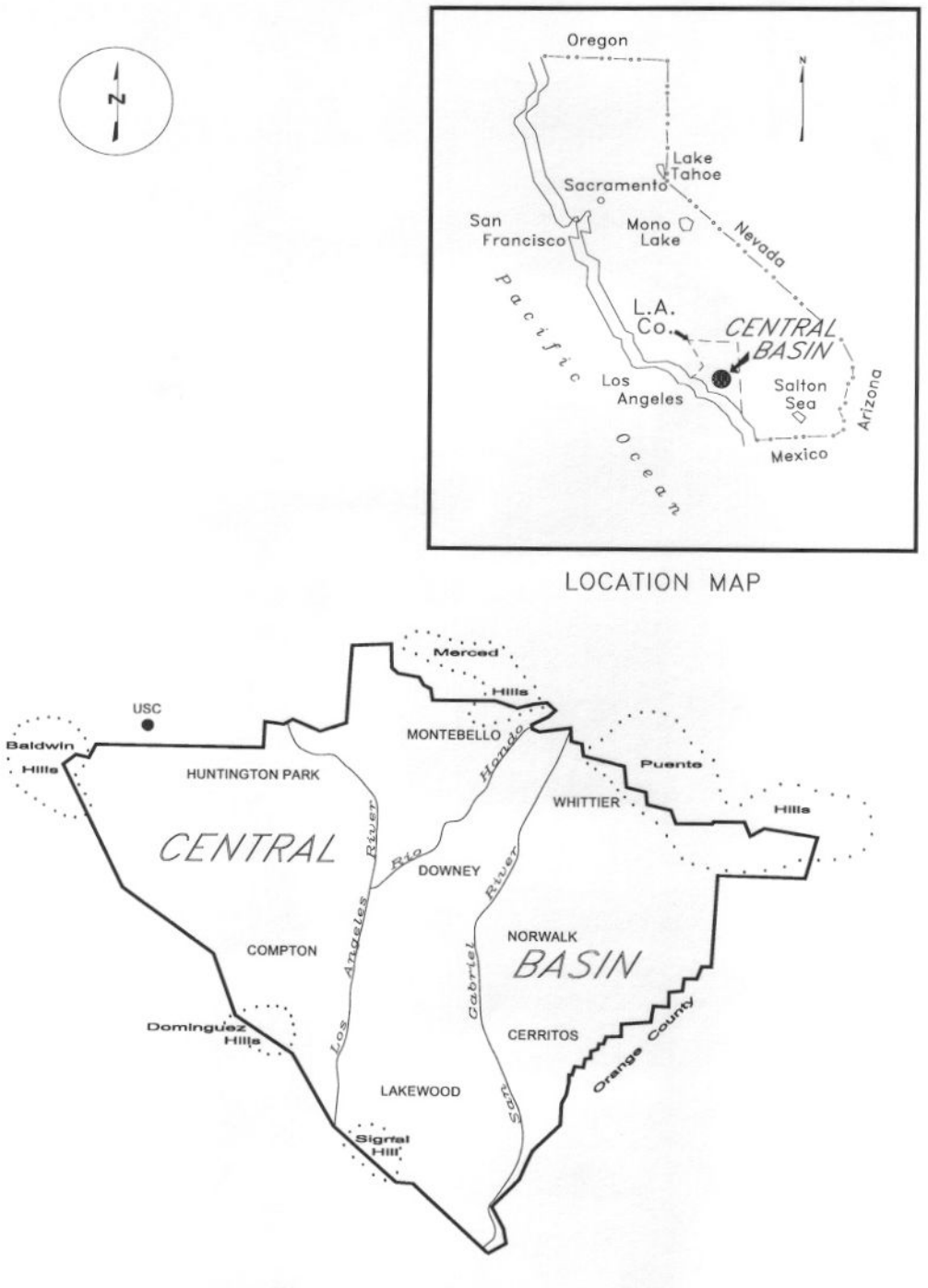


FIGURE 1 - CENTRAL BASIN

II. SUMMARY OF WATER CONDITIONS AND OPERATIONS

Tables and figures referred to in the text that follows are for Fiscal Year 2003-2004.

Average Rainfall

- 9.01 inches, 64 percent of the calculated 90-year average rainfall on the Coastal Plain.
- Mean seasonal precipitation on the Basin (base period 1897 - 1947) ranges from 12 inches at Long Beach to 16 inches at Whittier Narrows.

Conservation

- Overall replenishment operations decreased by 35 percent, excluding water used for sea water intrusion barrier operations.
- 36,128 acre-feet of storm runoff was recharged, 28,262 acre-feet less this year than last year.
- 20,369 acre-feet of purchased water was spread this year (3,072 more than the amount purchased and spread last year).
- 39 percent of the total water spread was recycled water from three nearby water reclamation plants.

Parties Wells

- 315 active and 151 inactive wells.
- 9 wells drilled, 6 destroyed.

Alamitos Barrier Project Operations (Table 6)

35 injection wells, 4 extraction wells, and 277 observation wells operating.

Water Quality

- The following averages were compiled for 2003-2004. Data were provided by Central Basin Municipal Water District and the Metropolitan Water District of Southern California.

Mean Values of Concentrations, in mg/L

Quality factor	Groundwater	Colorado River water at Lake Mathews	State Water Project water at Castaic Lake
Chloride	156	83	67
Sulfate	66	232	44
Hardness (as $CaCo_3$)	335	286	114
TDS	640	595	268

Central Basin Early Remediation Project

The Judgment as amended on May 6, 1991, provides conditions whereby the Water Replenishment District can grant a non-consumptive use permit as part of a project to remedy or ameliorate groundwater contamination.

On January 12, 2001, the Water Replenishment District of Southern California issued a "Non-Consumptive Use Permit" to the Southeast Water Coalition allowing groundwater extraction for removal of contaminants entering the Central Basin from the San Gabriel Groundwater Basin.

Exchange Pool

- There was no Exchange Pool administered for this fiscal year.

Water Right Sales and Leases

- Sales have reduced number of Parties from 508 (1966-67) to 143 (2003-2004).
- This fiscal year, 59 leases totaling 21,305.47 acre-feet were made.

In-Lieu Replenishment Program

Water Replenishment District of Southern California (WRD), in cooperation with the Metropolitan Water District of Southern California (MWD), operates an in-lieu replenishment program. There was no program this year.

Overextractions

- Nine parties and the State of California (Caltrans) overextracted. Caltrans and three parties were in violation of the judgment; the parties in violation were Midland Park Water Trust, St. John Bosco School, and Southern Service Co. and Environmentals, Inc. (Table 3).

- Midland Park Water Trust discontinued pumping after September 2001 in a move to eliminate its cumulative overextraction. The Parties will eliminate their overextractions by a combination of reducing pumping, leasing water rights, purchasing water, and obtaining Exchange Pool water.

California Department of Transportation (Caltrans)

- Caltrans pumped 11,261.96 acre-feet of water from 1997-98 through 2002-2003, and 2,043.74 acre-feet in 2003-2004. Since 1999-2000, Caltrans has been pumping more than 2,000 acre-feet of water per year and has been discharging this water to the Los Angeles and the San Gabriel Rivers.

  Caltrans representatives have been meeting with the Water Replenishment District and with pumpers during the last seven years to resolve issues involving water rights, replenishment assessments, and disposal of the water including treatment of the water and use of water by a water utility.

  Watermaster is monitoring these discussions in an effort to resolve these issues and find a way that Caltrans can operate within the decree.

Water Use (Tables 1, 10 and Appendix C)

- In fiscal year 2003-2004 extractions were 21,466 acre-feet less than the total Allowed Pumping Allocation, whereas in fiscal year 2002-2003, extractions were 19,966 acre-feet less than the Allowed Pumping Allocation.

- Imports increased 2.2 percent. Recycled use increased 2.6 percent.

- Total water use increased 1 percent. Parties supplied 421,464 acre-feet to their customers; this does not include the amount pumped by Caltrans and discharged to the Los Angeles and San Gabriel Rivers.

Long Beach Conjunctive Use Program

The City of Long Beach has executed agreements with the Metropolitan Water District of Southern California and the Water Replenishment District of Southern California, whereby Long Beach is importing water from MWD instead of pumping their groundwater rights. The object of the agreement is to store water in the groundwater basin for future use.

In the last two fiscal years, Long Beach claims the following quantities of stored water, in acre-feet:

F.Y. 2003	790
F.Y. 2004	12, 210
Total to date:	13,000

Watermaster is reporting these values, without acknowledging their legal standing under the Judgment. According to the Judgment, Long Beach lost 10,468.28 acre-feet of allowable pumping rights during the 2004 Fiscal Year.

Imported Water (Table 10)

- In fiscal year 2003-2004, a total of 215,535 acre-feet of water was imported to Central Basin.
- Water from the Colorado River and water from the State Water Project arrives through MWD's facilities for distribution throughout the Basin by the following agencies:
    1. Cities of Compton, Long Beach, and Los Angeles;
    2. Central Basin Municipal Water District (CBMWD); and
    3. West Basin Municipal Water District (WBMWD).
- The City of Los Angeles also imports water from the Owens River-Mono Basin.
- California Domestic Water Company, San Gabriel Valley Water Company, Suburban Water Systems, and the City of Whittier import groundwater from the San Gabriel Basin.

Recycled Water (Table 10)

- Excluding recycled water used to recharge groundwater aquifers of Central Basin, recycled water use amounted to 12,072 acre-feet (313 acre-foot increase from last year).

Budget (Table 12)

- The budget was submitted to the Parties on June 1, 2003, and adopted as final budget on July 1, 2003.

Apportionment of Parties' Share of Budget (Table 13)

- A 5 percent penalty is assessed if payments become delinquent.
- Eight parties were penalized because their payments were not made within the allowable 30 days after service of the invoice.
- Assessments totaling $313.36 was collected for delayed payments.

TABLE 1. SUMMARY OF OPERATIONS

		Fiscal Year 2002-2003	Fiscal Year 2003-2004
Parties		143	143
Active Pumpers		83	82
Active nonparties		5	5
Allowed Pumping Allocation, (APA) in acre-feet		217,367	217,367
Watermaster expenses		$ 429,215	$ 390,706
Watermaster expenses per acre-foot of APA		$ 1.97	$ 1.80
Rainfall, in inches		14.38	9.01
Injection at Alamitos Barrier Project, in acre-feet*		5,012	5,880
Spreading operations, in acre-feet*		141,414	92,316
Extractions, in acre-feet**		197,401	195,901
Imports, in acre-feet***	210,824#	~~211,070~~	215,535
Recycled water use, in acre-feet##		11,759	12,072
Total water use by Parties, in acre-feet	419,984#	~~420,230~~	423,508

* Provisional information from Los Angeles County Department of Public Works.
** Excludes nonparties.
*** Includes imports of San Gabriel Basin groundwater.
# Revised
Excludes amounts used for groundwater recharge.

TABLE 2. ALLOWED PUMPING ALLOCATION ACCOUNTING, 2003-04 (acre-feet)

Party	Sales * 2003-04	Allowed Pumping Allocation 2003-04	Carryover from 2002-03	Leases*		Allowable Extraction (2) thru (5)	Amount Pumped	In-Lieu	Balance (6)-(7)-(8)	Allowable Carryover into 2004-05		
				With Flex	Without Flex					Drought	Normal	Total
A B C Unified School District		298.00	2.54			300.54	47.84		252.70		59.60	59.60
Angeles Abbey Memorial Park, Inc		4.00	0.00		-4.00	0.00	0.00		0.00		0.00	0.00
Arco Metals Co, American Brass		0.00	34.46			34.46	0.00		34.46	24.46	10.00	34.46
Artesia Cemetery District		12.00	12.00	-12.00		12.00	0.00		12.00		12.00	12.00
Artesia, City of		24.00	7.73			31.73	29.38		2.35		2.35	2.35
Arzouman, Charles and Neuart		1.00	19.26			20.26	0.00		20.26		20.00	20.00
Ashland Chemical Co		0.00	-134.57			-134.57	16.62		-151.19		-151.19	-151.19
Atkinson Brick Co		9.00	20.75			29.75	0.00		29.75	0.75	20.00	20.75
Atlantic Richfield Co		55.00	0.00			55.00	0.00		55.00		20.00	20.00
Automobile Club of Southern California		6.00	20.00			26.00	0.00		26.00		20.00	20.00
Baker Commodities, Inc		60.00	20.00			80.00	0.00		80.00		20.00	20.00
Bell Gardens, City of		1,914.00	101.67	-1,100.00		915.67	850.08		65.59		65.59	65.59
Bellflower Christian School		26.00	9.12		-10.00	25.12	12.83		12.29		12.29	12.29
Bellflower, City of		382.00	0.00		-382.00	0.00	0.00		0.00		0.00	0.00
Bellflower Home Garden Water Co		306.00	34.38			340.38	340.70		-0.32		-0.32	-0.32
Bellflower Unified School District		89.00	0.00	-89.00		0.00	0.00		0.00		0.00	0.00
Bellflower-Somerset Mutual Water Co		4,312.88	881.98	347.00	12.00	5,553.86	4,820.00		733.86		733.86	733.86
Buell, Mary Dolores		1.00	5.24			6.24	0.68		5.56		5.56	5.56
California-American Water Co		2,067.00	220.19	358.00		2,645.19	2,509.49		135.70		135.70	135.70
California, State of		50.00	0.00	-50.00		0.00	0.00		0.00		0.00	0.00
California, State of (Caltrans) Non-party		0.00	-11,261.96			-11,261.96	2,043.74		-13,305.70		-13,305.70	-13,305.70
California Water Service Co		11,774.00	3,939.72	-4,200.00	-1,830.00	9,683.72	5,491.10		4,192.62	2,696.92	1,495.70	4,192.62
California Water Service Co (Dominguez)		6,480.00	659.78	-2,413.00	-55.00	4,671.78	1,324.34		3,347.44		813.40	813.40
Candlewood Country Club		147.00	22.00	-147.00		22.00	0.00		22.00	2.00	20.00	22.00
Cerritos, City of		4,680.03	2,030.74	5,262.47	856.00	12,829.24	10,348.81		2,480.43	30.44	1,988.50	2,018.94
Cerritos Community College District		147.00	0.00		-147.00	0.00	0.00		0.00		0.00	0.00
Cerro Metal Products		1.00	1.21			2.21			2.21		2.21	2.21
Chang, I-Hsin and Associates		1.00	15.80			16.80	0.00		16.80	3.84	12.96	16.80
Chevron U S A, Inc		94.00	20.00			114.00	0.00		114.00		20.00	20.00
Coast Packing Co		530.00	28.00	-390.00		168.00	86.40		81.60		28.00	28.00
Commerce, City of		5,081.00	1,016.20		-1,000.00	5,097.20	2,077.55		3,019.65		1,016.20	1,016.20
Compton, City of		5,723.00	1,087.38		1,504.00	8,314.38	6,852.73		1,461.65		1,144.60	1,144.60
Compton Unified School District		38.00	20.00			58.00	0.00		58.00		20.00	20.00
Conagra Trade Group, Inc		358.00	37.44	-358.00		37.44	0.00		37.44	4.24	20.00	24.24
County Water Co		456.00	91.20		-456.00	91.20	0.00		91.20		91.20	91.20
Crandell, F J		1.00	15.75			16.75	0.00		16.75	0.75	16.00	16.75
Darling-Delaware Co, Inc		117.00	23.40			140.40	30.30		110.10		23.40	23.40
Dolan, J E + Dolan, P A + Dolan, T P		2.00	4.00	-2.00		4.00	0.00		4.00		4.00	4.00
Downey, City of		16,553.62	3,297.08	1,550.00		21,400.70	18,236.59		3,164.11		3164.11	3,164.11
El Rancho Unified School District		55.00	20.00			75.00	21.53		53.47		20.00	20.00

TABLE 2. ALLOWED PUMPING ALLOCATION ACCOUNTING, 2003-04 (acre-feet)

Party	Sales * 2003-04	Allowed Pumping Allocation 2003-04	Carryover from 2002-03	Leases* With Flex	Leases* Without Flex	Leases* Net Lease *	Allowable Extraction (2) thru (5)	Amount Pumped	In-Lieu	Balance	Allowable Carryover into 2004-05 Drought	Allowable Carryover into 2004-05 Normal	Allowable Carryover into 2004-05 Total
Emoto, John H		2.00	20.00				22.00	0.00		22.00		20.00	20.00
Engler Rentals I		8.00	0.00	-8.00		-8.00	0.00	0.00		0.00		0.00	0.00
Equilon Enterprises, LLC		6.00	20.00				26.00	0.00		26.00		20.00	20.00
Farmers & Merchants Trust Co of L B		14.00	20.00				34.00	0.00		34.00		20.00	20.00
Filtrol Corp		456.00	91.20				547.20	0.00		547.20		91.20	91.20
Flesch, Elizabeth, et al		14.00	14.00				28.00	0.00		28.00		20.00	20.00
Ford Motor Co		4.50	20.00				24.50	0.00		24.50		20.00	20.00
Frampton, Harvey		10.00	20.00				30.00	0.00		30.00		20.00	20.00
Frampton, William H		25.00	36.42				61.42	16.30		45.12	16.42	20.00	36.42
G N B, Inc		62.00	20.00	-62.00		-62.00	20.00	0.00		20.00		20.00	20.00
Gordon, Robert E		4.00	18.21				22.21	0.68		21.53	0.80	20.00	20.80
Graham, Hugh W or Marcia K, Trustees		6.00	0.00	-6.00		-6.00	0.00	0.00		0.00		0.00	0.00
Harada Brothers		6.00	6.00				12.00	0.00		12.00		12.00	12.00
Hathaway, John J		8.00	8.00				16.00	0.00		16.00		16.00	16.00
Hathaway, Julian I & Helen M, Trustees		8.00	20.00				28.00	1.49		26.51		20.00	20.00
Hathaway Family Qtip Trust		11.11	11.11				22.22	0.00		22.22		20.00	20.00
Hathaway Family Survivor's Trust		11.11	11.11				22.22	0.00		22.22		20.00	20.00
Huntington Park, City of		3,853.00	-330.08				3,522.92	3,946.84		-423.92		-423.92	-423.92
Inglewood Park Cemetery		317.00	20.00	-317.00		-317.00	20.00	0.00		20.00		20.00	20.00
Jefferson Smurfit Corp (US)		1,058.00	254.57				1,312.57	682.67		629.90	42.97	211.60	254.57
Jones Co, The		70.00	0.00	-70.00		-70.00	0.00	0.00		0.00		0.00	0.00
Kal Kan Foods, Inc		140.00	28.00	-140.00		-140.00	28.00	0.00		28.00		20.00	20.00
King Kelly Marmalade Co, Inc		22.00	14.92	-9.00		-9.00	27.92	8.30		19.62		19.62	19.62
Kotake, Masao		27.97	0.00	-27.97		-27.97	0.00	0.00		0.00		0.00	0.00
La Habra Heights County Water District		2,498.00	14.43				2,512.43	2,477.40		35.03		35.03	35.03
La Hacienda Water Co		1.00	1.00				2.00	0.00		2.00		2.00	2.00
Lakewood, City of		9,423.00	1,877.06	-170.00		-170.00	11,130.06	9,463.68		1,666.38	0.59	1,665.79	1,666.38
Lincoln Memorial Park, Inc		34.00	72.16				106.16	44.77		61.39	52.16	9.23	61.39
Little Lake Cemetery District		14.00	15.22				29.22	12.02		17.20		17.20	17.20
Long Beach, City of		32,684.00	4,950.00	685.00		685.00	38,319.00	21,172.63		17,146.37	4.29	6,673.80	6,678.09
Los Angeles, City of		15,000.00	3,000.00				18,000.00	13,790.97		4,209.03		3,000.00	3,000.00
Los Angeles County Rancho Los Amigos		490.00	95.74				585.74	424.87		160.87		98.00	98.00
Los Angeles Paper Box and Board Mills		257.00	51.40				308.40	217.28		91.12		51.40	51.40
Lunday-Thagard Oil Co		212.00	42.40	-120.00		-120.00	134.40	109.73		24.67		20.00	20.00
Lussman, Paul H Jr, et al		7.00	20.00				27.00	0.24		26.76		20.00	20.00
Lynwood, City of		5,337.00	637.60				5,974.60	5,229.04		745.56		745.56	745.56
Lynwood Park Mutual Water Co #		222.00	-72.56		80.00	80.00	229.44	221.11		8.33		8.33	8.33
McLaren, Velma and Arline K Nuzum		9.00	0.00	-9.00		-9.00	0.00	0.00		0.00		0.00	0.00
Martin, Mary		28.00	0.00				28.00	0.00		28.00		20.00	20.00
Maywood Mutual Water Co No 1		741.00	101.32				842.32	755.75		86.57		86.57	86.57
Maywood Mutual Water Co No 2		912.00	499.36				1,411.36	896.94		514.42	316.96	182.40	499.36
Maywood Mutual Water Co No 3		1,407.00	134.84				1,541.84	1,465.51		76.33		76.33	76.33

TABLE 2. ALLOWED PUMPING ALLOCATION ACCOUNTING, 2003-04 (acre-feet)

Party	Sales * 2003-04	Allowed Pumping Allocation 2003-04	Carryover from 2002-03	Leases*			Allowable Extraction	Amount Pumped	In-Lieu	Balance	Allowable Carryover into 2004-05		
				With Flex	Without Flex	Net Lease *					Drought	Normal	Total
Mellano, G, et al		13.00	13.00	-26.00		-26.00	0.00	0.00		0.00		0.00	0.00
Midland Park Water Trust		57.00	-136.63				-79.63	0.00		-79.63		-79.63	-79.63
Mitsuuchi, Mary F Trust		11.00	0.00	-11.00		-11.00	0.00	0.00		0.00		0.00	0.00
Montebello, City of		386.50	77.30				463.80	371.03		92.77		77.30	77.30
Montebello Land and Water Co		1,624.00	421.06	2,078.00	400.00	2,478.00	4,523.06	3,848.25		674.81	23.24	651.57	674.81
New England Mutual Life Insurance Co		2.00	20.00				22.00	0.00		22.00		20.00	20.00
Newark Group Industries, Inc		757.00	139.86	-300.00		-300.00	596.86	431.04		165.82		91.40	91.40
N I Industries, Inc		138.00	20.00	-138.00		-138.00	20.00	0.00		20.00		20.00	20.00
Northrop Corp		4.50	20.00				24.50	0.00		24.50		20.00	20.00
Norwalk, City of		1,267.00	253.40		-250.00	-250.00	1,270.40	562.89		707.51		253.40	253.40
Norwalk-La Mirada Unified School District		378.00	75.60				453.60	0.00		453.60		75.60	75.60
O N K Farms		8.00	11.33				19.33	0.00		19.33		19.33	19.33
Oltmans Construction Co		3.00	20.00				23.00	0.00		23.00		20.00	20.00
Orange County Nursery, Inc		13.00	20.00				33.00	0.00		33.00		20.00	20.00
Orchard Dale Water District		1,107.00	191.27				1,298.27	1,090.49		207.78		207.78	207.78
PABCO Building Products, LLC		800.00	0.95	-800.00		-800.00	0.95	0.00		0.95		0.95	0.95
Paradise Memorial Park		16.00	18.08				34.08	0.96		33.12		20.00	20.00
Paramount, City of		5,883.00	1,176.60	-800.00		-800.00	6,259.60	5,518.21		741.39		741.39	741.39
Paramount Unified School District		46.00	19.85	-46.00		-46.00	19.85	0.21		19.64		19.64	19.64
Park Water Co		1.30	21.73	147.00	1,382.00	1,529.00	1,552.03	1,441.60		110.43		29.66	29.66
Patrician Associates Inc/Majestic Realty Co		12.00	20.00				32.00	0.00		32.00		20.00	20.00
Peerless Water Co		986.00	-13.75	-525.00		-525.00	447.25	432.34		14.91		14.91	14.91
Pico Boys Baseball, Inc		13.00	0.00				13.00	0.00		13.00		13.00	13.00
Pico Rivera, City of		5,579.00	115.78				5,694.78	5,381.54		313.24		313.24	313.24
Pico Water District		3,624.00	-307.27		250.00	250.00	3,566.73	3,877.08		-310.35		-310.35	-310.35
Randall, Villis Family Trust		4.00	4.00				8.00	0.00		8.00		8.00	8.00
Rockview Dairies, Inc		75.00	5.12	10.00	10.00	20.00	100.12	94.97		5.15		5.15	5.15
Rocky Mountain Industries, Inc		0.00	-1.24		30.00	30.00	28.76	13.44		15.32		15.32	15.32
Roman Catholic Archbishop of Los Angeles		347.00	60.68				407.68	322.85		84.83		69.40	69.40
Rosales, Elvira C		3.00	22.00				25.00	0.00		25.00	2.00	20.00	22.00
Rosing, L S Trust and P Schwartz		6.00	0.00				6.00	0.00		6.00		6.00	6.00
St John Bosco School		42.00	8.38				50.38	71.42		-21.04		-21.04	-21.04
San Gabriel Valley Water Co		2,616.00	505.20	-1,500.00		-1,500.00	1,621.20	1,763.83		-142.63		-142.63	-142.63
Santa Fe Springs, City of		4,035.78	882.87		-400.00	-400.00	4,518.65	3,852.35		666.30	166.88	499.42	666.30
Sativa Los Angeles County Water District		474.00	-1.28		275.00	275.00	747.72	808.10		-60.38		-60.38	-60.38
Scantlebury, Robert P		4.00	38.00				42.00	0.75		41.25	18.00	20.00	38.00
Seven Up/RC Bottling Co of So California		69.00	0.00				69.00	0.00		69.00		20.00	20.00
Signal Hill, City of		2,022.00	-85.34				1,936.66	1,745.79		190.87		190.87	190.87
Simmons Survivor's Trust		33.00	0.00	-33.00		-33.00	0.00	0.00		0.00		0.00	0.00
Smith, Rex M		24.00	0.00	-24.00		-24.00	0.00	0.00		0.00		0.00	0.00

TABLE 2. ALLOWED PUMPING ALLOCATION ACCOUNTING, 2003-04 (acre-feet)

Party	Sales * 2003-04	Allowed Pumping Allocation 2003-04	Carryover from 2002-03	Leases* With Flex	Leases* Without Flex	Allowable Extraction (2) thru (5)	Amount Pumped	In-Lieu	Balance	Allowable Carryover into 2004-05 Drought	Allowable Carryover into 2004-05 Normal	Allowable Carryover into 2004-05 Total
South Montebello Irrigation District		1,268.00	367.42	701.00		2,336.42	1,970.73		365.69		365.69	365.69
Southern California Edison Co		670.00	134.00			804.00	259.35		544.65		134.00	134.00
Southern California Water Co		16,439.20	4,098.00	2,000.00		22,537.20	19,111.64		3,425.56		3,425.56	3,425.56
Southern Service Co & Environmentals, Inc		65.00	14.42			79.42	184.07		-104.65		-104.65	-104.65
South Gate, City of		11,183.00	-212.01			10,970.99	10,913.38		57.61		57.61	57.61
Statewide Stations		1.00	34.00			35.00	0.00		35.00	14.00	20.00	34.00
Suburban Water Systems		3,721.00	284.20	-700.00	-800.00	2,505.20	1,877.62		627.58		604.20	604.20
Tract Number One Hundred & Eighty Water Co		2,137.00	367.40	-300.00		2,204.40	1,743.73		460.67		367.40	367.40
Tract 349 Mutual Water Co		423.00	143.92	516.00	147.00	1,229.92	1,050.76		179.16		179.16	179.16
Tucker, W and/or Bobby Robertson		8.00	21.38			29.38	0.12		29.26	1.38	20.00	21.38
Union Development Co, Inc		12.00	12.00		-12.00	12.00	0.00		12.00		12.00	12.00
United States Gypsum Co		1,265.00	73.00			1,338.00	184.76		1,153.24		253.00	253.00
Vangrootheest, Ernest A		10.00	0.00	-10.00		0.00	0.00		0.00		0.00	0.00
Vernon, City of		8,039.00	1,214.65	1,668.00		10,921.65	9,021.97		1,899.68	728.05	1,171.63	1,899.68
Vernon Cold Storage, LLC		74.00	0.00	-74.00		0.00	0.00		0.00		0.00	0.00
Virginia Country Club		274.00	6.44	-274.00		6.44	0.00		6.44		6.44	6.44
Walnut Park Mutual Water Co		996.00	25.24			1,021.24	630.18		391.06		199.20	199.20
Whittier, City of		895.00	-251.83		400.00	1,043.17	1,213.12		-169.95		-169.95	-169.95
Whittier Union High School District		100.00	20.00	-50.00		70.00	31.64		38.36		20.00	20.00
Wolfsberger, Helen and Christine Joseph		2.00	6.00			8.00	0.00		8.00		8.00	8.00
Yamamoto, George and Alice		14.00	9.70			23.70	0.03		23.67		20.00	20.00
Zane, Steve or Frances		11.50	0.00	-11.50		0.00	0.00		0.00		0.00	0.00
Total	0.00	217,367.00	24,090.40	0.00	0.00	241,457.40	195,901.17	0.00	45,556.23	4,151.14	19,976.75	24,127.89

* See Table 13 and Appendix B for information concerning leases, transfer of water right entitlements or prior ownership. Includes lease with flex where applicable.

Fiscal Year	Sales * this year	Allowed Pumping Allocation this year	Carryover from previous year	Leases* With Flex	Leases* Without Flex	Allowable Extraction	Amount Pumped**	In-Lieu	Balance	Allowable Carryover into 2003-04 Drought	Allowable Carryover into 2003-04 Normal	Allowable Carryover into 2003-04 Total
Non-parties												
Atlas Iron and Metal Co		0.00				0.00	0.24					
Bannan, Charles F		0.00				0.00	0.00					
Demenno/Kerdoon		0.00				0.00	3.99					
Furr, Arnold		0.00				0.00	0.12					
Grant, John		0.00				0.00	0.68					
Central Basin Municipal Water District						0.00	115.75					
						Total Pumped	196,021.95					

Southern California Edison - Adjudicated Right Accounting for Adjusted Extraction & F.Y. 2000-2003

Fiscal Year	Sales * this year	Allowed Pumping Allocation this year	Carryover from previous year	Leases* With Flex	Leases* Without Flex	Allowable Extraction	Amount Pumped**	In-Lieu	Balance	Allowable Carryover into 2003-04 Drought	Allowable Carryover into 2003-04 Normal	Allowable Carryover into 2003-04 Total
2000*		670.00	1.16	-350.00	-140.00	181.16	284.05		-102.89	0.00*	-102.89	-102.89
2001		670.00	-102.89		-415.00	152.11	264.49		-112.38		-112.38	-112.38
2002		670.00	-6.88		-450.00	213.12	320.64		-107.52		-107.52	-107.52
2003		670.00	-2.02		-10.00	657.98	303.68		354.30		134.00	134.00

* Southern California Edison lost Drought Carryover of 1.16 acre-feet due to adjustment

** Amount pumped values from previous report have been revised.

TABLE 3. OVEREXTRACTIONS (acre-feet)

Party	Allowed Pumping Allocation	Allowable Extractions	Amount Pumped	Balance	Allowable *
Ashland Chemical Company	0.00	-134.57	16.62	-151.19 **	0.00
Bellflower Home Garden Water Company	306.00	340.38	340.70	-0.32	61.20
California, State of (Caltrans) Non-party***	0.00	-11,261.96	2,043.74	-13,305.70 #	
Huntington Park, City of	3,853.00	3,522.92	3,946.84	-423.92	770.60
Midland Park Water Trust	57.00	-79.63	0.00	-79.63 #	20.00
Pico Water District	3,624.00	3,566.73	3,877.08	-310.35	724.80
St John Bosco School	42.00	50.38	71.42	-21.04 #	20.00
San Gabriel Valley Water Company	2,616.00	1,621.20	1,763.83	-142.63	523.20
Sativa LA County Water District	474.00	747.72	808.10	-60.38	94.80
Southern Service Co & Environmentals, Inc	65.00	79.42	184.07	-104.65 #	20.00
Whitter, City of	895.00	1,043.17	1,213.12	-169.95	179.00
Total				-14,769.76	

* Judgment allows overextractions computed as 20 acre-feet or 20 percent of the "Allowed Pumping Allocation" + carryover provisions; whichever is greater.

** WRD Resolution 03-684 granted a clean up exemption allowing Ashland Chemical Company to extract 625.00 acre-feet of water during the period from May 26, 1999, through June 30, 2008.

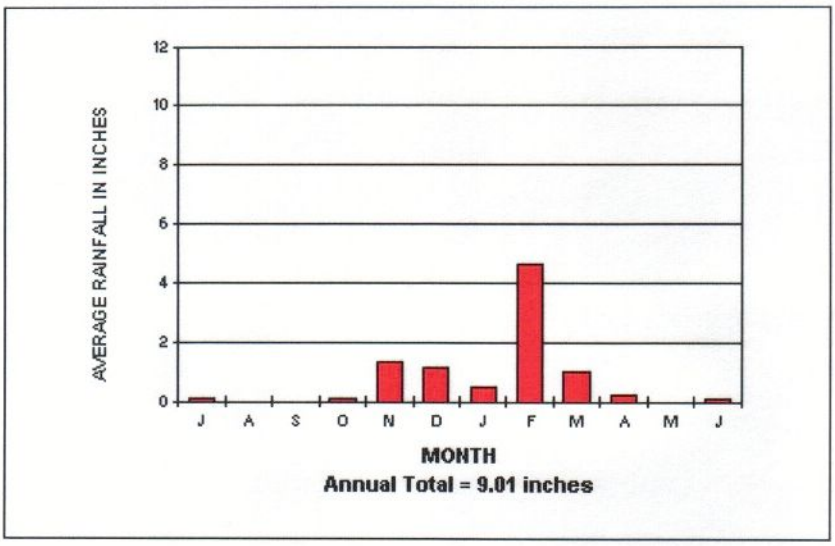
*** Dewatering under 105 Freeway in Downey. Caltrans, a non-party, is negotiating a settlement on water rights and pump assessments.

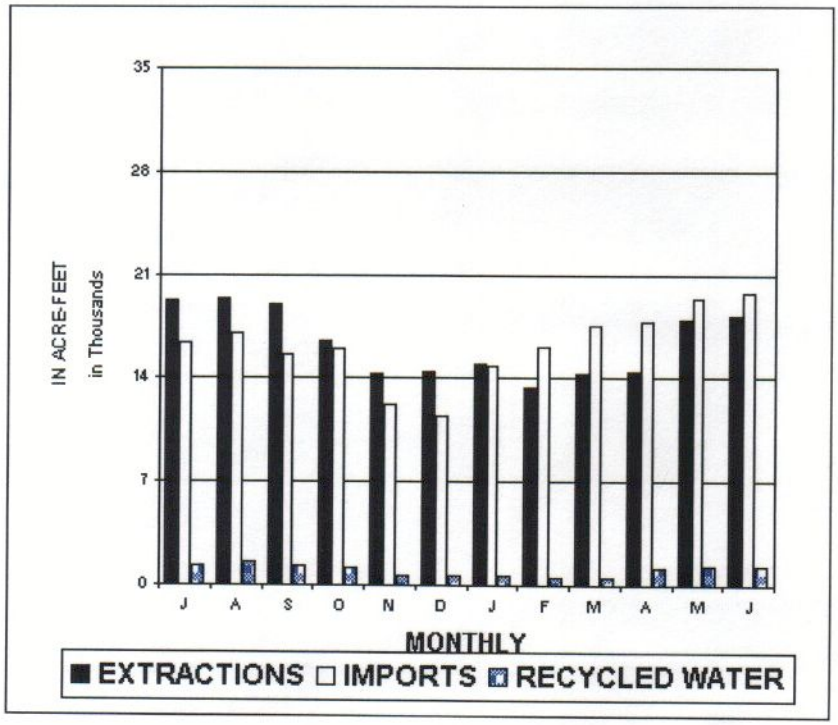
\# Violation of Judgment.

TABLE 4. STATEMENT OF INCOME AND EXPENDITURES

Item	Parties	State	Parties and State
Income			
From 2003-2004 billing	$ 217,500	$ 208,500	$ 426,000
Balance from 2002-2003	-18,123		-18,123
From penalties:	313		313
Total Income	$ 199,690	$ 208,500	$ 408,190
Expenditures			
Salaries and wages	$ 195,020	$ 195,019	$ 390,039
Operating expenses:			
Miscellaneious Office Supplies	99	99	198
Travel	234	235	469
Total expenditures	$ 195,353	$ 195,353	$ 390,706
Balance	$ 4,337 *		

* Credit to parties in 2004-2005 fiscal year, subject to delayed charges or credits.





Excludes imports from San Gabriel Ground Water Basin.

Figure 2 - BASIN MONTHLY RAINFALL AND WATER DEMAND, FY 2003-2004

III. DETAILS OF WATER USE AND OPERATIONS

The following tables, figures, and plates give information on water use and operation for Fiscal Year 2003-2004:

Precipitation

Figure 3 - Precipitation Stations (p. 19)

Operations

Table 5 - Replenishment Operations (p. 19)
Figure 4 - Location of Water Reclamation Plants, Spreading Grounds, and Alamitos Barrier Project (p. 20)
Table 6 - Alamitos Barrier Project Operations (p. 20)

Water Service Areas (Plate bound at back of report)

Plate 1 – Active Wells in Central Basin

Exchange Pool

Table 7 - Exchange Pool (2003-2004) (p. 21)

Water Use

Table 8 - Extractions by Nonparties and Parties with Zero Adjudicated Rights (p. 21)
Table 9 - Water Replenishment District In-Lieu Program (p. 21)
Figure 5 - Pattern of Groundwater Production for July 2003 through June 2004 (p. 22)
Figure 6 - Fluctuations of Water Level Elevations in Principal Aquifers in April (p. 23)
Table 10 - Imported Water and Recycled Water Use (p. 24)
Table 11 - Transfers of Adjudicated Rights (p. 26)

Budget

Table 12 - Approved Budget (p. 31)
Table 13 - Apportionment of Parties' Share of Budget 2003-2004 (p. 32)

Meter Testing Program

Accurate measurement of groundwater extractions is essential to the success of the Basin's management plan. Due to the State hiring freeze, Watermaster reduced the meter testing program temporarily. In the future, Watermaster will be scheduling meter tests when parties request them and will test all meters every two to three years. During the 2003-2004 fiscal year, 76 meters were tested, including several re-tests. Tests showed that two meters were more than 5 percent fast, with registration accuracy ranging from plus 17 percent to plus 28 percent, and eleven meters were more than 5 percent slow, with registration accuracy ranging from minus 5.2 percent to minus 76 percent.

It is the responsibility of each party to ensure that its meter and test facilities are installed properly and maintained in good working conditions. Test points must be properly installed.

Watermaster tests meters by volumetric or pitot comparisons. Parties are notified to make repairs when the meter registers beyond 5% accuracy. Meters which register beyond 10% accuracy may be considered faulty, and reported readings could be subject to adjustments as corrections to well production records. The Board of Directors of the Central Basin Water Association has reviewed and concurs with this Watermaster policy.

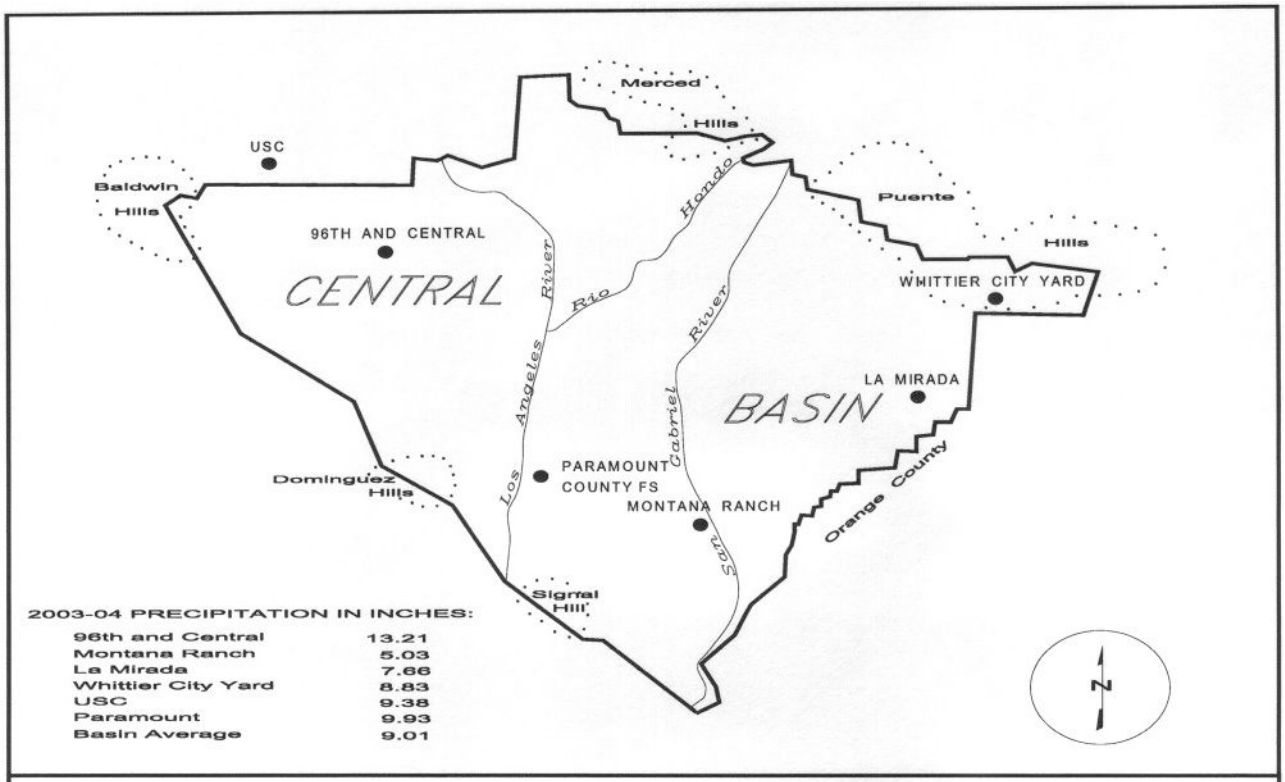


FIGURE 3 - PRECIPITATION STATIONS

TABLE 5. REPLENISHMENT OPERATIONS
(acre-feet)

Water Source	Quantity 2002-2003	Quantity 2003-2004
Local runoff	64,390	36,128
Recycled water:		
Whittier Narrows Water Reclamation Plant	7,436	5,970
San Jose Creek Water Reclamation Plant	50,006	27,494
Pomona Water Reclamation Plant	2,285	2,355
MWD water purchased with WRD funds	17,297	20,369
Make-up water from Upper San Gabriel Basin	0	0
Total	141,414	92,316

Provisional data provided by Los Angeles County Department of Public Works and Water Replenishment District

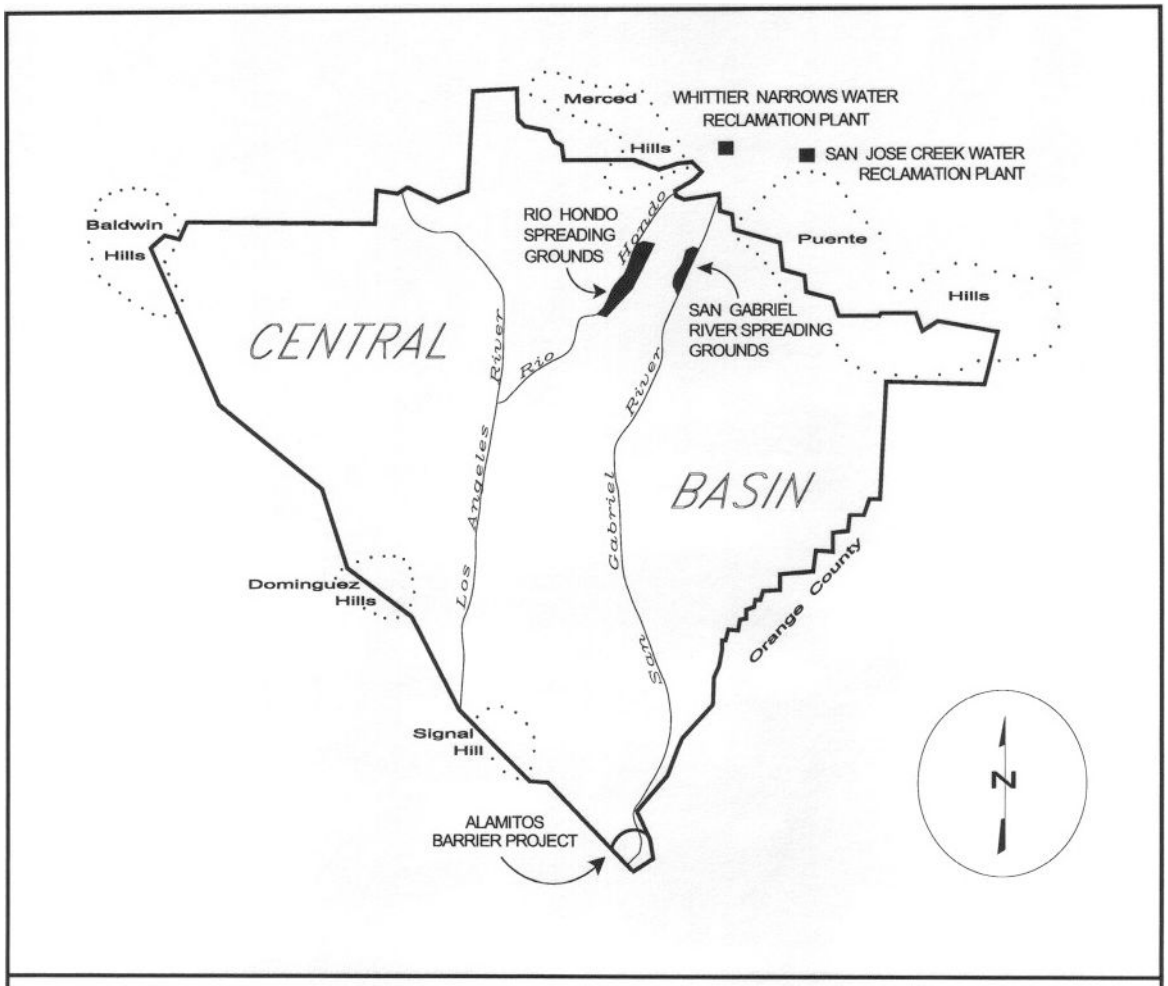


FIGURE 4 - LOCATION OF WATER RECLAMATION PLANTS, SPREADING GROUNDS, AND LOS ALAMITOS BARRIER PROJECT

TABLE 6. ALAMITOS BARRIER PROJECT OPERATIONS
(acre-feet)

Item	Quantity
Water injected in 2003-2004, acre-feet	5,880
Water extracted, acre-feet	12.50
Injection wells	35
Extraction wells	4
Observation wells	277

Provisional information provided by Los Angeles County Department of Public Works.

TABLE 7. EXCHANGE POOL OFFERS (2003-2004)

Party	Allowed Pumping Allocation (acre-feet)	Required Offer (acre-feet)	Actual Offer (acre-feet)	Amount Sold (acre-feet)	Payment due Exchanger
There were no requests to purchase water; therefore, operation of the Exchange Pool Program was suspended.					

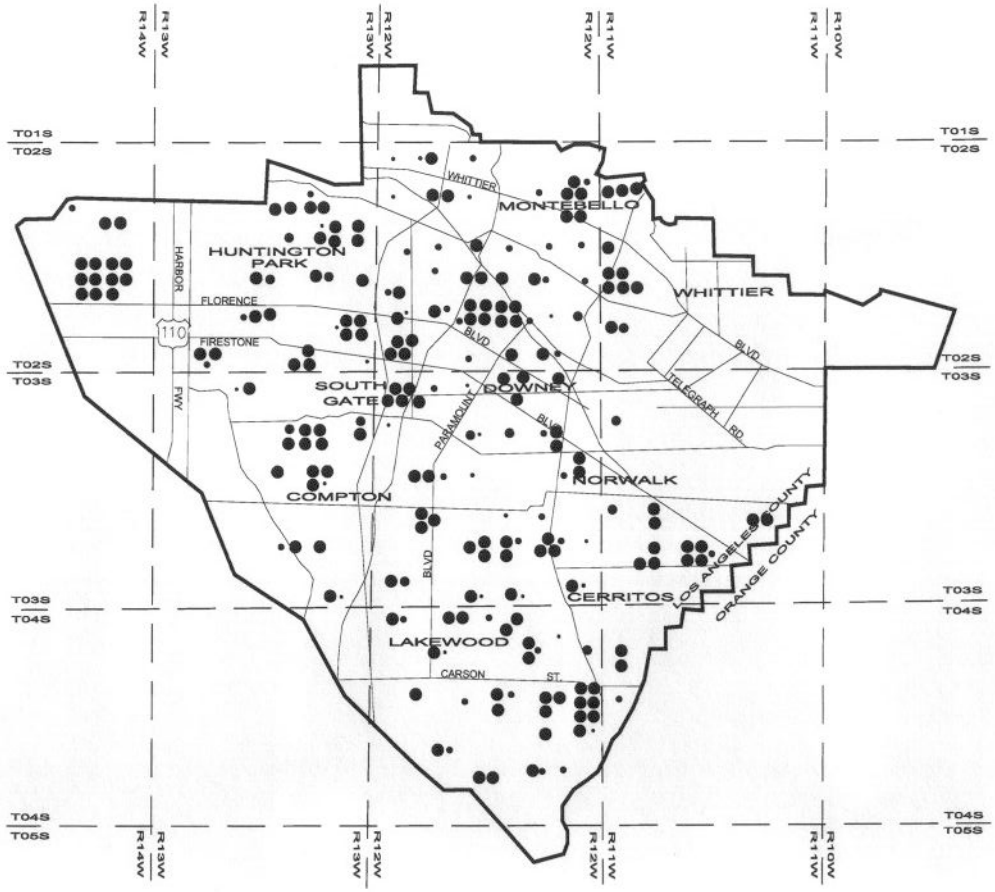
TABLE 8. EXTRACTIONS BY NONPARTIES AND PARTIES WITH ZERO ADJUDICATED RIGHTS

Pumper	Amount Pumped (acre-feet)
Nonparties	
Atlas Iron and Metal Co	0.24
Bannan, Charles F	0.00
Demenno/Kerdoon	3.99 *
Furr, Arnold E	0.12
Grant, John	0.68
Total	5.03
Parties with Zero Adjudicated Rights	
Arco Metals Co, American Brass	0.00
Ashland Chemical Co	16.62
Rocky Mountain Industries, Inc	13.44 **
Total	30.06

* Contaminated groundwater cleanup permit.
** Party leased rights.

TABLE 9. WATER REPLENISHMENT DISTRICT IN-LIEU PROGRAM

Party	In-Lieu Amount Reserved (acre-feet)
None	



● EACH DOT REPRESENTS 1000 ACRE-FEET

FIGURE 5 - PATTERN OF GROUNDWATER PRODUCTION FOR JULY 2003 THROUGH JUNE 2004

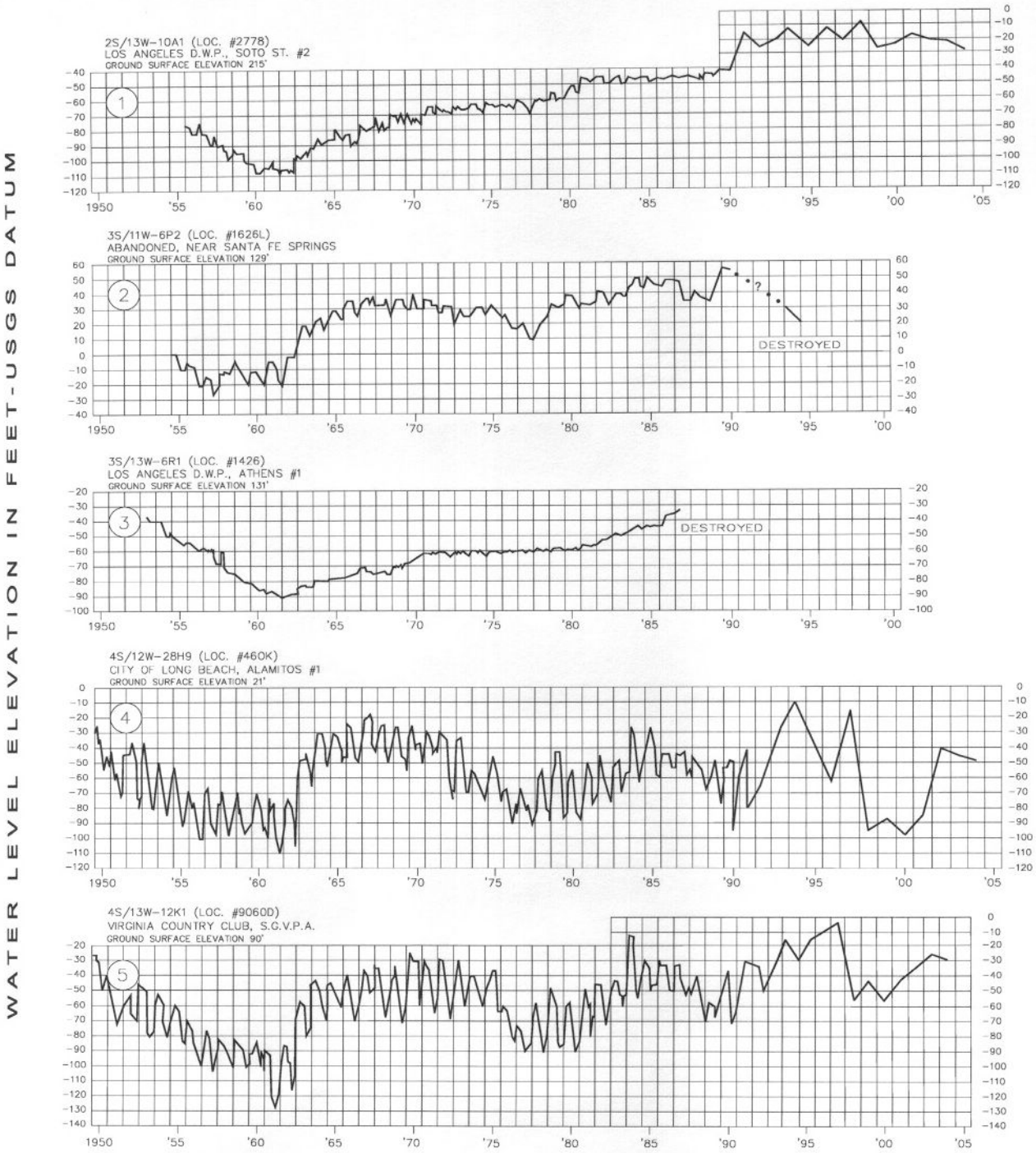


FIGURE 6 - FLUCTUATIONS OF WATER LEVEL ELEVATIONS IN PRINCIPAL AQUIFERS IN APRIL

TABLE 10. IMPORTED WATER AND RECYCLED WATER USE *
(acre-feet)

Source	Party		2002-2003	2003-2004
IMPORTED WATER				
State Water Project water and Colorado River water through MWD, and Mono-Owens Basin	Compton, City of		2,892	3,205
	Long Beach, City of		40,789	43,080
	Subtotal		43,681	46,285
	Central Basin Municipal Water District:			
	Bell Gardens, City of		449	475
	Bellflower Somerset Mutual Water Co.		2,185	2,003
	California Water Service Company		15,449	15,324
	Cerritos, City of		2,515	2,898
	Commerce, City of		883	515
	Downey, City of		0	--
	Huntington Park, City of		1,111	1,853
	La Habra Heights County Water District		119	434
	Los Angeles County Rancho Los Amigos		442	413
	Los Angeles County Waterworks District No.16		3,479 **	***
	Lynwood, City of		1,782	1,581
	Maywood Mutual Water Co. No. 1		147	199
	Maywood Mutual Water Co. No. 2		461	411
	Maywood Mutual Water Co. No. 3		63	225
	Montebello, City of		1,244	1,292
	Norwalk, City of		908	917
	Orchard Dale Water District		1,359	1,377
	Paramount, City of		4,323	2,258
	Park Water Company		11,996	12,468
	San Gabriel Valley Water Company		869	933
	Santa Fe Springs, City of		3,504	3,909
	Signal Hill, City of		165	679
	Southern California Water Company		7,589	9,916
	South Gate, City of		--	--
	Suburban Water Systems		1,869	2,276
	Vernon, City of		1,320	2,578
	Walnut Park Mutual Water Company		410	955
	CBMWD Subtotal		64,641	65,889
	West Basin Municipal Water District:			
	California-American Water Company		1,892	1,451
	California Water Service Co. (Dominguez)		25,190	27,836
	WBMWD Subtotal		27,082	29,287
State Water Project water and Colorado River water through MWD, and Owens River-Mono Basin	Los Angeles, City of		33,720	31,017
San Gabriel Basin groundwater	California Domestic Water Company		21,338	21,233
	San Gabriel Valley Water Company	1,454##	~~1,700~~ #	1,450 #
	Suburban Water Systems		11,497	12,353
	Whittier, City of		7,411	8,021
	San Gabriel Basin Subtotal	41,700##	~~41,946~~	43,057
	Total Imported Water	210,824##	~~211,070~~	215,535

TABLE 10. IMPORTED WATER AND RECYCLED WATER USE*
(acre-feet)

Source	Party	2002-2003	2003-2004
RECYCLED WATER	Bellfower-Somerset Mutual Water Company	118.29	125.48
Century - E. Thornton	Downey, City of	663.6	685.52
Ibbetson Reclamation	Lynwood, City of	69.56	66.56
Program	Norwalk, City of	109.07	110.85
	Paramount, City of	430.55	443.10
	Park Water Company	471	488.77
	Peerless Water Company	16.86	20.29
	Santa Fe Springs, City of	807.17	774.03
	Southern California Water Company	506.48	610.01
	South Gate. City of	161.4	177.22
	Cudahy, City of	6.96	5.03
	Century Subtotal	3,360.94	3,506.86
Cerritos Reclamation	Cerritos, City of	1,726.45	2,042.25
Program	Lakewood, City of	372.83	294.31
	Cerritos Reclamation Subtotal	2,099.28	2,336.56
Rio Hondo - Esteban E.	Huntington Park, City of	47.54	63.93
Torres Reclamation	San Gabriel Valley Water Company	64.8	76.22
Program	Whittier, City of	82.42	98.49
	Pico Rivera, City of	19.27	39.42
	Esteban E. Torres Subtotal	214.03	278.06
Long Beach	Long Beach, City of	6,084.90	5,950.75
	Total Recycled Water	11,759.15	12,072.23

* Excludes recycled water used for ground water recharge.
** Delivered for use in Alamitos Barrier Project (Water Replenishment District).
*** City of Long Beach serves Alamitos Barrier Project and delivered 5,939 acre-feet for injection.
\# Estimate.
\## Revised.

TABLE 11. TRANSFERS OF ADJUDICATED RIGHTS

Party	Transaction *	Amount in acre-feet	Date		Party	Net Lease
ANGELES ABBEY MEMORIAL PARK, INC	LEASE	-4.00	07/02/03	TO	COMPTON, CITY OF	-4.00 a/
ARTESIA CEMETERY DISTRICT	LEASE WITH FLEX	-12.00	04/14/04	TO	CERRITOS, CITY OF	-12.00
BELL GARDENS, CITY OF	LEASE WITH FLEX	-1,100.00	06/29/04	TO	SOUTHERN CALIFORNIA WATER CO.	-1,100.00
BELLFLOWER CHRISTIAN SCHOOL	LEASE	-10.00	12/02/03	TO	ROCKVIEW DAIRIES, INC	-10.00
BELLFLOWER, CITY OF	LEASE	-382.00	07/02/03	TO	PARK WATER CO	-382.00 b/
BELLFLOWER UNIFIED SCHOOL DIST	LEASE WITH FLEX	-89.00	08/20/03	TO	BELLFLOWER-SOMERSET MUTUAL WATER CO	-89.00
BELLFLOWER-SOMERSET MUTUAL WATER CO	LEASE WITH FLEX	8.00	07/17/03	FROM	ENGLER RENTALS I	
	LEASE	12.00	07/17/03	FROM	UNION DEVELOPMENT CO., INC.	
	LEASE WITH FLEX	89.00	08/20/03	FROM	BELLFLOWER UNIFIED SCHOOL DIST.	
	LEASE WITH FLEX	250.00	06/30/04	FROM	CA WATER SERVICE CO. (DOMINGUEZ)	359.00
CALIFORNIA-AMERICAN WATER CO	LEASE WITH FLEX	358.00	05/18/04	FROM	CONAGRA TRADE GROUP, INC	358.00
CALIFORNIA, STATE OF	LEASE WITH FLEX	-50.00	07/02/03	TO	TRACT 349 MUTUAL WATER CO	-50.00
CALIFORNIA WATER SERVICE CO	LEASE WITH FLEX	-4,000.00	07/02/03	TO	CERRITOS, CITY OF	
	LEASE	-250.00	01/02/04	TO	CA WATER SERVICE CO (DOMINGUEZ)	
	LEASE	-1,500.00	06/30/04	TO	COMPTON, CITY OF	
	LEASE	-80.00	06/30/04	TO	LYNWOOD PARK MUTUAL WATER CO	
	LEASE WITH FLEX	-200.00	06/30/04	TO	SOUTHERN CALIFORNIA WATER CO	-6,030.00
CA WATER SERVICE CO (DOMINGUEZ)	LEASE WITH FLEX	317.00	07/02/03	FROM	INGLEWOOD PARK CEMETERY	c/
	LEASE WITH FLEX	70.00	07/02/03	FROM	JONES CO, THE	d/
	LEASE	-275.00	07/07/03	TO	SATIVA L A COUNTY WATER DISTRICT	
	LEASE	-30.00	08/27/03	TO	ROCKY MOUNTAIN INDUSTRIES, INC	
	LEASE	250.00	01/02/04	FROM	CALIFORNIA WATER SERVICE CO	
	LEASE WITH FLEX	-250.00	06/30/04	TO	BELLFLOWER-SOMERSET MUTUAL WATER CO	
	LEASE WITH FLEX	-1,550.00	06/30/04	TO	DOWNEY, CITY OF	
	LEASE WITH FLEX	-1,000.00	06/30/04	TO	VERNON, CITY OF	-2,468.00
CANDLEWOOD COUNTRY CLUB	LEASE WITH FLEX	-147.00	07/03/03	TO	PARK WATER CO	-147.00
CERRITOS, CITY OF	LEASE WITH FLEX	4,000.00	07/02/03	FROM	CALIFORNIA WATER SERVICE CO	
	LEASE WITH FLEX	11.00	07/03/03	FROM	MITSUUCHI, MARY F TRUST	
	LEASE WITH FLEX	800.00	07/03/03	FROM	PABCO BUILDING PRODUCTS, LLC	
	LEASE WITH FLEX	27.97	08/14/03	FROM	KOTAKE, MASAO	
	LEASE WITH FLEX	11.50	08/14/03	FROM	ZANE, STEVE OR FRANCES	
	LEASE	456.00	01/30/04	FROM	COUNTY WATER CO	
	LEASE	400.00	03/04/04	FROM	SANTA FE SPRINGS, CITY OF	
	LEASE WITH FLEX	400.00	03/09/04	FROM	PARAMOUNT, CITY OF	
	LEASE WITH FLEX	12.00	04/14/04	FROM	ARTESIA CEMETERY DISTRICT	6,118.47
CERRITOS COMMUNITY COLLEGE DIST	LEASE	-147.00	07/03/03	TO	TRACT 349 MUTUAL WATER CO	-147.00
COAST PACKING CO	LEASE WITH FLEX	-390.00	09/30/03	TO	VERNON, CITY OF	-390.00

TABLE 11. TRANSFERS OF ADJUDICATED RIGHTS

Party	Transaction *	Amount in acre-feet	Date		Party	Net Lease
COMMERCE, CITY OF	LEASE	-1,000.00	07/04/03	TO	PARK WATER CO	-1,000.00
COMPTON, CITY OF	LEASE	4.00	07/02/03	FROM	ANGELES ABBEY MEMORIAL PARK, INC	a/
	LEASE	1,500.00	06/30/04	FROM	CALIFORNIA WATER SERVICE CO	1,504.00
CONAGRA TRADE GROUP, INC	LEASE WITH FLEX	-358.00	05/18/04	TO	CALIFORNIA-AMERICAN WATER CO	-358.00
COUNTY WATER CO	LEASE	-456.00	01/30/04	TO	CERRITOS, CITY OF	-456.00
DOLAN, J E+DOLAN, P A+DOLAN, T P	LEASE WITH FLEX	-2.00	07/02/03	TO	LONG BEACH, CITY OF	-2.00 e/
DOWNEY, CITY OF	LEASE WITH FLEX	1,550.00	06/30/04	FROM	CA WATER SERVICE CO (DOMINGUEZ)	1,550.00
ENGLER RENTALS I	LEASE WITH FLEX	-8.00	7/17//03	TO	BELLFLOWER-SOMERSET MUTUAL WATER CO	-8.00
G N B, INC	LEASE WITH FLEX	-62.00	07/02/03	TO	MONTEBELLO LAND AND WATER CO	-62.00
GRAHAM, HUGH W OR MARCIA K AS...	LEASE WITH FLEX	-6.00	03/04/04	TO	SOUTH MONTEBELLO IRRIGATION DIST	-6.00
INGLEWOOD PARK CEMETERY	LEASE WITH FLEX	-317.00	07/02/03	TO	CA WATER SERVICE CO (DOMINGUEZ)	-317.00 c/
JONES CO, THE	LEASE WITH FLEX	-70.00	07/02/03	TO	CA WATER SERVICE CO (DOMINGUEZ)	-70.00 d/
KAL KAN FOODS, INC	LEASE WITH FLEX	-140.00	09/30/03	TO	VERNON, CITY OF	-140.00
KING KELLY MARMALADE CO, INC	LEASE WITH FLEX	-9.00	07/04/03	TO	TRACT 349 MUTUAL WATER CO	-9.00
KOTAKE, MASAO	LEASE WITH FLEX	-27.97	08/14/03	TO	CERRITOS, CITY OF	-27.97
LAKEWOOD, CITY OF	LEASE WITH FLEX	-170.00	05/18/04	TO	SOUTH MONTEBELLO IRRIGATION DIST	-170.00
LONG BEACH, CITY OF	LEASE WITH FLEX	2.00	07/02/03	FROM	DOLAN, J E+DOLAN, P A+DOLAN, T P	e/
	LEASE WITH FLEX	9.00	07/02/03	FROM	MCLAREN, VELMA AND ARLINE K NUZUM	f/
	LEASE WITH FLEX	274.00	07/02/03	FROM	VIRGINIA COUNTRY CLUB	g/
	LEASE WITH FLEX	400.00	04/28/04	FROM	PARAMOUNT, CITY OF	685.00
LUNDAY-THAGARD OIL CO	LEASE WITH FLEX	-120.00	02/11/04	TO	MONTEBELLO LAND AND WATER CO.	-120.00
LYNWOOD PARK MUTUAL WATER CO.	LEASE	80.00	06/30/04	FROM	CALIFORNIA WATER SERVICE CO	80.00
MCLAREN, VELMA AND ARLINE K NUZUM	LEASE WITH FLEX	-9.00	07/03/03	TO	LONG BEACH, CITY OF	-9.00 f/
MELLANO, G, ET AL	LEASE WITH FLEX	-26.00	07/05/03	TO	TRACT 349 MUTUAL WATER CO	-26.00

TABLE 11. TRANSFERS OF ADJUDICATED RIGHTS

Party	Transaction *	Amount in acre-feet	Date		Party	Net Lease
MITSUUCHI, MARY F TRUST	LEASE WITH FLEX	-11.00	07/03/03	TO	CERRITOS, CITY OF	-11.00
MONTEBELLO LAND AND WATER CO	LEASE WITH FLEX	62.00	07/02/03	FROM	G N B, INC	
	LEASE WITH FLEX	300.00	07/03/03	FROM	NEWARK GROUP INDUSTRIES, INC	
	LEASE WITH FLEX	46.00	07/03/03	FROM	PARAMOUNT UNIFIED SCHOOL DISTRICT	
	LEASE WITH FLEX	1,500.00	07/03/03	FROM	SAN GABRIEL VALLEY WATER CO	
	LEASE WITH FLEX	50.00	07/09/03	FROM	WHITTIER UNION HIGH SCHOOL DIST	
	LEASE WITH FLEX	120.00	02/11/04	FROM	LUNDAY-THAGARD OIL CO	
	LEASE	400.00	06/22/04	FROM	SUBURBAN WATER SYSTEMS	2,478.00
NEWARK GROUP INDUSTRIES, INC	LEASE WITH FLEX	-300.00	07/03/03	TO	MONTEBELLO LAND AND WATER CO	-300.00
N I INDUSTRIES, INC	LEASE WITH FLEX	-138.00	09/30/03	TO	VERNON, CITY OF	-138.00
NORWALK, CITY OF	LEASE	-250.00	06/29/04	TO	PICO WATER DISTRICT	-250.00
PABCO BUILDING PRODUCTS, LLC	LEASE WITH FLEX	-800.00	07/03/03	TO	CERRITOS, CITY OF	-800.00
PARAMOUNT, CITY OF	LEASE WITH FLEX	-400.00	03/09/04	TO	CERRITOS, CITY OF	
	LEASE WITH FLEX	-400.00	04/28/04	TO	LONG BEACH, CITY OF	-800.00
PARAMOUNT UNIFIED SCHOOL DISTRICT	LEASE WITH FLEX	-46.00	07/03/03	TO	MONTEBELLO LAND AND WATER CO	-46.00
PARK WATER CO	LEASE	382.00	07/02/03	FROM	BELLFLOWER, CITY OF	b/
	LEASE WITH FLEX	147.00	07/03/03	FROM	CANDLEWOOD COUNTRY CLUB	
	LEASE	1,000.00	07/04/03	FROM	COMMERCE, CITY OF	1,529.00
PEERLESS WATER CO	LEASE WITH FLEX	-525.00	12/02/03	TO	SOUTH MONTEBELLO IRRIGATION DIST	-525.00
PICO WATER DISTRICT	LEASE	250.00	06/29/04	FROM	NORWALK, CITY OF	250.00
ROCKVIEW DAIRIES, INC	LEASE WITH FLEX	10.00	11/13/03	FROM	VANGROOTHEEST, ERNEST A	
	LEASE	10.00	12/02/03	FROM	BELLFLOWER CHRISTIAN SCHOOL	20.00
ROCKY MOUNTAIN INDUSTRIES, INC	LEASE	30.00	08/27/03	FROM	CA WATER SERVICE CO (DOMINGUEZ)	30.00
SAN GABRIEL VALLEY WATER COMPANY	LEASE WITH FLEX	-1,500.00	07/03/03	TO	MONTEBELLO LAND AND WATER CO	-1,500.00
SANTA FE SPRINGS, CITY OF	LEASE	-400.00	03/04/04	TO	CERRITOS, CITY OF	-400.00
SATIVA L A COUNTY WATER DISTRICT	LEASE	275.00	07/02/03	FROM	CA WATER SERVICE CO (DOMINGUEZ)	275.00
SIMMONS SURVIVOR'S TRUST	LEASE WITH FLEX	-33.00	07/06/03	TO	TRACT 349 MUTUAL WATER CO	-33.00

TABLE 11. TRANSFERS OF ADJUDICATED RIGHTS

Party	Transaction *	Amount in acre-feet	Date		Party	Net Lease
SMITH, REX M	LEASE WITH FLEX	-24.00	07/07/03	TO	TRACT 349 MUTUAL WATER CO	-24.00
SOUTH MONTEBELLO	LEASE WITH FLEX	525.00	12/02/03	FROM	PEERLESS WATER CO	
IRRIGATION DIST	LEASE WITH FLEX	6.00	03/04/04	FROM	GRAHAM, HUGH W OR MARCIA K AS ...	
	LEASE WITH FLEX	170.00	05/18/04	FROM	LAKEWOOD, CITY OF	701.00
SOUTHERN CALIFORNIA	LEASE WITH FLEX	1,100.00	06/29/04	FROM	BELL GARDENS, CITY OF	
WATER CO	LEASE WITH FLEX	200.00	06/30/04	FROM	CALIFORNIA WATER SERVICE CO	
	LEASE WITH FLEX	700.00	06/30/04	FROM	SUBURBAN WATER SYSTEMS	2,000.00
SUBURBAN WATER SYSTEMS	LEASE	-400.00	06/22/04	TO	MONTEBELLO LAND AND WATER CO	
	LEASE WITH FLEX	-700.00	06/30/04	TO	SOUTHERN CALIFORNIA WATER CO	
	LEASE	-400.00	06/30/04	TO	WHITTIER, CITY OF	-1,500.00
TRACT NUMBER 180 WATER CO	LEASE WITH FLEX	-300.00	07/08/03	TO	TRACT 349 MUTUAL WATER CO	-300.00
TRACT 349 MUTUAL WATER CO	LEASE WITH FLEX	50.00	07/02/03	FROM	CALIFORNIA, STATE OF	
	LEASE	147.00	07/03/03	FROM	CERRITOS COMMUNITY COLLEGE DIST	
	LEASE WITH FLEX	9.00	07/04/03	FROM	KING KELLY MARMALADE CO, INC	
	LEASE WITH FLEX	26.00	07/05/03	FROM	MELLANO, G, ET AL	
	LEASE WITH FLEX	33.00	07/06/03	FROM	SIMMONS SURVIVOR'S TRUST	
	LEASE WITH FLEX	24.00	07/07/03	FROM	SMITH, REX M	
	LEASE WITH FLEX	300.00	07/08/03	FROM	TRACT NUMBER 180 WATER CO	
	LEASE WITH FLEX	74.00	07/09/03	FROM	VERNON COLD STORAGE, LLC	663.00
UNION DEVELOPMENT CO, INC	LEASE	-12.00	07/17/03	TO	BELLFLOWER-SOMERSET MUTUAL WATER COMPANY	-12.00
VANGROOTHEEST, ERNEST A	LEASE WITH FLEX	-10.00	11/13/03	TO	ROCKVIEW DAIRIES, INC	-10.00
VERNON, CITY OF	LEASE WITH FLEX	390.00	09/30/03	FROM	COAST PACKING CO	
	LEASE WITH FLEX	140.00	09/30/03	FROM	KAL KAN FOODS, INC	
	LEASE WITH FLEX	138.00 #	09/30/03	FROM	N I INDUSTRIES, INC	
	LEASE WITH FLEX	1,000.00	06/30/04	FROM	CA WATER SERVICE CO (DOMINGUEZ)	1,668.00
VERNON COLD STORAGE, LLC	LEASE WITH FLEX	-74.00	07/09/03	TO	TRACT 349 MUTUAL WATER CO	-74.00
VIRGINIA COUNTRY CLUB	LEASE WITH FLEX	-274.00	07/02/03	TO	LONG BEACH, CITY OF	-274.00 g/
WHITTIER, CITY OF	LEASE	400.00	06/30/04	FROM	SUBURBAN WATER SYSTEMS	400.00

TABLE 11. TRANSFERS OF ADJUDICATED RIGHTS

Party	Transaction *	Amount in acre-feet	Date	Party	Net Lease
WHITTTIER UNION HIGH SCHOOL DISTRICT	LEASE WITH FLEX	-50.00	07/09/03	TO MONTEBELLO LAND AND WATER CO	-50.00
ZANE, STEVE OR FRANCES	LEASE WITH FLEX	-11.50	08/14/03	TO CERRITOS, CITY OF	-11.50

* Lease with flex: carryover provisions included with lease.

a/ Long-term lease, 1998-2008 (4.00 acre-feet)

b/ Long-term lease, 1999-2004 (382.00 acre-feet)

c/ Long –term lease 2001-2004 (317.00 acre-feet)

d/ Long-term lease, 1998-2007 between Dominguez Water Corp (original licensee) and Jones Co (licensor). Dominguez Water Corp became known as Dominguez Water Co. Dominguez Water Co was merged with and into California Water Service Co with "Dominguez" kept as a separate account known as California Water Service Co (Dominguez) (70.00 acre-feet).

e/ Long-term lease, 1998-2008 (2.00 acre-feet)

f/ Long-term lease, 1998-2008 (9.00 acre-feet)

g/ Long-term lease, 1993-2003 (274.00 acre-feet), extended to 2008 in the Second Amendment to Water Right License and Agreement WD-1992

TABLE 12. APPROVED BUDGET

Salaries, wages & Operating Expenses	417,000		
Total budget	417,000		
One-half payable by State		208,500	
One-half payable by Parties			208,500
Estimated carryover from previous year (+) deficit, (-) credit			9,000
Total amount billed			217,500

TABLE 13. APPORTIONMENT OF PARTIES' SHARE OF BUDGET 2003-2004

PARTY NAME	ACRE-FEET	Party's Apportioned Share of Budget
A B C Unified School District	298.00	$ 312.72 *
Angeles Abbey Memorial Park Inc	4.00	20.00
Artesia Cemetery District	12.00	20.00
Artesia, City of	24.00	24.00
Atlantic Richfield Company	55.00	54.98
Baker Commodities, Inc	60.00	59.97
Bell Gardens, City of	1,914.00	1,912.81
Bellflower Christian School	26.00	26.00
Bellflower, City of	382.00	381.77
Bellflower Home Garden Water Co	306.00	305.82
Bellflower Unified School District	89.00	88.96
Bellflower-Somerset Mutual Wtr Co	4,312.88	4,310.19
Buell, Mary Dolores	1.00	20.00
California-American Water Co	2,067.00	2,065.72
California, State of	50.00	49.98
California Water Service Co	11,774.00	11,766.63
California Water Service Co (Dominguez)	6,480.00	6,475.95
Candlewood Country Club	147.00	146.92
Cerritos, City of	4,680.03	4,677.11
Cerritos Community College Dist	147.00	146.92
Cerro Metal Products	1.00	20.00
Chevron USA Inc.	94.00	93.95
Coast Packing Co	530.00	529.68
Commerce, City	5,081.00	5,077.83
Compton, City of	5,723.00	6,005.39 *
County Water Co	456.00	455.73
Darling-Delaware Co, Inc	117.00	116.94
Dolan, J. E. & Dolan, P. A. & Dolan, T. P.	2.00	20.00
Downey, City of	16,553.62	16,543.25
El Rancho Unified School Dist	55.00	54.98
Emily Eastman	8.00	20.00
Farmers + Merchants Trust Co/LB	14.00	20.00
Filtrol Corp	456.00	455.73
Flesch, Elizabeth	14.00	20.00
Frampton, William H.	25.00	25.00
GNB Inc	62.00	61.97
Gordon, Robert E	4.00	20.00
Graham, Hugh W	6.00	20.00
Great Western Malting Co	358.00	357.79
Harada, George	6.00	21.00 *
Hathaway, J. Benjamin and NTBCA	8.00	20.00
Hathaway, Julian I. And Helen M., Trust	8.00	20.00
Hathaway Ranch Museum	11.11	20.00

TABLE 13. APPORTIONMENT OF PARTIES' SHARE OF BUDGET 2003-2004

PARTY NAME	ACRE-FEET	Party's Apportioned Share of Budget
Hathaway Family Survivor's Trust	11.11	$ 20.00
Huntington Park, City of	3,853.00	3,850.60
Inglewood Park Cemetery	317.00	316.81
Jeffererson Smurfit Corporation	1,058.00	1,057.35
Jones Company, The	70.00	73.47 *
Kal Kan Foods Inc	140.00	139.92
King Kelly Marmalade Co Inc	22.00	22.00
Kotake, Masao	27.97	27.97
La Habra Heights County Wtr Dist	2,498.00	2,496.45
La Hacienda Water Company	1.00	20.00
Lakewood, City of	9,423.00	9,417.10
Lincoln Memorial Park Inc	34.00	33.99
Little Lake Cemetery District	14.00	20.00
Long Beach, City of	32,684.00	32,663.48
Los Angeles, City of	15,000.00	14,990.60
Los Angeles County Ran Los Amigos	490.00	489.71
Los Angeles Paper Box +Brd Mills	257.00	256.85
Lunday-Thagard Oil Co	212.00	211.88
Paul H. Lussman Jr., et. al.	7.00	20.00
Lynwood, City of	5,337.00	5,333.66
Lynwood Park Mutual Water Co	222.00	221.87
McLaren, Velma and Arline K Nuzum	9.00	20.00
Martin, Mary	28.00	27.99
Maywood Mutual Water Co No 1	741.00	740.55
Maywood Mutual Water Co No 2	912.00	911.44
Maywood Mutual Water Co 3	1,407.00	1,406.13
Mellano, G. et al	13.00	20.00
Midland Park Water Trust	57.00	56.98
Mitsuuchi, Fumiko Mary	11.00	20.00
Montebello, City of	386.50	386.27
Montebello Land and Water Co	1,624.00	1,622.99
Newark Group Industries Inc	757.00	756.54
N I Industries, Inc	138.00	137.93
Norwalk, City of	1,267.00	1,266.22
Norwalk La Mirada Unified School Dist	378.00	377.78
Orange County Nursery, Inc.	13.00	20.00
Orchard Dale Water District	1,107.00	1,106.32
PABCO Bldg Produts Inc	800.00	799.51
Paradise Memorial Park	16.00	20.00
Paramount, City of	5,883.00	5,879.32
Paramount Unified School District	46.00	45.98
Park Water Co	1.30	20.00
Patrician Associates Inc./Majestic Realty	12.00	20.00

TABLE 13. APPORTIONMENT OF PARTIES' SHARE OF BUDGET 2003-2004

PARTY NAME	ACRE-FEET	Party's Apportioned Share of Budget
Peerless Water Company	986.00	$ 985.39
Pico Boys Baseball Inc	13.00	21.00 *
Pico Water District	3,624.00	3,621.74
Pico Rivera, City of	5,579.00	5,575.51
Randall, Villis Family Trust	4.00	20.00
Rockview Dairies Inc	75.00	74.97
Roman Catholic Archbishop of L A	347.00	346.79
St John Bosco School	42.00	41.99
San Gabriel Valley Water Co	2,616.00	2,614.37
Santa Fe Springs, City of	4,035.78	4,033.26
Sativa L A County Water District	474.00	473.72
Scantlebury, Robert P.	4.00	21.00 *
Seven-Up/RC Bottling Co. of So. Calif.	69.00	68.97
Signal Hill, City of	2,022.00	2,020.74
Simmons, Survivor's Trust	33.00	32.99
Smith, Rex, M.	24.00	24.00
South Montebello Irrigation Dist	1,268.00	1,267.22
Southern California Edison Co	670.00	669.59
Southern California Water Co	16,439.20	16,428.90
Southern Service Co + Environ Inc	65.00	64.97
South Gate, City of	11,183.00	11,176.00
Suburban Water Systems	3,721.00	3,718.68
Tract Number 180 Water Co	2,137.00	2,135.67
Tract Number 349 Water Co	423.00	422.75
Bobby Ray Robertson, Jr. (Tucker)	8.00	20.00
Union Development Co	12.00	20.00
United States Gypsum Co.	1,265.00	1,264.22
Vangrootheest, Ernest A	10.00	20.00
Vernon, City of	8,039.00	8,033.97
Vernon Cold Storage, LLC	74.00	73.97
Virginia Country Club	274.00	273.84
Walnut Park Mutual Water Co	996.00	995.39
Whittier, City of	895.00	894.45
Whittier Union High School Dist	100.00	104.95 *
Yamamoto, George and Alice	14.00	21.00 *
Zane, Steve or Francis	11.50	20.00
TOTALS	**217,259.00**	**$ 217,813.36**

* A total of $313.36 was collected for late payments.

APPENDIX A

CONTINUING HISTORY OF WATERMASTER SERVICE

History of Water Resources Development

More than one hundred years ago the Los Angeles Coastal Plain was on the threshold of a sharp increase in population. The key to its future was water.

A shortage of sufficient year-round surface water in the Central Basin forced the development of groundwater sources. As early as 1870, water users had tapped the artesian wells and springs east of the Newport-Inglewood Uplift. When those wells stopped flowing, users were forced to drill shallow wells, which supplied enough water to continue development and economic growth.

Groundwater development increased dramatically in 1909 with the advent of the deep-well turbine pump. Its tremendous adaptability and superior operating characteristics provided efficient water wells within economic reach of everyone. In time, the availability of reliable water supplies attracted industry and agriculture. Eventually, however, the demand for groundwater exceeded the natural replenishment of the Central Basin.

The resulting overdraft affected the groundwater basin by lowering the water levels and by causing oceanfront areas to be subjected to sea water intrusion.

The deteriorating groundwater situation in the Central Basin and in the adjoining West Coast Basin led to the formation of the Central Basin Water Association in 1950, similar to the water association in the West Coast Basin. This led to a plan to achieve the following results:

1. Provide supplemental water to major producers;

2. Limit groundwater extractions from the Central Basin; and

3. Create an exchange water pool to provide groundwater pumping rights for users lacking access to other supplemental water supplies.

Step 1 was realized in 1952 when the Central Basin Municipal Water District was formed to distribute water from the Colorado River. The district was annexed to The Metropolitan Water District of Southern California (MWD) in 1954, and Colorado River water soon flowed into the Central Basin. State Water Project water was first delivered in 1973.

The West Basin and the Central Basin Water Associations were largely responsible for the creation of the Central and West Basin Water Replenishment District (CWBWRD) in 1959. This special district covers 420 square miles of the Central and West Coast Basins (Coastal Plain) of Los Angeles County. Its objective is to replenish and maintain the groundwater basins by purchasing imported water, recharging the basins, and halting sea water intrusion.

On January 2, 1962, the CWBWRD filed Case No. 786,656 in the Superior Court, County of

Los Angeles, naming more than 700 parties as defendants. It sought to obtain quiet title to rights to the use of groundwater, to secure a judicial definition of each right as against each and every other right involved, and to regulate withdrawals from the Central Basin to protect the water supply from deterioration.

Adverse groundwater conditions and the indefinite period before final adjudication prompted the Central Basin Water Association to draft an interim agreement curtailing extractions from the Basin. By September 1962, the proposed agreement had been approved by a sufficient number of water producers (producers owning over 75 percent of the Assumed Relative Rights within the Basin) to guarantee control over groundwater pumping in the Basin. On September 28, 1962, the Court signed the "Order Pursuant to Stipulation and Interim Agreement and Petition for Order" and appointed the Department of Water Resources (DWR) as Watermaster.

To avoid the protracted litigation experienced by other Watermaster service areas in Los Angeles County, the attorneys representing principal parties held monthly meetings to work out a settlement. A stipulated judgment was drafted. Approval by public utility water companies and other producers represented well over 200,000 acre-feet, 75 percent, of the total rights within the Basin. This was a prerequisite to filing the stipulated judgment with the Court.

A pretrial hearing was held in March 1965, and on May 17, 1965, the case went to trial before Judge Edmund M. Moor. After a week's testimony on engineering, geology, hydrology, and safe yield of the Basin and arguments on water right entitlement, the case was continued to August 25, 1965. Shortly thereafter, Judge Moor appointed DWR as Watermaster. The final Judgment was signed on October 11, 1965 and became effective on October 1, 1966.

The Judgment was for the first time amended on March 21, 1980, to provide for a transition in the administrative year from a water year (October 1 to September 30) to a fiscal year (July 1 to June 30). Under the Judgment, this transition in turn contained a "short" administrative year of nine months -- October 1, 1980, to June 30, 1981. The administrative year starting July 1, 1981, was on a fiscal year basis.

The Judgment was again amended on July 9, 1985, modifying the annual budget ($20 minimum assessment) and exchange pool provisions. The second amended Judgment of May 6, 1991, modified the carryover and overproduction provisions (to 20 percent or 20 acre-feet from 10 percent or 10 acre-feet), defined drought carryover, and provided for exemptions for extractors of contaminated groundwater.

On January 12, 2001 by order of Watermaster, the Water Replenishment District of Southern California issued Non-Consumptive Use Permit No. 2000-01 to the Southeast Water Coalition for the "Central Basin Early Remediation Project" to remedy or ameliorate groundwater contamination that originated in the San Gabriel Valley and that has moved into the northeast portion of the Central Groundwater Basin.

Watermaster Service

Watermaster Service is administered by DWR in accordance with Part 4, Division 2, of the California Water Code. Watermaster service areas are created by DWR, either at the request of water users or by order of the Superior Court. The first Watermaster service area was formed in September 1929.

Once a month, every groundwater pumper reports its extractions to the Watermaster. This makes it possible to update the water right account (Watermaster Water Production Summary) by computing the amount pumped during the previous month, the amount pumped during the current fiscal year, and the amount that can legally be pumped during the remainder of the year. A copy of the Watermaster Water Production Summary is mailed to the pumper each month.

If electric meter readings are reported along with water meter readings, electric power consumption can be correlated with water production. Erratic or rapidly increasing electric power consumption vs. water production, for instance, may suggest an inefficient pump, system losses, or an inaccurate or malfunctioning water meter.

The Watermaster's field staff schedules tests to determine water meter accuracy on every active well. Large systems are tested at least once every two years. Accurate measurement of groundwater extractions is absolutely necessary for the success of the Basin's management plan. All available means, including system efficiency tests, are used to confirm water meter test results. Results of each test are furnished to the well owner. If a meter is inaccurate beyond plus or minus 5 percent, it must be repaired within 30 days. Follow-up tests on repaired meters and initial tests on new meters are scheduled whenever necessary. Parties may also request a meter test at any time.

Water Replenishment District of Southern California

The Central and West Basin Water Replenishment District changed its name to Water Replenishment District of Southern California (WRD). WRD is an active water conservation organization in Los Angeles County. It is responsible for replenishing the groundwater supply to both the Central and West Coast Basins.

The creation of water replenishment districts is a statutory procedure established by the Legislature. Division 18 of the California Water Code describes the duties and obligations of such a district, which has powers well suited to solving groundwater problems, whether they be quality- or quantity-oriented.

WRD is comprised of a Board of Directors and a small staff. It is actively engaged in several replenishment programs. These programs, (i.e., water spreading, barrier operation, and in-lieu replenishment), are described in this report. WRD also publishes an annual report of its operations. (Additional information may be obtained from its staff, 12621 East 166th Street, Cerritos, CA 90703, phone 562-921-5521).

The Watermaster cooperates closely with WRD for the following reasons: (1) Watermaster service areas in the Central and West Coast Basins closely match the district boundaries;

(2) both WRD and the Watermaster are required to record all groundwater extractions from the Basins; (3) WRD was the plaintiff in the Central Basin Water Right Case (Case No. 786,656, Superior Court, Los Angeles County); and (4) both WRD and the Watermaster are concerned with the usefulness of the groundwater basins in the Coastal Plain. Many of the Watermaster's data collection programs are coordinated with the WRD to prevent duplication. Hence, monthly or quarterly water well production reports are sent to the Watermaster through WRD.

Water from many sources is required to serve the needs of Southern California's thriving urban economy. Water from the Colorado River, the Owens River-Mono Basin, and Northern California; runoff from local mountains, local groundwater, and reclaimed water contribute to the water supply.

Local precipitation on the Basin has only a small direct influence on the recharge of groundwater supply in the Central Basin because a layer of impermeable material lies between the surface and the producing aquifers, except in the forebay areas. As a consequence, very little of the rain which falls directly on the Basin reaches the zones where it can be pumped back to the surface.

Groundwater Recharge

Natural replenishment of the Basin's groundwater supply is largely from surface inflow through Whittier Narrows (and some underflow) from the San Gabriel Valley. Some of the water that percolates into the forebay areas of the Central Basin eventually crosses the barrier between the Central Basin and the West Coast Basin and flows into the West Coast Basin.

Outflow and extractions have exceeded natural replenishment. Extractions controlled by the Judgment are fairly constant year to year. Today, attempts are made to reestablish nature's balance by natural, artificial, and in-lieu replenishment.

In one common method of replenishment, water spreading, water is flooded on areas where it can percolate into the underground aquifers and can supplement the natural recharge supply. Large quantities of water can be returned to the ground by spreading, but the process is limited by the space available for facilities for spreading and by the ability of the recharge aquifers to percolate water back to the Basin. Imported water purchased from the Metropolitan Water District and recycled water from the Whittier Narrows and the San Jose Creek Water Reclamation Plants are used for artificial recharge.

In-Lieu Replenishment

During the 1965-66 water year, WRD began a program of in-lieu replenishment. The program is authorized by Section 60230 of the California Water Code. In effect, WRD was given the power to contract with any producer having access to supplemental water that can be used instead of pumping water from the ground.

The program may be used to achieve the following purposes: alter pumping patterns within a groundwater basin; replenish areas of low transmissivity where conventional recharge

techniques are ineffective; heighten the effect of injecting water to form a sea water barrier by reducing extractions in the vicinity; reduce the amount of replenishment water purchased by WRD; and reduce the annual extractions from a groundwater basin (See Table 9).

Alamitos Barrier Project

The Alamitos Barrier Project (Figure 4 and Table 6), designed to prevent sea water intrusion into the fresh water aquifers of the Central Basin, is of great importance to water users in the Central Basin.

Sea water intrusion at the mouth of the San Gabriel River (Alamitos Gap) poses a serious threat to the groundwater supply. This area has seven water-bearing zones identified in downward order as the Recent aquifer, C Zone, B Zone, A Zone, I Zone, Main (Silverado) aquifer, and Lower Zone (Sunnyside) aquifer.

Sea water intrusion occurs through the Recent aquifer, which is very permeable and open to the sea. The C, B, A, and I Zones merge with the Recent aquifer and are, therefore, susceptible to intrusion, as can be noted by the varying degrees of salinity occurring in the water in each zone. The saline water intrusion has been detected as far as 10,000 feet landward of the Newport-Inglewood fault zone and, if unchecked, the intrusion could extend into the Silverado and Sunnyside aquifers, which are the principal groundwater-producing zones in the Basin.

The Los Angeles County Department of Public Works operates a barrier comprised of a saline water extraction trough and a fresh water injection pressure ridge to halt intrusion. addition to the extraction wells and injection wells required, a number of observation wells are also part of the project. These provide data along the barrier and are used to monitor groundwater levels and water quality in this area.

The information from this monitoring program will be utilized in determining if additional barrier facilities are necessary. Since operation of the barrier began in 1965, the sea water intrusion problem has been contained.

Basinwide Water Quality Monitoring

In compliance with Title 22 of the California Administrative Code, the Central Basin Water Association is involved in a basinwide plan to monitor the quality of water being pumped for domestic use.

Primary enforcement responsibility of the 1974 National Drinking Water Act, as embodied in the National Interim Primary Drinking Water Standards, was given to the states. California has assumed primary enforcement responsibility through passage of Senate Bill 1078, signed by the Governor in October 1976.

Groundwater Levels

Every water well owner in the Central Basin is concerned with groundwater levels because the cost of pumping water is largely dependent on the distance it must be lifted. Energy costs have risen dramatically and are expected to continue to rise in the foreseeable future.

Figure 6 shows water level information in the form of selected hydrographs. The hydrographs are representative of water levels in wells producing from several aquifers underlying the Basin. Additional water level information is contained in WRD's annual report.

Prior to 1961, groundwater from the Basin satisfied most of the demand. However, the Judgment reduced extractions to 217,367 acre-feet annually, so imported water has become a major component of the area's water supply.

Figure 7 illustrates the groundwater extractions and imported water use from 1957-58 to the present, less San Gabriel Valley imports. Much of the increase in demand for imported water during the mid-1960s may be attributed to the curtailment of groundwater extractions. Since the early l970s the demand for imported water has leveled off.

Groundwater Extractions

The Central Basin Judgment limits the amount of groundwater each party can extract annually from the Basin (Appendix B). This limit is referred to as the "Allowed Pumping Allocation" (APA). Recipients of Exchange Pool water may pump the amount released to them in addition to their APA.

The monthly groundwater production from each active well in the Basin is listed by Party in Appendix C. Water wells producing less than 25 acre-feet per year do not require a meter and their production, which may be reported on a quarterly basis, is also included in Appendix C. Wells where groundwater was extracted are shown on Plate 1.

To provide flexibility in the control of groundwater extractions, the Judgment contains provisions allowing the parties to carry over into the succeeding water year a portion of their unused water rights and in some cases to overextract. This flexibility was necessary to meet unforeseen emergencies in water demand.

One provision allows parties to carry over from one water year to another any unused APA not to exceed 20 percent of their APA or 20 acre-feet, whichever is greater*. In addition, any unused Exchange Pool water can be carried over into the following fiscal year.

Parties are also allowed to overextract by 20 percent of their APA or 20 acre-feet, whichever is greater. Under certain circumstances, parties may overextract in greater amounts; however, prior approval by the Watermaster must be obtained. In any case, the

*This provision of the Judgment was amended to permit all parties full 100 percent carryover from 1976-77 and 1977-78 because of the drought.

overextraction must be made up the following fiscal year unless Watermaster grants relief due to an unreasonable hardship; such relief can be prorated over a 5-year period.

Water Well Identification

A State Well Number identifying water wells in the Central Basin is derived from a system based on the U. S. Public Land Survey. Each number consists of township and range designations, a section number, a letter representing the 40-acre tract in which the well is situated, a sequence number indicating the chronological order in which the well number was assigned, and a letter representing the base and meridian. The last letter is frequently omitted from well numbers in a single area because all wells there share a single base and meridian. The components of Well 3S/11W-12C03S, for example, are identified in Figure 8.

Well numbers are assigned and recorded by the Department of Water Resources. In addition, information on each well shown on Plate 1 is maintained in the Watermaster's office.

ADMINISTRATION OF JUDGMENT

The Central Basin Judgment contains provisions for the parties to obtain additional pumping rights, to exceed entitled extractions, or to vary annual pumping. The procedure thus established is described below.

Exchange Pool

The Court and parties foresaw that adjudicating the water rights in the Central Basin and limiting the total extractions would not suffice for all parties. For this reason, Part III, Subpart C of the Judgment authorizes an Exchange Pool to provide additional water rights for parties without a supplementary supply.

On or about July 1 of each year, the Watermaster mails an Exchange Pool form to each party, requesting that the form be completed and returned to the Watermaster by August 9. The form provides for making mandatory offers of water rights to the pool, referred to as "Required Subscription" in the Judgment; voluntary offers referred to as "Voluntary Subscription"; and making requests for water rights from the pool. In completing the form, the member must estimate his water needs and supply for the, ensuing fiscal year.

Requests

A request for Exchange Pool water rights may be made when a Party's estimated needs exceed its total supply, including leases. A Category (a) Request is defined as that quantity requested by a member not in excess of 150 percent of his APA or 100 acre-feet, whichever is greater. Category (b) Requests are those which exceed the 150 percent or 100-acre-foot limitation. Whenever there are insufficient Voluntary Subscriptions to meet all Category (a) Requests, Required Subscriptions may be used. All Category (a) Requests shall be filled first before any Category (b) Requests are filled. Category (b) Requests are filled first by any remaining Voluntary Subscriptions before the Required Subscriptions are used.

A Required Subscription can be made to the pool when a member has a connection to supplementary water and can obtain imported water from MWD or the Central and West Basin Municipal Water District. The Required Subscription is limited to 20 percent of the member's APA, except that the Required Subscription, plus the party's water needs for the year, cannot exceed the party's total supply.

A Voluntary Subscription can be made by any member of the Exchange Pool. The only requirement is that the member's supply must exceed its estimated needs and only the difference between the member's supply and needs may be offered.

However, the Watermaster must first allocate all the Voluntary Subscriptions before using the Required Subscriptions in filling Category (a) Requests and Category (b) Requests.

Experience has shown that Voluntary Subscriptions have always been sufficient to meet all the Category (a) Requests; as a result, no Required Subscriptions have been used to fill Category (a) Requests.

The price charged for Exchange Pool water rights is fixed by Part III, Subpart C, Paragraph 10 of the Judgment. This provision was amended by the Court order on July 9, 1985. The price is now based primarily on: (a) the weighted daily normal price as of the beginning of the administrative year charged by the Central Basin Municipal Water District for treated MWD water used by the exchangers during the preceding fiscal year (July 1 - June 30); (b) less the incremental cost of pumping water in the Basin at the beginning of the administrative year determined by Southern California Edison Company's schedule PA-1 rate multiplied by 560 kilowatt-hours per acre-foot rounded to the nearest dollar; and (c) less the current replenishment assessment. Because item (a) varies among exchangers and items (b) and (c) vary from year to year, the cost of Exchange Pool water will likewise vary among exchangers and from year to year.

Exchange Pool Carryover

The Judgment provided that the parties be allowed to pump their entire exchange-water-right purchases, regardless of the provisions limiting carryover of water rights. Therefore, a specific exchange water carryover provision was drafted and included in the Judgment.

The provision specifically allows a party who purchased exchange water to carry over the unpumped portion of its allowable extraction into the next succeeding administrative year. The carryover cost is authorized by the Judgment and is based on the difference in the prices of Exchange Pool water between the year the water was purchased and the succeeding year.

Transfers of Allowed Pumping Allocations

The Central Basin Exchange Pool is not the only method of obtaining additional pumping rights. Each water year, there are many water-right leases and sales between parties.

In Appendix B there are also recorded sales of water rights between parties and the current ownership of Allowed Pumping Allocations by each of the parties as of June 30.

Suggested samples of water right lease and sale agreements are illustrated in Appendix B. The Watermaster recommends that all documents be prepared on an 8-1/2 x 11-inch sheet of paper. Any necessary additions to the recommended agreement may be attached on another page. These sample documents do not have to be used, but they are sufficient for most purposes.

When property on which water rights have been developed is sold, the Watermaster must be furnished a copy of the sale document. The sale document is required for the proper accounting of the water rights. The Watermaster assumes that the water rights pass to the new owner unless ownership of the water rights is specifically reserved in the sale document.

In leasing, buying, or selling water rights, parties should be specific as to the type, i.e., Total Water Right or Allowed Pumping Allocation. All leases should be entered into on the basis of Allowed Pumping Allocation, whereas sales should specify both amount of Total Water Right and amount of Allowed Pumping Allocation, each to the nearest whole acre-foot. All water-right leases should be made on a fiscal year basis, i.e., July 1 of one calendar year through June 30 of the following year.

The Watermaster keeps a list of parties who have interest in buying, selling, or leasing water rights. Any party wishing to be listed should call the Watermaster. This is a courtesy to assist parties unable to resolve problems regarding an excess or deficiency of water rights. Watermaster will make no recommendation regarding transactions conducted relative to the use of this service. The names of all parties using this service are available in the Watermaster's office and may be obtained by telephone or by a visit to the office.

Overextractions

Each year some parties extract more groundwater from the Central Basin than they are entitled to. The overextractions are usually small and are usually within the tolerance set by the Judgment. Each party may overextract by 20 acre-feet or 20 percent of its Allowed Pumping Allocation, whichever is greater, on the premise that the overextraction will be eliminated during the following fiscal year. Any overextractions above this limit must have prior approval of the Watermaster. Most overextractions are caused by unexpected increases in water demand, so it would be unreasonable not to allow some deviation from the limits and guidelines of the Judgment.

Findings and Determinations by Watermaster

From time to time, the Watermaster evaluates historical groundwater production records of parties at the request of the parties or at the Watermaster's discretion. In some instances, the evaluations and findings result in minor uncontested changes in the production records; which may be to the benefit of or to the detriment of the party.

Carryover of Allowed Pumping Allocation

The provision in the Judgment (Subpart A, Part III)* relative to allowable carryover of unused water rights states in part: "Each party ... who ... does not extract ... a total quantity equal to such party's Allowed Pumping Allocation for the particular Administrative year ... is permitted to carry over from such Administrative year the right to extract from Central Basin in the next succeeding Administrative year so much of said total quantity as it did not extract .... not to exceed 20% of such party's Allowed Pumping Allocation, or 20 acre-feet, whichever ... is the larger." (Underlining added.)

The method of computing the carryover and allowable overextractions was changed, effective in the 1972-73 fiscal year. It is now assumed that, when not specifically passed to the lessee by the lease document, the amount leased is not deducted from the lessor's Allowed Pumping Allocation for computing the carryover or allowable overextraction. All future lease documents must contain a statement as to which party receives the benefit of the amount leased for computing carryover or overextractions. Item (5) in suggested Water Right License and Agreement is sufficient for this requirement (see Appendix B).

Cost of Watermaster Service

The Judgment requires that the Watermaster prepare and mail a copy of the tentative budget to each of the parties at least 60 days before the beginning of each fiscal year. If no objections are received within 15 days after submitting the budget, it becomes final.

The administrative cost chargeable to the parties was apportioned among the parties as directed by the Judgment. The Judgment provides that, if the amount to be assessed to each party of the final budget is equal to or less than $20 per party, the cost shall be equally apportioned among the parties. However, if the party's share of the budget is greater than $20, each party will be assessed a minimum of $20 and the total amount collected will be deducted from the parties' share of the budget. The balance to be collected is then assessed among the parties in proportion to their Allowed Pumping Allocations.

* This provision of the Judgment was amended because of the drought to permit all 206 parties full carryover for the 1976-77 and 1977-78 fiscal years.

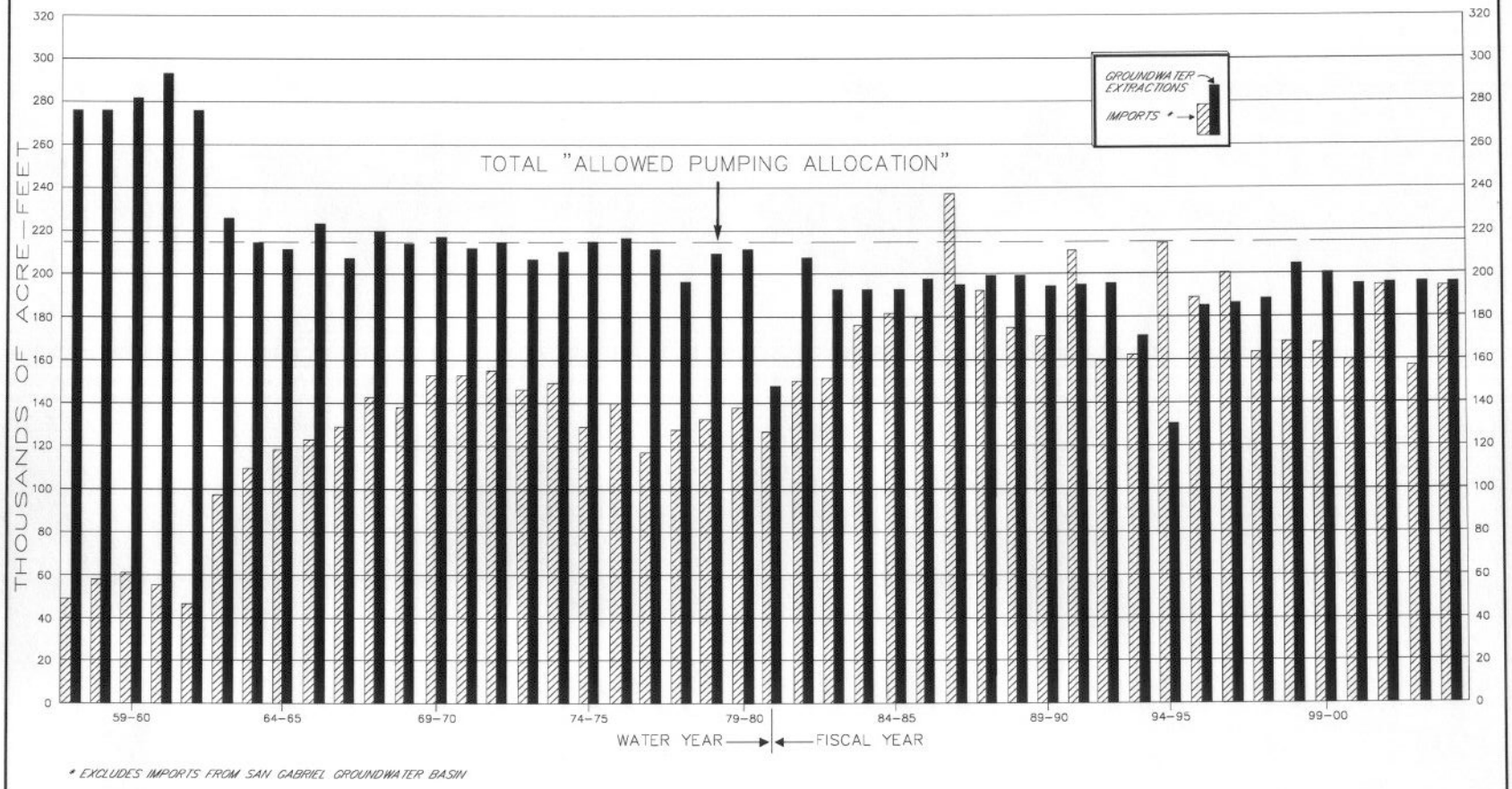
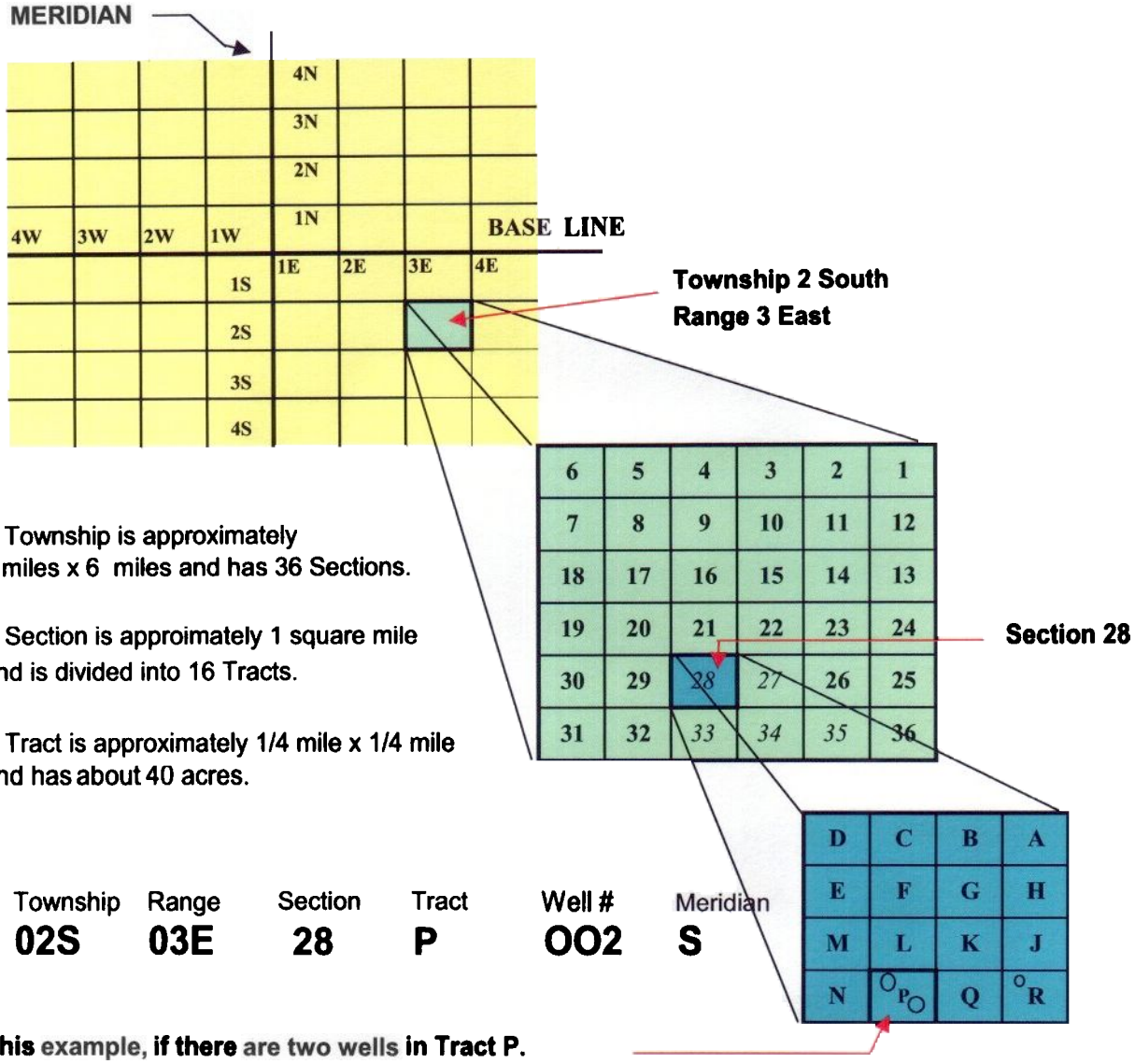


FIGURE 7 – HISTORICAL GROUNDWATER EXTRACTIONS AND USE OF IMPORTED WATER BY PARTIES
CENTRAL BASIN

FIGURE 8 - STATE WELL NUMBER SYSTEM



- o A Township is approximately 6 miles x 6 miles and has 36 Sections.
- o A Section is approimately 1 square mile and is divided into 16 Tracts.
- o A Tract is approximately 1/4 mile x 1/4 mile and has about 40 acres.

Township	Range	Section	Tract	Well #	Meridian
02S	03E	28	P	OO2	S

In this example, if there are two wells in Tract P.

APPENDIX B

SUCCESSION OF ALLOWED PUMPING ALLOCATION IN CENTRAL BASIN, JUNE 2004

SUGGESTED SAMPLES OF DOCUMENTS FOR TRANSFERRING WATER RIGHTS

YEARLY LEASE

WATER RIGHT LICENSE AND AGREEMENT

For a valuable consideration, THE JOHN DOE COMPANY hereby grants to JOHN SMITH: a license to extract _____ acre-feet of Licensor's Allowed Pumping Allocation allocated to Licensor (or predecessors in interest) under and pursuant to Judgment dated October 11, 1965, and entered in Los Angeles Superior Court Case No. 786,656 entitled "Central and West Basin Water Replenishment District vs. Charles E. Adams, et al." during the period commencing July 1, 20____ and continuing to and including June 30, 20____.

Said License is granted subject to the following conditions:

(1) Licensee shall exercise said right and extract the same on behalf of Licensor during the period above specified and put the same to beneficial use and Licensee shall not by the exercise hereunder of said right acquire any right to extract water independent of the rights of Licensor.

(2) Licensee shall pay assessments levied on the pumping of said ground waters by the Water Replenishment District of Southern California.

(3) Licensee shall notify the District and the Watermaster that said pumping was done pursuant to this license and provide the Watermaster with a copy of this document.

(4) Licensee shall note, in any recording of water production for the period of agreement, that said pumping was done pursuant to this license.

(5) Licensee's Allowed Pumping Allocation _____
(shall) (shall not)
be increased by the amount hereby leased when computing carryover or allowable overextraction as provided by Part III, Subpart A and B in said Judgment.

THE JOHN DOE COMPANY warrants that it has _____ acre-feet of Allowed Pumping Allocation and that it has not pumped and will not pump or permit or license any other person to pump any part of said _____ acre-feet during the period of July 1, 20____ through June 30, 20____.

Dated: _____

JOHN SMITH

By _____

Title _____

THE JOHN DOE COMPANY

By _____

Title _____

PERMANENT TRANSFER

DEED OF WATER RIGHTS

For a valuable consideration, JOHN SMITH hereby sells and transfers to THE JOHN DOE COMPANY:

The Right to extract _____ acre-feet of grantor's Allowed Pumping Allocation (_____ acre-feet of Total Water Right) allocated to grantor (or predecessors in interest) under and pursuant to Judgment dated October 11, 1965 and entered in Los Angeles Superior Court Case No. 786,656 entitled "Central and West Basin Water Replenishment District vs. Charles E. Adams, et al."

Dated: _____

THE JOHN DOE COMPANY

By _____

Title _____

JOHN SMITH

By _____

Title _____

SUCCESSION OF ALLOWED PUMPING ALLOCATION IN CENTRAL BASIN-JUNE 2004 (in acre-feet)

There were no ownership changes this fiscal year.
See 2003 Annual Report for details

APPENDIX C

GROUNDWATER EXTRACTIONS

PARTIES REPORTING MONTHLY AND PARTIES REPORTING QUARTERLY

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG-NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
ABC UNIFIED SCHOOL DISTRICT														
0020														
03S/12W-25J01S	NEMUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/11W-06Q02S	TETZL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/11W-07C01S	ART2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/11W-07N03S	KISCH	6.10	5.21	3.65	3.82	1.42	1.10	0.71	1.21	1.18	1.63	3.55	6.68	36.26
04S/11W-07R03S	MESCH	0.47	0.95	0.96	2.26	1.39	0.25	0.19	0.22	0.19	0.73	1.44	2.53	11.58
PARTY TOTALS:		6.57	6.16	4.61	6.08	2.81	1.35	0.90	1.43	1.37	2.36	4.99	9.21	47.84
ARTESIA, CITY OF														
0160														
03S/11W-31N02S	1	4.41	4.35	3.15	2.32	1.39	0.63	0.49	0.82	1.61	2.61	4.13	3.47	29.38
ASHLAND CHEMICAL CO														
0182														
03S/11W-05G02S	EX-1	0.00	0.00	0.00	0.00	0.13E	1.71	1.90	1.32	0.68	0.78	0.00	1.09	7.61
03S/11W-05G03S	EX-2	0.00	0.00	0.00	0.00	0.06E	1.47	1.13	1.04	1.65	0.18	0.00	1.33	6.86
03S/11W-05G04S	EX-3	0.00	0.00											0.00
03S/11W-05K04S	EX-4						0.48	0.53	0.29	0.01	0.00	0.00	0.08	1.39
03S/11W-05K05S	EX-5					0.09E	0.26	0.17	0.15	0.05	0.00	0.00	0.04	0.76
PARTY TOTALS:		0.00	0.00	0.00	0.00	0.28	3.92	3.73	2.80	2.39	0.96	0.00	2.54	16.62
BELL GARDENS, CITY OF														
0387														
02S/12W-28A04S	3F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-28M02S	1	90.32	76.18	79.86	77.08	63.98E	59.69	63.42	55.66	65.54	65.05	83.92	69.38	850.08

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG-NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
PARTY TOTALS:		76.18		77.08		59.69		55.66		65.05		69.38		
		90.32		79.86		63.98		63.42		65.54		83.92		850.08
BELLFLOWER CHRISTIAN SCHOOL														
0400														
03S/12W-35B01S	VCHS	1.49E	1.30E	1.97E	1.30E	1.10E	1.16E	0.82E	0.63E	0.92E	1.13E	1.01E	0.00	12.83
BELLFLOWER HOME GARDEN WATER CO														
0420														
03S/12W-28N02S	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-28P06S	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-28P07S	2	31.30	32.20	31.05	28.71	26.31	27.77	23.63	25.09	28.75	30.07	27.97	27.85	340.70
PARTY TOTALS:			32.20		28.71		27.77		25.09		30.07		27.85	
		31.30		31.05		26.31		23.63		28.75		27.97		340.70
BELLFLOWER-SOMERSET MUTUAL WTR CO														
0445														
03S/12W-22G02S	00949	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-22M02S	09884	22.72	20.92	12.16	11.90	11.56	8.89	7.89	7.77	7.62	7.25	12.29	6.53	137.50
03S/12W-23E04S	02587	61.46	60.30	56.86	57.36	36.39	43.94	37.77	59.88	54.06	52.67	63.24	56.46	640.39
03S/12W-26C02S	00944	29.00	83.77	79.78	84.89	72.64	78.69	83.67	44.93	89.52	81.52	57.23	37.67	823.31
03S/12W-27B01S	09833	104.58	123.63	117.79E	124.00	94.29	63.71	50.92	34.09	34.10	74.97	116.99	114.15	1053.22
03S/12W-27C02S	00759	51.52	48.75	40.05E	47.98	48.24	47.60	36.92	45.82	50.42	32.60	53.70	49.01	552.61
03S/12W-27H02S	09903	59.36	50.18	50.94	12.66	21.30	27.27	7.38	8.12	10.30	10.42	12.33	10.61	280.87
03S/12W-27R01S	00955	67.91	66.84	64.66	65.20	64.59	66.49	66.47	62.57	66.43	63.72	63.91	61.91	780.70
03S/12W-28H03S	00767	0.00	0.00	0.00	0.00									0.00
03S/12W-33B01S	02615	52.54	50.66	48.63	14.68	35.56	35.17	28.50	55.98	59.88	57.16	57.35	55.29	551.40
PARTY TOTALS:			505.05		418.67		371.76		319.16		380.31		391.63	
		449.09		470.87		384.57		319.52		372.33		437.04		4820.00
CALIFORNIA-AMERICAN WATER CO														
0679														
02S/14W-10Q02S	CREN	84.43	83.85	101.22	49.86	22.30	8.47	0.09	0.55	9.05	14.39	23.40	32.76	430.37
02S/14W-14C05S	VERN2	0.00	0.00	0.00	7.85	28.08	50.86	98.92	65.76	72.49	61.31	29.43	25.06	439.76
02S/14W-14C06S	VERN3	62.25	60.65	64.70	56.92	27.88	1.51	58.59	53.91	39.29	50.20	62.20	67.18	605.28
02S/14W-14C07S	48THS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/14W-14F02S	ARL	104.69	84.20	114.75	90.32E	106.57	106.08	145.37	85.75	40.48	25.71	36.51	93.65	1034.08
PARTY TOTALS:			228.70		204.95		166.92		205.97		151.61		218.65	
		251.37		280.67		184.83		302.97		161.31		151.54		2509.49

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG-NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
CALIFORNIA, STATE OF (CALTRANS)														
0690														
03S/12W-15F03S	3D1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-15F04S	3D2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-15G06S	4D1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-15H03S	4D2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-15H04S	4D3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-15H05S	4D4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-17E01S	1D1	13.94	4.74	8.25	0.00	0.00	6.33	0.00	1.08	0.00	0.00	0.00	0.00	34.34
03S/12W-17E02S	1D2	7.82	0.00	1.07	0.79	0.79	3.75	0.00	4.30	0.00	1.18	0.00	0.00	19.70
03S/12W-17E03S	1D3	6.10	0.00	11.74	0.00	0.00	0.00	7.47	0.00	25.26	0.00	0.00	0.00	50.57
03S/12W-17E04S	1D4	40.67	41.51	39.51	55.24	43.18	38.47	52.53	51.63	40.39	47.26	37.98	35.65	524.02
03S/12W-17E05S	1D5	24.47	0.00	26.04	0.00	23.30	0.00	26.20	0.04	21.07	0.00	21.55	0.00	142.67
03S/12W-17E06S	1D6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-17E07S	1D7	30.37	0.00	32.78	0.00	18.97	0.00	32.24	0.00	15.08	0.00	14.13	32.97	176.54
03S/12W-17E08S	1D6A	0.00	34.51	0.00	29.70	0.00	25.28	0.00	29.71	0.00	28.61	0.00	29.38	177.19
03S/12W-17F02S	1D8	0.00	31.54	0.00	43.95	11.31	29.61	0.00	32.07	0.99	34.36	0.00	0.00	183.83
03S/12W-17F03S	1D9	25.37	0.00	33.60	0.00	31.71	0.00	32.79	0.00	30.31	0.00	25.16	0.00	178.94
03S/12W-17F04S	1D10	0.00	30.35	0.00	36.12	0.00	27.31	0.00	30.33	0.99	33.91	0.00	30.54	189.55
03S/12W-17F05S	1D11	20.75	0.00	21.34	0.00	0.00	0.00	10.29	0.00	31.64	0.00	13.33	0.00	97.35
03S/12W-17F06S	1D12	0.00	31.93	0.00	40.58	23.38	27.44	0.00	31.12	0.00	33.40	0.00	20.95	208.80
03S/12W-17F07S	1D13	11.79	0.00	13.57	0.00	0.00	0.00	20.41	0.00	0.00	0.00	14.47	0.00	60.24
03S/12W-17G04S	2D1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-17H01S	2T1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-17H02S	2D2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARTY TOTALS:		181.28	174.58	187.90	206.38	152.64	158.19	181.93	180.28	165.73	178.72	126.62	149.49	2043.74
CALIFORNIA WATER SERVICE CO														
0740														
01S/12W-33P02S	3301	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-04C01S	2501	33.44	33.79	32.84	33.89	33.21	34.36	32.86	30.82	32.76	29.98	33.11	32.18	393.24
02S/12W-05A01S	1502	0.00												0.00
02S/12W-05J01S	5101	61.33	61.86	58.93	60.99	59.42	61.22	61.40	57.93	65.18	62.47	71.37	69.61	751.71
02S/12W-05M01S	602	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-05P02S	702	11.24	0.00	0.00	0.00	1.05	10.82	64.35	69.06	74.34	69.11	75.13	70.90	446.00
02S/12W-06P01S	4601	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-07C01S	2801	0.00	0.00	0.00										0.00
02S/12W-07C02S	5301	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-07C03S	05201	34.87	34.44	32.81	34.55	33.21	34.27	33.84	30.92	33.67	31.62	32.94	31.66	398.80
02S/12W-07G01S	3901	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-07H01S	2201	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG-NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
02S/12W-07Q04S	1003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-08C01S	3701	36.84	35.74	34.19	34.90	33.69	34.15	26.66	6.77	0.52	0.14	28.80	26.48	298.88
02S/12W-08F01S	4301	0.00	17.31E	17.17E	48.21	50.94E	53.41	47.19	62.60	58.92	57.68	55.45E	50.87E	519.75
02S/12W-08P01S	5401	105.00	103.31	99.03	79.59	100.62E	103.43E	96.56	70.94E	69.15E	80.62	87.46	83.55	1079.26
02S/12W-09M01S	2901	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-09M02S	2902	25.22	25.44	24.66	25.11	23.67	24.77	24.74	14.83	0.00	13.88	0.00	0.00	202.32
02S/12W-10J01S	1903	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-10K03S	1904	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-16H01S	5601	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-16L01S	3802	73.13	71.47	70.55	62.07	68.14	61.67	64.86	53.25	71.12	75.85	77.12	68.35	817.58
02S/12W-17C01S	2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-17D02S	1302	50.11	49.54	43.00	49.31	47.86	48.91	51.50	44.88	50.38	49.18	50.82	48.07	583.56
PARTY TOTALS:		431.18	432.90	413.18	428.62	451.81	467.01	503.96	442.00	456.04	470.53	512.20	481.67	5491.10
CA WATER SERVICE CO (DOMINGUEZ) 0742														
03S/13W-35F01S	290-0	0.00	60.37	101.32	100.82	96.77	100.37	100.47	92.24	100.43	45.27	38.63	32.98	869.67
03S/13W-35H02S	297-0	46.78	44.88	42.51	38.46	35.59	23.57	44.75	34.48	9.34	48.17	45.43	40.71	454.67
03S/13W-35P01S	224-0	0.00	0.00	0.00	0.00									0.00
03S/13W-35Q05S	223-0	0.00	0.00	0.00	0.00									0.00
03S/13W-35Q06S	231-0	0.00	0.00	0.00	0.00									0.00
04S/13W-02G02S	272-0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARTY TOTALS:		46.78	105.25	143.83	139.28	132.36	123.94	145.22	126.72	109.77	93.44	84.06	73.69	1324.34
CENTRAL BASIN MUNICIPAL WATER DIS 0795														
02S/11W-07C05S	CB-2									10.41	15.94	13.34	19.35	59.04
02S/11W-07D10S	CB-1									14.31	12.28	14.07	16.05	56.71
PARTY TOTALS:		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.72	28.22	27.41	35.40	115.75
CERRITOS, CITY OF 0826														
03S/11W-28G05S	C-2	360.35	356.15	292.96	363.08	363.99	345.55	325.74	384.25	413.13	394.00	400.76	379.12	4379.08
03S/11W-29N06S	C-1	272.33	270.97	249.33	162.23	269.50	259.91	264.89	255.87	270.18	260.19	264.24	248.85	3048.49
03S/12W-26J03S	C-4	322.63	330.37	300.99	302.43	363.89	305.13	272.31	0.00	0.00	0.09	331.78	391.62	2921.24
PARTY TOTALS:		955.31	957.49	843.28	827.74	997.38	910.59	862.94	640.12	683.31	654.28	996.78	1019.59	10348.81

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG-NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
COAST PACKING CO														
0970														
02S/13W-11P03S	1	12.10	12.84	7.25	6.23	4.64	5.86	5.59	5.23	7.40	5.25	6.21	7.80	86.40
COMMERCE, CITY OF														
1017														
02S/12W-21B05S	00006	64.56	61.24	45.01	62.22	54.51E	56.19	56.15	57.74E	59.09E	60.00E	60.15E	58.31E	695.17
02S/12W-21G03S	00004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-21J01S	3E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-21K02S	3D	86.73	89.11	86.85	75.18	35.67	28.87	13.10	9.39	20.38	34.39	0.05	0.00	479.72
02S/12W-21R02S	00007	0.00	0.00	6.34E	41.51E	93.97E	100.09E	95.68E	106.44	109.99E	113.56	116.68	118.40	902.66
PARTY TOTALS:		151.29	150.35	138.20	178.91	184.15	185.15	164.93	173.57	189.46	207.95	176.88	176.71	2077.55
COMPTON, CITY OF														
1020														
03S/13W-11M02S	00016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-11M03S	00017	119.38	111.65	106.21	99.06	96.35	102.22	38.90	0.00	0.00	44.58E	128.62E	24.70E	871.67
03S/13W-14F01S	00018	280.08	277.62	270.39	279.40	270.39	279.41E	279.40E	261.37E	279.40E	270.39E	279.40E	270.39E	3297.64
03S/13W-15R01S	00002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-22H02S	00001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-22Q04S	00009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-26C01S	00013	15.53	43.12	92.66	140.38	110.20	117.25	102.13	76.90	78.43	133.35	162.65	52.36	1124.96
03S/13W-26M01S	00014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-27E02S	00011	67.23	84.13	45.15	86.47	60.15	59.17	87.12	107.36	102.04	112.22	110.21	24.16	945.41
03S/13W-27G01S	00015	53.86	0.00	0.00	19.82	69.42	47.91	88.89	68.44	79.64	72.99	78.99	33.09	613.05
PARTY TOTALS:		536.08	516.52	514.41	625.13	606.51	605.96	596.44	514.07	539.51	633.53	759.87	404.70	6852.73
DARLING-DELAWARE CO, INC														
1236														
02S/13W-10H03S	2778J	3.90	4.03	2.78	2.74	3.28	2.42	2.27	2.25	1.71	1.87	1.18	1.87	30.30
DOWNEY, CITY OF														
1450														
02S/12W-27A05S	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-27H01S	2	73.79	72.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	185.60E	331.57
02S/12W-27R02S	4	556.55	583.49	528.13	502.56	536.97	546.64	523.10	468.45	526.73	480.83	522.81	477.54	6253.80
02S/12W-28J06S	7	91.84	91.41	83.53	80.84	75.67	70.27	71.56	61.48	76.68	70.10	84.83	78.60	936.81
02S/12W-28Q01S	8	106.85	95.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.66	212.94

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG-NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
02S/12W-33B01S	13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-33M01S	17	46.41E	47.50E	50.66E	33.02E	26.70E	5.73E	17.04E	19.31E	34.20E	50.35E	67.10E	53.01E	451.03
02S/12W-34G01S	9	110.59	112.10	99.66	98.98	94.29	82.16	90.97	83.39	93.10	88.81	103.37	95.74	1153.16
02S/12W-34P01S	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.37E	5.95E	1.21E	8.53
02S/12W-35D04S	5	64.85	61.30	56.57	52.28	53.90	50.19	48.28	7.36	3.40	47.01	53.53	47.85	546.52
02S/12W-35P01S	10	106.11	139.97	86.13	54.65	54.98	41.62	44.02	39.19	75.38	84.88	110.47	91.14	928.54
03S/12W-02H04S	12	25.34	28.61	17.97	0.00	0.00	0.00	0.00	0.00	0.00	19.88E	52.72E	54.63	199.15
03S/12W-02L01S	15	1.67	1.58	5.13	1.30	1.29	0.22	0.00	0.09	4.03	2.15	6.26	5.53	29.25
03S/12W-03F01S	11	211.98	221.32	203.85	193.78	164.04	191.79E	191.79E	179.40E	191.79E	195.10	239.52	201.74	2386.10
03S/12W-03J01S	16	75.80E	59.84E	59.60E	28.50E	23.86E	6.88E	12.90	14.06	41.67	57.97	90.68	21.58	493.34
03S/12W-03M01S	19	0.08	0.54	0.01	0.06	0.00	0.25	0.00	0.10	0.00	0.29	0.20	0.13	1.66
03S/12W-04D02S	18	84.28	69.84	67.60	63.51	3.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	289.15
03S/12W-04Q02S	23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-05A01S	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-09B01S	25	103.85	89.31	86.20	78.60	82.07	72.34	81.28	62.95	86.73	93.25	150.08	132.72	1119.38
03S/12W-09G01S	29	5.65	7.29	16.28	6.66	4.83	0.65	1.05	2.07	13.11	11.37	19.17	17.59	105.72
03S/12W-10N03S	30	0.55E	101.40E	159.09E	153.79E	1.33E	0.00	0.11	0.08	22.60	34.15	129.55	120.81E	723.46
03S/12W-11E01S	24	144.70	209.06	181.82	185.22	187.77	180.75	171.01	147.63	169.67	155.22	175.36	158.27	2066.48
PARTY TOTALS:		1810.89	1992.17	1702.23	1533.75	1311.62	1249.49	1253.11	1085.56	1339.09	1392.73	1811.60	1754.35	18236.59
EL RANCHO UNIFIED SCHOOL DISTRICT 1550														
02S/12W-26J01S	MAGEE	4.85	9.40	6.65	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.03	0.43	21.53
02S/12W-36D01S	BIRNY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARTY TOTALS:		4.85	9.40	6.65	0.06	0.06	0.01	0.01	0.01	0.01	0.01	0.03	0.43	21.53
FRAMPTON, WILLIAM H 1735														
03S/11W-30N02S	3	1.35E	1.50E	1.50E	1.25E	1.25E	1.90E	1.30E	1.00E	1.30E	1.25E	1.30E	1.40E	16.30
HATHAWAY,JULIAN I & HELEN M,TRUST 2206														
03S/11W-06N02S	SOUTH	0.15	0.15	0.16	0.18	0.11	0.05	0.09	0.06	0.10	0.10	0.17	0.17	1.49
HUNTINGTON PARK, CITY OF 2378														
02S/13W-22P02S	15	13.29	5.50	0.90	31.56	19.39	5.40	7.13	0.00	0.11	0.00	0.63	0.01	83.92
02S/13W-23D06S	17	159.89	140.65E	130.27	19.00	31.85	2.49	48.88	86.40	141.07	123.88	136.53	137.73	1158.64
02S/13W-23H01S	14	18.08	7.90	17.01	35.34	22.73	42.05	24.43	17.31	10.46	12.81	18.64	10.86	237.62
02S/13W-23J02S	9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG-NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
02S/13W-23J04S	18	0.10	0.00	0.00	0.09	0.00	0.18	0.00	0.00	0.15	0.00	0.00	0.21	0.73
02S/13W-25D04S	16	90.73	83.10	33.15	126.82	92.01	108.72	96.50	53.61	33.18	57.87	78.41	81.77	935.87
02S/13W-25Q01S	12	106.54	140.84	130.89	128.31	123.73	108.82	105.74	123.99	142.05	136.21	148.56	134.38	1530.06
PARTY TOTALS:		388.63	377.99	312.22	341.12	289.71	267.66	282.68	281.31	327.02	330.77	382.77	364.96	3946.84
INGLEWOOD PARK CEMETERY														
2440														
02S/14W-22P03S	19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JEFFERSON SMURFIT CORP (U S)														
2482														
02S/13W-15P01S	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/13W-15P10S	8	44.31	17.93	0.00	2.63	1.46	0.00	0.03	0.00	0.00	0.00	0.00	0.00	66.36
02S/13W-15P11S	9	12.31	67.98	91.98	152.11	39.24	39.99	37.06	34.35	37.60	35.98	32.68	35.03	616.31
PARTY TOTALS:		56.62	85.91	91.98	154.74	40.70	39.99	37.09	34.35	37.60	35.98	32.68	35.03	682.67
KING KELLY MARMALADE CO, INC														
2624														
03S/12W-35A06S	2	0.89	0.17	0.00	0.00	0.11	1.01	1.24	0.85	1.34	1.74	0.55	0.40	8.30
LA HABRA HEIGHTS COUNTY WTR DIST														
2749														
02S/11W-19F01S	8	5.90E	14.84E	0.69E	0.32E	2.61E	1.09E	0.21E	1.75E	6.49E	6.49E	2.85E	6.23E	49.47
02S/11W-19F03S	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00
02S/11W-19M01S	9	30.34E	35.72E	8.36E	4.09E	1.86E	2.40E	0.48E	1.99E	5.13E	7.74E	24.28E	8.94E	131.33
02S/11W-19M04S	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00
02S/11W-19P02S	10	92.92E	96.78E	57.57E	47.83E	33.86E	42.76E	134.46E	34.88E	28.60E	40.99E	68.30E	11.71E	690.66
02S/11W-19P03S	11	193.63E	191.32E	142.80E	153.42E	132.17E	107.55E	30.50E	90.11E	130.65E	146.41E	207.39E	79.99E	1605.94
PARTY TOTALS:		322.79	338.66	209.42	205.66	170.50	153.80	165.65	128.73	170.87	201.63	302.82	106.87	2477.40
LAKEWOOD, CITY OF														
2770														
03S/12W-33A07S	LK02A	59.85	56.33	55.30	34.15	45.47	46.94	48.63	43.11	48.84	50.23	58.87	61.01	608.73
03S/12W-33H04S	LK03A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-33R01S	LK011	0.00	0.00	0.00										0.00
03S/12W-33R04S	LK11A	0.03	0.09	0.09	0.06	0.10	0.19	0.02	0.07	0.02	0.12	0.05	35.38	36.22

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG-NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
03S/12W-34F01S	LK018	100.70	115.76	83.57	90.26	87.35	102.16	93.27	92.11	94.69	95.42	123.77	110.61	1189.67
04S/11W-07M01S	LK006	3.63	3.63	3.39	2.01	2.00	1.89	0.81	0.94	1.64	2.24	4.52	4.01	30.71
04S/12W-02F02S	13-A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/12W-03A02S	LK015	106.31	104.00	77.61	66.66	46.06	38.41	44.06	44.56	67.56	64.08	114.21	123.65	897.17
04S/12W-03E01S	LK023	0.02	0.05	0.08	0.02	0.03	0.05	0.04	0.04	0.08	0.01	0.01	0.02	0.45
04S/12W-03H01S	LK017	121.61	114.37	97.29	84.04	80.24	72.48	66.40	47.84	117.96	124.25	69.78	0.00	996.26
04S/12W-04J03S	LK012	66.44	65.16	62.59	64.54	62.89	62.66	65.66	61.63	1.82	37.08	65.49	61.59	677.55
04S/12W-05J01S	LK022	231.50	258.26	256.17	265.32	154.36	117.98	126.87	117.21	126.58	130.98	178.27	171.64	2135.14
04S/12W-10G01S	LKT04	71.77	75.50	74.40	66.38	43.37	48.95	40.17	32.58	57.43	61.55	79.33	89.09	740.52
04S/12W-10H01S	LK010	2.50	28.30	11.34	12.77	20.26	17.76	19.54	20.06	31.82	37.14	53.84	59.31	314.64
04S/12W-10H03S	LK008	60.86	44.51	40.65	26.67	22.66	20.78	24.80	23.18	31.81	41.41	57.62	60.88	455.83
04S/12W-10J02S	LK014	89.16	87.26	81.37	84.00	81.33	78.84	89.75	70.21	80.86	84.51	86.15	81.56	995.00
04S/12W-11B03S	LK016	46.21	41.47	35.63	19.66	27.44	18.38	23.92	16.26	36.42	30.04	49.22	41.14	385.79
PARTY TOTALS:		960.59	994.69	879.48	816.54	673.56	627.47	643.94	569.80	697.53	759.06	941.13	899.89	9463.68
LINCOLN MEMORIAL PARK, INC														
2884														
03S/13W-28F01S		10.00	2.87	7.49	3.41	0.48	0.00	0.78E	1.88E	0.85	2.96	7.50	6.55	44.77
LITTLE LAKE CEMETERY DISTRICT														
2890														
03S/11W-06N01S	1	1.69	1.32	1.54	1.47	0.64	0.01	0.00	0.01	0.00	0.00	1.86	3.48	12.02
LONG BEACH, CITY OF														
2910														
04S/12W-06J01S	NLB08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/12W-06J02S	NLB11	17.77	76.56	92.10E	33.27	0.00	0.00	30.16	17.03	14.32	0.00	0.00	0.00	281.21
04S/12W-06K01S	NLB04	114.90	104.44	65.72	25.11	0.00	103.45	87.60	0.03	0.00	0.00	0.00	0.00	501.25
04S/12W-06K02S	NLB09	58.31	74.85	50.91E	50.10	0.00	114.61	96.80	120.42	4.45	0.00	0.00	108.12	678.57
04S/12W-06K04S	NLB05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/12W-08M01S	NLB12	55.62	0.00	229.30E	75.66E	0.00	0.00	0.00	0.15	0.00	0.00	353.11	336.09	1049.93
04S/12W-13B04S	COM19	203.49	132.93	0.00	56.19	0.00	0.00	25.22	0.00	0.00	151.49	220.85	230.44	1020.61
04S/12W-13C03S	COM6A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/12W-13F02S	COM21	0.00	188.96	248.03	77.23	0.00	129.09	205.22	235.57	206.35	63.78	0.00	0.00	1354.23
04S/12W-13G01S	01017	23.34	10.28	22.42	13.14	4.84	2.39	2.37	0.00	0.00	15.63	22.53	24.49	141.43
04S/12W-13H01S	COM20	286.22	257.73	280.05	55.60	0.00	0.00	0.00	262.02	28.61	70.51	129.03	63.70	1433.47
04S/12W-13J02S	1017B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/12W-13K01S	COM22	188.90	103.13	357.67	50.23	130.71	345.05	186.59	63.64	0.00	0.00	334.38	411.50E	2171.80
04S/12W-13N02S	COM13	81.09	62.11	0.00	0.00	0.00	0.00	55.45	0.00	46.29	0.00	6.02	79.50	330.46
04S/12W-13Q01S	COM23	0.00	161.85	209.22	20.61	0.00	0.00	21.35	0.00	48.27	0.00	0.00	186.35	647.65
04S/12W-14A02S	COM10	119.78	106.35	44.38	44.26	15.29	0.00	36.77	20.44	20.40	123.40	109.83	124.92	765.82
04S/12W-14A04S	COM18	128.17	116.62	129.97	140.44	144.49	158.40	115.03	144.29	140.75	137.73	118.22	126.66	1600.77

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG-NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
04S/12W-14B02S	COM17	4.49	106.59	137.37	41.78	63.04	147.84	111.57	0.00	0.00	0.00	0.00	0.00	612.68
04S/12W-14D04S	COM14	90.75	72.32	0.00	0.00	101.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	264.51
04S/12W-14K01S	AN206	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/12W-14R01S	AN205	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/12W-15A01S	COM16	153.27	154.51	175.04	51.13	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	534.23
04S/12W-15B03S	COM15	261.57	0.00	0.00	0.00	126.18	21.79	190.79	264.99E	315.35	49.47	293.10	331.54	1854.78
04S/12W-16J01S	AN026	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/12W-16J03S	CIT09	38.66	53.91	49.80	18.57E	0.00	0.00	0.00	0.11	0.00	53.08	4.83	0.00	218.96
04S/12W-16R01S	CIT08	43.75	42.80	45.42	8.20	0.00	0.00	14.26	7.93	40.71	52.24	43.96	43.92	343.19
04S/12W-17E01S	DEV09	150.81	0.00	0.00	0.00	130.19	256.31	211.48	0.37	0.00	0.00	97.69	283.31	1130.16
04S/12W-17Q01S	DEV04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/12W-20G01S	DEV05	61.98	30.53	38.52	4.31	34.04	0.00	43.02	24.28	0.00	0.00	121.26	136.33	494.27
04S/12W-20K01S	CIT10	145.07	0.00	187.13	77.97	0.00	0.00	0.00	0.58	0.00	0.00	41.86	0.00	452.61
04S/12W-21M07S	CIT7A	143.51	0.00	0.00	77.92	0.00	0.00	0.00	0.47	0.00	0.00	0.00	277.33	499.23
04S/12W-23C01S	WIL1A	5.17	101.72	109.55	54.82	0.00	0.00	41.83	24.95	0.00	0.00	14.50	0.00	352.54
04S/12W-23K03S	AN201	111.58	110.06	123.60	22.90	0.00	0.00	38.87	21.19	2.68	103.04	4.80	0.00	538.72
04S/12W-24J01S	LBTFW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/12W-24M08S	WIS1A	44.01	64.84	67.06	7.56	25.35	69.11	38.15	68.32	1.52	0.00	8.27	0.00	394.19
04S/12W-25E01S	AN204	0.00	0.00	6.18	1.27	0.00	6.60	8.92	0.00	0.00	1.83	2.50	4.46	31.76
04S/12W-28H01S	ALA 9	73.41	110.48	73.84	55.34	0.00	0.00	50.01	26.91	0.00	0.00	0.00	0.00	389.99
04S/12W-28H06S	ALA 8	127.32	143.97	60.68	0.00	38.09	0.00	0.00	0.26	0.00	0.00	0.00	151.89	522.21
04S/12W-28H12S	ALA13	89.03	89.20	57.54	35.27	0.00	0.00	28.87	20.76	0.00	0.00	95.52	104.78	520.97
04S/12W-34B02S	TEST1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/13W-12E01S	NLB10	3.13	2.67	5.55	3.58	3.69	2.14	2.14	1.39	2.21	4.98	4.43	4.52	40.43
PARTY TOTALS:		2825.10	2479.41	2867.05	1102.46	817.35	1356.78	1642.47	1326.10	871.91	827.46	2026.69	3029.85	21172.63
LOS ANGELES, CITY OF														
2920														
02S/13W-32R08S	MM3	0.00	0.00	305.53	283.75	378.12	361.18	419.67	450.67	275.53	0.00	54.18	127.11	2655.74
02S/13W-32R11S	1445N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/13W-32R12S	1445M	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/13W-32R13S	1445Q	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/13W-32R15S	1445R	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/13W-32R16S	1445S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/14W-23H14S	1381L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/14W-23H17S	1391E	842.84	820.82	955.05	1031.91	965.91	881.61	982.02	950.73	874.22	919.88	950.21	960.03	11135.23
03S/13W-05F01S	MM2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARTY TOTALS:		842.84	820.82	1260.58	1315.66	1344.03	1242.79	1401.69	1401.40	1149.75	919.88	1004.39	1087.14	13790.97
LOS ANGELES COUNTY LAKEWOOD GOLF														
2929														
04S/12W-08R01S	21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG- NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
LOS ANGELES COUNTY RAN LOS AMIGOS														
2930														
03S/12W-05P01S	DW002	0.00	0.00	0.00	0.00	0.00	6.23	17.72	14.14	16.01	17.15	19.83	17.61	108.69
03S/12W-05P03S	DW001	49.53	34.29	38.28	31.63	20.13	24.15	16.06	9.89	11.76	15.86	17.95	16.23	285.76
03S/12W-08F01S	PH003	4.04	6.60	3.23	3.39	0.23	0.15	1.98	0.43	0.83	1.87	3.47	4.20	30.42
PARTY TOTALS:		53.57	40.89	41.51	35.02	20.36	30.53	35.76	24.46	28.60	34.88	41.25	38.04	424.87
LOS ANGELES PAPER BOX & BRD MILLS														
2970														
02S/12W-20L02S	NEW	9.24	20.64	21.51	26.05	18.70	14.16	19.39	15.91	14.04	14.55	24.63	18.46	217.28
LUNDAY-THAGARD OIL CO														
3010														
03S/12W-05D05S	SLY	9.18	9.09	9.05	10.28	10.27	10.82	7.52	8.87	11.50	7.82	8.18	7.15	109.73
LYNWOOD, CITY OF														
3060														
03S/12W-07C04S	0015A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-18D07S	0017A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-02Q01S	00003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-03R01S	00004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-10K01S	00019	248.95	249.78	229.81	213.88	66.20	149.50	208.45	255.12	202.28	217.59	203.87	248.97	2494.40
03S/13W-11C01S	00006	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-11E01S	00011	127.01	126.27	119.31	96.82	4.55	0.41	1.55	53.19	110.27	118.13	110.21	133.37	1001.09
03S/13W-12E04S	00008	76.43	114.18	100.42	80.75	78.05	32.66	35.36	80.39	42.80	74.39	58.20	65.51	839.14
03S/13W-12J01S	00005	88.95	91.54	83.82	69.84	75.39	79.20	70.77	51.74	58.95	62.22	68.24	88.58	889.24
03S/13W-12P01S	00020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-12Q03S	00007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-13D01S	00009	5.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.17
PARTY TOTALS:		546.51	581.77	533.36	461.29	224.19	261.77	316.13	440.44	414.30	472.33	440.52	536.43	5229.04
LYNWOOD PARK MUTUAL WATER CO														
3080														
03S/13W-10R08S	NW25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-10R09S	SOUTH	17.42	14.06	19.56	17.89	13.97	13.94	2.82	0.34	12.38	12.83	21.33	9.71	156.25
03S/13W-15H01S	MONA	6.81	3.22	1.86	2.83	1.24	0.47	14.28	20.17	3.70	5.29	0.67	4.32	64.86
PARTY TOTALS:		24.23	17.28	21.42	20.72	15.21	14.41	17.10	20.51	16.08	18.12	22.00	14.03	221.11

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG-NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
MAYWOOD MUTUAL WATER CO NO 1														
3170														
02S/13W-24B02S	00004	47.17	54.32	43.92	45.57	48.03	60.87	54.20	34.20	34.49	60.73	68.34	62.48	614.32
02S/13W-24F01S	00003	25.86	25.12	20.20	21.68	8.03	0.00	10.58	18.42	11.54	0.00	0.00	0.00	141.43
PARTY TOTALS:		73.03	79.44	64.12	67.25	56.06	60.87	64.78	52.62	46.03	60.73	68.34	62.48	755.75
MAYWOOD MUTUAL WATER CO NO 2														
3180														
02S/12W-18M01S	52ST	41.30	48.17	49.46	23.91	32.05	29.28	36.84	41.31	44.02	45.80	73.29	25.40	490.83
02S/13W-13M02S	MAYAV	37.63	30.70	31.87	0.00	0.00	0.00	20.42	42.54	58.61	56.13	40.87	87.34	406.11
PARTY TOTALS:		78.93	78.87	81.33	23.91	32.05	29.28	57.26	83.85	102.63	101.93	114.16	112.74	896.94
MAYWOOD MUTUAL WATER CO NO 3														
3190														
02S/12W-19C01S	57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-19J03S	DIST4	94.90	103.44	96.13	76.00	58.54	56.63	55.69	8.15	5.26	56.85	65.31	85.85	762.75
02S/12W-19M03S	PROS	79.97	77.89	94.78	54.61	64.03	64.44	59.08	10.98	1.26	45.00	70.95	79.77E	702.76
PARTY TOTALS:		174.87	181.33	190.91	130.61	122.57	121.07	114.77	19.13	6.52	101.85	136.26	165.62	1465.51
MIDLAND PARK WATER TRUST														
3250														
03S/13W-14K01S		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MONTEBELLO, CITY OF														
3351														
02S/12W-22J02S	MONT1	34.52	36.05	34.62	37.63	30.19	28.97	29.88	28.48	29.93E	23.37	29.80	27.59	371.03
MONTEBELLO LAND AND WATER CO														
3360														
02S/11W-11G01S	00014	89.30	96.77	95.66	78.04	79.26	58.83	68.22	61.50	68.84	70.85	77.62	0.00	844.89
02S/12W-11R04S	0011A	51.57	61.26	53.13	49.25	51.18	36.32	47.35	40.68	29.93	35.96	48.37	57.52	562.52
02S/12W-12E05S	00009	41.47	53.33	54.92	38.23	41.44	35.28	43.18	35.09	4.55	43.65	45.62	55.83	492.59
02S/12W-12E06S	00010	50.38	64.35	55.45	27.32	0.00	34.10	45.82	28.70	44.04	34.53	55.33	57.58	497.60
02S/12W-12E07S	0008A	54.75	16.63	21.99	34.94	47.63	35.35	47.70	34.61	51.21	38.54	40.03	56.88	480.26
02S/12W-12E08S	00012	50.40	63.02	54.41	51.22	31.83	30.68	0.00	9.19	47.99	32.57	51.43	61.82	484.56
02S/12W-12M02S	00007	44.88	54.04	14.71	43.53	39.03	32.92	44.85	37.72	38.29	37.14	43.66	55.06	485.83

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG- NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
PARTY TOTALS:		382.75	409.40	350.27	322.53	290.37	263.48	297.12	247.49	284.85	293.24	362.06	344.69	3848.25
NEWARK GROUP INDUSTRIES, INC														
3517														
02S/12W-20E01S	1	42.03	39.71	37.90	35.90	35.70	34.56	32.92	35.26	36.38	35.38	33.79	31.51	431.04
02S/12W-20M02S	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARTY TOTALS:		42.03	39.71	37.90	35.90	35.70	34.56	32.92	35.26	36.38	35.38	33.79	31.51	431.04
NORWALK, CITY OF														
3550														
03S/11W-18M02S	00008	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.20	0.00	0.00	0.00	3.10	3.64
03S/12W-13L01S	LEF	1.29	1.03	2.96	0.86	4.45	0.30	0.43	1.78	2.29	1.00	2.36	0.91	19.66
03S/12W-13Q01S	TAD	54.32	55.53	48.54	47.41	35.98	39.58	40.46	35.05	39.93	41.88	50.49	50.42	539.59
PARTY TOTALS:		55.61	56.56	51.50	48.27	40.43	39.88	41.23	37.03	42.22	42.88	52.85	54.43	562.89
ORCHARD DALE WATER DISTRICT														
3640														
02S/11W-19F01S	8	2.13E	5.16E	0.31E	0.14E	1.12E	0.41E	0.07E	0.73E	2.67E	3.33E	1.32E	6.57E	23.96
02S/11W-19F03S	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00
02S/11W-19M01S	9	10.95E	12.43E	3.70E	1.84E	0.79E	0.89E	0.18E	0.84E	2.12E	3.97E	11.23E	9.43E	58.37
02S/11W-19M04S	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00
02S/11W-19P02S	10	33.56E	33.68E	25.43E	21.60E	14.46E	15.93E	48.56E	14.68E	11.80E	20.99E	31.58E	12.37E	284.64
02S/11W-19P03S	11	69.92E	66.59E	63.08E	69.28E	56.45E	40.06E	11.02E	37.92E	53.89E	74.98E	95.90E	84.43E	723.52
PARTY TOTALS:		116.56	117.86	92.52	92.86	72.82	57.29	59.83	54.17	70.48	103.27	140.03	112.80	1090.49
PABCO BUILDING PRODUCTS, LLC														
3705														
02S/13W-10Q08S	00012	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/13W-15B04S	00009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARTY TOTALS:		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG- NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
PARADISE MEMORIAL PARK 3745														
03S/12W-01K09S	1	0.08E	0.08E	0.08E	0.08E	0.08E	0.08E	0.08E	0.08E	0.08E	0.08E	0.08E	0.08E	0.96
PARAMOUNT, CITY OF 3755														
03S/12W-20F08S	13	179.38	327.71	347.77	291.07	256.18	263.54	0.21	285.81	297.08	334.78	272.61	73.90	2930.04
03S/12W-28D01S	14	141.86	192.04	85.69	217.35	306.35	270.77	373.45	79.11	285.14	248.60	298.48	89.33	2588.17
PARTY TOTALS:		321.24	519.75	433.46	508.42	562.53	534.31	373.66	364.92	582.22	583.38	571.09	163.23	5518.21
PARAMOUNT UNIFIED SCHOOL DISTRICT 3760														
03S/12W-33F02S	COKE	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.04	0.03	0.21
PARK WATER CO 3780														
03S/11W-19E02S	29K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/11W-19Q01S	29H	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.37
03S/12W-11K06S	41A	61.20	51.20	53.34	19.96	14.43	9.08	16.55	12.28	21.28	76.17	91.66	86.93	514.08
03S/12W-14F01S	28B	16.75	8.59	23.43	4.11	2.35	6.20	8.73	4.57	12.66	13.90	9.65	23.81	134.75
03S/12W-14J01S	46C	41.58	15.54	24.33	1.34	0.05	0.15	5.72	18.16	17.04	42.86	27.21	43.76	237.74
03S/12W-16H01S	40D	33.57	20.09	33.72	10.60	2.36	5.39	7.19	10.10	18.78	27.79	41.87	53.40	264.86
03S/12W-22A01S	40B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-24K01S	6E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-13F04S	4B	17.54	13.36	15.06	9.73	4.66	5.29	8.81	5.74	9.36	20.16	16.68	14.61	141.00
03S/13W-16K01S	12B	0.10	0.08	0.08	0.09	0.07	0.11	0.08	0.07	0.11	0.33	0.08	0.10	1.30
03S/13W-21B01S	13C	15.43	11.93	16.05	6.43E	3.46	7.33	10.85	9.91	17.10	25.42	8.97	14.60	147.48
03S/13W-21C06S	13B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-25F04S	9D	0.02E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
PARTY TOTALS:		186.19	120.79	166.01	52.26	27.38	33.55	57.93	60.83	96.33	207.00	196.12	237.21	1441.60
PEERLESS WATER CO 3800														
03S/12W-14F02S	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-14P01S	15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-15K02S	9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-15L01S	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG-NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
03S/12W-22C03S	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-22G04S	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-22G05S	1A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-23M02S	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-23P02S	8	13.26	12.58	12.50	10.93	9.12	7.98	8.60	8.65	9.23	9.85	13.17	11.67	127.54
03S/12W-28C01S	3	11.31	12.38	9.83	10.56	9.51	8.22	9.41	9.62	9.32	8.43	10.21	9.29E	118.09
03S/12W-28F02S	2	5.51	5.88	4.18	4.04	2.68	3.05	2.45	2.28	2.77	3.70	5.49	4.71	46.74
03S/12W-35C02S	11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-35F02S	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-35F03S	17	14.45	13.59	13.66	12.03	10.32	8.77	9.03	9.22	9.91	11.43	14.56	13.00	139.97
PARTY TOTALS:		44.53	44.43	40.17	37.56	31.63	28.02	29.49	29.77	31.23	33.41	43.43	38.67	432.34
PICO WATER DISTRICT														
3850														
02S/11W-07M04S	7	78.02	95.84	83.04	70.50	77.14	92.75	108.35	87.51	108.61	108.62	103.51	121.97	1135.86
02S/11W-07P02S	10	146.13	135.55	129.58	134.61	110.63	124.98	125.54	121.16	137.90	136.18	138.12	132.80	1573.18
02S/11W-18B08S	4A	88.88	87.40	63.52	47.61	49.25	11.64	19.06	13.22	13.83	22.65	46.72	21.25	485.03
02S/11W-18C03S	2	6.00	2.37	4.74	7.06	6.82	2.65	0.06	2.67	0.32	0.01	5.39	1.81	39.90
02S/12W-12Q01S	9A	0.19	0.00	0.24	0.14	0.30	0.34	0.24	0.18	0.28	0.25	0.23	0.05	2.44
02S/12W-13L05S	8	4.69	11.90	18.34	27.51	3.82	34.78	17.05	10.48	14.97	9.86	42.99	42.01	238.40
02S/12W-24E07S	5A	64.01	62.70	57.61	57.22	25.77	2.07	7.70	9.99	16.51	23.06	31.55	44.08	402.27
02S/12W-25E10S	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARTY TOTALS:		387.92	395.76	357.07	344.65	273.73	269.21	278.00	245.21	292.42	300.63	368.51	363.97	3877.08
PICO RIVERA, CITY OF														
3853														
02S/11W-05P01S	GOLF1	7.61E	7.61E	7.61E	7.16E	5.00E	5.00E	5.00E	5.00E	5.00E	5.00E	5.00E	5.00E	69.99
02S/12W-12A01S	W1	0.00	58.04E	58.04E	62.00E	102.97E	126.87	114.53	105.04	70.25	0.00	0.00	0.00	697.74
02S/12W-12A05S	W2	292.67E	237.21E	231.21E	280.59E	190.00E	156.68E	143.29	143.07	231.70	244.86	167.13	0.00	2318.41
02S/12W-23B04S	W3	195.54	218.08	156.03	100.53	92.14	80.90E	54.04	59.70	19.93	23.34	21.28E	71.89	1093.40
02S/12W-23B08S	W4	0.00	3.07	2.16	22.07	15.97	0.00	0.00	0.00	4.40E	43.42	59.35E	140.15E	290.59
02S/12W-25E13S	W10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-25G01S	W12	0.00	0.00	0.01	23.42	1.05E	31.53E	68.05	0.00	0.00	4.51	136.94	130.56	396.07
02S/12W-25G02S	W11	19.43	58.14E	58.13E	59.00E	59.00E	0.01	7.02	0.00	21.58	24.79	2.99	0.91	311.00
02S/12W-25M01S	W9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-26D07S	W5	0.84	0.01	1.86	0.97	0.06E	0.00	0.06	36.70	76.34	8.20	12.06	13.16	150.26
02S/12W-26E03S	W6	8.80	6.99	0.85	18.63	0.01	0.22E	0.56	0.00	0.56E	0.09	0.12	0.41	37.24
02S/12W-26Q01S	W7	0.33	0.05	0.04	0.04	0.00	0.13E	0.09	0.04	0.00	0.01	0.00	0.00	0.73
02S/12W-36M06S	W8	0.82	0.00	0.82	12.31	2.10E	0.00	0.01	0.01	0.01	0.01	0.01	0.01	16.11
PARTY TOTALS:		526.04	589.20	516.76	586.72	468.30	401.34	392.65	349.56	429.77	354.23	404.88	362.09	5381.54

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG- NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
ROCKVIEW DAIRIES, INC 4115														
03S/12W-05C08S	NEW2	8.81	9.26	9.46	11.54	5.32	0.00	3.66	4.52	9.86	9.97	11.62	10.95	94.97
ROCKY MOUNTAIN INDUSTRIES, INC 4116														
03S/11W-06C03S	1	3.44	4.24	3.41	2.35	0.00								13.44
ROMAN CATHOLIC ARCHBISHOP OF L A 4150														
02S/12W-06K08S	YARD	0.01	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.53	3.79	0.24	4.63
02S/12W-06L01S	PKLOT	36.39	56.72	24.01	21.66	14.81	3.90	13.66	7.46	20.72	28.41	44.22	35.92	307.88
03S/11W-31N03S	HFPAR	0.85	1.26	0.77	0.94	0.44	0.63	0.70	0.86	0.75	0.84	1.14	1.16	10.34
PARTY TOTALS:		37.25	57.98	24.78	22.60	15.31	4.53	14.36	8.32	21.47	29.78	49.15	37.32	322.85
ST JOHN BOSCO SCHOOL 4300														
03S/12W-15K03S	15HP	10.72	8.69	9.87	5.21	2.50	2.16	2.11	0.06	1.53	8.95	9.30	10.32	71.42
SAN GABRIEL VALLEY WATER CO 4330														
02S/11W-18Q01S	W1C	0.00	1.72	2.55	0.56	0.40	1.01	0.68	0.36	0.86	0.51	0.64	17.65	26.94
02S/11W-18Q07S	W1E	87.32	10.38	21.97	16.03	7.08	11.99	7.28	4.41	4.91	25.28	128.38	130.35	455.38
02S/11W-19F07S	W6C	8.11	0.63	1.05	0.67	0.66	1.17	0.67	0.81	0.86	2.95	0.72	0.50	18.80
02S/11W-19F08S	W6D	248.23	289.20	307.55	50.48	4.19	1.90	0.41	0.11	3.82	31.24	171.98	153.60	1262.71
02S/12W-01R01S	M2A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-01R02S	M2B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARTY TOTALS:		343.66	301.93	333.12	67.74	12.33	16.07	9.04	5.69	10.45	59.98	301.72	302.10	1763.83
SANTA FE SPRINGS, CITY OF 4335														
02S/11W-30R03S	1	154.78	154.64	146.00	147.11	137.66	140.48	141.03	130.90	146.14	141.91	149.91	144.51	1735.07
03S/11W-06D03S	4	0.00	0.00	0.46	0.02	0.00	0.05	0.00	0.00	0.09	0.00	0.00	0.16	0.78
03S/11W-20R09S	2	220.63	218.15	212.99	213.14	177.40	171.90	156.50	167.54	197.60	204.86	145.50	30.29	2116.50
03S/12W-01F08S	309W2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARTY TOTALS:			372.79		360.27		312.43		298.44		346.77		174.96	

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG- NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
		375.41		359.45		315.06		297.53		343.83		295.41		3852.35
SATIVA L A COUNTY WATER DISTRICT														
4345														
03S/13W-15C02S	00004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-15G01S	00003	24.25	29.45	23.10	20.15	17.07	25.93	11.39	15.71	18.40	5.92	0.00	0.00	191.37
03S/13W-15M04S	00002	17.70	12.98	11.61	10.71	6.26	25.23	11.88	16.54	35.91	18.44	21.82	30.78	219.86
03S/13W-15M05S	00005	39.69	32.39	39.00	35.49	26.63	11.47	37.47	22.03	10.24	46.92	46.59	48.95	396.87
PARTY TOTALS:			74.82		66.35		62.63		54.28		71.28		79.73	
		81.64		73.71		49.96		60.74		64.55		68.41		808.10
SIGNAL HILL, CITY OF														
4450														
03S/12W-31B01S	7	82.61	69.63	61.37	98.22	87.08	88.86	92.12	82.98	85.55	100.66	102.39	91.83	1043.30
03S/12W-31J02S	8	77.99	35.54	58.05	91.41	84.55	86.76	90.55	11.63	0.00	0.00	27.50	138.51	702.49
PARTY TOTALS:			105.17		189.63		175.62		94.61		100.66		230.34	
		160.60		119.42		171.63		182.67		85.55		129.89		1745.79
SOUTH MONTEBELLO IRRIGATION DIST														
4540														
02S/12W-13D07S	00005	27.99	20.71	21.74	18.02	13.14	10.51	9.47	11.40	11.96	26.12	30.63	26.17	227.86
02S/12W-14B02S	00001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-14B07S	00002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-14B08S	00003	53.23	46.69	42.24	36.29	37.70	43.01	43.17	21.82	11.45	34.33	43.95	52.72	466.60
02S/12W-15J04S	00006	36.66	38.11	40.80	38.39	55.72	50.35	49.16	47.84	40.90	24.53	47.08	33.29	502.83
02S/12W-22G02S	00007	86.34	95.83	79.67	82.72	33.60	33.77	37.37	43.36	79.97	69.02	60.46	71.33	773.44
PARTY TOTALS:			201.34		175.42		137.64		124.42		154.00		183.51	
		204.22		184.45		140.16		139.17		144.28		182.12		1970.73
SOUTHERN CALIFORNIA EDISON CO														
4549														
02S/12W-21N04S	LBSUB	0.05	0.41	0.06	0.85	0.01	0.12	0.11	0.05	0.16	0.66	0.88	0.68	4.04
02S/12W-32B02S	KGARF	0.65	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.39	0.43	0.34	2.67
03S/12W-07B05S	NKIMP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-11A06S	SCEDI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-11B07S	CESUB	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
03S/12W-19G02S	ABILA	5.49	5.80	5.88	2.26	2.82	2.70	1.82	2.79	3.33	3.07	3.63	0.02	39.61
03S/12W-29K01S	PAR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-30K02S	LHSUB	2.62	3.84	3.51	3.42	2.50	2.11	2.78	1.00	1.35	1.95	3.28	2.18	30.54
03S/12W-30L02S	ISHIB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-25K01S	DEMED	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-25K02S	DEMHO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-26H02S	DEMDZ	3.50	4.01	4.08	1.71	1.86	1.67	0.96	0.95	0.52	1.83	2.85	3.49	27.43

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG- NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
03S/13W-36C02S	DEMED	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/13W-36N02S	RIVER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00E	100.00
04S/12W-01P04S	DASUB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/12W-25K03S	DEMT2	5.64	6.16	5.26	3.22	0.76	1.78	1.61	2.30	3.27	7.44	6.10	6.00	49.54
04S/13W-02J05S	SCOTT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.50E	5.50
PARTY TOTALS:		17.95	20.97	18.79	11.46	7.95	8.38	7.28	7.09	8.76	15.34	17.17	118.21	259.35
SOUTHERN CALIFORNIA WATER CO														
4560														
02S/12W-28K01S	FL001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-28N03S	CL001	35.20	34.67	36.66	38.53	37.30	38.14	38.01	36.00	38.99	37.80	39.09	37.39	447.78
02S/12W-29A02S	GAG02	101.32	110.87	100.31	97.05	93.84	94.70	91.21	86.44	93.15	90.33	93.17	90.09	1142.48
02S/12W-29A04S	GAG01	25.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.19
02S/12W-29M05S	PRY02	42.50	23.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	66.03
02S/12W-30G03S	WATS1	120.88	121.26	108.86	115.77	88.39	114.66E	105.71	104.03	127.87	127.36	127.91	128.30	1391.00
02S/12W-30H02S	OC002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-31B03S	HOF02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/13W-21E01S	G0004	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
02S/13W-21K04S	CON 1	0.06	0.00	0.13	40.26	66.45	9.90	0.00	0.00	0.04	0.00	0.07	0.00	116.91
02S/13W-21K07S	CON 2	126.31	125.88	121.35	126.76	133.68	141.91	141.80	131.44	140.57	135.68	139.47	134.33	1599.18
02S/13W-23J01S	BIS01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/13W-23J03S	BIS20	30.69	27.70	30.03	35.10	32.24	34.83	34.83	31.36	36.69	33.57	35.61	33.67	396.32
02S/13W-24Q02S	OT001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/13W-24Q03S	OT002	22.99	21.88	19.74	20.06	18.82	20.17	21.53	18.52	10.98	0.00	0.00	0.00	174.69
02S/13W-27E03S	NA003	42.23	41.68	40.88	41.97	40.64	43.26	43.92	40.79	43.12	43.86	55.65	58.68	536.68
02S/13W-28G01S	MI003	29.27	0.00	50.20	106.90	92.50	123.97	32.29	0.00	99.93	117.17	118.47	114.68	885.38
02S/13W-28G02S	MI001	11.88	17.06	8.49	0.56	7.05	25.08	59.55	68.47	42.16	40.28	56.72	51.58	388.88
02S/13W-28G03S	MI002	73.11	94.85	62.98	18.71	3.82	0.00	0.00	0.00	0.00	0.00	0.00	7.26	260.73
02S/13W-28H01S	NA002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/11W-07E01S	PI001	64.97	62.90	57.33	52.05	56.33	56.18	55.85	52.15	57.24	55.41	59.08	54.14	683.63
03S/11W-07E02S	PI002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/11W-08H01S	MEYER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/11W-18G05S	DAC01	72.26	70.59	66.80	60.04	46.95	44.70	47.70	46.86	43.88	60.42	69.41	66.45	696.06
03S/11W-30P02S	ELA01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/11W-31M03S	VIN02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-02R01S	ST002	57.37	53.60	48.26	52.46	46.80	49.15	48.36	43.06	49.54	51.84	54.69	52.32	607.45
03S/12W-07Q05S	CTY01	19.28	20.24	17.51	17.72	13.80	13.84	14.76	13.15	13.37	13.43	16.21	15.13	188.44
03S/12W-08M02S	C0002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-12A02S	PI003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-13A02S	IMP02	111.13	100.16	89.04	86.65	76.23	70.51	65.34	62.95	74.53	70.43	90.02	90.70	987.69
03S/12W-13A03S	IMP01	0.07	0.10	3.22	0.05	0.00	16.20	23.82	19.08	26.73	31.04	57.70	67.36	245.37
03S/12W-13B04S	IMP03	71.63	61.12	46.88	49.32	30.48	11.60	0.00	0.00	0.00	0.92	0.29	0.00	272.24

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG-NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
03S/12W-17A01S	MCK02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-17A02S	MCK03	76.54	79.99	71.82	65.86	52.20	51.97	52.23	45.48	56.88	63.34	75.37	74.01	765.69
03S/12W-25Q03S	ROS02	0.34	0.00	0.11	0.08	0.00	0.11	0.00	62.94	95.32	91.91	70.55	0.00	321.36
03S/12W-25R02S	MDSTN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-36B01S	ROS01	116.13	117.75	111.32	75.01	152.16E	114.31	113.07	109.13	116.19	113.47	116.29	111.50	1366.33
03S/13W-04N01S	BEL03	78.28	76.90	80.72	95.59	90.73	97.70	94.62	79.09	89.33	87.84	99.01	97.22	1067.03
03S/13W-04N03S	BEL01	71.27	69.94	48.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	189.36
03S/13W-10L02S	WLBK1	95.20	97.14	89.13	76.99	61.36	61.68	61.60	54.57	66.76	69.61	62.78	74.88	871.70
03S/13W-10L04S	WLBK3	18.80	17.16	22.80	27.59	19.22	27.28	26.97	27.86	26.94	25.93	41.04	26.95	308.54
04S/11W-07E02S	00003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/11W-07H02S	HAW01	85.07	85.53	81.54	82.11	79.24	81.49	84.03	81.14	86.95	83.82	84.54	77.16	992.62
04S/11W-07L01S	CEN03	49.02	43.99	26.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.36	74.66	218.90
04S/11W-07L03S	CEN04	57.78	60.52	57.27	60.81	58.26	58.85	63.93	61.51	68.90	67.23	59.91	46.46	721.43
04S/11W-07L04S	CEN05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/11W-07N01S	0024C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/11W-07P02S	0024A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/11W-18F01S	JUAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/11W-18F02S	JUAN4	0.00	2.00	60.95	51.43	35.81E	41.85	24.61	38.90	38.66	37.13	41.01	33.71	406.06
04S/12W-12J01S	MAS01	76.41	73.18	76.72	75.65	66.95	65.26	55.91	52.81	58.90	60.43	57.80	50.45	770.47
PARTY TOTALS:		1783.18	1712.19	1636.07	1571.10	1501.25	1509.30	1401.65	1367.73	1603.62	1610.25	1746.22	1669.08	19111.64
SOUTHERN SERVICE CO & ENVIRON INC 4570														
04S/12W-08N02S		14.73	15.75	12.65	16.19	13.18	16.20	17.06	13.25	13.16	21.16E	16.08	14.66	184.07
SOUTH GATE, CITY OF 4590														
02S/12W-31M02S	00007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02S/12W-31Q02S	00025	240.85E	235.87E	204.39E	198.86E	137.55E	41.43E	0.00	139.10	130.82	179.41	114.05	17.61	1639.94
02S/12W-31Q03S	00024	120.05	120.17	93.61	100.42	71.26	179.28	205.33	67.37	86.95	105.78	101.80	97.31	1349.33
02S/13W-34Q03S	00026	67.20E	55.08E	53.68E	56.98E	27.61E	5.08E	0.00	0.00	0.00	0.00	0.00	0.00	265.63
02S/13W-34R01S	00027	231.40	230.78	222.22	240.23	204.92	239.10	219.90	205.97	223.30	231.15	191.30	201.84	2642.11
03S/12W-05M01S	0022B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-06B03S	00023	0.45	0.15	0.18	0.21	0.13	0.02	0.12	0.14	0.10	0.19	0.00	0.13	1.82
03S/12W-06D01S	00013	253.56E	204.01E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	197.25	655.18
03S/12W-06D02S	00014	225.42E	299.34E	248.89E	150.66E	108.00E	263.44E	260.43E	214.16E	284.59E	118.01	319.22	351.20	2843.36
03S/12W-06D03S	00018	42.63	17.53	5.21	22.66	109.91	118.42	117.87	93.80	119.89	150.87	129.59	11.27	939.65
03S/12W-06D04S	00019	1.35E	1.41E	197.47E	248.53E	113.49E	0.39E	1.33E	12.08E	0.31E	0.00	0.00	0.00	576.36
PARTY TOTALS:		1182.91	1164.34	1025.65	1018.55	772.87	847.16	804.98	732.62	845.96	785.41	856.32	876.61	10913.38

PRODUCTION - CENTRAL BASIN

STATE WELL NUMBER	OWNERS DESIG-NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
SUBURBAN WATER SYSTEMS 4810														
03S/11W-22D01S	409	177.01	190.86	179.67	177.58	175.11	177.47	164.94	161.51	168.71	78.54	132.72	93.50	1877.62
03S/11W-27L01S	410	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARTY TOTALS:		177.01	190.86	179.67	177.58	175.11	177.47	164.94	161.51	168.71	78.54	132.72	93.50	1877.62
TRACT NUMBER 180 WATER CO 4980														
02S/13W-25H06S	6	73.83	72.30	65.86	66.71	66.59	44.37	68.42	53.14	30.80	74.26	160.05	106.38	882.71
02S/13W-25H S	5	91.23	89.82	82.08	81.70	82.88	54.61	84.31	98.54	113.57	33.28	0.00	49.00	861.02
PARTY TOTALS:		165.06	162.12	147.94	148.41	149.47	98.98	152.73	151.68	144.37	107.54	160.05	155.38	1743.73
TRACT 349 MUTUAL WATER CO 4990														
02S/12W-31D01S	3	92.64	93.62	85.25	86.26	76.70	76.84	78.57	69.52	78.26	74.75	84.62	81.73	978.76
02S/13W-25C02S	2	8.25	6.60	6.43	5.66	2.87	2.29	1.79	3.88	6.10	8.99	8.87	10.27	72.00
PARTY TOTALS:		100.89	100.22	91.68	91.92	79.57	79.13	80.36	73.40	84.36	83.74	93.49	92.00	1050.76
TUCKER, W AND OR BOBBY ROBERTSON 5019														
02S/13W-12P04S	BAND2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.12
UNITED STATES GYPSUM CO 5080														
02S/13W-36A02S	2	14.34	13.26	14.09	14.39	14.25	13.77	15.08	8.82	17.11	17.00	22.45	20.20	184.76
02S/13W-36H02S	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARTY TOTALS:		14.34	13.26	14.09	14.39	14.25	13.77	15.08	8.82	17.11	17.00	22.45	20.20	184.76
VERNON, CITY OF 5460														
02S/13W-10P05S	11	70.62	77.67	76.87	0.00	46.00	101.37	40.65	25.17	96.84	21.65	35.96	112.17	704.97

02S/13W-10P08S	16	81.85	93.11	81.14	113.73	117.34	93.68	85.99	114.24	50.93	120.58	159.24	65.00	1176.83
02S/13W-11E04S	14	0.00	0.71	111.47	35.70	0.00	0.00	0.00	0.00	0.00	0.00	24.59	205.23	377.70
02S/13W-11R04S	12	34.43	26.21	17.39	0.06	1.95	60.07	13.10	13.43	15.13	19.45	38.98	17.44	257.64
02S/13W-11R06S	17	89.92	110.81	131.79	201.88	171.97	144.20	153.03	120.84	130.90	135.68	88.99	122.53	1602.54
02S/13W-13H02S	20	95.62	104.05	153.50	124.47	107.41	126.67	116.04E	83.29	144.45	128.69	162.33	134.41	1480.93
02S/13W-14H04S	15	133.96	187.64	162.92	192.45	170.69	143.10	175.64	169.90	173.95	178.38	181.67	138.82	2009.12
02S/13W-14H05S	19	150.06	123.07	38.33	143.38	41.24	0.00	148.06	131.22E	138.43	142.30	122.31	117.69	1296.09
02S/13W-15E02S	18	53.61	35.42	23.89	0.44	0.14	0.46	0.00	0.66	0.61	0.38	0.34	0.20	116.15
PARTY TOTALS:		710.07	758.69	797.30	812.11	656.74	669.55	732.51	658.75	751.24	747.11	814.41	913.49	9021.97

VIRGINIA COUNTRY CLUB

5490

04S/13W-12E10S	VIR2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04S/13W-12M06S	TEX1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARTY TOTALS:		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

WALNUT PARK MUTUAL WATER CO

5610

02S/13W-27B19S	00009	0.00	0.00											0.00
02S/13W-27B20S	00010	65.43	18.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.48	57.48	146.49
02S/13W-27B22S	00011	96.28	146.35	134.99	53.45	0.00	0.00	0.00	0.00	0.00	0.00	1.26	51.36	483.69
PARTY TOTALS:		161.71	164.45	134.99	53.45	0.00	0.00	0.00	0.00	0.00	0.00	6.74	108.84	630.18

WHITTIER, CITY OF

5660

02S/11W-05N04S	00014	232.87	274.38	245.22	243.10	49.14	0.00	0.00	0.00	54.16	66.26	7.20	0.00	1172.33
02S/11W-07H01S	00008	16.49	7.84	1.88	0.44	0.77	0.00	0.00	0.00	8.25	2.50	1.62	1.00	40.79
02S/11W-07J01S	00007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARTY TOTALS:		249.36	282.22	247.10	243.54	49.91	0.00	0.00	0.00	62.41	68.76	8.82	1.00	1213.12

WHITTIER UNION HIGH SCHOOL DIST

5670

02S/11W-32J04S	SH550	3.85	5.15	3.08	1.73	0.87	0.26	1.29	1.57	2.03	3.29	3.75	4.77	31.64
03S/11W-03C01S	CHS40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03S/12W-01G09S	SF50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARTY TOTALS:		3.85	5.15	3.08	1.73	0.87	0.26	1.29	1.57	2.03	3.29	3.75	4.77	31.64

YAMAMOTO, GEORGE AND ALICE														
5800														
03S/12W-29J02S	68TH	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03
BASIN TOTALS:		19378.33	16534.03	14398.18	13412.23	14490.09	18152.41	19252.72	18933.60	14314.19	14921.49	14328.13	17899.17	196014.57

PRODUCTION - SMALL PRODUCERS

STATE / WELL / NUMBER	OWNERS / DESIG- / NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
ARZOUMAN, CHARLES AND NEUART														
0180														
04S/11W-05H06S				0.00			0.00			0.00			0.00	0.00
ATLAS IRON AND METAL CO														
0225														
02S/13W-34Q02S	1			0.06E			0.06E			0.06E			0.06E	0.24
BANNAN, CHARLES F														
0295														
02S/12W-33A04S				0.00			0.00			0.00			0.00	0.00
BUELL, MARY DOLORES														
0657														
03S/12W-35B06S				0.17E			0.17E			0.17E			0.17E	0.68
DEMENNO/KERDOON														
1333														
03S/13W-14M02S	RW-3			0.00			0.00			0.01			0.03	0.04
03S/13W-14M03S	RW-6			0.01			0.00			0.07			0.17	0.25
03S/13W-14M04S	RW-11			0.00			0.00			0.00			0.00	0.00
03S/13W-15H02S	RW-2			0.00			0.00			0.04			0.12	0.16
03S/13W-15H03S	RW-7			0.00			0.00			0.00			0.00	0.00
03S/13W-15H04S	RW-8			0.00			0.00			0.00			0.00	0.00
03S/13W-15H05S	RW-10			0.00			0.00			0.12E			2.44	2.56
03S/13W-15H06S	RW-4			0.00			0.02			0.07			0.07	0.16
03S/13W-15J01S	RW-1			0.00			0.00			0.02			0.09	0.11
03S/13W-15J02S	RW-5			0.22			0.02			0.17			0.30	0.71
03S/13W-17H07S	RW-9			0.00			0.00			0.00			0.00	0.00
PARTY TOTALS:			0.00		0.00		0.04		0.00		0.00		3.22	

PRODUCTION - SMALL PRODUCERS

STATE / WELL NUMBER	OWNERS / DESIG-NATION	2003 JUL	AUG	SEP	OCT	NOV	DEC	2004 JAN	FEB	MAR	APR	MAY	JUN	TOTAL
		0.00		0.23		0.00		0.00		0.50		0.00		3.99
	FURR, NANCY J													
1745														
03S/12W-21G05S				0.03E			0.03E			0.03E			0.03E	0.12
	GORDON, ROBERT E													
1960														
04S/12W-12D01S				0.17E			0.17E			0.17E			0.17E	0.68
	GRANT, JOHN													
1987														
03S/12W-26R04S				0.17E			0.17E			0.17E			0.17E	0.68
	LUSSMAN, PAUL H JR, ET AL													
3040														
03S/12W-32G01S				0.06E			0.06E			0.06E			0.06E	0.24
	SCANTLEBURY, ROBERT P													
4349														
03S/11W-07N01S 1				0.34			0.13			0.00			0.28	0.75
BASIN TOTALS:		0.00	0.00	1.23	0.00	0.00	0.83	0.00	0.00	1.16	0.00	0.00	4.16	7.38

APPENDIX D. CHANGES IN WELL STATUS

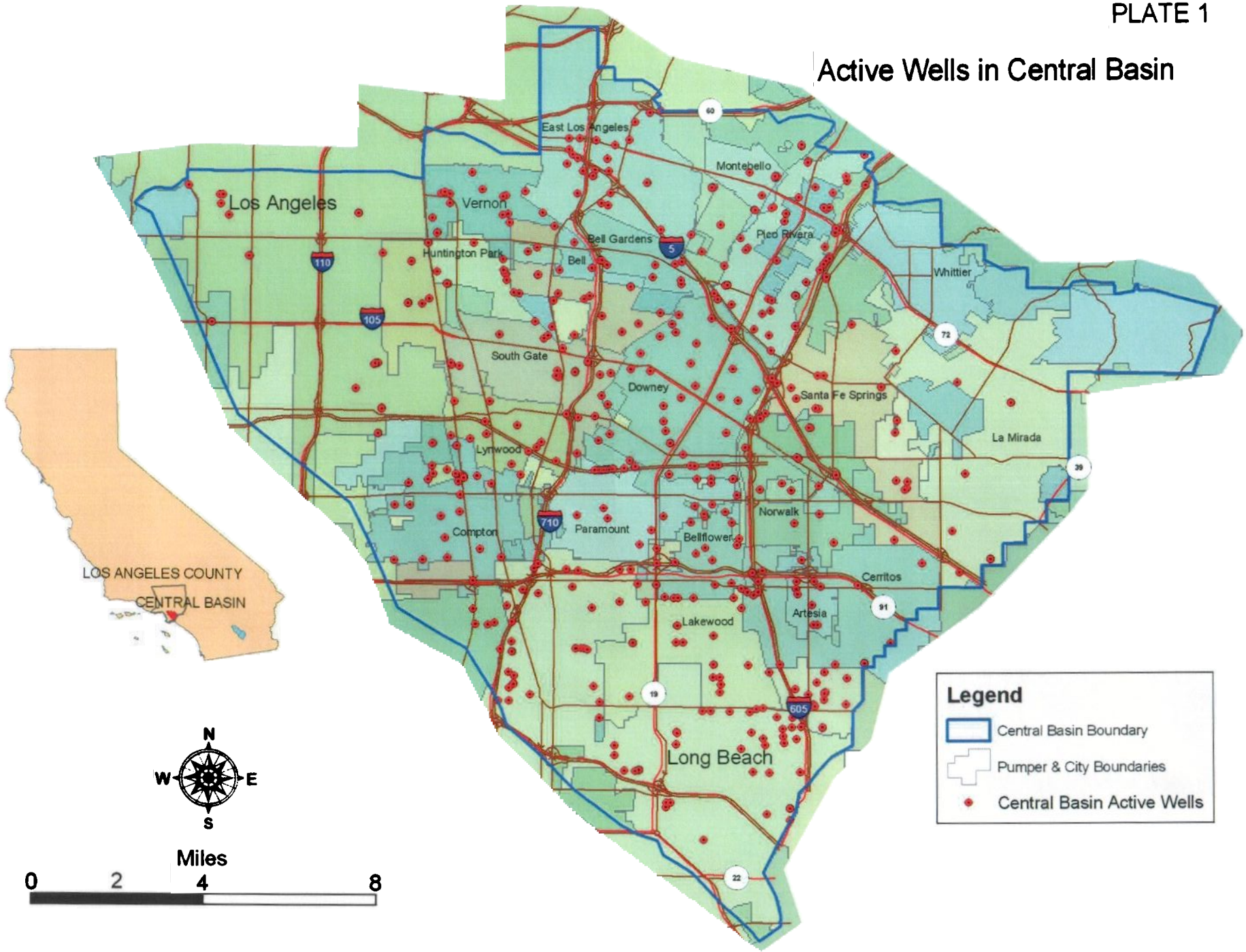
Party	Recordation No.	State Well No.	Owner Designation
New Wells			
Ashland Chemical Company (Completed in July 2003)	1909990	3S/11W-05K004S	EX-4
Ashland Chemical Company (Completed in July 2003)	1909991	3S/11W-05K005S	EX-5
Central Basin Municipal Water Dist. (Completed in February 2003)	1909993	2S/11W-07D010S	CB-1
Central Basin Municipal Water Dist. (Completed in April 2002)	1909994	2S/11W-07C005S	CB-2
Lakewood City of (Completed in February 2001)	1909976	4S/12W-03A002S	15A
Lakewood City of (Completed in May 2003)	1909989	4S/12W-02F002S	13A
Los Angeles City of LADWP (Completed in June 2002)		2S/13W-32R019S	14
Los Angeles City of LADWP (Completed in March 2002)		2S/13W-32R020S	15
Maywood Mutual Water Company #3 (Completed in February 2004)	1909992	2S/12W-19C003S	3
Destroyed Wells			
Bellflower-Somerset Mutual Water Company (Destroyed in October 2003)	1900767	3S/12W-28H003S	00767
California Water Service Company (Destroyed in July 2003)	1900156	2S/12W-05A001S	1502
California Water Service Company (Destroyed in August 2003	1900164	2S/12W-07C001S	2801
La Habra Heights County Water Dist. (Destroyed in March 2004)	1901088	2S/11W-10M004S	2
La Habra Heights County Water Dist. (Destroyed in March 2004)	1901089	2S/11W-19L001S	3
La Habra Heights County Water Dist. (Destroyed in March 2004)	1901090	2S/11W-19F003S	5

APPENDIX D. CHANGES IN WELL STATUS (Con't)

Party	Recordation No.	State Well No.	Owner Designation
Destroyed Wells (Con't)			
Lakewood City of (Destroyed in August 2003)	1909132	3S/12W-33R001S	LK011
Maywood Mutual Water Co. #2 (Destroyed in October 2001)	1909153	2S/13W-13R001S	Pine Ave
Southern California Water Company (Destroyed in July 2000)	1902225	4S/11W-18F001S	Juan
Southern California Water Company (Destroyed in February 2001)	1902048	2S/12W-28K001S	Florence 1
South Gate City of (Destroyed in October 2002)	1901548	2S13W-35A001S	2
Union Development Co. Inc. (Destroyed in December 2003)		3S/12W-26Q006S	
Walnut Park Mutual Water Co. (Destroyed in July 2003)	1902472	2S/13W-27B019S	9
Whittier City of (Destroyed in April 2002)	1901742	2S/11W-18K003S	5

PLATE 1

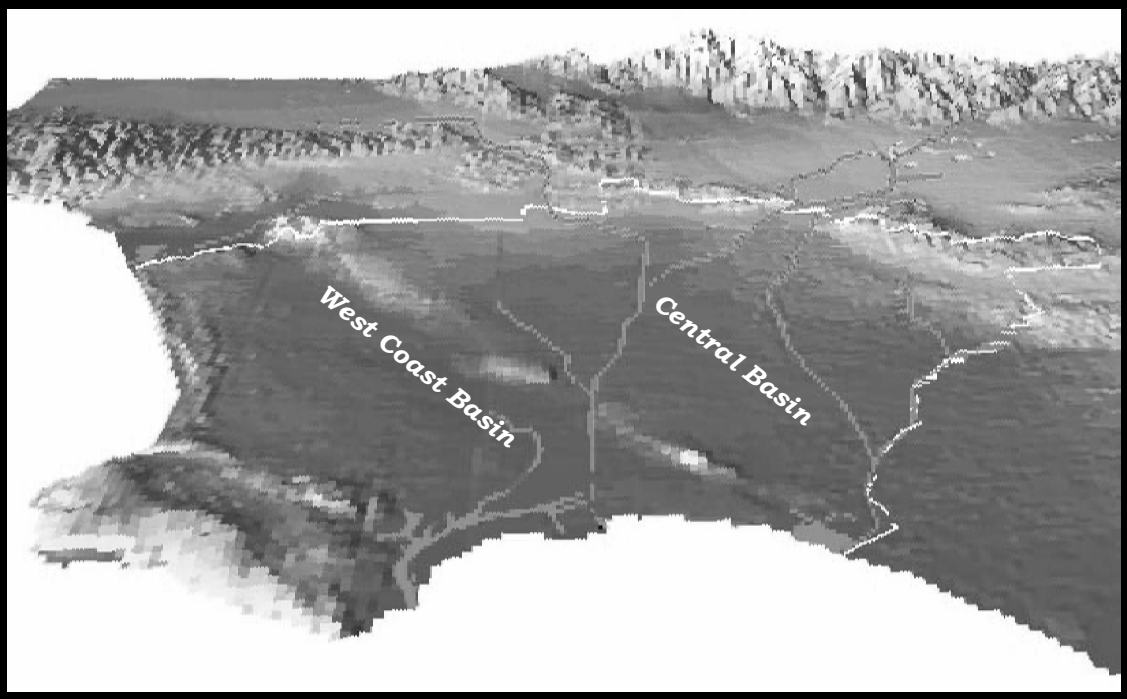
Active Wells in Central Basin



Attachment E

WRDSC's
2005 Engineering Survey & Report

Water Replenishment District of Southern California



Engineering Survey and Report

2005

WRD

March 2, 2005

Water Replenishment District
Of Southern California

ENGINEERING SURVEY AND REPORT, 2005
March 2, 2005

BOARD OF DIRECTORS	MANAGEMENT
Division 1	**General Manager**
Willard H. Murray, Jr., President	Robb Whitaker
Division 2	**Asst. General Manager/Chief Engineer**
Rob Katherman, Secretary	Mario Garcia
Division 3	**Chief Hydrogeologist**
Norm Ryan, Treasurer	Theodore Johnson
Division 4	**Manager of Administration**
Pat Acosta, Director	Tina Graham
Division 5	**Chief Financial Officer**
Albert Robles, Director	Scott Ota
District Counsel:	**Manager of External Affairs**
J. Arnoldo Beltran and Edward Casey	Evelyn Fierro

Professional Certification

This Engineering Survey and Report has been prepared under the direct supervision of the California registered professionals whose signatures appear below. These individuals certify that the information contained in the report has been prepared in accordance with the generally accepted principles and practices of their respective professions.

(Original signatures will appear on the final ESR following adoption of Replenishment Assessment)

Mario Garcia, RCE 43947

Theodore Johnson, RG 6142, CHG 240

TABLE OF CONTENTS

BOARD SUMMARY

1. Groundwater Production i
2. Annual Overdraft i
3. Accumulated Overdraft ii
4. Water Levels ii
5. Quantity Required for Replenishment ii
6. Source of Replenishment Water ii
7. Cost of Replenishment Water iii
8. Projects and Programs iii
9. Conclusions iii

CHAPTER I - INTRODUCTION

Purpose of the Engineering Survey & Report I-1
Scope of Engineering Survey & Report I-1
Schedule for Setting of the Replenishment Assessment I-1

CHAPTER II - GROUNDWATER PRODUCTION

Adjudication and Demand II-1
Production II-1
- Previous Water Year II-1
- Current Water Year II-1
- Ensuing Water Year II-2
- Measurement of Production II-2
- Carryover and Drought Provisions II-2

CHAPTER III - GROUNDWATER CONDITIONS

Introduction III-1
Annual Overdraft III-1
Accumulated Overdraft III-3
Groundwater Levels III-4
- Los Angeles Forebay III-4
- Montebello Forebay III-5
- Central Basin Pressure Area III-5
- West Coast Basin III-6
- Change in Storage III-6

TABLE OF CONTENTS (Continued)

CHAPTER IV - GROUNDWATER REPLENISHMENT: QUANTITIES, AVAILABILITY, AND COSTS

Recommended Quantities of Replenishment Water IV-1
Spreading IV-1
Injection IV-2
In-Lieu Replenishment Water IV-2
Expected Availability of Replenishment Water IV-3
Recycled Water IV-3
Imported Water IV-4
Projected Cost of Replenishment Water IV-4
Recycled Water Rates IV-4
Imported Water Rates IV-5
In-Lieu Rates IV-5
Summary IV-5

CHAPTER V - PROJECTS AND PROGRAMS

001 - Leo J. Vander Lans Water Treatment Facility Project V-1
002 - Robert W. Goldsworthy Desalter Project V-1
003 - Cal Trans Highway 105 Dewatering V-2
004 - Recycled Water Program V-2
005 - Groundwater Resources Planning Program V-3
006 - Groundwater Quality Program V-4
007 - Whittier Narrows Groundwater Contamination V-6
010 - Geographic Information System V-7
11A - Regional Groundwater Monitoring Program V-7
11B - Hydrogeology Program V-8
012 - Safe Drinking Water Program V-9
016 - Seawater Barrier Improvement Program V-9
018 - Dominguez Gap Barrier Recycled Water Injection V-10
023 - Replenishment Operations V-11
030 - Alamitos Barrier Deep Soil Mixing Pilot Study V-11

TABLE OF CONTENTS (Continued)

LIST OF TABLES

Table 1: Groundwater Conditions.....Tables Section
Table 2: Quantity and Cost of Replenishment Water .....Tables Section
Table 3: WRD Projects and Programs .....Tables Section
Table 4: Average Long-Term Groundwater Balance.....Tables Section
Table 5: Historical Rainfall.....Tables Section
Table 6: Annual Overdraft Calculation.....Tables Section
Table 7: Accumulated Overdraft Calculation .....Tables Section
Table 8: Changes in Groundwater Storage Since 1961 .....Tables Section
Table 9: Quantity Required for Spreading.....Tables Section

Historical Tables..... Tables Section
Table A-1: Historical Amounts of Water Purchased for Spreading .....Tables Section
Table A-2: Historical Amounts of Water Purchased for Injection .....Tables Section
Table A-3: Historical Amounts of Water Purchased for In-Lieu .....Tables Section
Table A-4: Historical Amounts of Water Purchased for Replenishment .....Tables Section
Table A-5: Historical Amounts of Groundwater Production .....Tables Section
Table A-6: Historical Amounts of Total Water Use in the WRD.....Tables Section

LIST OF FIGURES

Figure A: Historical Rainfall.....Figures Section
Figure B: Los Angeles Forebay Key Well Hydrograph .....Figures Section
Figure C: Montebello Forebay Key Well Hydrographs .....Figures Section
Figure D: Central Basin Pressure Area Key Well Hydrographs.....Figures Section
Figure E: West Coast Basin Key Well Hydrographs.....Figures Section

LIST OF PLATES

Plate 1: Groundwater Production Water Year 2003/2004 .....Plates Section
Plate 2: Groundwater Elevation Contour Map for Fall 2004 .....Plates Section
Plate 3: Change in Groundwater Levels Fall 2003 to Fall 2004 .....Plates Section

BOARD SUMMARY

District Staff is pleased to present the 2005 Engineering Survey and Report (ESR). It was prepared pursuant to Chapter I, Part 6, Division 18 of the California Water Code, and determines the past, current, and ensuing year groundwater conditions in the Central and West Coast Basins. The report contains information on groundwater production, annual and accumulated overdraft, water levels, the quantity, source, and cost of replenishment water, and a discussion of necessary projects and programs to protect and preserve the groundwater resources of the basins.

The ESR provides the Board of Directors with the necessary information to make a determination as to whether a replenishment assessment will be needed in the ensuing year to purchase replenishment water and to fund replenishment and water quality projects and programs. This determination is required by the second Tuesday in March so that public hearings can be held and the replenishment assessment set by the second Tuesday in May.

In brief, Staff has determined that the District will need to purchase 122,103 acre-feet (AF) of replenishment water in the ensuing year at an estimated cost of $26,636,006, and that projects and programs are needed to protect and preserve the groundwater resources of the basins. A summary of the findings is presented below. Detailed information is presented in the remaining chapters.

1. Groundwater Production

The District tracks the amount of groundwater production (pumping) that occurs every year in the Central and West Coast Basins. A replenishment assessment is levied on the pumping to generate revenue to purchase supplemental water to help replace the extracted amounts, as well as to fund District activities. In this manner, the users of the groundwater pay for the replenishment of the groundwater.

- Adjudicated Amount: 281,835 AF
- Previous Water Year: 248,334 AF
- Current Water Year: 245,025 AF (estimated)
- Ensuing Water Year: 248,157 AF (estimated)

2. Annual Overdraft

The groundwater basins face overdraft every year. This is a simple fact because pumping exceeds natural groundwater replenishment. One of the District's main responsibilities since its formation in 1959 is to make up this annual overdraft by purchasing artificial replenishment water (imported and recycled) to help refill the aquifers. The following annual overdraft numbers have been determined and form the basis for the Board to adopt a replenishment assessment in the ensuing year to help make up the annual overdraft.

- Previous Water Year: 135,686 AF

- Current Water Year: 75,639 AF (estimated)
- Ensuing Water Year: 102,952 AF (estimated)

3. Accumulated Overdraft

The accumulated overdraft is defined by the Water Code as a measure of the aggregate effects of subsequent years of overdraft. Since the District's formation it has improved basin conditions by providing artificial replenishment water to supplement the natural replenishment resulting in a reduced accumulated overdraft.

- Previous Water Year: 702,100 AF
- Current Water Year: 660,247 AF (estimated)
- Ensuing Water Year: not required for determination by the Water Code

4. Water Levels

WRD tracks groundwater levels in production wells and monitoring wells located throughout the District to observe the conditions of the basins and to identify any up or down trends that may impact the groundwater resources. Water levels rise when more water enters the basins than leaves, resulting in an increase in storage. Water levels fall when more water leaves the basins than enters, resulting in a decrease in storage.

In the previous Water Year, overall water levels fell for the sixth straight year. In general, water levels fell up to 40 feet in the Central Basin but remained neutral or rose slightly in the West Coast Basin. For both basins the net result was a loss from storage of 43,000 AF. Over the past six years, 200,000 AF has been lost from storage (120,000 AF over five years, since the year 2000). In the current year, however, with only 5 months completed so far, precipitation has been nearly double the annual average. This is expected to cause water levels to rise and storage to increase.

5. Quantity Required for Replenishment

Chapter IV details that the quantity of water that WRD must purchase in the ensuing water year to help offset the annual overdraft. A summary is listed below:

- Spreading Water: 75,600 AF (48,000 recycled water, 27,600 AF imported water)
- Seawater Barrier Water: 36,200 AF (19,000 AF WCBBP, 13,400 AF DGBP, 3,800 AF ABP)
- In-Lieu Program Water: 10,303 AF (6,000 AF CB, 4,303 AF WCB)
- Total Water: 122,103 AF

6. Source of Replenishment Water

The sources of replenishment water to the District for the ensuing water year include the following:

- Recycled Water: Spreading water from the County Sanitation Districts of Los Angeles County. West Coast Basin Barrier Project (WCBBP) water from the West Basin Municipal Water

District. Dominguez Gap Barrier Project (DGBP) water from the City of Los Angeles. Alamitos Barrier Project (ABP) water from WRD's Leo J. Vander Lans Water Treatment Facility.

- Imported Water: Spreading water from Central Basin Municipal Water District. WCBBP water and DGBP water from West Basin Municipal Water District. ABP water from the City of Long Beach. In-Lieu program water from various MWD-member agencies.

7. Cost of Replenishment Water

WRD has estimated that the cost for purchasing 122,103 AF of replenishment water in the ensuing water year will be $26,836,006. This is a 9.2% increase from last year's ESR due to the new injection wells at the DGBP to better protect the basins from seawater intrusion, and an increase in MWD's treated imported water rate of $20/AF. **Tables 1 and 2** present the details of this cost.

The estimated cost for replenishment water has been detailed in this report. However, it does not represent the full District costs for the ensuing year. Additional costs are necessary for projects and programs to replenish the basins and protect and preserve the quality of the groundwater. The costs for those projects and programs are presented in District's separate annual budget document which is currently being prepared. The total District costs for the ensuing year (replenishment water costs plus project and program costs) form the basis for the Board to adopt the replenishment assessment by the second Tuesday in May.

8. Projects and Programs

A list of the WRD projects and programs related to groundwater replenishment and the protection and preservation of water quality is shown on **Table 3**. Funds are required to finance these projects and programs. Sections 60221 and 60230 of the Water Replenishment Districts Act authorize the WRD to undertake a wide range of capital projects and other programs aimed at enhancing groundwater replenishment. Section 60224 of the Water Replenishment Districts Act states that WRD may establish projects or programs that will directly or indirectly preserve and protect the groundwater supplies within its boundaries. These projects and programs address any existing or potential problems related to the basin's groundwater, and may extend beyond the District's boundaries if the threat of contamination is outside those boundaries. The programs span all phases of planning, design, and construction and are financed by the collection of a replenishment assessment. A more detailed description of each project and program is presented in Chapter V of this report.

9. Conclusions

Based upon the information presented in this ESR, a replenishment assessment is needed in the ensuring year to purchase replenishment water and to finance projects and programs related to replenishment and clean water activities. These actions will ensure adequate supplies of high quality groundwater within the District for the benefit of all groundwater users in the Central and West Coast Basins.

CHAPTER I
INTRODUCTION

Purpose of the Engineering Survey & Report

To facilitate the Board of Directors' decisions and actions, the Water Replenishment Districts Act requires that an engineering survey and report (ESR) be prepared each year. This *Engineering Survey and Report 2005* is in conformity with the requirements of the Water Replenishment Districts Act, and presents the necessary information on which the Board of Directors can declare whether funds shall be raised to purchase water for replenishment during the ensuing year, as well as to finance projects and programs aimed at accomplishing groundwater replenishment. With the information in this ESR, the Board can also declare whether funds shall be collected to remove contaminants from the groundwater supplies or to exercise any other power under Section 60224 of the California Water Code. The information presented in this report along with the District's strategic planning and budget preparation presents the necessary information on which the Board of Directors can base the establishment of a replenishment assessment for 2005/2006.

Scope of Engineering Survey & Report

This report contains specific information outlined in Chapter I, Part 6 of Division 18 of the Water Code (the Water Replenishment Districts Act, § 60300 and § 60301). The following is a brief description of the contents of this report:

1) *a discussion of groundwater production within the District (Chapter II);*
2) *an evaluation of groundwater conditions within the District, including estimates of the annual overdraft, the accumulated overdraft, changes in water levels, and the effects of water level fluctuations on the groundwater resources (Chapter III);*
3) *an appraisal of the quantity, availability, and cost of replenishment water required for the ensuing water year (Chapter IV); and*
4) *a description of current and proposed programs and projects to accomplish replenishment goals and to protect and preserve high quality groundwater supplies within the District (Chapter V).*

Schedule for Setting the Replenishment Assessment

The following actions are required by the Water Code to set the Replenishment Assessment:

1) *On or before the second Tuesday in February the Board shall order the ESR.*
2) *On or before the second Tuesday in March and after the ESR has been completed, the Board shall declare by resolution whether funds shall be collected to purchase replenishment water and to fund projects and programs related to replenishment and/or water quality activities.*
3) *On or before the second Tuesday in April a Public Hearing will be held for the purpose of determining whether District costs will be paid for by a replenishment assessment. The hearing may be continued from time to time but shall be completed by the first Tuesday in May.*
4) *On or before the second Tuesday in May, the Board by resolution shall levy a replenishment assessment for the ensuing fiscal year.*

Introduction

The ESR is typically presented to the Board by the second Tuesday in March to provide the necessary information for the Board to determine whether funds need to be collected in the ensuing year to purchase replenishment water and for projects or programs related to replenishment and groundwater quality. However, the contents of the report are often updated over the next several months as new information is received during discussions with Staff, the Board, the pumper Technical Advisory Committee, agencies, and other stakeholders during the Public Hearing process. After the Board adopts the replenishment assessment for the ensuing year by the second Tuesday in May, a revised ESR is prepared to incorporate all of the updated information received since the filing of the March report. Anyone with comments to this document should submit them in writing to District staff prior to the closing of the Public Hearing.

CHAPTER II
GROUNDWATER PRODUCTION

Adjudication and Demand

Prior to the adjudication of groundwater rights, annual production (pumping) reached levels as high as 292,000 AF in the Central Basin and 94,000 AF in the West Coast Basin. In the early 1960s, the court limited the amount of pumping that could occur in the CWCB to stop the declining water levels that were causing the basins to lose valuable groundwater storage and causing the seawater to intrude into the coastal aquifers. The West Coast Basin pumping limit (adjudication) was set at 64,468.25 acre feet/year (AFY). The Central Basin adjudicated rights were set at 271,650 AFY, although the Judgment set a lower Allowed Pumping Allocation (APA) of 217,367 AFY. Therefore, the current amount that can be pumped from both basins is 281,835 AFY.

The adjudicated pumping amounts were set higher than the natural replenishment of the groundwater aquifers resulting in an annual overdraft every year. To make up this deficiency, WRD was enabled under the Water Code as the entity to purchase artificial replenishment water to make up the annual overdraft. The WRD has the authority to levy a replenishment assessment on all pumping within the District to raise the funds necessary to purchase the supplemental water and to fund necessary projects and programs related to groundwater replenishment and groundwater quality.

Production

Under the terms of the Water Replenishment Districts Act, each groundwater producer must submit a report to the District summarizing their monthly production activities (quarterly for smaller producers). The information from these reports is the basis by which each producer pays the replenishment assessment. WRD then provides these production data to the State Department of Water Resources (DWR), which acts as the court-appointed Watermaster in connection with the adjudication of the CWCB.

Previous Water Year:

Over the past 5 water years (1999/00 – 2003/04) groundwater production in the CWCB averaged 248,157 AFY (196,709 AF in CB and 51,448 AF in WCB). For the previous water year 2003/2004, groundwater production totaled 248,334 AF, of which 200,367 AF was from the CB and 47,967 AF was from the WB. The previous year's pumpage is a 0.1% increase from the five year average (1.9% increase in CB, 6.8% decrease in WCB).

Plate 1 illustrates the groundwater production areas throughout the CWCB during the previous water year and **Table A-5** presents historical pumping amounts in the CWCB.

Current Water Year:

For the first three months of the current water year, production was 43,361 AF in the CB and 10,664 AF in the WCB (a 4.2% decrease and 11.8% decrease from the same period a year earlier, respectively). Assuming the remaining 9 months will be the same as the prior year, the estimated production for the current water year is 245,025 AF (198,478 AF CB, 46,547 AF WCB).

Groundwater Production

Ensuing Water Year:

To estimate production for the ensuing water year, the 5-year average was used. As stated previously, the 5-year average pumping in the CB was 196,709 AF and in the WB was 51,448 AF. Therefore, the total estimated pumping for the ensuing year is 248,157 AF.

Table 1 presents the groundwater production for the previous, current, and ensuing years.

This pumping estimate includes 3,000 AF from WRD's Robert W. Goldsworthy Desalter Facility in the City of Torrance, which does not contribute the replenishment assessment revenue. Therefore, when the District determines assessable pumping for ensuing year revenue estimates in the annual budget, it subtracts 3,000 AF from the total estimate, or 245,157 AF.

Measurement of Production

With few exceptions, meters installed and maintained by the individual producers measure the groundwater production from their wells. Through periodic testing, both WRD and Watermaster verify the accuracy of individual meters and orders corrective measures when necessary. The production of the few wells that are not metered is estimated on the basis of electrical energy consumed by individual pump motors, duty of water, or other reasonable means.

WRD has recently completed the testing of 41 meters and will be testing another 43 next year.

Carryover and Drought Provisions

The "carryover" of unused rights influences the actual amount of production for any given year. The "carryover" for any single year is 20% of the allotted pumping right in the Central Basin and 20% in the West Coast Basin. This provision extends the flexibility with which the pumpers can operate. Conversely, the use of rights beyond the annual allotted quantity affects the annual production amount in the opposite manner. The original court adjudication in both basins allows for each individual pumper to extract up to 10% beyond their allowable pumping rights within a given year.

During emergency or drought conditions, WRD can also allow an additional 27,000 AF (17,000 for Central Basin and 10,000 for West Coast Basin) of extractions for a four-month period. This provision has yet to be exercised but offers the potential use of an additional 7.8% for Central Basin and 15% for West Coast Basin pumpers.

CHAPTER III
GROUNDWATER CONDITIONS

Introduction

The California Water Code Section 60300 requires WRD to determine annually in the Engineering Survey and Report (ESR) the following items related to groundwater conditions in the Central and West Coast Basins:

1) Total groundwater production for the previous water year and estimates for the current and ensuing water years;

2) The annual overdraft for the previous water year and estimates for the current and ensuing water years;

3) The accumulated overdraft for previous water year and an estimate for the current water year;

4) Changes in groundwater levels (pressure levels or piezometric heights) within the District and the effects these changes have on groundwater supplies within the District; and

5) An estimate of the quantity, source, and cost of water available for replenishment during the ensuing water year;

To meet these requirements, WRD's hydrogeologists and engineers closely monitor, collect data, and manage the groundwater resources of the District throughout the year. We track groundwater levels from our network of specialized monitoring wells and from groundwater producer's production wells. We update and run a computer model developed by the United States Geological Survey (USGS) to simulate groundwater conditions and to predict future conditions. We use our geographic information system (GIS) and database management system to store, analyze, map, and report on the information required for the ESR. We work closely with the Los Angeles County Department of Public Works on spreading grounds and seawater barrier wells to determine current and future operational impacts to groundwater supplies. We work closely with the Metropolitan Water District of Southern California (MWD), the local MWD member agencies, and the County Sanitation Districts of Los Angeles County on the current and future availability of supplemental replenishment water. We work with regulators on replenishment criteria for water quality and recycled water use. And, we work with the pumper's Technical Advisory Committee, other pumpers, and other stakeholders to discuss the current and future groundwater conditions within the District and in neighboring basins.

The ESR presents the results of these data collection and analysis efforts. The items of annual overdraft, accumulated overdraft, water levels, and change in storage are discussed in the remainder of this chapter. Groundwater production was previously discussed in Chapter II. The estimated quantity, source, and cost of replenishment water will be discussed in Chapter IV.

Annual Overdraft

The Water Replenishment Districts Act defines *"Annual Overdraft"* as "*...the amount...by which the quantity of groundwater removed by any natural or artificial means from the groundwater supplies*

within such replenishment district during the water year exceeds the quantity of non-saline water replaced therein by the replenishment of such groundwater supplies in such water year by any natural or artificial means other than replenishment under the provisions of Part 6 of this act or by any other governmental agency or entity."

Part 6 of the Act referenced in the above definition pertains to water that WRD purchases for replenishment. Therefore, the *Annual Overdraft* is the natural inflows to basins (not including WRD replenishment water) minus the outflows. There is an annual overdraft every year for the simple fact that groundwater extractions exceed natural groundwater replenishment. It has been one of the District's main responsibilities since 1959 to help make up this annual overdraft by purchasing artificial replenishment water to put into the underlying aquifers.

To determine the actual annual overdraft that occurred in the previous water year, WRD determines the variables of the following water balance equation:

Inflows - Outflows = Change in Storage

Inflows include the net natural inflows into the basins plus WRD's artificial replenishment water. Outflows are the groundwater pumping that occurred. Change in Storage is amount of water that was lost or gained in the basins over the previous year as calculated using water level change maps and USGS model information (see the end of this chapter for a more detailed discussion of change in storage calculations). Therefore, the equation can be expanded as follows:

(Natural Inflow + WRD Recharge) - Outflows = Change in Storage

Only the first term (natural inflow) is unknown in this equation. Therefore it can be rewritten as:

Natural Inflow = Change in Storage - WRD Recharge + Outflows

For the previous year, Change in Storage was calculated at -43,000 AF, WRD Recharge was 92,686 AF, and there was 248,334 AF of pumping (outflows). Using these values, the net natural inflow for the previous year is calculated at 112,648 AF.

Using the Water Code definition for Annual Overdraft gives the following equation:

Annual Overdraft = Outflows - Natural Inflow

Or substituting the known values gives:

Annual Overdraft = 248,334 - 112,648 = <u>135,686 AF</u>

Therefore, the Annual Overdraft for the previous water year was determined to be 135,686 AF. Another way to look at this is to say that the Annual Overdraft was 135,686 AF, and WRD purchased 92,686 AF to help make up this overdraft, but there was still 43,000 AF short which was lost from storage.

As a means of estimating the annual overdraft for the current and ensuing water years, the concept of "Average Annual Groundwater Deficiency" is utilized. The Average Annual Groundwater Deficiency is the long-term average of natural inflows minus total outflows and represents the long term average deficit (annual overdraft) in the basins. The development of the USGS/WRD computer

model derived these long term average inflow and outflow terms. **Table 4** presents this information, which concluded that the Average Annual Groundwater Deficiency is 105,385 AFY. This value is slightly different from last year to account for updates to the model. Values of the average deficiency are based on calculated inflows and outflows to the basins. Long-term average inflows are influenced by the amount of precipitation falling on the District as well as for storm water capture at the spreading grounds. **Table 5** shows the historical precipitation at LACDPW Station #107D, located in Downey near the Montebello Forebay.

The calculation of the Average Annual Groundwater Deficiency represents that, in general, WRD needs to replenish about 105,385 AFY assuming long-term average conditions for the water balance to reach equilibrium, the overall change in storage to equal zero, and for groundwater levels to remain relatively constant. However, deviations from the average conditions occur every year, and WRD must forecast these changes for the ensuing year to determine the amount of water necessary for purchase and replenishment. As shown in **Table 6**, adjustments have been made to the average inflows and outflows of the current and ensuing water years to reflect estimates of the annual overdraft. Based on these adjustments, the current year Annual Overdraft is estimated at 75,639 AF (less due to the heavy rains we have had so far resulting in above normal natural replenishment), and 102,952 AF in the ensuing year. The presence of an annual overdraft gives the District justification under the Water Code to levy a replenishment assessment on groundwater production in the ensuing year to purchase artificial replenishment water.

Accumulated Overdraft

The Water Replenishment Districts Act defines *"Accumulated Overdraft"* as "*...the aggregate amount…by which the quantity of ground water removed by any natural or artificial means from the groundwater supplies…during all preceding water years shall have exceeded the quantity of nonsaline water replaced therein by the replenishment of such ground water supplies in such water years by any natural or artificial means…"*

In connection with the preparation of Bulletin No. 104-Appendix A (1961), the DWR estimated that the historically utilized storage (accumulated overdraft) between the high water year of 1904 and 1957[1] was 1,080,000 AF (780,000 in CB, 300,000 in WCB). Much of this storage removal was from the forebay areas (Montebello Forebay and Los Angeles Forebay), where aquifers are merged and unconfined and serve as the "headwaters" to the confined pressure aquifers. Storage loss from the confined and completely full, deeper aquifers was minimal in comparison or was replaced by seawater intrusion which can not be accounted for under the language of the Water Code since it is considered saline water.

The goal of groundwater basin management by WRD is to ensure a sufficient supply of high quality groundwater in the basins for annual use by the pumpers, to keep a sufficient supply in storage for times of drought when imported water supplies may be curtailed for several consecutive years, and also to keep suitable room available in the basins to receive natural water replenishment in very wet years, such as an El Niño type year. Recent conjunctive use discussions may also lead to projects that bank water in some of the available storage space in the basins.

[1] DWR Bulletin 104-A did not refer to the ending year for the storage determination. WRD has assumed it to be the year 1957, as this is the end year for their detailed storage analysis presented in Bulletin 104-B – Safe Yield Determination.

To compute the accumulated overdraft since this initial amount, WRD takes each consecutive year's annual overdraft and replenishment activities and determines the change in storage, and adds to or subtracts the corresponding value from the accumulated overdraft. Since the base level, the aggregate excess of extractions over recharge from the basins has been reduced due to the replenishment by WRD, the reduction of pumping from the adjudications, and the replenishment from seawater barrier injection. Because of the loss of storage last year of 43,000 AF, the Accumulated Overdraft has been determined to be 702,100 AF. For the current year, the Accumulated Overdraft is expected to be reduced due to the wet winter we have experienced so far to an amount of 660,247 AF.

Table 7 presents information for the current and ensuing years accumulated overdraft estimate. The annual changes in storage since 1961 are presented on **Table 8**.

Groundwater Levels

A groundwater elevation contour map representing water levels in the District in fall 2004 (end of the water year) was prepared for this report and is presented as **Plate 2**. The data for the map were collected from wells screened in the deeper "San Pedro Formation" aquifers where the majority of groundwater pumping occurs. These deeper aquifers include the Lynwood, Silverado, and Sunnyside aquifers. Water level data was obtained from WRD's network of basin-wide monitoring wells and from groundwater production wells that are screened in the deeper aquifers.

As can be seen on the Plate, groundwater elevations range from a high of about 160 feet above mean sea level (msl) in the northeast portion of the basin above the spreading grounds to a low of about 120 feet below msl in the Long Beach area of the Central Basin, and 110 feet below msl in the West Coast Basin in the Gardena area. With the exception of the Montebello Forebay area, the majority of groundwater levels in the District are below sea level, which is why continued injection at the seawater barriers is needed to prevent saltwater intrusion.

Plate 2 also shows the location of the key wells used for long-term (decades) water level data. These long-term hydrographs have been presented in the ESR for years, and provide a consistent basis from which to compare changing water levels. A discussion of water levels observed in the key wells is presented below.

Los Angeles Forebay

The Los Angeles Forebay occupies the westerly portion of the Central Basin Non-pressure Area. Historically a recharge area for the Los Angeles River, this forebay's recharge capability has been substantially reduced since the river channel was lined. Recharge is now limited to deep percolation of precipitation, in-lieu when available, and subsurface inflow from the Montebello Forebay, the Hollywood Basin, and relatively small amounts from the San Fernando Valley through the Los Angeles Narrows.

Key well **2S/13W-10A01** represents the overall water level conditions of the Los Angeles Forebay (see **Figure B**). The water level high was observed in 1938. But, by 1962 water levels had fallen nearly 180 feet due to basin over-pumping and lack of sufficient natural recharge. Since that time, basin adjudication and artificial replenishment by WRD have improved water levels in this area by over 80 feet. At the end of water year 2003/04, groundwater levels in this well had fallen two feet from the previous year, and were 96 feet below the 1938 high and 83 feet above the 1962 low. With

the above average rainfall so far in the current water year 2004/05, it is expected that water levels will rise in the Los Angeles Forebay.

Montebello Forebay

The Montebello Forebay lies in the northeastern portion of the Central Basin and connects the San Gabriel Basin to the north to the Central Basin via the Whittier Narrows. The Rio Hondo and San Gabriel River spreading grounds in the forebay provide the vast majority of surface recharge to the Central Basin aquifers. Two key wells help describe the water level conditions in the Montebello Forebay:

- **Well 2S/12W-24M08** (LACDPW Well No. 1601T) is centrally located between the two spreading grounds. This well is monitored weekly by WRD to assess water levels in the forebay and as an indicator for the need to purchase replenishment water. The upper chart on **Figure C** shows the water levels for this well. The historic water level high was observed in 1942, but by 1957 had fallen 117 feet to an all-time low due to basin over-pumping and insufficient natural recharge. As was described above for the Los Angeles Forebay, adjudication of pumping rights and artificial replenishment water by WRD helped restore water levels in the Montebello Forebay too. At the end of water year 2003/04, groundwater levels in this well were 58 feet higher than the 1957 low, 59 feet lower than the 1942 high, and were 10 feet lower than the previous year. For the current water year, water levels at this well have already risen 35 feet due to the heavy rainfall and are expected to rise even more at the winter continues and spring snow melt arrives.
- **Well 3S/12W-01A06** (LACDPW Well No. 1615P) is located downgradient of the spreading grounds near the southern end of the Montebello Forebay. The lower chart on **Figure C** shows the water levels for this well. The historic water level high was observed in 1947, but by 1957 had fallen 102 feet to an all-time low due to basin over-pumping and insufficient natural recharge. The adjudication of pumping rights and WRD artificial replenishment water helped restore water levels at this location in the Montebello Forebay too. At the end of water year 2003/04, groundwater levels in this well were 51 feet higher than the 1957 low, 51 feet lower than the 1947 high, and were 8.5 feet lower than the previous year. For the current water year, water levels at this well are also expected to rise due the above average precipitation.

Central Basin Pressure Area

The District monitors two key wells, Well **4S/13W-12K01** (DPW No. 906D) and Well **4S/12W-28H09** (DPW No. 460K) that represent the condition of the pressurized groundwater levels in the Central Basin Pressure Area. The hydrographs for these two wells are shown on **Figure D**.

Groundwater highs were observed in these wells in 1935. Immediately after that time, water levels continually dropped over 110 feet to their lows in 1961 due to the over-pumping and insufficient natural recharge described earlier. Groundwater levels recovered substantially during the early 1960s as a result of replenishment operations and reduced pumping. Since 1995, there have been 100-foot swings in water levels each year from winter to summer. These swings are due to pumping pattern changes by some of the Central Basin producers who participate in MWD's seasonal storage program, which promotes increased pumping in May-September and decreased pumping from October to April. For example, in WY 2003/04 average monthly Central Basin pumping in May through September was about 19,000 AF, whereas in October through April was 15,000 AF. This

4,000 AF/month difference, combined with the pressurized Central Basin aquifers in this area, result in the wide water level swings observed on **Figure D**.

At the end of WY 2003/04, water levels were on average 25 feet lower than the previous year, and Well 906D was 82 feet below its 1935 high and 57 feet above its 1961 low, whereas Well 460K was 116 feet above its historic high and only 1 foot above its historic low.

West Coast Basin

The West Coast Basin is separated from the Central Basin by the Newport-Inglewood Uplift which is a series of discontinuous, subparallel hills and faults. Groundwater moves across the uplift from one basin to the next, but its movement is slow and restricted based on the tightness of the geologic formations and offset of aquifers caused by faulting along any given stretch.

Figure E shows the hydrographs of key wells **3S/14W-22L01** and **4S/13W-21H05** -- two wells that represent the general conditions of the water levels in the West Coast Basin. In 1955, the control of groundwater extractions in the West Coast Basin resulted in stabilizing and reversal of the observed water levels in the center of the basin (well 3S/14W-22L01). Whereas, at the eastern end near the Dominguez Gap Barrier, water levels continued to decline until about 1971, when a recovery began due mostly to the startup of the Dominguez Gap Barrier project. Water levels in the West Coast Basin were, on average between these two wells, four feet higher in WY 2003/04 than WY 2002/03.

Based on the groundwater levels observed over various areas of the Central and West Coast Basins, and because of the above average precipitation occurring in the current year, the District expects no problems in having adequate groundwater supplies to meet the current and/or emergency demands of its pumpers in the immediate future. However, the District will continue to monitor water levels and imported/recycled availability to take advantage of opportunities to replenish the basins as necessary to ensure its current and future health.

Change in Storage

To determine the change in groundwater storage over the previous water year, WRD used water level elevation data from its specialized monitoring well network screened in the 4 main aquifer systems in the basins. These water level data were used to construct maps of the changes in water levels in each system over the previous water year.

Plate 3 is an example of one of the four maps prepared, and represents water level changes in the Upper San Pedro Formation which contains the prolific Silverado and Lynwood aquifers among others. These water level change maps were converted into computer grids in the District's Geographic Information System (GIS) so that they could be multiplied by the storage coefficient grids developed by the USGS in their regional groundwater flow model of the District to obtain the change in storage. Although water levels rise in some parts of the basins and fall in others, the overall net result for the previous water year was a loss in groundwater storage of 43,000 AF. This was the sixth straight year of water level declines and storage loss in the basins, with a total of 200,400 AF of groundwater being lost from storage over this time frame (120,000 AF loss over the past five years, since the year 2000). Over the past 10 years, the average annual storage loss has been 13,610 AFY. For the current water year, this losing trend is expected to reverse and the basin is expected to gain groundwater into storage due to the above normal precipitation so far.

CHAPTER IV
GROUNDWATER REPLENISHMENT: QUANTITIES, AVAILABILITY, AND COSTS

As discussed in the previous chapter, the Central and West Coast Basins have an annual overdraft every year because groundwater pumping is greater than natural replenishment. The District purchases imported water and recycled water to help offset this imbalance. The purchased water enters the groundwater basins by percolation into the aquifers at the Montebello Forebay spreading grounds (Rio Hondo, San Gabriel River, and Whittier Narrows Reservoir), through direct injection into the aquifers at the seawater barrier wells (West Coast Basin Barrier Project - WCBBP, Dominguez Gap Barrier Project - DGBP, and Alamitos Barrier Project - ABP), or through the District's In-Lieu Program. The purpose of this Chapter is to determine the quantities of water needed for purchase in the ensuing year and to determine the availability and cost of that water.

The District currently has available to it recycled and imported water sources for use as artificial replenishment water. These two sources are described below:

- ***Recycled Water****: Recycled water is sewer water that is treated at local wastewater treatment plants to meet high quality standards so that it can be reused as a valuable water resource instead of being wasted to the ocean. Other agencies use recycled water to irrigate parks, golf courses, plants and crops, or for industrial purposes. WRD and numerous other agencies also use recycled water for groundwater recharge. In semi-arid areas such as Southern California where groundwater and imported water are in short supply, recycled water has proven to be a safe and reliable additional resource to supplement the water supply. Recycled water is used at the spreading grounds and the seawater barrier wells. Although recycled water is high quality, relatively low cost, and a reliable supply all year long, the District is limited by regulatory agencies in the amount it can use for replenishment. Therefore, imported water is also used.*
- ***Imported Water****: This source originates from northern California (State Water Project) and the Colorado River and is brought to the District by the Metropolitan Water District of Southern California. Raw (untreated) imported water is used at the spreading grounds whereas treated imported water is used at the seawater intrusion barriers and for the In-Lieu program. Because of treatment and transportation costs, it is the most expensive source for recharge water. The supply is under full upstream control, and its availability at the spreading grounds is limited and variable, especially during drought years.*

Recommended Quantities of Replenishment Water

With information presented in the preceding chapters regarding the basins' pumping demands and the overall condition of the groundwater basins, WRD can estimate its projected need for replenishment water in the ensuing year.

Spreading

Groundwater recharge through surface spreading takes place in spreading grounds adjacent to the Rio Hondo and the San Gabriel River, within the unlined portion of the San Gabriel River, and behind the Whittier Narrows Dam in the Whittier Narrows Reservoir. Owned and operated by the Los Angeles County Department of Public Works (LACDPW), they were originally constructed for

flood control and conservation of local storm water, but have been used by WRD since 1960 to replenish the basins with imported and recycled water.

Since recycled water is the cheaper source of replenishment water, the District maximizes its use within established regulatory limits. These limits are discussed below under "Expected Availability of Replenishment Water", but in general the District will plan on purchasing 48,000 AF in the ensuing year to maximize the amount under regulatory limits. Additional replenishment water is needed, however, and will be made up through imported water. In 2003, the WRD Board adopted the long term average of 27,600 AFY of imported water to purchase for spreading. This value was based on long-term (30 year) averages of the overall water budget of the basins using the USGS computer model. The 2003 ESR discusses the derivation of this value in more detail. This long-term value will be revisited every 5 years and adjusted as necessary to account for changes in basin conditions such as pumping pattern changes, projects that conserve additional storm water, conjunctive use projects, and barrier improvements. **Table 9** presents the imported water replenishment needs. The total WRD spreading needs for the ensuing year is 75,600 AF.

Injection

Another means of replenishing the groundwater supply is to inject water at the three seawater intrusion barriers. Although the primary purpose of the barriers is for seawater intrusion control, groundwater replenishment is an added benefit. Because the barriers are necessary and vital facilities protecting the District's groundwater supply from seawater intrusion, their continued operation is essential. Increasing the reliability and minimizing the cost of this operation, however, are of primary concern to the District.

To determine the amount of barrier water needed in the ensuing year, WRD requested estimates from the LACDPW who own and operate the barriers and can take into account planned operations activities at the barriers. They stated that for the ensuing year, it is expected that the WCBBP, DGBP, and ABP will require 19,000 AF, 13,400 AF, and 5,700 AF, respectively (Dr. Youn Sim, personal communication, 1/31/05). The DGBP estimate is considerable higher than its 5-year average of 6,000 AFY due to the recent completion of 52 new injection wells (in two phases of 19 and 33 wells) which are presently going on line, although the County says that the new wells will only be turned on 75% of their maximum capacity in this first year. For the ABP, the County estimate of 5,700 AF included not only WRD's contribution, but Orange County Water District's (OCWD) contribution for the injection wells on their side of the County line. For WRD's contribution, the 5-year average was calculated at 3,800 AFY, which is the value to be used in this ESR.

The barrier well injection forecasts for the ensuing year are shown on **Table 1**. WRD has determined that the purchase of water for injection will total 36,200 AF in the ensuing year.

In-Lieu Replenishment Water

The basic premise of the In-Lieu program is to offset the pumping in the basin to lower the annual overdraft and thus the artificial replenishment needs by WRD. It helps provide an alternate means of replenishing the groundwater supply by encouraging basin pumpers to purchase surplus imported water when available instead of pumping groundwater, and can help raise water levels in areas that are otherwise more difficult to address. For the current year, the Board approved an In-Lieu program of 10,303 AF (6,000 AF in CB and 4,303 AF in WCB). As the Board has not yet adopted

the In-Lieu program for the ensuing year, it is assumed that the current year program will continue into the ensuing year.

Based on this information, it has been determined that the District will need to purchase 122,103 AF of replenishment water in the ensuing year. **Table 1** summarizes these quantities.

Expected Availability of Replenishment Water

The availability of water supplies for the ensuing water year is also taken into account when determining how funds should be raised. If a particular resource is expected to be unavailable during a given year, money can still be raised to fund the purchase of that quantity of water in a succeeding year. That situation, for the most part, is rare, and in the ensuing water year, availability of the necessary supplies should not be a problem.

Recycled Water

The current recycled water spreading requirements for the Montebello Forebay established by the California Regional Water Quality Control Board (RWQCB) are detailed in Order No. 91-100 adopted on September 9, 1991. WRD plans on maximizing its allowable use of recycled water because it is a reliable and cost-effective replenishment source of good quality water. The District is limited to spreading 60,000 AF of recycled water per year or an amount not to exceed 50% of the total inflow into the Montebello Forebay for that year, whichever is less. Furthermore, the Order stipulates that recycled water shall not exceed 150,000 AF in any three-year period or 35% of the total inflow into the Forebay.

The County Sanitation Districts of Los Angeles County (CSDLAC) plans to continue plant-scale testing of its Whittier Narrows Water Reclamation Plant (WNWRP) using the nitrification / denitrification configuration and is exploring ultra violet light (UV) treatment. Currently, the WNWRP is operating at a capacity of approximately 10 million gallons per day (mgd) (11,200 AFY) rather than at its design capacity of 15 mgd (16,800 AFY). Except for unused portions during storm periods and a small amount historically used by a commercial nursery, WRD purchases the entire output of WNWRP. However, the Upper San Gabriel Valley MWD is initiating Phase IIA of its San Gabriel Valley Water Recycling Project which could take 2,500 AFY of water from the WNWRP, and ultimately another 2,000 AFY in the next phase. The impact on this loss of supply or cost impact to WRD is not known at this time but is being investigated. However, because the near by San Jose Creek Water Reclamation Plant (SJCWRP) has excess capacity that is currently wasted to the ocean, any loss from WNWRP could be made up from SJCWRP.

With its Stage III expansion (112,000 AFY/100 mgd) in full operation, SJCWRP is able to deliver an estimated 95,000 AFY (85 mgd) of reclaimed water. Other existing uses of recycled water from this plant do not deplete the supply to the point of jeopardizing the quantity available to WRD. However, future projects may form competing interests for this water. WRD will continue to monitor the availability of this supply as new projects develop.

Recycled water from the Pomona WRP also reaches the Montebello Forebay. This flow is not purchased because it is considered incidental. To comply with the regulatory order, however, the District assumes that 2,000 AF from the Pomona WRP will reach the forebay. For planning purposes, the District assumes that a total of 50,000 AFY will be used for spreading to meet the 3-

year cap of 150,000 AF, but must account for the 2,000 AF of incidental water from the Pomona WRP. This leaves a total of 48,000 AFY of recycled water for WRD to purchase for spreading.

Recycled water for injection at the WCBP is also available from WBMWD's West Basin Recycling Plant. Per regulatory limits, this resource can provide up to 50% of the water injected into the West Coast Basin Barrier. However, efforts are underway to increase this amount to 75% for several years and then possibly up to 100%. WRD has recently entered into an agreement with WBMWD to purchase up to 12,500 AFY of their recycled water for the WCBBP. Based on information from WBMWD (Richard Nagel, personal communication, 2/7/05) their plant expansion will be completed in September 2005. Therefore, WRD will incorporate the water from this plant into its volume and cost calculations for the ensuing water year which starts October 2005.

Recycled water for the DGBP is expected to be available in 2005 from the City of Los Angeles' Terminal Island Treatment Plant (Harbor Recycled Water Project). The plant is expected to provide up to 5 mgd (5,600 AFY) of the barrier water demand in the ensuing year, which is the maximum permitted amount. If the LACDPW's total barrier water estimate of 13,600 AF is correct for the ensuing year, then recycled water will contribute 41% of the total barrier supply, with imported water comprising the remaining amount.

Recycled water for the ABP is also expected to be available in 2005 from the WRD's Leo J. Vander Lans Water Treatment Facility. This treatment plant will provide up to 50% of the source water to the barrier, with imported water comprising the other half.

Imported Water

For spreading, although MWD's Colorado River water allotment has been reduced, WRD expects supplemental water for replenishment to be available in the ensuing year based on statements by MWD and assuming a normal to wet year. But, as imports are cut back or with drought, WRD may need to look at other sources for replenishment operations, such as increased used of recycled water. In addition to Colorado River water, northern California water is also expected to be available in the ensuing year. However, this is not guaranteed, and spreading water may not be available if there is a dry year. For the current year, imported water is available due to the above normal precipitation.

For imported water for the seawater barrier wells, the District pays the premium price for non-interruptible water meaning that it will be available all year long. However, because of the increasing water costs at the barriers, the District is looking at ways to minimize costs such as switching to less expensive but not as reliable seasonal water at the barriers. Evaluations will be performed to evaluate the impact on the seasonal water to barrier performance. For the in-lieu program, it is anticipated that the water will be available from MWD in the ensuing year.

Projected Cost of Replenishment Water

The cost of buying water to satisfy the District's replenishment needs are based on the unit rates set by the various retailers with whom the District deals.

Recycled Water Rates

Under an interim contract, the current price for recycled water from the WNWRP is $7.00 AF. The unit cost of recycled water from the SJCWRP was adjusted per a three-year readjustment provision in the contract. The price is currently $21.31 AF.

At the WCBBP, the cost of recycled water is currently estimated to be $450/AF for the ensuing water year, although the price for the water has not been established yet. The $450/AF estimate is the average between the current rate of $430/AF and the maximum rate of $470/AF under the new agreement for water using the expanded treatment plant. At the DGBP, the rate for recycled water from the Terminal Island Treatment Plant will cost $431/AF from the City of Los Angeles. For recycled water at the ABP from the Leo J. Vander Lans Water Treatment Facility, WRD has determined that the cost of water to the District will be $286/AF, which represents the operations and maintenance costs of the treatment plant less the MWD rebate.

Imported Water Rates

WRD cannot buy directly from MWD because it is not a member agency. The District, therefore, relies on and purchases water from MWD member agencies such as the CBMWD, WBMWD, and the City of Long Beach for the spreading grounds, barrier wells, and In-Lieu. The cost of replenishment water to WRD is the MWD rate and any surcharges added by the MWD member agencies. In January 2006, MWD rates to WRD are expected to go up $20/AF for treated water.

Effective July 1, 2004, WRD entered into an agreement with CBMWD for imported water at the spreading grounds. Between July 1, 2004 and June 30, 2005, WRD pays a flat fee of $800,000 to cover CBMWD's administrative costs, and WRD pays only the MWD commodity rate for the spreading water no matter how much water it buys. If the WRD purchases more than 21,600 AFY of spreading water, then it is saving money on the previously assigned surcharges that have now been eliminated. The fee can increase by the consumer price index (CPI) each year. Therefore, for the ensuing year WRD has estimated that the CPI will be 3.5%, which will cause the spreading water fee to be $828,000 in the ensuring year. The terms of the agreement can be revisited or eliminated every 5 years, or 2009 in this case.

The expected unit costs of water to WRD along with the time period to which they correspond are presented in **Table 1**. The table breaks out two time frames, October through December 2005 and January through September 2006. This accounts for expected MWD price increases starting the beginning of the next calendar year.

In-Lieu Rates

The WRD Board of Directors sets the In-Lieu rates. For 2005/2006, the rates reflect the cost of MWD seasonal storage water plus any surcharges by the MWD member agencies less the cost to pump groundwater (assumed $65/AF) and less WRD's replenishment assessment ($128.25/AF). The unit costs for In-Lieu water are shown on Table 1 and range from $142/AF to $179/AF, depending on the basin of In-Lieu participation and the MWD member agency providing the water.

Summary

Based on the pricing structures discussed above and the quantities of water to be purchased, WRD has estimated that the cost for purchasing 122,103 AF of replenishment water in the ensuing water year will be $26,836,006, which is a 9.2% increase from last year's ESR. The increase is attributed to the new injection wells at the DGBP and the increase in MWD's treated imported water rate. **Table 2** presents the detailed breakdown of these costs. These amounts may be different from those presented in the District's 2005/2006 annual budget document due to the fact that the ESR presents costs for a Water Year (October 1 - September 30) as required by the Water Code, versus the budget document which covers WRD's Fiscal Year (July 1 - June 30).

Groundwater Replenishment

These estimated costs are for water purchases only. They do not include the additional costs for the projects and programs needed to replenish the basins and to protect groundwater quality. Those projects and programs are discussed in the next chapter and their costs will be presented in the District's separate annual budget document currently being prepared.

CHAPTER V
PROJECTS AND PROGRAMS

California Water Code Sections 60220 through 60226 describe the broad purposes and powers of the District to perform any acts necessary to replenish, protect, and preserve the groundwater supplies of the District. In order to meet its statutory responsibilities, WRD has instituted numerous projects and programs in a continuing effort to effectively manage groundwater replenishment and groundwater quality in the Central and West Coast Basins (CWCB). These projects and programs include activities that enhance the replenishment program, increase the reliability of the groundwater resources, improve and protect groundwater quality, and ensure that the groundwater supplies are suitable for beneficial uses.

These projects and programs have had a positive influence on the basins, and WRD anticipates continuing these activities into the ensuing year as a necessary act to replenish, protect, preserve and enhance the groundwater resources in the CWCB. The following is a discussion of the projects and programs that WRD will continue or initiate during the ensuing year.

001 – Leo J. Vander Lans Water Treatment Facility Project (formerly known as the Alamitos Barrier Recycled Water Project)

The District completed construction of the Vander Lans facility, which will provide advanced treatment to recycled water through a process train that includes microfiltration, reverse-osmosis, and ultraviolet light. The product water from this facility will replace 50% of the imported water now supplying the nearby Alamitos Seawater Intrusion Barrier, thereby improving the reliability and quality of supply to the barrier. The plant is designed to produce approximately 3,000 acre-feet per year for delivery to the barrier.

The project is currently in its final permitting stage. The State Department of Health Services held a public hearing and issued findings of fact and recommended approval of the project to the Regional Water Quality Control Board. The permit is scheduled for approval by summer 2005, at which time deliveries of recycled water to the barrier will begin. The Long Beach Water Department (LBWD) will operate and maintain the new treatment plant under contract with WRD. Expected costs for the coming year will primarily involve operating and maintaining the plant through the LBWD contract as well as meeting groundwater monitoring requirements from the permit to inject recycled water at the barrier. Because the primary purpose of this project is to provide a more reliable means of replenishing the basin through injection, 100% of the costs are considered to be drawn from the Replenishment Fund.

002 – Robert W. Goldsworthy Desalter Project

The Robert W. Goldsworthy Desalter has been operating since 2002 to remove impacted groundwater from a saline plume stranded inland of the West Coast Basin Barrier after the barrier was put into operation. The production well and desalting facility are located within the city of Torrance, and the product water is delivered for potable use to the City's distribution system. The project currently extracts about 3,000 AFY and chloride levels are generally within the 1,000 to 1,200 parts per million (ppm) range.

As with the Vander Lans facility, future costs for this project will involve O&M activities and replacement costs. The purpose of the desalter is directly related to remediating degraded groundwater quality, and costs are thus attributed 100% to the Clean Water Fund.

Additional measures may be necessary in the future to fully contain and remediate the saline plume. WRD is actively pursuing long-term solutions to this problem and continues to work with the City of Torrance Municipal Water Department, California Water Service Company, the pumpers' Technical Advisory Committee, and other stakeholders on the future of saline plume removal in the West Coast Basin.

003 – Caltrans Highway 105 Dewatering Project

Caltrans owns and operates 13 extraction wells along the alignment of the I-105 Freeway between the I-605 and I-710 Freeways. These wells were installed as a primary method of dewatering the ground underneath this section of the freeway to maintain the integrity of the pavement substructure. The wells produce an average of about 2,000 acre-feet per year, and because of their relatively shallow depths, the quality of the groundwater extracted can not be used for potable purposes. Consequently, the water produced is discharged directly to the Los Angeles River after treatment through granular activated carbon (GAC) units. To better manage the valuable resources of the groundwater basins, WRD seeks a practical application to put Caltrans' dewatering activities to beneficial use rather than simply discharging to the ocean. This concept, coupled with the need to provide a more reliable supply to the seawater barriers, leads to the idea behind the proposed project.

This project is in its feasibility stage wherein reasonable cost estimates must be developed for the overall project. The project will potentially include one new production well, treatment facilities, appurtenant piping and valves to the treatment facilities, and a transmission main to deliver treated water to the Dominguez Gap Barrier located in the Wilmington/San Pedro area. While some work has already been completed to evaluate existing water quality and general pipeline alignments, a more detailed assessment to define treatment requirements, identify potential pipeline routes, and evaluate ongoing operational/monitoring needs is in progress. The results and recommendations from such a study will provide the basis to justify whether or not to proceed with the design and construction of the project.

Accordingly, costs associated with this project in the coming year will include the finalization of the feasibility study to better estimate overall project costs and associated negotiations with Caltrans to coordinate project funding. While the existing Caltrans extractions serve to remove contaminated groundwater from the basin, the primary objective of this project is to provide a new source of water for the Dominguez Gap Barrier. Consequently, 100% of the costs will be covered through the Replenishment Fund.

004 – Recycled Water Program

Using recycled water to replenish the groundwater basins provides a reliable source of water for surface spreading in the Montebello Forebay and injection at the seawater intrusion barriers. In view of the potential for drought conditions to strike California and uncertainty in the future availability of imported supplies, this resource has become increasingly attractive.

WRD participates in various activities to ensure that the use of recycled water continues to be safe for groundwater recharge. WRD, along with other stakeholders, is working closely with the State

Department of Health Services (DHS) to revise regulations on groundwater recharge using recycled water. Through this dialogue, WRD and DHS exchange information and develop a mutual understanding of each agency's perspectives.

From an operational standpoint, the District will continue to provide permit compliance for groundwater monitoring and reporting to the regulatory agencies to ensure that the current practice and operation of utilizing recycled water continues to be safe. Many monitoring wells and production wells are monitored frequently by WRD staff, and the results are reported as required to ensure permit compliance.

In addition to regular monitoring and sampling around the spreading grounds, WRD is participating with other agencies to more fully investigate the effectiveness of soil aquifer treatment during percolation. These studies are partially sponsored by the American Water Works Association Research Foundation and include specific tests to characterize the percolation process and quantify the filtering and purifying properties of the underlying soil on constituents of concern such as nitrogen, total organic compounds, and emerging contaminants. WRD is also sponsoring an investigation by the United States Geological Survey (USGS) to evaluate the effectiveness of the soil in inactivating viral indicators, which serve as surrogates for any potential viruses.

Work continues on tracer studies to verify travel time estimates from the spreading facilities to neighboring production wells. These efforts, in addition to periodic studies assessing health effects and toxicological issues, are necessary to provide continued assurances that using recycled water for groundwater recharge remains safe.

Recycled water use at the three seawater intrusion barrier systems (Alamitos, West Coast Basin, and Dominguez Gap Barriers) is a large component of the District's overall resource mix. Work associated with the use of recycled water at those facilities is maintained under the specific project (e.g., Leo J. Vander Lans Water Treatment Facility) that delivers that resource to the barriers or under the program related to recycled water use at the specified barrier.

Projects under this program help to improve the reliability and utilization of an available local resource. This resource is used to improve replenishment capabilities and is thus funded 100% from the Replenishment Fund.

005 – Groundwater Resources Planning Program

The Groundwater Resources Planning Program was instituted to evaluate basin management issues and to provide a means of assessing project impacts over the Central and West Coast Groundwater Basins. Prior to moving forward with a new project, an extensive evaluation is undertaken. Within the Groundwater Resources Planning Program, new projects and programs are analyzed based on benefits to overall basin management. This analysis includes performing an extensive economic evaluation to compare estimated costs with anticipated benefits. As part of this evaluation process, all new capital projects are brought to the District's Technical Advisory Committee for review and recommendation. Projects deemed worthy by the TAC and District Board will be recognized as independent projects and may be included within the District's Capital Improvement Program (CIP). District staff will perform an update to the CIP in the upcoming year upon resolution of outstanding issues related to basin management.

While several conceptual programs (e.g., relaxing carryover provisions, increasing Allowed Pumping Allocation, banking groundwater, etc.) were previously identified, the past several years have focused on the potential storage capabilities of the two basins. It is recognized that there is great conjunctive use/storage potential over the coastal basins yet there remain differences in opinion as to how that storage should be accessed and managed. In the latter half of 2003, a facilitated forum called the Conjunctive Use Working Group was created to address technical and institutional issues associated with storing water in the basins. Along with WRD, the group includes Central and West Basin Municipal Water Districts, Department of Water Resources (Watermaster Services), L.A. County Department of Public Works, Central and West Basin Water Associations, and several large groundwater producers within both basins. The group has made a good deal of headway to identify areas of concern, but more work is needed to reach some sort of resolution that will enable full utilization of available groundwater storage. It is expected that this group will come to resolution on the technical and institutional issues related to conjunctive use in the near future.

WRD will continue to coordinate with the workgroup and others to bring to reality a workable groundwater storage program. Meanwhile, the District must also determine the effects of such a program on the overall management of the basins and the specific impacts to aspects such as water levels, annual overdraft, accumulated overdraft, etc. The management alone of such a program will definitely require close review and administration by District staff.

During the coming year, work under this program will focus on the implementation of recommendations that arise as a result of the re-evaluation of West Coast Basin operations and the resolution of Conjunctive Use Working Group efforts. Those projects located in the West Coast Basin that were considered for inclusion in the District's CIP will be re-evaluated within the context of the recommendations put forth in the West Coast Basin Operating Plan Study. Also, any new conceptual projects that arise as a result of that study will be further evaluated. With the expected resolution of technical and institutional issues related to conjunctive use, it is anticipated that District staff will work extensively on the development and analysis of conjunctive use projects for both the Central and West Coast Basins. Additionally, District staff will continue to monitor State and Federal grant programs to determine applicability to the District's list of potential projects. In the coming year, it is anticipated that Proposition 50 and AB303 grant funds will become available through a competitive proposal process. WRD will continue to work with Federal agencies such as the U.S. Bureau of Reclamation to identify potential opportunities for funding.

Projects under the Groundwater Resources Planning Program serve to improve replenishment operations and general basin management. Accordingly, this program is also wholly funded through the Replenishment Fund.

006 – Groundwater Quality Program

This comprehensive program constitutes an ongoing effort to address water quality issues that affect WRD projects and the pumpers' facilities. The District monitors and evaluates the impacts of pending drinking water regulations and proposed legislation. WRD assesses the justification and reasoning used to draft the proposal and, if warranted, joins in coordinated efforts with other interested agencies to resolve concerns during the early phases of the regulatory and/or legislative process.

The District continually evaluates current and proposed water quality compliance in production wells, monitoring wells, and recharge/injection waters of the basins. If noncompliance is identified, WRD staff develops a recommended course of action and associated cost estimates to address the problem and to achieve compliance.

In recent years, new contaminants have been identified as impacting local groundwater not only in the Central and West Coast Basins, but also in neighboring regions such as the Main San Gabriel Basin, Orange County Basin, Chino Basin, etc. Constituents such as perchlorate, nitrosodimethylamine (NDMA), hexavalent chromium, and 1,4-dioxane have emerged as *contaminants of concern* and pose a potential threat to the local resources. In addition, existing regulations are being revisited and drinking water standards for some constituents, such as arsenic, may be lowered in the near future, which would impact the use of some existing wells unless new treatment is utilized.

Fortunately, contamination thus far detected in the Central and West Coast Basins have been localized in nature. When such conditions are identified, the District works closely with the affected purveyor to help characterize the nature and extent of the contamination and investigate potential causes and remedies. Efforts are also underway to evaluate and characterize the potential impacts of many site-specific groundwater cleanup investigations by the United States Environmental Protection Agency (USEPA), the State Department of Toxic Substances Control (DTSC), and the Regional Water Quality Control Board (RWQCB). Due to staffing and resource limitations with these agencies, WRD has offered to provide technical assistance with respect to monitoring and cleanup activities at these sites.

Even though investigations and cleanup efforts at individual sites continue, the migration of contaminants to deeper aquifers and the potential threat to groundwater quality is of great concern. WRD, along with the USGS, USEPA, DTSC, RWQCB, and City of Santa Fe Springs, recently partnered and resubmitted a grant application through AB303 (Groundwater Management) funding to conduct an investigation on potential contamination movement within the aquifer system in the southeastern Montebello Forebay area. If accepted, much of that work will be conducted next year.

In addition to native groundwater quality, WRD takes special interest in the water quality affecting replenishment operations. In addition to local storm runoff, recycled water from upstream treatment plants and imported water from northern California and the Colorado River are used in the spreading grounds of the Montebello Forebay. Any water quality issues related to these sources are of extreme importance as the District fulfills its duty to replenish the basins. As previously mentioned, WRD continues to be vigilant in monitoring for impacts from the use of recycled water. Meanwhile, the County Sanitation Districts of Los Angeles County (CSDLAC) take great care in assessing the water quality of recycled water from its plants as does the Metropolitan Water District (MWD) on imported water delivered to the spreading grounds. New areas of concern include emerging chemicals (e.g., pharmaceuticals and personal care products) in recycled water and perchlorate in imported water from the Colorado River. While the above two agencies do the primary analyses associated with water quality and overall impacts, WRD works closely with each to ensure that the basins are not adversely affected.

WRD is also participating in the *Water Augmentation Study* (WAS) of the Los Angeles and San Gabriel River Watershed Council. This is a multi-year investigation to evaluate the feasibility of capturing storm runoff at localized sites in lieu of discharge into the storm drains, channels, and

ultimately to the ocean. It is a potential source of new replenishment water, and would be in addition to storm water currently used for percolation in the existing spreading grounds in the Montebello Forebay. The concept was born of the desire to retain more storm water rather than allow it to be wasted to the ocean; however, precautions must be taken to ensure that this new water does not degrade groundwater quality if allowed to percolate at local sites. Much of the WAS is focused on evaluating the technical feasibility of this project and the potential impacts on groundwater quality. Other aspects of the WAS include modeling and estimating the amount of water available for recharge in the local watersheds and the economic value of this additional source of water.

Much of the work for the coming year will involve additional investigations at well sites known to have contaminated water, continued monitoring of water quality regulations and proposals affecting production and replenishment operations, further characterization of contaminant migration into the deeper aquifers, and monitoring and expediting cleanup activities at contaminated sites. All work under this program is related to water quality and cleanup efforts; therefore, 100% of it is funded from the Clean Water Fund.

007 – Whittier Narrows Groundwater Contamination

Migrating contamination (primarily volatile organic compounds – VOCs) from the Main San Gabriel Groundwater Basin passes through the Whittier Narrows prior to entering the Central Basin. With the degree of contamination identified within the Main San Gabriel Basin, this concern has been specific and warranted a separate WRD program.

Since the early 1990s, WRD has worked through the Southeast Water Coalition (SEWC) to develop a plan of action to prevent pollution from entering the Central Basin. The Narrows serves as the geological and political boundary between the two basins and provides a defining line at which to stop the movement of contaminated groundwater. Because of the Superfund label put on the San Gabriel Basin, the USEPA has been at the center of the discussions and responsible for the implementation of an action plan.

SEWC, which includes nearly all the cities overlying the Central Basin, serves as a strong voice to Congress. Through the efforts of the coalition and stakeholders in the San Gabriel Basin, Congressional representatives were made aware of the situation of the moving plume of pollution and endorsed projects to address the issue. Federal funding was also made available, and cleanup projects through the EPA were eventually implemented on both sides of the Narrows.

With monitoring wells constructed and pump and treat projects initiated, the start of the physical solution is in place. However, special attention and observation remains to ensure San Gabriel Basin contamination does not adversely impact the water quality of the Central Basin. These efforts will include a watchful approach to analyzing monitoring data and getting involved in any proposed projects associated with the plume of contamination. Also, WRD should encourage and support cleanup projects developed upgradient of the Whittier Narrows within the operable units identified in the San Gabriel Basin.

No additional projects are envisioned for the coming year, but a great deal of coordination between existing projects will be needed to ensure objectives are being met. Similar to the previous program mentioned, the work involved under the Whittier Narrows Groundwater Contamination program is 100% funded through the Clean Water Fund.

010 – Geographic Information System (GIS)

The District maintains an extensive database and Geographic Information System (GIS) in-house. The database includes water level and water quality data throughout the entire WRD service area with information drawn not only from the District's Regional Groundwater Monitoring Program, but also from water quality data downloaded from DHS. The system requires continuous update and maintenance but serves as a powerful tool for understanding basin characteristics and overall basin health.

GIS, in conjunction with the regional groundwater model, is used to provide better planning and basin management. The system is used to organize and store an extensive database of spatial information, including well locations, water level data, water quality information, well construction data, production data, aquifer locations, and computer model files. Staff uses the system daily for project support and database management. Specific information is available to any District pumper or stakeholder upon request and can be delivered through the preparation of maps, tables, reports, or other compatible format. Additionally, the District has made its web-based Interactive Well Search tool available to the public; this web site provides users with limited access to WRD's water quality and production database.

District staff will continue to streamline and refine the existing data management system and website as well as satisfy both internal and external data requests. Continued use, upkeep, and maintenance of the GIS are planned for the coming year. The use of the system supports both replenishment activities and groundwater quality efforts. Accordingly, the cost for this program is equally split between the Replenishment and Clean Water Funds.

11A – Regional Groundwater Monitoring Program

The Regional Groundwater Monitoring Program continues to be very successful and currently consists of a network of about 200 WRD and USGS-installed monitoring wells at 45 locations throughout the District. This program provides for the collection of basic information used for effective groundwater basin management including groundwater level data and water quality data. The data is stored in the District's GIS and provides the basis to better understand the dynamic changes in the Central and West Coast Basins. Monitoring well data is supplemented with information from production wells to capture the most accurate information available. WRD staff, comprised of certified hydrogeologists and registered engineers, provides the in-house capability to collect, analyze and report groundwater data.

Water quality samples from the monitoring wells are collected twice a year. Water levels are measured in most monitoring wells with automatic data loggers every six hours, while water levels in all monitoring wells are measured by WRD field staff a minimum of four times per year. On an annual basis, staff prepares a report that documents groundwater production, groundwater level, and groundwater quality conditions throughout the District.

Most of the work during the coming year will involve continuous field activities including quarterly and semi-annual data collection, continuous well and equipment maintenance, and annual reporting activities. Work associated with the Regional Groundwater Monitoring Program also supports activities relating to both replenishment and water quality projects. The program, therefore, is funded 50% each from the Replenishment and Clean Water Funds.

11B – Hydrogeology Program

This program accounts for hydrogeologic analysis of the Central, West Coast, and surrounding groundwater basins as necessary for specific issues, projects, programs and basin management issues that face the District. It includes evaluation of replenishment needs and forecasting at the spreading grounds and barrier wells, computer modeling, and assessing the overall health of the basins from an analysis of water levels and water quality data.

Staff work performed under this program includes the preparation of the annual Engineering Survey and Report, including the calculation and determination of important hydrogeologic factors such as annual overdraft, accumulated overdraft, change in storage, and replenishment needs. Extensive amounts of data are compiled and analyzed by internal State-certified hydrogeologists and professional engineers to determine these values. Maps are created showing water levels in the basins and production patterns and amounts. The updates, maintenance, and use of the Regional Groundwater Flow Model developed by the USGS and WRD are part of this program. This model is a significant analytical tool utilized by WRD to determine basin benefits and impacts of changes proposed in the management of the Central and West Coast Basins. It will be utilized for conjunctive use and water banking programs discussed earlier under project 005.

A focused effort to better characterize the hydrogeologic conditions in the District is also underway and will continue into the ensuing year. This long-term project involves compiling and interpreting extensive data which were generated during the drilling and logging of the WRD/USGS monitoring wells and collected from historical information for production wells and oil wells within the District. The ultimate goal of this project is to incorporate these data in WRD's GIS and then use the system to generate aquifer surfaces and cross-sections to compare with historical interpretations of basin hydrogeology. The information and final conceptual model will significantly improve the understanding of the aquifer depths, extents, and thicknesses throughout the District to assist Staff, pumpers, and stakeholders better plan for groundwater resource projects, such as new well drilling, storage opportunities, or modeling. The data will also be made available on WRD's website to be used as a reference source for hydrogeologic interpretations and fulfilling project-related data requests.

Hydrogeological analysis is also needed for projects associated with groundwater quality concerns and specific cleanup projects. Work by in-house staff may include investigative surveys, data research, oversight of specific project studies, etc. Such efforts are used to relate water quality concerns with potential impact to basin resources.

Special projects arise occasionally under this program such as the as the sulfur hexafluoride (SF6) tracer test. Results of the tracer study will allow an evaluation of the travel time between water recharged at the spreading grounds and its extraction at nearby production wells. This analysis will improve WRD's understanding of the dynamic characteristics of groundwater flow beneath the spreading facilities and serve as a basis for justifying any changes to proposed regulations on the use of recycled water for groundwater recharge. Other pending special projects include optimum and minimum groundwater quantity analysis, technical bulletins to stakeholders on depth to water, specific capacity, zone sampling and spinner logging, and other groundwater tracers.

The Hydrogeology Program addresses both groundwater replenishment objectives and groundwater quality matters. This dual service warrants that the cost of the program be split evenly between the Replenishment and Clean Water Funds.

012 – Safe Drinking Water Program

WRD's Safe Drinking Water Program (SDWP) is intended to promote the cleanup of groundwater resources at specific well locations. Through the installation of wellhead treatment facilities at existing production wells, the District hopes to remove contaminants from the underground supply and deliver the extracted water for potable purposes. Projects implemented through this program are accomplished through direct input and coordination with well owners.

The current program focuses on the removal of volatile organic compounds (VOCs) and offers financial assistance for the design and equipment of the selected treatment facility. Another component of the program offers no-interest loans for other constituents of concern that affect a specific production well. The capital costs of wellhead treatment facilities range from $200,000 to over $900,000. Due to financial constraints, this initial cost is generally prohibitive to most pumpers. Financial assistance through the District's SDWP makes project implementation much more feasible.

There are several current projects in various stages of completion and a total of eleven (11) facilities already online. While continued funding of this program is anticipated for next year, the District is currently re-evaluating its policy with respect to the incorporation of projects that treat non-VOC constituents such as iron and manganese, arsenic, and the like. Once this issue is resolved, the program will be better defined and the allocation of money can be made available through the program in the coming year. There have already been several informal funding requests for projects involving non-VOC contaminants which will be prioritized. While such projects are of interest to WRD, availability of funding for them will not be determined until after the budget process.

Projects under the SDWP involve the treatment of contaminated groundwater for subsequent beneficial use. This water quality improvement assists in meeting the District's groundwater cleanup objectives. Thus, funding for the costs of the program is drawn wholly from the Clean Water Fund.

016 – Seawater Barrier Improvement Program

The three seawater barriers – Alamitos, Dominguez Gap, and West Coast Basin Barriers –along the Coastal Plain of Los Angeles County are vital systems that sustain the groundwater resources enjoyed by the Central and West Coast Basins. They were designed to prevent further seawater intrusion into the basins, but in the case of the Dominguez Gap and West Coast Basin Barriers, they also serve as the primary means of replenishing the West Coast Basin.

The barriers are owned and operated by the Los Angeles County Department of Public Works (LACDPW), but WRD purchases all the water that is used for injection. Because the water delivered to the barriers requires the highest degree of treatment, it typically is the most costly to buy. Accordingly, the District has a key interest in new and innovative ways to achieve the objectives of the existing barriers while reducing long-term costs.

WRD works cooperatively with LACDPW to maintain or improve the effectiveness of the barriers. Together, the two agencies secured funding from the USBR to identify potential barrier improvement studies. Such studies include an evaluation of different methods for well redevelopment, the installation of telemetry systems to monitor barrier operations, and an investigation of alternative concepts to prevent seawater intrusion (e.g., deep soil mixing, rubber dams, nitrogen injection). These concepts are being further developed and evaluated for feasibility on a case-by-case basis. In fact, the alternative concept of deep soil mixing at the Alamitos Barrier has been separated out as a separate project and described later in this chapter.

As new technology and innovative methods are being evaluated, WRD and LACDPW still continue to assess current barrier operations and overall effectiveness to ensure the integrity of the barriers is maintained and objectives are being met. For instance, the County has recently installed new injection wells from the northerly reach of the Dominguez Gap Barrier to prevent further intrusion around the easterly extent. Because new wells require additional water for injection, WRD needs to understand the full impact of the improvements especially as it relates to future costs. WRD continues to be under contract with the USGS to collect detailed hydrogeologic and water quality data and model alternative barrier schemes for the Dominguez Gap to identify acceptable changes that can be implemented to optimize injection. Monitoring wells drilled in the vicinity of the barrier alignment have helped District staff to better understand the aquifer/aquitard relationship in this complex area as well as identify possible mechanisms of seawater intrusion.

At the West Coast Basin Barrier, WRD, LACDPW and USBR are continuing a pilot investigation to test whether nitrogen gas can replace water injected into a barrier well as a means to raise aquifer pressure levels and prevent seawater intrusion. The pilot test will involve injecting nitrogen gas into an existing barrier well for several days and checking water levels in nearby wells to assess effectiveness.

In the coming year, WRD expects to continue the above-mentioned pilot study as well as coordinate with LACDPW on other potential investigations related to barrier optimization and effectiveness. Work in this program serves a dual purpose of recharge and protection of the existing water quality of the basins. Costs associated with it are split 50-50 between the Replenishment and Clean Water Funds.

018 – Dominguez Gap Barrier Recycled Water Injection

This Project involves the delivery of recycled water from the City of Los Angeles Department of Water and Power's (LADWP) Terminal Island Treatment Plant (TITP) to the Dominguez Gap Barrier. The treatment works and infrastructure to deliver water to the Barrier have been completed. The regulatory permit to allow injection of the water has been issued, but additional testing is in progress to satisfy water quality criteria of the County. Deliveries are scheduled to start in spring 2005.

This water will be treated with microfiltration, reverse osmosis, and chlorination before being injected into the barrier. The project will maintain a ratio of 50% recycled water and 50% potable water to satisfy regulatory requirements. While LADWP will be responsible for the treatment and delivery of the recycled water and all the water quality sampling associated with those activities, WRD will have responsibility over groundwater monitoring compliance. As part of the permit, groundwater monitoring is required to observe water quality conditions and to anticipate potential

problems before reaching downgradient drinking water wells. Baseline monitoring has been completed. Subsequent groundwater monitoring will resume upon the start of delivery of the recycled water to the barrier.

Recycled water use at the barriers improves the reliability of a supply that is needed on a continuous basis. Traditionally, water purchases for the barriers have been viewed as a replenishment function. Therefore, this program is funded 100% through the Replenishment Fund.

023 – Replenishment Operations

The District actively monitors the operation and maintenance practices at the LACDPW-owned and operated spreading grounds and seawater barriers. Optimizing replenishment opportunities is fundamentally important to WRD in part because imported and recycled water deliveries directly affect the District's annual budget. Consequently, the District wants to make certain that the conservation of stormwater is maximized so as to offset the need to purchase replenishment water.

WRD coordinates regular meetings with LACDPW, MWD, CSDLAC, and other water interests to discuss replenishment water availability, spreading grounds operations, scheduling of replenishment deliveries, seawater barrier improvements, upcoming maintenance activities, and facility outages or shutdowns. The District tracks groundwater levels in the Montebello Forebay weekly to assess general basin conditions and determine the level of artificial replenishment needed. WRD also monitors the amount of recycled water used at the spreading grounds and seawater barriers to maximize use while complying with pertinent regulatory limits.

In a recent action associated with the Whittier Narrows, WRD and LACDPW successfully challenged the previous decision to lower the conservation pool elevation behind Whittier Narrows Dam. The pool elevation was returned to its original designation of 201.6 feet MSL, allowing for an additional 3,000 AF/year average of potential water conservation. In the coming year, WRD will evaluate the costs and benefits associated with raising the conservation pool level even higher.

Work also continues to evaluate the potential benefits of bringing water to the under-utilized Dominguez Gap Spreading Grounds (DGSG). WRD has proposed concepts such as utilizing extractions from Caltrans' dewatering project at the I-105 Freeway and making some improvements at the grounds themselves. Recently, LACDPW indicated that the easterly basins of the DGSG would be reserved for the development of wetlands; however, the County set aside the smaller westerly basin for future recharge potential. The District will evaluate the effects of this plan and work closely with LACDPW during the design of the proposed wetlands.

As its name implies, this program deals primarily with replenishment issues and its costs are borne completely by the Replenishment Fund.

030 – Alamitos Barrier Deep Soil Mixing Pilot Study (Physical Barrier Project)

This concept seeks to create a "physical barrier" at the Alamitos Gap to replace the water injection scheme of the current barrier system. A full physical barrier is intended to be a passive system that ultimately eliminates the need to inject water for the express purpose of preventing seawater intrusion; although this would not preclude the use of the current injection wells to replenish the basin.

Prior to using a physical barrier for seawater intrusion, the technology and construction must first be put to the test to verify the validity of the concept itself. Therefore, a pilot study is underway to assess the potential value. The USBR and WRD initiated this pilot investigation to test the hydraulic effectiveness of a physical wall constructed of a deep soil-slurry mix. The USBR is the lead agency for the ongoing pilot study which has been separated into two phases. The results first phase demonstrated that the site selected was indeed viable based extensive site review and data collection. It is anticipated that a determination will be made in the coming year whether to move forward with phase two of the pilot study, which would involve the construction and monitoring of a deep soil mixed wall test section. This determination will be based on available matching funds from the USBR and additional funding that may be required from the District or other local agencies.

The benefits of this project (i.e. improve recharge capability at the existing barrier wells and prevent seawater intrusion) span both replenishment and water quality objectives. Accordingly, an equal split of the costs incurred will divided between both the Replenishment and Clean Water Funds.

TABLES

Table 1

GROUNDWATER CONDITIONS AND REPLENISHMENT SUMMARY

ITEM	WATER YEAR Oct 1 - Sep 30		
	2003-2004	*2004-2005* [(a)]	*2005-06* [(a)]
Total Groundwater Production	248,334 AF	245,025 AF	248,157 AF
Annual Overdraft	(135,686) AF	(75,639) AF	(102,952) AF
Accumulated Overdraft	(702,100) AF	(660,247) AF	

Quantity Required for Artificial Replenishment for the Ensuing Year

Spreading		
Imported for Spreading in Montebello Forebay		27,600 AF
Recycled for Spreading in Montebello Forebay		48,000
	Subtotal Spreading	75,600
Injection		
West Coast Basin Barrier		19,000
Dominguez Gap Barrier		13,400
Alamitos Barrier		3,800
	Subtotal Injection	36,200
In-lieu[(b)]	Subtotal In-lieu	10,303
	Total	**122,103** AF

Source and Unit Cost of Replenishment Water for the Ensuing Year

Recycled Water	**Oct-Dec**	**Jan-Sep**
Spreading (CSDLAC - San Jose Creek)	$ 21.31 /AF	$ 21.31 /AF
Spreading (CSDLAC - Whittier Narrows)	$ 7.00 /AF	$ 7.00 /AF
Injection (WBMWD - West Coast Barrier)	$ 450.00 /AF	$ 450.00 /AF
Injection (LA-Terminal Island - Dominguez Barrier)	$ 431.00 /AF	$ 431.00 /AF
Injection (WRD-Alamitos Barrier)	$ 286.00 /AF	$ 286.00 /AF
Imported Water		
Spreading from CBMWD	$ 238.00 /AF	$ 238.00 /AF
Injection - Alamitos (includes $5/af Long Beach surcharge)	$ 448.00 /AF	$ 468.00 /AF
Injection - Dominguez Gap & West Coast (includes $92/af WBMWD surcharge [$31 admin fee, $61 RTS])	$ 535.00 /AF	$ 555.00 /AF
CBMWD Contract Rate for Spreading	$828,000	
WBMWD Water Service & Capacity Reservation Charges	$ 51,287	$ 175,013
In-lieu[(b)]		
Central Basin Met Member Agency (Long Beach, Compton, Los Angeles)		$ 142 /AF
CBMWD Customer		$ 179 /AF
West Basin Met Member Agency (Torrance, Los Angeles)		$ 142 /AF
WBMWD Customer		$ 173 /AF

(a) Estimated values

(b) Amounts and rates for In-lieu are estimated and have not yet been established by the Board for ensuing year

Table 2

QUANTITY AND COST OF REPLENISHMENT WATER FOR WY 2005-2006

ITEMS	October - December			January - September			TOTAL	TOTAL
	acre feet	unit cost	subtotal	acre feet	unit cost	subtotal	WATER (af)	COST
Spreading Imported	6,900	$238	$1,642,200	20,700	$238	$4,926,600	27,600	$6,568,800
Spreading Recycled (San Jose Creek Plant)	9,500	$21.31	$202,445	28,500	$21.31	$607,335	38,000	$809,780
Spreading Recycled (Whittier Narrows Plant)	2,500	$7	$17,500	7,500	$7	$52,500	10,000	$70,000
West Coast Barrier imported	1,625	$535	$869,375	4,875	$555	$2,705,625	6,500	$3,575,000
West Coast Barrier recycled	3,125	$450	$1,406,250	9,375	$450	$4,218,750	12,500	$5,625,000
Dominguez Gap Barrier imported	1,950	$535	$1,043,250	5,850	$555	$3,246,750	7,800	$4,290,000
Dominguez Gap Barrier recycled	1,400	$431	$603,400	4,200	$431	$1,810,200	5,600	$2,413,600
Alamitos Barrier imported	475	$448	$212,800	1,425	$468	$666,900	1,900	$879,700
Alamitos Barrier recycled	475	$286	$135,850	1,425	$286	$407,550	1,900	$543,400
In-Lieu Central Basin Met Member	1,500	$142	$213,000	4,500	$142	$639,000	6,000	$852,000
In-Lieu CBMWD Customer	0	$179	$0	0	$179	$0	0	$0
In-Lieu West Basin Met Member	376	$142	$53,357	1,127	$142	$160,070	1,503	$213,426
In-Lieu WBMWD Customer	700	$173	$121,100	2,100	$173	$363,300	2,800	$484,400
CBMWD Spreading Contract Rate	-	-	-	-	-	-	-	$828,000
WBMWD Water Service & Capacity Reservation Fees	-	-	$51,287	-	-	$175,013	-	$226,300
Subtotal							122,103	$27,379,406
less Alamitos Barrier Recycled								($543,400)
TOTAL							**122,103**	**$26,836,006**

Met - Metropolitan Water District of Southern California, WBMWD = West Basin Municipal Water District, CBMWD = Central Basin Municipal Water District

* The Alamitos recycled water cost is based on O&M less MWD rebate. It is shown as a water cost, but is deducted at the end since it is part of the Vander Lans (Water Supply) project

Table 3

WRD PROJECTS AND PROGRAMS

PROJECT / PROGRAM	DISTRICT FUNCTION	
	Replenishment	Clean Water
001 Leo J. Vander Lans Water Treatment Facility Project	100%	
002 Robert W. Goldsworthy Desalter Project		100%
003 Cal Trans Highway 105 Dewatering	100%	
004 Recycled Water Program	100%	
005 Groundwater Resources Planning Program	100%	
006 Groundwater Quality Program		100%
007 Whittier Narrows Groundwater Contamination		100%
010 Geographic Information System	50%	50%
11A Regional Groundwater Monitoring Program	50%	50%
11B Hydrogeology Program	50%	50%
012 Safe Drinking Water Program		100%
016 Seawater Barrier Improvement Program	50%	50%
018 Dominguez Gap Barrier Recycled Water Injection	100%	
023 Replenishment Operations	100%	
030 Alamitos Barrier Deep Soil Mixing Pilot Study	50%	50%

Table 4

30-YEAR AVERAGE GROUNDWATER BALANCE FROM USGS & WRD REGIONAL MODEL

INFLOWS	Average AFY	OUTFLOWS	Average AFY
Natural Inflows:		**Artificial Outflows:**	
Local water conserved at spreading grounds [1]	48,825	Pumping	250,590
Interior and mountain front recharge	47,900		
Net underflow from adjacent basins [2]	48,480		
Subtotal Natural Inflows:	145,205		
Artificial Inflows:			
Imported and recylced spreading [3]	74,075		
Barrier injection water [4]	34,600		
Subtotal Artificial Inflows:	108,675		
Total Inflows:	**253,880**	**Total Outflows:**	**250,590**

Average Annual Groundwater Deficiency = Natural Inflows - Total Outflows = (105,385)

[1] includes stormwater and base flow water captured and recharged at the spreading grounds

[2] does not include average of 7,100 afy of seawater intrusion, which can not be considered as replenishment per the water code

[3] includes all imported purchased, all recycled purchased, and Pomona Plant (free) recycled water.

[4] includes all injected water at the three barrier systems, including all of Alamitos Barrier. Model value may differ slightly from actual purchas

Description of the model can be found in USGS, 2003, Geohydrology, Geochemistry, and Ground-Water Simulation - Optimiation of the Central and West Coast Basins, Los Angeles County, California; Water Resources Investigation Report 03-4065 by Reichard, E.G., Land, M., Crawford, S.M., Johnson, T., Everett, R.R., Kulshan, T.V., Ponti, D.J., Halford, K.J., Johnson, T.A., Paybins, K.S., and Nishikawa, T.

Table 5

HISTORICAL RAINFALL

Station #107D, Downey Fire Department

Water Year	Inches	Water Year	Inches	Water Year	Inches	Water Year	Inches
1925-26	12.63	1950-51	8.27	1975-76	9.55	2000-01	14.98
1926-27	16.92	1951-52	24.68	1976-77	11.23	2001-02	2.52
1927-28	11.97	1952-53	10.53	1977-78	33.85	2002-03*	19.89
1928-29	11.52	1953-54	12.33	1978-79	18.68	2003-04	7.73
1929-30	10.84	1954-55	11.84	1979-80	28.29		
1930-31	10.45	1955-56	13.97	1980-81	8.74		
1931-32	14.52	1956-57	9.89	1981-82	13.41		
1932-33	10.02	1957-58	24.65	1982-83	30.3		
1933-34	11.1	1958-59	6.68	1983-84	11.96		
1934-35	21.94	1959-60	9.84	1984-85	12.44		
1935-36	9.65	1960-61	4.3	1985-86	19.47		
1936-37	22.11	1961-62	18.46	1986-87	6.49		
1937-38	21.75	1962-63	10.9	1987-88	11.47		
1938-39	18.69	1963-64	6.86	1988-89	7.82		
1939-40	12.81	1964-65	13.27	1989-90	7.87		
1940-41	34.21	1965-66	17.02	1990-91	12.22		
1941-42	14.66	1966-67	17.78	1991-92	16.07		
1942-43	17.91	1967-68	11.46	1992-93	26.55		
1943-44	17.89	1968-69	22.33	1993-94	9.26		
1944-45	11.25	1969-70	7.52	1994-95	26.82		
1945-46	10.31	1970-71	11.45	1995-96	10.68		
1946-47	15.24	1971-72	6.4	1996-97	13.95		
1947-48	8.62	1972-73	18.57	1997-98	32.47		
1948-49	9.04	1973-74	14.51	1998-99	7.29		
1949-50	10.14	1974-75	15.01	1999-00	9.21		

Period of Record	**79 years**
Running 79 Year Average	**14.4 inches**
Standard Deviation	**6.9 inches**
Minimum	**2.5 inches**
Maximum	**34.2 inches**

* 2002/03 from station 388D (City of Paramount Fire Station), since 107D data are incomplete

Table 6

ANNUAL OVERDRAFT CALCULATION

for Current and Ensuing Water Years (in acre-feet)

Item	WATER YEAR 2004-2005	WATER YEAR 2005-06
Average Annual Groundwater Deficiency (from Table 4)	(105,385)	(105,385)
Adjustments/Variances to AAGD		
(1) Local Water at Spreading Grounds[a]	12,206 [d]	0 [d]
(2) Precipitation, mountain front recharge, applied water[a]	11,975 [d]	0 [d]
(3) Subsurface inflow[b]	0 [d]	0 [d]
(4) Groundwater Extractions[c]	(5,565) [d]	(2,433) [d]
ANNUAL OVERDRAFT [AAGD+(1)+(2)+(3)-(4)]	(75,639)	(102,952)

Note: Numbers in parentheses represent negative values.

(a) Difference between actual and model average. Positive value indicates increased recharge.

(b) Difference between annual model value and average model value. Positive value indicates increased inflow. Does not include seawater intrusion inflow

(c) Difference between actual and model average. Positive value indicates increased pumpage.

(d) Estimated Values. A value of zero indicates average year was assumed.

Table 7

ACCUMULATED OVERDRAFT CALCULATION (in acre-feet)

ITEM	AMOUNT
Accumulated Overdraft at end of Previous Water Year	(702,100)
Estimated Annual Overdraft for Current Year	(75,639)
Subtotal without artificial replenishment	(777,739)
Planned Artificial Replenishment for Current Year	
Imported Water Purchased for Spreading	37,947
Recycled Water Purchased for Spreading	48,000
Imported and Recycled Water Purchased for Barrier Wells	31,545
Replenishment Subtotal	117,492
PROJECTED ACCUMULATED OVERDRAFT FOR CURRENT YEAR	**(660,247)**

Note: Numbers in parentheses represent negative values.

Table 8

CHANGES IN GROUNDWATER STORAGE

WATER YEAR	CHANGE IN AMT OF WATER IN STORAGE (AF)	CUMULATIVE CHANGE IN STORAGE (AF)	WATER YEAR	CHANGE IN AMT OF WATER IN STORAGE (AF)	CUMULATIVE CHANGE IN STORAGE (AF)
1961-62	88,500	88,500	1985-86	10,600	238,200
1962-63	(11,100)	77,400	1986-87	4,000	242,200
1963-64	10,300	87,700	1987-88	(11,700)	230,500
1964-65	35,200	122,900	1988-89	10,400	240,900
1965-66	21,100	144,000	1989-90	13,600	254,500
1966-67	21,400	165,400	1990-91	28,400	282,900
1967-68	11,400	176,800	1991-92	1,600	284,500
1968-69	(7,500)	169,300	1992-93	45,800	330,300
1969-70	(800)	168,500	1993-94	(28,500)	301,800
1970-71	(3,400)	165,100	1994-95	19,400	321,200
1971-72	(50,600)	114,500	1995-96	12,500	333,700
1972-73	34,800	149,300	1996-97	15,700	349,400
1973-74	(2,400)	146,900	1997-98	16,700	366,100
1974-75	(14,100)	132,800	1998-99	(80,196)	285,904
1975-76	(40,200)	92,600	1999-00	(30,000)	255,904
1976-77	(32,900)	59,700	2000-01	(400)	255,504
1977-78	88,600	148,300	2001-02	(36,454)	219,050
1978-79	30,100	178,400	2002-03	(10,350)	208,700
1979-80	(1,100)	177,300	2003-04	(43,000)	165,700
1980-81	17,100	194,400	2004-05	-	-
1981-82	18,400	212,800	2005-06	-	-
1982-83	46,800	259,600	2006-07	-	-
1983-84	(22,400)	237,200	2007-08	-	-
1984-85	(9,600)	227,600	2008-09	-	-

Note: Numbers in parentheses represent negative values.

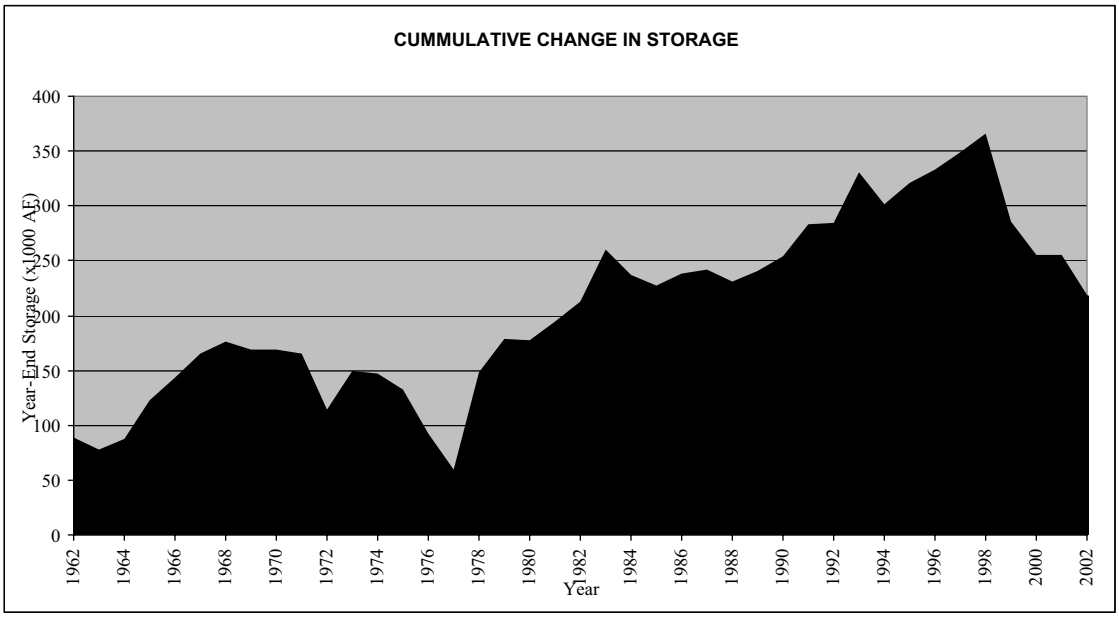


Table 9

QUANTITY OF IMPORTED WATER REQUIRED FOR SPREADING (acre-feet)

ITEM	AMOUNT
Long Term Average for Imported Spreading (from 2003 ESR)*	27,600
Adjustments for Water Year 2005-06	
Projects/Programs to reduce/increase imported needs	0
Amount of additional recharge to help offset accumulated overdraft	0
Additional increases/decreases in spreading needs	0
TOTAL IMPORTED WATER REQUIRED FOR SPREADING	27,600

* The Long Term Averagae is re-evaluated every 5 years to account for changes in the water balance in the Central and West Coast Basins. The next re-evaluation period will be in the 2008 ESR.

HISTORICAL AMOUNTS OF WATER PURCHASED FOR SPREADING IN THE MONTEBELLO FOREBAY [a]

(In Acre-feet)

WATER YEAR	Imported Water		Reclaimed Water		Make-up Water		TOTAL
	LACFCD	WRD	WHITTIER NARROWS WRP	SAN JOSE CREEK WRP	USGVMWD & SGVMWD	CBMWD	
1953-54	30,000						30,000
1954-55	24,800						24,800
1955-56	54,500						54,500
1956-57	50,000						50,000
1957-58	105,100						105,100
1958-59	54,400						54,400
1959-60	80,900						80,900
1960-61	80,800	66,400					147,200
1961-62	39,500	168,600	1,178				209,278
1962-63	4,800	75,800	12,405				93,005
1963-64		104,900	13,258				118,158
1964-65	75,500	84,600	14,528				174,628
1965-66	67,800	53,900	15,056		6,500		143,256
1966-67	74,100	10,200	16,223		-		100,523
1967-68	66,600	28,800	18,275		-		113,675
1968-69	12,500	5,300	13,877		-		31,677
1969-70	25,800	43,100	17,158		-		86,058
1970-71	46,700	25,400	19,494		-		91,594
1971-72		34,400	17,543		-	-	51,943
1972-73		71,900	13,622	8,327	-	20,000	113,849
1973-74		68,200	13,385	7,064	-	23,900	112,549
1974-75		71,900	14,650	6,549	-	-	93,099
1975-76		50,800	12,394	9,062	-	-	72,256
1976-77		9,300	10,158	12,705	14,500	6,900	53,563
1977-78		39,900	13,104	5,997	-	-	59,001
1978-79		65,300	10,716	11,741	-	-	87,757
1979-80		10,200	14,568	9,815	10,900	-	45,483
1980-81	3,300	28,700	11,464	14,645	31,500	-	89,609
1981-82		4,600	14,133	15,285	30,900 [c]	-	64,918
1982-83		2,000	12,818	4,217	8,900 [c]	-	27,935
1983-84		1,500	13,194	14,590	20,800 [c]	-	50,084
1984-85		40,600	12,905	14,093	-	-	67,598
1985-86		21,500	13,827	11,487	-	-	46,814
1986-87		49,200	15,280	20,041	-	6,500	91,021
1987-88		23,300	14,585	27,182 [b]	5,800 [c]	-	70,867
1988-89		50,300	13,830	33,327	6,500 [c]	-	103,957
1989-90		52,700	15,043	33,498	13,600 [c]	-	114,841
1990-91		56,287	13,841	38,603	100 [c]	-	108,831
1991-92		43,103	12,620	31,326	-	-	87,049
1992-93		16,561	11,026	29,811	-	-	57,397
1993-94		20,411	10,249	40,768	-	-	71,427
1994-95		21,837	10,642	18,431	-	-	50,909
1995-96		18,012	9,971	40,922	-	-	68,906
1996-97		22,738	9,850	36,977	-	-	69,566
1997-98		952	8,378	26,483	-	-	35,813
1998-99		-	10,968	34,782	-	-	45,750
1999-00		45,037	8,950	30,481	-	-	84,468
2000-01		23,451	8,253	35,165	-	-	66,869
2001-02		42,875 [d]	8,474	50,194	-	-	101,543
2002-03		22,366 [e]	5,156	35,320	-	-	62,842
2003-04		27,520	8,195	34,033	-	-	69,748
TOTAL	897,100	1,724,449	535,244	742,921	150,000	57,300	**4,107,013**
	Import:	2,621,549	Reclaimed:	1,278,164	Make-up:	207,300	

(a) Does not include stormwater (local water) conservation.

(b) Of which 2,501 AF was delivered in October 1988.

(c) Includes State Project water imported by the San Gabriel Valley Municipal Water District.

(d) Includes 1,607 af of EPA extracted groundwater from Whittier Narrows considered imported water to WRD. Paid for in 2003.

(e) Includes 5,069 af of EPA extracted groundwater from Whittier Narrows considered imported water to WRD. Paid for in 2004.

HISTORICAL AMOUNTS OF WATER PURCHASED FOR INJECTION

(In Acre-feet)

WATER YEAR	WEST COAST BASIN BARRIER[a]		DOMINGUEZ GAP BARRIER[b]		ALAMITOS BARRIER[c]		TOTAL
	Imported	Recycled	Imported	Recycled	Imported	Recycled	
1952-53	1,140						1,140
1953-54	3,290						3,290
1954-55	2,740						2,740
1955-56	2,840						2,840
1956-57	3,590						3,590
1957-58	4,330						4,330
1958-59	3,700						3,700
1959-60	3,800						3,800
1960-61	4,480						4,480
1961-62	4,510						4,510
1962-63	4,200						4,200
1963-64	10,450						10,450
1964-65	33,020				2,760		35,780
1965-66	44,390				3,370		47,760
1966-67	43,060				3,390		46,450
1967-68	39,580				4,210		43,790
1968-69	36,420				4,310		40,730
1969-70	29,460				3,760		33,220
1970-71	29,870		2,200		3,310		35,380
1971-72	26,490		9,550		4,060		40,100
1972-73	28,150		8,470		4,300		40,920
1973-74	27,540		7,830		6,140		41,510
1974-75	26,430		5,160		4,440		36,030
1975-76	35,220		4,940		4,090		44,250
1976-77	34,260		9,280		4,890		48,430
1977-78	29,640		5,740		4,020		39,400
1978-79	23,720		5,660		4,220		33,600
1979-80	28,630		4,470		3,560		36,660
1980-81	26,350		3,550		3,940		33,840
1981-82	24,640		4,720		4,540		33,900
1982-83	33,950		6,020		3,270		43,240
1983-84	28,000		7,640		2,440		38,080
1984-85	25,210		7,470		3,400		36,080
1985-86	20,260		6,160		3,410		29,830
1986-87	26,030		6,230		4,170		36,430
1987-88	24,270		7,050		3,990		35,310
1988-89	22,740		5,220		3,900		31,860
1989-90	20,279		5,736		4,110		30,125
1990-91	16,039		7,756		4,096		27,891
1991-92	22,180		6,894		4,172		33,246
1992-93	21,516		4,910		3,350		29,776
1993-94	15,482		5,524		2,794		23,800
1994-95	14,237	1,480	4,989		2,883		23,589
1995-96	12,426	4,170	5,107		3,760		25,463
1996-97	11,388	6,241	5,886		4,015		27,530
1997-98	8,173	8,308	3,771		3,677		23,929
1998-99	10,125	6,973	4,483		4,012		25,591
1999-00	11,172	7,460	6,010		4,028		28,670
2000-01	13,988	6,838	3,923		3,710		28,459
2001-02	12,724	7,276	5,459		3,961	-	29,420
2002-03	10,419	6,192	8,056		3,445		28,112
2003-04	9,304	3,669	6,089		3,876		22,938
TOTAL	1,004,712	58,606	201,953	-	153,779	-	1,419,049

(a) Prior to 10/1/71, water was purchased by the State, West Basin Water Association, local water interests, Zone II of the LA County Flood Control District and WRD. After 10/1/71, all purchases have been by WRD

(b) In 1970-71, purchases were shared by WRD and Zone II. After 10/1/71, all purchases have been by WRD

(c) Excludes water purchases by Orange County Water District. Refer to Regional Groundwater Monitoring Report for Total Water.

HISTORICAL AMOUNTS OF THE IN-LIEU PROGRAM

(In Acre-Feet)

WATER YEAR	CENTRAL BASIN	WEST COAST BASIN	TOTAL
1965-66	-	745	745
1966-67	-	851	851
1967-68	-	850	850
1968-69	-	850	850
1969-70	-	900	900
1970-71	-	881	881
1971-72	-	756	756
1972-73	-	901	901
1973-74	-	901	901
1974-75	-	400	400
1975-76	-	400	400
1976-77	-	400	400
1977-78	11,316	4,815	16,131
1978-79	9,723	8,655	18,378
1979-80	10,628	4,333	14,961
FISCAL YEAR			
1980-81	17,617	6,206	23,823
1981-82	14,050	4,833	18,883
1982-83	13,813	5,939	19,752
1983-84	29,216	12,524	41,740
1984-85	23,246	13,594	36,840
1985-86	15,505	10,627	26,132
1986-87	16,205	12,997	29,202
1987-88	15,518	12,893	28,411
1988-89	11,356	14,069	25,425
1989-90	16,858	12,293	29,151
1990-91	11,886	10,153	22,039
1991-92	13,000	6,104	19,104
1992-93	37,652	15,654	53,306
1993-94	83,488	26,093	109,581
1994-95	32,904	17,994	50,898
1995-96	37,517	13,816	51,333
1996-97	34,547	4,847	39,394
1997-98	22,995	7,335	30,330
1998-99	13,213	10,303	23,516
1999-00	18,799	3,479	22,278
2000-01	18,364	2,817	21,181
2001-02	11,931	8,789	20,720
2002-03	6,866	4,339	11,205
2003-04	-	-	-
TOTAL	548,215	264,337	812,551

SUMMARY OF HISTORICAL AMOUNTS OF WATER PURCHASED FOR REPLENISHMENT

(In Acre-feet)

WATER YEAR	SPREADING				INJECTION	IN-LIEU	TOTAL
	IMPORTED WATER	RECLAIMED WATER	MAKEUP WATER	SUBTOTAL			
1952-53					1,140		1,140
1953-54	30,000		-	30,000	3,290		33,290
1954-55	24,800		-	24,800	2,740		27,540
1955-56	54,500		-	54,500	2,840		57,340
1956-57	50,000		-	50,000	3,590		53,590
1957-58	105,100		-	105,100	4,330		109,430
1958-59	54,400		-	54,400	3,700		58,100
1959-60	80,900		-	80,900	3,800		84,700
1960-61	147,200		-	147,200	4,480		151,680
1961-62	208,100	1,178	-	209,278	4,510		213,788
1962-63	80,600	12,405	-	93,005	4,200		97,205
1963-64	104,900	13,258	-	118,158	10,450		128,608
1964-65	160,100	14,528	-	174,628	35,780		210,408
1965-66	121,700	15,056	6,500	143,256	47,760	745	191,761
1966-67	84,300	16,223	-	100,523	46,450	851	147,824
1967-68	95,400	18,275	-	113,675	43,790	850	158,315
1968-69	17,800	13,877	-	31,677	40,730	850	73,257
1969-70	68,900	17,158	-	86,058	33,220	900	120,178
1970-71	72,100	19,494	-	91,594	35,380	881	127,855
1971-72	34,400	17,543	-	51,943	40,100	756	92,799
1972-73	71,900	21,949	20,000	113,849	40,920	901	155,670
1973-74	68,200	20,449	23,900	112,549	41,510	901	154,960
1974-75	71,900	21,199	-	93,099	36,030	400	129,529
1975-76	50,800	21,456	-	72,256	44,250	400	116,906
1976-77	9,300	22,863	21,400	53,563	48,430	400	102,393
1977-78	39,900	19,101	-	59,001	39,400	16,131	114,532
1978-79	65,300	22,457	-	87,757	33,600	18,378	139,735
1979-80	10,200	24,383	10,900	45,483	36,660	14,961	97,104
1980-81	32,000	26,109	31,500	89,609	33,840	23,823	147,272
1981-82	4,600	29,418	30,900	64,918	33,900	18,883	117,701
1982-83	2,000	17,035	8,900	27,935	43,240	19,752	90,927
1983-84	1,500	27,784	20,800	50,084	38,080	41,740	129,904
1984-85	40,600	26,998	-	67,598	36,080	36,840	140,518
1985-86	21,500	25,314	-	46,814	29,830	26,132	102,776
1986-87	49,200	35,321	6,500	91,021	36,430	29,202	156,653
1987-88	23,300	41,767	5,800	70,867	35,310	28,411	134,588
1988-89	50,300	47,157	6,500	103,957	31,860	25,425	161,242
1989-90	52,700	48,541	13,600	114,841	30,125	29,151	174,117
1990-91	56,287	52,444	100	108,831	27,891	22,039	158,761
1991-92	43,103	43,946	-	87,049	33,246	19,104	139,399
1992-93	16,561	40,837	-	57,397	29,776	53,306	140,479
1993-94	20,411	51,016	-	71,427	23,800	109,581	204,808
1994-95	21,837	29,073	-	50,909	23,589	50,898	125,396
1995-96	18,012	50,893	-	68,906	25,463	51,333	145,702
1996-97	22,738	46,827	-	69,566	27,530	39,394	136,490
1997-98	952	34,861	-	35,813	23,927	30,330	90,070
1998-99	-	45,750	-	45,750	25,591	23,516	94,857
1999-00	45,037	39,431	-	84,468	28,670	22,278	135,416
2000-01	23,451	43,418	-	66,869	28,459	21,181	116,509
2001-02	42,875	58,668	-	101,543	29,420	20,720	151,684
2002-03	22,366	40,476	-	62,842	28,112	11,205	102,159
2003-04	27,520	42,228	-	69,748	22,938	-	92,686
TOTAL	2,621,549	1,278,164	207,300	4,107,013	1,420,187	812,551	6,339,752

HISTORICAL AMOUNTS OF GROUNDWATER PRODUCTION

(In Acre-feet)

YEAR	CENTRAL BASIN	WEST COAST BASIN	TOTAL
WATER YEAR			
1960-61	292,500	61,900	354,400
1961-62	275,800	59,100	334,900
1962-63	225,400	59,100	284,500
1963-64	219,100	61,300	280,400
1964-65	211,600	59,800	271,400
1965-66	222,800	60,800	283,600
1966-67	206,700	62,300	269,000
1967-68	220,100	61,600	281,700
1968-69	213,800	61,600	275,400
1969-70	222,200	62,600	284,800
1970-71	211,600	60,900	272,500
1971-72	216,100	64,800	280,900
1972-73	205,600	60,300	265,900
1973-74	211,300	55,000	266,300
1974-75	213,100	56,700	269,800
1975-76	215,300	59,400	274,700
1976-77	211,500	59,800	271,300
1977-78	196,600	58,300	254,900
1978-79	207,000	58,000	265,000
1979-80	209,500	57,100	266,600
1980-81	211,915	57,711	269,626
1981-82	202,587	61,874	264,461
1982-83	194,548	57,542	252,090
1983-84	196,660	51,930	248,590
1984-85	193,085	52,746	245,831
1985-86	195,889	52,762	248,650
1986-87	196,587	48,026	244,613
1987-88	194,561	43,833	238,394
1988-89	200,105	44,162	244,267
1989-90	197,811	47,904	245,715
1990-91	186,977	53,075	240,052
1991-92	196,382	55,964	252,346
1992-93	150,386	40,058	190,444
1993-94	156,930	41,768	198,697
1994-95	181,164	41,396	222,560
1995-96	182,067	52,759	234,826
1996-97	187,452	52,581	240,033
1997-98	188,988	51,841	240,829
1998-99	204,418	51,331	255,749
1999-00	197,946	53,579	251,525
2000-01	195,251	53,842	249,093
2001-02	199,900	50,066	249,966
2002-03	190,082	51,789	241,871
2003-04	200,367	47,967	248,334
TOTAL	9,009,657	2,416,906	11,426,563

HISTORICAL AMOUNTS OF TOTAL WATER USE IN THE WATER REPLENISHMENT DISTRICT

(In Acre-feet)

YEAR	GROUNDWATER PRODUCTION	IMPORTED WATER FOR DIRECT USE*	RECLAIMED WATER FOR DIRECT USE*	TOTAL
WATER YEAR				
1960-61	354,400	196,800		551,200
1961-62	334,900	178,784		513,684
1962-63	284,500	222,131		506,631
1963-64	280,400	257,725		538,125
1964-65	271,400	313,766		585,166
1965-66	283,600	308,043		591,643
1966-67	269,000	352,787		621,787
1967-68	281,700	374,526		656,226
1968-69	275,400	365,528		640,928
1969-70	284,800	398,149		682,949
1970-71	272,500	397,122		669,622
1971-72	280,900	428,713		709,613
1972-73	265,900	400,785		666,685
1973-74	266,300	410,546		676,846
1974-75	269,800	380,228		650,028
1975-76	274,700	404,958		679,658
1976-77	271,300	355,896		627,196
1977-78	254,900	373,116		628,016
1978-79	265,000	380,101	100 [a]	645,201
1979-80	266,600	397,213	200	664,013
1980-81	269,626	294,730	300	564,656
1981-82	264,461	391,734	300	656,495
1982-83	252,090	408,543	400	661,033
1983-84	248,590	441,151	1,800	691,541
1984-85	245,831	451,549	2,000	699,380
1985-86	248,650	427,860	2,400	678,910
1986-87	244,613	478,744	2,300	725,657
1987-88	238,394	479,318	3,500	721,212
1988-89	244,267	466,166	5,300	715,733
1989-90	245,715	448,285	5,900	699,900
1990-91	240,052	485,109	5,000	730,161
1991-92	252,346	395,191	4,900	652,437
1992-93	190,444	388,949	824	580,217
1993-94	198,697	483,287	3,413	685,397
1994-95	222,560	437,191	6,143	665,894
1995-96	234,826	426,699	19,804	681,329
1996-97	240,033	436,569	25,046	701,648
1997-98	240,829	375,738	27,075	643,642
1998-99	255,749	396,655	30,510	682,914
1999-00	251,525	395,681	33,589	680,795
2000-01	249,093	395,024	32,589	676,706
2001-02	249,966	395,799	38,694	684,459
2002-03	241,871	381,148	38,839	661,858
2003-04	248,334	389,233	36,626	674,193
TOTAL	11,426,563	16,967,270	327,552	28,721,385

(a) Los Coyotes on-line in 1979; Long Beach on-line in 1980

** - Imported and reclaimed water reported for Fiscal Year starting 1980/81, includes barrier injection water but not spreading*

FIGURES

HISTORICAL RAINFALL
DPW Station #107D - Downey Fire Station

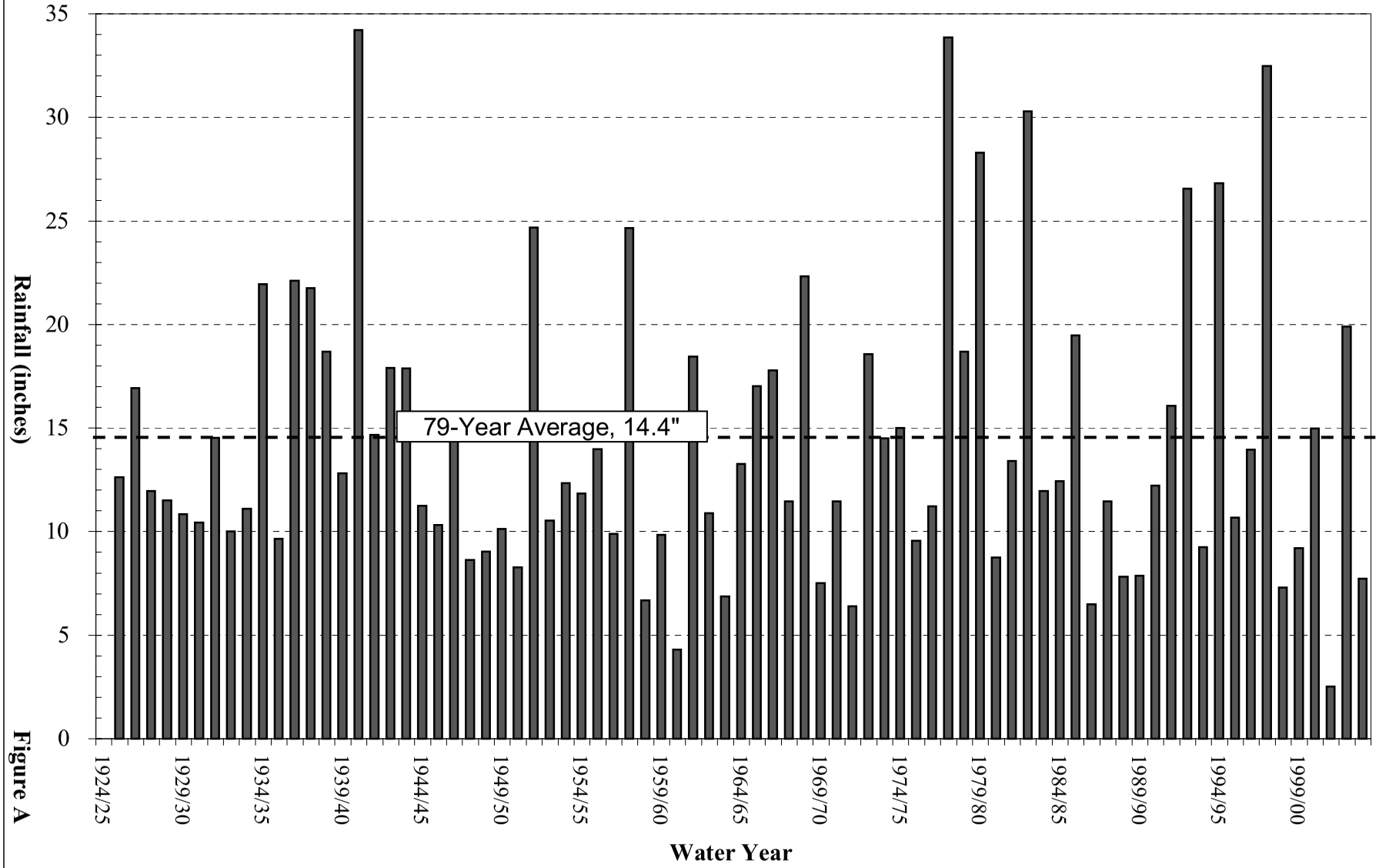
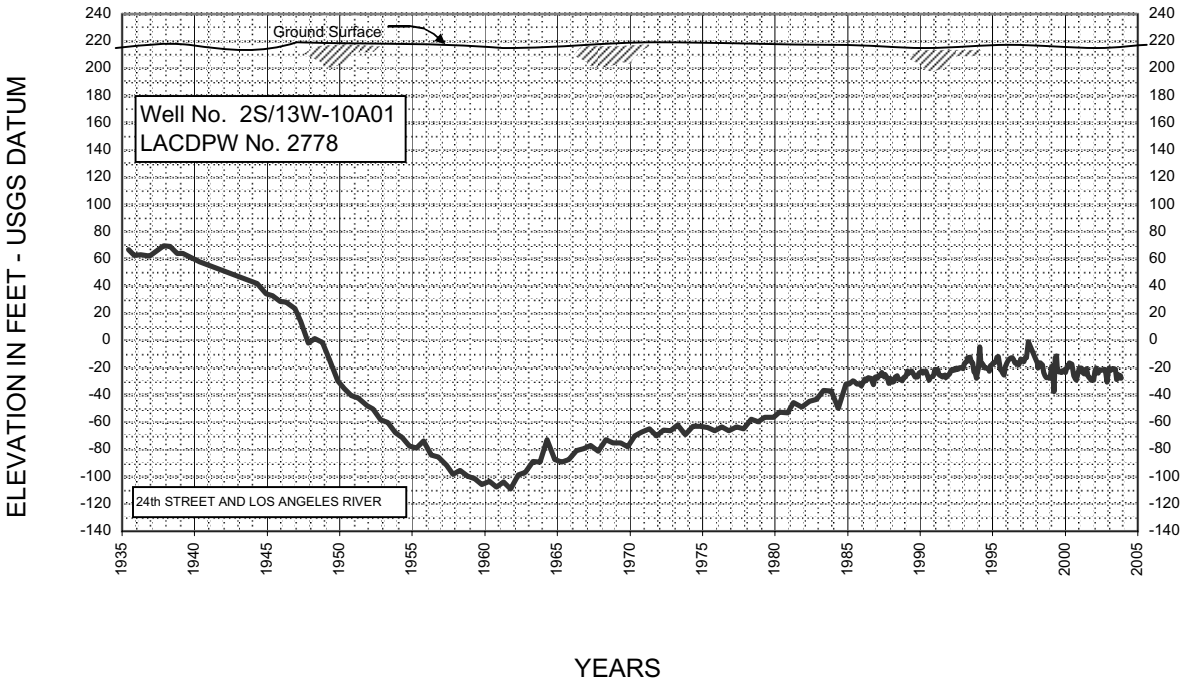
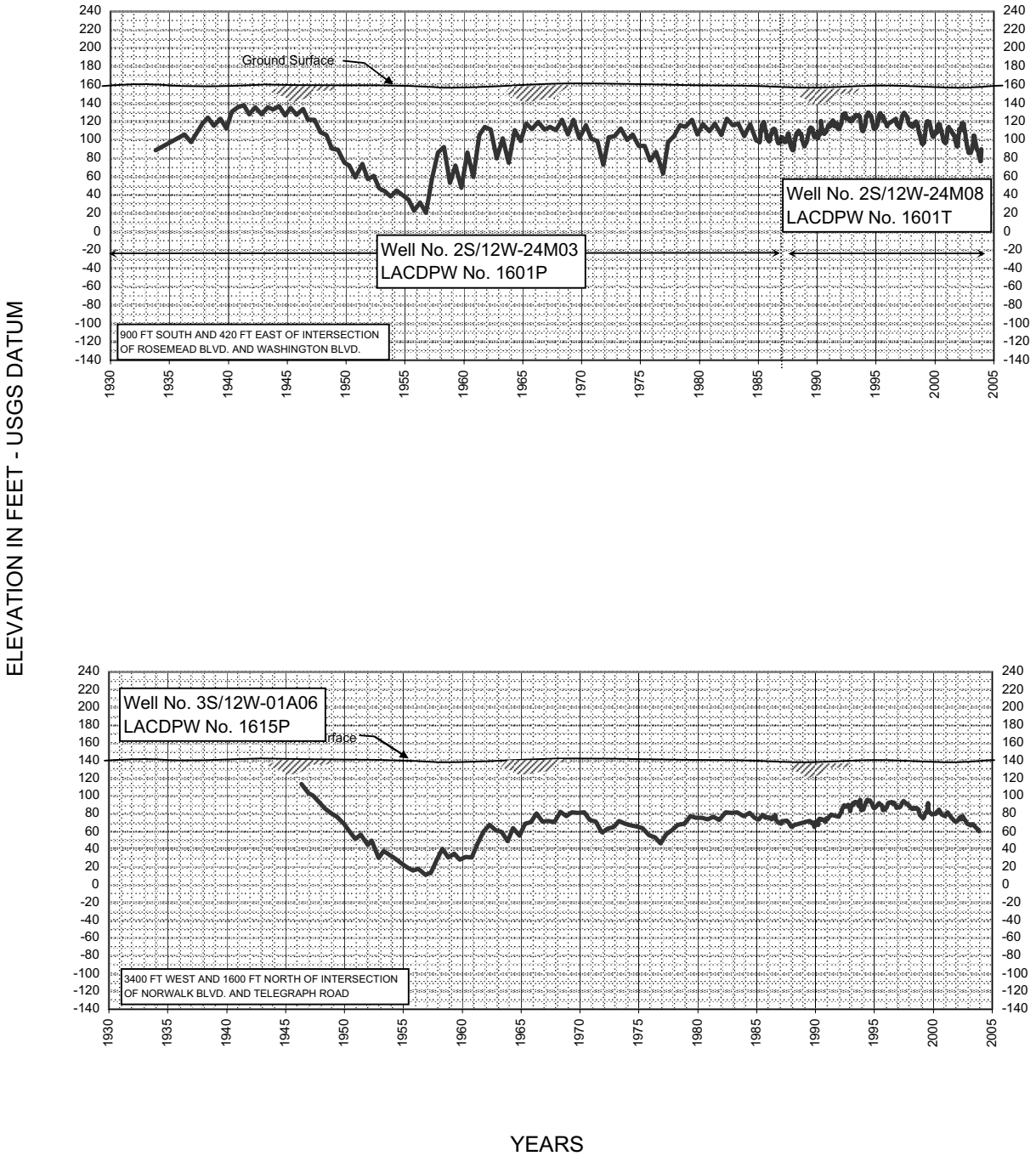


Figure A



FLUCTUATIONS OF WATER LEVEL AT WELLS
LOS ANGELES FOREBAY

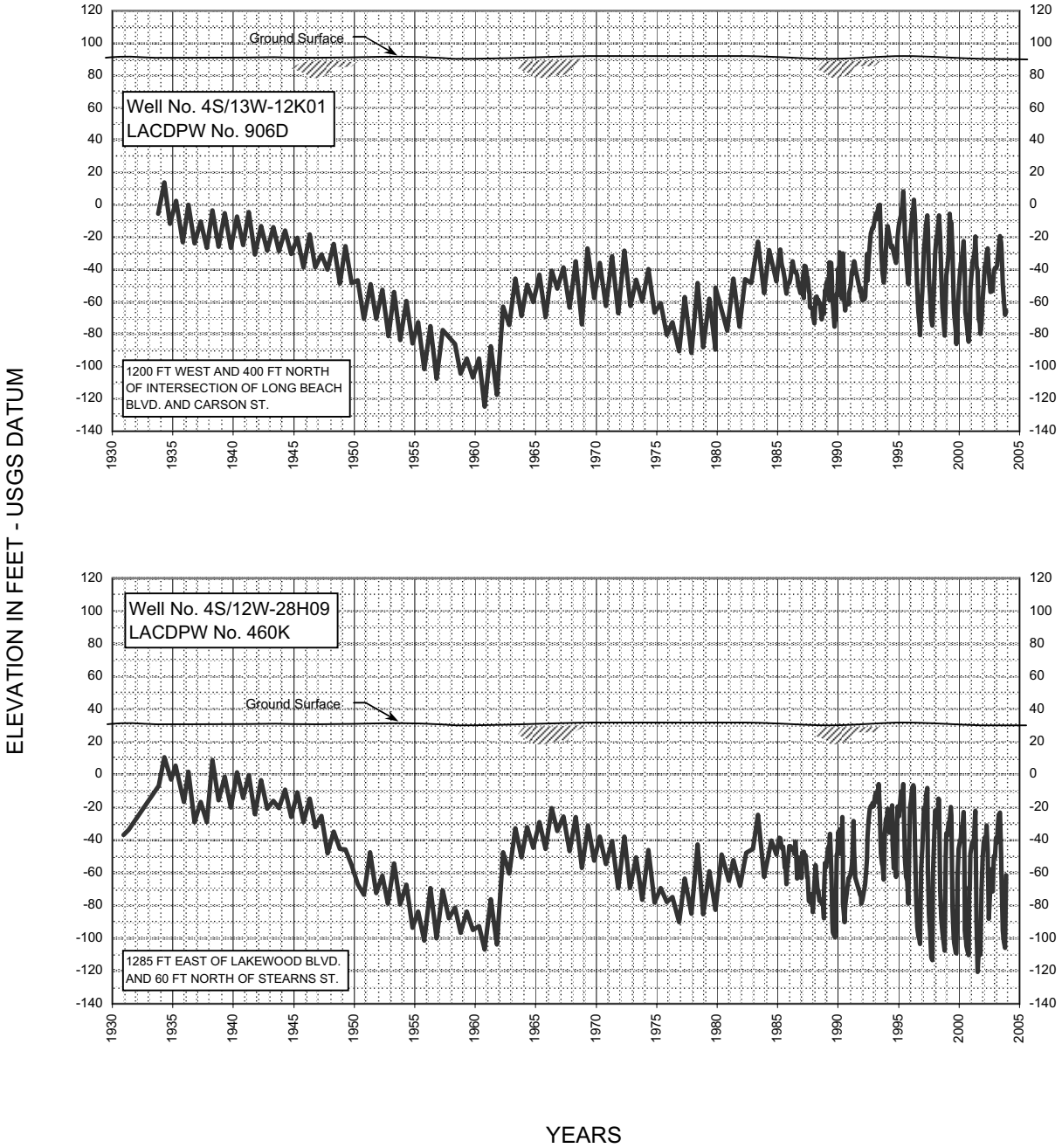
Figure B



FLUCTUATIONS OF WATER LEVEL AT WELLS

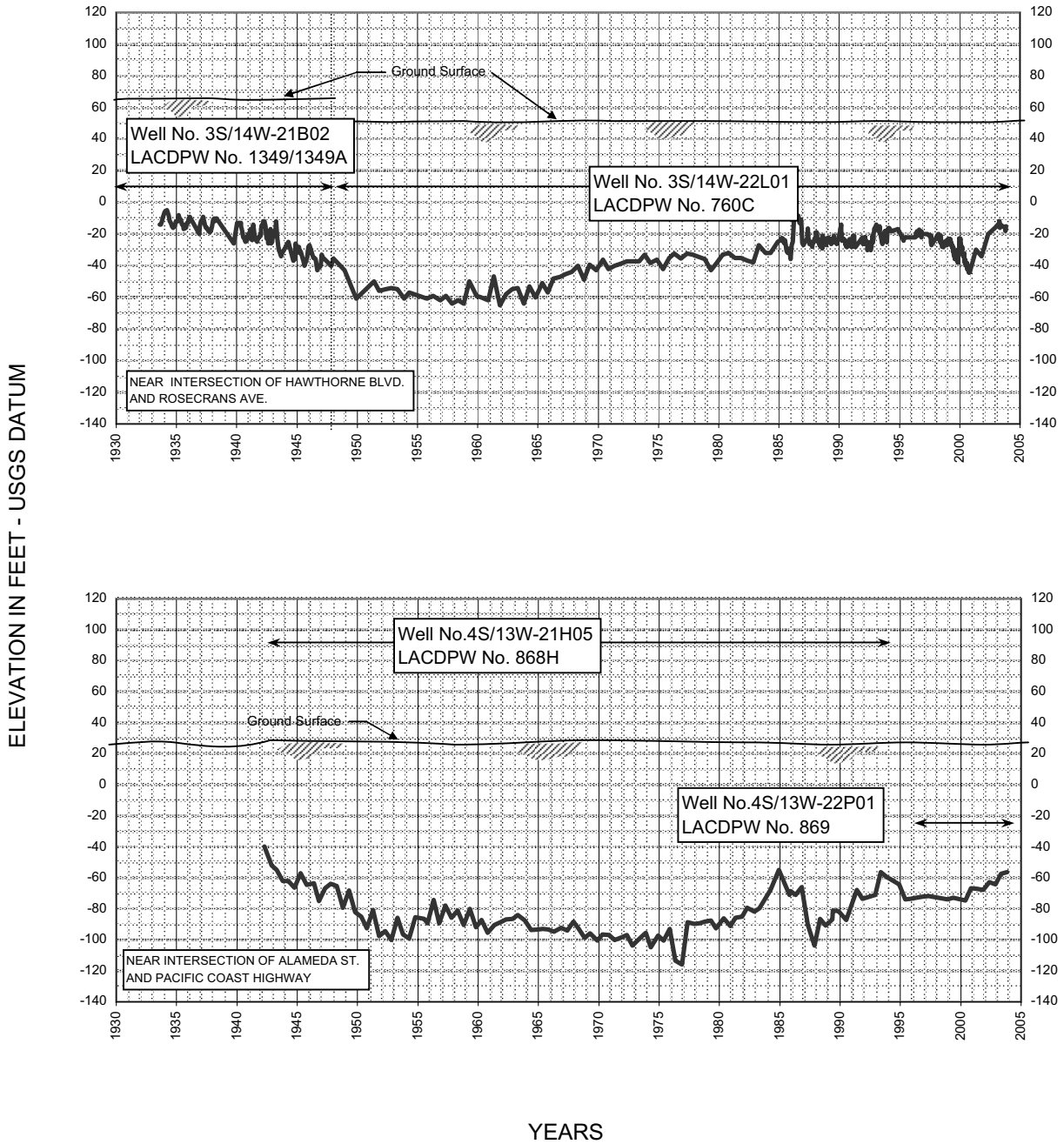
MONTEBELLO FOREBAY

Figure C



FLUCTUATIONS OF WATER LEVEL AT WELLS
CENTRAL BASIN PRESSURE AREA

Figure D



FLUCTUATIONS OF WATER LEVEL AT WELLS

WEST BASIN

Figure E

PLATES

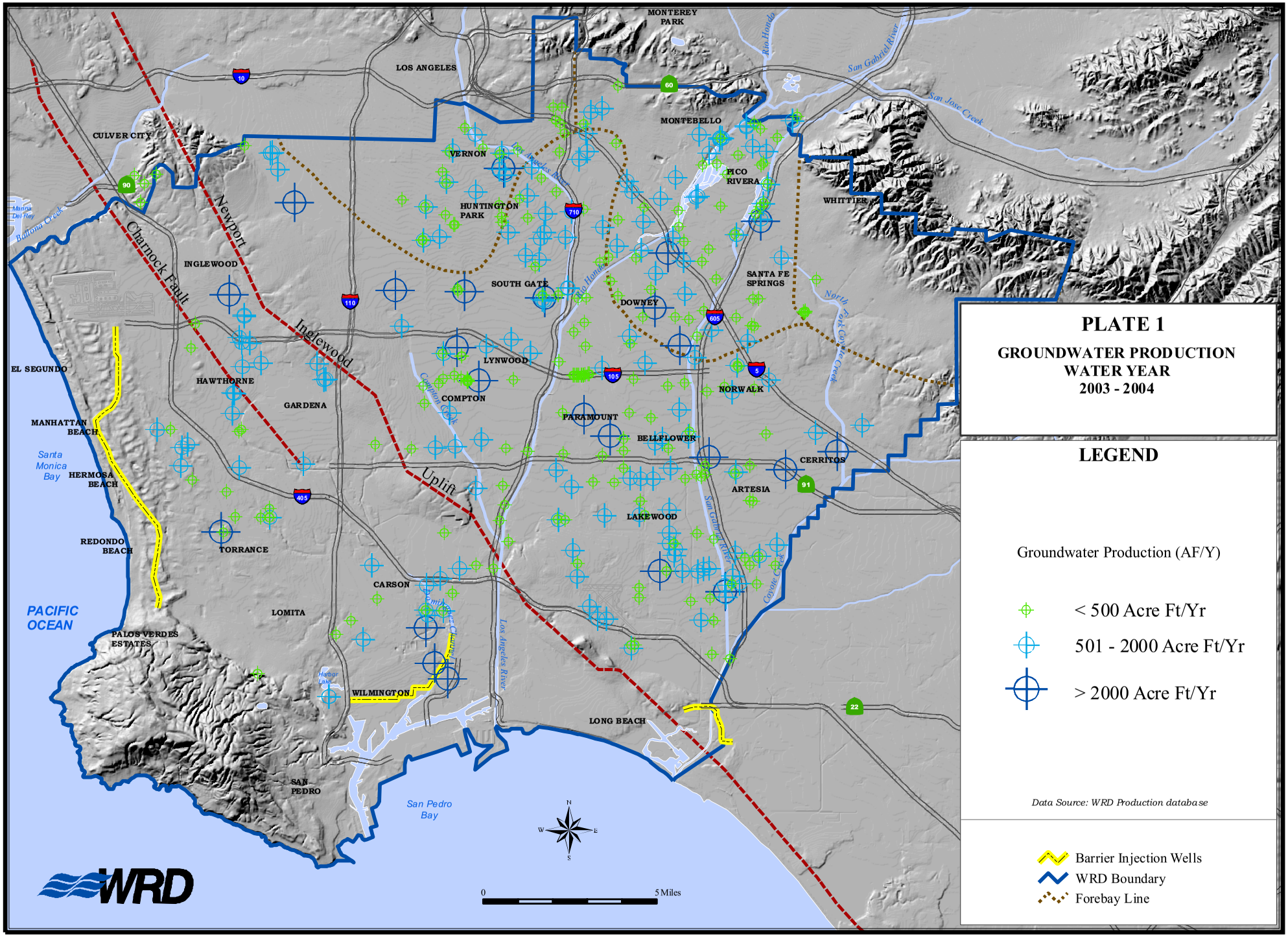


PLATE 1
GROUNDWATER PRODUCTION
WATER YEAR
2003 - 2004
LEGEND
Groundwater Production (AF/Y)
< 500 Acre Ft/Yr
501 - 2000 Acre Ft/Yr
> 2000 Acre Ft/Yr
Data Source: WRD Production database
Barrier Injection Wells
WRD Boundary
Forebay Line
MONTEREY PARK
LOS ANGELES
MONTEBELLO
CULVER CITY
VERNON
PICO RIVERA
WHITTIER
HUNTINGTON PARK
INGLEWOOD
SOUTH GATE
SANTA FE SPRINGS
DOWNEY
LYNWOOD
EL SEGUNDO
HAWTHORNE
GARDENA
COMPTON
NORWALK
PARAMOUNT
MANHATTAN BEACH
BELLFLOWER
CERRITOS
HERMOSA BEACH
ARTESIA
LAKEWOOD
REDONDO BEACH
TORRANCE
CARSON
LOMITA
PALOS VERDES ESTATES
WILMINGTON
LONG BEACH
SAN PEDRO
PACIFIC OCEAN
Santa Monica Bay
San Pedro Bay
Charnock Fault
Newport
Inglewood
Uplift
Los Angeles River
San Gabriel River
San Jose Creek
Rio Hondo
Coyote Creek
Compton Creek
Dominguez Channel
Harbor Lake
Marina Del Rey
Ballona Creek
0
5 Miles
N
S
E
W

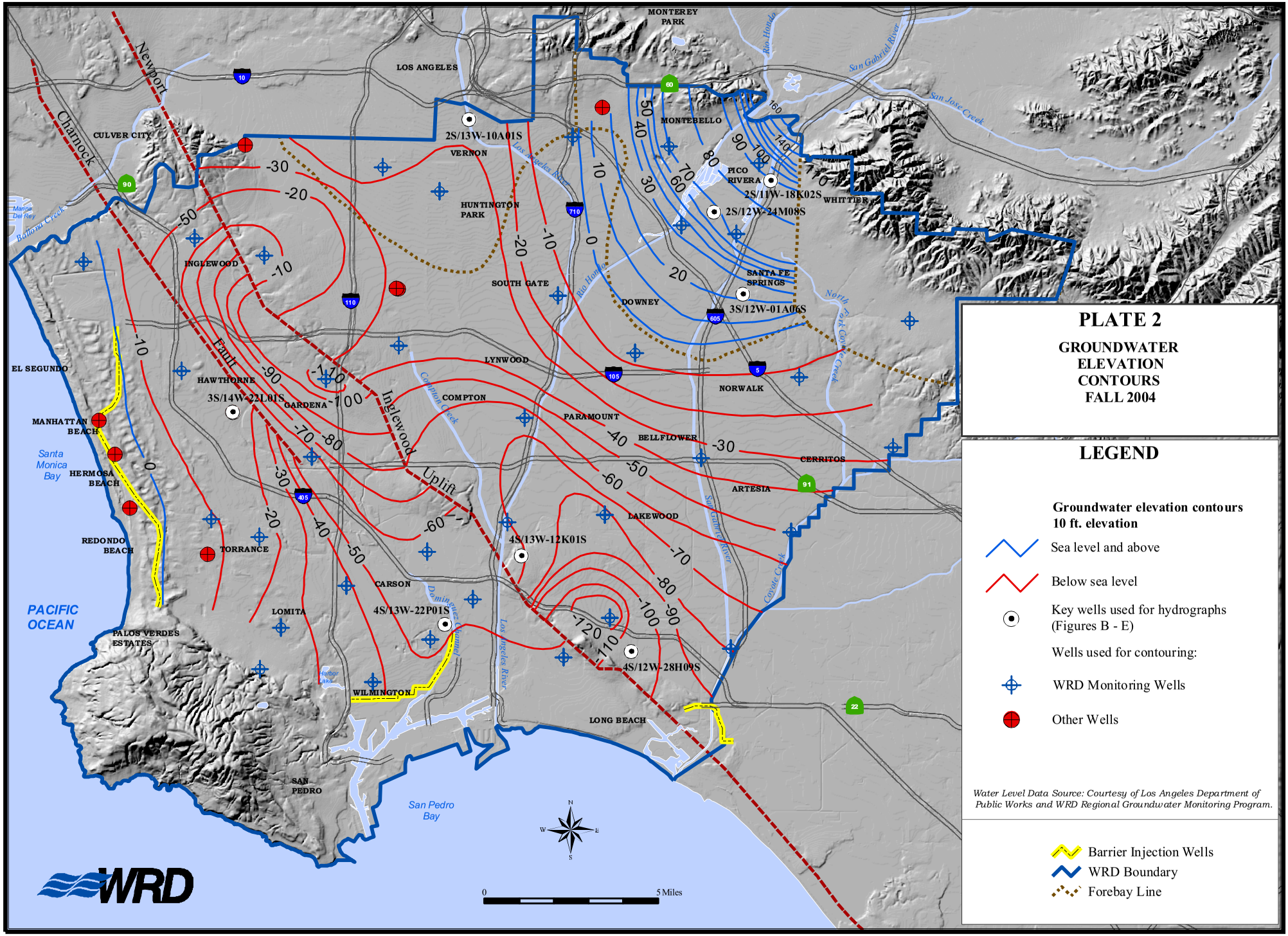


PLATE 2
GROUNDWATER ELEVATION CONTOURS FALL 2004
LEGEND
Groundwater elevation contours 10 ft. elevation
Sea level and above
Below sea level
Key wells used for hydrographs (Figures B - E)
Wells used for contouring:
WRD Monitoring Wells
Other Wells
Water Level Data Source: Courtesy of Los Angeles Department of Public Works and WRD Regional Groundwater Monitoring Program.
Barrier Injection Wells
WRD Boundary
Forebay Line
PACIFIC OCEAN
Santa Monica Bay
San Pedro Bay
Newport
Charnock
Inglewood
Fault
Uplift
2S/13W-10A01S
2S/11W-18K02S
2S/12W-24M08S
3S/12W-01A06S
3S/14W-22L01S
4S/13W-12K01S
4S/13W-22P01S
4S/12W-28H09S
0
5 Miles
WRD

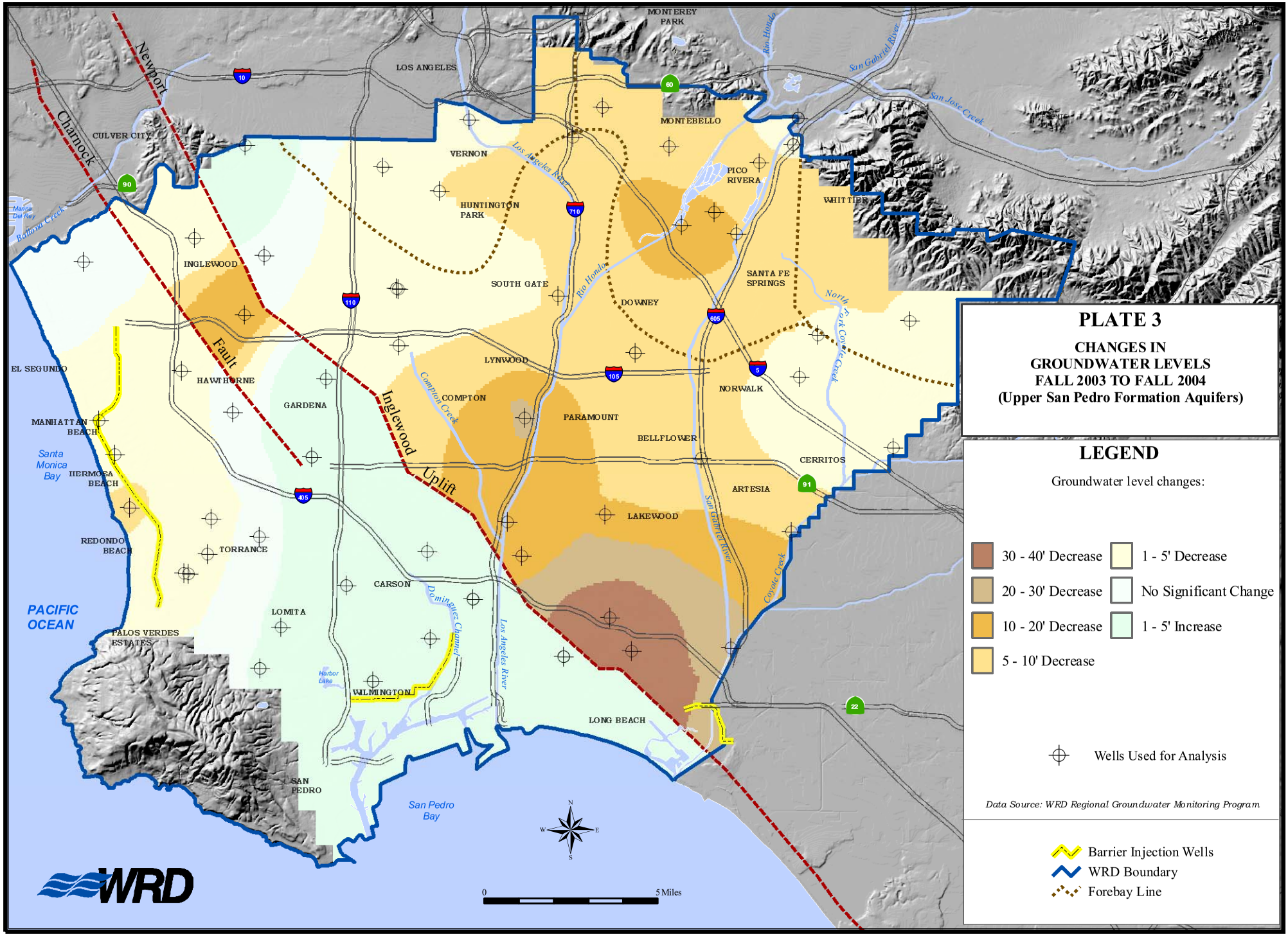


PLATE 3
CHANGES IN
GROUNDWATER LEVELS
FALL 2003 TO FALL 2004
(Upper San Pedro Formation Aquifers)
LEGEND
Groundwater level changes:
30 - 40' Decrease
20 - 30' Decrease
10 - 20' Decrease
5 - 10' Decrease
1 - 5' Decrease
No Significant Change
1 - 5' Increase
Wells Used for Analysis
Data Source: WRD Regional Groundwater Monitoring Program
Barrier Injection Wells
WRD Boundary
Forebay Line
0
5 Miles
N
S
E
W
WRD
PACIFIC OCEAN
San Pedro Bay
Santa Monica Bay
Newport
Charnock
Fault
Inglewood
Uplift
LOS ANGELES
MONTEREY PARK
MONTEBELLO
CULVER CITY
VERNON
HUNTINGTON PARK
PICO RIVERA
WHITTIER
INGLEWOOD
SOUTH GATE
SANTA FE SPRINGS
DOWNEY
EL SEGUNDO
HAWTHORNE
LYNWOOD
GARDENA
COMPTON
NORWALK
MANHATTAN BEACH
PARAMOUNT
BELLFLOWER
HERMOSA BEACH
CERRITOS
ARTESIA
LAKEWOOD
REDONDO BEACH
TORRANCE
CARSON
LOMITA
PALOS VERDES ESTATES
WILMINGTON
LONG BEACH
SAN PEDRO
Marina Del Rey
Ballona Creek
Los Angeles River
Rio Hondo
San Gabriel River
San Jose Creek
North Fork Coyote Creek
Compton Creek
Dominguez Channel
Coyote Creek
Harbor Lake
10
60
90
710
110
605
105
5
405
91
22

Attachment F

LBWD
Water Conservation
&
Water Supply Shortage Plan

RESOLUTION NO. WD-1209

A RESOLUTION OF THE BOARD OF WATER COMMISSIONERS OF THE CITY OF LONG BEACH ADOPTING A WATER CONSERVATION AND WATER SUPPLY SHORTAGE PLAN, AND RESCINDING RESOLUTION NO. WD-1071

WHEREAS, on September 21, 1995, the Board of Water Commissioners of the City of Long Beach ("Board") adopted Resolution No. WD-1071 entitled "A Resolution of the Board of Water Commissioners of the City of Long Beach Restating The Emergency Water Conservation Plan and Rescinding Resolution Nos. WD-990, WD-994, WD-1005 and WD-1020"; and

WHEREAS, a reliable, minimum supply of quality potable water is essential to the welfare of the people and economy of the City of Long Beach ("City"); and

WHEREAS, responsible management of water supplies in non-shortage conditions is wise and prudent for both water supply reliability and environmental stewardship; and

WHEREAS, effective and equitable management of limited water supplies during a water supply shortage minimizes the impact on the people and economy of the City;

NOW, THEREFORE, the Board of Water Commissioners of the City of Long Beach resolves as follows:

Section 1. Scope. There is hereby established a Water Conservation and Water Supply Shortage Plan (the "Plan").

Sec. 2. Objectives. The objectives of the Plan are:

(a) To prevent water supply shortages through aggressive and

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effective water management programs such as conjunctive use, water conservation, water education and use of reclaimed water;

(b) To minimize the impact of a water supply shortage on the City's population and economy;

(c) To provide first for public health and fire protection and other essential services, then to provide for the economic health of the City, and then to provide for other uses of water; and

(d) To ensure that water users who conserve water during normal-year hydrology and wet-year hydrology are not disadvantaged by the Plan during shortages.

Sec. 3. Public Communication. When a Stage 1 Water Supply Shortage, a Stage 2 Water Supply Shortage, or a Stage 3 Water Supply Shortage is in effect, the Long Beach Water Department ("Department") will inform its customers of the effective date, of the prohibited uses of water associated with the relevant Stage and will encourage its customers to take additional voluntary actions to conserve water.

The Department will inform and prepare its customers about possible restrictions on use of water and rate increases related to the higher levels of water conservation required by this Plan. The Department will continue to educate its customers for the duration of a potential and actual water supply shortage. The Department will communicate effectively with its diverse customer base.

Sec. 4. Prohibited Uses of Water at All Times. The following uses of water are prohibited at all times:

(a) Permitting the excess use, loss or escape of water through breaks, leaks or other malfunctions in the water user's plumbing or distribution system for any period of time after such escape of water should have reasonably been discovered and corrected;

(b) Watering or irrigating lawns, turf, or landscape areas beyond saturation causing significant runoff, as determined by the Long Beach Water

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Department ("Department");

(c) Operating a fountain or other water feature that does not re-circulate the water;

(d) Washing a vehicle with a hose when the hose does not have a water shut-off nozzle or device attached to it or allowing a hose to run continuously while washing a vehicle;

(e) Using potable water, rather than reclaimed water, after the Department has provided to the customer an analysis showing that reclaimed water is a cost-effective alternative to potable water and the customer has had a reasonable amount of time, as determined by the General Manager of the Department or the General Manager's designee (collectively, "General Manager"), to make the conversion to reclaimed water;

(f) For water customers that are a hotel or motel, failing to provide customers the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each bathroom and sleeping room using clear and easily understood language. The Department shall make suitable displays available.

Sec. 5 Prohibited Uses of Water Effective in One Year. Effective one (1) year after the adoption of this Resolution, the following uses of water are prohibited:

(a) Installation of single pass cooling systems in buildings requesting new water connections; and

(b) Installation of non-recirculating systems in new conveyor car wash systems and new commercial laundry systems.

Sec. 6 Prohibited Use of Water Effective in Four Years. A. Effective four (4) years after the adoption of this Resolution, all conveyor car wash systems shall have installed and operational water recycling systems, or shall have secured a waiver of this requirement from the General Manager.

B. Water Rates for Prohibited Use. Conveyor car wash systems

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that fail to meet this requirement within the time limit stated above shall be charged the Tier III water rate beginning four (4) years after the effective date of this Resolution and will continue at that rate until the conveyor car wash system meets this requirement.

Sec. 7. Potential Water Supply Shortage. A. The Board shall declare a Potential Water Supply Shortage by resolution when the Board determines, in its sole discretion, that a declaration will help to avoid or lessen the impact of a potential water supply shortage. The type of event which may prompt the Board to declare a Potential Water Supply Shortage may include, among other factors, a finding that its wholesale water provider calls for extraordinary water conservation.

B. In addition to the prohibited uses of water identified in Sections 4, 5, and 6, the following uses of water are prohibited during a declared Potential Water Supply Shortage, as defined below:

(1) Serving drinking water to any customer in a restaurant or other public place where food is served, sold, or offered for sale unless expressly requested by the customer. The Department shall make "table tents" alerting customers to this restriction available to restaurants and these types of other public places;

(2) Operating a non-water conserving pre-rinse nozzle in a food-preparation establishment, such as a restaurant or cafeteria;

(3) Washing driveways, sidewalks, parking areas, patios or other outdoor areas with water from a pressurized source, such as a garden hose, except as approved in writing by the General Manager when required to eliminate conditions that threaten public health, safety or welfare;

(4) Irrigating landscape with potable water any day other than Monday, Thursday, or Saturday, except for very short periods of time for the expressed purpose of adjusting or repairing the irrigation system;

(5) Irrigating landscape with potable water between the hours of 7:00 a.m. and 6:00 p.m.;

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(6) Irrigating landscape with potable water using stream rotator-type or gear-driven sprinklers for more than fifteen (15) minutes per watering day per station, or for more than ten (10) minutes per watering day per station for all other types of sprinklers. Exempt from these landscape irrigation restrictions are irrigation systems using very low-flow drip-type irrigation when no emitter produces more than two (2) gallons of water per hour;

(7) Operating an irrigation system which, in the determination of the General Manager, is significantly water-inefficient by virtue of any or all of the following: excessive over spray, misting, over pressurization, misaligned or tilted spray heads, or any other malfunction or out-of-adjustment condition;

(8) Irrigating landscape using reclaimed water to the point that the landscape becomes saturated and irrigation waters flow off the landscape.

C. Publication. The Board shall publish the declaration of a Potential Water Supply Shortage in a local newspaper of general circulation, including the implementation date of the declaration.

Sec. 8. Stage 1 Water Supply Shortage. A. The Board may declare by resolution that a Stage 1 Water Supply Shortage exists, in its sole discretion, and that the actions outlined in this Section are necessary. The type of event which may prompt the Board to declare a Stage 1 Water Supply Shortage includes, among other factors, an allocation of water by the Department's wholesale water provider.

B. Prohibited Uses of Water in a Stage 1 Water Supply Shortage. In addition to the prohibited uses of water identified in Sections 4 and 7, the following uses of water are prohibited during a Stage 1 Water Supply Shortage:

(1) Irrigating landscape with potable water any day other than Monday or Thursday, beginning on the first day of October through the end of the last day of the following March, except for very short periods of time for the expressed purpose of adjusting or repairing the irrigation system;

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(2) Filling residential swimming pools and spas with potable water;

(3) Other prohibited uses as determined by the Board, after notice to customers.

C. Water Rates. During a Stage 1 Water Supply Shortage, the Board may increase water rates, other than Tier 1 or life-line rates and reclaimed water rates, by an amount necessary, as determined by the Board. The increase in water rates, which could average approximately 10%, may vary among categories of customers. Examples of categories are single family residential, duplex residential, multi-family residential, other residential, commercial, industrial, irrigation, and fireline.

D. Publication. The Board shall publish the declaration of a Stage 1 Water Supply Shortage in a local newspaper of general circulation, including the implementation date of the declaration.

Sec. 9. Stage 2 Water Supply Shortage. A. The Board may declare by resolution that a Stage 2 Water Supply Shortage exists, in its sole discretion, and that the actions outlined in this Section are necessary.

B. Prohibited Uses of Water in a Stage 2 Water Supply Shortage. In addition to the prohibited uses of water identified in Sections 4 and 7, the following uses of water are prohibited during a declared Stage 2 Water Supply Shortage:

(1) Irrigating landscape with potable water any day other Monday or Thursday, except for very short periods of time for the expressed purpose of adjusting or repairing the irrigation system;

(2) Filling residential swimming pools and spas with potable water;

(3) Other prohibited uses as determined by the Board, after notice to customers.

C. Water Rates. During a Stage 2 Water Supply Shortage, the Board may increase water rates, other than Tier 1 or life-line rates and reclaimed water

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rates, by an amount necessary, as determined by the Board. The increase in water rates, which could average approximately 15% above the pre-shortage rates, may vary among categories of customers.

D. Publication. The Board shall publish the declaration of a Stage 2 Water Supply Shortage in a local newspaper of general circulation, including the implementation date of the declaration.

Sec. 10. Stage 3 Water Supply Shortage. A. The Board may declare by resolution that a Stage 3 Water Supply Shortage exists, in its sole discretion, and that the actions outlined in this Section are necessary.

B. Restrictions and Rates. During a Stage 3 Water Supply Shortage, the Board may, in its sole discretion, impose additional restrictions or prohibitions on the use of water and make additional adjustments to the water rates.

C. Publication. The Board shall publish the declaration of a Stage 3 Water Supply Shortage in a local newspaper of general circulation, including the implementation date of the declaration.

Sec. 11. Sudden Catastrophic Water Supply Shortage. When the General Manager determines that a sudden event has, or threatens to, significantly diminish the reliability or quality of the City's water supply, then the General Manager may declare a Catastrophic Water Supply Shortage and impose whatever emergency water allocation or conservation actions deemed necessary, in the General Manager's professional judgment, to protect the reliability and quality of the City's water supply, until the emergency passes or the Board takes other action.

Sec. 12. Notification and Water Usage Charge for Prohibited Uses of Water.

A. Notification.

(1) When a prohibited use of water occurs, the Department will notify the customer of the problem with suggestion(s) for solving the problem. The notice will inform the customer that a second notice could be sent if the

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prohibited use continues, and that a third and subsequent notices will include a Water Usage Charge. If the notice is related to run-off or landscape irrigation, the notice may include an offer to provide a free analysis of the irrigation system and other water uses by the customer.

(2) If the Board or General Manager has not declared a water supply shortage, the customer will have fourteen (14) days after the effective date of the first notice to solve the problem if significant capital costs are not required, as determined by the General Manager, and up to one hundred eighty (180) days after the effective date of the first notice if significant capital costs are required to solve it. An example of significant capital costs include, but are not limited to, the complete rehabilitation of an irrigation system. If significant capital costs are required in order for the customer to solve the problem, the General Manager will indicate on the notice the date by which the prohibited use of water must cease before the second notice may be sent. In determining this date, the General Manager may consider, among other factors, the total cost of the project, whether the customer has cooperated with a water use study, if appropriate, and the quantity of water expected to be wasted before the project is complete.

(3) If the Board or General Manager has declared a water supply shortage, the customer will have seven (7) days after the effective date of the first notice to solve the problem if significant capital costs are not required, as determined by the General Manager, and up to one hundred twenty (120) days after the effective date of the first notice if significant capital costs are required to solve it. If significant capital costs are required in order for the customer to solve the problem, the General Manager shall indicate on the notice the date by which the prohibited use of water must cease before the second notice may be sent. In determining this date, the General Manager may consider, among other factors, the total cost of the project, whether the customer has cooperated with a water use study, if appropriate, and the quantity of water expected to be wasted before the project is complete

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(4) If a second notice is issued within 18 months after a previous notice for the same kind of prohibited use, then the notice will inform the customer that a third and subsequent notices may be sent in 7-day intervals, with an increase in the Water Usage Charge for each subsequent notice.

(5) If a third and subsequent notice(s) are issued for the same type of prohibited use within 18 months after the previous notice, then the notice will inform the customer that subsequent notices may be sent in 7-day intervals, with an increase in the Water Usage Charge for each subsequent notice. And, the notice may inform the customer that a flow restriction device may be installed or the service may be terminated, at the discretion of the General Manager, and that the customer shall be required to pay the cost of these actions and the cost of restoring the connection to full service.

(6) If a customer has filed for relief from compliance, then a second, third or subsequent notice will not be issued until a determination on that relief has been made by the General Manager. If the determination of the General Manager in denying relief is overturned by action of the Board, then any notices given after the determination of the General Manager shall be rescinded and LBWD will refund any charges imposed by those notices.

B. Water Usage Charge. The Water Usage Charge shall equal the number of notices, minus two, multiplied by the Base Charge, where the Base Charge is equal to the following:

(1) Prior to Stage 1: Base Charge = $50.00

(2) Stage 1: Base Charge = $100.00

(3) Stage 2: Base Charge = $150.00

(4) Stage 3: Base Charge = $200.00 unless determined otherwise by the Board prior to during the Stage 3 Water Supply Shortage.

For example, the Water Usage Charge associated with a third notice in Stage 1: (3 – 2) x $100 = $100; the charge associated with the 5th notice in Stage 1: (5

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– 2) x $100 = $300.

Failure to pay these charges may subject the customer to termination of water service. If water service is terminated pursuant to this Plan, the Department will not restore water service until the General Manager has determined that the customer has provided reasonable assurances that future violations of the Plan will not occur and that any unpaid charges have been paid in full. In addition, the General Manager may require a security deposit.

Sec. 13. Reduce or Terminate Water Service. Depending on the severity of the prohibited use of water and the seriousness of the water supply shortage or potential water supply shortage, the General Manager may cause the installation of a flow restriction device or may have the water service terminated. The General Manager shall give fourteen (14) days notice that these actions may be taken unless, in the General Manager's discretion, the severity of the misuse or the severity of the shortage mandates a shorter period of time.

The customer shall pay the cost of restricting the flow or terminating the service and shall pay the cost of re-installing full service, prior to the restoration of full service.

Sec. 14. Relief from Compliance. A. A customer shall have the right to a hearing to obtain relief from compliance with the Plan by filing a written request for hearing on a form provided by the Department within fourteen (14) days after the effective date of the notice if the requested relief is related to a prohibited water use or thirty (30) days after the billing date if the requested relief is related to an increase in the water bill associated with a water rate increase implemented as part of this Plan.

B. To the extent possible, the hearing shall be held by the General Manager within fourteen (14) days after receipt of the request, provided that all information requested on the form has been completed.

C. In determining whether or not to grant relief, the General Manager shall consider all relevant factors including but not limited to:

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(1) In the case of a request of relief from a high water bill, whether the customer's total water bill was significantly greater than the bill normally received, coupled with a compelling reason for the account not conserving an amount of water such that, had it been conserved, the total bill would not have been significantly greater than the normal bill.

In order to grant relief, the General Manager must find that the customer fully cooperated with the Department in its investigation. The General Manager may grant relief of any portion of the high water bill and may grant relief of a portion of future water bills for up to two (2) years into the future. If the conditions on which relief were granted change during that period, the customer must notify the Department within thirty (30) days. Failure to notify the Department may result in immediate revocation of the relief granted.

(2) In the case of a request of relief from a water usage charge related to a prohibited use of water, the General Manager may grant partial or total relief, at the General Manager's discretion, if the General Manager finds that a reasonable attempt, as determined by the General Manager, was made to mitigate the prohibited use of water, prior to the imposition of the charge.

(3) The General Manager may grant relief from the water usage charge or a high bill when, at the General Manager's determination, doing so is in the public interest.

D. The General Manager shall give to the customer notice of the decision, including notice of the customer's right to appeal the decision to the Board. No customer shall appeal to the Board prior to receipt of a decision from the General Manager.

Sec. 15. Notice. Except as otherwise provided in the Plan, all notices given under the Plan shall be in writing and personally delivered to the customer at the customer's billing address or deposited in the U.S. Postal Service, first class, postage prepaid, addressed to the customer at the customer's billing address and addressed to

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the Department at 1800 East Wardlow Road, Long Beach, CA 90807, Attention: General Manager. Notice shall be effective on the date personal delivery is made or the date on which the notice is deposited in the mail, whichever occurs first. If the customer is absent from his/her residence or place of business so that personal delivery cannot be made, notice may be given by leaving a copy with a responsible person at either place and then sending a copy by regular mail addressed to the customer at the billing address or, if the residence or place of business cannot be ascertained or a responsible person cannot be found there, then notice may be given by affixing a copy in a conspicuous place on the property where the prohibited use of water occurred and delivering a copy to a person residing there is such person can be found and sending a copy by regular mail addressed to the customer at the billing address.

Sec. 16. Reservation of Rights. The rights of the Department shall be cumulative to any other right of the Department stated in its "Rules, Regulations and Charges Governing Potable Water, Reclaimed Water, Sewer and The Emergency Water Conservation Plan" ("Rules and Regulations").

Sec. 17. Exceptions. The prohibited uses of water in this Plan are not applicable to that use of water necessary, as determined by the General Manager, for public health and safety or for essential governmental services such as police, fire, and other similar emergency services.

Sec. 18. General Provisions. A. Nothing contained in this Plan shall be construed to require the Department to curtail the supply of water to any customer when, in the discretion of the General Manager, that water is required by that customer to maintain an adequate level of public health and safety.

B. Any term not defined in this Plan which is defined in the then current Rules and Regulations of the Department shall have the meaning stated in those Rules and Regulations.

C. This Plan shall apply to all customers and property receiving

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water from the Department wherever situated, and shall also apply to all property and facilities owned, maintained, operated or under the jurisdiction of the various officials, boards, departments, bureaus or agencies of the City.

D. If any section, subsection, sentence, clause or phrase in this Plan or the application of it to any person or circumstances is for any reason held invalid, the validity of the remainder of this Plan or the application of such provision to other persons or circumstances shall not be affected. The Board declares that it would have passed this Plan and each section, subsection, sentence, clause, and phrase in it irrespective of the fact that one or more sections, subsections, sentences, clauses, or phrases or the application of them to any person or circumstances be held invalid.

Sec. 19. Resolution No. WD-1071 is hereby rescinded and superseded.

The Secretary of the Board of Water Commissioners shall certify to the passage of this Resolution, cause a notice of same to be published one time only in a newspaper of general circulation in the City, and it shall take effect immediately on the Secretary's certification.

I hereby certify that this resolution was adopted by the Board of Water Commissioners of the City of Long Beach at its meeting on November 3, 2005, by

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the following vote:

Ayes: Commissioners: STEPHEN CONLEY, FRANK CLARKE, WILLIAM TOWNSEND, HELEN HANSEN

Noes: Commissioners: NONE

Absent: Commissioners: LILLIAN KAWASAKI

Secretary
Board of Water Commissioners of the
City of Long Beach

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DFG:dfe 10-18-05;10-25-05(RES Water ConservationPlan)05-05066
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Attachment G

CUWCC BMP Reports
for
2003 & 2004

Reported as of 8/30/05

Water Supply & Reuse

Reporting Unit:
Long Beach Water Department

Year:
2003

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
Long Beach Recycled Water Facility	6620	Recycled
Central Basin Aquifer	23606	Groundwater
MWD SC - M&I	44436	Imported
MWD SC - Seawater Barrier	4769	Imported

Total AF: 79431

Reported as of 8/30/05

Accounts & Water Use

Reporting Unit Name:	Submitted to	Year:
Long Beach Water Department	CUWCC **10/11/2004**	**2003**

A. Service Area Population Information:

1. Total service area population 487100

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	60510	22048	0	0
2. Multi-Family	19956	23612	0	0
3. Commercial	5815	10578	0	0
4. Industrial	787	3135	0	0
5. Institutional	1143	3580	0	0
6. Dedicated Irrigation	988	2680	0	0
7. Recycled Water	79	6620	0	0
8. Other	1	4769	0	0
9. Unaccounted	NA	2408	NA	0
Total	89279	79430	0	0
	Metered		**Unmetered**	

Reported as of 8/30/05

Reported as of 8/30/05

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2003**

A. Implementation

1. Based on your signed MOU date, 09/28/1995, your Agency STRATEGY DUE DATE is:	09/27/1997
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	2/1/2002
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	1/1/2003

B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	3303	2520
2. Number of surveys completed:	992	757
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	yes	yes
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	no	no
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	yes	yes
Outdoor Survey:		
6. Check irrigation system and timers	no	no
7. Review or develop customer irrigation schedule	no	no
8. Measure landscaped area (Recommended but not required for surveys)	no	no
9. Measure total irrigable area (Recommended but not required for surveys)	no	no
10. Which measurement method is typically used (Recommended but not required for surveys)		None
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	yes	yes
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	yes	yes
a. If yes, in what form are surveys tracked?		database

b. Describe how your agency tracks this information.

Customer request and results from water surveys are logged in an MS Access database.

C. Water Survey Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	107000	113300
2. Actual Expenditures	107000	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

In addition to performing water surveys based on High Bill Investigations, LBWD has begun a more intensive campaign at marketing water conservation to our residential customers. We distribute 5,000 low-flow shower heads at various community events throughout the year. We also distribute brochures that offer LBWD water conservation services to our residential customers in three languages, Spanish, Khmer, and English.

E. Comments

We have a very aggressive "high bill" investigation team that works closely with customer concerned about overuseage or that our automated billing system identifies as having unusually high useage. Through,this service offered to our customers, we have been able to maximize resources by marketing water surveys as part of the high bill service to our customers.

Reported as of 8/30/05

BMP 02: Residential Plumbing Retrofit

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2003**

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? — no

   a. If YES, list local jurisdictions in your service area and code or ordinance in each:

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? — no
3. Estimated percent of single-family households with low-flow showerheads: — 60%
4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? — no
5. Estimated percent of multi-family households with low-flow showerheads: — 60%
6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? — yes

   a. If YES, when did your agency begin implementing this strategy? — 5/1/1993

   b. Describe your targeting/ marketing strategy.

   In conjunction with MWD the department distributeed ULFT's in cooperation with CBO's and local high schools. In addition,the Department has a volunteer Water Ambassador Program which consists of volunteers who distribute low-flow showerheads, garden hoze nozzles and other conservation materials throughout the year.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	7000	1000
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	0	0

6. Does your agency track the distribution and cost of low-flow devices? — yes

   a. If YES, in what format are low-flow devices tracked? — Manual Activity

   b. If yes, describe your tracking and distribution system :

   Our devices are tracked through the ordering process. LBWD distributed low flow showerheads and hose nozzles from LBWD facilities, during

water surveys, and at various community events through the Water Ambassadors.

C. Low-Flow Device Distribution Expenditures

	This Year	Next Year
1. Budgeted Expenditures	15000	15000
2. Actual Expenditures	15000	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 8/30/05

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2003**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year?	yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	65634
b. Determine other system verifiable uses (AF)	1200
c. Determine total supply into the system (AF)	68042
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.98
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production?	yes
4. Did your agency complete a full-scale audit during this report year?	no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit?	yes
6. Does your agency operate a system leak detection program?	yes

a. If yes, describe the leak detection program:

For the past 7 years, the Long Beach Water Department (LBWD) has maintained a very aggressive Capital Improvement Program (CIP) that has replaced up to 100,000 LF of cast iron mains each year. The mains being replaced are mains that have been identified through comprehensive studies using the latest technology, such as GIS, to be the most vulnerable pipes in the distribution system due to a combination of factors, corrosion, past pipe failure, and years of service. The LBWD has also seismically retrofitted our potable water storage tanks in the event of a natural disaster. The Department*s CIP includes other programs such as a continuous replacement and new installation of water main in order to accomplish quicker shut downs with minimal impact to service or water loss. The Department*s Water Operation program calls for ongoing replacement of all of the customer water meters as well as a testing program to assure accuracy, the LBWD currently replaces meters every fourteen years and on an as need basis. The Department also maintains a 24hour emergency crew on call in the event of any water leak report or other water related emergencies. Emergency field crews drive the length of all of the major water distribution mains to visually inspect for any leaks as well as inspect and exercise large valves. The Departments meter readers also serve as an integral part of the system leak detection program, by reporting to our construction personnel any leaking or malfunctioning meters. The LBWD Finance Bureau maintains accurate records of unaccounted for water usage. Such accurate reporting practice has averted serious water losses as well as assisted in the Department's ongoing effort at maintaining an extremely low unaccounted for water use, as low as 5%. Last year, a consultant was hired to validate our construction crews work in leak detection. To no surprise, from the 21 miles of pipe inspected no leaks where detected. However, we did learn about new technology

available for water system leak detection and will at times use the services of specialized leak detection consultant to verify any suspect or critical areas.

B. Survey Data

1. Total number of miles of distribution system line.	900
2. Number of miles of distribution system line surveyed.	300

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	95800	100000
2. Actual Expenditures	100000	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

In addition to our leak detection program, LBWD maintains an aggressive CIP that has replaced an average of 100,000 linear feet of cast iron mains each year. The mains being replaced are mains that hve been identified through comprehensive studies using the latest technology, such as GIS, to identify the most vulnerable pipes based on factors such as corrosion, past pipe failure, and years of service. LBWD CIP also includes other programs such as continuous replacement and new installation of water mains in order to accomplish quicker shut downs with minimal impact to service or water loss. To further minimalize water loss, LBWD's CIP calls for ongoing replacement of aged meters and a testing program to ensure accuracy.

Reported as of 8/30/05

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2003**

A. Implementation

1. Does your agency require meters for all new connections and bill by volume-of-use? — yes

2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? — yes

   a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed? — 1/1/1995

   b. Describe the program:

   All connections in the City of Long Beach are metered. Our system is quite old, going back to the 1800's, and we are not certain when the system-wide metering began.

3. Number of previously unmetered accounts fitted with meters during report year. — 0

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? — no

   a. If YES, when was the feasibility study conducted? (mm/dd/yy)

   b. Describe the feasibility study:

2. Number of CII accounts with mixed-use meters. — 0

3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. — 0

C. Meter Retrofit Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? — yes

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

   Since all City of Long Beach connections are metered, we have maximized the potential for the BMP.

E. Comments

Reported as of 8/30/05

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2003**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	900
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	0
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):	0
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):	0
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	no

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	no
a. If YES, when did your agency begin implementing this strategy?	
b. Description of marketing / targeting strategy:	
2. Number of Surveys Offered.	1
3. Number of Surveys Completed.	1
4. Indicate which of the following Landscape Elements are part of your survey:	
a. Irrigation System Check	yes
b. Distribution Uniformity Analysis	no
c. Review / Develop Irrigation Schedules	no
d. Measure Landscape Area	no
e. Measure Total Irrigable Area	no
f. Provide Customer Report / Information	no
5. Do you track survey offers and results?	yes
6. Does your agency provide follow-up surveys for previously completed surveys?	yes
a. If YES, describe below:	

Follow-up surveys are offered at the request of the customer or if account is persistently identified as a high bill user.

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with landscape budgets?	no
2. Number of CII mixed-use accounts with landscape budgets.	0
3. Do you offer landscape irrigation training?	yes

4. Does your agency offer financial incentives to improve landscape water use efficiency? yes

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	18000	18000

5. Do you provide landscape water use efficiency information to new customers and customers changing services? yes

a. If YES, describe below:

We provide all of our customers with water efficiency information on a regular basis via our monthly bill insert/newsletter.

6. Do you have irrigated landscaping at your facilities? yes

a. If yes, is it water-efficient? yes

b. If yes, does it have dedicated irrigation metering? yes

7. Do you provide customer notices at the start of the irrigation season? yes

8. Do you provide customer notices at the end of the irrigation season? yes

D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	15000	10000
2. Actual Expenditures	10000	

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

We have a very aggressive reclaimed water program, in which we have spent in excess of $2 million this year, converting large landscape irrigation from potable to reclaimed water. We are reaching out to the largest landscape users in the City, such as parks, golf courses college campuses. We do not have many other large landscape areas that require large amounts of irrigation. In addition, we provide our customers with various literature on water conserving landscape as well as offer rebates for a variety of programs being administered by MWD of Southern California.

F. Comments

Reported as of 8/30/05

BMP 06: High-Efficiency Washing Machine Rebate Program

Reporting		BMP Form Status:	Year:
Long Bea	**Department**	**100% Complete**	**2003**

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers?	no
a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.	
2. Does your agency offer rebates for high-efficiency washers?	yes
3. What is the level of the rebate?	125
4. Number of rebates awarded.	751

B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	65000	130000
2. Actual Expenditures	97630	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

D. Comments

The LBWD Residential High Efficiency Clothes Washer Rebate Program has become a very successful. We have increased the number of customer rebates from around 300 last year to nearly 800 this year, which equates to potable water saving of approximately 16 AF/Y. It is our intent to continue the program through 2005.

Reported as of 8/30/05

BMP 07: Public Information Programs

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2003**

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

The Water Ambassador Program - comprised of volunteers who are trained and versed in water issues attend all civic events, safety fairs, off-site City Council meetings, attend various events and functions during the year and have an especially intense month long water awareness program during the month of May. Water awareness month activities throughout the City of Long Beach also include news paper adds, bill inserts and other promotional activities such as community presentations and media events. We have continued to offer residential gardening classes know as "Protector del Agua" (PDA) a series of classes developed by MWD, to our customers. The PDA classes focus on a number of issues from planning, plant selection, irrigation to maintenance.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	yes	15
b. Public Service Announcement	yes	24
c. Bill Inserts / Newsletters / Brochures	yes	12000
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	yes	2
f. Special Events, Media Events	yes	4
g. Speaker's Bureau	yes	2
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	90000	93000
2. Actual Expenditures	90000	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 8/30/05

Reporting Unit:
Long Beach Water Department

BMP Form Status:
100% Complete

Year:
2003

A. Implementation

1.Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	12	350	4
Grades 4th-6th	yes	183	5500	183
Grades 7th-8th	yes	2	50	2
High School	yes	1	25	1

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 1/1/1993

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	105000	105000
2. Actual Expenditures	16350	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

In 2002 LBWD implemented a new program reaching out to the entire 3rd grade population in the Long Beach Unified School District (8,000 students). This is in addition to the 4th grade program implemented in 2001 and youth outreach (coloring books). LBWD has hired a consultant to handle most of the K-12 education programs. In addition, the Water Ambassadors (a group of volunteers) assist with the various educational programs conducted at schools and at the Aquarium of the Pacific.

Reported as of 8/30/05

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2003**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	yes

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option?	yes

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	1655	0	0
b. Number of New Surveys Completed	455	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0

CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	yes	yes	yes
f. Evaluation of all water-using apparatus and processes	no	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	no	no	no

Agency CII Customer Incentives	Budget ($/Year)	No. Awarded to Customers	Total $ Amount Awarded
h. Rebates	0	36	43120
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	yes
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	yes
7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.	3.49
8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.	31.37

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	30000	60000
2. Actual Expenditures	51400	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

In addition to other water conserving incentives, LBWD in conjunction with MWD of Southern California offered rebates to all CII customers within our service area, which include ULFTs, High Efficiency Commercial Washing Machines, Cooling Tower Conductivity Controllers, Pre-rinse Sprayers, X-Ray water recirculation system.

Reported as of 8/30/05

BMP 09a: CII ULFT Water Savings

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2003**

1. Did your agency implement a CII ULFT replacement program in the reporting year? If No, please explain why on Line B. 10. — Yes

A. Targeting and Marketing

1. What basis does your agency use to target customers for participation in this program? Check all that apply.
   - CII Sector or subsector
   - CII ULFT Study subsector targeting

   a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

   We found CII sectors and sub sectors most effective because we were able to version our marketing efforts appropriately

2. How does your agency advertise this program? Check all that apply.
   - Bill insert
   - Newsletter
   - Web page
   - Newspapers
   - Trade publications
   - Trade shows and events
   - Direct letter
   - Telemarketing
   - Other print media

   a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

   For the purposes of this program, Trade Allies have proven to be the most effective overall marketing tool, as well as the most effective per dollar expended. Trade Allies include plumbers, distributors, retail home improvement stores and product manufacturers.

B. Implementation

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) — Yes
2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? — Yes
3. What is the total number of customer accounts participating in the program during the last year ? — 5

CII Subsector	Number of Toilets Replaced			
4.	Standard Gravity Tank	Air Assisted	Valve Floor Mount	Valve Wall Mount
a. Offices	0	0	0	0
b. Retail / Wholesale	0	0	0	0

c. Hotels	22	0	0	0
d. Health	0	0	0	0
e. Industrial	0	0	0	0
f. Schools: K to 12	0	0	0	0
g. Eating	0	0	0	0
h. Government	0	0	0	0
i. Churches	3	0	0	0
j. Other	0	0	0	0

5. Program design

Rebate or voucher

6. Does your agency use outside services to implement this program? Yes

a. If yes, check all that apply.

Consultant

7. Participant tracking and follow-up. Telephone

Site Visit

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

a. Disruption to business	1
b. Inadequate payback	3
c. Inadequate ULFT performance	2
d. Lack of funding	5
e. American's with Disabilities Act	0
f. Permitting	0

g. Other. Please describe in B. 9.

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other isues affecting program implementation or effectiveness.

Customers are generally more willing to participate in the program if the cost of the retrofit is in balance with the amount of the rebate, and the projected water savings is significant. Resistance occurs if the out-of-pocket expense for the retrofit is too costly and the rebate amount is too low.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

Either Metropolitan or its Agencies to provide this response.

C. Conservation Program Expenditures for CII ULFT

1. CII ULFT Program: Annual Budget & Expenditure Data

	Budgeted	Actual Expenditure
a. Labor	0	0
b. Materials	0	0

c. Marketing & Advertising	0	0
d. Administration & Overhead	0	0
e. Outside Services	0	0
f. Total	0	0

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution	1920
b. State agency contribution	0
c. Federal agency contribution	0
d. Other contribution	0
e. Total	1920

D. Comments

Reported as of 8/30/05

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2003**

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential	
a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$30865567
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$11540852
2. Commercial	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$7288507
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$2304093
3. Industrial	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$286684
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$90628
4. Institutional / Government	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$2695749
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$852199
5. Irrigation	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$1589206
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$502391

6. Other

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$608322
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$192307

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	3000	3000
2. Actual Expenditures	3000	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

For many years, the LBWD has been using an increasing block rate for residential customers and uniform rate structure for CII customers and Large Landscapes. Sewer rates are uniform, but are based on water use, therefore, conserving potable water reduces the customer's sewer bill.

D. Comments

The numbers in this report are estimates and represent the CY 2003. Our agency relies on the City's utility billing system for revenue information; but the utility billing system is not capable of providing the information broken into the categories required by BMP 11. Therefore, we take the data available to us and break that information out into the BMP 11 categories are best we can. The "Total Revenue from Non-Volumetric Charges" includes monthly service charge and taxes.

Reported as of 8/30/05

BMP 12: Conservation Coordinator

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2003**

A. Implementation

1. Does your Agency have a conservation coordinator?	yes
2. Is this a full-time position?	yes
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?	no
4. Partner agency's name:	N/A
5. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	100%
b. Coordinator's Name	Juan E. Ovalle
c. Coordinator's Title	Administrative Analyst III
d. Coordinator's Experience and Number of Years	2.55
e. Date Coordinator's position was created (mm/dd/yyyy)	7/1/1992
6. Number of conservation staff, including Conservation Coordinator.	1

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	105000	105000
2. Actual Expenditures	105000	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

LBWD has partnered with MWD for many years in order to bring greater rewards to our customers for conserving, as well as promoting water conservation and the BMP's. LBWD currently has one fulltime employee (FTE) performing the tasks of Water Conservation Coordinator and additional staff that share their time with various water conservation education outreach and promotional activities which equals to a total of 1.33 FTE's.

Reported as of 8/30/05

BMP 13: Water Waste Prohibition

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2003**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? no

a. If YES, describe the ordinance:

The City of Long Beach Board of Water Commissioners Resolution No. WD-1071 -Emergency Water Conservation Plan adopted in 1991 includes Water Waste Prohibition. However, it is has been reserved for water emergencies resulting from State and local water supply and storage shortages.

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

City of Long Beach	Resolution No. WD-1071 is currently inactive.

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding	yes
b. Single-pass cooling systems for new connections	no
c. Non-recirculating systems in all new conveyor or car wash systems	no
d. Non-recirculating systems in all new commercial laundry systems	no
e. Non-recirculating systems in all new decorative fountains	yes
f. Other, please name Customer system leaks; hosing off hard surfaces; water automatically served in restaurants.	yes

2. Describe measures that prohibit water uses listed above:

Long Beach Board of Water Commissioners Resolution No. WD-1071, -Emergency Water Conservation Plan. Resolution No. WD-1071 is currently inactive.

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models.	n
b. Develop minimum appliance efficiency standards that:	
i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used.	n
ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced.	n

c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. no

4. Does your agency include water softener checks in home water audit programs? no

5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

C. Water Waste Prohibition Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	5000	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

Rather than having a Water Waste Prohibition ordinance in effect in the LBWD service area, we have developed very extensive educational and outreach programs. LBWD's primary objective is to reach our customers on a very positive tone and work at changing behavior and developing greater awareness of water issues facing the City of Long Beach and in particular water conservation. A program begun in 2002, and developed by MWD is a set of residential gardening classes know as "Protector del Agua" a series of classes that deal with a number of issues from planning, plant selection, irrigation to maintenance have been offered to our residential customers. The City of Long Beach Board of Water Commissioners Resolution No. WD-1071 -Emergency Water Conservation Plan adopted in 1991 includes water waste prohibition measures. However, the resolution is reserved for water shortage emergencies resulting from extremely low water supply and storage as indicated by the State Water Resources Control Board and the Metropolitan Water District of Southern California.

E. Comments

Reported as of 8/30/05

BMP 14: Residential ULFT Replacement Programs

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2003**

A. Implementation

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes

Number of Toilets Replaced by Agency Program During Report Year

Replacement Method	SF Accounts	MF Units
2. Rebate	198	174
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	3507	1036
Total	**3705**	**1210**

6. Describe your agency's ULFT program for single-family residences.

The LBWD Single-family Residential ULFT Program encourages the replacement of water-guzzling toilets with no greater than 1.6 gallon ultra low-flush toilets. Single-family customers can either purchase their toilet from a vendor and apply for a rebate, or they can pick up free toilets at a designated distribution site. The distributions are handled using local area high schools and or CBO.

7. Describe your agency's ULFT program for multi-family residences.

The LBWD Multi-family Residential ULFT Program encourages the replacement of water-guzzling toilets with no greater than 1.6 gallon ultra low-flush toilets. Multi-family customers can either purchase their toilet from a vendor and apply for a rebate, or they can pick up free toilets at a designated distribution site. The distributions are handled using local area high schools and or CBO. Delivery service is provided to multi-family customers requesting over 10 toilets from the Water Departments ULFT Program.

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

City of Long Beach	Resale ordinance not in effect

B. Residential ULFT Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	600000	650000
2. Actual Expenditures	657390	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

MWD of Southern California is a cosponsor of the LBWD ULFT Program and provides funding to cover half the cost of each toilet exchanged or rebated.

Attachment G

CUWCC BMP Reports
for
2004

Reported as of 8/30/05

Water Supply & Reuse

Reporting Unit:
Long Beach Water Department

Year:
2004

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
Long Beach Recycled Water Facility	6178	Recycled
Central Basin Aquifer	25639	Groundwater
MWD SC-M&I	45300	Imported
MWD SC - Seawater Barrier	5970	Imported

Total AF: 83087

Reported as of 8/30/05

Accounts & Water Use

Reporting Unit Name:	Submitted to	Year:
Long Beach Water Department	CUWCC **12/03/2004**	**2004**

A. Service Area Population Information:

1. Total service area population 490000

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	60253	22630	0	0
2. Multi-Family	19864	23053	0	0
3. Commercial	6427	10768	0	0
4. Industrial	724	3176	0	0
5. Institutional	1052	3596	0	0
6. Dedicated Irrigation	981	3062	0	0
7. Recycled Water	79	6178	0	0
8. Other	1	5970	0	0
9. Unaccounted	NA	4653	NA	0
Total	89381	83086	0	0
	Metered		**Unmetered**	

Reported as of 8/30/05

Reported as of 8/30/05

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2004**

A. Implementation

1. Based on your signed MOU date, 09/28/1995, your Agency STRATEGY DUE DATE is:	09/27/1997
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	2/01/2002
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	01/01/2003

B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	501	2604
2. Number of surveys completed:	73	212
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	yes	yes
4. Check showerhead flow rates, aerator flow rates and offer to replace or recommend replacement, if necessary	no	no
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	yes	yes
Outdoor Survey:		
6. Check irrigation system and timers	no	yes
7. Review or develop customer irrigation schedule	no	yes
8. Measure landscaped area (Recommended but not required for surveys)	no	yes
9. Measure total irrigable area (Recommended but not required for surveys)	no	yes
10. Which measurement method is typically used (Recommended but not required for surveys)	Odometer Wheel	
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	yes	yes
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	yes	yes
a. If yes, in what form are surveys tracked?	database	

b. Describe how your agency tracks this information.

Customer request and results from water surveys are logged in an MS Access database.

C. Water Survey Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	50000	100000
2. Actual Expenditures	50000	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

In addition to performing water surveys based on High Bill Investigations, LBWD has begun a more intensive campaign at marketing water conservation to our residential customers. We distribute 8,000 low-flow shower heads at various community events throughout the year. We also distribute brochures that offer LBWD water conservation services to our residential customers in three languages, Spanish, Khmer, and English. In addition, we have expanded our efforts to include landscaping. Due to a limited staff, during this reporting period LBWD hired a consultant to conduct irrigation surveys of commercial/institutional customers. In the coming years we expect to expand to residential customers as well.

E. Comments

We have a very aggressive "high bill" investigation team that works closely with customer concerned about overuseage or that our automated billing system identifies as having unusually high useage. Through,this service offered to our customers, we have been able to maximize resources by marketing water surveys as part of the high bill service to our customers.

Reported as of 8/30/05

BMP 02: Residential Plumbing Retrofit

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2004**

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? — no

   a. If YES, list local jurisdictions in your service area and code or ordinance in each:

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? — no
3. Estimated percent of single-family households with low-flow showerheads: — 63%
4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? — no
5. Estimated percent of multi-family households with low-flow showerheads: — 63%
6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? — yes

   a. If YES, when did your agency begin implementing this strategy? — 05/01/1993

   b. Describe your targeting/ marketing strategy.

   The Department has a volunteer Water Ambassador Program which consists of volunteers who distribute low-flow showerheads, garden hoze nozzles and other conservation materials throughout the year.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	7000	1000
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	0	0

6. Does your agency track the distribution and cost of low-flow devices? — yes

   a. If YES, in what format are low-flow devices tracked? — Manual Activity

   b. If yes, describe your tracking and distribution system :

   Our devices are tracked through the ordering process. LBWD distributed low flow showerheads and hose nozzles from LBWD facilities, during water surveys, and at various community events through the Water Ambassadors.

C. Low-Flow Device Distribution Expenditures

	This Year	Next Year
1. Budgeted Expenditures	15000	15000
2. Actual Expenditures	15000	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 8/30/05

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2004**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year?	yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	66285
b. Determine other system verifiable uses (AF)	5970
c. Determine total supply into the system (AF)	76908
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.94
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production?	yes
4. Did your agency complete a full-scale audit during this report year?	no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit?	yes
6. Does your agency operate a system leak detection program?	yes

a. If yes, describe the leak detection program:

The Long Beach Water Department (LBWD) maintains a very aggressive Capital Improvement Program (CIP) replaces up to 60,000 LF of cast iron mains each year. The mains being replaced are mains that have been identified through comprehensive studies using the latest technology, such as GIS, to be the most vulnerable pipes in the distribution system due to a combination of factors, corrosion, past pipe failure, and years of service. The Department's CIP includes other programs such as a continuous replacement and new installation of water main in order to accomplish quicker shut downs with minimal impact to service or water loss. The Department's Water Operation program calls for ongoing replacement of all of the customer water meters as well as a testing program to assure accuracy, the LBWD currently replaces meters every fourteen years and on an as need basis. The Department also maintains a 24-hour emergency crew on call in the event of any water leak report or other water-related emergencies. Emergency field crews drive the length of all of the major water distribution mains to visually inspect for any leaks as well as inspect and exercise large valves. The Departments meter readers also serve as an integral part of the system leak detection program, by reporting to our construction personnel any leaking or malfunctioning meters. The LBWD Finance Bureau maintains accurate records of unaccounted for water usage. Such accurate reporting practice has averted serious water losses as well as assisted in the Department's ongoing effort at maintaining an extremely low unaccounted for water use, as low as 5%. LBWD learned about new technology available for water system leak detection and will at times use the services of specialized leak detection consultant to verify any suspect or critical areas.

B. Survey Data

1. Total number of miles of distribution system line. 915

2. Number of miles of distribution system line surveyed. 225

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	100000	100000
2. Actual Expenditures	96386	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

In addition to our leak detection program, LBWD maintains an aggressive CIP that has replaced an average of 100,000 linear feet of cast iron mains each year. The mains being replaced are mains that hve been identified through comprehensive studies using the latest technology, such as GIS, to identify the most vulnerable pipes based on factors such as corrosion, past pipe failure, and years of service. LBWD CIP also includes other programs such as continuous replacement and new installation of water mains in order to accomplish quicker shut downs with minimal impact to service or water loss. To further minimalize water loss, LBWD's CIP calls for ongoing replacement of aged meters and a testing program to ensure accuracy.

Reported as of 8/30/05

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2004**

A. Implementation

1. Does your agency require meters for all new connections and bill by volume-of-use? — yes

2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? — yes

   a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed? — 01/01/1995

   b. Describe the program:

   All connections in the City of Long Beach are metered. Our system is quite old, going back to the 1800's, and we are not certain when the system-wide metering began.

3. Number of previously unmetered accounts fitted with meters during report year. — 0

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? — yes

   a. If YES, when was the feasibility study conducted? (mm/dd/yy) — 06/07/2004

   b. Describe the feasibility study:

   The feasibility study identified the 1,000 CII accounts that are most likely to use the most amount of water irrigating landscape. A present-worth analysis took into consideration the likely capital cost and operating cost of a dedicated landscape meter program as well as the benefits of the program's conserved water. The study found the program would not be feasible in large part because of the cost of significant changes necessary in the billing software and the capital cost of installing a new service line and meter.

2. Number of CII accounts with mixed-use meters. — 0

3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. — 0

C. Meter Retrofit Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? — yes

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

Since all City of Long Beach connections are metered, we have maximized the potential for the BMP.

E. Comments

Our utility billing system does not have such a classification as "mixed use" customer which makes it impossible to quantify how many accounts actually qualify as mixed use.

Reported as of 8/30/05

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2004**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	915
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	170
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):	225
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):	208
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	yes

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	yes
a. If YES, when did your agency begin implementing this strategy?	03/31/2004

b. Description of marketing / targeting strategy

LBWD has developed an aggressive landscape survey/ water budget program. The targeting strategy is to identify dedicated landscape meter accounts and, working with the account owners, develop water budgets. The budgets will be based on daily CIMIS reads. Initially, the budgets will be reported at the time of the regular billing cycles; but we hope to eventually make the budgets available on a weekly basis over the internet. The landscape surveys will have two components: one is a budget based on current landscape and irrigation system conditions (with minor adjustments); the second budget will be a 'stretch goal' for the irrigator to hopefully reach within 5 years.

2. Number of Surveys Offered.	170
3. Number of Surveys Completed.	170
4. Indicate which of the following Landscape Elements are part of your survey:	
a. Irrigation System Check	yes
b. Distribution Uniformity Analysis	no
c. Review / Develop Irrigation Schedules	no
d. Measure Landscape Area	yes
e. Measure Total Irrigable Area	yes
f. Provide Customer Report / Information	yes
5. Do you track survey offers and results?	yes
6. Does your agency provide follow-up surveys for previously completed surveys?	

a. If YES, describe below:

Sites where problems are noted are prioritized within our database

based on the amount of water loss from High (broken/missing sprinkler heads) to low (foliage blockage). These accounts are checked on a monthly basis until all noted problems are addressed to LBWD's satisfaction.

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program.
Does your agency provide mixed-use accounts with landscape budgets? — no

2. Number of CII mixed-use accounts with landscape budgets. — 0

3. Do you offer landscape irrigation training? — yes

4. Does your agency offer financial incentives to improve landscape water use efficiency? — yes

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	1	300
b. Loans	0	0	0
c. Grants	0	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services? — yes

a. If YES, describe below:

We provide all of our customers with water efficiency information on a regular basis via our monthly bill insert/newsletter.

6. Do you have irrigated landscaping at your facilities? — yes

a. If yes, is it water-efficient? — yes

b. If yes, does it have dedicated irrigation metering? — yes

7. Do you provide customer notices at the start of the irrigation season? — yes

8. Do you provide customer notices at the end of the irrigation season? — yes

D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	15000	20000
2. Actual Expenditures	17000	

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? — yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

We have a very aggressive reclaimed water program, in which we have spent in excess of $2 million this year, converting large landscape irrigation from potable to reclaimed water. We are reaching out to the largest landscape users in the City, such as parks, golf courses college campuses. We do not have many other large landscape areas that

require large amounts of irrigation. In addition, we provide our customers with various literature on water conserving landscape as well as offer rebates for a variety of programs being administered by MWD of Southern California.

F. Comments

Reported as of 8/30/05

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2004**

A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? — no

   a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

2. Does your agency offer rebates for high-efficiency washers? — yes
3. What is the level of the rebate? — 125
4. Number of rebates awarded. — 875

B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	130000	280000
2. Actual Expenditures	125160	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? — no

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

The LBWD Residential High Efficiency Clothes Washer Rebate Program has become a very successful. We have increased the number of customer rebates from around 500 last year to over 800 this year, which equates to potable water saving of approximately 16 AF/Y. It is our intent to continue the program through 2005.

Reported as of 8/30/05

BMP 07: Public Information Programs

Reporting Unit:	BMP Form Status	Year:
Long Beach Water Department	**100% Complete**	**2004**

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? — yes

a. If YES, describe the program and how it's organized.

LBWD maintains an aggressive public education program. Our Water Ambassador Program offers the most visibility. Volunteers are trained and educated by our staff and in turn they attend various community meetings, City Council meetings, and various other public events promoting water conservation. We also aggressively promote Water Awareness Month during the month of May. Activities during the month include: community presentations; media events; advertisements; bill inserts; and other promotional activities. LBWD also offers residential & professional landscaping courses throughout the year. We have a dedicated page on our website strictly for water conservation. This past year we also created a "self audit" home inspection that has received good reviews from our residential customers. We have also partnered with the Aquarium of the Pacific to increase our educational outreach.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	yes	4
b. Public Service Announcement	yes	1
c. Bill Inserts / Newsletters / Brochures	yes	15000
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	yes	1
f. Special Events, Media Events	yes	8
g. Speaker's Bureau	yes	2
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	260000	260000
2. Actual Expenditures	251274	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? — No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

This year we created a Residential Self Audit pamphlet which was sent to over 6,000 residents. The pamphlet has been well received and we anticipate expanding the distribution to multi-family residents in the coming year.

Reported as of 8/30/05

BMP 08: School Education Programs

Reporting Unit: **Long Beach Water Department**

BMP Form Status: **100% Complete**

Year: **2004**

A. Implementation

1.Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	36	320	3
Grades 4th-6th	yes	38	830	0
Grades 7th-8th	yes	7	120	0
High School	yes	4	35	2

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 09/15/2002

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	23000	23000
2. Actual Expenditures	17585	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

In 2002 LBWD implemented a new program reaching out to the entire 3rd grade population in the Long Beach Unified School District (8,000 students). This is in addition to the 4th grade program implemented in 2001 and youth outreach (coloring books). LBWD has hired a consultant to handle most of the K-12 education programs. In addition, the Water Ambassadors (a group of volunteers) assist with the various educational programs conducted at schools and at the Aquarium of the Pacific.

Reported as of 8/30/05

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2004**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	yes

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option?.	yes

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	5	0	0
b. Number of New Surveys Completed	5	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	1	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0

CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	yes	yes	yes
f. Evaluation of all water-using apparatus and processes	no	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	no	no	no

Agency CII Customer Incentives	Budget ($/Year)	No. Awarded to Customers	Total $ Amount Awarded
h. Rebates	0	53	82380
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	yes
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	yes
7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.	6.08
8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.	54.75

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	0	100000
2. Actual Expenditures	95470	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

In addition to other water conserving incentives, LBWD in conjunction with MWD of Southern California offered rebates to all CII customers within our service area, which include ULFTs, High Efficiency Commercial Washing Machines, Cooling Tower Conductivity Controllers. Pre-rinse Sprayers, X-Ray water recirculation system.

Reported as of 8/30/05

BMP 09a: CII ULFT Water Savings

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2004**

1. Did your agency implement a CII ULFT replacement program in the reporting year? If No, please explain why on Line B. 10. — Yes

A. Targeting and Marketing

1. What basis does your agency use to target customers for participation in this program? Check all that apply. — Service area zones

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended

Long Beach Water Department (LBWD) targets all of its service area, by promoting water conservation and the opportunity to participate in CII ULFT rebates. LBWD works with the Metropolitan Water District of So. Cal., and Honeywell DMC (who manages the program).

2. How does your agency advertise this program? Check all that apply.

Bill insert
Newsletter
Web page
Newspapers
Trade publications
Trade shows and events

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

The most effective method for promoting water conservation programs including the CII ULFT rebates has been through a monthly bill insert/newsletter produced by the City of Long Beach and paid for in large part by LBWD.

B. Implementation

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) — Yes

2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? — Yes

3. What is the total number of customer accounts participating in the program during the last year ? — 53

CII Subsector	Number of Toilets Replaced			
4.	Standard Gravity Tank	Air Assisted	Valve Floor Mount	Valve Wall Mount
a. Offices	0	0	0	0
b. Retail / Wholesale	0	0	0	0

c. Hotels	256	0	0	0
d. Health	0	0	0	0
e. Industrial	1	0	0	0
f. Schools: K to 12	0	0	0	0
g. Eating	0	0	0	0
h. Government	0	0	0	0
i. Churches	1		0	0
j. Other	1		0	0

5. Program design. Rebate or voucher

6. Does your agency use outside services to implement this program? Yes

a. If yes, check all that apply. Consultant

7. Participant tracking and follow-up. No follow-up

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

a. Disruption to business	5
b. Inadequate payback	4
c. Inadequate ULFT performance	1
d. Lack of funding	4
e. American's with Disabilities Act	2
f. Permitting	1
g. Other. Please describe in B. 9.	0

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other isues affecting program implementation or effectiveness.

Acceptance of the program has increased. In comparison to last year, we have increased participation by almost 50%. The increase was largely attributed to targeting trade shows where the consultant was in direct contact with our customers.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

With an increase of almost 50% in customer participation, we believe the program was successful. With the consultant concentrating on trade shows for future campaigns, we anticipate participation to grow.

C. Conservation Program Expenditures for CII ULFT

1. CII ULFT Program: Annual Budget & Expenditure Data

	Budgeted	Actual Expenditure

a. Labor	0	0
b. Materials	0	0
c. Marketing & Advertising	0	0
d. Administration & Overhead	0	0
e. Outside Services	0	0
f. Total	0	0

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution	82380
b. State agency contribution	0
c. Federal agency contribution	0
d. Other contribution	0
e. Total	82380

D. Comments

LBWD participates in Metropolitan Water District of Southern California' CII program, which is administered by Honeywell DMC. In coordination with MWD, we provide supplemental advertising.

Reported as of 8/30/05

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2004**

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential	
a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$33085451
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$11639372
2. Commercial	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$7868042
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$2356444
3. Industrial	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$309479
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$92688
4. Institutional / Government	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$2910098
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$871562
5. Irrigation	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$1715569
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$513805

6. Other

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$656691
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$196676

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	3000	3000
2. Actual Expenditures	3000	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

For many years, the LBWD has been using an increasing block rate for residential customers and uniform rate structure for CII customers and Large Landscapes. Sewer rates are uniform, but are based on water use, therefore, conserving potable water reduces the customer's sewer bill.

D. Comments

The numbers in this report are estimates and represent the CY 2004. Our agency relies on the City's utility billing system for revenue information; but the utility billing system is not capable of providing the information broken into the categories required by BMP 11. Therefore, we take the data available to us and break that information out into the BMP 11 categories are best we can. The "Total Revenue from Non-Volumetric Charges" includes monthly service charge and taxes. Revenue for the months of Nov and Dec '04 are estimates based on the same months in '03.

Reported as of 8/30/05

BMP 12: Conservation Coordinator

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2004**

A. Implementation

1. Does your Agency have a conservation coordinator?	yes
2. Is this a full-time position?	yes
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?	no
4. Partner agency's name:	n/a
5. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	100%
b. Coordinator's Name	Matthew P. Lyons
c. Coordinator's Title	Manager, Planning
d. Coordinator's Experience and Number of Years	7.5
e. Date Coordinator's position was created (mm/dd/yyyy)	10/01/2000
6. Number of conservation staff, including Conservation Coordinator.	3

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	215000	210930
2. Actual Expenditures	215000	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

LBWD has been able to increase its conservations efforts with the increase in staff.

Reported as of 8/30/05

BMP 13: Water Waste Prohibition

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2004**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? — no

   a. If YES, describe the ordinance:

   The City of Long Beach Board of Water Commissioners Resolution No. WD-1071 -Emergency Water Conservation Plan adopted in 1991 includes Water Waste Prohibition. However, it is has been reserved for water emergencies resulting from State and local water supply and storage shortages.

2. Is a copy of the most current ordinance(s) on file with CUWCC? — yes

   a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

City of Long Beach	Resolution No. WD-1071 is currently inactive.

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding	yes
b. Single-pass cooling systems for new connections	no
c. Non-recirculating systems in all new conveyor or car wash systems	no
d. Non-recirculating systems in all new commercial laundry systems	no
e. Non-recirculating systems in all new decorative fountains	yes
f. Other, please name Customer system leaks; hosing off hard surfaces; water automatically served in restaurants.	yes

2. Describe measures that prohibit water uses listed above:

   Long Beach Board of Water Commissioners Resolution No. WD-1071, -Emergency Water Conservation Plan. Resolution No. WD-1071 is currently inactive.

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

   a. Allow the sale of more efficient, demand-initiated regenerating DIR models.

   b. Develop minimum appliance efficiency standards that:

   i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. — no

   ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced.

c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. no

4. Does your agency include water softener checks in home water audit programs? no

5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

C. Water Waste Prohibition Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

Rather than having a Water Waste Prohibition ordinance in effect in the LBWD service area, we have developed very extensive educational and outreach programs. LBWD's primary objective is to reach our customers on a very positive tone and work at changing behavior and developing greater awareness of water issues facing the City of Long Beach and in particular water conservation. A program begun in 2002, and developed by MWD is a set of residential gardening classes know as "Protector del Agua" a series of classes that deal with a number of issues from planning, plant selection, irrigation to maintenance have been offered to our residential customers. The City of Long Beach Board of Water Commissioners Resolution No. WD-1071 -Emergency Water Conservation Plan adopted in 1991 includes water waste prohibition measures. However, the resolution is reserved for water shortage emergencies resulting from extremely low water supply and storage as indicated by the State Water Resources Control Board and the Metropolitan Water District of Southern California.

E. Comments

Reported as of 8/30/05

BMP 14: Residential ULFT Replacement Programs

Reporting Unit:	BMP Form Status:	Year:
Long Beach Water Department	**100% Complete**	**2004**

A. Implementation

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes

Number of Toilets Replaced by Agency Program During Report Year

Replacement Method	SF Accounts	MF Units
2. Rebate	220	380
3. Direct Install	0	0
4. CBO Distribution	1466	1658
5. Other	0	0
Total	**1686**	**2038**

6. Describe your agency's ULFT program for single-family residences.

The LBWD Single-family Residential ULFT Program encourages the replacement of water-guzzling toilets with no greater than 1.6 gallon ultra low-flush toilets. Single-family customers purchase their toilets from a vendor and apply for the rebates.

7. Describe your agency's ULFT program for multi-family residences.

The LBWD Multi-family Residential ULFT Program encourages the replacement of water-guzzling toilets with no greater than 1.6 gallon ultra low-flush toilets. Single-family customers purchase their toilets from a vendor and apply for the rebates.

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

City of Long Beach	Resale ordinance not in effect

B. Residential ULFT Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	600000	700366
2. Actual Expenditures	603489	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

MWD of Southern California is a cosponsor of the LBWD ULFT Program and provides funding to cover half the cost of each toilet exchanged or rebated.

Attachment H

MWD Water Supply Projections

Metropolitan Water District of Southern California

Average Year

Demographics (1)	2005	2010	2015	2020	2025	2030
Population	**18,233,700**	**19,138,000**	**19,914,600**	**20,664,600**	**21,367,500**	**22,053,200**
Occupied Housing Units	**5,803,800**	**6,145,200**	**6,444,600**	**6,751,100**	**7,075,600**	**7,376,400**
Single Family	3,477,300	3,651,000	3,767,600	3,945,800	4,128,700	4,250,100
Multi-Family	2,326,500	2,494,200	2,677,000	2,805,300	2,946,800	3,126,300
Persons Per Household	**3.08**	**3.05**	**3.03**	**3.01**	**2.97**	**2.94**
Urban Employment	**8,186,200**	**8,991,300**	**9,402,700**	**9,795,200**	**10,163,000**	**10,537,600**

Conservation	2005	2010	2015	2020	2025	2030
Total Conservation	**735,900**	**865,200**	**955,200**	**1,027,600**	**1,106,900**	**1,188,300**
Installed Active Devices Through 2004	91,200	85,800	63,200	23,000	900	100
IRP Conservation Target (2)	6,100	27,100	38,300	45,700	30,500	23,800
Code-Based and Price-Effect Savings (3)	388,600	502,300	603,700	708,900	825,500	914,400
Pre-1990 Conservation	250,000	250,000	250,000	250,000	250,000	250,000

Total Demands After Conservation	2005	2010	2015	2020	2025	2030
Total Demands	**4,303,900**	**4,647,500**	**4,764,200**	**4,927,200**	**5,068,100**	**5,190,400**
Retail Agricultural	347,800	318,800	285,000	250,500	215,000	194,600
Retail Municipal and Industrial	3,768,000	4,053,400	4,196,900	4,392,100	4,569,600	4,719,400
Groundwater Replenishment	140,100	200,400	212,800	215,100	214,000	206,900
Seawater Barrier	48,000	74,900	69,500	69,500	69,500	69,500

Local Supplies	2005	2010	2015	2020	2025	2030
Total Local Supplies	**2,107,600**	**2,377,400**	**2,465,900**	**2,593,300**	**2,613,500**	**2,612,100**
Groundwater	1,341,500	1,416,000	1,429,800	1,431,000	1,443,500	1,442,300
Surface Water	59,400	100,000	99,500	99,200	99,200	98,600
Los Angeles Aqueduct	373,300	252,500	253,000	252,900	253,200	253,600
IRP Local Resource Program Target	0	12,800	33,000	38,300	37,500	37,500
Groundwater Recovery	60,500	81,700	82,100	85,300	85,300	85,300
Total Recycling	221,000	328,800	350,900	376,400	377,200	377,200
M&I and Agricultural	*152,300*	*180,900*	*204,000*	*229,500*	*230,300*	*230,300*
Groundwater Replenishment	*52,000*	*90,000*	*90,000*	*90,000*	*90,000*	*90,000*
Sea Water Barrier	*16,800*	*57,900*	*56,900*	*56,900*	*56,900*	*56,900*
Other Imported Supplies	51,900	185,600	217,600	310,100	317,600	317,600

Demands on Metropolitan	2005	2010	2015	2020	2025	2030
Total Metropolitan Demands	**2,196,100**	**2,270,100**	**2,298,300**	**2,334,000**	**2,454,500**	**2,578,300**
Full Service (Tier I and Tier II)	1,918,900	2,007,000	2,039,100	2,085,400	2,225,400	2,364,800
Replenishment Water Rate (4)	167,500	169,200	179,700	182,800	183,100	176,800
Interim Agricultural Water Program	109,700	93,900	79,500	65,800	46,000	36,700
Firm Demands on Metropolitan (5)	**1,996,000**	**2,073,000**	**2,095,000**	**2,131,000**	**2,258,000**	**2,390,000**

Notes:
All units are acre-feet unless specified, rounded to the nearest hundred
Totals may not sum due to rounding
(1) Growth Projections: SCAG 2004 Regional Transportation Plan; SANDAG 2030 Forecast
(2) The 2030 savings target is derived from the 2003 IRP Update forecast projections for 2030; it is not an official target for 2030.
(3) Measured from 1990; Includes plumbing codes for pre-rinse spray heads and high efficiency washing machines
(4) Replenishment Water Rate demands include: seasonal shift, groundwater spreading, and groundwater in-lieu
(5) Firm demand on Metropolitan equals Full Service demands plus 70% of the Interim Agricultural Water Program demands

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
Base Apportionment – Priority 4	503,000	503,000	503,000
IID/MWD Conservation Program	85,000	85,000	85,000
Priority 5 Apportionment	0	0	19,000
PVID Land Management Program	111,000	111,000	70,000
Subtotal of Current Programs	***699,000***	***699,000***	***677,000***
Programs Under Development			
Hayfield Storage Program	100,000	100,000	0
Lower Coachella Storage Program	150,000	150,000	0
Chuckwalla Storage Program	150,000	150,000	0
Salton Sea Restoration Transfer	0	0	0
Subtotal of Proposed Programs	***400,000***	***400,000***	***0***
Less: Coachella SWP/QSA Transfer	(35,000)	(35,000)	(35,000)
Maximum Metropolitan Supply Capability	**1,064,000**	**1,064,000**	**642,000**

Average Supply Capability[1] & Projected Demands

(Average of 1922 - 2004 Hydrologies)
(acre-feet per year)

	2010	2015	2020	2025	2030
Current Supplies					
Colorado River Aqueduct[2]	711,000	678,000	677,000	677,000	677,000
California Aqueduct[3]	1,772,000	1,772,000	1,772,000	1,772,000	1,772,000
In-Basin Storage	0	0	0	0	0
Supplies Under Development					
Colorado River Aqueduct	0	0	0	0	0
California Aqueduct	185,000	185,000	240,000	240,000	240,000
In-Basin Storage	0	0	0	0	0
Transfers to Other Agencies	0	(35,000)	(35,000)	(35,000)	(35,000)
Metropolitan Supply Capability	***2,668,000***	***2,600,000***	***2,654,000***	***2,654,000***	***2,654,000***
Metropolitan Supply Capability w/CRA Maximum of 1.25 MAF[4]	***2,668,000***	***2,600,000***	***2,654,000***	***2,654,000***	***2,654,000***
Firm Demands on Metropolitan[5,6]	***2,073,000***	***2,095,000***	***2,131,000***	***2,258,000***	***2,390,000***
Potential Reserve & Replenishment Supplies	**595,000**	**505,000**	**523,000**	**396,000**	**264,000**

[1] Represents supply capability for resource programs under listed year type.
[2] Colorado River Aqueduct includes water management program supplies conveyed by the aqueduct
[3] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct
[4] Maximum CRA deliveries limited to 1.25 MAF including SDCWA/IID Transfer supplies and Coachella and All-American Canals lining supplies.
[5] Based on SCAG 2004 RTP, SANDAG 2030 forecasts, projections of member agency existing and contracted active conservation and local supplies, remaining regional targets for active conservation and local supplies, SDCWA/IID Transfer supplies and Coachella and All-American Canals lining supplies.
[6] Includes projected firm sales plus 70% of projected IAWP agricultural sales

Single Dry-year Supply Capability[1] & Projected Demands

(Repeat of 1977 Hydrology)
(acre-feet per year)

	2010	2015	2020	2025	2030
Current Supplies					
Colorado River Aqueduct[2]	722,000	699,000	699,000	699,000	699,000
California Aqueduct[3]	777,000	777,000	777,000	777,000	777,000
In-Basin Storage	840,000	837,800	807,900	784,300	784,300
Supplies Under Development					
Colorado River Aqueduct	95,000	460,000	400,000	400,000	400,000
California Aqueduct	330,000	214,500	269,500	269,500	269,500
In-Basin Storage	78,000	103,000	103,000	103,000	103,000
Transfers to Other Agencies	0	(35,000)	(35,000)	(35,000)	(35,000)
Metropolitan Supply Capability	***2,842,000***	***3,056,300***	***3,021,400***	***2,997,800***	***2,997,800***
Metropolitan Supply Capability w/CRA Maximum of 1.25 MAF[4]	***2,842,000***	***2,988,600***	***2,921,200***	***2,890,100***	***2,890,100***
Firm Demands on Metropolitan[5,6]	***2,326,000***	***2,342,000***	***2,377,000***	***2,504,000***	***2,631,000***
Potential Reserve & Replenishment Supplies	**516,000**	**646,600**	**544,200**	**386,100**	**259,100**

[1] Represents supply capability for resource programs under listed year type.
[2] Colorado River Aqueduct includes water management program supplies conveyed by the aqueduct
[3] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct
[4] Maximum CRA deliveries limited to 1.25 MAF including SDCWA/IID Transfer supplies and Coachella and All-American Canals lining supplies.
[5] Based on SCAG 2004 RTP, SANDAG 2030 forecasts, projections of member agency existing and contracted active conservation and local supplies, remaining regional targets for active conservation and local supplies, SDCWA/IID Transfer supplies and Coachella and All-American Canals lining supplies.
[6] Includes projected firm sales plus 70% of projected IAWP agricultural sales

Multiple Dry-year Supply Capability [1] & Projected Demands

(Repeat of 1990-92 Hydrology)
(acre-feet per year)

	2010	2015	2020	2025	2030
Current Supplies					
Colorado River Aqueduct [2]	722,000	699,000	699,000	699,000	699,000
California Aqueduct [3]	911,600	911,600	911,600	911,600	911,600
In-Basin Storage	481,500	480,200	462,800	449,000	449,000
Supplies Under Development					
Colorado River Aqueduct	95,000	460,000	400,000	400,000	400,000
California Aqueduct	330,000	214,500	269,500	269,500	269,500
In-Basin Storage	78,000	103,000	103,000	103,000	103,000
Transfers to Other Agencies	0	(35,000)	(35,000)	(35,000)	(35,000)
Metropolitan Supply Capability	***2,618,100***	***2,833,300***	***2,810,900***	***2,797,100***	***2,797,100***
Metropolitan Supply Capability w/CRA Maximum of 1.25 MAF [4]	***2,618,100***	***2,765,600***	***2,710,700***	***2,689,400***	***2,689,400***
Firm Demands on Metropolitan [5,6]	***2,410,000***	***2,431,000***	***2,459,000***	***2,596,000***	***2,729,000***
Potential Reserve & Replenishment Supplies	**208,100**	**334,600**	**251,700**	**93,400**	**-39,600**

[1] Represents supply capability for resource programs under listed year type.
[2] Colorado River Aqueduct includes water management program supplies conveyed by the aqueduct
[3] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct
[4] Maximum CRA deliveries limited to 1.25 MAF including SDCWA/IID Transfer supplies and Coachella and All-American Canals lining supplies.
[5] Based on SCAG 2004 RTP, SANDAG 2030 forecasts, projections of member agency existing and contracted active conservation and local supplies, remaining regional targets for active conservation and local supplies, SDCWA/IID Transfer supplies and Coachella and All-American Canals lining supplies.
[6] Includes projected firm sales plus 70% of projected IAWP agricultural sales

In Basin Storage Activities
Program Capabilities
Year 2010
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
Metropolitan Surface Storage (DVL, Mathews, Skinner)	297,500	510,000	0
Flexible Storage in Castaic & Perris	73,000	219,000	0
Groundwater Conjunctive-use			
North Las Posas Storage	47,000	47,000	0
Prop 13 Storage	64,000	64,000	0
Subtotal of Current Programs	***481,500***	***840,000***	***0***
Programs Under Development			
Groundwater Conjunctive-use			
Raymond Basin	22,000	22,000	0
Prop 13 Storage Programs	1,000	1,000	0
Additional Programs[1]	55,000	55,000	0
Subtotal of Proposed Programs	***78,000***	***78,000***	***0***
Maximum Supply Capability	**559,500**	**918,000**	**0**

[1] Includes expansions of existing programs

In Basin Storage Activities
Program Capabilities
Year 2015
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
Metropolitan Surface Storage (DVL, Mathews, Skinner)	296,200	507,800	0
Flexible Storage in Castaic & Perris	73,000	219,000	0
Groundwater Conjunctive-use			
North Las Posas Storage	47,000	47,000	0
Prop 13 Storage	64,000	64,000	0
Subtotal of Current Programs	***480,200***	***837,800***	***0***
Programs Under Development			
Groundwater Conjunctive-use			
Raymond Basin	22,000	22,000	0
Prop 13 Storage Programs	1,000	1,000	0
Additional Programs[1]	80,000	80,000	0
Subtotal of Proposed Programs	***103,000***	***103,000***	***0***
Maximum Supply Capability	**583,200**	**940,800**	**0**

[1] Includes expansions of existing programs

In Basin Storage Activities
Program Capabilities
Year 2020
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
Metropolitan Surface Storage (DVL, Mathews, Skinner)	278,800	477,900	0
Flexible Storage in Castaic & Perris	73,000	219,000	0
Groundwater Conjunctive-use			
North Las Posas Storage	47,000	47,000	0
Prop 13 Storage	64,000	64,000	0
Subtotal of Current Programs	***462,800***	***807,900***	***0***
Programs Under Development			
Groundwater Conjunctive-use			
Raymond Basin	22,000	22,000	0
Prop 13 Storage Programs	1,000	1,000	0
Additional Programs[1]	80,000	80,000	0
Subtotal of Proposed Programs	***103,000***	***103,000***	***0***
Maximum Supply Capability	**565,800**	**910,900**	**0**

[1] Includes expansions of existing programs

In Basin Storage Activities
Program Capabilities
Year 2025
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
Metropolitan Surface Storage (DVL, Mathews, Skinner)	265,000	454,300	0
Flexible Storage in Castaic & Perris	73,000	219,000	0
Groundwater Conjunctive-use			
North Las Posas Storage	47,000	47,000	0
Prop 13 Storage	64,000	64,000	0
Subtotal of Current Programs	***449,000***	***784,300***	***0***
Programs Under Development			
Groundwater Conjunctive-use			
Raymond Basin	22,000	22,000	0
Prop 13 Storage Programs	1,000	1,000	0
Additional Programs[1]	80,000	80,000	0
Subtotal of Proposed Programs	***103,000***	***103,000***	***0***
Maximum Supply Capability	**552,000**	**887,300**	**0**

[1] Includes expansions of existing programs

In Basin Storage Activities
Program Capabilities
Year 2030
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
Metropolitan Surface Storage (DVL, Mathews, Skinner)	265,000	454,300	0
Flexible Storage in Castaic & Perris	73,000	219,000	0
Groundwater Conjunctive-use			
North Las Posas Storage	47,000	47,000	0
Prop 13 Storage	64,000	64,000	0
Subtotal of Current Programs	***449,000***	***784,300***	***0***
Programs Under Development			
Groundwater Conjunctive-use			
Raymond Basin	22,000	22,000	0
Prop 13 Storage Programs	1,000	1,000	0
Additional Programs[1]	80,000	80,000	0
Subtotal of Proposed Programs	***103,000***	***103,000***	***0***
Maximum Supply Capability	**552,000**	**887,300**	**0**

[1] Includes expansions of existing programs and North Las Posas Phase 3

California Aqueduct
Program Capabilities
Year 2010
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
SWP Deliveries[1,2]	509,000	175,000	1,472,000
San Luis Carryover[3]	93,000	280,000	280,000
SWP Call-back of DWCV Table A Transfer	25,600	5,000	0
Central Valley Storage and Transfers			
Semitropic Program	107,000	107,000	0
Arvin Edison Program	90,000	90,000	0
San Bernardino Valley MWD Program	37,000	70,000	20,000
Kern Delta Program	50,000	50,000	0
Subtotal of Current Programs	***911,600***	***777,000***	***1,772,000***
Programs Under Development			
Delta Improvements[4]	55,000	55,000	185,000
Market Transfer Options	150,000	150,000	0
Central Valley Transfers/Purchases	125,000	125,000	0
Mojave Program	0	0	0
Subtotal of Proposed Programs	***330,000***	***330,000***	***185,000***
Maximum Supply Capability	**1,241,600**	**1,107,000**	**1,957,000**

[1] Single Dry-year figure includes 76 TAF of additional SWP supplies in 1977 per DWR
[2] Multiple and Single Dry year figures include DWCV Table A supplies
[3] Includes DWCV carryover
[4] Includes Phase 8 and increased pumping capacity

California Aqueduct
Program Capabilities
Year 2015
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
SWP Deliveries[1,2]	509,000	175,000	1,472,000
San Luis Carryover[3]	93,000	280,000	280,000
SWP Call-back of DWCV Table A Transfer	25,600	5,000	0
Central Valley Storage and Transfers			
Semitropic Program	107,000	107,000	0
Arvin Edison Program	90,000	90,000	0
San Bernardino Valley MWD Program	37,000	70,000	20,000
Kern Delta Program	50,000	50,000	0
Subtotal of Current Programs	***911,600***	***777,000***	***1,772,000***
Programs Under Development			
Delta Improvements[4]	55,000	55,000	185,000
Market Transfer Options	0	0	0
Central Valley Transfers/Purchases	125,000	125,000	0
Mojave Program	34,500	34,500	0
Subtotal of Proposed Programs	***214,500***	***214,500***	***185,000***
Maximum Supply Capability	**1,126,100**	**991,500**	**1,957,000**

[1] Single Dry-year figure includes 76 TAF of additional SWP supplies in 1977 per DWR
[2] Multiple and Single Dry year figures include DWCV Table A supplies
[3] Includes DWCV carryover
[4] Includes Phase 8 and increased pumping capacity

California Aqueduct
Program Capabilities
Year 2020
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
SWP Deliveries[1,2]	509,000	175,000	1,472,000
San Luis Carryover[3]	93,000	280,000	280,000
SWP Call-back of DWCV Table A Transfer	25,600	5,000	
Central Valley Storage and Transfers			
Semitropic Program	107,000	107,000	0
Arvin Edison Program	90,000	90,000	0
San Bernardino Valley MWD Program	37,000	70,000	20,000
Kern Delta Program	50,000	50,000	0
Subtotal of Current Programs	***911,600***	***777,000***	***1,772,000***
Programs Under Development			
Delta Improvements[4]	110,000	110,000	240,000
Market Transfer Options	0	0	0
Central Valley Transfers/Purchases	125,000	125,000	0
Mojave Program	34,500	34,500	0
Subtotal of Proposed Programs	***269,500***	***269,500***	***240,000***
Maximum Supply Capability	**1,181,100**	**1,046,500**	**2,012,000**

[1] Single Dry-year figure includes 76 TAF of additional SWP supplies in 1977 per DWR
[2] Multiple and Single Dry year figures include DWCV Table A supplies
[3] Includes DWCV carryover
[4] Includes Phase 8 and increased pumping capacity

California Aqueduct
Program Capabilities
Year 2025
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
SWP Deliveries[1,2]	509,000	175,000	1,472,000
San Luis Carryover[3]	93,000	280,000	280,000
SWP Call-back of DWCV Table A Transfer	25,600	5,000	0
Central Valley Storage and Transfers			
Semitropic Program	107,000	107,000	0
Arvin Edison Program	90,000	90,000	0
San Bernardino Valley MWD Program	37,000	70,000	20,000
Kern Delta Program	50,000	50,000	0
Subtotal of Current Programs	***911,600***	***777,000***	***1,772,000***
Programs Under Development			
Delta Improvements[4]	110,000	110,000	240,000
Market Transfer Options	0	0	0
Central Valley Transfers/Purchases	125,000	125,000	0
Mojave Program	34,500	34,500	0
Subtotal of Proposed Programs	***269,500***	***269,500***	***240,000***
Maximum Supply Capability	**1,181,100**	**1,046,500**	**2,012,000**

[1] Single Dry-year figure includes 76 TAF of additional SWP supplies in 1977 per DWR
[2] Multiple and Single Dry year figures include DWCV Table A supplies
[3] Includes DWCV carryover
[4] Includes Phase 8 and increased pumping capacity

California Aqueduct
Program Capabilities
Year 2030
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
SWP Deliveries[1,2]	509,000	175,000	1,472,000
San Luis Carryover[3]	93,000	280,000	280,000
SWP Call-back of DWCV Table A Transfer	25,600	5,000	0
Central Valley Storage and Transfers			
Semitropic Program	107,000	107,000	0
Arvin Edison Program	90,000	90,000	0
San Bernardino Valley MWD Program	37,000	70,000	20,000
Kern Delta Program	50,000	50,000	0
Subtotal of Current Programs	***911,600***	***777,000***	***1,772,000***
Programs Under Development			
Delta Improvements[4]	110,000	110,000	240,000
Market Transfer Options	0	0	0
Central Valley Transfers/Purchases	125,000	125,000	0
Mojave Program	34,500	34,500	0
Subtotal of Proposed Programs	***269,500***	***269,500***	***240,000***
Maximum Supply Capability	**1,181,100**	**1,046,500**	**2,012,000**

[1] Single Dry-year figure includes 76 TAF of additional SWP supplies in 1977 per DWR
[2] Multiple and Single Dry year figures include DWCV Table A supplies
[3] Includes DWCV carryover
[4] Includes Phase 8 and increased pumping capacity

Colorado River Aqueduct
Program Capabilities
Year 2010
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
Base Apportionment – Priority 4	526,000	526,000	526,000
IID/MWD Conservation Program	85,000	85,000	85,000
Priority 5 Apportionment	0	0	30,000
PVID Land Management Program	111,000	111,000	70,000
Subtotal of Current Programs	***722,000***	***722,000***	***711,000***
Programs Under Development			
Hayfield Storage Program	0	0	0
Lower Coachella Storage Program	0	0	0
Chuckwalla Storage Program	0	0	0
Salton Sea Restoration Transfer	95,000	95,000	0
Subtotal of Proposed Programs	***95,000***	***95,000***	***0***
Less: Coachella SWP/QSA Transfer	0	0	0
Maximum Metropolitan Supply Capability	**817,000**	**817,000**	**711,000**
Additional Non-Metropolitan CRA Supplies			
SDCWA/IID Transfer	60,000	70,000	70,000
Coachella & All-American Canals Lining	93,700	93,700	93,700
Maximum CRA Supply Capability	**970,700**	**980,700**	**874,700**
Maximum Expected CRA Deliveries	**970,700**	**980,700**	**874,700**

Colorado River Aqueduct
Program Capabilities
Year 2015
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
Base Apportionment – Priority 4	503,000	503,000	503,000
IID/MWD Conservation Program	85,000	85,000	85,000
Priority 5 Apportionment	0	0	20,000
PVID Land Management Program	111,000	111,000	70,000
Subtotal of Current Programs	***699,000***	***699,000***	***678,000***
Programs Under Development			
Hayfield Storage Program	100,000	100,000	0
Lower Coachella Storage Program	150,000	150,000	0
Chuckwalla Storage Program	0	0	0
Salton Sea Restoration Transfer	210,000	210,000	0
Subtotal of Proposed Programs	***460,000***	***460,000***	***0***
Less: Coachella SWP/QSA Transfer	(35,000)	(35,000)	(35,000)
Maximum Metropolitan Supply Capability	**1,124,000**	**1,124,000**	**643,000**
Additional Non-Metropolitan CRA Supplies			
SDCWA/IID Transfer	100,000	100,000	100,000
Coachella & All-American Canals Lining	93,700	93,700	93,700
Maximum CRA Supply Capability	**1,317,700**	**1,317,700**	**836,700**
Maximum Expected CRA Deliveries	**1,250,000**	**1,250,000**	**836,700**

Colorado River Aqueduct
Program Capabilities
Year 2020
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
Base Apportionment – Priority 4	503,000	503,000	503,000
IID/MWD Conservation Program	85,000	85,000	85,000
Priority 5 Apportionment	0	0	19,000
PVID Land Management Program	111,000	111,000	70,000
Subtotal of Current Programs	***699,000***	***699,000***	***677,000***
Programs Under Development			
Hayfield Storage Program	100,000	100,000	0
Lower Coachella Storage Program	150,000	150,000	0
Chuckwalla Storage Program	150,000	150,000	0
Salton Sea Restoration Transfer	0	0	0
Subtotal of Proposed Programs	***400,000***	***400,000***	***0***
Less: Coachella SWP/QSA Transfer	(35,000)	(35,000)	(35,000)
Maximum Metropolitan Supply Capability	**1,064,000**	**1,064,000**	**642,000**
Additional Non-Metropolitan CRA Supplies			
SDCWA/IID Transfer	192,500	192,500	192,500
Coachella & All-American Canals Lining	93,700	93,700	93,700
Maximum CRA Supply Capability	**1,350,200**	**1,350,200**	**928,200**
Maximum Expected CRA Deliveries	**1,250,000**	**1,250,000**	**928,200**

Colorado River Aqueduct
Program Capabilities
Year 2025
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
Base Apportionment – Priority 4	503,000	503,000	503,000
IID/MWD Conservation Program	85,000	85,000	85,000
Priority 5 Apportionment	0	0	19,000
PVID Land Management Program	111,000	111,000	70,000
Subtotal of Current Programs	***699,000***	***699,000***	***677,000***
Programs Under Development			
Hayfield Storage Program	100,000	100,000	0
Lower Coachella Storage Program	150,000	150,000	0
Chuckwalla Storage Program	150,000	150,000	0
Salton Sea Restoration Transfer	0	0	0
Subtotal of Proposed Programs	***400,000***	***400,000***	***0***
Less: Coachella SWP/QSA Transfer	(35,000)	(35,000)	(35,000)
Maximum Metropolitan Supply Capability	**1,064,000**	**1,064,000**	**642,000**
Additional Non-Metropolitan CRA Supplies			
SDCWA/IID Transfer	200,000	200,000	200,000
Coachella & All-American Canals Lining	93,700	93,700	93,700
Maximum CRA Supply Capability	**1,357,700**	**1,357,700**	**935,700**
Maximum Expected CRA Deliveries	**1,250,000**	**1,250,000**	**935,700**

Colorado River Aqueduct
Program Capabilities
Year 2030
(acre-feet per year)

Hydrology	Multiple Dry Years (1990-92)	Single Dry Year (1977)	Average Year (1922-2004)
Current Programs			
Base Apportionment – Priority 4	503,000	503,000	503,000
IID/MWD Conservation Program	85,000	85,000	85,000
Priority 5 Apportionment	0	0	19,000
PVID Land Management Program	111,000	111,000	70,000
Subtotal of Current Programs	***699,000***	***699,000***	***677,000***
Programs Under Development			
Hayfield Storage Program	100,000	100,000	0
Lower Coachella Storage Program	150,000	150,000	0
Chuckwalla Storage Program	150,000	150,000	0
Salton Sea Restoration Transfer	0	0	0
Subtotal of Proposed Programs	***400,000***	***400,000***	***0***
Less: Coachella SWP/QSA Transfer	(35,000)	(35,000)	(35,000)
Maximum Metropolitan Supply Capability	**1,064,000**	**1,064,000**	**642,000**
Additional Non-Metropolitan CRA Supplies			
SDCWA/IID Transfer	200,000	200,000	200,000
Coachella & All-American Canals Lining	93,700	93,700	93,700
Maximum CRA Supply Capability	**1,357,700**	**1,357,700**	**935,700**
Maximum Expected CRA Deliveries	**1,250,000**	**1,250,000**	**935,700**