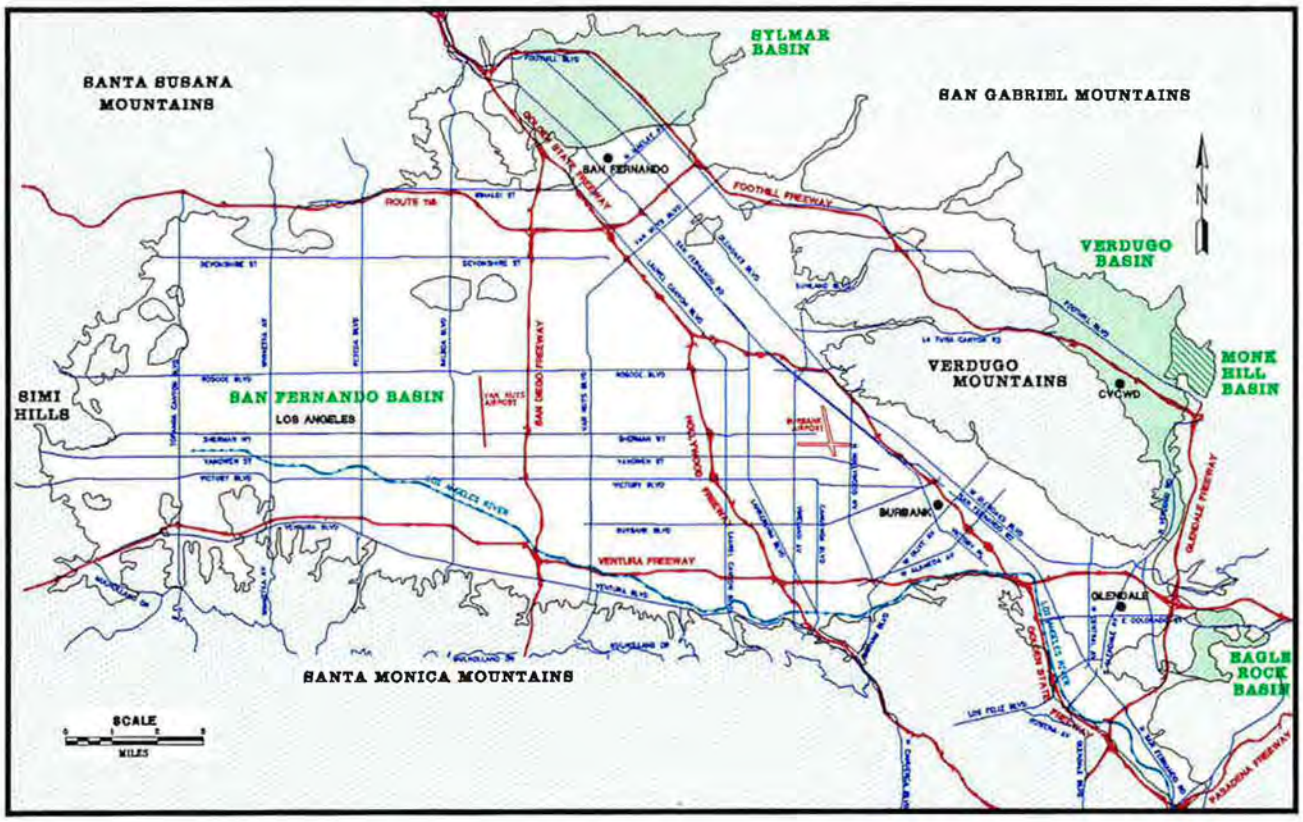
UPPER LOS ANGELES RIVER AREA WATERMASTER

CITY OF LOS ANGELES VS. CITY OF SAN FERNANDO, ET AL
CASE NO. 650079 – COUNTY OF LOS ANGELES

WATERMASTER SERVICE
IN THE
UPPER LOS ANGELES RIVER AREA
LOS ANGELES COUNTY

1997-98 WATER YEAR
OCTOBER 1, 1997 – SEPTEMBER 30, 1998



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MAY 1999

FOREWORD
ULARA Watermaster Report

As Watermaster for the Upper Los Angeles River Area (ULARA), I am pleased to submit this report of the water supply in accordance with the provisions of the Final Judgment signed by the Los Angeles Superior Court on January 26, 1979.

This report describes the water rights in each basin, lists the allowable pumping for the 1997-98 Water Year, and indicates the water in storage to the credit of each party as of October 1, 1998. In addition, this report includes background information on the history of the San Fernando Case, information as to each basin and the ULARA, with respect to water supply, groundwater extractions, groundwater levels, quantities of imported water use, recharge operations, water quality conditions, and other pertinent information occurring during the 1997-98 Water Year pursuant to the provisions of the Judgment.

Updates on the development of "Significant Events" through April 1999 are discussed in Section 1.5. These include the status of the Headworks Well Field Remediation Project, the progress of the East Valley Water Recyling Project, and the status of the Pollock Wells Treatment Plant Project. Other significant events include the Pacoima Area Groundwater Investigation, the Burbank Operable Unit continued operations, and the progress of the Glendale North/South Operable Unit which is expected to be completed in June 1999.

Present matters that are under investigation, and are in the process of being resolved are CalMat's gravel operations and its non-compliance with the ULARA Judgment regarding the pumping of groundwater in the San Fernando Basin. The legal issues regarding the groundwater pumping by the Middle Ranch Party (formerly DeMille) was resolved by a Court Order Injunction on June 24, 1998 and finalized on March 31, 1999. Other legal issues under investigation deal with the groundwater pumping by those with no water rights. These include the Hathaway Children and Family Services, the Agape Church, the Wildlife Waystation, and many others in Brown's Canyon, Kagel Canyon, Iverson Ranch, and various companies and individuals with illegal pumping activities throughout ULARA.

Additional significant action items that are being evaluated include the total storage of groundwater, rising groundwater outflow, high groundwater levels (dewaterers) and water rights issues. The Watermaster activities include improving the process for water rights notification and continuing investigations in progress of many potential situations requiring enforcement of the Judgment. A major goal of the Watermaster and Administrative Committee is continuing the overall basin management of the ULARA which requires ensuring the effective use of the four basins (San Fernando, Sylmar, Verdugo and Eagle Rock),

As ULARA Watermaster, I have completed my 20th year (January 26, 1979 through January 26, 1999). It has become a more difficult and extensive responsibility to serve as Watermaster, dealing with the implementation of the Los Angeles Superior Court Judgment and many technical and legal issues. I have served seven Judges (beginning with Judge Harry Hupp in 1979). Beginning on January 1, 1999, I now serve Judge Susan Bryant-Deason. I have reviewed with Judge Bryant-Deason the role of the Watermaster and many of the issues before the ULARA Administrative Committee and the Court. It is my intent to meet with her at least on a quarterly basis, in addition to those occasions when the Watermaster brings legal issues before the Court.

In the process of serving the Los Angeles Superior Court and the ULARA Administrative Committtte, there have been many technical and legal issues involved. To provide legal guidance, the law firm of Nossaman, Guthner, Knox & Elliott, LLP were retained with Fred Fudacz and John Ossiff serving as Special Counsel to the ULARA Watermaster. To assist in the technical and leadership role of the Watermaster, Ms. Pat Kiechler and Mr. Richard Nagel (Administrator and Assistant Watermaster, respectively) have been involved extensively.

I wish to acknowledge and express appreciation to all the Parties and State and Federal Agencies who have provided information and data which were essential to the completion of this report. Thanks to all.

M L Blevins

MELVIN L. BLEVINS
ULARA Watermaster

TABLE OF CONTENTS

TABLE OF CONTENTS - cont'd

TABLES

TABLE OF CONTENTS - cont'd

FIGURES

PLATES

TABLE OF CONTENTS - cont'd

APPENDICES

1. INTRODUCTION

1. INTRODUCTION

1.1 Background

The Upper Los Angeles River Area (ULARA) encompasses all the watershed of the Los Angeles River and its tributaries above a point in the river designated as Los Angeles County Department of Public Works (LACDPW) Gaging Station F-57C-R, near the junction of the Los Angeles River and the Arroyo Seco (Plates 1 and 5). ULARA encompasses 328,500 acres, composed of 122,800 acres of valley fill, referred to as the groundwater basins, and 205,700 acres of hills and mountains. ULARA is bounded on the north and northwest by the Santa Susana Mountains; on the north and northeast by the San Gabriel Mountains; on the east by the San Rafael Hills, which separate it from the San Gabriel Basin; on the south by the Santa Monica Mountains, which separate it from the Los Angeles Coastal Plain; and on the west by the Simi Hills.

ULARA has four distinct groundwater basins. The water supplies of these basins are separate and are replenished by deep percolation from rainfall, surface runoff and from a portion of the water that is delivered for use within these basins. The four groundwater basins in ULARA are the San Fernando, Sylmar, Verdugo, and Eagle Rock Basins.

THE SAN FERNANDO BASIN (SFB), the largest of the four basins, consists of 112,000 acres and comprises 91.2 percent of the total valley fill. It is bounded on the east and northeast by the San Rafael Hills, Verdugo Mountains, and San Gabriel Mountains; on the north by the San Gabriel Mountains and the eroded south limb of the Little Tujunga Syncline which separates it from the Sylmar Basin; on the northwest and west by the Santa Susana Mountains and Simi Hills; and on the south by the Santa Monica Mountains.

THE SYLMAR BASIN, in the northerly part of ULARA, consists of 5,600 acres and comprises 4.6 percent of the total valley fill. It is bounded on the north and east by the San Gabriel Mountains; on the west by a topographic divide in the valley fill between the Mission Hills and the San Gabriel Mountains; on the southwest by the Mission Hills; on the east by the Saugus formation along the east bank of the Pacoima Wash; and on the south by the eroded south limb of the Little Tujunga Syncline, which separates it from the SFB.

THE VERDUGO BASIN, north and east of the Verdugo Mountains, consists of 4,400 acres and comprises 3.6 percent of the total valley fill. It is bounded on the north by the San Gabriel Mountains; on the east by a groundwater divide separating it from the Monk Hill Subarea of the

Raymond Basin; on the southeast by the San Rafael Hills; and on the south and southwest by the Verdugo Mountains.

THE EAGLE ROCK BASIN, the smallest of the four basins, is in the extreme southeast corner of ULARA and consists of 800 acres and comprises 0.6 percent of the total valley fill.

1.2 History of Adjudication

The water rights in ULARA were established by the JUDGMENT AFTER TRIAL BY COURT in Superior Court Case No. 650079, entitled The City of Los Angeles, a Municipal Corporation, Plaintiff, vs. City of San Fernando, et al., Defendants, signed March 14, 1968, by the Honorable Edmund M. Moor, Judge of the Superior Court. Numerous pretrial conferences were held subsequent to the filing of the action by the City of Los Angeles in 1955 and before the trial commenced on March 1, 1966.

On March 19, 1958, an Interim Order of Reference was entered by the Court directing the State Water Rights Board, now known as the State Water Resources Control Board (SWRCB), to study the availability of all public and private records, documents, reports, and data relating to a proposed order of reference in the case. The Court subsequently entered an "Order of Reference to State Water Rights Board to Investigate and Report upon the Physical Facts (Section 2001, Water Code)" on June 11, 1958.

A final Report of Referee was approved on July 27, 1962 and filed with the Court. The Report of Referee made a complete study of the geology, insofar as it affects the occurrence and movement of groundwater and the surface and groundwater hydrology of the area. In addition, investigations were made of the history of channels of the Los Angeles River and its tributaries; the areas, limits, and directions of flow of all groundwater within the area; the historic extractions of groundwater in the basin and their quality; and all sources of water, whether they be diverted, extracted, imported, etc. The Report of Referee, the testimony of the hydrologic and geologic experts and the basic data of the Parties, served as the principal basis for the geological and hydrological facts for the original Trial Court Judgment in 1968, the Decision of the Supreme Court in 1975 (14 Cal 3d 199, 123 Cal Rept 1), and the Los Angeles Superior Court Final Judgment on remand on January 26, 1979.

The City of Los Angeles filed an appeal from the Judgment of the Trial Court with the Court of Appeal, which held a hearing on November 9, 1972, and issued its opinion on November 22,

1972. The opinion, prepared by Judge Compton and concurred in by Judges Roth and Fleming, reversed, with direction, the Original Trial Court Judgment handed down by Judge Moor. In essence, the City of Los Angeles was given rights to all water in ULARA, including the use of the underground basins. The defendants, however, were given the right to capture "return water", which is water purchased from the Metropolitan Water District of Southern California (MWD) that percolates into the basin.

A petition for rehearing was filed on December 7, 1972, but was denied by the Court of Appeal. On January 2, 1973, the defendants filed a petition for hearing with the California Supreme Court. The Court on March 2, 1973 advised the parties it would hear the case. The hearing was held on January 14, 1975.

On May 12, 1975, the California Supreme Court filed its opinion on the 20-year San Fernando Valley water litigation. This opinion, which became final on August 1, 1975, upheld the Pueblo Water Rights of the City of Los Angeles to all groundwater in the SFB derived from precipitation within ULARA. The City of Los Angeles' Pueblo Water Rights were not allowed to extend to the groundwaters of the Sylmar and Verdugo Basins, but did include surface runoff from these basins.

The City of Los Angeles was also given rights to all groundwater derived from imported water either spread or delivered within the SFB. The Cities of Glendale and Burbank were also given rights to all SFB groundwater derived from water that each imports and is delivered within the SFB. The City of San Fernando was not a member of MWD until the end of 1971, and had never prior thereto imported any water to the SFB. Also, San Fernando has no return flow rights presently of delivered imported water based on a mutual agreement between Los Angeles and San Fernando in the March 22, 1984 amendment to the Final Judgment.

The California Supreme Court reversed the principal judgment of the Trial Court and remanded the case back to the Superior Court for further proceedings consistent with the Supreme Court's opinion. On remand the case was assigned to the Honorable Harry L. Hupp, Judge of the Superior Court of Los Angeles County.

The Final Judgment (Judgment), signed by the Honorable Harry L. Hupp, was entered on January 26, 1979. Copies of the Judgment are available from the ULARA Watermaster's office. The water rights set forth in the Judgment are consistent with the opinion of the Supreme Court described above. In addition, the Judgment includes provisions and stipulations regarding water rights, the calculation of imported return water credit, storage of water, stored water

credit, and arrangements for physical solution water for certain parties as suggested by the Supreme Court. A separate stipulation was filed in Superior Court on January 25, 1979 appointing Melvin L. Blevins to serve as Watermaster under the Judgment in this case.

On August 26, 1983, the Watermaster reported to the Court pursuant to Section 10.2 of the Judgment that the Sylmar Basin was in a condition of overdraft. In response to the Watermaster's letter and a Minute Order of this Court, the Cities of Los Angeles and San Fernando responded by letter to the Court, agreeing with the Watermaster's report on overdraft. On March 22, 1984, Judge Harry L. Hupp signed a stipulation ordering, effective October 1, 1984, that the Cities of Los Angeles and San Fernando would be limited in their pumping to bring the total pumping within the safe yield of the basin, including any rights exercised by private parties.

The following table lists the judges who have succeeded Judge Hupp as Judge of Record for the San Fernando Judgment.

TABLE 1-1: JUDGES OF RECORD

Judge	Date Appointed
Susan Bryant-Deason	January 1, 1999
Ricardo A. Torres	January 1, 1993
Gary Klausner	December 9, 1991
Jerold A. Krieger	April 16, 1991
Sally Disco	May 25, 1990
Miriam Vogel	January 16, 1990
Vernon G. Foster	April 30, 1985

1.3 Extraction Rights

The extraction rights under the Judgment and Sylmar Basin Stipulation are as follows:

San Fernando Basin

Native Water

Los Angeles has an exclusive right to extract and utilize all the native safe yield water which is evaluated to be 43,660 acre-feet per year. This represents Los Angeles' Pueblo water right.

Import Return Water

Los Angeles, Glendale, and Burbank each has a right to extract the following amount:

Los Angeles: 20.8 percent of all delivered water, including reclaimed water, to valley fill lands of the SFB.

Burbank: 20.0 percent of all delivered water, including reclaimed water, to the SFB and its tributary hill and mountain areas.

Glendale: 20.0 percent of all delivered water, including reclaimed water, to the SFB and its tributary hill and mountain areas (i.e., total delivered water less 105 percent of total sales by Glendale in the Verdugo Basin and its tributary hills).

Physical Solution Water

Several parties are granted limited rights to extract water chargeable to the rights of others upon payment of specified charges. The following table lists the parties and their physical solution quantities.

TABLE 1-2: PHYSICAL SOLUTION PARTIES

Chargeable Party	Pumping Party	Allowable Pumping (acre-feet)
City of Los Angeles	City of Glendale	5,500
	City of Burbank	4,200
	Middle Ranch	50
	Hathaway[1]	60
	Van de Kamp[2]	120
	Toluca Lake	100
	Sportsmen's Lodge	25
City of Glendale	Forest Lawn	400
	Angelica Healthcare[2]	75
City of Burbank	Valhalla	300
	Lockheed	25

1. Agreement not presently completed, but is in progress.
2. Abandoned Pysical Soluition rights. They will not be listed in the future.

Stored Water

Los Angeles, Glendale, and Burbank each has a right to store water and to extract equivalent amounts.

Sylmar Basin

Native and Import Return Water

As of October 1, 1984, Los Angeles and San Fernando were assigned equal rights to the safe yield of the basin. The Administrative Committee on July 16, 1996 at the recommendation of the Watermaster approved increasing the safe yield in the Sylmar Basin on a trial basis by 300 acre-feet to 6,510 acre-feet per year. The only potentially active private party with overlying rights is Santiago Estates. As a successor to Meurer Engineering, Santiago Estates as of June 1998 was owned by M.H.C. Inc. Santiago Estates pumping is deducted from the safe yield and the two cities divide the remainder. Santiago Estates did not pump groundwater during the 1997-98 Water Year and reported that the pump was removed from the well.

Stored Water

Los Angeles and San Fernando each has a right to store water and to extract equivalent amounts.

Verdugo Basin

Native and Import Return Water

Glendale and the Crescenta Valley Water District (CVWD) own prescriptive and appropriative rights to extract 3,856 and 3,294 acre-feet per year, respectively. Glendale is not currently pumping its full water right. CVWD has requested and has been given approval by the Watermaster and Administrative Committee to once again pump an adjusted amount above its normal water right the 1998-99 Water Year (Appendix F). CVWD pumped 573 acre-feet above its water right during the 1997-98 Water Year.

Eagle Rock Basin

Native Water

The Eagle Rock Basin has no significant native safe yield.

Imported Return Water

Los Angeles delivers imported water to lands overlying the Eagle Rock Basin, and return flow from this delivered water constitutes the entire safe yield of the basin (approximately 500 acre-feet per year). Los Angeles has the right to extract or cause to be extracted the safe yield of the basin.

Physical Solution Water

McKesson Water Products (successor to Sparkletts) and Deep Rock each have physical solution rights to extract water pursuant to a stipulation with the City of Los Angeles, and as provided in Section 9.2.1 of the Judgment.

1.4 Watermaster Service and Administrative Committee

In preparing the annual Watermaster Report, the Watermaster collected and reported all information affecting and relating to the water supply, water use and disposal, groundwater

levels, water quality, and ownership and location of new wells within ULARA. Groundwater pumpers report their extractions monthly to the Watermaster. This makes it possible to update the Watermaster Water Production Accounts on a monthly basis and determine the allowable pumping for the remainder of the year.

Section 8, Paragraph 8.3 of the Judgment established an Administrative Committee for the purpose of advising the Watermaster in the administration of his duties. The duly appointed members of the Committee, as of May 1, 1999, are:

BURBANK, CITY OF
Fred Lantz (President)
Peter Frankel (Alternate)

GLENDALE, CITY OF
Donald Froelich (Vice-President)
Wil Wilson (Alternate)

SAN FERNANDO, CITY OF
Michael Drake
Harold Tighe (Alternate)

LOS ANGELES, CITY OF
Thomas Erb
Ernest Wong (Alternate)

CRESCENTA VALLEY WATER DISTRICT
Michael Sovich
David Gould (Alternate)

The Watermaster may convene the Administrative Committee at any time in order to seek its advice. Each year the Committee is responsible for reviewing and approving with the Watermaster the proposed annual report. The Committee met in October, December, February, April, June, and August of the 1997-98 Water Year. The Committee approved the 1997-98 Watermaster Report on April 15, 1999.

1.5 Significant Events through April 1999

Headworks Well Field Remediation Project

Until the early 1980s, the Headworks wells were the most productive wells in the Los Angeles Department of Water and Power (DWP) water system, each well pumping between 2,500 - 4,000 gpm. However, the well field was taken out of service when it was discovered that the groundwater was contaminated with industrial solvents, primarily Trichloroethylene (TCE) and Tetrachloroethylene (PCE). The project goal is to reactivate the well field by using some form of groundwater treatment process. The preliminary concept is to pump approximately 13,500 gpm from four wells, convey the groundwater to a central treatment facility located at the

Headworks Spreading Grounds, remove the contaminants, chlorinate the supply, and finally pump the supply back into the River Supply Conduit distribution system. In December 1998, Applied Process Technology installed a commercial scale system to Headworks Well No. 29. Testing will continue through March 1999 to evaluate the full viability of this system for the Headworks project. The project Negative Declaration was certified in August of 1998.

East Valley Water Recycling Project

The East Valley Water Recycling Project (EVWRP) is the cornerstone of the City of Los Angeles' water recycling efforts and will ultimately fulfill nearly half the goal of reusing about 40 percent of the city's recycled water by 2010. This project is intended to utilize up to 35,000 acre-feet per year of reclaimed water from the Tillman Water Reclamation Plant, primarily for groundwater recharge in theHansen and Pacoima Spreading Grounds within the Sun Valley area of the San Fernando Valley. Other incidental uses will be for irrigation and industrial applications. The 10 miles of pipeline and the Balboa Pumping Station are scheduled to be completed by April 1999. The installation of twelve monitoring wells was completed in 1997, and quarterly background sampling events are progressing. Phase I of the EVWRP is a three-year demonstration project that features 10,000 acre-feet per year of water spread at the Hansen Spreading Grounds beginning in mid-1999. Groundwater quality will be evaluated over this three-year period with the goal of increasing the spreading up to 35,000 acre-feet per year.

Pollock Wells Treatment Plant

The Pollock Well Field, which is located in the Los Angeles River Narrows area, was removed from service in 1989 because water quality was significantly degraded with industrial solvents. The DWP has completed construction of the Pollock Wells Treatment Plant, a 3,000 gpm facility to restore the use of two existing Pollock production wells by treating the groundwater with Liquid-Phase Granular Activated Carbon (GAC). The GAC will remove the volatile organic compounds (VOCs), the supply will be chlorinated, and blended with imported supplies to reduce nitrate levels. One major reason for the Pollock project was to reduce the rising groundwater outflow in the Los Angeles River at Gage F-57, thus, preserving Los Angeles' water rights of up to 3,000 acre-feet per year. The Pollock plant will also provide increased flexibility in utilizing the basin. The plant was dedicated March 17, 1999.

Pacoima Area Groundwater Investigation

A significant groundwater contaminant plume exists in the Pacoima area near the intersection of the Simi Valley Freeway and San Fernando Road (Plate 7). As the lead agency, the Department of Toxic Substances Control (DTSC) of the California Environmental Protection

Agency (Cal-EPA) is working with the Los Angeles Regional Water Quality Control Board (RWQCB), the DWP, and the Watermaster's Office to develop strategies to further investigate the extent and nature of the contaminant plume. The DWP has installed two downgradient monitoring wells to provide a better understanding of the extent of contamination and to provide an early warning detection system for the nearest DWP supply wells, the Tujunga Well Field. In addition to continued groundwater monitoring, interim remediation actions are under consideration including a soil vapor extraction and air-sparging system.

Marquardt Contamination Investigation

Marquardt Company property in the San Fernando Valley is used for rocket testing and development. The Watermaster coordinated an investigation and published a report in November 1998 with regard to Marquardt's contamination of the SFB groundwater and assisted DTSC in gaining Marquardt's compliance to characterize the contamination. The following regulatory agencies and water purveyors participated in the report preparation: City of Burbank, City of Glendale, City of Los Angeles, Los Angeles Fire Department, Los Angeles County Fire Department, Los Angeles County Department of Health Services, LACDPW, DTSC, RWQCB, California Department of Health Services, and the United States Environmental Protection Agency.

Burbank Operable Unit (BOU)

Phase II of the United States Environmental Protection Agency (EPA) Consent Decree project (BOU) was expected to be completed in 1998. The Second Consent Decree specifies the obligations of operation and maintenance on the treatment facility for the next 18 years. Lockheed began delivering water to the Burbank distribution system in January 1996. In mid-December 1997, the facility was closed to rehabilitate Burbank Well No. 10, improve filtration of the backwash, and re-configure the Liquid-Phase GAC to a downward flow system. The facility continued to remain closed until December 12, 1998. The California Department of Health Services (DHS) required re-permitting of the facility and specified additional operational conditions to provide greater protection to the drinking water supply. This delay has changed the dates of various phases of the Consent Decree. The treatment plant began operating again as Phase II of the Consent Decree. There is a 60-day shake down period before Burbank accepts the facility. During the shut down, the water table returned to its normal non-pumping level, which is 5-6 feet higher. In the first month of operation the pumping cone was re-established around the contaminated area. The average pumping rate at the facility should be about 9,000 gpm.

Glendale Operable Unit

The City of Glendale and the DreamWorks Studios SKG entered into an agreement during 1995 permitting DreamWorks to develop a studio on the Crystal Springs well site which had been previously selected as the site for the treatment plant of the operable unit (OU). DreamWorks animation studio was completed in December 1997. The EPA signed the Unilateral Administrative Order (UAO) and sent it to the Glendale Respondents Group in October 1997. The UAO provides for the construction, operation and maintenance of remedial facilities in accordance with the work schedule. The project goal is to pump and treat up to 5,000 gpm from the Glendale North and South OU Well Fields. The City of Glendale, EPA, and the Glendale Respondents Group have made progress in the construction of the water treatment plant, building a blending pipeline, and refurbishing the Grandview Pump Station. The EPA expects the project to be completed by June 1999. A map of the project can be seen in Appendix G

CalMat

Under the Judgment, CalMat was assigned a minimal consumptive use right to use groundwater for processing sands and gravel in their mining operations with the entire amount of groundwater being returned (recharged) to the San Fernando Basin. CalMat does not hold a water right. CalMat may use the groundwater for aggregate washing with the obligation to return 90 percent of the pumped groundwater back into the basin and to compensate Los Angeles for up to 10 percent consumptive losses by purchasing an equivalent amount of water from Los Angeles. The Watermaster is in the process of resolving such issues as evaporative losses at the Sheldon Pond, studying the impact to water quality of an exposed water table and wash water discharges into the Sheldon Pond. The Watermaster is considering that possible mining at the Boulevard Pit could expose the water table and create additional water quality problems. During 1997, 1998, and 1999, the Watermaster, working with CalMat and the City of Los Angeles, identified critical factors that must be used to measure compliance with the Judgment.

Middle Ranch (formerly DeMille)

Watermaster investigations included the DeMille Estate, a Disclaiming Party, which gave up any water rights during the San Fernando litigation which ended with a Judgment on January 26, 1979. Most of the DeMille property was purchased by the Pankow Family Trust on December 31,1986 and is now known as Middle Ranch. On June 24, 1998 the Superior Court of Los Angeles in Department 64 ordered that the motion to enforce the injunction set forth in the Judgment against the Pankow parties be granted. The order affirmed that the parties are successors-in-interest to a party (DeMille) orginally named in the action with respect to water

rights adjudicated in the Judgment, and that the parties are subject to the terms of the Judgment to the same extent as such predecessor in interest (Appendix H). The enforcement of the injunction regarding groundwater pumping was extended several months to permit the parties to re-structure their water distribution system so that the land and livestock would suffer no harm. The City of Los Angeles as the holder of the water rights negotiated the terms of the water use, as a physical solution, to make the city whole, consistent with its policy toward all its customers. Middle Ranch will be required to abandon several of its wells and be limited in groundwater use to an annual maximum allowable pumping of 50 acre-feet per year. Middle Ranch is only allowed use of groundwater outside the City of Los Angeles, where there is no present available water supply service. Middle Ranch is required to pay Los Angeles for the pumped groundwater.

Hathaway Children and Family Services (Hathaway)

Hathaway is a Party in the case of City of Los Angeles v. San Fernando by virtue of being successor-in-interest to Disclaiming Parties, the DeMille Estate. The Watermaster, City of Los Angeles, and Hathaway are in the process of developing a stipulation. The property is located within ULARA in the County of Los Angeles without availllable municipal water supply service. A pumping cap of approximately 60 acre-feet per year is being developed. Monthly production reports for the three wells will be sent to the Watermaster and Hathaway will be required to pay Los Angeles, the water right holder, for pumped groundwater.

Well Permits

Well permits are obtained and approved by the Los Angeles County DHS. The DHSs primary concern is public health. The issue becomes confusing when a party obtains a permit to install a well because the permit does not establish the right to use that well nor does it establish a water right. In adjudicated groundwater basins, water rights are assigned to parties by their judgments and are enforced by the various court appointed watermasters. To assist the public and the watermasters in the Los Angeles County area, the Watermaster's Office, working with DHS, took the lead in drafting a public notice explaining water rights and also reviewed well permits from 1990-1998 (See Appendix I). The well permits were distributed to the appropriate watermasters for investigation. The water rights information notices have been distributed to the various offices of DHS. The Watermaster intends to review well permits prior to 1990 to determine the potential illegal wells that may be pumping within ULARA.

GPS Survey

A survey of 498 groundwater wells and related facilities in ULARA was completed in 1998. The purpose of the survey is to acquire the most recent information for the on-going development of the SFB groundwater model and geographic information system (GIS). The first task is acquiring the horizontal survey data in accordance with the North American Datus 1983 projection and vertical survey data in accordance with the NAD 1988 projection. The survey uses a real-time Global Positioning System (GPS) surveying system that efficiently measures and calculates real-world geographic locations. The purpose of this data is to bring the existing GIS spatial data into compliance with the most current and accepted industry and federal standards. These standards provide a practical and effective vehicle for the exchange of spatial data among GIS users and external regulatory agencies such as the USEPA, the RWQCB, and DHS. DWP submittals of Compliance Data to these agencies under the aforementioned industry and federal standards will be required by the year 2000.

Electronic Data Loggers (EDL)

During 1998, DWP installed EDLs in 81 monitoring wells in the SFB. These EDLs were programmed to provide a daily reading of water elevations. The first annual download of data is scheduled in June 1999.

Hansen and Tujunga Spreading Grounds Task Force

The Watermaster intiated the Hansen and Tujunga Spreading Grounds Task Force in May 1998. The purpose of the task force was to establish criteria to better utilize the Hansen and Tujunga Spreading Grounds to recharge the SFB with native and imported waters. Their use has been significantly limited in years when above normal local runoff is available. The task force is made up of representatives of the LACDPW, Los Angeles Bureau of Sanitation, DWP, and the Watermaster's Office. The task force established preliminary mitigation plans for both spreading grounds. Both plans will be implemented in the 1998-99 water year.

Sun Valley Watershed Stakeholders

The Watermaster participates in the Sun Valley Watershed Stakeholders meetings. The objective of the group is to identify the feasibility of alternative ways to solve the local flooding problems in the Sun Valley area. Alternatives could replace or support the traditional approach of an improved storm drain system. Some of the alternatives under consideration include permeable road covers, storm detention basins, and individual home cisterns. The work is a feasibility study to be completed by July 1999.

1.6 Summary of Water Supply, Operations, and Hydrologic Conditions

Highlights of operations for the 1996-97 and 1997-98 Water Years are summarized in Table 1-3. Details of the 1997-98 Water Year operations and hydrologic conditions are given in Section 2. Locations of the groundwater basins, water service areas of the parties and individual producers, and other pertinent hydrologic facilities are shown on Plates 2 through 9.

Average Rainfall

Precipitation on the valley fill floor area during 1997-98 was 37.04 inches, 225 percent of the calculated 100-year mean (16.48 inches); precipitation in the mountain areas was 39.45 inches, 181 percent of the calculated 100-year mean (21.62 inches).

Spreading Operations

A total of 61,119 acre-feet of water was spread, an increase from the 23,171 acre-feet spread during the dry 1996-97 Water Year. Average annual spreading for the 1968-1998 period was 35,758 acre-feet.

Extractions

Total extractions amounted to 108,401 acre-feet. This is an decrease of 9,782 acre-feet from 1996-97 and approximately 112 percent of the 1968-98 average of 96,375 acre-feet. Of the total for the 1997-98 Water Year, 2,552 acre-feet were for non-consumptive use. The decrease in pumping was due in part to an abundance of local rainfall and heavy snows in the Eastern Sierras, the source of the Los Angeles Aqueduct water supply. Appendix A contains a summary of groundwater extractions for the 1997-98 Water Year.

Imports

Gross imports (including pass-through water) totaled 503,111 acre-feet, a decrease of 9 percent from 1996-97. Net imports used within ULARA amounted to 283,242 acre-feet, a 32,881 acre-feet decrease.

Exports

A total of 298,114 acre-feet of water was exported from ULARA, a decrease of 15,399 acre-feet from the previous year. Of the 298,114 acre-feet exported, 78,244 acre-feet were from groundwater extractions, and 219,870 acre-feet were from imported supplies (pass-through).

Treated Wastewater

A total of 108,579 acre-feet of wastewater was treated in ULARA. The majority of the treated water was discharged to the Los Angeles River, a small amount was delivered to the Hyperion Treatment Plant, and approximately six percent was used as reclaimed water.

Recycled Water

Total recycled water used in ULARA was 6,912 acre-feet, a 2,739 acre-feet decrease from last year. The recycled water is used for landscape irrigation, in-plant use, power plant use (i.e. cooling), and other industrial uses.

Sewage Export

Sewage export was estimated at 109,544 acre-feet; this was the amount of sewage delivered by pipeline to the Hyperion Treatment Plant. The estimate does not include treated wastewater discharged to the Los Angeles River that leaves ULARA as surface flow.

Groundwater Storage

Groundwater storage in the SFB during 1997-98 increased by 44,113 acre-feet; the total cumulative increase in groundwater storage since October 1, 1968 is 270,362 acre-feet. The 1997-98 increase is due to a combination of increase in spreading activities by the LACDPW, and above average rainfall. The change in groundwater storage for the Sylmar, Verdugo, and Eagle Rock Basins was +1,650, +1825, and (- 16) acre-feet, respectively. The total change in groundwater storage in ULARA was +47,572 acre-feet.

Wells

During the 1997-98 Water Year, two illegal wells in Middle Ranch were identified for abandonment.

TABLE 1-3: SUMMARY OF OPERATIONS IN ULARA

Item	Water Year 1996-97	Water Year 1997-98
Active Pumpers (party and nonparties)	26	29
Inactive Pumpers (parties within valley fill)[1]	4	4
Valley Rainfall, in inches		
Valley Floor	15.17	37.04
Mountain Area	20.27	39.45
Spreading Operations, in acre-feet	23,171	61,119
Extractions, in acre-feet		
Used in ULARA	27,479	25,494
Exported from ULARA	86,770	78,244
Nonconsumptive Use	2,286	2,552
Basin Account/Testing[2]	1,095	1,102
Clean-up/Dewaterers	553	1,009
Total	**118,183**	**108,401**
Gross Imports, in acre-feet		
Los Angeles Aqueduct Water	451,048	401,665
MWD Water	82,807	101,446
Total	**533,855**	**503,111**
Exports, in acre-feet		
Los Angeles Aqueduct Water	203,909	196,250
MWD Water	13,823	23,620
Groundwater	86,572	78,244
Total	**304,304**	**298,113**
Net Imports Used in ULARA, in acre-feet	316,123	283,242
Reclaimed Water Use, in acre-feet	9,651	6,912
Total Water Use in ULARA, in acre-feet[3]	353,253	315,648
Treated Wastewater, in acre-feet[4]	103,240	108,579
Sewage Export to Hyperion, in acre-feet[5]	118,050	109,544

1) The four inactive pumpers are Hinkle-Schmidt (Deep Rock), Van de Kamp, Disney, and Angelica.
2) Water accounted for under a testing situation or treatment facility water used for backwash.
3) Extractions used in ULARA plus Net Imports and Reclaimed.
4) Most treated wastewater flows to LA River, a portion to Hyperion (see T2-7), and for reclaimed water.
5) Sewage outflow includes estimates of outflow from each of the four basins, and discharges to Hyperion from the Tillman and Los Angeles-Glendale Reclamation Plants.

1.7 Allowable Pumping for the 1998-99 Water Year

Table 1-4 shows a summary of extraction rights for the 1998-99 Water Year and stored water credit as of October 1, 1998, for the Cities of Los Angeles, Burbank, Glendale, San Fernando, and the CVWD. The calculation of these values is shown in more detail in Section 2.

TABLE 1-4: ALLOWABLE PUMPING 1998-99 WATER YEAR

(acre-feet)

	Native Safe Yield Credit[1]	Import Return Credit[2]	Total Native+Import	Stored Water Credit (as of Oct. 1, 1998)	Allowable Pumping 1998-99 Water Year
San Fernando Basin					
City of Los Angeles	43,660	39,752	83,412	298,067	381,479
City of Burbank	—	4,489	4,489	57,543	62,032
City of Glendale	—	5,127	5,127	64,983	70,110
Total	**43,660**	**49,368**	**93,028**	**420,593**	**513,621**
Sylmar Basin					
City of Los Angeles	3,255	—	3,255	4,371	7,626
City of San Fernando	3,255	—	3,255	2,264	5,519
Total	**6,510**	**—**	**6,510**	**6,635**	**13,145**
Verdugo Basin[3]					
CVWD	3,294	—	3,294	—	3,294
City of Glendale	3,856	—	3,856	—	3,856
Total[4]	**7,150**	**—**	**7,150**	**—**	**7,150**

1) Native Safe Yield extraction right per Judgment, page 11.
2) Import Return extraction right per Judgment, page 17.
3) There is no Stored Credit assigned in the Verdugo Basin.
4) "Total" does not include the Eagle Rock Basin. All water rights in the Eagle Rock Basin belong to LADWP, though imported water returns (recharge). The estimated safe-yield is approximately 500 AF/Yr and is partially pumped by Physical Solution parties.

2. WATER SUPPLY, OPERATIONS, AND HYDROLOGIC CONDITIONS

2. WATER SUPPLY, OPERATIONS, AND HYDROLOGIC CONDITIONS

2.1 Precipitation

Precipitation varies considerably throughout ULARA depending on topography and elevation. Mean seasonal precipitation ranges from about 14 inches at the western end of the San Fernando Valley to 35 inches in the San Gabriel Mountains. Approximately 80 percent of the annual rainfall occurs from December through March.

The 1997-98 Water Year experienced much higher than average rainfall. The valley floor received 37.04 inches of rain (225 percent of the 100-year mean), while the mountain area received 39.45 inches (181 percent of the 100-year mean). Figure 2.1 shows monthly valley floor and mountain area rainfall in ULARA. The weighted average of both valley and mountain areas was 38.51 inches (196 percent of the 100-year mean). Table 2-1 shows a record of rainfall at the valley and mountain precipitation stations, and Plate 5 shows their locations.

FIGURE 2.1: MONTHLY RAINFALL

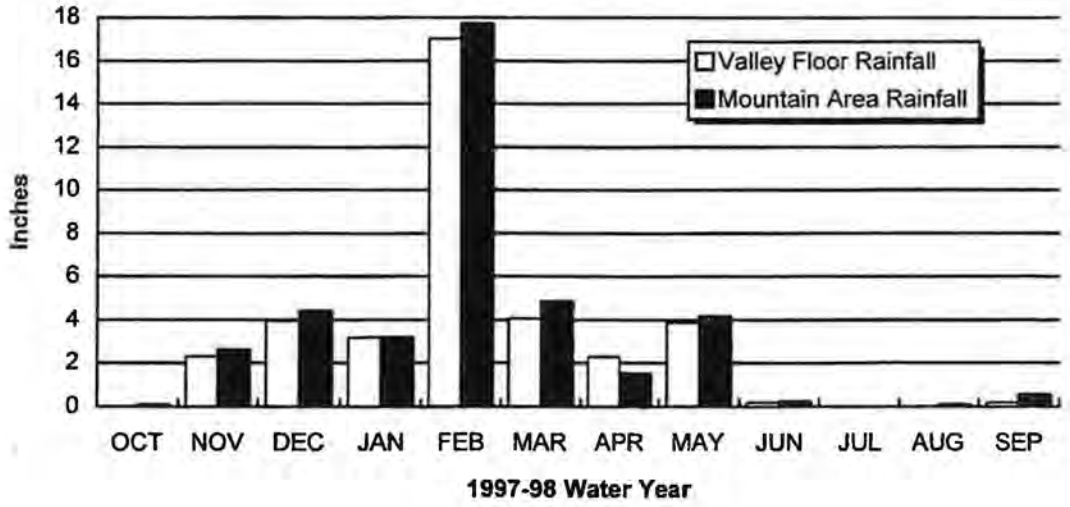


TABLE 2-1: 1997-98 PRECIPITATION

(inches)

No.	Name	Precipitation	(1881-1981)	100-Year Mean
	Valley Stations			
13C	North Hollywood-Lakeside	41.40	16.63	249%
1107D	La Tuna Canyon	32.59	14.98	218%
465C	Sepulveda Dam	38.93	15.30	254%
21B	Woodland Hills	38.04	14.60	261%
23B	Chatsworth Reservoir	41.00	15.19	270%
25C	Northridge-LADWP	25.96	15.16	171%
251C	La Crescenta	45.13	23.31	194%
293B	Los Angeles Reservoir	38.05	17.32	220%
	Weighted Average[1]	**37.04**	**16.48**	**225%**
	Mountain Stations			
11D	Upper Franklin Canyon Reservoir	27.81	18.50	150%
17	Sepulveda Canyon at Mulholland	48.11	16.84	286%
33A	Pacoima Dam	48.51	19.64	247%
47D	Clear Creek - City School	43.83	33.01	133%
1076B	Monte Cristo Ranger Station	42.58	29.04	147%
54C	Loomis Ranch-Alder Creek	34.70	18.62	186%
210C	Brand Parks	29.06	19.97	146%
797	DeSoto Reservoir[2]	42.57	17.52	243%
1074	Little Gleason	25.56	21.79	117%
	Weighted Average[1]	**39.45**	**21.76**	**181%**
	Weighted Average Valley/Mountain Areas[1]	**38.51**	**19.64**	**196%**

1. Weighted Average calculations performed according to Report of Referee-7/62.
2. Station 797 replaced Station 259 which has been discontinued.
3. Station 1107D substituted for 14C.
4. Station 1076B substituted for 53C.

2.2 Runoff and Outflow from ULARA

The drainage area of ULARA contains 328,500 acres, of which 205,700 acres are hills and mountains. The drainage system is made up of the Los Angeles River and its tributaries. Surface flow originates as storm runoff from the hills and mountains, storm runoff from the impervious areas of the valley, industrial and sanitary waste discharges, and rising groundwater.

A number of stream-gaging stations are maintained throughout ULARA, either by the LACDPW or the United States Geological Survey (USGS). The Watermaster has selected six key gaging

stations which record runoff from the main hydrologic areas in ULARA (Plate 5 shows the location of the stations). The six gage stations are as follows:

1. Station F-57C-R registers all surface outflow from ULARA.

2. Station F-252-R registers flow from Verdugo Basin which includes flows from Dunsmore and Pickens Canyons.

3. Station E-285-R registers flow from the westerly slopes of the Verdugo Mountains and some flow from east of Lankershim Boulevard. It also records any releases of reclaimed wastewater discharged by the City of Burbank.

4. Station F-300-R registers all flow east of Lankershim Boulevard plus the portion of outflow from Hansen Dam which is not spread. These records also include flow through the Sepulveda Dam.

5. Station F-168-R registers all releases from Big Tujunga Dam, which collects runoff from the watershed to the northeast. Runoff below this point flows to Hansen Dam.

6. Station F-118B-R registers all releases from the Pacoima Dam. Runoff below this point flows to the Los Angeles River through lined channels, or can be diverted to the Lopez and Pacoima Spreading Grounds. This station, severely damaged in January 1994 during the Northridge Earthquake, began reporting again in November 1996.

Table 2-2 summarizes the 1996-97 and 1997-98 monthly runoff for these stations. The higher runoff in 1997-98 is due to much higher rainfall. The mean daily discharge rates for these six stations during 1997-98 are summarized in Appendix B.

TABLE 2-2: MONTHLY RUNOFF AT SELECTED GAGING STATIONS

(acre-feet)

Station	Water Year	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
F-57C-R	1997-98	6,210	16,400	29,050	17,960	140,100	37,100	20,460	49,050	10,300	7,700	6,270	6,130	346,730
LA River Arroyo Seco	1996-97	12,950	15,320	34,460	33,280	8,230	6,680	6,750	7,340	7,420	8,540	5,860	8,260	155,290
F-252-R	1997-98	327	772	945	986	6,210	1,850	985	1,750	642	644	523	506	16,140
Verdugo Wash	1996-97	675	1,580	6,120	4,510	691	665	592	606	556	200	271	398	16,864
E-285-R	1997-98	641	1,330	1,810	1,350	7,200	2,670	1,250	2,280	772	707	873	787	21,670
Burbank Storm Drain	1996-97	956	1,120	1,840	2,000	618	550	470	464	537	548	607	600	10,310
F-300-R	1997-98	4,810	13,500	25,010	13,600	125,500	35,760	16,760	44,500	6,330	6,250	6,500	4,760	304,280
LA River Tujunga Ave.	1996-97	7,970	9,500	25,490	24,960	6,360	5,560	5,320	5,490	5,300	5,410	5,370	5,970	112,690
F-168-R	1997-98	2	94	—	—	—	—	—	—	—	—	—	—	96
Big Tujunga Dam [1]	1996-97	0	0	1,390	2,800	1,830	905	614	331	142	7	0	2	8,023
F-118B-R	1997-98	181	43	133	471	7,240	6,160	4,580	7,030	4,190	1,140	150	377	31,695
Pacoima Dam	1996-97	61	59	581	2,170	1,440	497	337	37	143	37	37	37	36

1. F-168-R Station Problems

2.3 Components of Surface Flow

The surface flow of the Los Angeles River at Gaging Station F-57C-R consists of:

1. Storm flows;
2. Reclaimed wastewater from the Tillman, Burbank, and Los Angeles-Glendale Water Reclamation Plants;
3. Industrial discharges; and,
4. Rising groundwater.

In the Report of Referee (Volume II, Appendix O), procedures were developed for the calculation of rising groundwater for the period 1928-1958. Some of the important factors of that study are no longer significant - releases of Owens River water, operation of the Chatsworth Reservoir, and (temporarily, at least) operation of the Headworks Spreading Grounds. As shown on Figure O-2 of the Report of Referee, rising groundwater was considered to have fallen to zero by the late 1950s. The January 1993 report by Brown and Caldwell, "Potential Infiltration of Chlorides from the Los Angeles River into the Groundwater Aquifer" studied groundwater levels along the course of the Los Angeles River. The Watermaster provided the insight and data for this evaluation. As of the end of the drought

period in 1977, groundwater levels in the Los Angeles Narrows were very low, with very little potential for rising groundwater. Heavy runoff occurred during the 1978-83 period, which, combined with reduced pumping in the Crystal Springs, Grandview, and Pollock Well Fields, caused large recoveries of groundwater levels in the Los Angeles Narrows.

An even greater factor affecting hydrologic conditions in the Los Angeles Narrows has been the increasing releases of reclaimed waters. Releases from the Los Angeles-Glendale Plant were started in 1976-77 and from the Tillman Plant in 1985-86. These large year-round releases tend to keep the alluvium of the Los Angeles River Narrows full, even in dry years. There is opportunity for continuing percolation in the unlined reach, both upstream and downstream of the paved section near the confluence of the Verdugo Wash and the Los Angeles River. Water percolating in the unlined reach is believed to circulate through shallow zones and re-appear as rising groundwater downstream from Los Feliz Boulevard. Also, there is up to 3,000 acre-feet of recharge from delivered water within the Los Angeles Narrows-Pollock Well Field area that adds to the rising groundwater conditions. The start-up of pumping at the Pollock Well Field Treatment Plant in March 1999 should increase the opportunity for recharge.

Rising groundwater also occurs above the Verdugo Narrows, with the Verdugo Basin,and in the reach upgradient from Gage F-57C-R within the SFB. During dry periods, conditions in the unlined reach are stabilized with regard to percolation and rising groundwater by releases of treated water. In wet periods, rising groundwater above gage F-57C-R has been considered to be related to the increase of rising water and storm drain flows above the Verdugo Narrows. From 1991-92 (Table 2-3) to the very wet year of 1992-93 there was an increase of rising water and storm drain flows at Gage F-252-R of about 1,900 acre-feet. From 1996-97 to 1997-98, flows of rising groundwater and storm drain flows at gage F-252-R was estimated at 4,000 acre-feet. For 1997-98 the rising groundwater at gage F-57C-R was estimated at 4,000 acre-feet.

Field inspection during 1997-98 revealed significant unmetered flows of storm drain water contributing to year-round flows of water from residences, golf courses and others beginning high in the San Rafael Hills that flow down to the Los Angeles River through the Sycamore Channel and several other storm drains north of gage F-57 C-R. The Watermaster's Office is working with the LACDPW to more precisely measure the rising groundwater from other sources of run-off.

TABLE 2-3: ESTIMATED SEPRATION OF SURFACE FLOW AT STATIONS F-57C-R & F-252-R

(acre-feet)

	F-57C-R				F-252-R		
Water Year	Rising Groundwater	Waste Discharge	Storm Runoff	Total Outflow	Rising GW* Storm Drains	Storm Runoff	Total Outflow
1997-98	4,000	97,681	245,079	346,730	4,000	12,140	16,140
1996-97	3,000	75,827	76,485	155,312	3,000	13,860	16,860
1995-96	3,841	86,127	61,188	151,156	2,577	10,946	13,523
1994-95	4,900	66,209	367,458	438,567	4,809	28,881	33,696
1993-94	2,952	60,594	73,149	136,695	1,387	6,156	7,543
1992-93	4,900	77,000	478,123	560,023	3,335	20,185	23,520
1991-92	3,000	120,789	197,040	320,829	1,412	13,209	14,621
1990-91	3,203	75,647	117,779	196,629	1,157	6,865	8,022
1989-90	3,000	76,789	55,811	167,639	1,182	2,938	4,120
1988-89	3,000	80,020	56,535	136,843	1,995	4,453	6,448
1987-88	3,000	81,920	74,074	156,204	3,548	10,493	14,041
1986-87	3,000	64,125	19,060	83,295	2,100	1,690	3,790
1985-86	3,880	48,370	102,840	155,090	2,470	6,270	8,740
1984-85	3,260	21,600	46,300	71,160	2,710	3,970	6,680
1983-84	3,000	17,780	49,090	69,870	4,000	n/a	n/a
1982-83	3,460	17,610	384,620	405,690	5,330	21,384	26,714
1981-82	1,280	18,180	80,000	99,460	3,710	5,367	9,077
1980-81	4,710	19,580	51,940	76,230	5,780	2,917	8,697
1979-80	5,500	16,500	n/a	n/a	5,150	7,752	12,902
1978-79	2,840	16,450	119,810	139,100	2,470	n/a	n/a
1977-78	1,331	7,449	357,883	366,663	1,168	23,571	24,739
1976-77	839	7,128	58,046	66,013	1,683	2,635	4,318
1975-76	261	6,741	32,723	39,725	2,170	2,380	4,550
1974-75	427	7,318	56,396	64,141	1,333	4,255	5,588
1973-74	2,694	6,366	79,587	88,878	1,772	5,613	7,385
1972-73	4,596	8,776	100,587	113,959	1,706	7,702	9,408
1971-72	—	—	—	—	2,050	2,513	4,563

*Values estimated based on gage data and estimates of storm drain contriubtion.

2.4 Groundwater Recharge

Precipitation has a marked influence on groundwater recharge and, with some delay, groundwater storage. Urban development in ULARA has resulted in an increasing percentage of rainfall being collected and routed into paved channels which discharge into the Los Angeles River. To partially offset the increased runoff due to urbanization, Pacoima and Hansen Dams, originally built for flood control, are utilized to regulate storm flows and allow recapture of the flow in downstream spreading basins operated by the LACDPW and the City of Los Angeles.

The LACDPW operates the Branford, Hansen, Lopez, and Pacoima Spreading Grounds. The City of Los Angeles operates the Headworks Spreading Grounds. However, this spreading basin is currently inactive. The LACDPW, in cooperation with the City of Los Angeles, operates the Tujunga Spreading Grounds. The spreading grounds are utilized for spreading native and imported waters under agreements. The LACDPW and DWP are cooperatively working towards optimizing the use of the spreading basins and maximizing the capture and spreading of storm water. Table 2-4 summarizes the spreading operations for the 1997-98 Water Year, and Plate 6 shows the locations of the spreading grounds.

TABLE 2-4: 1997-98 SPREADING OPERATIONS IN THE SAN FERNANDO BASIN

(acre-feet)

Native Waters

Agency	Spreading Facility	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
LACDPW														
	Branford	10	156	57	109	70	60	32	64	21	16	16	30	641
	Hansen	367	336	1,170	1,130	4,650	7,850	6,010	1,570	4,070	182	0	794	28,129
	Lopez	50	0	0	35	4	2	68	82	23	0	0	114	378
	Pacoima	0	359	868	577	3,950	5,340	3,220	2,560	3,070	717	53	0	20,714
	Tujunga	0	90	360	67	4,380	1,630	0	914	1,080	1,810	790	59	11,180
	Total	427	941	2,455	1,918	13,054	14,882	9,330	5,190	8,264	2,725	859	997	61,042
City of Los Angeles														
	Tujunga	0	0	0	0	0	10	7	4	1	46	0	8	77
	Headworks	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hansen	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	10	7	4	1	46	0	8	77
Basin Total		427	941	2,455	1,918	13,054	14,892	9,337	5,194	8,265	2,771	859	1,005	61,119

2.5 Groundwater Extractions

The original trial court adjudication of groundwater rights in ULARA restricted all groundwater extractions, effective October 1, 1968. On that date, extractions were restricted to approximately 104,000 acre-feet per water year. This amounted to a reduction of approximately 50,000 acre-feet from the previous six-year average. The State Supreme Court's opinion, as implemented on remand in the ULARA Judgment, provides a similar restriction in groundwater pumping.

Figure 2.2 illustrates the annual groundwater extractions and imported water used in ULARA, beginning with the 1954-55 Water Year. It can be noted that for the 14 years prior to pumping restrictions (1954-55 to 1967-68), imports exceeded extractions by 50,000 to 90,000 acre-feet per year, in contrast to the past 30 years (1968-69 to 1997-98) where imports have exceeded extractions by 110,000 to 250,000 acre-feet per year (Refer to Figure 2.3 - Monthly Extractions and Imports).

A total of 108,4012 acre-feet was pumped from ULARA during the 1997-98 Water Year- 94,682 acre-feet from the SFB, 6,945 acre-feet from the Sylmar Basin, 6,688 acre-feet from the Verdugo Basin, and 200 acre-feet from the Eagle Rock Basin. The respective safe yield values for the 1997-98 Water Year are 98,731 acre-feet (Native Safe Yield of 43,660 and an import return of 55,071 acre-feet) for the SFB, 6,510 acre-feet for the Sylmar Basin, and 7,150 acre-feet for the Verdugo Basin. Appendix A contains a summary of groundwater extractions for the 1997-98 Water Year, Plate 9 shows the locations of the well fields, and Plate 10 shows the pattern of groundwater extractions.

Of the total amount pumped in the SFB (94,682 acre-feet), 89,281 acre-feet constitutes extraction rights by Parties to the Judgment, 2,552 acre-feet constitutes nonconsumptive use, and 3,220 acre-feet was by physical solution parties, groundwater cleanup, testing/well development, and dewatering parties (Appendix E). Table 2-5 summarizes 1997-98 private party pumping in the SFB, and Plate 3 shows the locations of the individual producers.

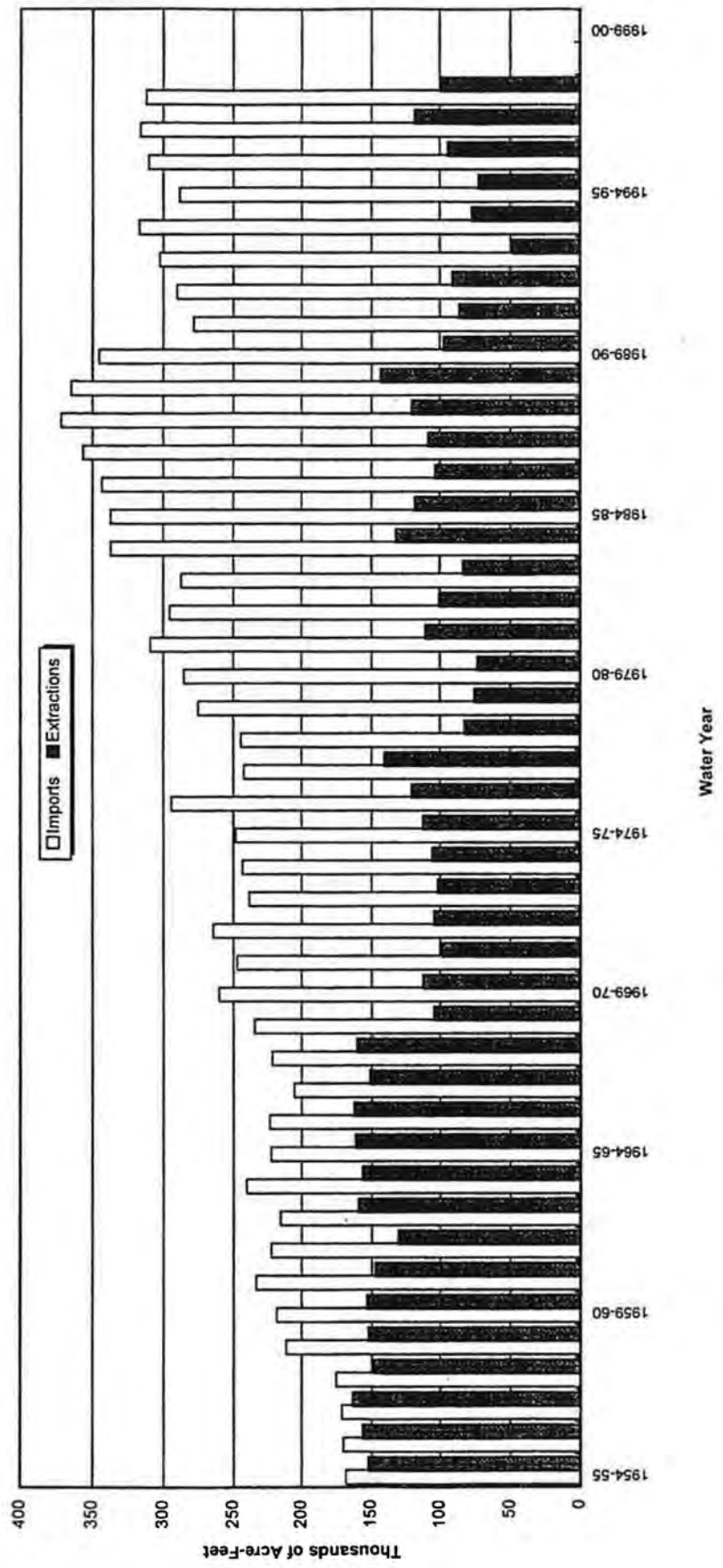


FIGURE 2.2 - YEARLY IMPORTS USED IN ULARA AND ULARA EXTRACTIONS

TABLE 2-5: 1997-98 PRIVATE PARTY PUMPING - SAN FERNANDO BASIN

(acre-feet)

Nonconsumptive Use or Minimal Consumption		Groundwater Dewatering	
CalMat (Gravel washing)	2,331	Auto Stiegler (Charged to Los Angeles' water rights)	37
Sears, Roebuck and Company (Air Conditioning)	221	First Financial Plaza Site (Charged to Los Angeles' water rights)	53
Sportsmen's Lodge	0	Trillium Corporation (Charged to Los Angeles' water rights)	31
Toluca Lake Property Owners Ass'n (Lake overflows to LA River)	0	Metropolitan Transportation Agency (Charged to Basin Account)	588
Walt Disney Productions (3 wells inactive/Not abandoned)	0	Metropolitan Water District (MWD) (Charged to Los Angeles' water rights)	184
		MWD Sepulveda Feeder Pipeline (Charged to Los Angeles' water rights)	6
		Walt Disney Riverside Building (Charged to Los Angeles' water rights)	526
Total	**2,552**	**Total**	**1,425**
Groundwater Cleanup		**Physical Solution**	
Burbank GAC (GAC restart charged to Basin Account)	36	Angelica Healthcare Services (Well Abandoned 12/97)	0
Lockheed-Burbank Operable Unit (Well Development charged to Basin Account)	478	CalMat (10% applied to evaporative loss=286; Amount in excess of 90/10=239)	525
Hughes (Charged to Los Angeles' water rights)	7	Forest Lawn Cemetery Assn. (Charged to Glendale's water rights)	274
Mobil Oil Corporation (Charged to Los Angeles' water rights)	1	Sportsmen's Lodge (Charged to Los Angeles' water rights)	0
Philips Components (Recharged to groundwater)	22	Toluca Lake Property Owners Ass'n (Charged to Los Angeles' water rights)	30
Rockwell International (Charged to Los Angeles' water rights)	105	Valhalla Memorial Park (Charged to Burbank's water rights)	281
3M-Pharmaceutical (Recycled for on-site use)	37	Middle Ranch (deMille) (Charged to Los Angeles' water rights)	32
Total	**686**	**Total**	**1,142**
Total Extractions	**5,804**		

2.6 Imports and Exports of Water

Residential, commercial, and industrial expansions in ULARA have required the importation of additional water supplies to supplement that provided by the groundwater basins.

The imported supplies to ULARA are from the Los Angeles Aqueducts and the MWD. Los Angeles Aqueduct water consists of runoff from the Eastern Sierra Nevada and groundwater from the Owens Valley. The MWD supplies consist of State Water Project and Colorado River Aqueduct waters.

Exports from ULARA include imported Los Angeles Aqueduct and MWD waters (pass-through), and groundwater from the SFB. Exports of wastewater are by pipeline to Hyperion Treatment Plant.

Table 2-6 summarizes the nontributary imports and exports from ULARA during the 1996-97 and 1997-98 Water Years, and Figure 2.3 shows the monthly extractions and imports.

FIGURE 2.3 - TOTAL MONTHLY EXTRACTIONS AND GROSS IMPORTS

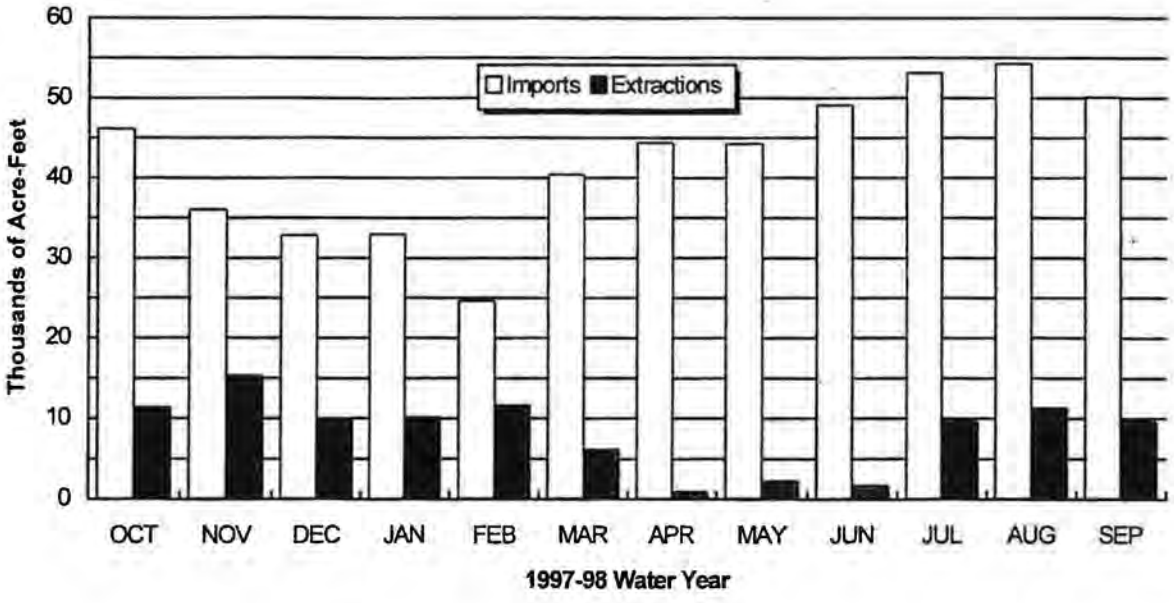


TABLE 2-6: ULARA NONTRIBUTARY WATER IMPORTS AND EXPORTS

(acre-feet)

Source and Agency	Water Year 1996-97	Water Year 1997-98
Gross Imported Water		
Los Angeles Aqueduct		
City of Los Angeles	451,048	401,665
MWD Water		
City of Burbank	10,525	16,972
Crescenta Valley Water District	1,811	1,244
City of Glendale	28,061	25,685
City of Los Angeles[1]	34,297	51,204
La Canada Irrigation District[1]	1,173	990
Las Virgenes Municipal Water District[1]	6,624	5,351
City of San Fernando	316	0
Total	**82,807**	**101,446**
Grand Total	**533,855**	**503,111**
Exported Water (Pass-Through)		
Los Angeles Aqueduct		
City of Los Angeles	203,909	196,250
MWD water		
City of Los Angeles	13,823	23,620
Total	**217,732**	**219,869**
Net Imported Water	**316,123**	**283,242**

1. Deliveries to those portions of these Districts that are within ULARA.

2.7 Water Recycling

Water recycling presently provides a source of water for irrigation, industrial, and recreational uses. In the future, water recycling will provide water for groundwater recharge within the Hansen, Headworks and Pacoima Spreading Grounds. Six wastewater reclamation plants are in operation in ULARA. The Las Virgenes Municipal Water District operates a water recycling facility outside ULARA but uses part of the treated water in ULARA. The ultimate goal of the City of Los Angeles East Valley Water Recycling Project is to use up to 35,000 acre-feet/year of reclaimed water from the Donald C. Tillman Water Reclamation Plant for groundwater recharge in the SFB. Table 2-7 summarizes the 1997-98 reclamation plant operations, and Plate 6 shows their location.

TABLE 2-7: WASTEWATER RECYLCING OPERATIONS

(acre-feet)

Plant/Agency	Treated Water	Water Discharged to L.A. River	Water Discharged to Hyperion	Recycled Water
City of Burbank	8,365	6,458	3,884	1,744 [1]
Los Angeles-Glendale	22,444	16,127	2,477	3,507 [2]
Donald C. Tillman	77,691	65,610	11,465	616 [3]
Indian Hills Mobile Homes	---	---	---	20 [4]
The Independent Order of Foresters	79	0	0	79 [4]
Rocketdyne (Canoga Park)	N/A	N/A	N/A	N/A [5]
Las Virgenes MWD	---	0	0	945 [6]
Total	**108,579**	**88,195**	**17,826**	**6,912**

1. Of the total recycled water (1,744.49 AF), 1,352.5 AF was delivered to the Burbank power plant. Of that, 270.5 AF is for cooling and 1,082 AF is for discharge to the Los Angeles River. Half of the water for cooling is also included in the "river discharges" column. 391.99 AF was used by CalTrans, DeBell Golf Course and other landscape irrigation.
2. Of the total recycled water (3,507 AF), 745 AF was delivered to Glendale for use in Glendale's Phosphate Plant and for irrigation water for CalTrans, Forest Lawn and Brand Park; 339 AF was for in plant use; 901 AF was delivered to Griffith Park by Los Angeles for irrigation; and 862 AF was used by CalTrans, Lake Side, Sinai Memorial Park, Forest Lawn 2, and Universal City MCA for irrigatio; 661 was in plant use.
3. Recycled water was for in plant use and then discharged to the Los Angeles River.
4. Recycled water is used for irrigation.
5. Rocketdyne: Treated water is reused within the facility.
6. Portion of recycled water is used within ULARA for irrigation.

2.8 Water Level Elevations

The 1999 contour maps for the Spring (April) and the Fall (September) were produced by using the SFB Groundwater Flow Model. The SFB model was initially developed during the RI study of groundwater contamination in the San Fernando Valley. The RI study was funded through the EPA's Superfund program.

The model is comprised of up to four layers, in the deepest portion of the eastern SFB, and includes 22,016 cells, ranging in size from 1,000 by 1,000 feet to 3,000 by 3,000 feet. The model parameters were calibrated by matching the simulated hydraulic-head fluctuations with the historical water level fluctuations measured at selected key monitoring wells for a 10-year period. The 1998 contours were simulated by incorporating the estimated monthly recharge (e.g. spread water, precipitation, etc.) and discharge (groundwater extractions, rising groundwater, etc.) values for the 1997-98 Water Year. The model was then run for twelve consecutive stress periods beginning October 1997 through September 1998. The simulated head values at the end of the April and September stress periods were then plotted by utilizing a groundwater contour software package.

The simulated Spring and Fall 1998 Groundwater Contour Maps are shown as Plates 11 and 12. These contours are intended to depict the general trend of groundwater flow for April and September of 1998. Up-to-date groundwater elevations for specific locations can be obtained by contacting the Watermaster's Office at (213) 367-0921 or (213)-367-1020.

Plate 13 exhibits the change in groundwater elevation from the Fall of 1997 to the Fall of 1998. The rise in groundwater levels in the north portion of the SFB, specifically near the Hansen Spreading Grounds, is attributed to the large volume of Native runoff water spread at the Hansen, Pacoima, and Tujunga Spreading Grounds (61,119 AF), as compared to the long-term average of 30,755 AF.

The 10 to 30 foot increase in groundwater levels near the Rinaldi-Toluca, North Hollywood and Burbank well field areas is primarily due to decreased groundwater extractions. Overall SFB extractions decreased 11 percent from 1996-97 to 1997-98 (105,900 acre-feet to 94,700 acre-feet). More specifically the decrease in extractions were by well field: Rinaldi-Toluca: 11,000 acre-feet, North Hollywood: 1,000 acre-feet, and Burbank/Lockheed; 7,500 acre-feet. Plate 14 exhibits groundwater flow directions and estimated groundwater veocities. Figure 2.4 shows historic well hydrographs of wells throughout ULARA and their locations.

2.9 Groundwater Storage

San Fernando Basin

The total groundwater storage capacity of the SFB was estimated in the Report of Referee to be approximately 3,200,000 acre-feet, of which a regulatory storage capacity of 360,000 acre-feet is required by the Judgment.

The estimated change in groundwater storage for 1997-98 is +44,113 acre-feet (Table 2-8). From the start of safe yield operation in the Fall of 1968 through Fall of 1998, the amount of groundwater in storage has increased by +270,362 acre-feet. However, during the 1968-98 period there has been an accumulation of 420,593 acre-feet of stored water credit through spreading and in-lieu activities of the parties. Such groundwater can be extracted at any time by the credited parties in excess of normal pumping rights. If this water were to be removed, the cumulative change in storage since October 1, 1968 would be (–150,231) acre-feet.

An annual comparison is made between the hydrologic conditions of the water year and change in groundwater storage. Table 2-8 summarizes the annual precipitation and change in storage from 1968-69 through 1997-98. Plate 15 shows the cumulative change in storage from Fall 1928 to the present.

Sylmar Basin

The groundwater storage capacity of the Sylmar Basin is approximately 310,000 acre-feet. The estimated change in groundwater storage for 1997-98 is (–2,370) acre-feet, and the cumulative change in groundwater storage from 1968-69 through 1997-98 is (–1,228) acre-feet

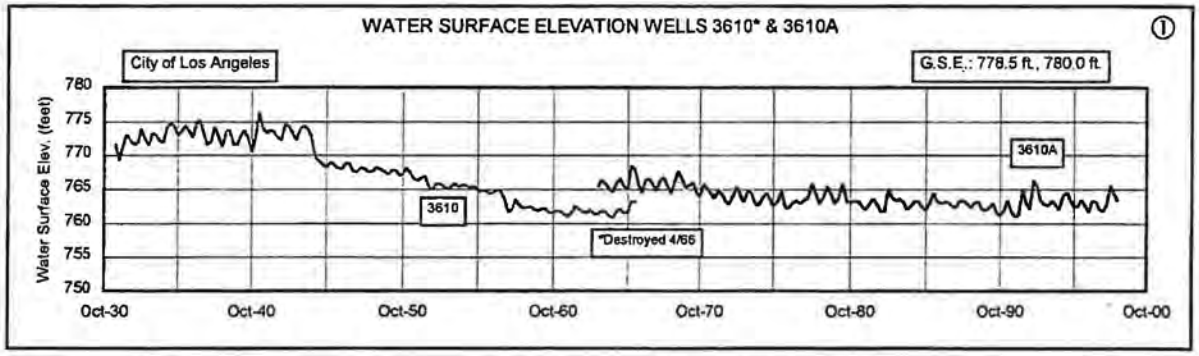
Verdugo Basin

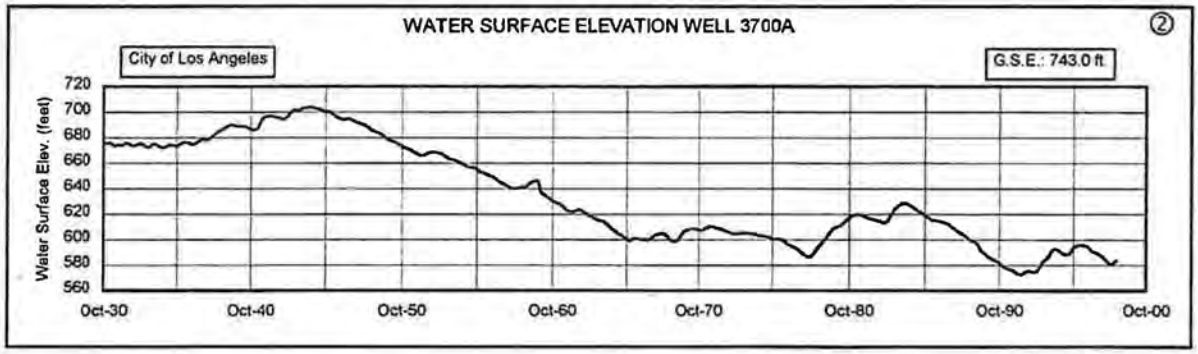
The groundwater storage capacity of the Verdugo Basin is approximately 160,000 acre-feet. The estimated change in groundwater storage for 1997-98 is +1,825 acre-feet, and the cumulative change in storage from 1968-69 through 1997-98 is (–5,500) acre-feet.

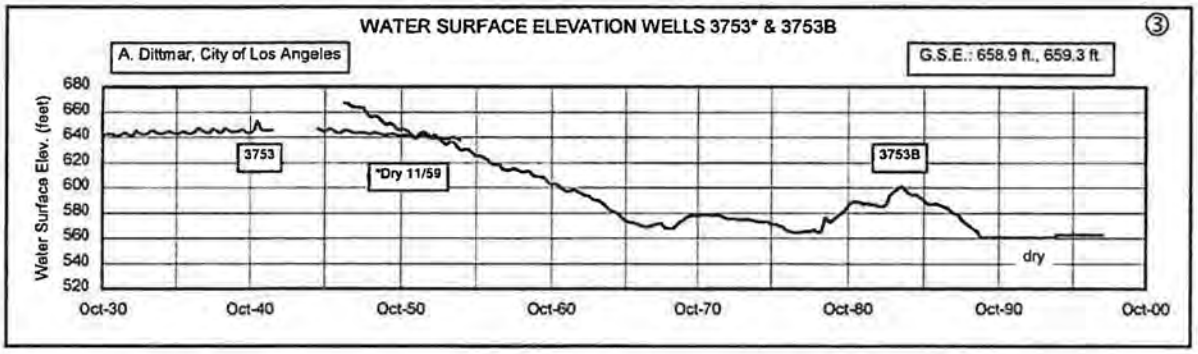
Eagle Rock Basin

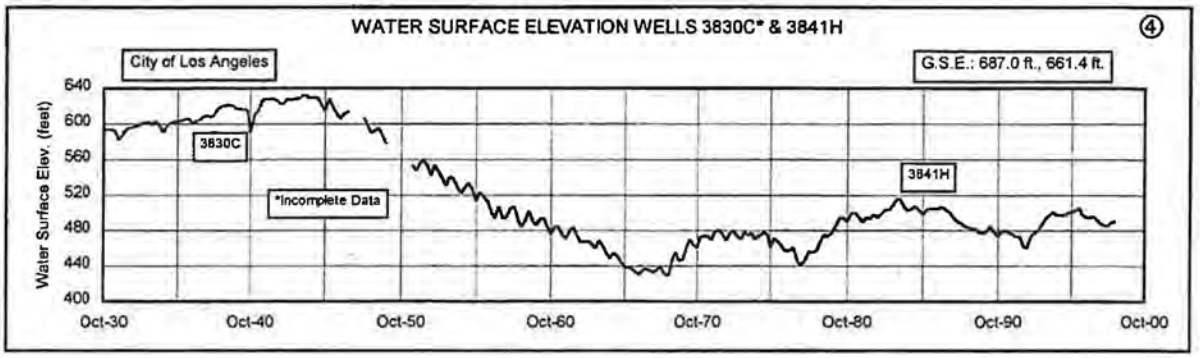
The estimated change in groundwater storage is (–16) acre-feet.

SAN FERNANDO BASIN

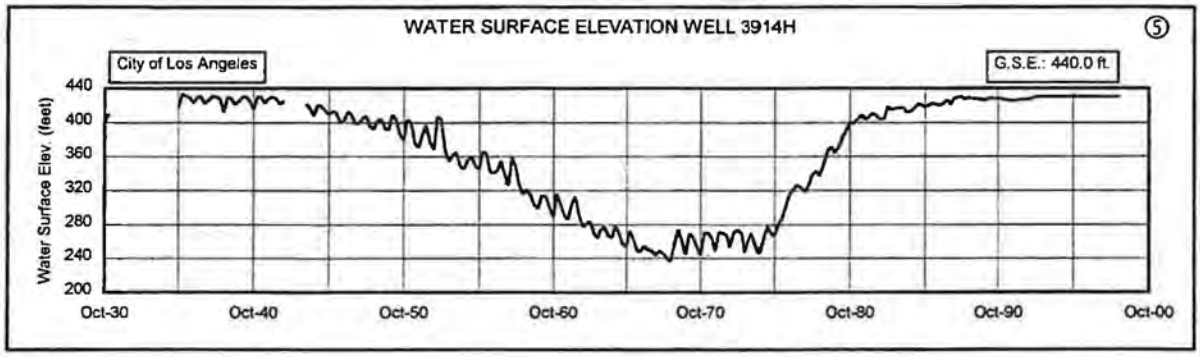


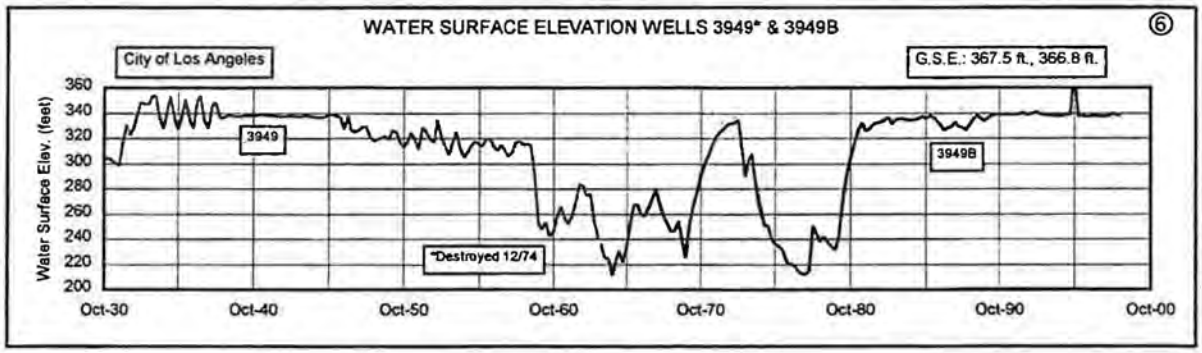


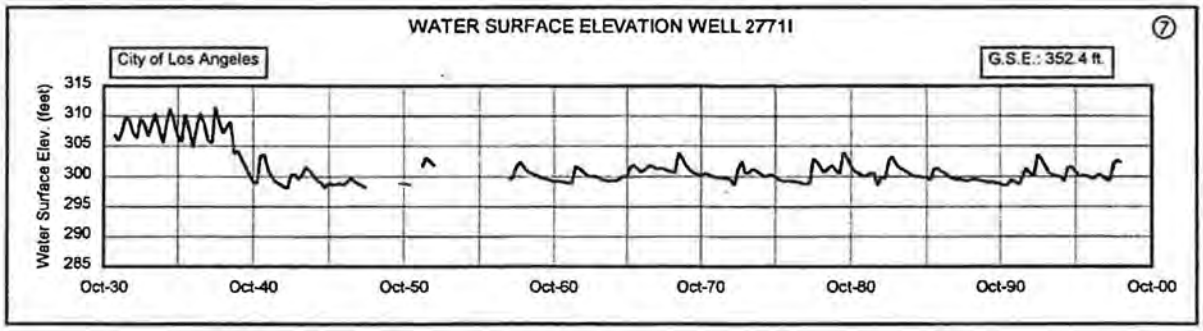




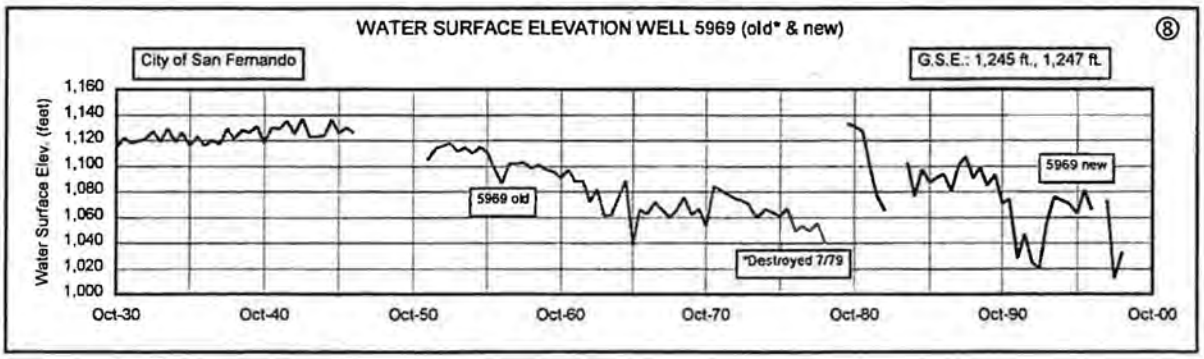
SAN FERNANDO BASIN



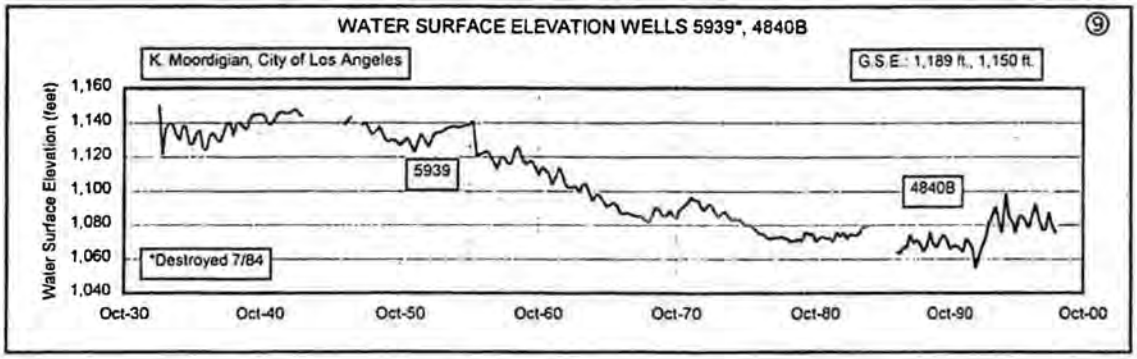




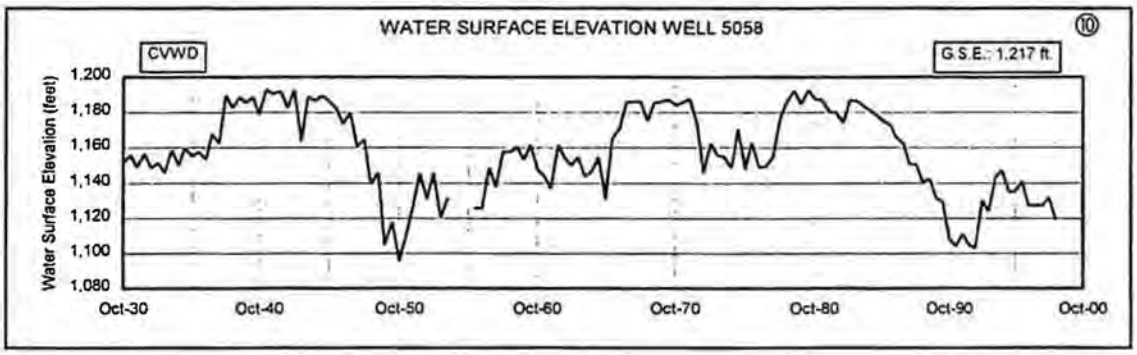
SYLMAR BASIN



SYLMAR BASIN



VERDUGO BASIN



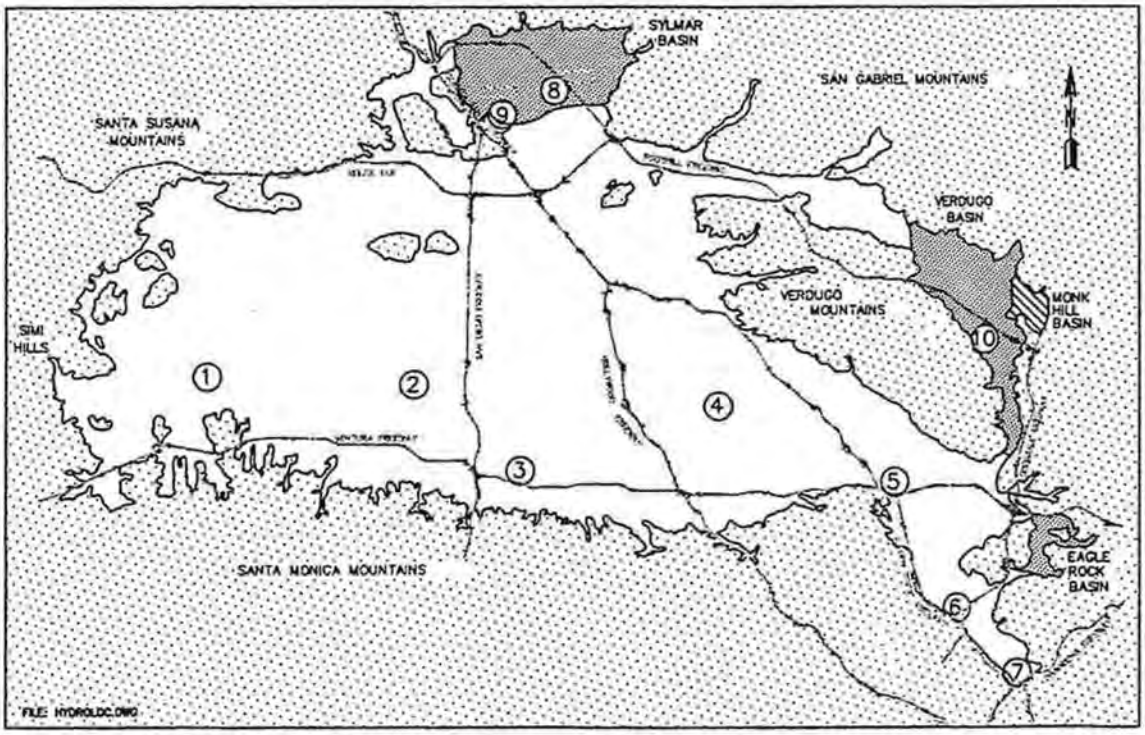


FIGURE 2.4: HYDROGRAPHS AND LOCATIONS OF WELLS THROUGHOUT ULARA

2.10 Water Supply and Disposal - Basin Summaries

Tables 2-9A, 2-9B, 2-9C, and 2-9D summarize water supply and disposal in the San Fernando, Sylmar, Verdugo, and Eagle Rock Basins, respectively. The Watermaster made computations of subsurface outflows based on similar computations made by the State Water Rights Board in the Report of Referee.

2.11 Extraction Rights and Stored Water Credit - Basin Summaries

San Fernando Basin

Tables 2-10A and 2-11A show the calculation of SFB extraction rights for the 1998-99 Water Year and stored water credit (as of October 1, 1998) for the Cities of Burbank, Glendale, and Los Angeles. All rights are based on the Judgment.

Sylmar Basin

Tables 2-10B and 2-11B show the calculation of Sylmar Basin extraction rights for the 1998-99 Water Year and stored water credit (as of October 1, 1998) for the Cities of Los Angeles and San Fernando. All rights are based on the March 22, 1984 stipulation between the City of San Fernando and the City of Los Angeles (filed with the Superior Court) and the action by the Administrative Committee based on the Watermaster's evaluation and recommendation on July 16, 1996 to increase the safe yield from 6,210 acre-feet per year to 6,510 acre-feet per year.

TABLE 2-8: CHANGE IN GROUNDWATER STORAGE SAN FERNANDO BASIN

Water Year	Valley Floor Precipitation (in)	Change in Storage (acre-feet)	Cumulative Change in Storage (acre-feet)	Pumping (acre-feet)
1997-98	37.04	44,113	270,362	94,682
1996-97	15.17	(35,737)	226,249	105,899
1995-96	12.03	(49,223)	261,986	82,862
1994-95	33.36	79,132	311,209	58,121
1993-94	10.19	(22,238)	232,077	62,990
1992-93	36.62	106,317	254,315	36,419
1991-92	30.05	411	147,998	76,213
1990-91	14.38	(14,122)	147,587	71,065
1989-90	8.20	(29,941)	161,709	81,466
1988-89	9.12	(30,550)	191,650	127,973
1987-88	18.62	(5,000)	222,200	105,470
1986-87	5.99	(31,940)	227,200	91,632
1985-86	20.27	(7,980)	259,140	86,904
1984-85	11.00	(31,690)	267,120	101,591
1983-84	9.97	(63,180)	298,810	115,611
1982-83	39.64	121,090	361,990	68,394
1981-82	17.18	(530)	240,900	84,682
1980-81	11.04	(32,560)	241,430	92,791
1979-80	30.25	99,970	273,990	58,915
1978-79	21.76	78,080	174,020	59,843
1977-78	35.43	136,150	95,940	66,314
1976-77	14.19	(50,490)	(40,210)	125,445
1975-76	9.90	(30,090)	10,280	103,740
1974-75	14.74	(22,580)	40,370	95,830
1973-74	15.75	(21,820)	62,950	88,017
1972-73	20.65	17,020	84,770	82,004
1971-72	8.10	(17,090)	67,750	84,140
1970-71	15.57	15,340	84,840	79,010
1969-70	10.50	(9,740)	69,500	88,856
1968-69	29.00	79,240	79,240 [1]	84,186
30 Year Average	**18.86**	**9,012**		**85,369**

1. Assumes storage as of October 1, 1968, to be zero.

TABLE 2-9A: SUMMARY OF 1997-98 WATER SUPPLY AND DISPOSAL SAN FERNANDO BASIN

Water Source and Use	Burbank	Glendale	Los Angeles	San Fernando	All Others	Total
Extractions						
Municipal Use	3,450	28	85,291	—	108	88,877
Basin Account		0	0	—	1,102	1,102
Physical Solution	281 [1]	274 [1]	—	—	587	1,142
Cleanup/Dewaterers	—	—	—	—	1,009	1,009
Non-consumptive Use	—	—	—	—	2,552	2,552
Total	**3,731**	**301**	**85,291**	**0**	**5,358**	**94,682**
Imports						
LA Aqueduct Water	—	—	401,665	—	—	401,665
MWD Water (25+35)[3]	16,972	25,685	49,014	0	5,351 [2]	97,022
Groundwater from Sylmar Basin	—	—	3,642	3,010	—	6,653
Total	**16,972**	**25,685**	**454,321**	**3,010**	**5,351**	**505,340**
Reclaimed Water Use	1,744	1,085	3,039	0	1,044	6,912
Exports						
LA Aqueduct Water out of ULARA (SPB)	—	—	205,007	—	—	205,007
MWD Water (25+35) out of ULARA (SPB)	—	—	24,708	—	—	24,708
to Verdugo Basin	—	1,435		—	—	1,435
Groundwater	—	—	78,244	—	—	78,244
Total	**0**	**1,435**	**307,959**	**0**	**0**	**309,394**
Delivered Water						
Hill & Mountain Areas	—	—	43,576	—	—	43,576
Total - All Areas	22,447	25,636	234,692	3,010	11,753	297,539
Water Outflow						
Surface (Sta. F-57C-R)	—	—	—	—	—	346,700
Subsurface	—	—	—	—	—	404
Sewage	3,884	19,881	77,691	2,035	—	103,490
Reclaimed Water to the LA River	6,458	—	—	—	—	6,458
Total	**10,342**	**19,881**	**77,691**	**2,035**	**0**	**457,052**

1. Includes Valhalla (Burbank) and Forest Lawn (Glendale)

2. Las Virgenes Municipal Water District.

3. 25 and 35 are MWD connections to the DWP system.

TABLE 2-9B: SUMMARY OF 1997-98 WATER SUPPLY AND DISPOSAL SYLMAR BASIN

(acre-feet)

Water Source and Use	City of Los Angeles	City of San Fernando	All Others	Total
Total Extractions	3,642	3,308	[1]	6,950
Imports				
LA Aqueduct Water	7,537	–	–	7,537
MWD Water	932	0	–	932
Total	**8,468**	**0**	**0**	**8,468**
Exports - Groundwater				
San Fernando Basin	3,642	3,010	0	6,653
Total Delivered Water	8,468	298	0	8,766
Water Outflow				
Subsurface	460 [2]	–	–	460
Sewage	830 [3]	200	–	1,030
Total	**1,290**	**200**	**0**	**1,490**

1. Pumping for landscape irrigation by Santiago Estates.
2. Estimated in the Report of Referee.
3. Estimated.

TABLE 2-9C: SUMMARY OF 1997-98 WATER SUPPLY AND DISPOSAL VERDUGO BASIN

(acre-feet)

Water Source and Use	Crescenta Valley Water District	City of Glendale	La Canada Irrigation District	City of Los Angeles	Total
Total Extractions	3,747 [1]	2,820	0	—	6,567
Imports					
LA Aqueduct Water	—	—	—	634	634
MWD Water	1,244	1,435	990	78	3,748
Total	1,244	1,435	990	712	4,382
Exports	0	0	0	0	0
Total Delivered Water	4,991	4,255 [2]	990	712	10,949
Water Outflow					
Subsurface to:					
Monk Hill Basin	—	—	—	—	300 [3]
San Fernando Basin	—	—	—	—	70 [3]
Sewage	1,750	1,138	0	190 [3]	3,078
Total	**1,750**	**1,138**	**0**	**190**	**3,448**

1. Administrative Committee and Watermaster approval (10/97), on a temporary basis, that CVWD may pump in excess of its prescriptive rights until the City of Glendale is able to pump its complete prescriptive right (Appendix G).
2. Verdugo Basin metered sales x 105%.
3. Maximum with high groundwater levels (Report of Referee).

TABLE 2-9D: SUMMARY OF 1997-98 WATER SUPPLY AND DISPOSAL EAGLE ROCK BASIN

(acre-feet)

Water Source and Use	City of Los Angeles	Deep Rock Water Company	McKesson Water Products Co.	Total
Total Extractions	0	0 [1]	200 [1]	200
Imports				
LA Aqueduct Water	587	–	–	587
MWD Water (25+35)	78			78
MWD Water (17)	2,190	–	–	2,190
Groundwater from SFB	1,056			1,056
Total	**3,911**	**0**	**0**	3,911
Exports				
Groundwater	0	0	0	0
Total Delivered Water	3,911	0	200	4,112
Water Outflow				
Surface	–	–	–	0
Subsurface	0 [2]	–	–	0
Sewage	1,940 [3]	0	0	1,940

1. Deep Rock Water Co. (currently Hinkle-Schmidt) and McKesson Water Products Co. (formerly Sparkletts Drinking Water Co.) are allowed to pump under a stipulated agreement with The City of Los Angeles; extractions are limited to 500 AF/year, and they are allowed to export equivalent amounts.
2. Estimated in Supplement No. 2 to Report of Referee for dry years 1960-61. Currently considered insignificant.
3. Estimated.

TABLE 2-10A: CALCULATION OF 1998-99 EXTRACTION RIGHTS SAN FERNANDO BASIN

(acre-feet)

	City of Burbank	City of Glendale	City of Los Angeles
Total Delivered Water, 1997-98	22,447	25,636	234,693
Water Delivered to Hill and Mountain Areas, 1997-98	—	—	43,576
Water Delivered to Valley Fill, 1997-98	22,447	25,636	191,117
Percent Recharge Credit	20.0%	20.0%	20.8%
Return Water Extraction Right	4,489	5,127	39,752
Native Safe Yield Credit	—	—	43,660
Total Extraction Right for the 1998-99 Water Year[1,2]	**4,489**	**5,127**	**83,412**

1. Does not include stored water credit.
2. Los Angeles' delivered water partially estimated. This will be adjusted next year.

TABLE 2-10B: CALCULATION OF 1998-99 EXTRACTION RIGHTS SYLMAR BASIN

(acre-feet)

	City of Los Angeles	City of San Fernando	All Others
Extraction Right for the 1998-99 Water Year[1]	3,255	3,255	— [2]

1. Does not include stored water credit. The safe yield of the Sylmar Basin has been increased on a trial basis to 6,510 AF/YR effective 10/1/95. Effective October 1, 1984 safe yield less pumping by one overlying party is equally shared by Los Angeles and San Fernando.
2. Santiago Estates (Home Owners Group) is no longer pumping. Backflow valve has been removed and pipe capped.

TABLE 2-11A: CALCULATION OF STORED WATER CREDIT SAN FERNANDO BASIN

(acre-feet)

	City of Burbank	City of Glendale	City of Los Angeles
1. Stored Water Credit (as of October 1, 1997)	56,297	59,776	296,630
2. Extraction Right for the 1997-98 Water Year	4,977	5,508	88,247
3. 1997-98 Extractions			
Party Extractions	3,450	28	85,291
Physical Solution Extractions	281	273	587
Clean-up/Dewaterers			1,009
Total	3,731	301	86,887
4. Total 1997-98 Spread Water	0	0	77
5. Stored Water Credit[1] (as of October 1, 1998)	**57,543**	**64,983**	**298,067**

1. Item 5 = 1 + 2 - 3 + 4

TABLE 2-11B: CALCULATION OF STORED WATER CREDIT SYLMAR BASIN

(acre-feet)

	City of Los Angeles	City of San Fernando
1. Stored Water Credit (as of October 1, 1997)	4,758	2,312
2. Extraction Right for the 1997-98 Water Year[1]	3,255	3,255
3. Total 1997-98 Extractions	3,642	3,303
Santiago Estates[2]	0.0	0.0
4. Stored Water Credit[3] (as of October 1, 1998)	**4,371**	**2,264**

1. The safe yield of the Sylmar Basin has been increased on a trial basis to 6,510 AF/YR as of 10/1/95.
2. Santiago Estates pumping is equally taken from the rights of San Fernando and Los Angeles. Santiago Estates has capped this well.
3. Item 4 = 1 + 2 - 3

3. WATER QUALITY, TREATMENT, AND REMEDIAL INVESTIGATION ACTIVITIES

3. WATER QUALITY, TREATMENT, AND REMEDIAL INVESTIGATION ACTIVITIES

3.1 Water Quality

Imported Water

1. *LOS ANGELES AQUEDUCT* water is sodium bicarbonate in character and is the highest quality water available to ULARA. Its Total Dissolved Solids (TDS) concentration averaged about 210 milligrams per liter (mg/L) for 30 years before 1969. The highest on record was 320 mg/L on April 1, 1946. TDS concentration on May 6, 1998, was 230 mg/L.

2. *COLORADO RIVER* water is predominantly sodium-calcium sulfate in character, changing to sodium sulfate after treatment to reduce total hardness. Samples taken at the Burbank turnout between 1941 and 1975 indicated a high TDS concentration of 875 mg/L in August 1955 and a low of 625 mg/L in April 1959. The average TDS concentration over the 34-year period was approximately 740 mg/L. Tests conducted at Lake Matthews showed an average TDS concentration of 597 mg/L for the 1997-98 Fiscal Year.

3. *NORTHERN CALIFORNIA* water (State Water Project) is sodium bicarbonate-sulfate in character. It generally contains less TDS and is softer than local and Colorado River water. Since its arrival in Southern California in April 1972, the water has had a high TDS concentration of 410 mg/L and a low of 247 mg/L. Tests conducted at the Joseph Jensen Filtration Plant showed an average TDS concentration of 292mg/L during the 1997-98 Fiscal Year.

4. *COLORADO RIVER/NORTHERN CALIFORNIA* water were first blended at Weymouth Plant in May 1975. Blending ratios vary, and tests are taken from the effluent. Tests conducted at the Weymouth Plant showed an average TDS concentration of 542 mg/L during the 1997-98 Fiscal Year.

Surface Water

Surface runoff contains salts dissolved from rocks in the tributary areas and is sodium-calcium, sulfate-bicarbonate in character. The most recent tests taken in September 1995 from flows in the Los Angeles River at the Arroyo Seco showed a TDS concentration of 667 and a total

hardness of 270 mg/L. These values also reflect the inclusion of rising groundwater in the Los Angeles River reach between Los Feliz Blvd. and Gage F-57C-R.

Groundwater

Groundwater in ULARA is moderately hard to very hard. The character of groundwater from the major water-bearing formations is of two general types, each reflecting the composition of the surface runoff in the area. In the western part of ULARA, it is calcium sulfate-bicarbonate in character, while in the eastern part, including Sylmar and Verdugo Basins, it is calcium bicarbonate in character.

Groundwater is generally within the recommended limits of the California Title 22 Drinking Water Standards, except for: 1) areas of the eastern SFB where high concentrations of TCE, PCE, and nitrates are present; 2) wells in the western end of the SFB having excess concentrations of sulfate; and 3) areas throughout the Verdugo Basin that have abnormally high concentrations of nitrate. In each area the groundwater delivered is either being treated or blended in order to meet State Drinking Water Standards.

A history of the TDS content and mineral analyses of imported, surface, and groundwater is contained in Appendix D.

3.2 Groundwater Quality Management Plan

During the 1997-98 Water Year, the Interagency Coordinating Committee continued to implement the recommendations of the "Groundwater Quality Management Plan - San Fernando Valley Basins" issued in July 1983. The objective of this effort is to protect and upgrade the quality of stored water held in ULARA. Special emphasis is placed on monitoring and removing the organic contaminants TCE and PCE found in the groundwater. Table 3-1 summarizes the number of ULARA wells that are contaminated at the indicated levels above the Maximum Contaminant Level (MCL) of the California Drinking Water Standards of 5 micrograms per liter (µg/L) for TCE and 5 µg/L for PCE.

TABLE 3-1: 1997-98 NUMBER OF WELLS IN THE ULARA WELL FIELDS EXCEEDING STATE MCL FOR TCE AND PCE

	Number of Wells Exceeding Contaminant Level[1]													
	City of Los Angeles[3]									Sub-	Others			Grand
Total Number of	NH	RT	P	HW	E	W	TJ	V	AE	Total	B	G	C	Total
Wells in Well Field[2]	37	15	3	6	9	10	12	9	7	108	10	15	11	144
TCE Levels µg/L														
5-20	8	4	0	0	3	4	5	3	0	27	0	3	0	30
20-100	5	0	3	5	0	3	0	1	6	23	5	4	0	32
>100	4	0	0	1	0	0	0	0	1	6	4	2	0	12
Total	17	4	3	6	3	7	5	4	7	56	9	9	0	74
PCE Levels µg/L														
5-20	6	0	0	3	0	1	0	1	5	16	1	2	1	20
20-100	2	0	3	1	0	0	0	0	1	7	4	0	0	11
>100	0	0	0	0	0	0	0	0	0	0	4	0	0	4
Total	8	0	3	4	0	1	0	1	6	23	9	2	1	35

1. Wells are categorized based upon maximum TCE and PCE values attained during the 1997-98 Water Year; where data was not available for 1997-98, data from the most recent water year was used. No data was available for some old inactive wells.
2. Includes active, inactive, and stand-by wells.

3.3 Underground Tanks, Sumps, and Pipelines

The City of Los Angeles Fire Department (LAFD) continues to implement the State-mandated Underground Storage Tank Program (UST) and is actively conducting a program to bring the large number of underground tanks in the San Fernando Valley into compliance with current law. During the 1997-98 Water Year, a total of 301 sites were remediated under the direction of the LAFD.

The main focus of the LAFD UST in ULARA has been the monitoring and removal of gasoline, diesel, and their related constituents from the soils, in order to prevent contamination of the underlying groundwater. If a site investigation indicates contamination, the site is referred to the RWQCB for further action. Since October 1, 1988, 3,214 sites have been assigned to the Underground Tank Plan Check Unit, and of these, 1,699 have been remediated. In addition, 960 sites have been referred to the RWQCB. Currently, the Environmental Unit of the LAFD is monitoring the remediation of 555 sites.

3.4 Private Sewage Disposal Systems (PSDS)

In order to eliminate existing commercial and industrial PSDS and their discharges of wastewater to the groundwater basin, a sanitary sewer construction program has been in progress for many years. This program is continuing to systematically install sanitary sewers in eighteen designated areas throughout the San Fernando Valley. At the end of the 1997-1998 Water Year, a total of twelve areas have had construction completed. Plate 8 shows the locations of the Districts.

The sewer construction program ordered by the Los Angeles City Council was affected through Assessment Act provisions. Proposition 218, approved by the electorate on November 5, 1996, will require a weighted majority mail-in ballot of property owners for any new or increased assessments. The passage of Proposition 218 and continued downsizing of the workforce of the City of Los Angeles has impeded the sewer construction program for the remaining six areas.

The Industrial Waste Management Division of the Bureau of Sanitation continued to pursue the enforcement aspect to the PSDS elimination program. There has been good compliance with the mandatory sewer hook-up ordinance, and more than 2,025 properties have already abandoned PSDS and connected to the public sewer. Continuation of this effort depends upon completion of the sanitary sewer construction program.

During the 1997-98 Water Year, a group of 7 owners of PSDS received the Final Reminder Notices to discontinue use of their PSDS and connect to newly constructed sanitary sewers.

3.5 Landfills

The Solid Waste Assessment Test (SWAT) reports for major SWAT Rank 1 to 4 landfills in the Los Angeles area have been completed and submitted to the RWQCB for approval. The reports reviewed by the RWQCB are listed in Table 3-2.

TABLE 3-2: LANDFILLS WITH SWAT INVESTIGATIONS

(reported to Interagency Coordinating Committee)

Name	Rank	Status	Current Owner	Location	SWAP Report Completed	Final SWAT Submitted	Phase II SWAT Req.	Approved by RWQCB	Site Leak (1)	Type of Emission (2)	Further Monitoring
Bradley West	1	Open	WMDSC	Sun Valley, SE of Sheldon St	6/87	11/90		4/92	G	NHA (I/O)	3
Sheldon-Arleta	1	Closed	City of Los Angeles Bureau of Sanitation	Sun Valley District near Hollywood & Golden State Fwys	5/87	5/87		2/90			4
Scholl Canyon	1	Open	City of Glendale	San Rafael Hills, 1 mile West of Rose Bowl	7/87	4/88		8/90	G	NHA (I/O)	3
Scholl Canyon	2	Closed	City of Glendale	San Rafael Hills, 1 mile West of Rose Bowl	7/87	1/91		12/93			5
Bradley East	2	Closed	WMDSC	SE of Sheldon St	6/87	11/90		4/92	G	NHA (I/O)	4, 8
Bradley West Extension	3	Open	WMDSC	Near Canyon Blvd & Sheldon St	7/88	7/89		4/92	G	Inert Site	4, 8
Sunshine Cyn. LA City	2	Closed	Browning - Ferris Industries	SE Santa Susana Mtns W of Golden State Fwy	7/88	7/89		4/94			6
Sunshine Cyn. LA County	2	Open	Browning - Ferris Industries	SE Santa Susana Mtns W of Golden State Fwy	7/88	7/89		4/94			6
Gregg Pit/Bentz	2	Closed	CalMat Properties	Between Pendleton St & Tujunga Ave	7/89	7/89		2/90	G	NHA	4
Branford	2	Closed	City of Los Angeles Bureau of Sanitation	Sun Valley District, NW of Tujunga Wash	7/88	10/90	X				5
CalMat (Sun Valley #3)	2	Open	CalMat Properties	Sun Valley District, NE of Glenoaks Blvd	7/88	11/90		6/92	N		7
Lopez Canyon	2	Closed	City of Los Angeles Bureau of Sanitation	N of Hansen Dam near Lopez and Kagel Cyn	6/88	6/88	X				6
Toyon Canyon	2	Closed	City of Los Angeles Bureau of Sanitation	Griffith Park	6/88	3/89		4/91	L	NHA (I/O)	4, 8
Tuxford Pit	2	Closed	Aadlin Bros (LA By-Products Co.)	Sun Valley District, SW of Golden State Fwy & Tujunga Ave	6/88	12/90		6/92			4, 8
Penrose	2	Closed	Los Angeles (LA By-Products Co.)	N of Strathern St, Tujunga Ave	6/88	7/89		9/89	G	NHB (I/O)	4
Newberry	3	Closed	Los Angeles (LA By-Products Co.)	N of Strathern St, Tujunga Ave	6/88	7/89		9/89	G	NHB (I/O)	4
Hewitt Pit	2	Closed	CalMat Properties	North Hollywood District Hollywood Fwy, Laurel	6/88	7/89		5/91	G	NHB (I)	
Pendleton St.	4	Open	DWP	Sun Valley, Pendelton St & Glenoaks Blvd	7/90	5/91		6/92	N		
Stough Park Strathern	2	Open	City of Burbank	Bel Air Drive & Cambridge Drive	6/88	12/88		4/90	G	NHA Inert Site	3

1. G – Gas, L – Liquid.
2. NHA - Non-Hazardous but above state drinking water regulatory levels
   NHB - Non-Hazardous but below state drinking water regulatory levels
   I – Inorganic, O – Organic
3. Under Chapter 15 Corrective Action Program (CAP), after completion of EMP.
4. Closed landfills with groundwater monitoring required under Chapter 15. Monitoring results are submitted to the Regional Board periodically.
5. Subject to SWAT requirements. Further monitoring may be required under Chapter 15.
6. All open landfills are required to have groundwater monitoring under Chapter 15. Monitoring results are submitted to the Regional Board quarterly.
7. Semi-annual groundwater monitoring
8. Groundwater contamination Evaluation Monitoring Program (EMP) required under chapter 15.

As stipulated by Article 5 of Chapter 15, a follow-on sampling program under an Evaluation Monitoring Plan was required for some landfills due to the presence of VOCs in the underlying groundwater.

The SWAT report of the Pendleton landfill, owned by the DWP was approved by the RWQCB. The landfill Closure Plan has been filed with the RWQCB. Closure activities are in progress.

3.6 San Fernando Valley Remedial Investigation Activities

A remedial investigation (RI) of groundwater contamination in the San Fernando Valley was initiated in July 1987 by the EPA to characterize the SFB and the Verdugo Basin and their contamination with TCE and PCE. The DWP was selected by the EPA to serve as the lead agency in conducting the RI and entered into a cooperative agreement that has provided over $21 million in federal funding to DWP since July 1987. In August 1987, the DWP selected James M. Montgomery, Consulting Engineers, Incorporated to serve as its consultant to perform various RI tasks.

The report, "Remedial Investigation of Groundwater Contamination in the San Fernando Valley," was completed in December 1992 and is a comprehensive, five-volume report that presents the findings and characterizations of the SFB and the Verdugo Basin with regard to their geology, hydrogeology, and nature and extent of contamination. The RI report also provides a description and the documentation of the SFB Groundwater Flow Model, summarizes the RI field investigation activities, and evaluates potential risks to human health and the environment. DWP and the Watermaster contributed to the review and write-up of these reports.

The SFB Groundwater Flow Model was developed as a part of the San Fernando Valley Remedial Investigation and is a comprehensive, three-dimensional, regional-scale model. A three-dimensional mass transport model has also been developed for the SFB. The model has been utilized for the EVWRP and other groundwater remediation projects to analyze the storage and physical characteristics of groundwater in the SFB.

EPA's consultant, CH2M HILL, continues to periodically sample the 87 groundwater monitoring wells that were installed as part of the RI. CH2M HILL also obtains groundwater quality and groundwater elevation data from the DWP, other municipalities, and various agencies and facilities in the San Fernando Valley to update the SFB database. CH2M HILL utilizes the data to produce contaminant plume maps.

The RI Report and semi-annual sampling reports are available for public use at the Superfund Primary Information Repositories, which are located in the following agencies' libraries: City of

Glendale, City of Burbank, DWP, California State University-Northridge, and the University of California - Los Angeles.

The DWP also maintains a current SFB database for use with the SFB flow model and generation of groundwater contour maps and contaminant plume maps. CH2M HILL forwards current groundwater quality data for incorporation into the DWP database.

3.7 Water Treatment

EPA Operable Units

The EPA is proceeding with enforcement actions against potentially responsible parties (PRPs) for the North Hollywood, Burbank, Glendale North and Glendale South OUs, which are part of the EPA's overall, long-term groundwater remediation activities in the SFB. The OUs are described below.

1. *NORTH HOLLYWOOD OU* - The North Hollywood OU was funded by the EPA and the California Department of Health Services (DHS). The facility operated satisfactorily during the 1997-1998 Water Year. A total of 686 million gallons (2,104 acre-feet) of groundwater was treated.

   The quality of air discharged to the atmosphere from the Aeration Facility was monitored on a regular basis to verify its conformance to permit requirements of the South Coast Air Quality Management District. The GAC in the off-gas adsorber was replaced in March 1998.

2. *BURBANK OU* - The Burbank OU, operated by Lockheed, removes VOCs from high nitrate groundwater and then blends it with water from the MWD for delivery to the City of Burbank. Lockheed started pumping and delivering groundwater to Burbank on January 3, 1996, pursuant to Phase I of the Consent Decree. The Burbank OU was shut down beginning December 11, 1997 to increase capacity and modify some treatment processes, and then the shut down was extended until December 12, 1998. The DHS was concerned that the operating process did not offer sufficient protection to the drinking water supply and required additional testing and restructuring of the operating system by Lockheed before it could re-permit the treatment facility. During the year long delay Burbank purchased water from MWD

3. *GLENDALE NORTH AND SOUTH OUs* – Significant progress has been made on the Glendale North and South Operable Units. The system includes four Glendale North OU wells with a capacity of 3,300 gpm and four Glendale South OU extraction wells with a capacity of 1,700 gpm. The contaminated water will be treated and then blended with MWD water at the refurbished Grandview Pump Station. Glendale will operate the facility using an operator under contract. The EPA completion date deadline is June 1999. In the future if maximum contaminant levels (MCL) are lowered and impact the operable units, the Consent Decree can be re-opened to accommodate the changed environment. A map of the project can be seen in Appendix G.

Other Treatment Facilities

1. *GLENDALE-VERDUGO PARK WATER TREATMENT PLANT (VPWTP)* - The VPWTP produces about 600 gpm. The water supply is limited at the lower end of the Verdugo Basin. Glendale continues to investigate opportunities to increase groundwater production.

2. *GLENWOOD NITRATE WATER TREATMENT PLANT* - The CVWD's Glenwood Nitrate Water Treatment Plant, which uses an ion-exchange process for nitrate removal treated a total of 453 million gallons (1,391 acre-feet) of water during the 1997-98 Water Year.

3. *POLLOCK WELLS TREATMENT PLANT* – An Open House was held for this 3,000 gpm groundwater treatment facility on March 17, 1999. The Pollock Project's focus is to reactivate the Pollock Well Field, to reduce rising groundwater flowing past gaging station F-57C-R, and to capture nearly all of the contamination upgradient of the wellfield and prevent migration of any contaminated groundwater into the Los Angeles River. The groundwater is being processed through four Liquid-Phase GAC vessels intended for VOC removal, followed by chlorinating and blending of groundwater to reduce nitrate levels. The processed water is delivered to DWP's distribution system. The tentative pumping pattern will be for a period of six months on followed by six months off.

4. *BURBANK GAC TREATMENT PLANT* - The GAC system treated 1,384 acre-feet of water from the combined pumping of Burbank Wells No. 7 and No. 15.

The facility was taken out of service beginning in October 1997 and returned to service March 1998. The treatment plant has been incorporated into Phase II of the Consent Decree (Burbank OU) between EPA, Lockheed, and Burbank. Production at the GAC may be considered as part of the designated average annual pumping goal of 9,000 gpm for the Burbank OU.

5. *HEADWORKS WELL FIELD REMEDIATION PROJECT*- The planned reactivation of the Headworks Well Field in 2002 will restore four wells in the Headworks Well Field and treat at a rate of approximately 12,000 gpm. A 1,000 gpm test was conducted this past winter using the APT Advanced Oxidation Process at Headworks Well No. 29. The environmental phase of the work was completed in 1998.

3.8 Groundwater Quality Investigations

During the 1997-98 Water Year, several groundwater contamination investigations were performed at various sites. As part of these investigations, groundwater monitoring wells have been drilled, and groundwater has been extracted for the purpose of testing or cleanup. Some of the major sites and their activities through April 1998 are summarized below:

Pacoima Area Groundwater Investigation

Little progress has been made in the Pacoima Area Groundwater investigation. The task force that had initiated a coordinated effort with the lead agency Cal-EPA DTSC, including the RWQCB, the USEPA, DWP, and the Watermaster's Office has been re-instituted to develop a faster track approach. A potential groundwater contaminant plume was identified several years ago in the Pacoima district near the intersection of the Simi Valley Freeway and San Fernando Road (Plate 7). The contaminant plume is comprised of VOCs with levels upward of 12,000 µg/L of TCE, 3,900 µg/L of PCE, and 7,600 µg/L of 1,1,1-TCA. This site is approximately 2.5 miles upgradient of DWP's Tujunga Well Field, which can supply up to 120 cfs of groundwater. DWP installed two monitoring wells downgradient of the contaminant plumes. An interim removal action plan consisting of a soil vapor extraction and an air sparging system is being considered. This past year 18 underground tanks were removed from the Holchem site revealing VOCs.

Philips Components (4561 Colorado Boulevard, Los Angeles)

Groundwater remediation, which involves extraction, air-stripping, and recharge through a trench was started in July 1988. The main contaminant is methylene chloride (MEC) which has been found in extraction well EW-1 and in a nearby monitoring well MW-19. Concentrations of MEC continue to exhibit a downward trend. During the 1997-98 Water Year, 68 acre-feet were pumped, treated, and recharged into the SFB. The TCE and PCE present in most of the monitoring wells is believed to originate off-site, to the north. The site was sold to Nichola International Co., an olive production company. Philips will continue to monitor the site. On January 26, 1998 Philips discontinued extraction and treatment of groundwater at the site after receiving a "No Further Action" letter from the RWQCB. Philips remains a PRP to the Glendale North and South OUs.

Rocketdyne Divison, Boeing North American (6633 Canoga Avenue, Canoga Park)

Contaminants at this site include chloroform, TCE, PCE, 1,1-DCE, TCA and Freon 113. There are also free-floating hydrocarbons derived from several upgradient service stations. There are 85 monitoring wells on site: 65 in the shallow zone, 14 in the upper zone, and 6 in the lower zone. Additionally, there are another 31 monitoring wells near four upgradient service stations. Nine extraction wells feed a treatment facility in the southeast portion of the property. During the 1997-98 Water Year, 105 acre-feet were pumped and treated. On May 22, 1998 Rocketdyne received a "No Further Action" designation from the RWQCB. A proposed groundwater monitoring plan to evaluate potential contaminant concentration rebound was approved by the RWQCB.

3M (Formerly Riker Lab, 19901 Nordhoff, Northridge)

The main pollutant at this site is chloroform. There has been an interim groundwater extraction and treatment system since 1988. REW-1 and REW-2 pump from the shallow zone. RMW-1 pumps from the lower water-bearing zone. There are numerous monitoring wells on the property, and off-site to the south. Treatment is by three GAC columns in series, then to an on-site holding tank. The pumping rate of the three wells is demand driven for the cooling tower. During the 1997-98 Water Year, 37 acre-feet were treated. 3M has pursued options for beneficially re-using the treated groundwater. Based upon the results of the pilot-scale testing program it apppears that 4 gpm of treated groundwater, blended with city water, can be used in the cooling towers. An additional use for the treated groundwater involves supplying the dust collectors (rotoclones) on the production building with treated groundwater. Preliminary studies have shown that the rotoclones would require about 25 gpm of treated groundwater. 3M plans to implement the cooling tower and rotoclone recirculations options during the next year.

Hughes Missile Systems Company (8433 Fallbrook Avenue, Canoga Park)

The most prominent contaminant has been 1,1-DCE with lesser amounts of TCE, PCE, TCA, and 1,1-DCA. Petroleum compounds (BTEX) are found in the northwest area of the site. TDS is in excess of the Basin Plan objectives, and may not be discharged to the Los Angeles River, although the origin of the high TDS is related to the naturally occurring groundwater. As a result of the high TDS, the treatment plant effluent is stored in holding tanks, and used for on-site irrigation. Since September 1995, approximately 6,900 pounds of hydrocarbons and 500 pounds of chlorinated hydrocarbons have been removed from the soil. Due to significant decreases in contaminant concentrations, the RWQCB has approved groundwater sampling and analyses on a semiannual basis. Residual concentrations of VOCs in groundwater remain primarily along the northern boundary of the property. Portions of the facility have recently been sold and are being redeveloped for new tenants. Hughes is evaluating options to obtain approval for partial shutdown of portions of the treatment system and to focus remediation on smaller areas that remain a concern.

Marquardt (16555 Saticoy Street, Van Nuys)

Marquardt Company owns property in the San Fernando Valley that is under investigation by the DTSC to characterize the nature and extent of soil and groundwater contamination resulting from activities conducted by the company and to develop a DTSC-approved workplan for Marquardt to remediate the site. The current land use is for rocket testing and development. DTSC had detected contamination under permitted units and determined that a clean closure to background levels was not feasible. In August 1995, the DTSC agreed to permit Marquardt to perform a risk-based closure assuming that the extent of the contamination was limited to shallow soils. Over the past several years Marquardt has proceeded with different sampling ignoring the DTSC request for approved workplans that characterize the complete nature and extent of contamination in the soil and groundwater. The analysis of groundwater samples shows PCE at 8.8 µg/L and TCFM at 7.8 µg/L. The DTSC believes that the groundwater contamination is a result of Marquardt operations and recommends that Marquardt complete a groundwater investigation, under a DTSC-approved workplan, to determine the full nature and extent (lateral and vertical) of the contamination and its impact to groundwater. In March 1999 the Court ordered Marquardt to comply with the Enforcement Order for Corrective Action issued by DTSC. The Watermaster will be a part of the review team that will evaluate Marquardt's progress.

A study of Marquardt was conducted by the Watermaster, the Los Angeles DWP, Los Angeles Fire Department, DHS, RWQCB, DTSC and the USEPA. The following recommendation was offered: that Los Angeles in order to deal with future development or re-development of properties, such as Marquardt, recommends that any application for land use approvals or building permits for properties in the San Fernando Valley require that the applicant provide full disclosure of any source investigation activities with regard to site contamination. Any discovery of nondisclosure should result in a possible revocation of any permits issued for the subject property.

Taylor Yard (Narrows Area)

The remediation of the Taylor Yard of the Southern Pacific Transportation Company is under the jurisdiction of the Cal-EPA DTSC. To expedite the remediation, the Taylor Yard has been divided into two parts - active yard and sale parcel. Part of the Taylor Yard was sold to Lincoln Properties for movie industry related facilities. The active yard has two areas of contamination located in the northern and northeastern sections of the Taylor Yard. Light nonaqueous phase liquids, approximately 6 inches deep, are perched at a depth of 30 feet over an area of five acres. Vapor extraction will be used in remediation. Phase III of the Remedial Investigation has been completed. Installation of 10 – 14 monitoring wells began in November 1997.

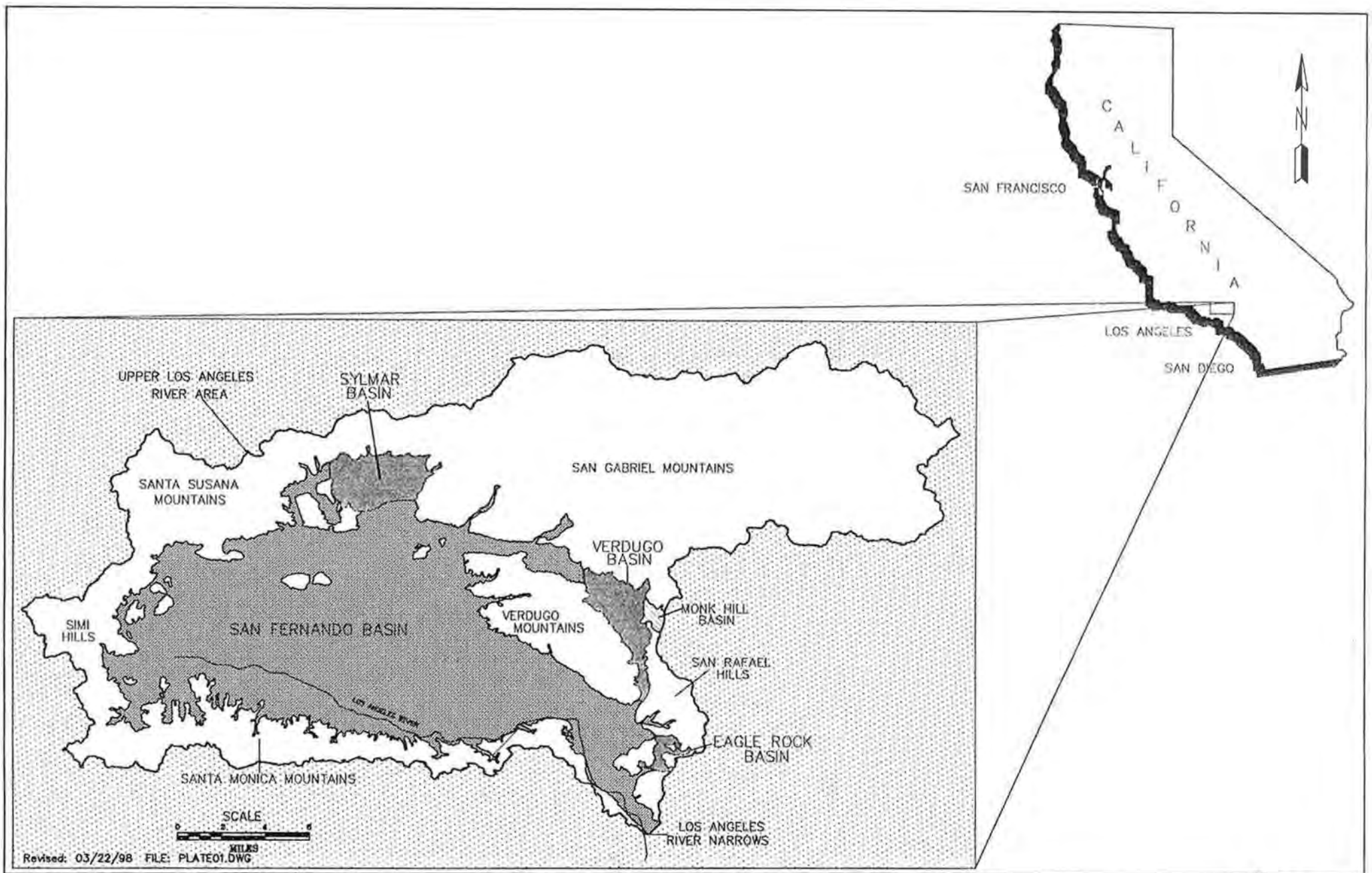
Chromium

A Chromium Task Force was formed to gather information on chromium and track any changes in water quality standards. The group includes the Watermaster, RWQCB, DHS, DTSC, and the DWP. During the past year the Office of Environmental Health Hazard Assessment (OEHHA) issued a final Public Health Goal (PHG) for total chromium at 2.5 μg/L. The ULARA Watermaster and other agencies statewide responded during the public comment period voicing concerns for the basis of the draft PHG. The respondents asked OEHHA to conduct further studies. The Watermaster, RWQCB, DTSC, and DWP provided the Los Angeles City Council Subcommittee on Environmental Quality and Waste Management an update on the chromium PHG and investigation activities.

The current MCL for chromium is 50 μg/L. Lowering of the MCL may impact the use of San Fernando Valley Groundwater. The MCL standard is established by the DHS, which takes under consideration many factors including the PHG, economic factors, natural occurrence, and

the health risk. The task force is taking steps to provide current data detailing chromium levels in the San Fernando Valley wells, Central Basin wells, and Mono/Owens Valley supplies at levels as low as 2 μg/L. This low level of detection is not commonly performed. Labs with the special equipment to perform these tests were identified to complete the larger sampling program. Simultaneously, the EPA has provided $450,000 in funding to the RWQCB to conduct an indepth investigation of potential chromium ladened sites.

PLATES

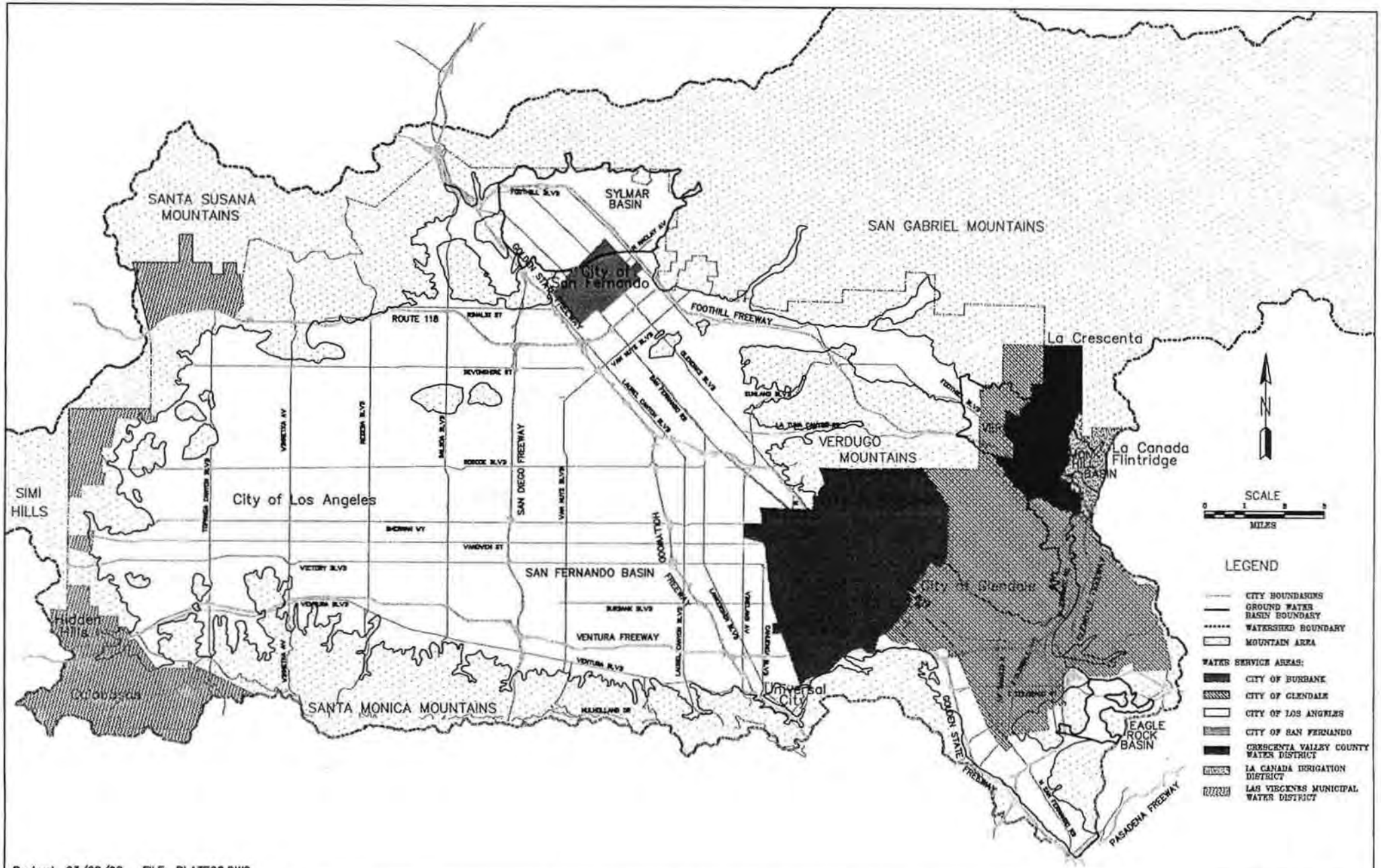


1997-98 Water Year
ULARA Watermaster
Report

Upper Los Angeles River Area: Vicinity and Location Map

PLATE

1



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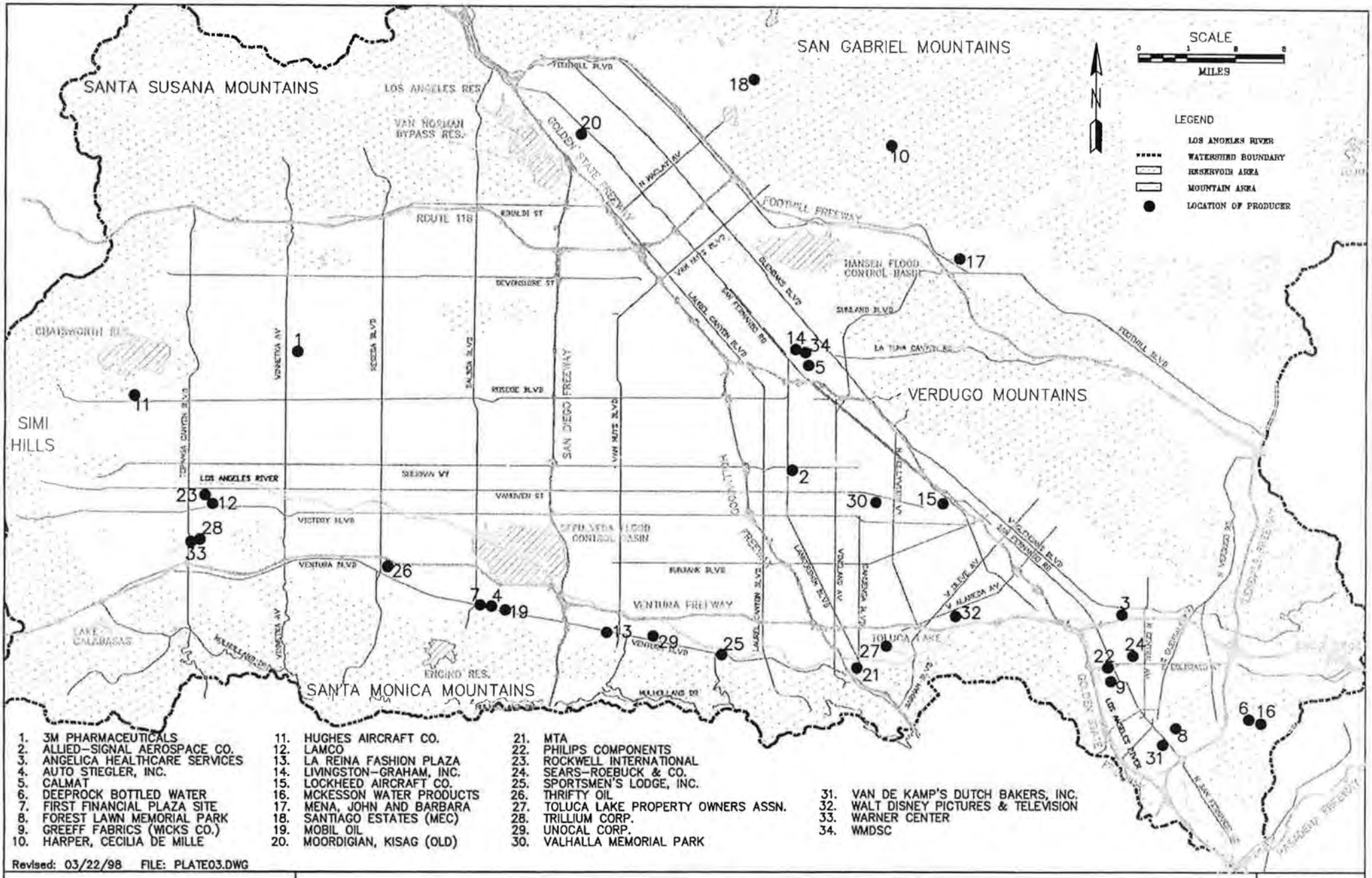
1997-98 Water Year **ULARA Watermaster Report**	**Upper Los Angeles River Area:** **Water Service Areas of Public Agencies**	**PLATE** **2**



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1997-98 Water Year
ULARA Watermaster Report

Upper Los Angeles River Area: Locations of Individual Producers

PLATE 3

Plate 4

UPPER LOS ANGELES RIVER AREA

LOCATION OF WELLS AND HYDROLOGIC FACILITIES

LEGEND

- IMPEDIMENTS TO GROUNDWATER FLOW
- GROUNDWATER CASCADES
- QUESTIONABLE IMPEDIMENT OR GROUNDWATER CASCADE
- CLIMATIC STATION
- SURFACE WATER GAGING STATION
- SURFACE WATER SAMPLING POINT
- KEY WELL USED FOR HYDROGRAPHS
- KEY WELL USED FOR SAMPLING
- ACTIVE, OBSERVATION, OR TEST WELL
- SURFACE AND GRAVITY DIVERSION

SCALE

SANTA SUSANA MOUNTAINS

SIMI HILLS

SANTA MONICA MOUNTAINS

VERDUGO MOUNTAINS

Rocketdyne Santa Susana Field Laboratory Wastewater Treatment Plants

Indian Hills Mobile Homes Wastewater Treatment Plant

Forestlawn Wastewater Treatment Plant

L.A. - Glendale Wastewater Treatment Plant

CVCWD Wastewater Treatment Plant

Tapia Water Reclamation Plant

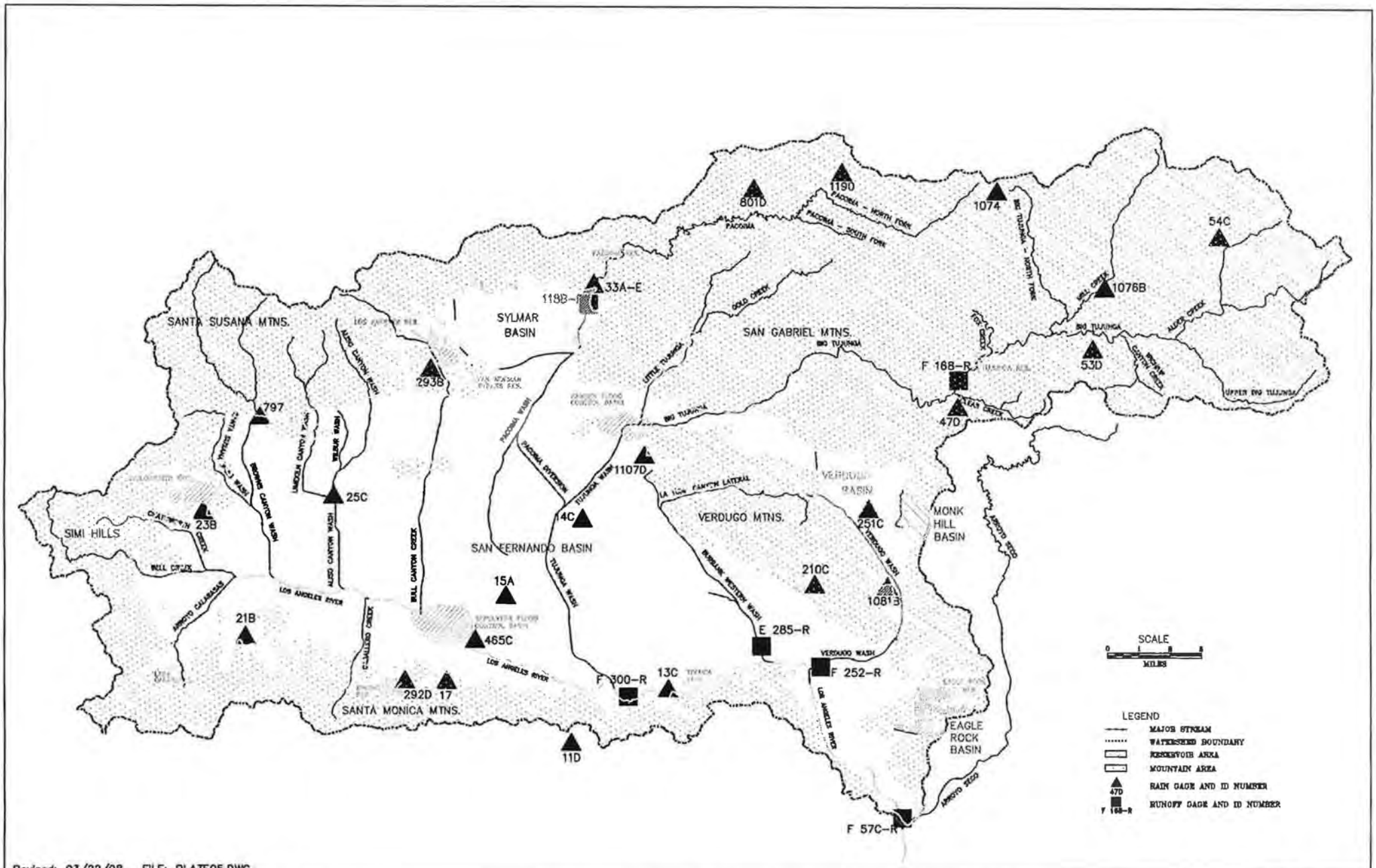
Big Tujunga Reservoir

Los Angeles Reservoir

Encino Reservoir

Groundwater Divide

NOTE: 4.25 miles to Tapia Water Reclamation Plant which delivers water to a portion of the west end of ULARA area.



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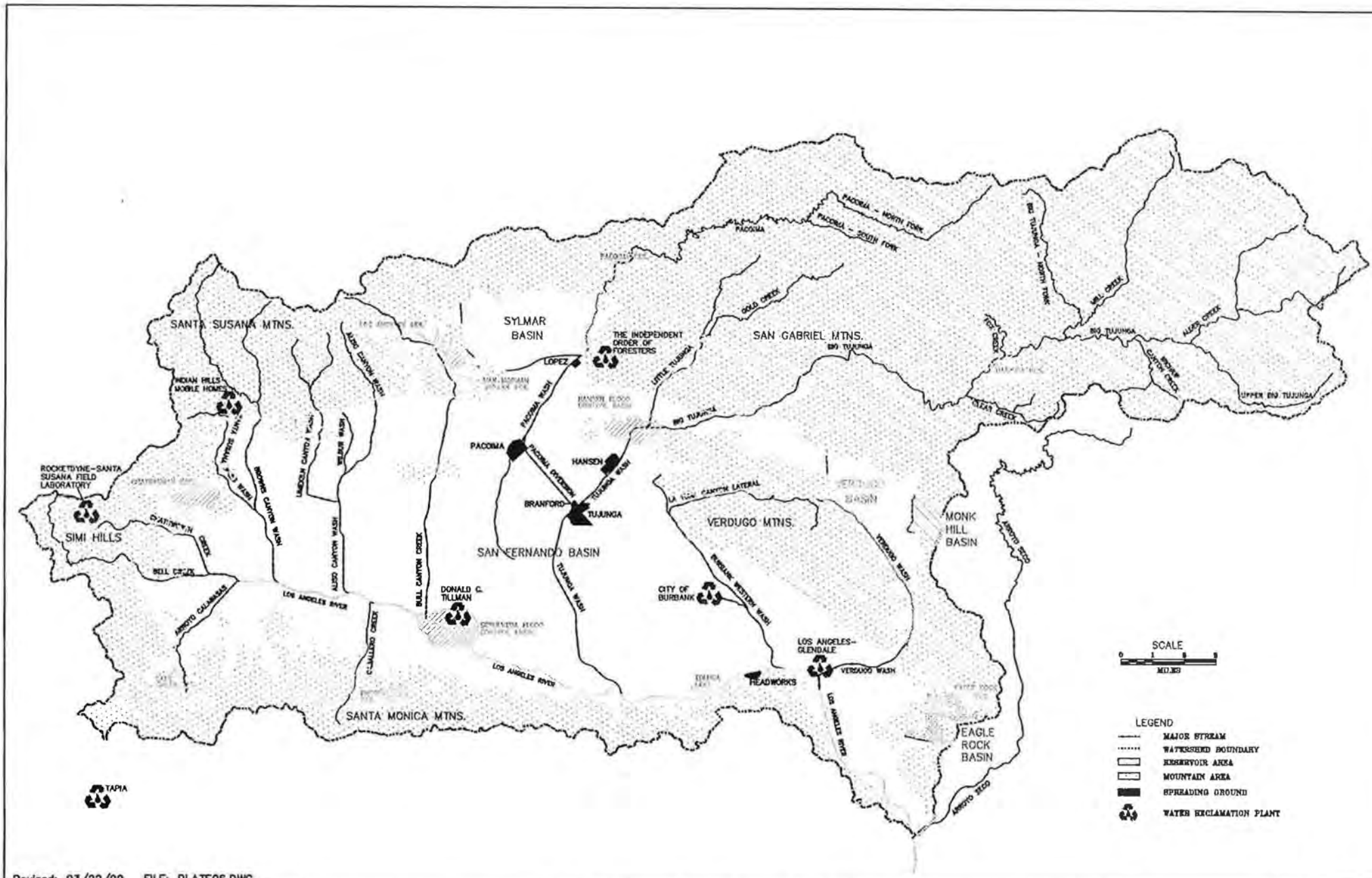
1997-98 Water Year ULARA Watermaster Report	**Upper Los Angeles River Area: Locations of Rain and Runoff Measuring Stations**	**PLATE 5**



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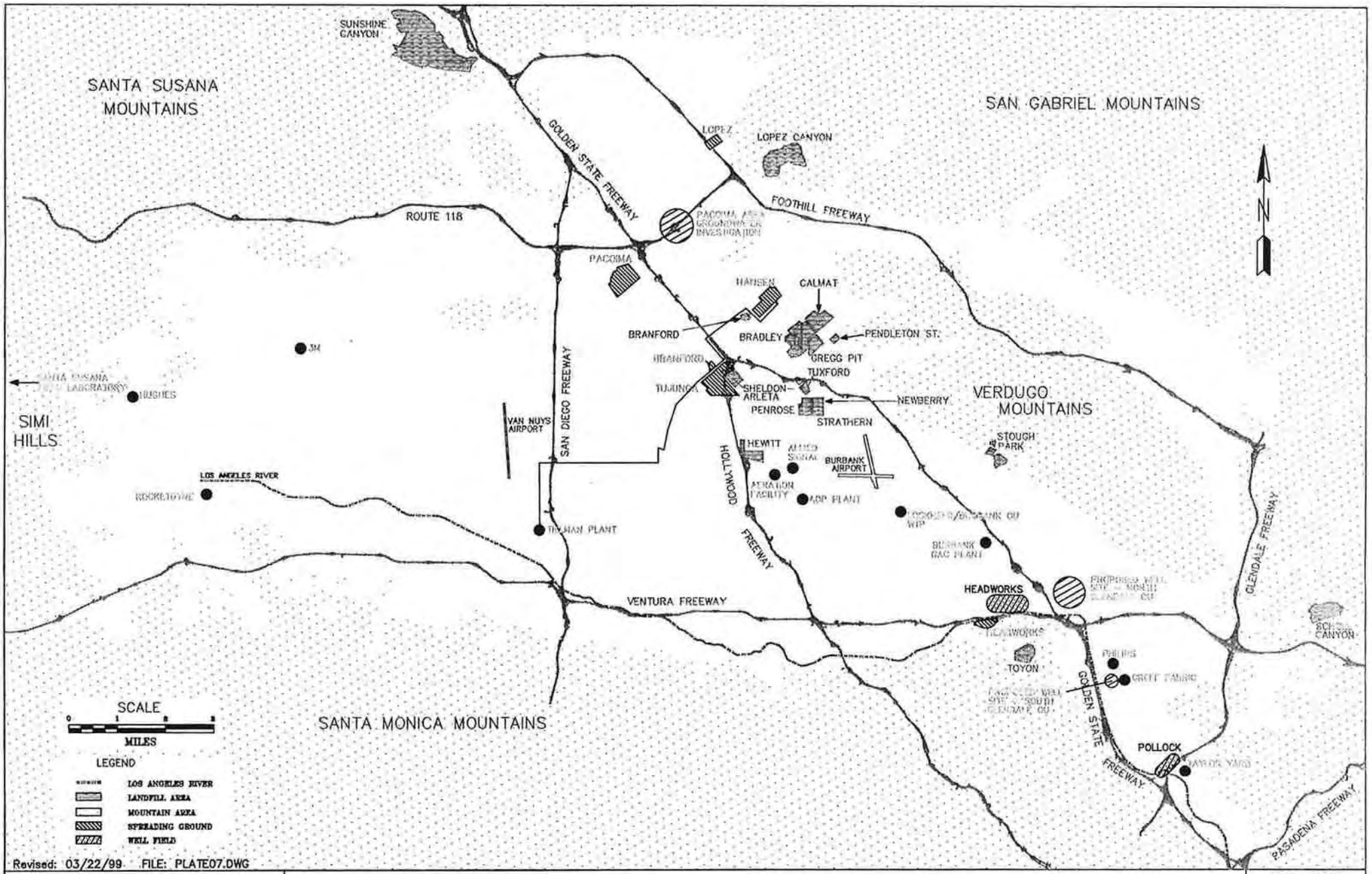
1997-98 Water Year ULARA Watermaster Report	**Upper Los Angeles River Area: Spreading Basins and Water Reclamation Plants**	**PLATE 6**



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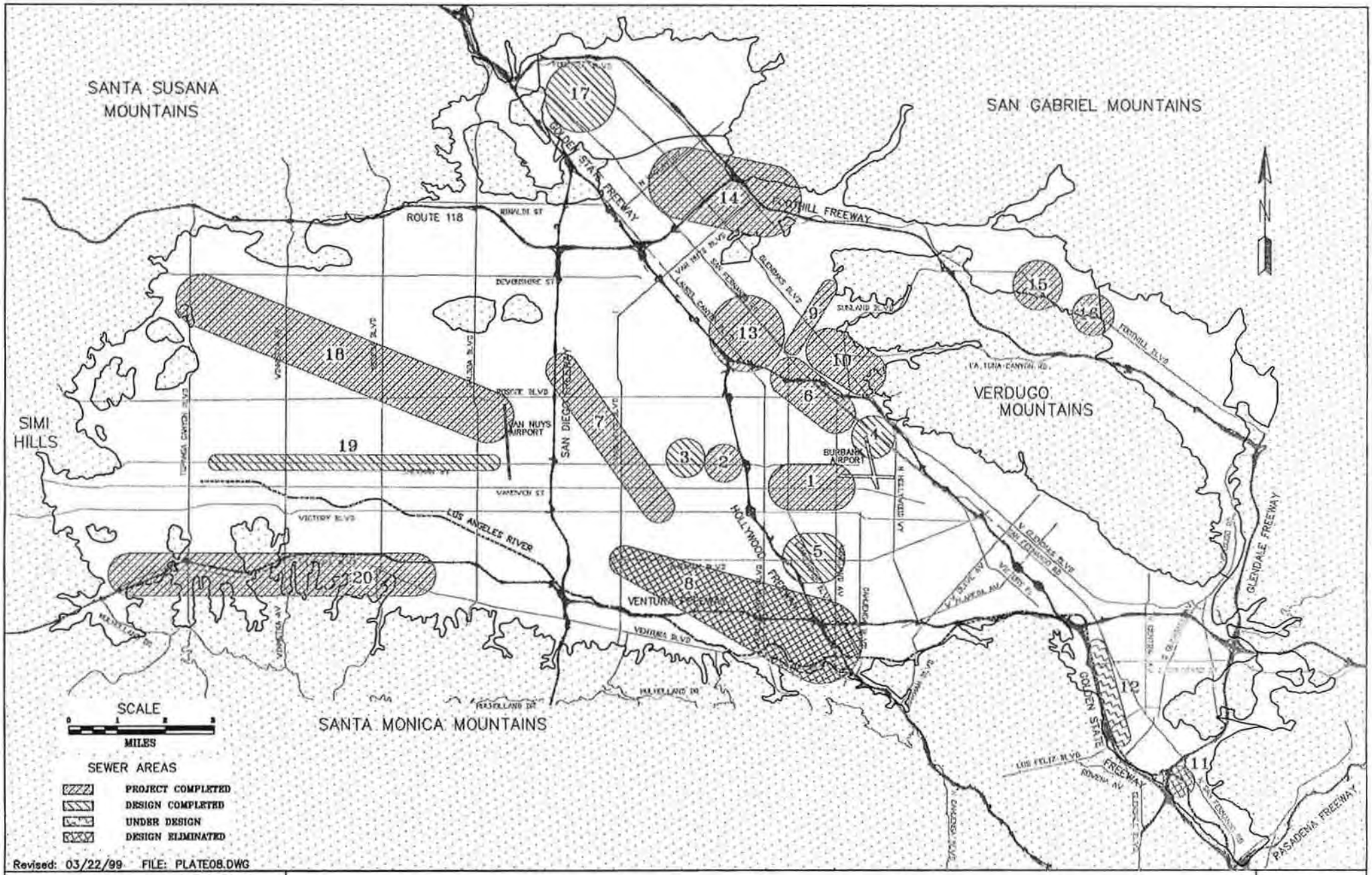
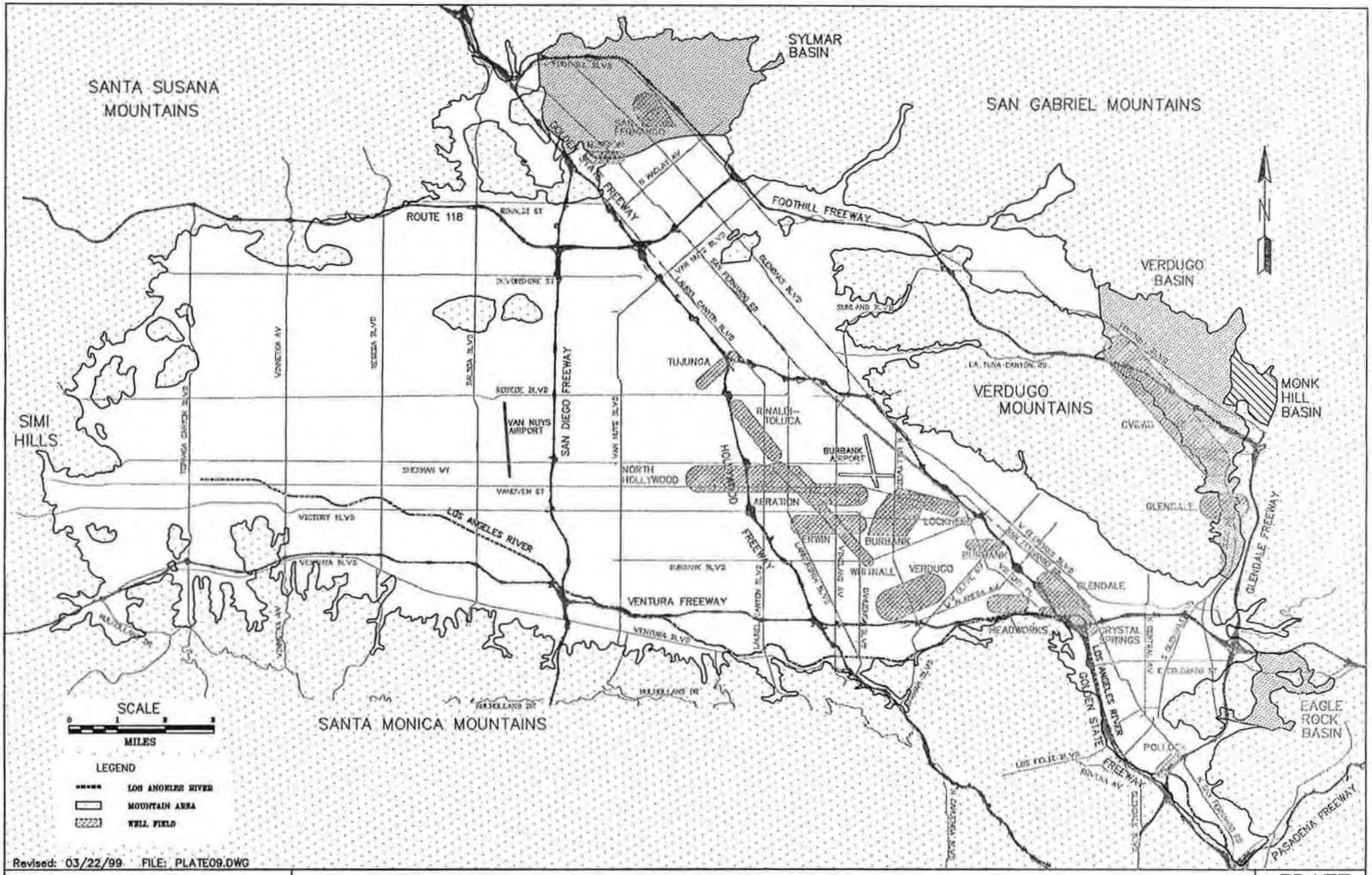
1997-98 Water Year ULARA Watermaster Report	**RELEVANT SITE AND LANDFILL LOCATIONS**	**PLATE 7**



1997-98 Water Year ULARA Watermaster Report	**Upper Los Angeles River Area: Los Angeles Bureau of Sanitation Sewer Construction Program**	**PLATE 8**

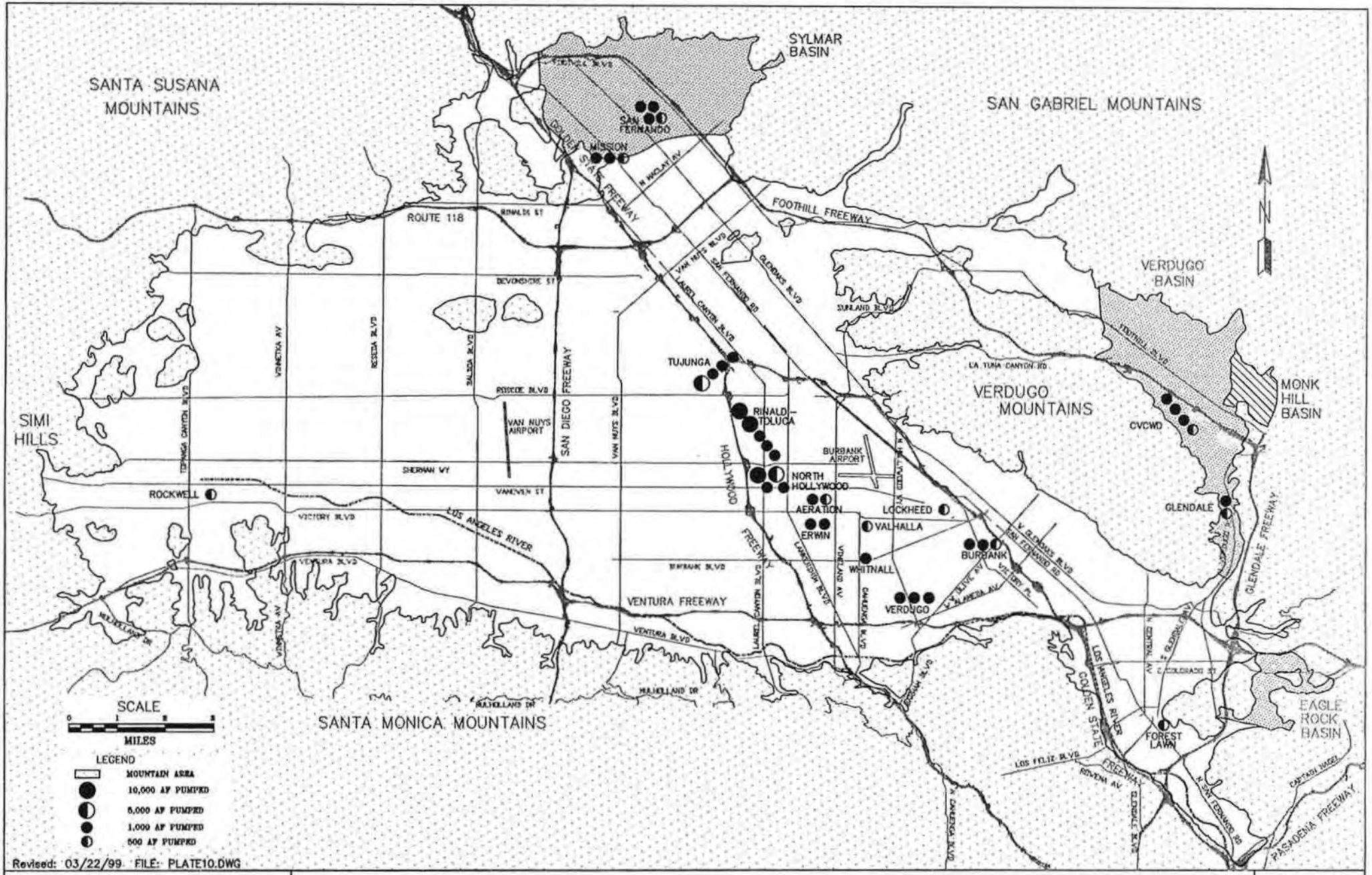


Revised: 03/22/99 FILE: PLATE09.DWG

1997-98 Water Year ULARA Watermaster Report

Upper Los Angeles River Area: Well Field Locations

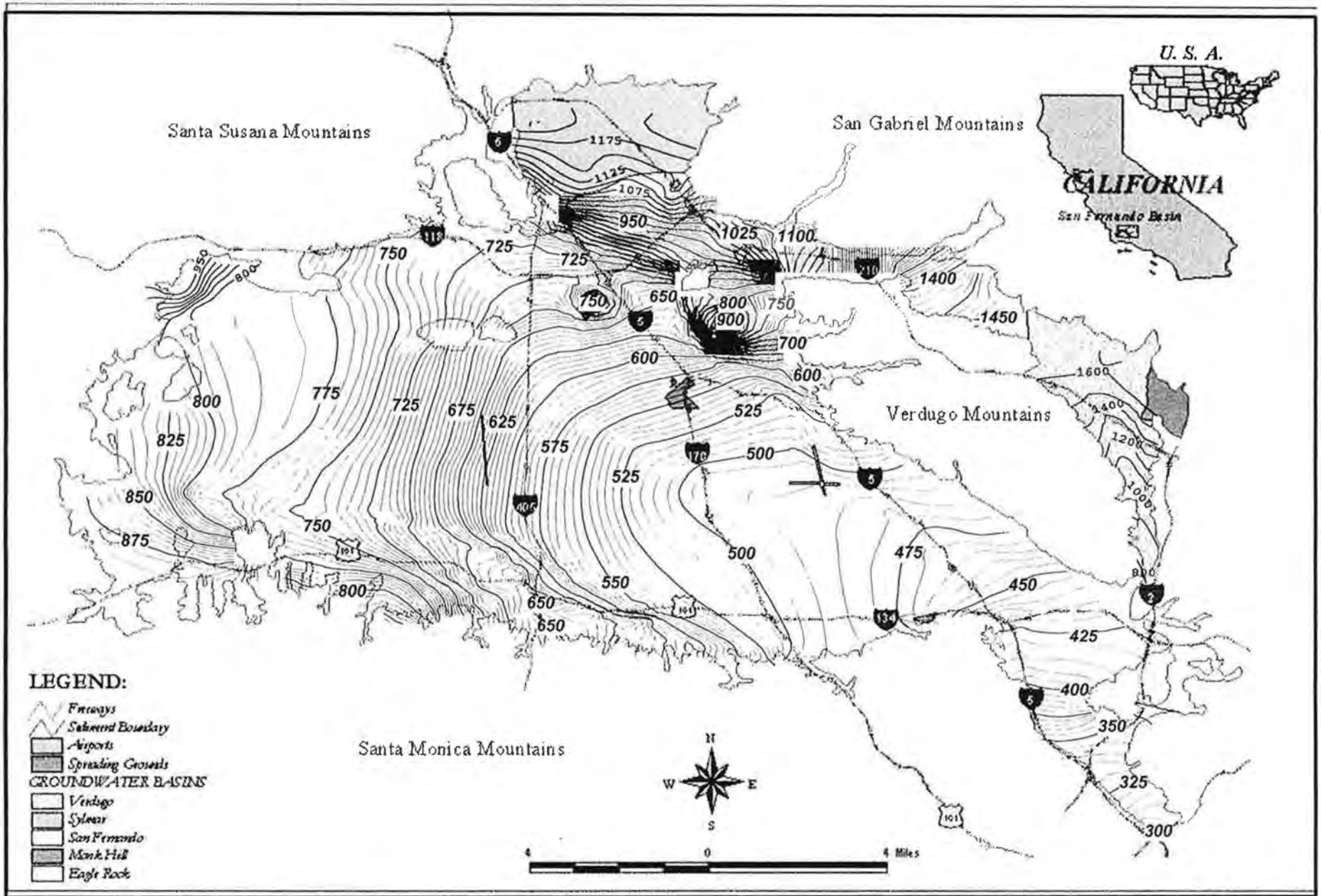
PLATE 9



1997-98 Water Year
ULARA Watermaster Report

Upper Los Angeles River Area: Pattern of Groundwater Production

PLATE
10



Upper Los Angeles River Area

WATERMASTER

SERVICE AREA

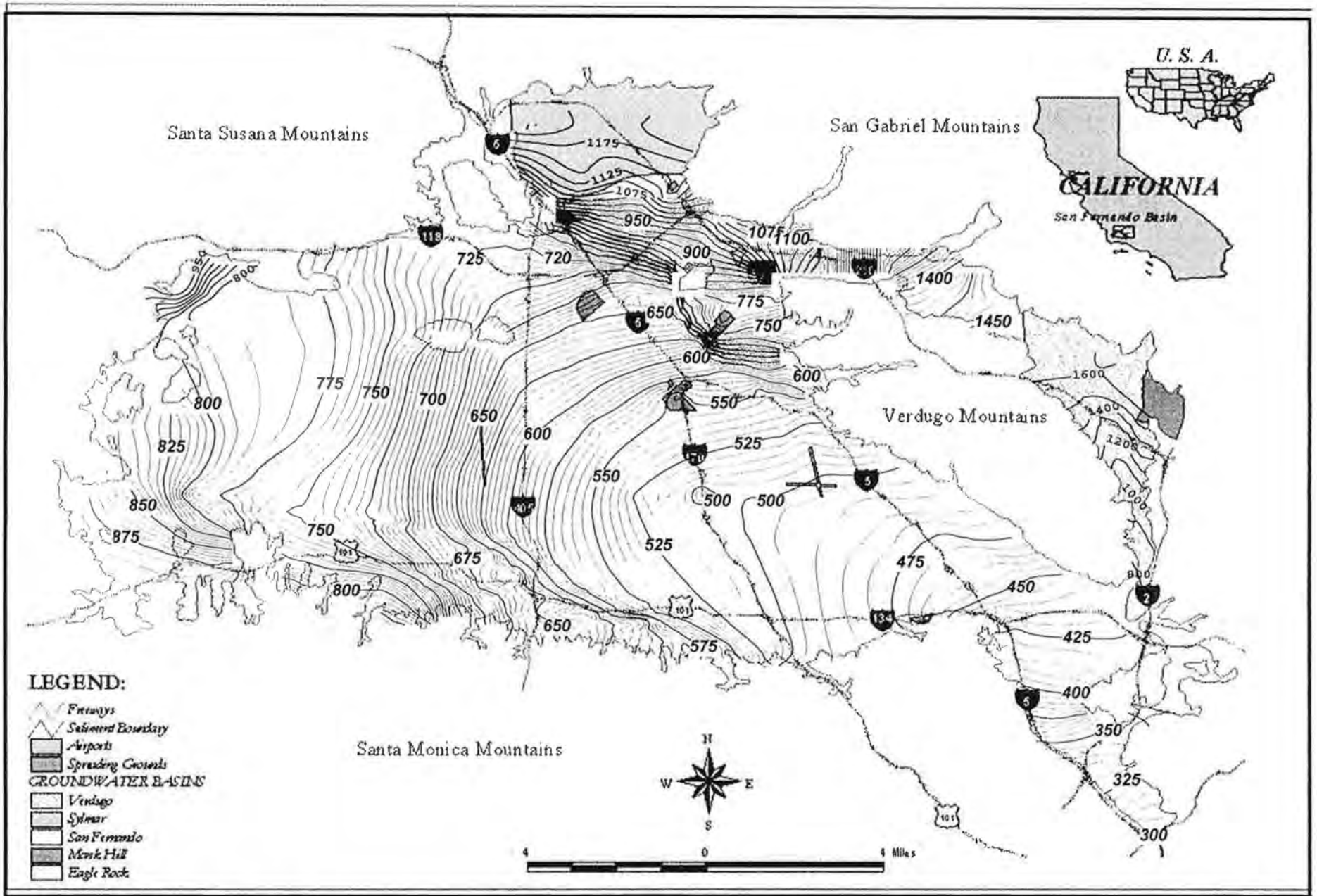
1997-98 WATER YEARS

Simulated Groundwater Contours

SPRING (April) 1998

PLATE

11



Upper Los Angeles River Area

WATERMASTER SERVICE AREA

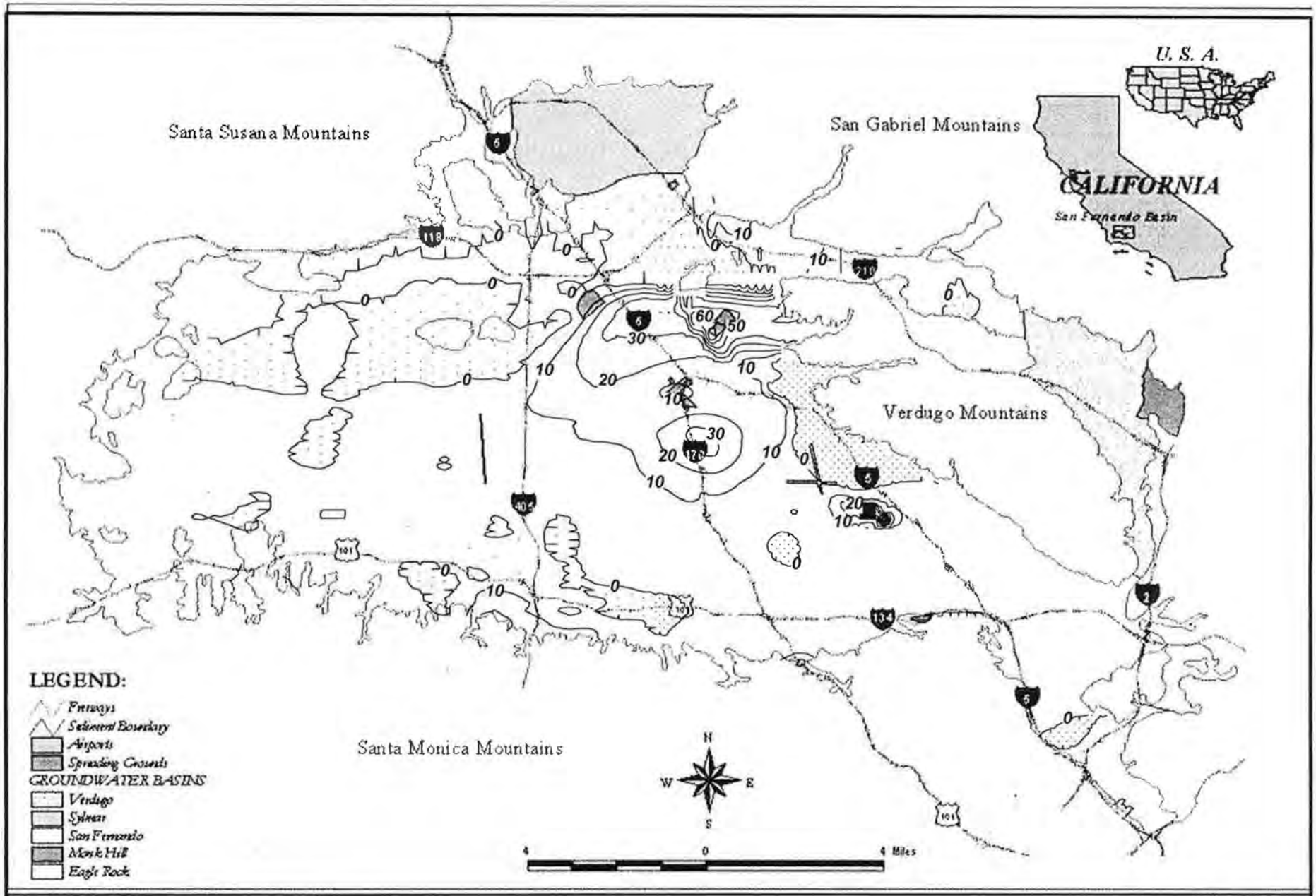
1997-98 WATER YEARS

Simulated Groundwater Contours

FALL (September) 1998

PLATE

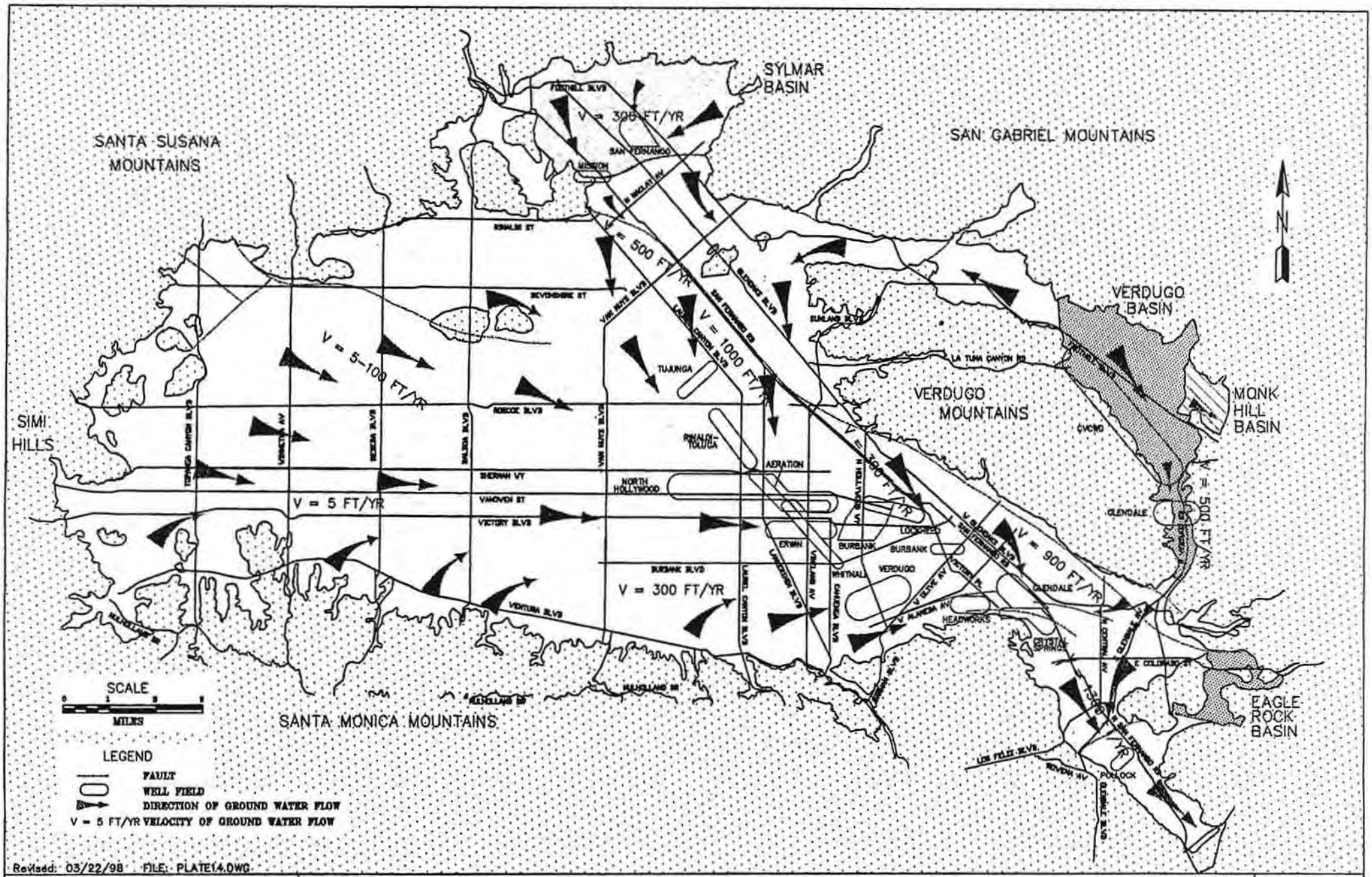
12



Upper Los Angeles River Area
WATERMASTER
SERVICE AREA
1997-98 WATER YEARS

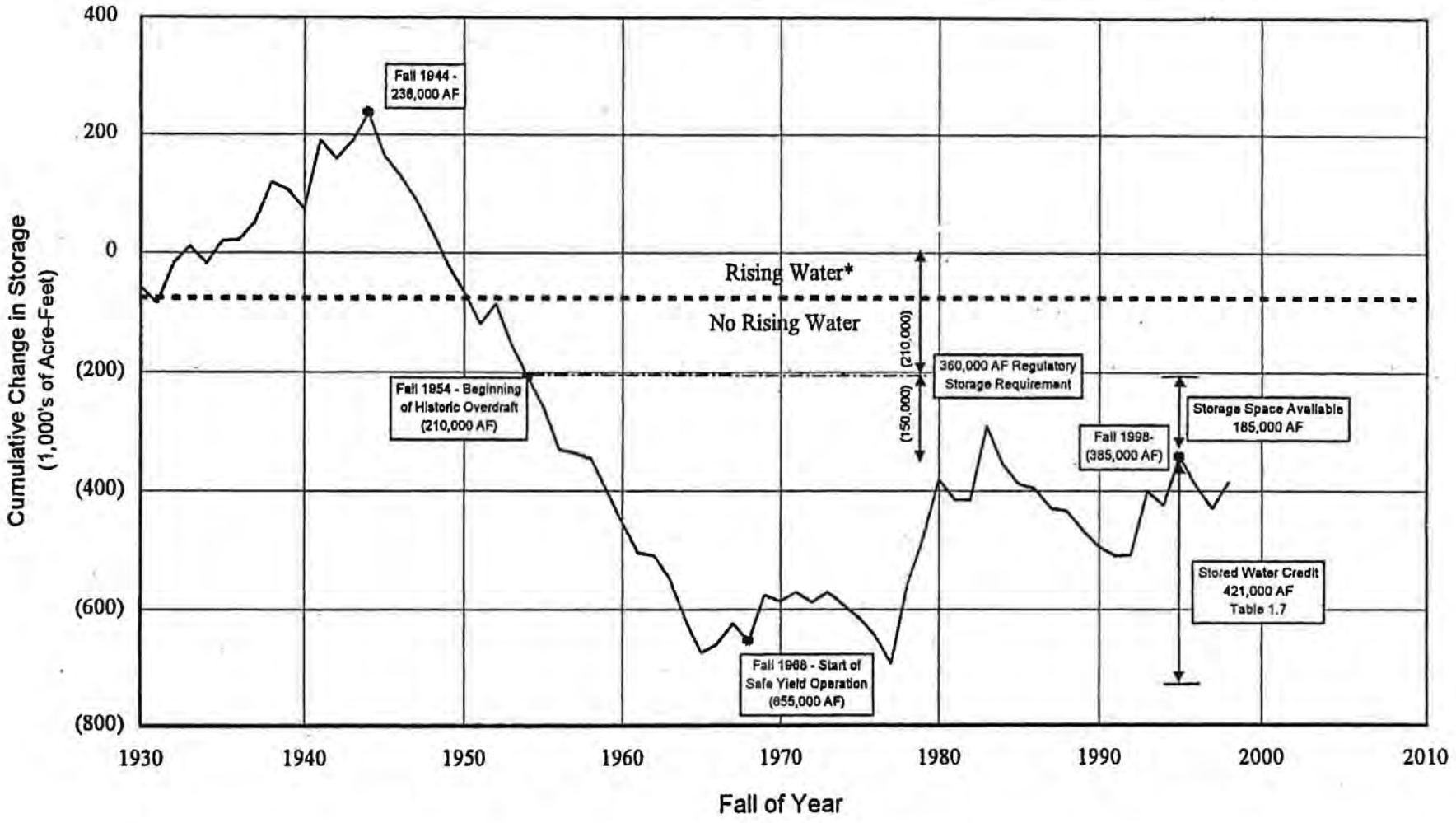
Change in Groundwater Elevations
FALL 1997 - FALL 1998

PLATE
13



Revised: 03/22/98 FILE: PLATE14.DWG

1997-98 Water Year ULARA Watermaster Report	**Upper Los Angeles River Area: Estimated Directions and Velocities of Groundwater Flow**	**PLATE 14**



* This line indicates levels at which excess rising ground water occurs and can be controlled by reduction of storage. Rising ground water can also occur naturally at lower levels.

1997-98 Water Year ULARA Watermaster Report	**San Fernando Basin: Cumulative Change in Groundwater Storage**	**PLATE 15**

PLATE 15 - ULARA WATERMASTER REPORT

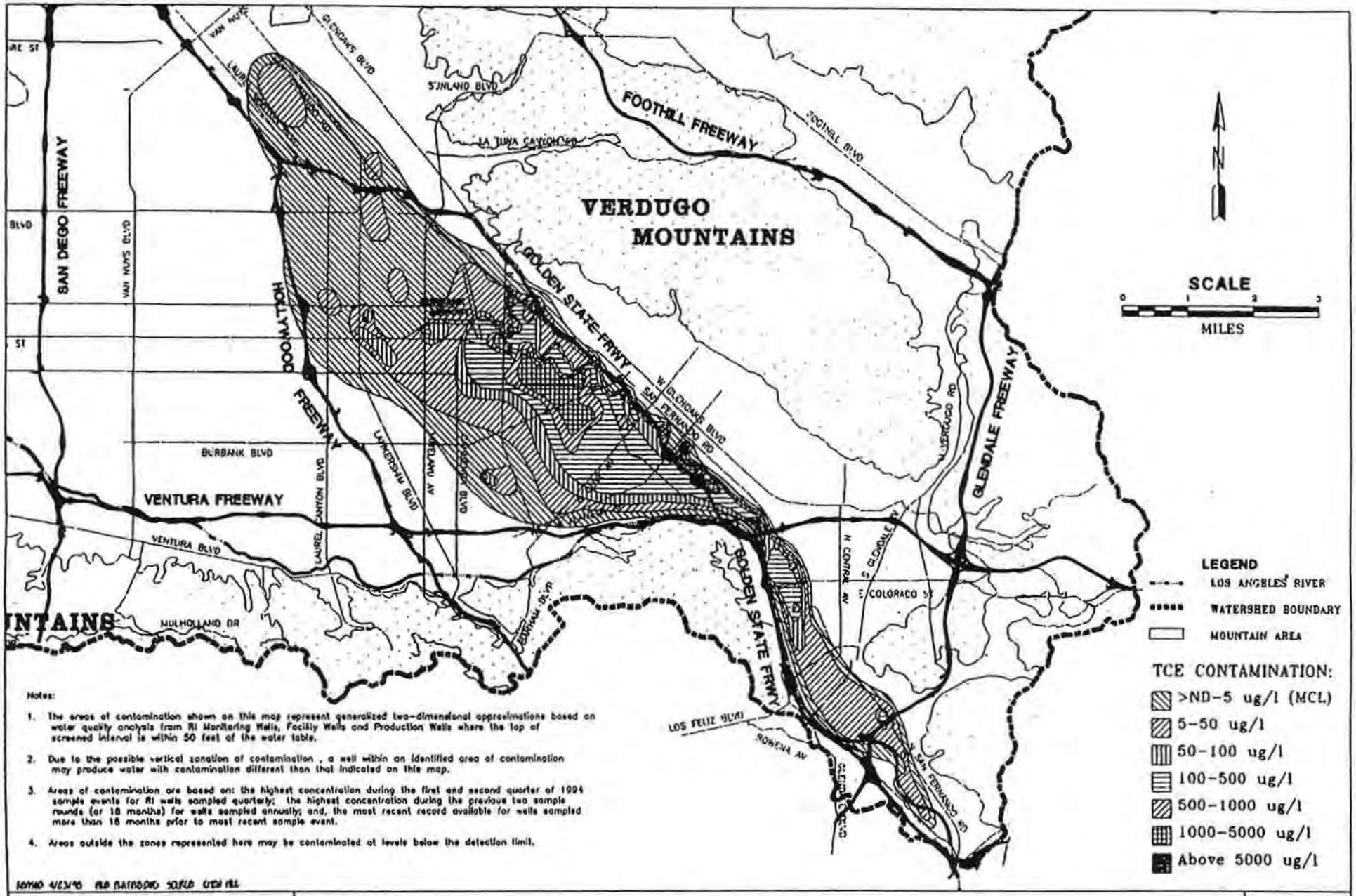
SAN FERNANDO BASIN
CUMULATIVE CHANGE IN GROUNDWATER STORAGE

Fall of Year	Change in Storage	Cumulative Chg. in Storage	Cumulative Chg. in Storage/1,000	Cumulative Chg. in Storage (1944)	Cumulative Chg. in Storage/1,000
1928	0	0	0		
1929	-41,510	-41,510	-42		
1930	-15,690	-57,200	-57		
1931	-26,320	-83,520	-84		
1932	67,030	-16,490	-16		
1933	26,640	10,150	10		
1934	-28,560	-18,410	-18		
1935	38,040	19,630	20		
1936	1,000	20,630	21		
1937	30,660	51,290	51		
1938	66,420	117,710	118		
1939	-12,540	105,170	105		
1940	-32,650	72,520	73		
1941	116,850	189,370	189		
1942	-31,230	158,140	158		
1943	31,030	189,170	189		
1944	47,200	236,370	236	0	0
1945	-74,180	162,190	162	-74,180	-74
1946	-33,300	128,890	129	-107,480	-107
1947	-41,200	87,690	88	-148,680	-149
1948	-52,770	34,920	35	-201,450	-201
1949	-56,360	-21,440	-21	-257,810	-258
1950	-43,390	-64,830	-65	-301,200	-301
1951	-53,290	-118,120	-118	-354,490	-354
1952	33,720	-84,400	-84	-320,770	-321
1953	-68,280	-152,680	-153	-389,050	-389
1954	-56,770	-209,450	-209	-445,820	-446
1955	-51,370	-260,820	-261	-497,190	-497
1956	-71,390	-332,210	-332	-568,580	-569
1957	-6,280	-338,490	-338	-574,860	-575
1958	-9,160	-347,650	-348	-584,020	-584
1959	-52,160	-399,810	-400	-636,180	-636
1960	-53,080	-452,890	-453	-689,260	-689
1961	-50,770	-503,660	-504	-740,030	-740
1962	-3,590	-507,250	-507	-743,620	-744
1963	-40,390	-547,640	-548	-784,010	-784
1964	-70,220	-617,860	-618	-854,230	-854
1965	-57,850	-675,710	-676	-912,080	-912
1966	14,970	-660,740	-661	-897,110	-897
1967	36,720	-624,020	-624	-860,390	-860
1968	-31,350	-655,370	-655	-891,740	-892
1969	79,240	-576,130	-576	-812,500	-813

PLATE 15 - ULARA WATERMASTER REPORT

SAN FERNANDO BASIN
CUMULATIVE CHANGE IN GROUNDWATER STORAGE

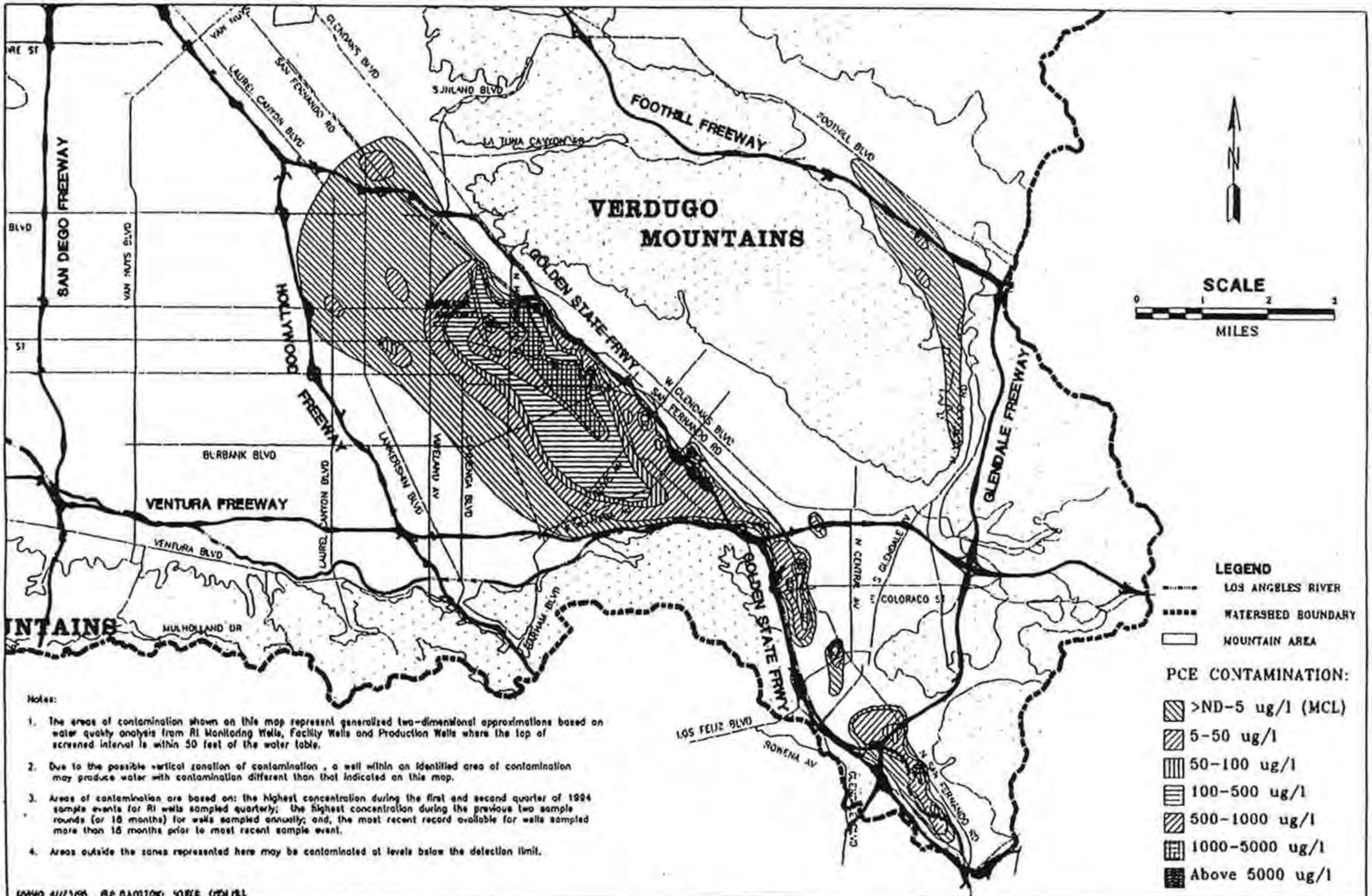
Fall of Year	Change in Storage	Cumulative Chg. in Storage	Cumulative Chg. in Storage/1,000	Cumulative Chg. in Storage (1944)	Cumulative Chg. in Storage/1,000
1970	-9,740	-585,870	-586	-822,240	-822
1971	15,340	-570,530	-571	-806,900	-807
1972	-17,090	-587,620	-588	-823,990	-824
1973	17,020	-570,600	-571	-806,970	-807
1974	-21,820	-592,420	-592	-828,790	-829
1975	-22,580	-615,000	-615	-851,370	-851
1976	-30,090	-645,090	-645	-881,460	-881
1977	-50,490	-695,580	-696	-931,950	-932
1978	136,150	-559,430	-559	-795,800	-796
1979	78,080	-481,350	-481	-717,720	-718
1980	99,970	-381,380	-381	-617,750	-618
1981	-32,560	-413,940	-414	-650,310	-650
1982	-530	-414,470	-414	-650,840	-651
1983	121,090	-293,380	-293	-529,750	-530
1984	-63,180	-356,560	-357	-592,930	-593
1985	-31,690	-388,250	-388	-624,620	-625
1986	-7,980	-396,230	-396	-632,600	-633
1987	-31,940	-428,170	-428	-664,540	-665
1988	-5,000	-433,170	-433	-669,540	-670
1989	-30,550	-463,720	-464	-700,090	-700
1990	-29,941	-493,661	-494	-730,031	-730
1991	-14,122	-507,783	-508	-744,153	-744
1992	411	-507,372	-507	-743,742	-744
1993	106,317	-401,055	-401	-637,425	-637
1994	-22,238	-423,293	-423	-659,663	-660
1995	79,132	-344,161	-344	-580,531	-581
1996	-49,223	-393,384	-393	-629,754	-630
1997	-35,737	-429,121	-429	-665,491	-665
1998	44113	-385,008	-385	-621,378	-621



1997-98 Water Year ULARA Watermaster Report

San Fernando Basin
TCE Contamination [ug/l] in the Upper Zone [Spring 1995]

PLATE 16



Notes:

1. The areas of contamination shown on this map represent generalized two-dimensional approximations based on water quality analysis from RI Monitoring Wells, Facility Wells and Production Wells where the top of screened interval is within 50 feet of the water table.

2. Due to the possible vertical zonation of contamination , a well within an identified area of contamination may produce water with contamination different than that indicated on this map.

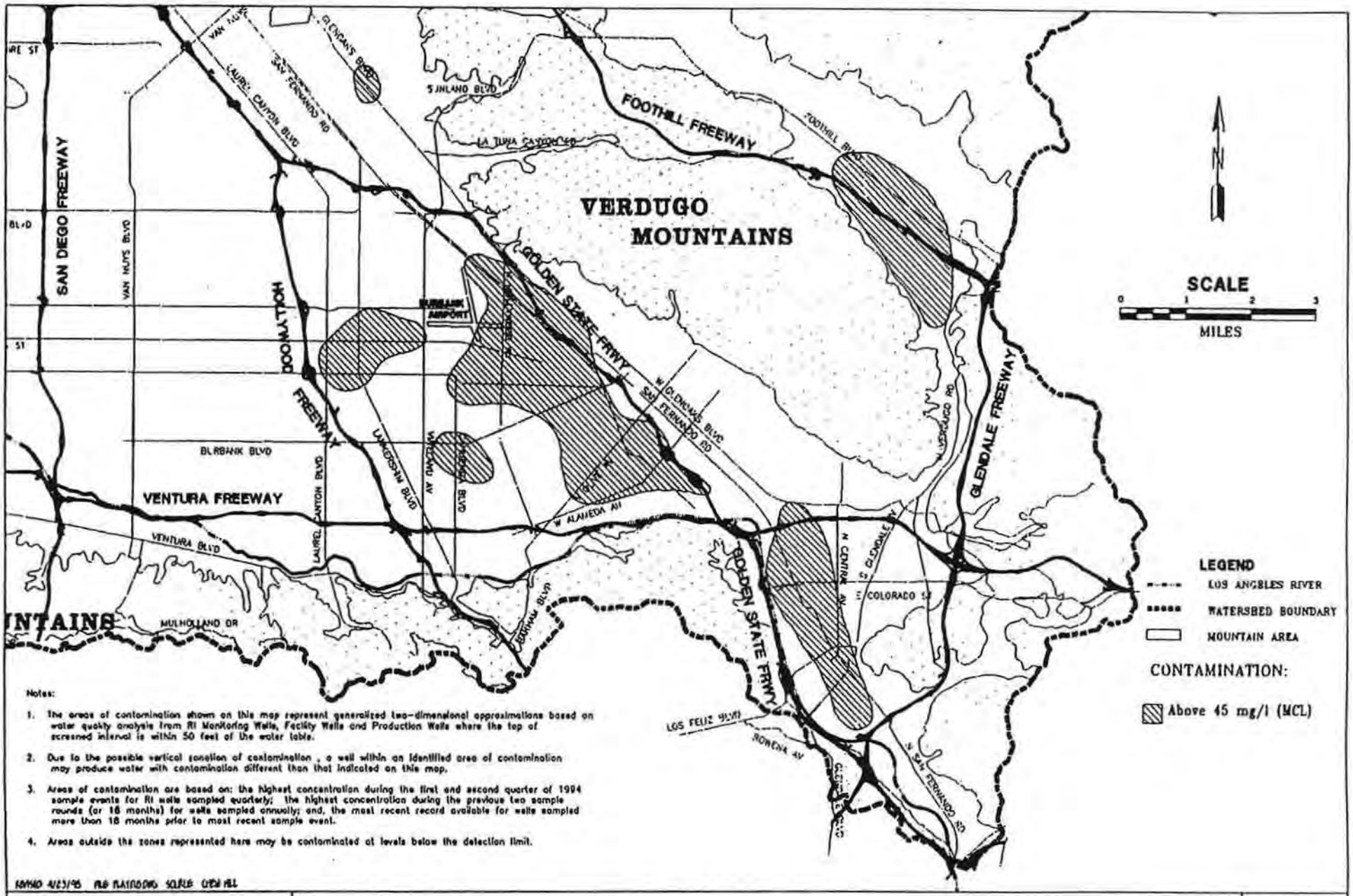
3. Areas of contamination are based on: the highest concentration during the first and second quarter of 1994 sample events for RI wells sampled quarterly; the highest concentration during the previous two sample rounds (or 18 months) for wells sampled annually; and, the most recent record available for wells sampled more than 18 months prior to most recent sample event.

4. Areas outside the zones represented here may be contaminated at levels below the detection limit.

1997-98 Water Year ULARA Watermaster Report

San Fernando Basin: PCE Contamination [ug/l] in the Upper Zone [Spring 1995]

PLATE 17



Notes:

1. The areas of contamination shown on this map represent generalized two-dimensional approximations based on water quality analysis from RI Monitoring Wells, Facility Wells and Production Wells where the top of screened interval is within 50 feet of the water table.
2. Due to the possible vertical zonation of contamination , a well within an identified area of contamination may produce water with contamination different than that indicated on this map.
3. Areas of contamination are based on: the highest concentration during the first and second quarter of 1994 sample events for RI wells sampled quarterly; the highest concentration during the previous two sample rounds (or 18 months) for wells sampled annually; and, the most recent record available for wells sampled more than 18 months prior to most recent sample event.
4. Areas outside the zones represented here may be contaminated at levels below the detection limit.

1997-98 Water Year ULARA Watermaster Report	**San Fernando Basin: NO_3 Contamination [ug/l] in the Upper Zone [Spring 1995]**	PLATE 18

APPENDIX A
GROUNDWATER EXTRACTIONS

GROUND WATER EXTRACTIONS
1997-98 WATER YEAR
(acre-feet)

LACDPW	Owner	1997			1998								
Well No.	Well No.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin														
Angelica Healthcare Services			(Abandoned 12/97)											
3934A	M050A	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
Auto Stiegler														
—	—	3.12	2.77	2.88	1.57	0.77	4.38	3.10	2.35	3.57	4.09	4.09	4.62	37.31
Burbank, City of														
3841C	6A	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
3882P	7	68.69	0.00	0.00	0.00	0.00	21.80	135.60	93.81	134.41	93.29	142.99	92.03	782.62
3851E	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
3851K	13A	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
3882T	15	64.60	0.00	0.00	0.00	0.00	18.82	119.52	94.97	116.73	96.56	69.28	21.17	601.65
3841G	18	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
	Total:	133.29	0.00	0.00	0.00	0.00	40.62	255.12	188.78	251.14	189.85	212.27	113.20	1,384.27
CalMat														
4916A	2	85.04	70.93	115.28	138.61	40.19	59.89	67.10	128.05	163.78	163.30	154.73	126.16	1,313.06
4916	3	50.49	54.19	70.04	38.04	145.12	61.86	49.71	3.72	0.00	0.00	0.00	48.75	521.92
	1						127.00	140.39	128.12	160.07	159.17	148.93	156.96	1,020.64
	Total:	135.53	125.12	185.32	176.65	185.31	248.75	257.20	259.89	323.85	322.47	303.66	331.87	2,855.62
First Financial Plaza Site														
N/A	F.F.P.S.	1.42	1.16	1.74	1.99	7.61	10.59	7.32	6.79	4.86	4.16	2.58	2.33	52.55
Forest Lawn Memorial Park														
3947A	2	9.88	4.52	1.14	1.28	0.21	0.73	7.09	5.16	14.45	24.28	17.89	17.21	103.84
3947B	3	11.01	5.00	1.27	1.43	0.23	0.82	7.15	2.32	6.58	0.65	10.54	19.16	66.16
3947C	4	9.83	4.54	1.17	1.31	0.22	0.76	7.07	5.22	14.48	24.02	17.98	16.95	103.55
3858K	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
	Total:	30.72	14.06	3.58	4.02	0.66	2.31	21.31	12.70	35.51	48.95	46.41	53.32	273.55
Glendale, City of														
3924N	STPT 1	2.46	2.34	1.43	1.34	0.72	1.56	1.24	2.32	2.00	4.81	5.75	1.83	27.80
3924R	STPT 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
GVENT	GVENT	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
	Total:	2.46	2.34	1.43	1.34	0.72	1.56	1.24	2.32	2.00	4.81	5.75	1.83	27.80
Greeff Fabrics (No Further Action)														
—	—													0.00
Hughes Missile Systems														
—	—	0.66	0.35	0.43	0.54	0.48	0.52	0.55	0.67	0.90	0.66	0.65	0.77	7.18
Lockheed - Burbank Operable Unit														
3871L	VO-1	169.07	87.19	105.82	1.78	14.33	11.48	6.01	0.07	21.63	8.17	5.89	0.00	431.44
3861G	VO-2	160.41	82.95	62.13	23.80	15.12	11.63	1.67	0.27	21.02	0.00	0.00	0.00	379.00
3861K	VO-3	11.22	48.85	0.00	16.13	0.00	0.00	1.57	5.28	1.76	0.00	0.81	0.00	85.62
3861L	VO-4	188.67	172.82	55.87	7.64	13.68	0.00	1.80	4.96	28.39	8.72	5.89	0.00	488.44
3850X	VO-5	153.72	237.81	28.58	2.04	2.15	3.79	0.61	0.00	0.00	0.00	0.00	0.00	428.70
3850Z	VO-6	27.43	0.00	0.00	0.00	2.20	3.84	25.60	16.67	59.95	0.09	0.00	0.00	135.78
3850	VO-7	264.06	163.50	63.48	1.73	0.21	2.46	8.12	2.30	26.62	2.81	6.66	21.57	563.52
3851C	VO-8				0.76	0.03	18.81	8.30	9.54	13.76	8.15	7.86	0.00	67.21
	Total:	974.58	793.12	315.88	53.88	47.72	52.01	53.68	39.09	173.13	27.94	27.11	21.57	2,579.71
Mena, John & Barbara														
4973J		0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.96
Metropolitan Transportation Authority														
—	1065	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
—	1075	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
—	1130	80.10	66.99	51.33	37.81	52.56	50.71	52.97	46.61	42.48	33.22	33.16	36.84	584.78
—	1140	0.00	0.00	0.00	0.00	0.33	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.50
—	1150	0.35	0.67	0.71	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.44
	Total:	80.45	67.66	52.04	38.52	52.89	50.88	52.97	46.61	42.48	33.22	33.16	36.84	587.72

GROUND WATER EXTRACTIONS
1997-98 WATER YEAR
(acre-feet)

LACDPW Well No.	Owner Well No.	1997 Oct.	Nov.	Dec.	1998 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin (cont'd)														
Metropolitan Water District														
	Jensen	13.90	13.60	14.40	14.10	14.60	21.30	13.10	10.10	13.60	19.10	19.80	16.70	184.30
Metropolitan Water District														
Sepulveda Feeder Pipeli		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.83	5.83
Mobil Oil Corporation														
—	—	0.08	0.06	0.01	0.01	0.03	0.03	0.80	0.01	0.06	0.09	0.10	0.14	1.42
Philips Components (No Further Action)														
—	—	7.55	7.21	7.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.36
Rockwell International (No Further Pumping until 2000)														
—	E-1 to E-9	18.40	21.13	5.65	17.21	11.99	13.45	17.05	0.00	0.00	0.00	0.00	0.00	104.88
Sears Roebuck & Co.														
3945	3945	18.07	17.84	32.19	16.18	16.01	16.05	16.33	16.70	18.04	17.80	18.01	17.97	221.19
Sportsmen's Lodge														
3785A	1	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06
3M-Pharmaceuticals														
—	—	2.03	0.00	2.08	4.71	4.27	4.18	4.06	3.17	3.52	2.75	2.55	3.42	36.74
Tegatz/Pankow (successor to DeMille)*														
4940A	NORTH	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.68	32.05
Toluca Lake Property Owners Association														
3845F	3845F	2.30	1.46	0.49	0.00	0.00	2.47	0.95	0.84	5.37	4.43	5.45	6.13	29.89
Trillium Corporation														
Well #1	—	0.67	0.67	0.67	0.67	0.67	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.37
Well #2	—	0.55	0.55	0.55	0.55	0.55	3.51	3.51	3.51	3.51	3.51	3.51	3.51	27.32
	Total:	1.22	1.22	1.22	1.22	1.22	3.53	3.51	3.51	3.51	3.51	3.51	3.51	30.69
Valhalla Memorial Park and Mortuary														
3840K	4	30.81	2.79	1.19	0.00	0.00	3.63	15.89	20.95	51.42	51.42	51.42	51.42	280.94
Waste Management Disposal Services of Calif.														
4916D		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
Walt Disney Pictures and Television				(Well Inactive/Not abandoned)										
3874E	EAST	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
3874F	WEST	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
3874G	NORTH	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
	Total:	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
Walt Disney Riverside Building														
—	—	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	143.10	383.03	526.13
Griffith Park Soccer Fields														
Ferraro Soccer Field				4.59	0.41	0.00	0.91	0.41	4.03	0.93	0.00	0.00	0.00	11.28
Betty Davis Park				0.00	0.00	0.00	0.00	0.00	56.23	11.60	11.59	9.19	9.19	97.80
				4.59	0.41	0.00	0.91	0.41	60.26	12.53	11.59	9.19	9.19	109.08

GROUND WATER EXTRACTIONS
1997-98 WATER YEAR
(acre-feet)

LACDPW	Owner	1997			1998									
Well No.	Well No.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin (cont'd)														
Los Angeles, City of														
Aeration (A)														
3800E	A-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
3810U	A-2	19.14	20.20	15.05	0.00	0.00	2.84	7.09	19.62	18.87	24.24	19.14	23.37	169.56
3810V	A-3	9.25	48.73	41.36	37.80	36.59	32.96	13.45	11.06	35.67	34.27	7.04	19.21	327.39
3810W	A-4	30.41	31.68	4.20	19.14	23.34	16.29	5.96	14.83	0.00	37.00	23.53	16.96	223.34
3820H	A-5	3.28	16.96	15.28	11.27	15.03	10.74	1.49	14.32	13.49	19.37	16.43	19.32	156.98
3821J	A-6	25.98	45.79	34.77	44.60	35.10	31.22	14.09	35.07	34.29	41.36	35.33	38.08	415.68
3830P	A-7	26.56	45.50	38.54	42.19	36.11	36.27	7.87	36.59	33.47	46.92	35.44	42.88	428.34
3831K	A-8	17.72	48.82	40.10	46.92	39.37	39.48	5.05	38.93	37.71	45.24	38.93	46.16	444.43
	A Total:	132.34	257.68	189.30	201.92	185.54	169.80	55.00	170.42	173.50	248.40	175.84	205.98	2,165.72
Erwin (E)														
3831H	E-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
3821J	E-2A	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
3831G	E-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
3821F	E-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
3831F	E-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
3821H	E-6	0.00	0.13	0.09	0.00	77.84	117.35	0.06	0.00	0.00	0.00	0.00	0.00	195.47
3811F	E-10	140.67	165.56	9.75	0.00	75.73	112.32	0.00	86.40	0.00	51.53	154.20	182.18	978.34
	E Total:	140.67	165.69	9.84	0.00	153.57	229.67	0.06	86.40	0.00	51.53	154.20	182.18	1,173.81
Headworks (H)														
3893L	H-26	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
3893K	H-27	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
3893M	H-28	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
3893N	H-29	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
3893P	H-30	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
	H Total:	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
North Hollywood (NH)														
3800	NH-2	0.16	0.00	0.20	0.29	81.81	0.00	0.20	0.66	11.52	385.07	297.65	409.94	1,187.50
3780A	NH-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
3810S	NH-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.09
3770	NH-7	0.06	0.04	0.00	0.09	0.09	121.78	5.21	0.00	5.39	154.56	134.64	188.86	610.72
3810	NH-11	0.00	0.09	0.11	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59
3810A	NH-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
3810B	NH-14A	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
3790B	NH-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
3820D	NH-16	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
3820C	NH-17	0.00	0.27	0.11	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63
3820B	NH-18	0.00	1.46	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.85
3830D	NH-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
3830C	NH-20	0.00	0.45	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51
3830B	NH-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
3790C	NH-22	0.00	0.11	0.18	0.00	89.94	243.87	0.00	0.00	0.00	18.02	255.09	346.67	953.88
3790D	NH-23	212.51	307.62	230.41	213.49	7.11	0.00	0.34	0.20	0.00	0.00	0.36	0.00	972.04
3800C	NH-24	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
3790F	NH-25	195.98	269.62	199.26	182.09	175.71	56.49	0.00	0.00	0.00	0.00	0.00	0.00	1,079.15
3790E	NH-26	176.69	242.88	183.99	177.15	171.74	163.65	0.00	0.00	0.00	12.16	177.36	241.23	1,546.85
3820F	NH-27	0.13	0.00	0.09	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44
3810K	NH-28	0.00	0.27	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68
3810L	NH-29	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
3800D	NH-30	0.00	0.00	0.29	0.09	0.09	0.11	0.45	0.11	0.00	0.20	0.00	0.27	1.61
3810T	NH-31	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
3770C	NH-32	236.06	328.85	246.16	226.51	218.59	191.91	8.19	0.00	8.81	291.96	220.54	311.52	2,289.10
3780C	NH-33	133.90	182.36	136.31	125.36	124.10	67.26	4.63	0.18	0.00	5.25	133.58	190.88	1,103.81
3790G	NH-34	217.40	300.45	231.65	219.76	210.05	85.19	0.11	52.80	16.27	277.70	217.63	296.55	2,125.56
3830N	NH-35	0.00	0.66	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.41

GROUND WATER EXTRACTIONS
1997-98 WATER YEAR
(acre-feet)

LACDPW	Owner	1997			1998									
Well No.	Well No.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin (cont'd)														
North Hollywood (NH)														
3790H	NH-36	119.51	162.05	121.32	114.37	108.93	102.82	0.06	46.30	8.86	151.42	108.33	0.00	1,043.97
3790J	NH-37	344.44	476.56	363.03	345.15	334.20	339.78	0.13	91.50	27.84	471.12	361.86	236.17	3,391.78
3810M	NH-38	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
3810N	NH-39	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
3810P	NH-40	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
3810Q	NH-41	0.00	0.66	0.45	0.39	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.70
3810R	NH-42	0.00	0.61	0.43	0.34	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67
3790K	NH-43A	0.45	0.29	0.16	0.25	95.04	256.19	0.20	108.99	19.78	332.55	17.03	0.00	830.93
3790L	NH-44	359.82	497.88	381.58	365.79	356.33	348.92	0.00	142.12	27.06	461.93	364.41	496.34	3,802.18
3790M	NH-45	445.98	620.45	476.83	457.18	442.90	437.60	0.00	175.89	33.28	567.86	449.12	611.79	4,718.88
	NH Total:	2,443.09	3,393.63	2,573.37	2,429.96	2,417.12	2,415.57	19.52	618.84	158.81	3,129.80	2,737.60	3,330.22	25,667.53
Pollock (P)														
3959E	P-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
3958H	P-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
3958J	P-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
	P Total:	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
Rinaldi-Toluca (RT)														
4909E	RT-1	377.86	321.07	365.79	469.21	227.47	132.55	0.09	0.06	0.25	245.36	0.00	0.00	2,139.71
4898A	RT-2	420.95	543.50	434.94	539.62	447.86	154.45	0.00	0.00	0.00	337.69	367.58	0.00	3,246.59
4898B	RT-3	0.00	343.48	472.65	171.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	987.27
4898C	RT-4	482.39	593.34	453.44	542.97	445.86	153.09	0.09	0.04	0.06	12.90	0.00	0.00	2,684.18
4898D	RT-5	471.48	248.39	452.27	583.63	477.43	165.26	0.11	0.18	0.16	376.76	406.15	0.00	3,181.82
4898E	RT-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
4898F	RT-7	458.14	572.22	451.88	573.66	405.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2,461.68
4898G	RT-8	279.31	396.55	312.16	391.59	318.98	105.78	0.00	0.00	0.00	0.00	0.00	0.00	1,804.37
4898H	RT-9	421.71	515.84	413.38	509.04	405.07	137.74	0.00	0.00	0.00	0.00	0.00	0.00	2,402.78
4909G	RT-10	498.80	604.84	489.23	603.60	478.39	168.18	0.00	0.09	0.00	390.08	387.39	0.00	3,620.60
4909K	RT-11	323.34	377.80	0.00	387.16	436.59	62.05	0.00	0.09	0.00	352.38	349.56	0.00	2,288.97
4909H	RT-12	458.86	565.81	128.19	0.87	300.57	160.97	0.09	0.09	0.13	356.81	351.35	0.00	2,323.74
4909J	RT-13	372.77	549.88	125.32	0.18	302.91	161.04	0.00	0.00	0.16	370.33	364.80	0.00	2,247.39
4909L	RT-14	409.20	344.00	0.00	1.12	0.00	0.06	0.00	0.04	0.06	0.29	0.36	0.00	755.13
4909M	RT-15	0.68	0.36	0.64	1.21	208.03	0.06	0.00	0.00	0.02	0.32	0.25	0.00	211.57
	RT Total:	4,975.49	5,977.08	4,099.89	4,775.00	4,454.94	1,401.23	0.38	0.59	0.84	2,442.92	2,227.44	0.00	30,355.80
Tujunga (T)														
4887C	T-1	297.26	480.67	512.14	631.77	507.09	145.15	0.00	0.94	0.00	266.78	511.11	215.40	3,568.31
4887D	T-2	540.70	669.39	524.90	652.47	521.30	148.82	0.00	0.00	0.34	274.97	527.36	220.38	4,080.63
4887E	T-3	303.32	487.55	336.17	134.94	520.33	111.15	0.52	0.89	0.71	275.13	526.72	222.58	2,920.01
4887F	T-4	298.89	649.42	127.91	130.71	505.71	107.89	0.52	0.45	0.43	266.94	490.17	65.74	2,644.78
4887G	T-5	0.00	168.64	13.82	1.07	0.34	0.50	0.00	0.00	0.00	0.00	0.00	559.15	743.52
4887H	T-6	0.00	1.37	14.80	0.34	0.27	1.56	0.68	0.50	0.00	138.03	506.10	548.18	1,211.83
4887J	T-7	0.00	1.49	4.06	18.82	0.39	1.30	0.43	0.68	0.00	135.99	498.20	541.89	1,203.25
4887K	T-8	173.87	441.48	213.91	137.51	528.00	112.94	0.48	0.61	0.00	135.83	310.30	542.44	2,597.37
4886B	T-9	20.40	431.84	2.02	133.56	515.67	111.31	1.67	1.14	0.00	138.63	312.53	546.46	2,215.23
4886C	T-10	20.79	442.44	1.65	129.36	393.61	1.85	1.49	0.89	0.00	0.98	0.00	0.36	993.42
4886D	T-11	282.55	19.62	0.89	1.65	0.50	0.59	0.55	0.43	0.00	0.00	0.00	0.00	306.78
4886E	T-12	303.03	344.32	0.78	6.35	0.50	1.46	0.87	2.36	0.00	4.17	0.29	0.27	664.40
	T Total:	2,240.81	4,138.23	1,753.05	1,978.55	3,493.71	744.52	7.21	8.89	1.48	1,637.45	3,682.78	3,462.85	23,149.53
Verdugo (V)														
3863H	V-1	0.00	0.00	0.18	0.00	0.34	0.04	0.00	56.84	0.00	0.00	0.00	0.22	57.62
3863P	V-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.64	0.82
3863J	V-4	0.00	0.11	0.13	0.00	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.30
3863L	V-11	0.00	0.27	0.22	0.00	0.43	0.11	0.00	118.29	0.00	161.01	202.22	252.96	735.51
3853G	V-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
3854F	V-22	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
3844R	V-24	0.00	0.22	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.48
	V Total:	0.00	0.60	0.53	0.00	0.94	0.17	0.00	175.31	0.00	161.01	202.22	253.95	794.73

GROUND WATER EXTRACTIONS
1997-98 WATER YEAR
(acre-feet)

LACDPW	Owner	1997			1998								
Well No.	Well No.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin (cont'd)														
Whitnall (W)														
3820E	W-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
3821B	W-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
3821C	W-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
3821D	W-4	0.57	0.09	0.25	0.43	0.57	0.00	0.00	0.84	0.00	0.00	0.00	0.89	3.64
3821E	W-5	0.16	0.13	0.16	0.27	0.32	0.00	0.00	0.27	0.00	0.00	0.00	0.71	2.02
3831J	W-6A	0.29	0.20	0.16	0.00	153.76	232.87	0.50	162.14	0.00	92.44	282.98	350.36	1,275.70
3832K	W-7	0.00	0.00	0.00	0.00	82.57	125.64	0.00	89.55	0.00	51.33	158.17	195.13	702.39
3832L	W-8	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
3832M	W-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
3842E	W-10	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
	W Total:	1.02	0.42	0.57	0.70	237.22	358.51	0.50	252.80	0.00	143.77	441.15	547.09	1,983.75
Los Angeles, City of														
	Total:	9,933.42	13,933.33	8,626.55	9,386.13	10,943.04	5,319.47	82.67	1,313.25	334.63	7,814.88	9,621.23	7,982.27	85,290.87
San Fernando Basin Total:		11,392.76	15,007.97	9,262.02	9,721.23	11,290.07	5,799.40	810.02	1,990.75	1,282.88	8,564.48	10,512.80	9,048.73	94,683.10

*Tegatz/Pankow in litigation. Estimates provided by party.

Sylmar Basin														
Los Angeles, City of														
	Mission													0.00
4840J	5	153.37	183.90	95.70	0.00	0.00	0.00	0.00	0.00	49.97	207.50	157.36	186.57	1,034.37
4840K	6	139.46	171.94	91.23	0.00	0.00	0.00	0.00	49.03	155.60	182.59	140.56	172.13	1,102.54
4840S	7	189.07	234.50	124.90	0.00	0.00	0.00	0.00	66.73	213.06	247.08	193.08	237.14	1,505.56
		481.90	590.34	311.83	0.00	0.00	0.00	0.00	115.76	418.63	637.17	491.00	595.84	3,642.47
Santiago Estates														
5998	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					0.00
San Fernando, City of														
5969D	2A	173.68	124.31	105.88	98.39	77.91	86.71	93.53	96.38	105.14	154.58	170.07	157.23	1,443.81
5959	3	69.22	56.23	57.38	56.68	50.38	80.44	85.69	91.58	107.48	102.16	122.80	90.87	970.91
5969	4	20.44	32.56	33.91	27.21	24.73	22.01	23.00	22.26	20.05	36.51	38.17	27.75	328.60
5968	7A	54.39	37.80	31.73	40.99	35.62	38.32	32.51	43.37	55.05	81.01	60.78	53.03	564.60
	Total:	317.73	250.90	228.90	223.27	188.64	227.48	234.73	253.59	287.72	374.26	391.82	328.88	3,307.92
Sylmar Basin Total:		799.63	841.24	540.73	223.27	188.64	227.48	234.73	369.35	706.35	1,011.43	882.82	924.72	6,950.39

Verdugo Basin														
Crescenta Valley Water District														
5058B	1	12.96	8.29	21.53	7.92	6.45	7.81	6.82	10.23	36.34	39.88	37.74	32.29	226.26
5036A	2	0.38	0.33	0.42	0.49	0.40	0.44	0.42	0.43	0.41	0.43	0.33	0.31	4.79
5058H	5	22.32	20.95	1.58	1.61	2.16	3.02	30.37	29.34	31.83	69.83	64.37	53.87	331.25
5058	6	22.95	21.59	21.19	19.98	1.84	0.00	4.32	33.94	32.22	33.33	31.66	25.83	248.85
5047B	7	46.59	45.45	25.78	44.44	40.03	46.23	43.64	47.32	44.16	43.98	40.92	39.80	508.34
5069J	8	52.42	52.40	28.27	35.22	36.40	46.32	45.61	38.64	50.00	65.78	63.98	60.38	575.42
5047D	9	36.24	28.31	31.78	30.20	25.14	33.72	34.71	35.04	39.12	34.82	32.55	34.13	395.76
5058D	10	35.92	48.85	28.88	21.83	55.82	64.92	64.16	68.86	64.67	67.10	64.38	60.30	645.69
5058E	11	13.61	26.05	21.72	18.83	15.01	26.32	27.95	29.54	33.25	45.96	42.34	39.96	340.54

GROUND WATER EXTRACTIONS
1997-98 WATER YEAR
(acre-feet)

LACDPW	Owner	1997			1998									
Well No.	Well No.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
Verdugo Basin (cont'd)														
Crescenta Valley Water District, cont'd														
5058J	12	34.60	24.46	43.67	26.93	12.29	19.85	23.57	6.95	14.98	41.39	41.51	31.08	321.28
5069F	14	16.34	19.56	29.75	9.21	5.54	0.00	0.00	0.00	0.00	2.80	0.69	2.72	86.61
	PICK	4.95	4.75	5.01	4.98	4.48	5.12	5.23	5.52	5.44	5.66	5.62	5.42	62.18
	Total:	299.28	300.99	259.58	221.64	203.56	253.75	286.80	305.81	352.42	450.96	426.09	386.09	3,746.97
Glendale, City of														
3961-3971	GL3-5	70.17	10.10	0.00	108.29	98.20	114.19	98.97	102.56	85.83	97.14	114.37	110.28	1,010.10
3970	GL-6	93.23	92.72	72.67	84.51	82.37	79.51	95.89	91.90	89.19	91.25	93.27	86.94	1,053.45
—	VPCKP	65.60	62.49	64.63	65.27	51.02	63.29	62.08	65.41	64.34	66.82	65.79	60.08	756.82
—	MM-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
	Total:	229.00	165.31	137.30	258.07	231.59	256.99	256.94	259.87	239.36	255.21	273.43	257.30	2,820.37
Verdugo Basin Total:		528.28	466.30	396.88	479.71	435.15	510.74	543.74	565.68	591.78	706.17	699.52	643.39	6,567.34

Eagle Rock Basin														
McKesson Water Products														
3987A	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
3987B	2	4.86	3.43	4.02	3.97	4.04	3.54	5.04	3.25	5.85	5.14	6.67	6.70	56.51
3987F	3	7.05	3.75	4.74	3.44	5.08	4.64	4.77	6.31	4.24	7.72	4.94	6.48	63.16
3987G	4	6.72	6.38	7.08	6.99	4.64	7.80	6.31	5.19	6.91	6.17	8.25	8.14	80.58
	Total:	18.63	13.56	15.84	14.40	13.76	15.98	16.12	14.75	17.00	19.03	19.86	21.32	200.25
Eagle Rock Basin Total:		18.63	13.56	15.84	14.40	13.76	15.98	16.12	14.75	17.00	19.03	19.86	21.32	200.25

ULARA Total:	12,739.30	16,329.07	10,215.47	10,438.61	11,927.62	6,553.60	1,604.61	2,940.53	2,598.01	10,301.11	12,115.00	10,638.16	108,401.08

APPENDIX B
KEY GAGING STATIONS SURFACE RUNOFF

WESTERN HYDROLOGIC SYSTEMS - (916) 885-2480
0F57RO.98 F57C-R LOS ANGELES RIVER ABOVE ARROYO SECO

AILY DISCHARGE IN CUBIC FEET PER SECOND WATER YEAR OCT 1997 TO SEP 1998

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	88	109	248	108	117	1,110	799	278	219	137	136	91
2	92	107	112	111	1,480	916	258	431	158	139	126	103
3	97	105	107	237	8,460	719	244	277	182	172	125	131
4	99	111	103	706	522	662	399	1,120	172	144	107	121
5	101	105	2,720	134	187	653	366	4,100	154	142	109	102
6	99	99	6,690	103	5,790	969	295	1,370	163	146	101	95
7	95	93	307	97	5,570	182	285	712	160	124	108	98
8	107	91	175	101	4,860	156	267	379	159	117	114	102
9	98	91	121	1,720	1,310	133	261	265	150	123	105	99
10	101	1,770	109	1,170	276	117	263	240	231	143	101	97
11	97	159	102	137	207	115	1,430	373	246	146	98	95
12	98	99	102	117	180	113	353	2,210	283	142	94	98
13	103	664	103	310	166	349	288	3,530	190	135	92	97
14	96	112	107	102	4,110	815	231	1,190	184	122	101	98
15	99	101	110	156	464	161	231	947	228	120	100	98
16	95	100	104	185	261	161	237	820	266	102	102	104
17	95	99	104	106	1,440	171	232	770	167	96	101	101
18	96	99	1,800	103	221	167	194	711	128	119	97	94
19	102	98	171	385	1,270	165	184	608	138	113	97	101
20	103	108	110	126	894	170	205	510	143	117	94	100
21	100	108	102	103	205	176	279	477	146	113	99	100
22	104	108	100	103	4,940	173	463	421	158	110	107	98
23	103	109	104	102	13,900	187	350	405	147	112	102	97
24	107	113	101	107	7,660	190	321	411	148	115	97	97
25	103	112	99	120	2,380	6,260	386	404	160	122	90	95
26	108	1,410	100	110	1,490	447	331	419	142	123	90	97
27	107	155	103	109	1,220	229	312	329	147	120	89	115
28	110	106	105	112	1,060	682	308	281	138	117	99	125
29	106	106	106	1,650	------	192	264	263	140	119	93	124
30	111	1,620	108	123	------	183	278	241	145	113	94	117
31	110	------	113	202	------	1,980	------	239	------	118	92	------
TOTAL	3,130	8,267	14,646	9,055	70,640	18,703	10,314	24,731	5,192	3,881	3,160	3,090
MEAN	101	276	472	292	2,523	603	344	798	173	125	102	103
MAX	111	1,770	6,690	1,720	13,900	6,260	1,430	4,100	283	172	136	131
MIN	88	91	99	97	117	113	184	239	128	96	89	91
AC-FT	6,210	16,400	29,050	17,960	140,100	37,100	20,460	49,050	10,300	7,700	6,270	6,130

CAL YEAR 1997	TOTAL	68,545	MEAN	188	MAX	6,690	MIN	88	AC-FT	136,000
WTR YEAR 1998	TOTAL	174,809	MEAN	479	MAX	13,900	MIN	88	AC-FT	346,700

WESTERN HYDROLOGIC SYSTEMS - (916) 885-2480
F118RO F118 B-R PACIOMA DAM OUTFLOW

AILY DISCHARGE IN CUBIC FEET PER SECOND WATER YEAR OCT 1997 TO SEP 1998

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.60	.60	.74	.60	0	149*	0	78	76	40	.60	11
2	.60	.60	.60	.60	0	141*	0	78	75	27	.60	20
3	.60	.60	.60	.60	0	135*	0	77	64	4.2	.60	11
4	.60	.60	.60	1.3	0	126*	0	63	57	2.1	.60	.60
5	.60	.60	1.6	1.2	0	111*	0	51	59	1.1	.60	.60
6	.60	.60	10	24	0	182*	0	0	65	32	.60	.60
7	.60	.60	12	14	12	124*	0	32	63	50	.60	.60
8	.60	.60	.46	1.2	92	121	25*	90	64	48	.60	25
9	.60	.60	.60	2.1	81	90	91*	87	59	45	.60	45
10	.60	1.4	.60	1.7	29	74	134*	83	64	43	29	28
11	.60	.64	.60	1.2	67	106	130*	108	72	40	28	.99
12	.60	.60	.60	29	77	119	128*	176	75	35	1.7	1.6
13	.60	.60	.60	33	23	75	126*	206	74	16	.60	.29
14	.60	.60	.60	1.2	50	74	125*	178	76	1.0	.60	0
15	.60	.60	.60	1.2	60	73	121*	161	81	28	.60	19
16	.60	.60	.60	1.2	50	150	113*	161	87	44	.60	26
17	.60	.60	.60	1.2	34	144	109*	164	87	18	.60	0
18	.60	.60	1.3	1.2	42	85	103*	160	88	.70	.60	0
19	.60	.60	15	1.9	54	83	96*	163	86	.60	.60	0
20	.60	.60	12	33	69	83	91*	159	84	.60	.60	0
21	.60	.60	.60	21	43	83	88*	156	85	.60	.60	0
22	.60	.60	.60	1.2	100	82	110*	155	84	.60	.60	0
23	.60	.60	.60	1.2	549*	81	180*	158	82	.60	.60	0
24	.60	.60	.60	1.2	1,020*	81	89	162	81	.60	.60	0
25	.60	.60	.60	1.2	487*	81	74	165	72	.60	.60	0
26	.60	1.8	.60	1.2	295*	81	74	105	56	.60	.60	0
27	.60	.60	.60	1.2	244*	81	74	80	56	24	.60	0
28	16	.60	.60	1.2	173*	81	73	60	48	41	.60	0
29	26	.60	.60	29	------	81	76	76	46	27	.60	0
30	24	2.1	.60	26	------	81	78	77	47	1.4	.60	0
31	8.9	------	.60	1.9	------	47	------	77	------	1.2	.60	------
TOTAL	91.10	21.54	66.90	237.70	3,651	3,105	2,308	3,546	2,113	574.50	75.50	190.28
MEAN	2.94	.72	2.16	7.67	130	100	76.9	114	70.4	18.5	2.44	6.34
MAX	26	2.1	15	33	1,020	182	180	206	88	50	29	45
MIN	.60	.60	.46	.60	0	47	0	0	46	.60	.60	0
AC-FT	181	43	133	471	7,240	6,160	4,580	7,030	4,190	1,140	150	377

CAL YEAR 1997	TOTAL	2,538.75	MEAN	6.96	MAX	174	MIN	.46	AC-FT	5,040
WTR YEAR 1998	TOTAL	15,980.52	MEAN	43.8	MAX	1,020	MIN	0	AC-FT	31,700

Due to logger damage, record is based upon Pacoima Dam records; Dates: Feb 1

WESTERN HYDROLOGIC SYSTEMS - (916) 885-2480
F252RO F252-R VERDUGO WASH @ ESTELLE AVE.

"AILY DISCHARGE IN CUBIC FEET PER SECOND WATER YEAR OCT 1997 TO SEP 1998

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.2	4.7	7.6	6.2	6.5	19	57	9.1	10	9.3	10	6.7
2	6.2	4.7	6.2	6.7	14	18	20	15	11	9.7	9.5	7.0
3	6.2	4.7	7.3	29	314	17	25	16	11	9.4	9.3	7.8
4	6.2	5.0	6.3	28	12	16	28	99	11	9.3	9.0	7.2
5	6.2	5.4	74	6.2	8.8	24	18	132	11	9.2	8.8	7.1
6	6.2	5.7	148	5.9	228	41	16	36	11	9.5	8.8	7.2
7	5.9	6.2	20	6.1	438	14	15	14	11	9.7	8.7	7.4
8	5.2	5.9	7.6	6.2	128	14	14	12	11	10	8.5	7.6
9	5.2	5.4	6.2	115	22	13	13	13	11	10	8.2	7.6
10	5.4	59	6.2	43	15	13	13	11	11	10	9.0	7.9
11	4.9	13	6.2	7.6	12	12	67	11	15	10	8.5	7.5
12	4.8	6.9	6.2	8.2	11	11	14	166	18	10	7.8	7.5
13	5.3	10	6.2	12	10	51	13	125	10	11	7.7	7.5
14	5.6	11	6.6	6.3	160	27	12	20	10	11	7.4	7.5
15	6.2	7.6	6.7	8.6	14	11	11	16	10	11	7.4	7.3
16	5.4	6.4	6.2	6.4	18	11	12	15	15	11	7.6	6.9
17	5.4	6.0	6.1	6.2	47	11	12	13	12	12	8.2	6.9
18	5.4	5.4	63	6.2	11	10	12	12	9.9	11	8.3	7.1
19	5.4	5.5	6.9	28	72	9.5	11	12	9.9	12	8.1	6.9
20	5.4	6.6	6.2	6.4	17	8.9	10	12	9.9	9.8	8.5	7.1
21	5.4	6.2	6.4	6.2	13	8.5	11	11	9.9	11	8.7	8.3
22	5.4	6.1	6.1	6.2	228	8.2	11	11	9.9	13	8.6	8.1
23	5.4	5.4	6.2	6.2	966	7.6	11	11	10	11	8.7	8.5
24	5.4	5.0	6.1	6.2	238	9.6	11	12	9.7	11	8.7	11
25	5.2	4.9	5.8	6.2	51	227	11	14	9.6	11	8.3	11
26	4.7	101	6.1	6.3	32	18	10	12	9.6	11	8.4	11
27	4.0	8.0	5.7	6.3	26	17	10	11	9.2	11	8.2	28
28	3.9	6.2	5.7	6.2	21	63	9.8	11	8.9	10	8.4	7.7
29	3.9	6.3	6.1	85	------	14	9.6	11	9.1	11	8.5	8.0
30	4.4	55	6.2	6.7	------	14	9.2	11	9.2	10	8.8	7.7
31	4.7	------	6.2	7.3	------	196	------	10	------	10	9.3	------
TOTAL	165.1	389.2	476.3	497.0	3,133.3	934.3	496.6	884.1	323.8	324.9	263.9	255.0
MEAN	5.33	13.0	15.4	16.0	112	30.1	16.6	28.5	10.8	10.5	8.51	8.50
MAX	6.2	101	148	115	966	227	67	166	18	13	10	28
MIN	3.9	4.7	5.7	5.9	6.5	7.6	9.2	9.1	8.9	9.2	7.4	6.7
AC-FT	327	772	945	986	6,210	1,850	985	1,750	642	644	523	506

CAL YEAR 1997	TOTAL	5,108.3	MEAN	14.0	MAX	242	MIN	1.9	AC-FT	10,130
WTR YEAR 1998	TOTAL	8,143.5	MEAN	22.3	MAX	966	MIN	3.9	AC-FT	16,150

WESTERN HYDROLOGIC SYSTEMS - (916) 885-2480
F300RO F300-R LOS ANGELES RIVER @ TUJUNGA AVE.

'AILY DISCHARGE IN CUBIC FEET PER SECOND WATER YEAR OCT 1997 TO SEP 1998

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	80	77	174	82	112	1,220	432	259	158	109	113	88
2	85	73	100	87	1,670	914	217	389	114	105	110	86
3	90	77	93	139	6,940	656	206	238	95	102	109	87
4	94	78	91	671	495	622	300	1,470	92	99	107	91
5	89	75	2,920	109	246	772	255	2,580	90	96	109	90
6	80	77	5,420	81	4,850	1,120	249	1,030	89	92	111	88
7	79	82	292	77	4,450	682	243	775	89	89	112	86
8	91	81	183	78	4,410	639	238	296	89	87	114	85
9	84	78	106	1,550	1,180	605	228	245	89	88	116	83
10	89	1,430	90	732	394	565	230	239	90	90	117	80
11	79	128	80	132	319	513	1,160	247	91	91	119	78
12	81	82	79	102	264	448	265	1,650	98	93	121	76
13	86	594	79	302	216	640	253	2,850	101	95	122	75
14	78	101	91	81	3,540	924	214	1,150	103	97	119	73
15	78	115	92	216	517	630	223	943	104	99	116	71
16	63	86	81	148	409	563	223	859	106	99	112	73
17	65	89	84	87	1,470	499	209	842	106	96	109	76
18	70	85	1,370	83	340	345	144	802	70	97	105	79
19	74	78	146	311	1,390	143	129	653	82	99	102	82
20	75	91	101	125	675	160	170	569	98	101	101	85
21	72	80	85	84	304	154	233	531	110	103	100	89
22	75	85	84	80	4,370	149	452	446	124	105	98	85
23	74	84	85	76	11,900	172	273	417	138	106	97	81
24	78	84	80	91	7,100	146	274	394	136	108	97	75
25	73	81	82	107	2,410	2,260	309	370	132	110	95	76
26	71	989	84	84	1,420	291	288	463	127	112	94	80
27	70	141	84	82	1,240	209	271	450	124	115	92	79
28	72	93	86	86	1,120	418	256	420	120	117	92	66
29	76	92	87	608	------	175	246	389	116	118	91	68
30	76	1,500	85	114	------	157	258	283	112	117	90	70
31	78	------	95	252	------	1,240	------	186	------	115	88	------
TOTAL	2,425	6,806	12,609	6,857	63,751	18,031	8,448	22,435	3,193	3,150	3,278	2,401
MEAN	78.2	227	407	221	2,277	582	282	724	106	102	106	80.0
MAX	94	1,500	5,420	1,550	11,900	2,260	1,160	2,850	158	118	122	91
MIN	63	73	79	76	112	143	129	186	70	87	88	66
AC-FT	4,810	13,500	25,010	13,600	126,500	35,760	16,760	44,500	6,330	6,250	6,500	4,760

CAL YEAR 1997	TOTAL	53,979	MEAN	148	MAX	5,420	MIN	53	AC-FT	107,100
WTR YEAR 1998	TOTAL	153,384	MEAN	420	MAX	11,900	MIN	63	AC-FT	304,200

WESTERN HYDROLOGIC SYSTEMS - (916) 885-2480
E285RO E285-R BURBANK WESTERN STORM DRAIN

AILY DISCHARGE IN CUBIC FEET PER SECOND WATER YEAR OCT 1997 TO SEP 1998

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	11	12	8.6	12	16	52	14	14	14	15	12
2	11	10	11	11	15	14	40	16	13	14	15	13
3	10	10	10	22	345	13	38	12	12	11	18	20
4	10	11	10	44	13	14	36	144	13	11	19	15
5	10	11	203	17	9.7	36	38	217	13	11	20	13
6	11	11	264	11	251	81	30	59	12	11	18	12
7	10	11	15	11	482	35	14	19	11	11	19	14
8	9.8	11	12	11	208	24	14	16	13	11	16	14
9	9.8	11	11	181	116	19	18	17	14	12	15	14
10	10	110	11	29	54	17	16	14	14	12	20	14
11	10	12	11	11	32	15	65	14	17	11	18	14
12	11	12	13	12	22	13	15	133	22	11	21	12
13	11	35	14	23	17	78	17	176	13	10	16	12
14	9.8	13	13	12	181	30	15	42	13	11	12	12
15	9.7	12	9.9	14	94	13	14	23	13	13	11	13
16	10	11	10	13	47	13	15	17	14	13	11	13
17	9.6	12	9.8	14	66	12	14	16	12	13	12	12
18	9.7	12	130	11	21	12	14	15	13	12	12	13
19	10	13	11	23	97	14	14	16	13	12	12	12
20	11	12	9.9	12	21	11	15	15	12	13	11	12
21	11	12	9.8	12	14	12	14	15	12	11	11	12
22	10	12	11	12	207	12	14	15	12	10	10	12
23	11	12	12	12	844	13	15	13	12	10	10	12
24	11	12	10	11	261	16	15	13	12	11	12	13
25	11	13	8.4	10	149	514	13	14	12	9.6	11	14
26	11	133	11	9.0	19	26	13	14	11	10	12	13
27	11	13	11	8.6	16	23	12	15	11	11	13	16
28	11	10	12	9.5	15	46	13	16	11	11	13	13
29	11	9.9	12	84	------	17	12	15	12	11	12	13
30	11	91	12	12	------	16	14	13	13	10	12	13
31	11	------	11	12	------	172	------	13	------	15	13	------
TOTAL	323.4	668.9	910.8	682.7	3,628.7	1,347	629	1,151	389	356.6	440	397
MEAN	10.4	22.3	29.4	22.0	130	43.5	21.0	37.1	13.0	11.5	14.2	13.2
MAX	11	133	264	181	844	514	65	217	22	15	21	20
MIN	9.6	9.9	8.4	8.6	9.7	11	12	12	11	9.6	10	12
AC-FT	641	1,330	1,810	1,350	7,200	2,670	1,250	2,280	772	707	873	787

CAL YEAR 1997	TOTAL	4,830.3	MEAN	13.2	MAX	264	MIN	6.5	AC-FT	9,580
WTR YEAR 1998	TOTAL	10,924.1	MEAN	29.9	MAX	844	MIN	8.4	AC-FT	21,670

Recorder inoperative, record estimated; 1/29/98 to 2/7/98.

WESTERN HYDROLOGIC SYSTEMS - (916) 885-2480
F168RO F168-R. BIG TUJUNGA CREEK BELOW DAM

AILY DISCHARGE IN CUBIC FEET PER SECOND WATER YEAR OCT 1997 TO SEP 1998

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	.02										
2	0	.01										
3	0	.01										
4	0	8.4										
5	0	15										
6	0	15										
7	0	5.9										
8	0	.09										
9	0	.06										
10	0	.64										
11	.01	.15										
12	0	.07										
13	0	.09										
14	0	.07										
15	0	.05										
16	0	.05										
17	0	.04										
18	0	.04										
19	0	.04										
20	0	.04										
21	0	.05										
22	.01	.05										
23	.01	.05										
24	.02	.06										
25	.02	.06										
26	.01	.76										
27	.01	.20										
28	.90	.12										
29	.05	.11			------							
30	.03	.32			------							
31	.03	------			------		------		------			------
TOTAL	1.10	47.55										
MEAN	.035	1.59										
MAX	.90	15										
MIN	0	.01										
AC-FT	2.2	94										

CAL YEAR 1997	TOTAL*	5,859.32	MEAN	17.5	MAX	386	MIN	0	AC-FT	11,620		
WTR YEAR 1998	TOTAL*	48.65	MEAN	.80	MAX	15	MIN	0	AC-FT	96		

* Incomplete Record

APPENDIX C
COMPONENTS OF LOS ANGELES RIVER FLOW

UPPER LOS ANGELES RIVER AREA: COMPONENTS OF LOS ANGELES RIVER FLOW; 1996-97 WATER YEAR

TOTAL FLOW AT GAGE F-57C-R

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
Total:	6210	16400	29050	17960	140100	37100	20460	49050	10300	7700	6270	6130	346730

F-57C-R: Storm, Reclaimed, Industrial, Rising Ground Water
F300-R: storm, Tillman, industrial waste, and rising water
E285-R :storm, Burbank WRP, industrial waste
F252-R: storm, rising water

I. RECLAIMED WATER DISCHARGED TO L.A. RIVER IN ULARA

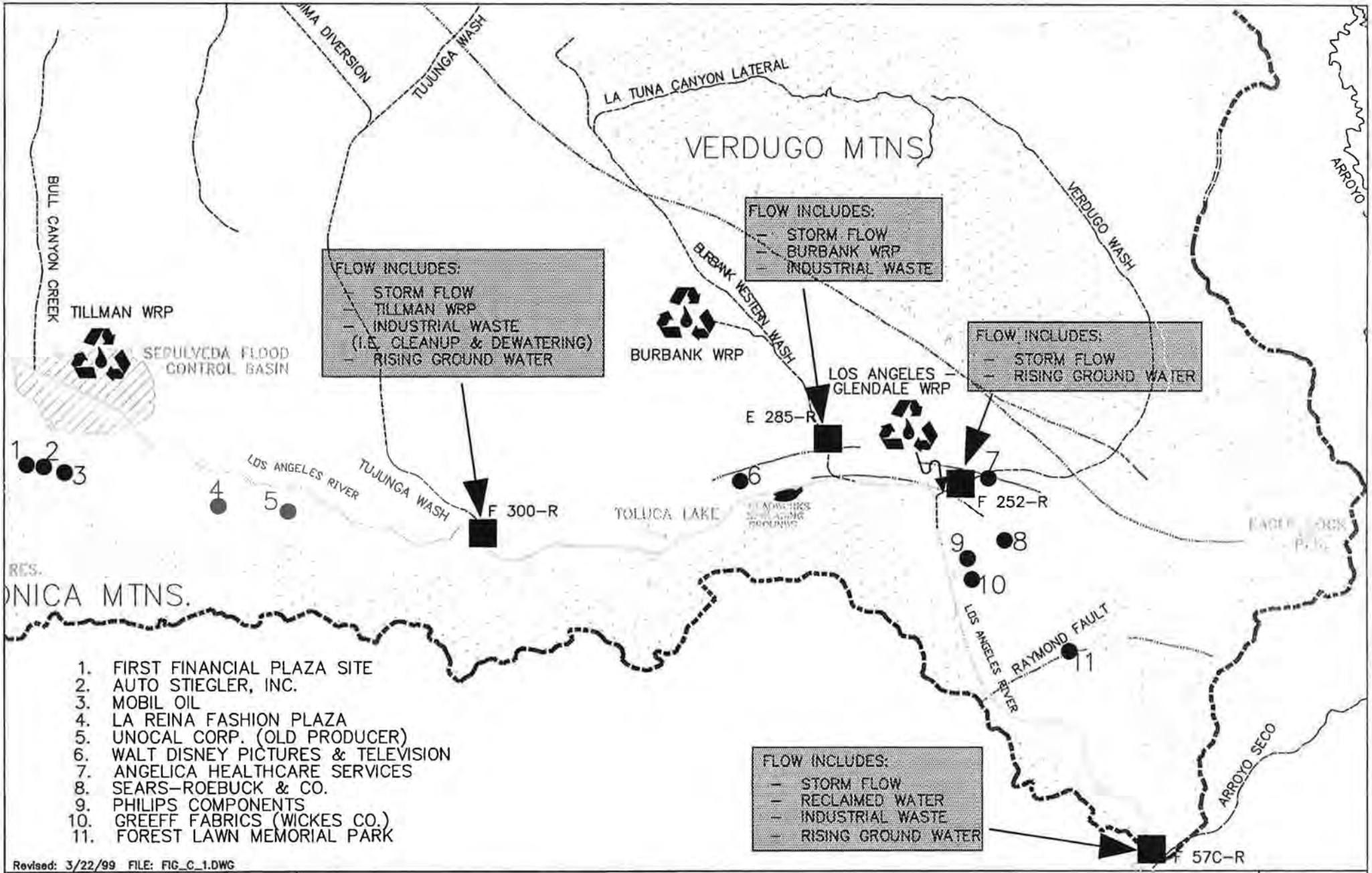
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep		
Tillman:	4736	5312	5480	5394	5790	5954	5726	5877	5403	5412	5559	3826		: Record 64469
L.A.-Glendale:	1232	1574	1690	1580	1428	1404	1268	1388	1214	930	1102	1318		: Record 16128
Burbank WRP:	480	502	457	467	602	610	625	658	540	482	511	524		: Record 6458
Total:	6448	7388	7627	7441	7820	7968	7619	7923	7157	6824	7172	5668	87055	

II. INDUSTRIAL WATER DISCHARGED TO L.A. RIVER IN ULARA

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep		
Upstream of F300-R	36	40	17	33	32	48	48	19	18	18	15	16	340	: From F300-R separation of flow
Between F300-R and (Old Rubber Dam Site)														
Disney	0	0	0	0	0	0	0	0	0	0	143	383		
Other:	60	60	60	60	60	60	60	60	60	60	60	60	1246	:20% of discharges 'Upstream of F300-R'; approximately 1cfs
Between Old Rubber Dam Site and F57C-R														
Headworks:	0	0	0	0	0	0	0	0	0	0	0	0		:pilot project record
Industrial waste:	430	416	430	430	388	430	416	430	416	430	430	416		:7 cfs assumed
Western Drain:	160	182	219	206	14	185	183	191	214	225	353	257		: From E285-R separation of flow
Total:	686	698	726	729	494	723	707	700	708	733	1001	1132	9040	

III. RISING WATER IN L.A. RIVER IN ULARA

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep		
Total:	333	333	333	333	333	337	333	333	333	333	333	333	4000	: See Section 2.3 of the Watermaster's Report



1997-98 Water Year ULARA Watermaster Report

Upper Los Angeles River Area: Components of Los Angeles River Flow

FIGURE C.1

APPENDIX D
WATER QUALITY DATA

REPRESENTATIVE MINERAL ANALYSES OF WATER

Well Number or Source	Date Sampled	Spec. Cond. µmho/c	Mineral Constituents in milligrams per liter (mg/l)												TDS mg/l	Hardness as $CaCO_3$ mg/l
			pH	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	NO_3	F	B		
Imported Water																
Colorado River Water at Eagle Rock Reservoir	1998/CY	883	8.6	64	24.5	82	4	0	140	210	76	1	0.29	0.11	542	260
LA Aqueduct Influent	5/6/98	357	8.2	22.6	5.3	45.8	4.9	0	151.9	25	24.6	0.44	0.79	0.76	227	76
LA Aqueduct/MWD Filtration Plant Influent	5/6/98	354	8.3	22.7	5.3	46.2	4.9	0	151.9	25.4	24.7	0.44	0.79	0.73	230	71
State Water Project at Joseph Jensen Filtration Plant (Influent)	1998CY	500	7.8	34	14.5	43	2.9	0	111	80	46	2.1	0.25	0.26	292	145
Surface Water																
Tillman Rec. Plant Discharge to LA River	1998FY	-	7.2	37	9.2	92	11	-	-	137	105	0.76	0.65	0.76	507	130
Los Angeles River at Arroyo Seco	9/95	981	8.0	68.1	24.3	96.5	9.75	ND	171	191	108	7.4	0.3	0.58	666	270
LA/Glendale Rec. Plant Discharge to LA River	1998FY	-	7.2	49	15	117	13	-	-	147	125	2.05	0.59	0.56	617	-
Ground Water																
(San Fernando Basin - Western Portion)																
4757C (Reseda No. 6)	10/13/83	944	7.8	115	31	43	2.1	-	301	200	33	2.6	0.31	0.24	595	416
(San Fernando Basin - Eastern Portion)																
3800 (No. Hollywood No. 2)	3/3/98	726	7.5	106	21.3	33.6	4.0	0	289.8	114	34.3	44.7	0.25	0.33	521	277
3841C (Burbank No. 7)	6/24/97	570	7.4	63.2	14.8	35.2	3.39	ND	218.4	105	30.5	19	0.53	-	384	228
3913H (Grandview No. 16)	1/96	540	7.8	60	14	37	3.8	ND	220	54.8	27	12.6	ND	-	326	180
(San Fernando Basin - L.A. Narrows)																
3959E (Pollock No. 4) (b)	3/8/93	794	7.5	77	24	49	NA	0	242	103	58	37.3	0.33	0.38	559	284
(Sylmar Basin)																
4840J (Mission No. 5)	8/5/97	680	7.6	82.9	17	35.3	4.45	0	249	83.8	39.1	24.3	0.33	0.27	439	259
5959 (San Fernando No. 3)	9/3/94	630	7.6	59	22	27	2.7	0.58	225	67	25	21	0.39	-	360	238
(Verdugo Basin)																
3971 (Glorietta No. 3)	11/6/98	996	6.6	100	38	37.6	3.5	ND	182	169	85	66.1	0.19	-	615	416
5058 (CVWD No. 14)	6/2/96	720	7.2	81.1	27.8	30.5	2.8	<1.0	205	88.8	54.7	50.1	0.2	-	437	300

APPENDIX E
DEWATERING AND REMEDIATION PROJECTS

DEWATERING PROJECTS

No.	Company	Contact	Address	ID	Start Date
1	Danalax Engineering Corp.	Krell, Alex	11239 Ventura Blvd.	P	
2		Henkin, Doug	8806 Etiwanda Ave.	P	
3	Delta Tech. Engineering	Abbasi, Z. A.	12800 Ventura Blvd.	P	
4	Helfman, Hoffman & Associates	Varadi, Ivan	5550 Topanga Canyon	D	Jun 19, 1989
5	Encino Spectrum Project	Helfman, Haloosim & Ass.	15503 Ventura Blvd.	D	Jun 14, 1989
6	Home Savings of America	Eli Silon & Associates	13949 Ventura Blvd.	D	Jun 14, 1989
7	Warner Center Ent. Complex	Tsuchiyama and Kaino	5955 Owensmouth Ave.	D	Jun 26, 1989
8	T Violes Construction Company	Viole, Tim, Jr.	15840 Ventura Blvd.	P	
9		Eccleston, C. W.	22020 Clarendon St.	P	
10		Marks, Ronald	5348 Topanga Canyon	P	
11		Helfman, Haloosim & Assoc.	21820 Burbank Blvd.	P	
12	Park Hill Medical Plaza	Anjomshoaa, Mahmoud	7303 Medical Center Dr.	D	Dec 27, 1989
13	Danalex Engineering		12050 Ventura Blvd.	P	
14	Ellis Plumbing Co.	Ellis, Chris	4235 Mary Ellen Ave.	P	
15	Tarzana Office Plaza	Varadi Engineering	18701 Burbank Ave.	P	
16	Helfman, Haloosim & Associates	Varadi, Ivan	5350 White Oak Ave.	P	
17	First Financial Plaza Site	Slade, Richard	16830 Ventura Blvd.	D	Oct 9, 1987
18	Trillium	Lewis, Bill	6310 Canoga Ave.	D	Apr 27, 1988
19	LAMCO	O'Neil, John	21300 Victory Blvd	D	Apr 27, 1988
20	La Reina Fashion Plaza	Blumenfeld, Dolores	14622 Ventura Blvd.	D	Apr 27, 1988
21	Auto Stiegler	Stiegler, John	16721 Ventura Blvd.	D	Oct 31, 1987
22	Sherway Properties	Vasquez, Rodney	4477 Woodman Ave.	P	
23	Ellis Plumbing Co.	Ellis, Chris	19951 Roscoe Blvd.	P	
24	Metropolitan Transit Authority	Higgins, John	Metro Red Line	TD	April, 1995
25		Carter, Dennis	4547 Murietta Ave	P	Jan 16, 1997
26	Walt Disney Imagineering	Phillip Clifford	Riverside Drive	TD	Aug. 20, 1998

Notes:

1) ID - Refers to the type of project;

D: Permanent dewatering required.

P: No dewatering required presently, however there is potential for dewatering in the future.

TD: Temporary Dewatering

2) Start Date - Date project was brought to the attention of the ULARA Watermaster.

REMEDIATION PROJECTS

No.	Company	Contact	Address	ID	Start Date	
1	Mobil Oil	Alton Geoscience	16461 Ventura Blvd.	R	May 11, 1989	
2	Thrifty Oil	Delta Tech. Eng.	18226 Ventura Blvd.	R	Feb 2, 1990	
3	California Environmental	Buckley, Charles	5455 Van Nuys Blvd.	R	Oct 4, 1989	
4	Rockwell International	Lafflam, S. R.	6633 Canoga Park Ave.	R	Jun 10, 1990	NFA
5	Lockheed	Helgerson, Ron	E. Empire Ave.	R	Jan 5, 1989	
6	3M Pharmaceutical	Lee, M. E.	19901 Nordhoff St.	R	Feb 8, 1989	
7	Philips Components	Smith, Wade	4561 Colorado St.	R	Jul 14, 1987	NFA
8	Greeff Fabrics	Edelson, Bruce	4000 Chevy Chase Dr.	R	March, 1993	NFA
9	Hughes Missile Systems Company	Barackman, Martin	Canoga Park, CA	R	February 1995	
10	Marquardt		16555 Saticoy St.	R	Mar-99	

Notes:

1) ID - Refers to the type of project;
R: Ground water remediation site.

2) Start Date - Date project was brought to the attention of the ULARA Watermaster.

3) NFA = No Further Action Notice issued by Regional Water Quality Control Board.

APPENDIX F
CRESCENTA VALLEY WATER DISTRICT

UPPER LOS ANGELES RIVER AREA WATERMASTER

CITY OF LOS ANGELES VS. CITY OF SAN FERNANDO, ET AL
CASE NO. 650079 – COUNTY OF LOS ANGELES

MELVIN L. BLEVINS – WATERMASTER

OFFICE LOCATION:
111 North Hope Street, Room 1463
Los Angeles, CA 90012
TELEPHONE: (213) 367-1020
FAX: (213) 367-1131

MAILING ADDRESS:
ULARA WATERMASTER
P.O. Box 51111, Room 1463
Los Angeles, CA 90051-0100

December 18, 1997

Mr. Michael G. Sovich
General Manager
Crescenta Valley Water District
2700 Foothill Boulevard
La Crescenta, California 91214

Dear Mr. Sovich:

1997-1998 Verdugo Basin Prescriptive Rights

The Watermaster and the Administrative Committee at its meeting October 14, 1997, approved the additional pumping requested by Crescenta Valley Water District (CVWD) in the Verdugo Basin for the 1997-1998 water year.

This approval permits CVWD to pump the unused portion of Glendale's annual pumping allocation, so long as, the total amount pumped is within the total safe yield for the Verdugo Basin of 7,150 acre foot per year.

Sincerely,

Melvin L. Blevins/pk

MELVIN L. BLEVINS
ULARA Watermaster

PTK:pg

C: ULARA Administrative Committee
Mr. Fred Lantz, President
City of Burbank
Mr. Michael Drake
City of San Fernando

The Honorable Judge Torres

Mr. Donald Froelich
City of Glendale
Mr. Robert Yoshimura
City of Los Angeles

Mr. Richard A. Nagel

bc: Gerald Gewe
Robert L. Simmons
ULARA Watermaster File ✓

Ernest F. Wong
Patricia T. Kiechler
PLG01-Verdugo

APPENDIX G
GLENDALE NORTH/SOUTH OPERABLE UNIT MAP

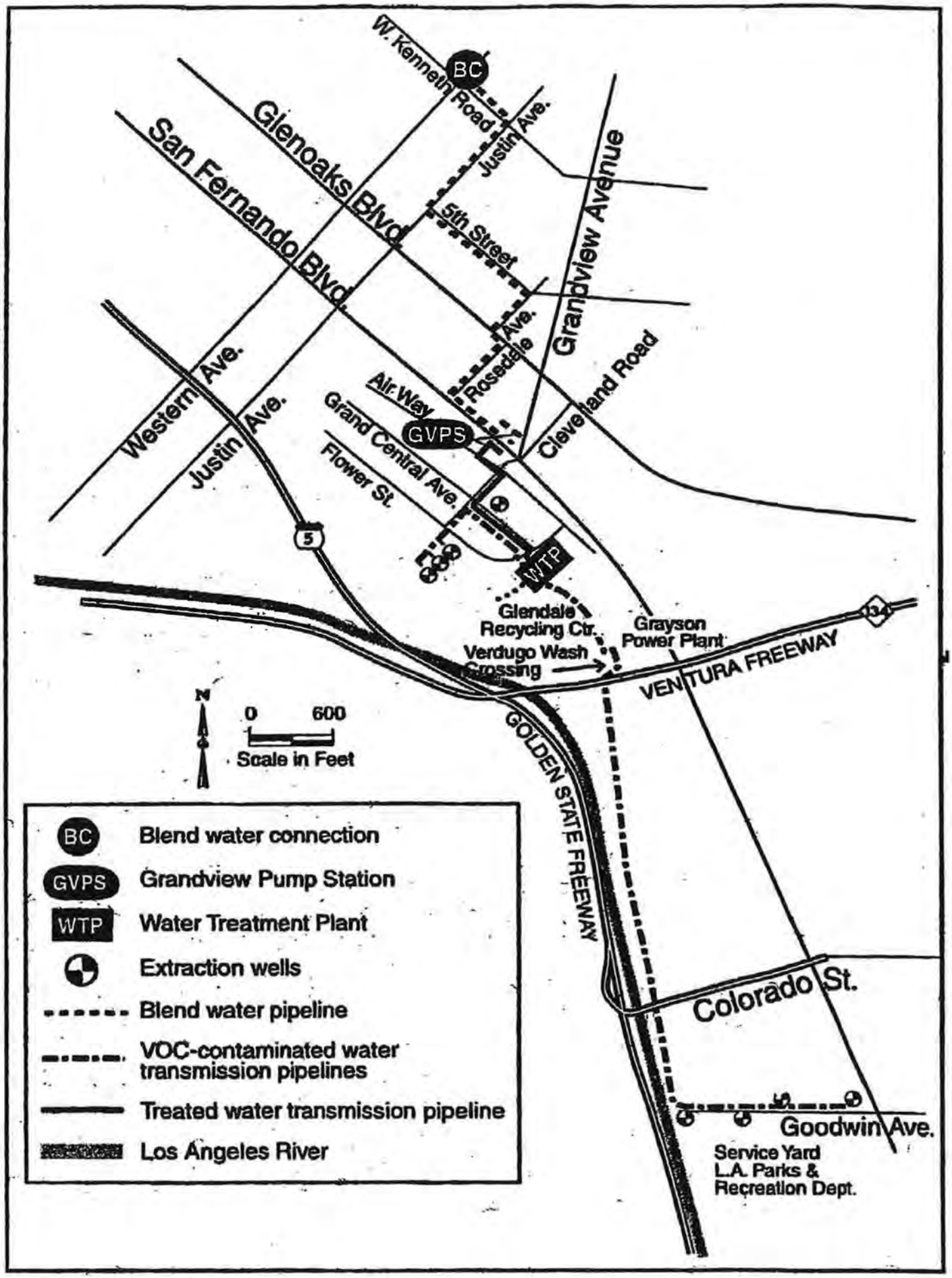


Figure 3: *Glendale Operable Units*

APPENDIX H
MIDDLE RANCH COURT ORDER

NOSSAMAN, GUTHNER, KNOX & ELLIOTT, LLP
Frederic A. Fudacz (SBN 050546)
John Ossiff (SBN 120149)
445 South Figueroa Street
Thirty-First Floor
Los Angeles, California 90071
Telephone: (213) 612-7800
Facsimile: (213) 612-7801

Attorneys for Upper Los Angeles River Area Watermaster

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

THE CITY OF LOS ANGELES,

Plaintiff,

v.

CITY OF SAN FERNANDO, et al.,

Defendants.

Case No. 650 079

~~[PROPOSED]~~ ORDER RE: ENFORCEMENT OF INJUNCTION

Hearing
Date: June 24, 1998
Time: 8:30 a.m.
Dept. 64

On June 24, 1998, at 8:30 a.m. in Department 64 of the above-entitled court, the motion of the Upper Los Angeles River Area Watermaster ("Watermaster") to enforce the injunction set forth in the Judgment against the following parties,

Charles J. Pankow, Jr., an individual

Charles J. Pankow, an individual

Doris M. Pankow, an individual

Charles J. Pankow, Jr., as trustee of the Pankow Family Trust, U/A August 21, 1976

Charles J. Pankow, Jr. as trustee, UTA dated December 31, 1992

Fritz Tegatz, an individual

Betsy Rue Tegatz, an individual

Middle Ranch, Ltd, a California limited partnership

Middle Ranch Operating Company, Inc., a California corporation, and

Middle Ranch Trust of 1992,

came on for hearing. The Court having duly heard and considered the matter, and good cause appearing therefor,

IT IS HEREBY ORDERED:

That the motion of Watermaster to enforce the injunction set forth in the Judgment against the above named parties is GRANTED.

That the above named parties are successors in interest to a party originally named in this action with respect to rights which were adjudicated in the Judgment, and that such parties are subject to the terms of the Judgment to the same extent as such predecessor in interest.

That such parties are bound by the terms of the Judgment entered in this case, that such parties and persons acting in concert with such parties are subject to the injunctions contained in the Judgment, and that such parties and persons acting in concert with such parties are enjoined from diverting or extracting water from within the boundaries of the Upper Los Angeles River Area.

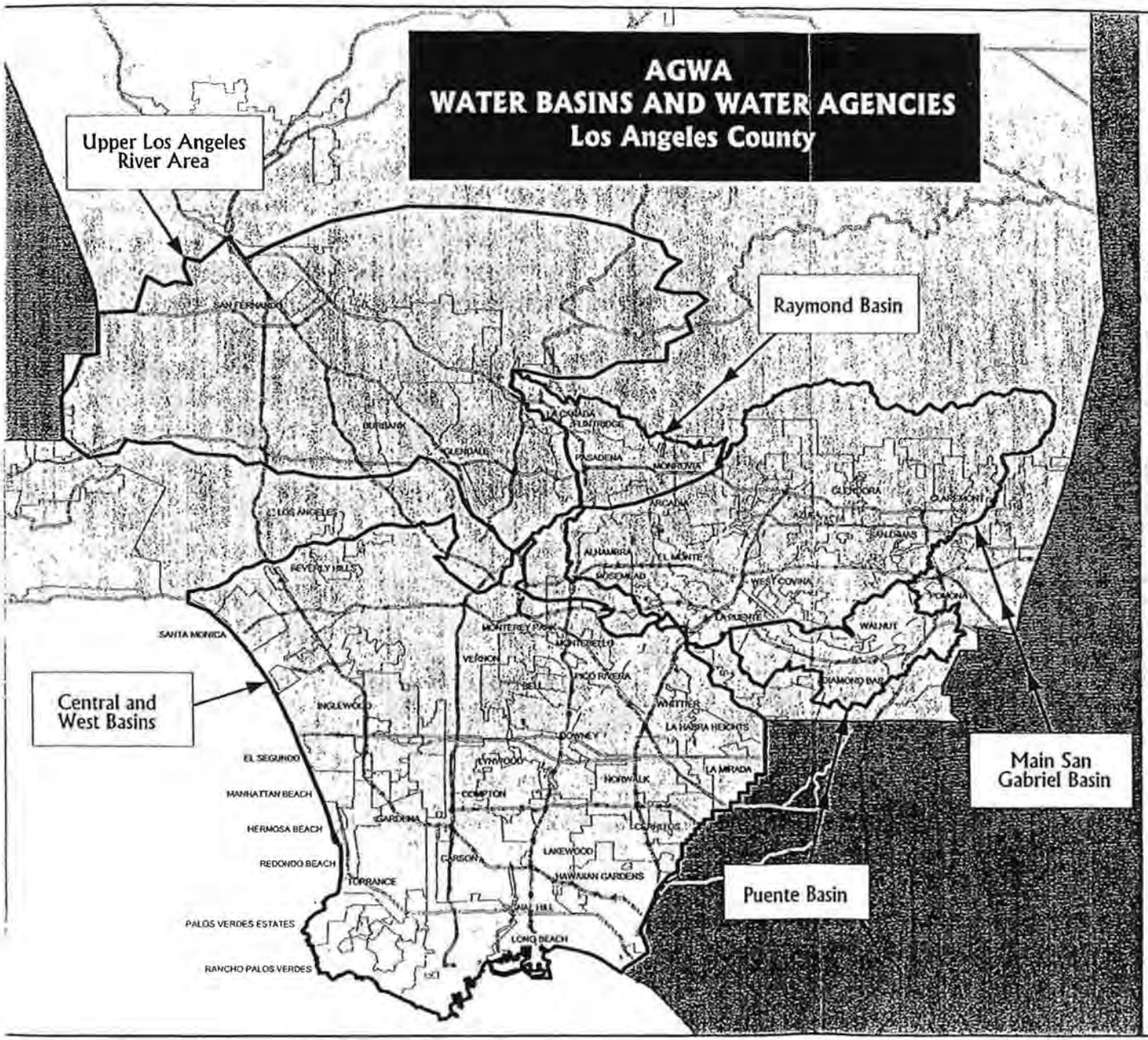
Enforcement of this injunction shall begin three months from the date of entry of judgment herein.

DATED: 7-15-98 ~~June 5, 1998~~

By: RICARDO A. TORRES

Ricardo A. Torres
Judge, Los Angeles County Superior Court

APPENDIX I
WATER RIGHTS NOTICE



Central and West Basins

Water Replenishment District
12621 E. 166th Street
Cerritos, CA 90703
Contact:
Mary Sellers
Tel: (562) 921-5521 Ext. 1914
Fax: (562) 921-6101

Main San Gabriel Basin

Watermaster
725 North Azusa Avenue
Azusa, CA 91702
Tel: (626) 815-1300
Fax: (626) 815-1303
Contacts:
Richard K. Sase, P.E., Staff Engineer
Carol Williams, Executive Officer

Puente Basin

Walnut Valley Water Distirct
271 South Brea Canyon Road
Walnut, CA 91789
Tel: (909) 595-1288
Fax: (909) 594-9532

Raymond Basin

Raymond Basin Management Board
4536 Hampton Rd/PO Box 686
La Canada Flintridge, CA 91012
Tel: (818) 790-4036
Fax: (818) 790-9418
Contact:
Ronald C. Palmer, Executive Officer

Upper Los Angeles River Area

San Fernando Basin, Sylmar Basin, Verdago Basin, Eagle Rock Basin

Upper Los Angeles Area (ULARA)
P.O. Box 51111, Room 1311
Los Angeles, CA 90051-0100
Tel: ((213) 367-0921
Fax: (213) 367-0939
Contact:
Patricia Kiechler, ULARA Administrator

WATER RIGHTS INQUIRY
LOS ANGELES COUNTY

Faxed to _____ Date _____

_____

_____

_____

Phone _____ Fax _____

Name of Well Owner _____

Mailing Address _____

City _____

Phone _____ Fax _____

E-Mail _____

Name of Driller _____

Trade Name _____

Business Address _____

City _____

Phone _____ Fax _____

E-Mail _____

Proposed Well Site Address _____
(Number, Street, Nearest Intersections)

City _____ Zip _____

Thomas Bros. Page, Grid No., Edition-Year _____

Diagram (Show Property Lines, Well Site, Dimensions From Various Streets)

Application for Water Rights: ☐ Approved ☐ Denied

Reason _____

Date _____ Signed by _____

Agency _____

H1-SF Area Water Rights

Water Rights Notice

If you plan on drilling any type of a well within any of the designated areas on the attached map, you must first contact the agency responsible for administering water rights in your area. Noncompliance with this notice may result in legal action, including significant expense related to the abandonment and destruction of your new well.

If you have questions regarding the relative location of your proposed well with the agency responsible for administering water rights, the general information number is (562) 921-5521 or directly contact the appropriate basin/area:

Central Basin	(562) 925-5521
West Coast Basin	(562) 925-5521
Raymond Basin	(818) 790-4036
Upper Los Angeles River Area (San Fernando Valley Area)	(213) 367-0921
Main San Gabriel Basin	(626) 815-1300
Puente Basin (San Gabriel Basin Area)	(909) 595-1268

J14-water rights notice

APPENDIX J
ACTION ITEMS 1998-1999

ACTION ITEMS

WATERMASTER ACTIVITIES FOR 1997-98 REPORT

- Investigate Dewaterers and Small Pumpers
- Coordinate Water Service for County Areas
- Work with County Departments of Public Works and Regional Planning to inform public about water rights
- Continue working with Department of Building and Safety to notify potential dewaterers
- Address CalMat Mining Operations
- Facilitate Pacoima Area Investigation
- Facilitate dissemination of information on chromium standards
- Complete filing of Hathaway Agreement
- Complete check list of Middle Ranch Agreement
- Continue conversion of Basinwide Groundwater Flow Model to the GMS System
- Re-evaluate Verdugo Basin Safe-Yield
- Continue investigation maximizing the use of the Tujunga/Hansen Spreading Grounds
- Record Judgment with Title Companies

APPENDIX K
CONVERSION FACTORS

CONVERSION FACTORS

Quantity	Metric Unit	Customary Unit	To Convert to Customary Unit Multiply Metric Unit By	To Convert to Metric Unit Multiply Customary Unit By
Length	millimeters (mm)	inches (in)	0.03937	25.4
	centimeters (cm)	inches (in)	0.3937	2.54
	meters (m)	feet (ft)	3.2808	0.3048
	kilometers (km)	miles (mi)	0.62139	1.6093
Area	square millimeters (mm^2)	square inches (in^2)	0.00155	645.16
	square meters (m^2)	square feet (ft^2)	10.764	0.092903
	square meters (m^2)	acres (ac)	0.00025	4046.9
	hectares (ha)	acres (ac)	2.4710	0.40469
	square kilometers (km^2)	square miles (mi^2)	0.3861	2.590
Volume	liters (L)	gallons (gal)	0.26417	3.7854
	megaliters	million gallons (10^6 gal)	0.26417	3.7854
	cubic meters (m^3)	gallons (gal)	264.17	0.003785
	cubic meters (m^3)	cubic feet (ft^3)	35.315	0.028317
	cubic meters (m^3)	cubic yards (yd^3)	1.308	0.76455
	cubic meters (m^3)	acre-feet (ac-ft)	0.00081	1233.5
	cubic decameters (dam^3)	acre-feet (ac-ft)	0.8107	1.2335
Flow	cubic meters per second (m^3/s)	cubic feet per second (ft^3/s)	35.315	0.028327
	liters per second (L/s)	cubic feet per second (ft^3/s)	0.035325	28.317
	liters per second (L/s)	gallons per minute (gal/min)	15.850	0.06309
	liters per minute (L/min)	gallons per minute (gal/min)	0.26417	3.7854
	liters per day (L/day)	gallons per day (gal/day)	0.26417	3.7854
	megaliters per day (ML/day)	million gallons per day (mgd)	0.26417	3.7854
	cubic decameters per day (dam^3/day)	acre-feet per day (ac-ft/day)	0.8107	1.2335
Mass	kilograms (kg)	pounds (lb)	2.2046	0.45359
	megagrams (Mg)	tons	1.1.023	0.90718
Velocity	meters per second (m/s)	feet per second (ft/s)	3.2808	0.3048
Concentration	milligrams per liter (mg/L)	parts per million (ppm)	1.0	1.0
Temperature	degrees Celsius (°C)	degrees Fahrenheit (°F)	(1.8 x °C)+32	(°F - 32)/1.8