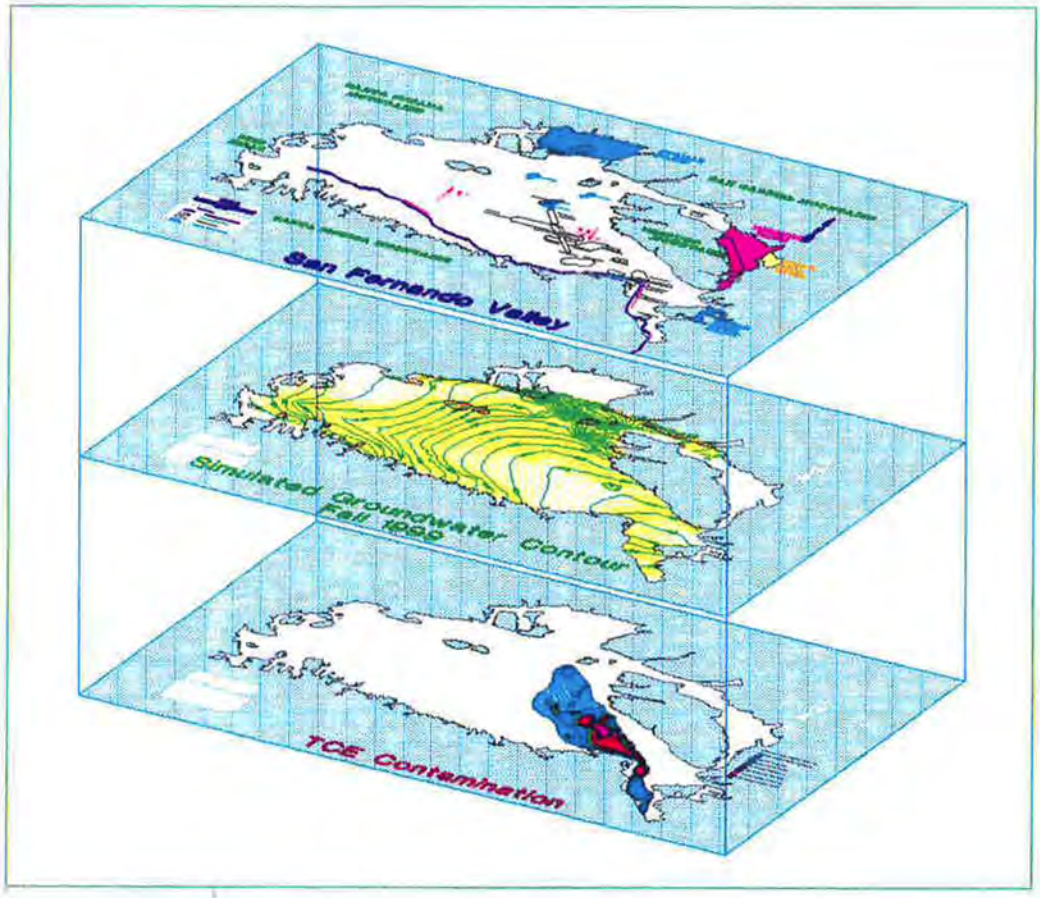
UPPER LOS ANGELES RIVER AREA WATERMASTER

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

GROUND WATER PUMPING AND SPREADING PLAN FOR THE UPPER LOS ANGELES RIVER AREA LOS ANGELES COUNTY

1995-96 WATER YEAR
October 1, 1995 - September 30, 1996



SEPTEMBER 1996

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P.O.Box 111, Room 1304
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SEPTEMBER 1996

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I. EXECUTIVE SUMMARY

This report is prepared for compliance with Section 2.9.4., amended July 1993, of the Upper Los Angeles River Area (ULARA) Watermaster's Policies and Procedures. This section established the Watermaster's responsibility for water quality management in the ULARA groundwater basins, by independently reviewing and approving all plans or activities that might affect water quality. This includes plans submitted by the five major water rights holders which might incorporate increased recharge, such as spreading, increased pumping, or change in pumping patterns, especially in relation to the present and future plans for groundwater clean-up.

The pumping and spreading plans for the 1995-96 Water Year feature the activation on January 3, 1996, Phase I of the Burbank Operable Unit (OU). Phase II of the Burbank OU is planned to begin production January 1998. Glendale's North and South OUs have been delayed almost another year because of negotiations between Glendale, the U.S. Environmental Protection Agency (USEPA), and the respondents. Glendale has limited pumping capacity in the Verdugo Basin. San Fernando can pump all its groundwater rights from the Sylmar Basin, and Crescenta Valley County Water District is pumping all its assigned water rights from the Verdugo Basin, and, on an interim basis, is increasing its groundwater pumping until Glendale has the ability to pump its full adjudicated right. This increase is subject to an annual review and approval by the Watermaster and Administrative Committee. At the encouragement of the Watermaster, Los Angeles will pump greater than its annual safe yield for 1996-97.

Currently, there are five clean-up plants in operation: the City of Los Angeles' North Hollywood OU and the Advanced Oxidation Process (AOP) Plant, the City of Burbank's Granular Activated Carbon Treatment Plant and the Burbank OU, and Crescenta Valley County Water District's Glenwood Nitrate Removal Plant. Two other treatment facilities are in the design or the construction stage: the Glendale North and South OUs and the Pollock Wells Treatment Plant. The City of Los Angeles' Headworks Wells Treatment Plant is currently in its planning stage.

There is a discussion of basin management activities including the investigations of groundwater contamination in the Pacoima Area, Greeff Fabrics facilities, and CalMat facilities in the San Fernando Basin (SFB), and groundwater rights at the Pankow/Tegatz site (formerly the DeMille estate in the SFB), and the Santiago Estates located in the Sylmar Basin.

The groundwater model this year examines the effect on groundwater elevation of three years projected pumping in the San Fernando Basin under average precipitation conditions. The most significant feature is the cone of depression formed as a result of the Burbank OU pumping.

II. INTRODUCTION

As a result of the groundwater contamination that was discovered in the SFB, the ULARA Watermaster and Administrative Committee, jointly with the Regional Water Quality Control Board (RWQCB), revised the ULARA Watermaster's Policies and Procedures in July 1993, in order to prevent further degradation of the groundwater quality and to limit the spread of contamination in the ULARA basins.

The thrust of the revisions to the ULARA Watermaster's Policies and Procedures is detailed in Section 2.9.4. In Section 2.9.4., any party who produces groundwater is required to submit to the ULARA Watermaster annually (on or before May 1 of the current water year), a Groundwater Pumping and Spreading Plan. This plan should include projected groundwater pumping and spreading amounts, recent water quality data on each well, and facility modification plans. In order to obtain the information needed to project future groundwater contamination levels, a monitoring program should also be included in the plan.

The ULARA Watermaster is required to evaluate and report on the impact of the combined pumping and spreading as it relates to the implementation of the ULARA Judgment (January 26, 1979) and groundwater management, and make the needed recommendations. The Watermaster's evaluation and recommendations are to be included in a Groundwater Pumping and Spreading Plan for ULARA, that the Administrative Committee is to review and approve by September of the current water year.

This is the 1995-96 Groundwater Pumping and Spreading Plan for ULARA, prepared following the revision of the Policies and Procedures (July 1993). This report provides guidance to the Administrative Committee for use in protecting the water quality within ULARA, improving basin management, and providing overall protection for each party's water rights.

III. PLANS FOR THE 1995-96 WATER YEAR

A. Projected Groundwater Pumping for 1995-96 Water Year

The total 1995-96 ULARA pumping is projected at 77,013 AF, approximately 14,700 AF below the 16 year average. However, estimated pumping for 1996-97 is 135,319 AF, a 47% increase above the adjudicated pumping rights (Appendices A-E).

In 1995-96, the City of Burbank plans to pump 8,000 AF, an increase of 6,000 AF as compared to its past three years pumping, and overall, approximately a 65% increase from its historical average. This is primarily due to the activation of Phase I of the Burbank OU. Burbank plans to pump 8,000 AF in 1996-97. As of October 1, 1995, Burbank has storage credit of 63,215 AF.

The Crescenta Valley County Water District (CVCWD) plans to pump 3,754 AF, which is an increase of about 1,150 AF compared to its average pumping since 1979. This is primarily due to pumping a greater portion of the Verdugo Basin's safe yield that the City of Glendale is presently unable to pump. This was approved by the Watermaster. CVCWD plans to pump 3,294 AF in 1996-97, or more, depending on Glendale's operation. Pumping beyond the 3,294 AF will still require the Watermaster's approval.

The City of Glendale will not resume significant pumping from the San Fernando Basin (SFB) until the Glendale N/S OUs come on-line. Its annual SFB extraction rights are approximately 5,100 AF. Glendale plans to extract 2,700 AF from the Verdugo Basin, an increase of about 500 AF greater than its historical average, and 1,450 AF more than the average over the past three years. Glendale anticipates pumping the same for 1996-97. Glendale has storage credit of 50,191 AF as of October 1, 1995.

The City of Los Angeles plans to pump about 57,000 AF this year, approximately 22,000 AF below its annual average and about 6,500 AF more than the last three years. Also, Los Angeles plans to pump 3,100 AF from the Sylmar Basin, about a 100 AF increase as compared to the historical average and 1,200 more than the last three years. The amount of Los Angeles' pumping is dependent upon the availability of imported water supplies, particularly, from the two Los Angeles aqueducts. In 1996-97 Los Angeles plans to pump 114,117 AF from the SFB, an increase of 45% compared to its average pumping, and 3,108 AF from the Sylmar Basin, which is just slightly above normal pumping. As of October 1, 1995, Los Angeles has storage credit of 294,043 AF in the SFB and 3,498 AF in the Sylmar Basin.

The City of San Fernando plans to pump 2,600 AF from the Sylmar Basin, 400 AF below its normal pumping for the past three years and 250 AF below the past 16 years' average. San Fernando has a storage credit of 2,043 AF as of October 1, 1995.

Estimated capactities of ULARA well fields are provided in Table 3-1. Actual and projected amounts of pumping and spreading by the major parties during 1995-96 are given in Tables 3-1A, 3-1B, and 5-1.

B. Constraints on Pumping as of 1995-96

SAN FERNANDO BASIN

Los Angeles - Several of the well fields within the SFB can not be fully utilized because of groundwater contamination, primarily from synthetic organic contaminants, such as TCE and PCE. The well fields most impacted include the Crystal Springs Well Field, which has been completely taken out-of-service, and the Pollock and Headworks well fields which are temporarily out-of-service. The number of wells has been reduced to the following: Crystal Springs wells from 4 to 0, Erwin wells from 6 to 4, the Headworks wells from 6 to 0, the North Hollywood wells from 35 to 30, Pollock wells from 4 to 0, the Verdugo from 7 to 6, and Whitnall Wells from 7 to 6. The loss of production from these 23 wells, amounting to approximately 14,000 AF/YR, can be made up by pumping Los Angeles' newest well field, the Tujunga Well Field (15,000 AF/YR) which is located upgradient of the most significant contaminant plumes.

Glendale - Essentially all of Glendale's pumping has been shut down because of groundwater contamination mostly related to TCE and PCE. At present, Glendale is unable to pump its water rights to return waters (recharge from delivered water), physical solution waters, or stored water credits from the SFB. However, Glendale continues to accumulate 20% return water credit for water delivered to hill, mountain, and valley floor areas of the SFB. The unpumped water rights are added to storage credits.

Burbank - In January 1996, Burbank's pumping capability was restored when the Lockheed - Burbank OU was activated under Phase I of the Consent Decree with the USEPA. In 1992, Burbank reactivated two of its municipal wells by constructing a Liquid Phase GAC Treatment Plant. In the SFB, Burbank accumulates storage credits from the

water delivered to the hill, mountain, and valley floor areas and receives storage credits for the return water rights it is unable to pump.

SYLMAR BASIN

San Fernando - All of San Fernando's groundwater rights are pumped from the Sylmar Basin, where there are no limitations related to contamination. The City of San Fernando is in the process of rehabilitating wells to maximize their efficiency.

Los Angeles - The number of wells at the Mission Well Field has been reduced from six to three, owing to the age and condition of these wells.

VERDUGO BASIN

Crescenta Valley - All of Crescenta Valley's groundwater rights are in the Verdugo Basin, where contamination from synthetic organic contaminants is minimal. High nitrate levels are reduced by sending a portion of the pumped groundwater through a nitrate removal plant and blending with MWD water to acceptability. Crescenta Valley was given permission by the Watermaster and Administrative Committee to pump in excess of its adjudicated right, on an interim basis until the City of Glendale is able to pump its complete adjudicated right. CVCWD will seek approval from the Watermaster for future years that such pumping may be done.

City of Glendale -The City of Glendale currently does not have the capability to pump its entire adjudicated right from the Verdugo Basin. Glendale is in the process of studying and evaluating various alternatives to increase its pumping capacity.

TABLE 3-1: ESTIMATED CAPACITIES OF ULARA WELL FIELDS

Party/Well Field	Number of Wells	Estimated Capacity (cfs)
	SAN FERNANDO BASIN	
City of Los Angeles		
Aeration	7	3
Erwin	4	10
Headworks	6	25
North Hollywood	30	129
Pollock	2	4
Rinaldi-Toluca	15	112
Tujunga	12	112
Verdugo	6	12
Whitnall	6	15
City of Burbank	7	5*
City of Glendale	3	15*
Lockheed	6	17
TOTAL:	104	459
	SYLMAR BASIN	
City of Los Angeles	3	9
City of San Fernando	4	9
TOTAL:	7	18
	VERDUGO BASIN	
CVCWD	11	18
City of Glendale	5	15
TOTAL:	16	33

Notes:
(*) - Only two wells capable of pumping.

TABLE 3-1A: 1995-96 ACTUAL AND PROJECTED GROUNDWATER EXTRACTIONS
(acre-feet)

Party/Well Field	Total	1995			1996								
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
		SAN FERNANDO BASIN											
City of Los Angeles		Actuals										Projections	
AERATION	1,065	168	0	27	67	121	127	91	74	109	81	100	100
CRYSTAL SPRINGS	0	0	0	0	0	0	0	0	0	0	0	0	0
ERWIN	2,431	152	152	204	150	17	0	0	62	157	450	552	535
HEADWORKS	0	0	0	0	0	0	0	0	0	0	0	0	0
No HOLLYWOOD	17,435	1,429	111	0	263	322	1,168	0	2,975	3,070	2,789	2,654	2,654
POLLOCK	0	0	0	0	0	0	0	0	0	0	0	0	0
RINALDI-TOLUCA	23,764	0	3,418	6,269	4,391	838	0	0	2,846	3,336	2,666	0	0
TUJUNGA	4,953	2	0	1,202	3,212	0	0	0	0	0	537	0	0
VERDUGO	3,540	377	403	437	385	242	0	0	308	194	229	490	475
WHITNALL	3,623	163	82.07	275	130	85	0	0	164	534	620	798	772
TOTAL:	56,811	2,291	4,166	8,414	8,598	1,625	1,295	91	6,429	7,400	7,372	4,594	4,536
City of Burbank	2,000	267	189	232	164	106	117	100	250	192	258	63	63
City of Glendale	64	5	1	1	1	1	1	4	2	2	4	21	21
Lockheed	6,000	9	16	8	502	526	640	824	918	944	632	490	490
TOTAL:	64,875	2,573	4,371	8,655	9,265	2,258	2,054	1,020	7,599	8,538	8,266	5,168	5,110
		SYLMAR BASIN											
City of Los Angeles	3,084	503	14	0	0	0	224	463	509	0	284	552	535
City of San Fernando	2,600	317	272	39	0	48	236	284	327	349	389	169	170
TOTAL:	5,684	820	286	39	0	48	460	747	836	349	673	721	705
		VERDUGO BASIN											
Crescenta Valley County Water Dist.	3,754	412	290	271	253	215	247	296	404	335	329	352	351
City of Glendale	2,700	158	266	147	188	164	50	133	252	219	216	454	454
TOTAL:	6,454	570	555	417	441	379	297	429	656	554	545	806	805
ULARA TOTAL:	77,013	3,962	5,213	9,112	9,706	2,684	2,810	2,195	9,091	9,441	9,484	6,695	6,620

TABLE 3-1B: HISTORICAL AND PROJECTED PUMPING
(acre-feet)

Party/Wellfield	Historical Average Pumping		Projected Groundwater Pumping			
		SAN FERNANDO BASIN				
City of Los Angeles	1979-95 (A)	1993-95 (B)	1995-96	1996-97	1997-98	1998-99
AERATION	438	1210	1065	1710	1403	1423
CRYSTAL SPRINGS	139	0	0	0	0	0
ERWIN	5854	1889	2431	4594	3769	3822
HEADWORKS	2454	0	0	0	0	0
No HOLLYWOOD	34661	9204	17435	34535	28337	26258
POLLOCK	995	0	0	0	0	2400
RINALDI-TOLUCA	16879	19410	23764	47092	38640	39177
TUJUNGA	2844	15168	4953	16419	13472	13659
VERDUGO	5997	1958	3540	5776	4739	4805
WHITNALL	8326	1471	3623	3991	3275	3320
TOTAL City of Los Angeles	78587	50310	56811	114117	93635	94864
City of Burbank	987	2113	2000	1000	1000	1000
LOCKHEED BOU	0	0	6000	8000	8000	8000
City of Glendale	1735	86	64	500	500	5500
TOTAL San Fernando Basin	**81309**	**52509**	**64875**	**123617**	**103135**	**109364**
		SYLMAR BASIN				
City of Los Angeles	2969	1911	3084	3108	3108	3108
City of San Fernando	2862	2988	2600	2600	2600	2600
TOTAL Sylmar Basin	**5831**	**4899**	**5684**	**5708**	**5708**	**5708**
		VERDUGO BASIN				
Crescenta Valley County Water Dist.	2412	3300	3754	3294	3294	3294
City of Glendale	2220	1342	2700	2700	2700	3300
TOTAL Verdugo Basin	**4632**	**4642**	**6454**	**5994**	**5994**	**6594**
TOTAL ULARA	91772	62050	77013	135319	114837	121666

(A) All wellfields divided by 16 yrs. even if not active.
(B) Average values for most recently in active service of the past three years. Well field start up: Tujunga 92/93; R-T 87/88. Wellfield shut down: Crystal Springs 87/88; Headworks 87/88; Pollock 90/91.

IV. GROUNDWATER PUMPING FACILITIES

A. Well Fields

There are 12 production well fields located in the SFB, two in the Sylmar Basin, and three in the Verdugo Basin. The locations of the well fields are shown in Plate 1, and their estimated capacities are given on Table 3-1. The City of Los Angeles' Pollock No. 5 and Crystal Springs Nos. 41, 44, 45, and 46 were completely deactivated in 1995-96. The City of Burbank requested permission to abandon well Nos. 10, 11A, 12, 13A, 14A, 17, and 18. The Watermaster approved of this action, after an evaluation of these wells was made. (Appendix F).

B. Active Groundwater Pumping and Treatment Facilities

Burbank OU- Lockheed

The remediation of groundwater contamination in the SFB has been significantly enhanced by the start-up of the Burbank OU on January 3, 1996. The Lockheed-Burbank OU, consisting of airstripping towers followed by liquid and gaseous phase GAC polishers, began pumping and delivering water to the municipal system at an average rate of about 6,000 gallons per minute (gpm), with a maximum rate of over 8,000 gpm.

North Hollywood OU (Aeration Facility) - City of Los Angeles

This facility is designed to treat by airstripping up to 2,000 gpm of groundwater. The treated water is delivered to the Los Angeles water distribution system. During 1995-96, the plant was closed for several months for repair work at the North Hollywood sump and the eastbound collector line. However, the plant operated at a capacity of 1,100 gpm during 1995-96.

AOP - City of Los Angeles

This plant is operated by the City of Los Angeles. It is testing the removal of VOCs from pumped groundwater by the use of ozone and hydrogen peroxide. Treated water is delivered to the Los Angeles distribution system. During 1995, the facility was operated for limited short-term tests to evaluate the efficiency of the treatment facility.

GAC Treatment Plant - City of Burbank

This facility is operated by the City of Burbank. Two wells (Nos. 7 and 15) have been reactivated to deliver water to a GAC plant for removal of VOCs. The treated water is delivered to the Burbank distribution system.

Glenwood Nitrate Removal Plant - CVCWD

Groundwater in the wells of the CVCWD is high in nitrates. A portion of the pumped groundwater is treated in an anion-exchange process and blended with untreated water to result in acceptable nitrate levels.

C. Projected Groundwater Pumping and Treatment Facilities

Glendale OU

Under the Record of Decision for the South and North Glendale OUs, many new facilities will be constructed consisting of: shallow extraction wells, a combined 5,000 gpm water treatment plant, piping to convey the untreated water from the wells to the treatment plant, a conveyance system from the treatment plant to Glendale's potable distribution system, a facility to blend the treated groundwater with water from the Metropolitan Water District to reduce nitrate levels, and a disinfection facility. The proposed site of the treatment facility was selected for an animation studio to be constructed by DreamWorks Inc. The treatment plant site will be relocated on city property at the Glendale Recycling Center approximately 500 feet from the previously proposed location. The revised schedule will delay the construction date at least a year.

Pollock Well Field Remediation Project

The start of the construction phase of the Pollock Wells Treatment Plant, planned to treat 3,000 gpm of groundwater, is Fall 1996. This project is being funded by the City of Los Angeles. The Pollock Project's main focus is to reduce rising groundwater flowing past gaging station F-57C-R and to enhance the overall groundwater clean-up program in the Los Angeles River Narrows area of the SFB. The groundwater will be processed through liquid-phase GAC vessels intended for VOC removal, followed by blending of the chlorinated groundwater to reduce nitrate levels. The processed water will then be delivered to LADWP's distribution system. The projected pumping pattern, through two existing wells, PO-4 and PO-7, will operate for a period of six months each year beginning approximately in April 1997. This project was recommended and supported by the Watermaster so that LADWP would not lose any of its water rights within the SFB, due to excess groundwater flowing from the basin.

Headworks Well Field Remediation Project

This project will be funded by the City of Los Angeles. The object is to rehabilitate the Headworks Well Field by pumping and treating the groundwater for VOCs from six wells with a

combined flow of approximately 13,000 gpm. Alternative studies have been conducted this past year including the evaluation of the effectiveness of other AOP treatment technologies such as Ultra-Violet-Hydrogen Peroxide and Ozone and Hydrogen Peroxide. The planning stage will continue into 1997. Construction is anticipated to begin in late 1998.

D. Groundwater Remediation Projects

Many privately owned facilities in the SFB have been found to have groundwater contamination, and are under Clean-up and Abatement Orders from the RWQCB. Each facility has numerous monitoring wells and most have pumping wells and treatment plants.

E. Dewatering Operations

Metropolitan Transit Authority (MTA)

As part of the planned transportation system in Los Angeles County, the MTA is constructing the Universal City Subway Station. This activity requires considerable dewatering, which is underway. It is estimated that about 1,200 acre-feet will be removed over a two-year period under an existing National Pollutant Discharge Elimination System permit. The water will be discharged to storm drains which flow into the Los Angeles River. The Administrative Committee at the recommendation of the Watermaster granted approval for this activity on October 10, 1995. The dewatering activities are subject to review by the Watermaster and Administrative Committee, until the project is completed. The water will be charged against the Basin Account.

Other Dewatering Operations

Many facilities along the southern and western boundaries of the SFB have deep foundations in the areas of high water tables that require a dewatering program. These activities are subject to approval by the affected Administrative Committee party and subject to a replacement cost of the water. The water is subtracted from the affected party's stored water account. The amounts of groundwater pumped are required to be reported to the Watermaster on a monthly basis.

V. GROUNDWATER RECHARGE FACILITIES AND PROGRAMS

A. Existing Spreading Operations

There are six spreading facilities located in the SFB. The Los Angeles County Department of Public Works (LACDPW) operates the Branford, Hansen, Lopez, and Pacoima Spreading Grounds. The City of Los Angeles operates the Headworks Spreading Grounds. The LACDPW in cooperation with the City of Los Angeles operates the Tujunga Spreading Grounds. The spreading facilities are used primarily for spreading native and imported water. There are no plans for modifications of existing spreading grounds, or for the construction of new facilities in the 1995-96 Water Year. Estimated capacities are shown in Table 5-1, and locations are shown on Plate 3.

B. Future Spreading Operations

The East Valley Water Recycling Project (EVWRP) will take tertiary-treated water from the Tillman Water Reclamation Plant for spreading at the Hansen Spreading Grounds. The RWQCB, the California Department of Health Services, and the ULARA Watermaster have approved a Phase IA Demonstration Project which allows for the spreading of 10,000 acre-feet per year (AF/YR) during a three-year demonstration period. Monitoring wells are currently being installed in the EVWRP study area to characterize the nature of groundwater quality associated with the spreading of recycled water. The monitoring will provide an evaluation of the impact of the vadose zone on the concentrations of Total Organic Compound and nitrogen compounds, as well as the expected rate of movement, under known and predicted groundwater gradients. If the results of the Demonstration Project are favorable, the spreading of recycled water may be increased up to 35,000 AF/YR. Construction of the pipeline in the Hansen Spreading Grounds will be completed in the Fall of 1996. The Phase I pipeline construction from the Tillman Plant began in August 1996.

C. Actual and Projected Spreading

Table 5-1 shows the actual and projected spread volumes during the 1995-96 Water Year, and Plate 1 shows the locations of the spreading facilities. The capacity of each basin is detailed on Table 5-2. As shown in table 5-1, the 1995-96 water year will experience below average recharge activities. Overall, approximately 20,564 AF will be spread as compared to the historical average of 35,662 AF, and as compared to the most recent three year average of 51,249 AF. Rainfall precipitation on the valley fill is estimated at 15.75 inches for 1995-96 as compared to the long-term average of 18.57 inches/year and the previous three year average of 26.72 inches/year.

TABLE 5-1A: 1995-96 ACTUAL SPREADING OPERATIONS

(acre-feet)

Spreading in ULARA Spreading Grounds in 1995-96							
	Operated by:						
	LACDPW				LADWP	LACDPW and LADWP	
Month	Branford	Hansen	Lopez	Pacoima	Headworks	Tujunga	Total
Oct-95	14	0	0	0	0	372	
Nov-95	18	0	0	0	0	498	
Dec-95	89	689	0	61	0	277	
Jan-96	105	1,060	0	250	0	26	
Feb-96	283	2,720	69	1,544	0	1,742	
Mar-96	30	1,230	102	2,170	0	3,250	
Apr-96	0	1,350	172	505	0	0	
May-96	14	554	25	0	0	750	
Jun-96	0	0	0	0	0	0	
	PROJECTIONS						
Jul-96	0	100	0	0	0	100	
Aug-96	0	100	0	0	0	100	
Sep-96	0	100	0	0	0	100	
TOTAL	553	7,903	368	4,530	0	7,215	20,569
1969-95 Average	514	15,010	578	6,958	2,755	9,487	35,662
1992-1995 Average	479	24,458	860	11,407	38	14,007	51,249

Table 5-1B: HISTORICAL PRECIPITATION

(inches per year)

1969-95 Average	1992-95 AV	1992-93	1993-94	1994-95		1995-96
18.57	26.72	36.62	10.19	33.36		15.75*

* - Estimated

TABLE 5-2: ESTIMATED CAPACITIES OF ULARA SPREADING GROUNDS

Spreading Ground	Type	Total Wetted Area (acres)	Capacity (acre-feet/year)
	Operated by the LACDPW		
Branford	Deep basin	8	1,000
Hansen	Shallow basin	110	36,000
Lopez	Shallow basin	13	5,000
Pacoima	Med. depth basin	111	29,000
	Operated by LADWP		
Headworks	Shallow basin	28	22,000
	Operated by LACDPW and LADWP		
Tujunga	Shallow basin	130	58,000
	TOTAL:	400	151,000

VI. BASIN MANAGEMENT ACTIVITIES AND INVESTIGATIONS

A. Groundwater Investigation Programs

Pacoima Area Groundwater Investigation

In January 1996, the RWQCB informed the Watermaster's Office that it had received groundwater quality information from three properties located in the Pacoima Area of the SFB that indicated high levels of synthetic organic contamination. These sites are located approximately 2.5 miles upgradient of the Los Angeles Department of Water and Power's (LADWP) Tujunga Well Field near the intersection of the Simi Valley (118) Freeway and San Fernando Road. Below is a summary of the highest concentrations for the most significant on-site contaminants:

Company	TCE (ug/L)	PCE (ug/L)	1,1,1-TCA (ug/L)	1,1 DCE (ug/L)
Holchem	12,000	3,900	7,600	330
Price Pfister	195	1,900	4,370	808
Kleinert Inds	329	1,100	1,300	98

These data were collected primarily in 1989 from monitoring wells that were installed on the subject property sites. LADWP, in cooperation with the RWQCB, and the lead agency, the Department of Toxics Substance Control, , will initiate action to further characterize the nature and extent of contamination. In the Fall of 1996, LADWP intends to install two downgradient monitoring wells and initiate a groundwater sampling program. Significant migration of these contaminants could severely jeopardize the operation of LADWP's Tujunga Well Field and, in general, jeopardize overall groundwater pumping activities in the SFB.

Greeff Fabrics

The Watermaster's Office visited the Greeff Fabrics' site on June 6, 1996. Greeff Fabrics operates a groundwater treatment and recovery system. Up to 30,000 gallons per day are treated and returned to the SFB through a percolation trench located upgradient of the treatment system. The groundwater, primarily contaminated with chlorotoluene, is treated using a ultraviolet and hydrogen peroxide system.

B. Basin Management

CalMat Facilities

The January 26, 1979 San Fernando Judgment established groundwater pumping rights for CalMat (formerly Conrock). Groundwater pumping was to be used as process water for the gravel and ready-mix operations under the guideline that 10 percent would be consumptively used and the remaining groundwater returned (recharged) to the SFB. CalMat has an obligation to purchase delivered water from Los Angeles in amounts equivalent to the consumptive use losses. Between 1981-1993, CalMat averaged 1,600 acre-feet of pumping per year.

In the late 1980s, the ULARA Watermaster became aware that CalMat's recharge facilities were not of sufficient design to adequately recharge the processed groundwater, resulting in evaporative losses. Correspondence between the two parties was exchanged in an attempt to address this issue. The existing condition prohibited adequate percolation by causing the process water to pond on top of a low permeability layer that was created from the silts and clays that settled from the processed water. As a result of the communications, CalMat agreed to develop a mitigation plan. The Watermaster's Office visited the site on June 3, 1996 and concluded that the existing facilities did not adequately mitigate the loss of water. The facilities included were the primary settling basin located at the Trout Sweitzer Pit, and the secondary and tertiary settling basins at the Sun Valley Pit .

In addition, the Sheldon Pit was visited which contains an existing groundwater table pond referred to as the Sheldon Pond. Past mining activities allowed native material to be excavated to below the groundwater table, which caused the advent of the Sheldon Pond, spanning to approximately 35 acres. The Watermaster has expressed his concern with respect to the evaporation and potential groundwater quality degradation associated with exposing the groundwater table pond.

C. Investigation of Groundwater Pumping

Tegatz Property (formerly DeMille)

The DeMille Estate, located along North Little Tujunga Canyon Road, was a Disclaiming Party to the San Fernando Judgment, 1979. On December 31, 1986, the Pankow/Tegatz family purchased about 600 acres of this property from the DeMille Estate.

There are a total of seven operable wells and two springs. These correspond generally to the original wells mapped out between 1958 and 1975 during surveys conducted for the San Fernando Valley litigation.. At the time of the land purchase, several of the wells were located in the riverbed, and several were inoperable. Mr. Tegatz reported that the new owners were unable to obtain additional water from the City of Los Angeles, apparently because the property is outside of the City boundary. Apparently, the State Water Resources Control Board (SWRCB) suggested to the Tegatz people that they make annual filings to the SWRCB. The new owners complied with the SWRCB's requirement to file annual recordation reports on water use. However, according to the 1979 San Fernando Judgment, which has legal precedence, the Tegatz property has no water rights.

Santiago Estates

The Santiago Estates, a modular home development, located in the Sylmar Basin within the Pacoima Canyon, changed hands in October 1995 when it was purchased by Ellenburg Capital Corporation. Well No. 5998 serving this property is on the former Estate of John Duckworth. The property has changed hands several times potentially carrying overlying water rights each time. These water rights were considered first in the past years before the final 50-50 split of the remaining water allotted to the cities of Los Angeles and San Fernando. The water is used to irrigate communal strips of landscaping and a large community recreation area with lawns and a pool. The well was taken out of service this summer for maintenance, and for meter repair and calibration. According to the 1979 San Fernando Judgment these water rights were considered valid. An evaluation is being made to see if the Santiago Estates have an overlying water right.

Monteria Lake Estates

The Monteria Lake Association is listed as a Defaulting Party in the 1979 San Fernando Judgment. During the years of the trial, a well on the site was used to pump groundwater into Monteria Lake. As a result of the 1979 Judgment, the Monteria Lake Association was allocated zero water rights for the lake. A recent investigation shows that although it was reported that a fire in 1970 destroyed the well and pump, the lake is currently full of water. In addition, the

Watermaster found early this year that several individual property owners within the boundaries of the Monteria Lake Estates have installed unauthorized wells for irrigation purposes of their individual properties. This matter is being pursued by the Watermaster and the City of Los Angeles.

Other Investigations

The Watermaster's Office is in the process of investigating reports of individuals drilling wells on their property to pump water for irrigation. These property owners will be contacted and informed of water rights law in the San Fernando Basin which is governed by the Superior Court Decision of January 1979 upholding the Pueblo Water Rights of the City of Los Angeles to all the water of the Upper Los Angeles River Area (ULARA), and that this area 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 Gaging Station F-57C-R located in the Narrows. These property owners have no water rights if the property is within the boundaries of the San Fernando Basin identified in the Judgment.

VII. ULARA WATERMASTER MODELING ACTIVITIES

A. Introduction

The purpose of the incorporated groundwater modeling study was to evaluate the effects of groundwater pumping in the SFB, as projected over a three-year period. The projected pumping values were extracted from the 1996 "Pumping and Spreading Plans" as submitted by each party pursuant to the provisions established in the July 1993 Policies and Procedures. The groundwater flow model used for this study is a comprehensive three-dimensional computer model that was developed for the U.S. Environmental Protection Agency to incorporate data, characterizations, and findings during the Remedial Investigation Study of the San Fernando Valley (December 1992).

The model code, "Modular Three-Dimensional Finite-Difference Groundwater Flow Model," commonly called MODFLOW, was developed by the U.S. Geological Survey (McDonald-Harbaugh) and was used to develop the groundwater model for the SFB. This model consists of four layers to reflect the varying geologic and hydrogeologic characteristics of the SFB as a function of depth. In the deepest portion of the SFB, the model is subdivided into four layers with each layer characterizing a specific aquifer zone. The model is broken up into cells, in a rectangular fashion, that vary in size from 1,000 by 1,000 feet near the southeastern SFB to 3,000 by 3,000 feet in the northwestern SFB or where less relevant data are available. The model is actively updated as new information reveals that modifications to the model are relevant.

B. Model Input

The three-year study period begins with the water year of 1996-97 and ends in 1998-99. Projected pumping values for each well field were taken from the "Pumping and Spreading Plans" submitted by each party and entered in the model's input (Table 7-1). The percentage of pumping assigned to a specific layer is calculated based on a percentage of a well's perforation in a particular layer and its aquifer characteristics, and then imported into the well file. Normal or average rainfall and recharge conditions were projected for the entire three-year study period. Initial head values (groundwater elevation) were derived from the previous simulations run for the 1995-96 Water Year.

C. Simulated Groundwater Contours

After running the model for three stress periods, each 12 months in length, the model output was imported into a graphics package that developed the simulated groundwater elevation contours for the water table (Layer 1) as shown in Plates 1 to 4, and for Layer 2 in Plate 5. In addition,

initial groundwater elevations were compared to elevations at the end of the three-year study. The results are demonstrated on Plates 6 and 7, the "Change in Groundwater Elevation from 1996-97 to 1998-99 (Layer 1 and 2)". Finally, superimposed on the 1998-99 groundwater elevation contour were the relevant contaminant plumes for TCE, PCE, and NO_3 (Plates 8 to 10).

D. Evaluation of Model Results

The most noticeable difference in the groundwater contours is the pumping cone in the Burbank area formed as a result of the Burbank OU pumping. The contours show that in Layer 1, the Burbank OU wells capture a portion of the "hot spot" TCE and PCE plumes (1,000- 5,000 ug/L) in that area. It is estimated that the capture zone extends to as much as 3 - 4,000 feet in the downgradient direction, the only area where the gradient most noticeably reverses direction. Other groundwater clean-up facilities, such as the Glendale North and South OUs and the Pollock Wells Treatment Plant will not be activated until 1998, and therefore, their radius of influence has not yet fully developed within this three-year study. The contour for Layer 2 shows that a small cone of depression has developed in the west branch of North Hollywood Well Field.

The change in groundwater elevation from 1996-97 to 1998-99, demonstrates that there will be a 50-foot depression at the deepest level in the water table (Layer 1) near the area where the highest average groundwater pumping (38,800 AF/YR) occurs, the Rinaldi-Toluca Well Field. The cone of depression is at a level of 40 feet in the Tujunga and North Hollywood Well Field areas and at a level of 30 feet near the Erwin, Burbank OU, and a portion of the Whitnall Well Fields. A 40-foot rise in the water table is shown beneath the Hansen Spreading Grounds. The recharge in this area is augmented by the spreading of an additional 10,000 AF/YR of water beginning in 1998, because of the East Valley Water Recycling Project (EVWRP).

E. Groundwater Contaminant Plume Evaluation

Groundwater Contaminant Plumes for TCE, PCE, and NO_3 were superimposed on the 1998-99 simulated groundwater contours. The Burbank OU is effective in capturing a portion of the most significant TCE and PCE plumes in the Burbank area. LADWP's pumping from the Rinaldi-Toluca and Tujunga Well Fields (55 percent of their total pumping) tends to flatten the gradient and decelerate the horizontal plume, downgradient of the well fields. This same condition is also present in the North Hollywood Well Field area, again probably associated with the well field pumping in the vicinity.

F. Groundwater Flow Direction

The "Groundwater Flow Direction" (Plates 11 and 12) at the end of the three year study (Fall 1999) was interpreted from the "Fall 1999 Groundwater Elevation Contours" (Plates 4 and 5). Horizontal groundwater flow lines were drawn over the superimposed outline of the TCE plume as depicted on Plates 11 and 12. For Model Layer 1, horizontal flow directions are in the south to southeastern directions near the well fields: Rinaldi-Toluca, Tujunga, Verdugo, Burbank and a portion of the Whitnall, and in the east to north-easterly direction, near the Aeration, Erwin, and North Hollywood well fields. The most noticeable influence from pumping is near the Burbank OU well field which depicts radial flow from all directions towards that well field. The Layer 2 groundwater flow directions are similar to those in Layer 1 except that the radius of influence near the Burbank OU wells, is less pronounced.

MODEL INPUT SUMMARY

Table 7-1

PROJECT: *WATERMASTER*
PROJECT NO.: *WM96001*
RUN DATE: 2-Aug-96

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
	BASIN RECHARGE (AF/Y)															
	RAINFALL (IN/Y)				SPREADING GROUNDS							SUB-SURFACE INFLOW				
WATER YEAR	VALLEY	HILL & MTN	HILL & MTN	VALLEY FILL RETURN & DELIVERED WATER	BRANFORD	HANSEN	HW	LOPEZ	PACOIMA	TUJUNGA	SUB-TOTAL	PACOIMA	SYLMAR	VERDUGO	SUB-TOTAL	TOTAL RECHARGE
1995-96	15.75	19.93	3,404	59,000	553	8,084	0	368	4,520	7,965	21,490	350	400	70	820	84,714
1996-97	18.62	23.06	3,939	74,433	352	13,252	0	1,037	4,520	4,000	23,161	350	400	70	820	102,353
1997-98	18.62	23.06	3,939	74,433	352	13,252	0	1,037	4,520	4,000	23,161	350	400	70	820	102,353
1998-99	18.62	23.06	3,939	74,433	352	23,252	0	1,037	4,520	4,000	33,161	350	400	70	820	112,353
AVERAGE	17.90	22.28	3,805	70,575	402	14,460		870	4,520	4,991	25,243	350	400	70	820	100,443

MODEL INPUT SUMMARY

PROJECT: *WATERMASTER*
ROJECT NO.: *WM96001*
RUN DATE: 2-Aug-96

Table 7-2

R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK
	BASIN EXTRACTION (AF/Y)																		
	LADWP										BURBANK			GLENDALE			OTHERS		
WATER YEAR	AE	EW	HW	NH	PO	RT	TJ	VD	WH	TOTAL LADWP	BURBANK PSD	LOCKHEED	VMP	CITY OF GLENDALE	OU-NORTH	OU-SOUTH	TOTAL NON-LADWP	TOTAL NON-GLENDALE	TOTAL EXTRACTION
1995-96	-1,075	-2,911	-15	-17,435	0	-24,267	-4,416	-3,600	-4,039	-57,758	-2,000	-6,000	-300	-500	0	0	-757	-606	-67,921
1996-97	-1,710	-4,594	0	-34,535	0	-47,092	-16,419	-5,776	-3,991	-114,117	-1,000	-8,000	-300	-500	0	0	-757	-606	-125,280
1997-98	-1,403	-3,769	0	-28,337	0	-38,640	-13,472	-4,739	-3,275	-93,635	-1,000	-8,000	-300	-500	0	0	-757	-606	-104,798
1998-99	-1,423	-3,822	0	-26,258	-2,400	-39,177	-13,659	-4,805	-3,320	-94,864	-1,000	-8,000	-300	-500	-3,000	-2,000	-757	-606	-111,027
AVERAGE	-1,403	-3,774		-26,641		-37,294	-11,992	-4,730	-3,656	-90,094	-1,250	-7,500	-300	-500			-757	-606	-102,257

VIII. WATERMASTER'S EVALUATION AND RECOMMENDATIONS

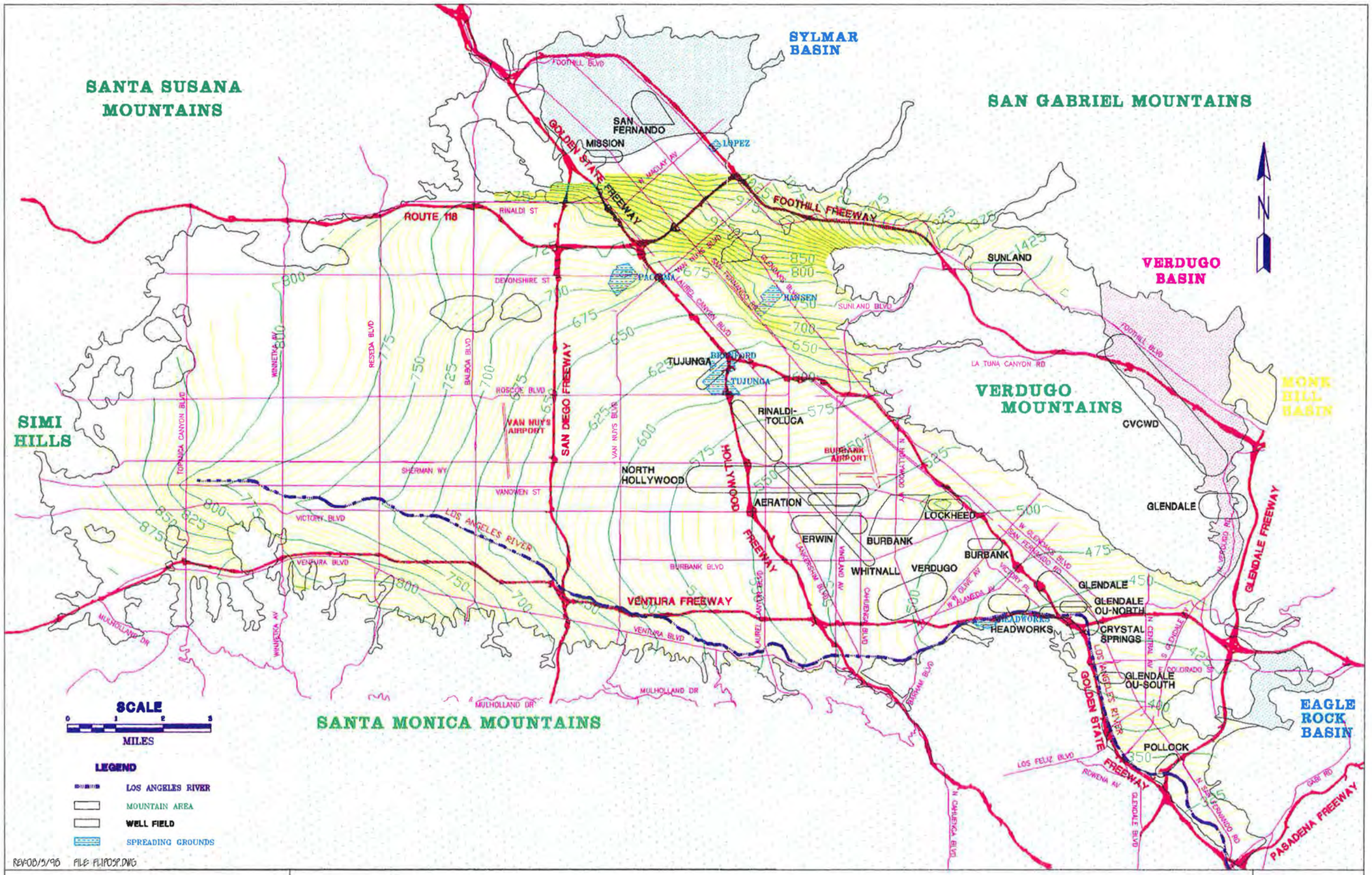
The Watermaster's evaluation of the simulated groundwater contours that were derived from the SFB's three year pumping projections is that the horizontal migration of contamination will not reverse gradient and migrate towards the less contaminated area of the SFB, such as the Rinaldi-Toluca and Tujunga well fields. The results also show that the Burbank OU wells will capture a portion of the highest contaminant plumes in the Burbank area, and will tend to decelerate the horizontal migration of the uncaptured portions. It is also expected that the uncaptured plumes will eventually migrate towards the Headworks, Glendale North and South OU Wells, and the Pollock wells. Overall, groundwater clean-up of the SFB is progressing in a positive manner that the Watermaster strongly encourages and supports.

The Watermaster is concerned about the nature and extent of the Pacoima Area groundwater contamination and, in particular, its relative location upgradient of all of the existing SFB Well Fields and the East Valley Water Recycling Project. The Watermaster's Office will closely monitor the investigation activities and recommends that each party actively participate in them.

The Watermaster recommends and supports Los Angeles' projected pumping for 1996-97 (115,000 AF) which is approximately 25,000 AF greater than its annual adjudicated rights. The cumulative stored water credit for Los Angeles is 294,053 AF. The modeling demonstrates that the SFB can sustain the projected groundwater pumping However, groundwater levels should be closely monitored during this period so that the data can be compared to the modeling results, and to the SFB's response to above-average pumping. The evaluation will also help determine the response to increased long-term recharge conditions because of the increased recharge due to spreading from the East Valley Water Recycling Project.

The Watermaster also supports CVCWD's and Glendale's pursuit of fully utilizing the Verdugo Basin safe yield.

PLATES



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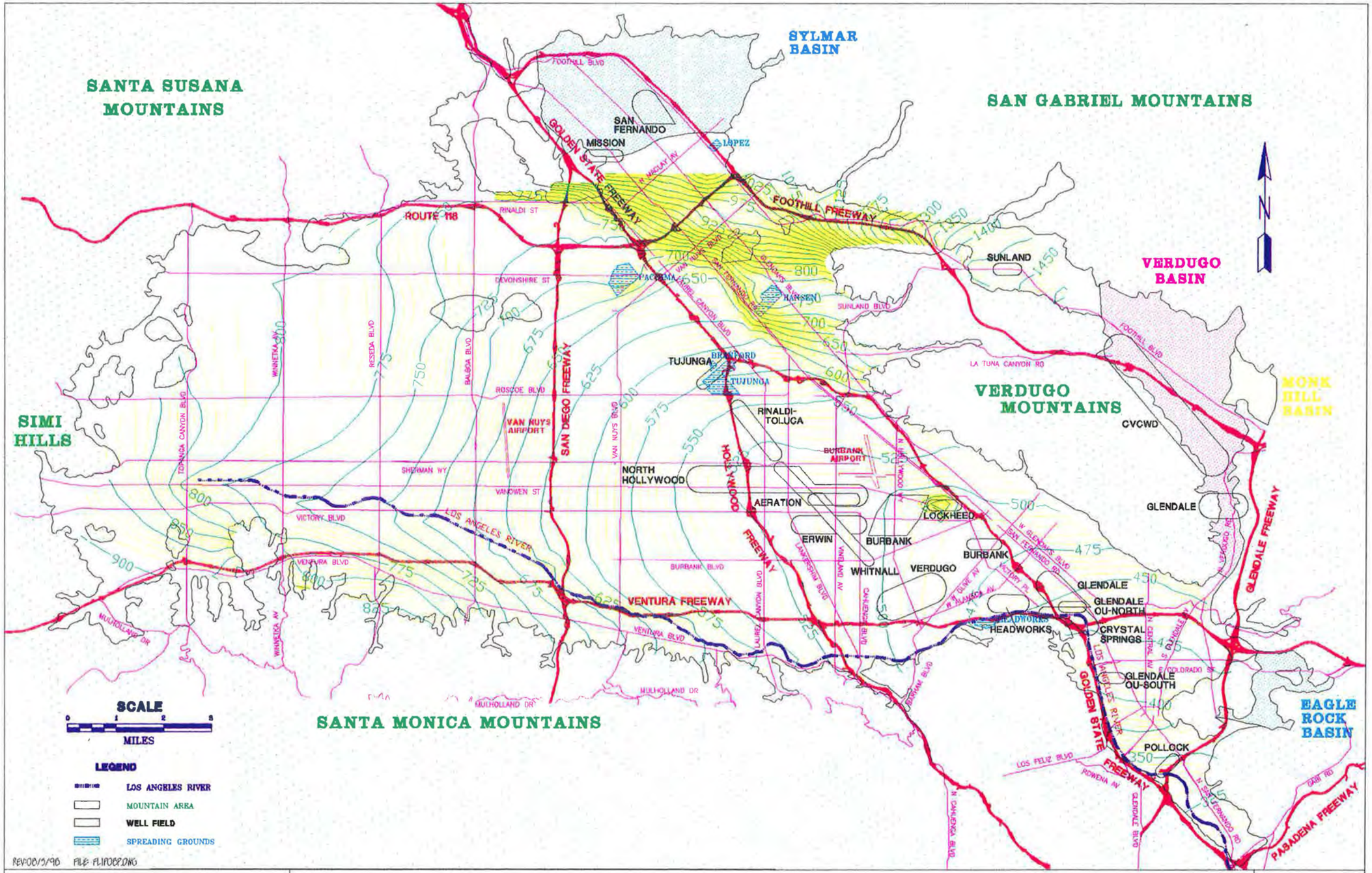
PROJECT: WATERMASTER
PROJECT NO.: WM96001

Simulated Groundwater Contour - Model Layer 1
Fall 1996

PLATE
1



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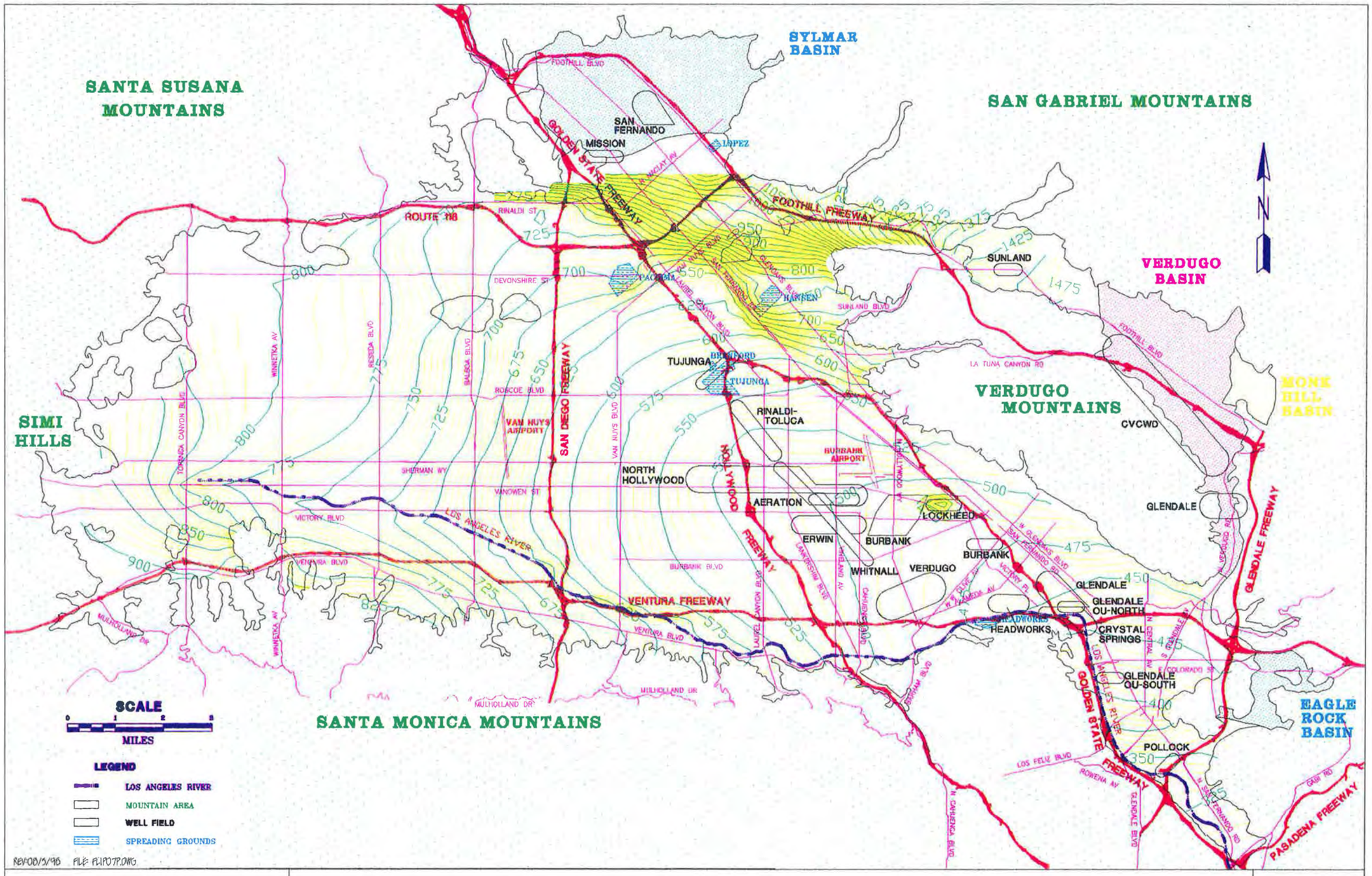
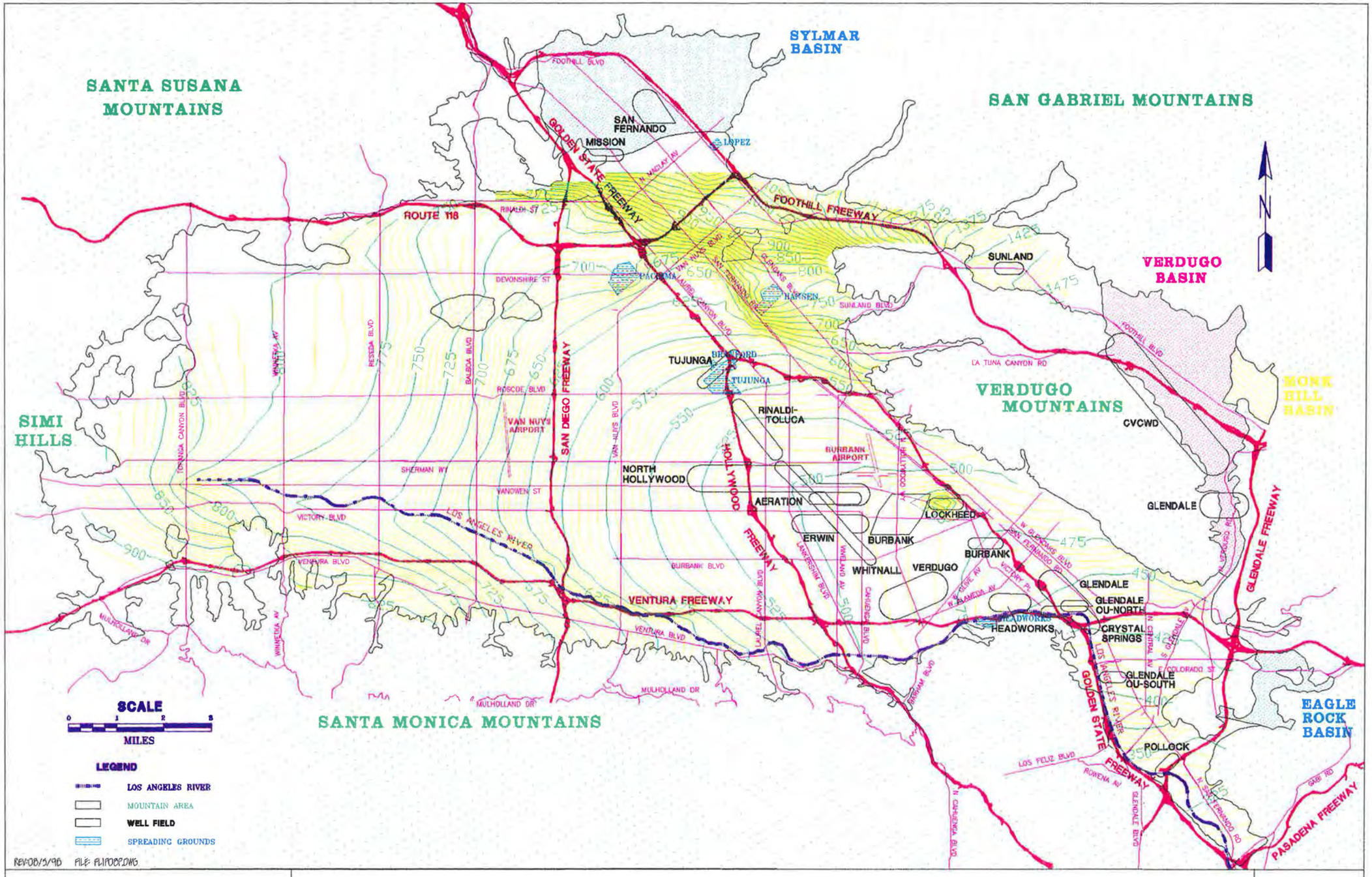
PROJECT: WATERMASTER
PROJECT NO.: WM96001

Simulated Groundwater Contour - Model Layer 1
Fall 1997

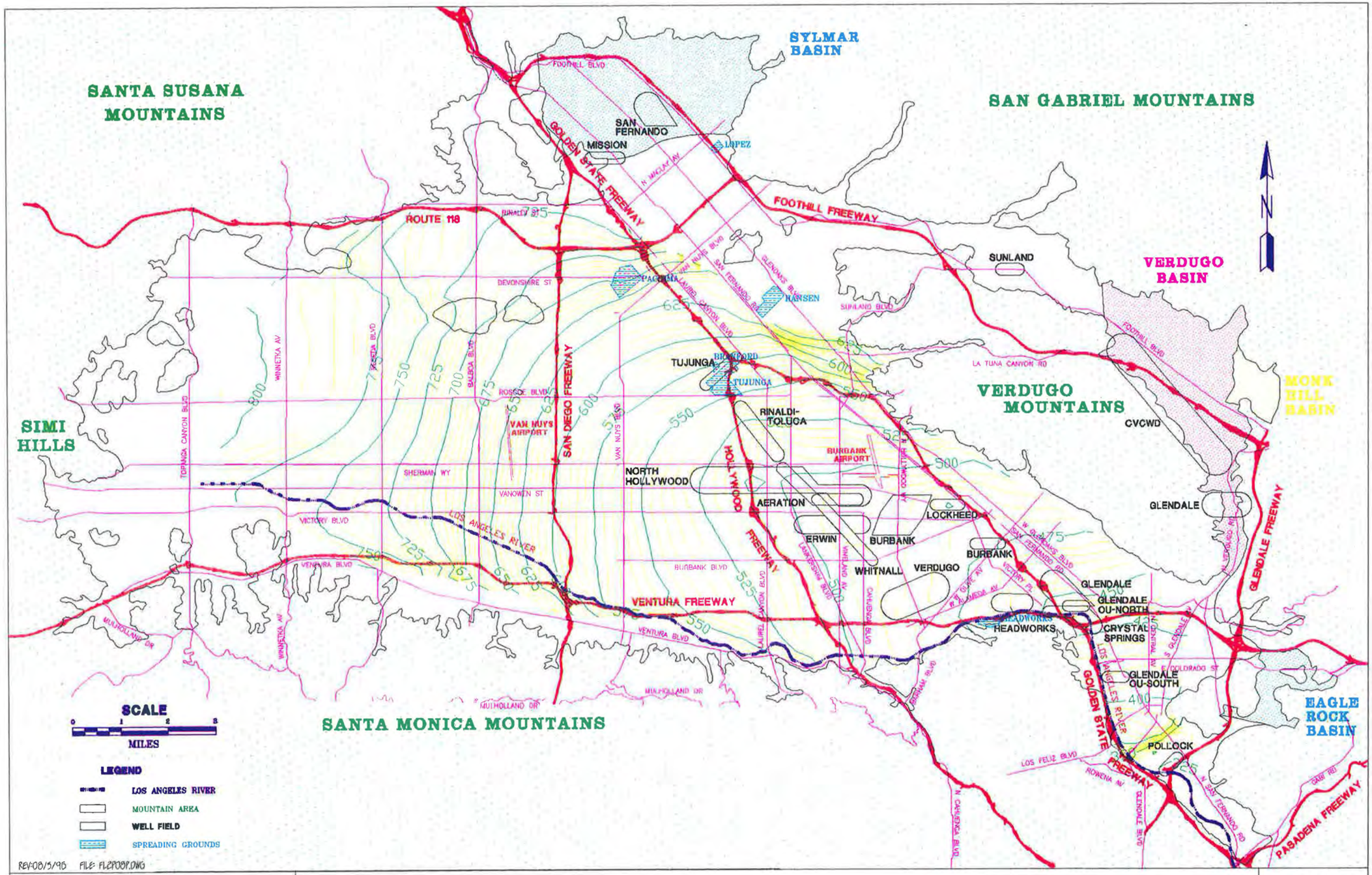
PLATE
2



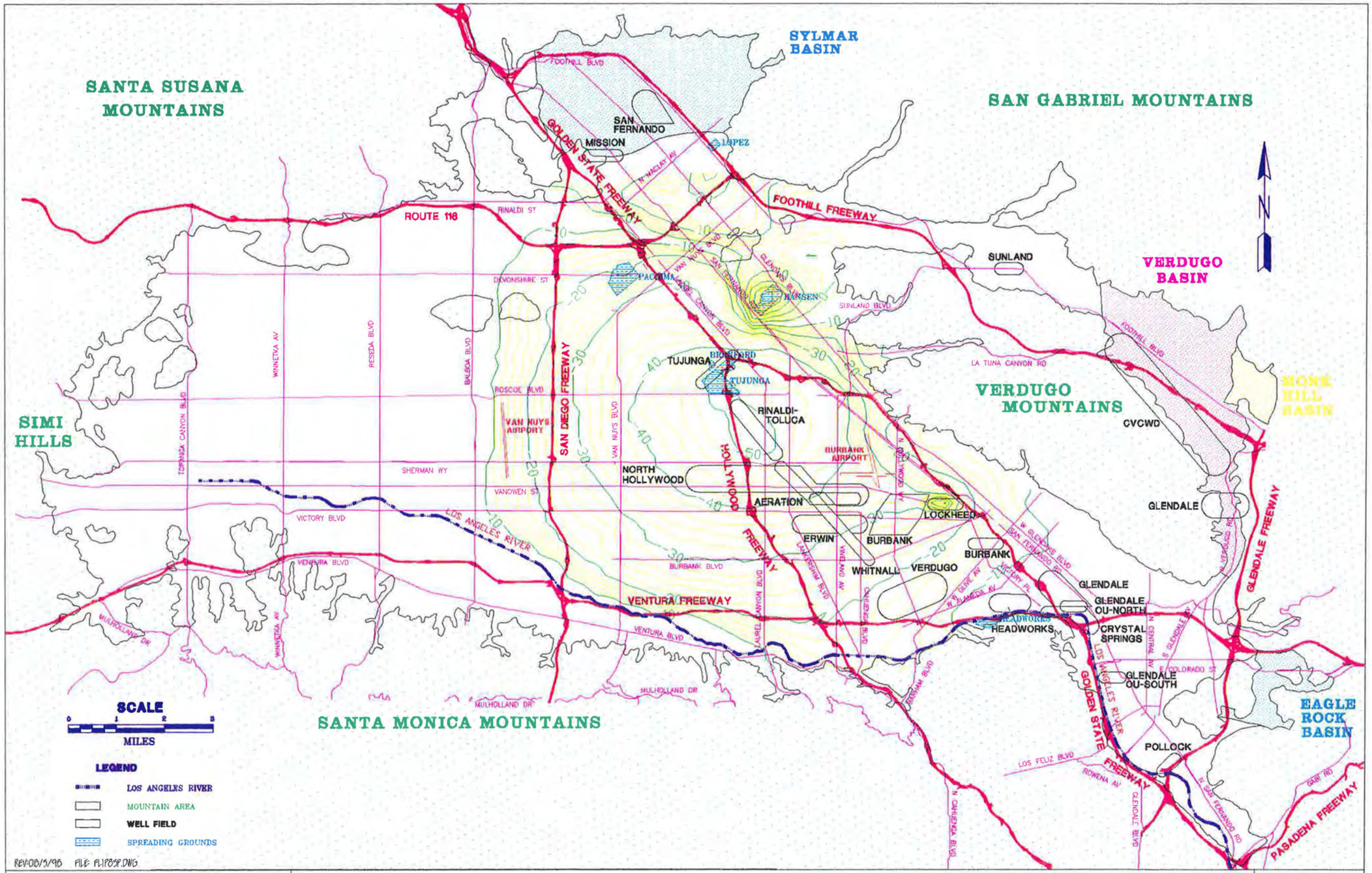
PROJECT: WATERMASTER PROJECT NO.: WM96001	**Simulated Groundwater Contour - Model Layer 1** **Fall 1998**	PLATE **3**



PROJECT: WATERMASTER PROJECT NO.: WM96001	**Simulated Groundwater Contour - Model Layer 1** **Fall 1999**	PLATE **4**



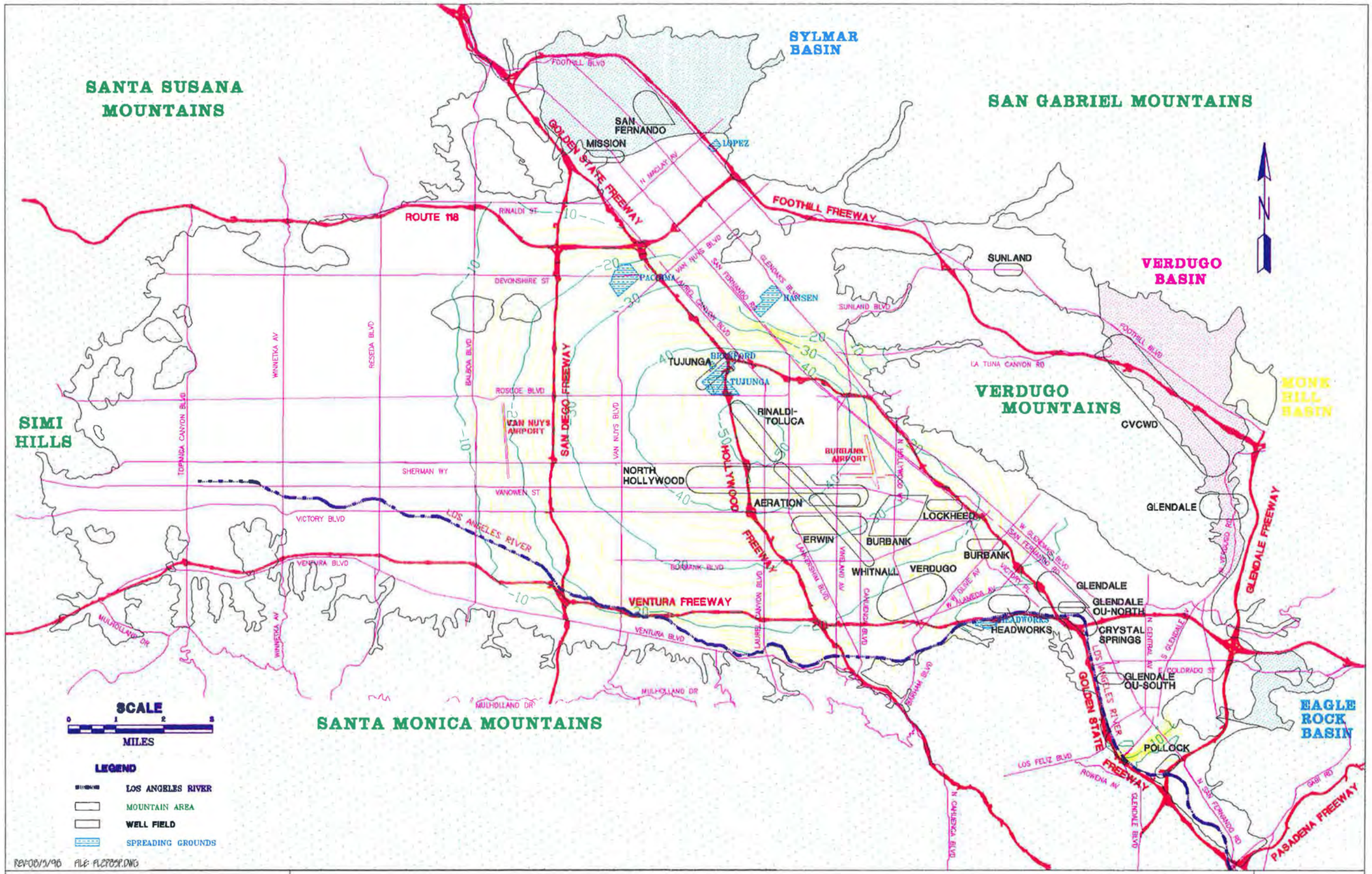
PROJECT: WATERMASTER PROJECT NO.: WM96001	**Simulated Groundwater Contour - Model Layer 2** **Fall 1999**	PLATE **5**



PROJECT: WATERMASTER
PROJECT NO.: WM96001

Change in Groundwater Elevation - Model Layer 1
Fall 1996 - Fall 1999

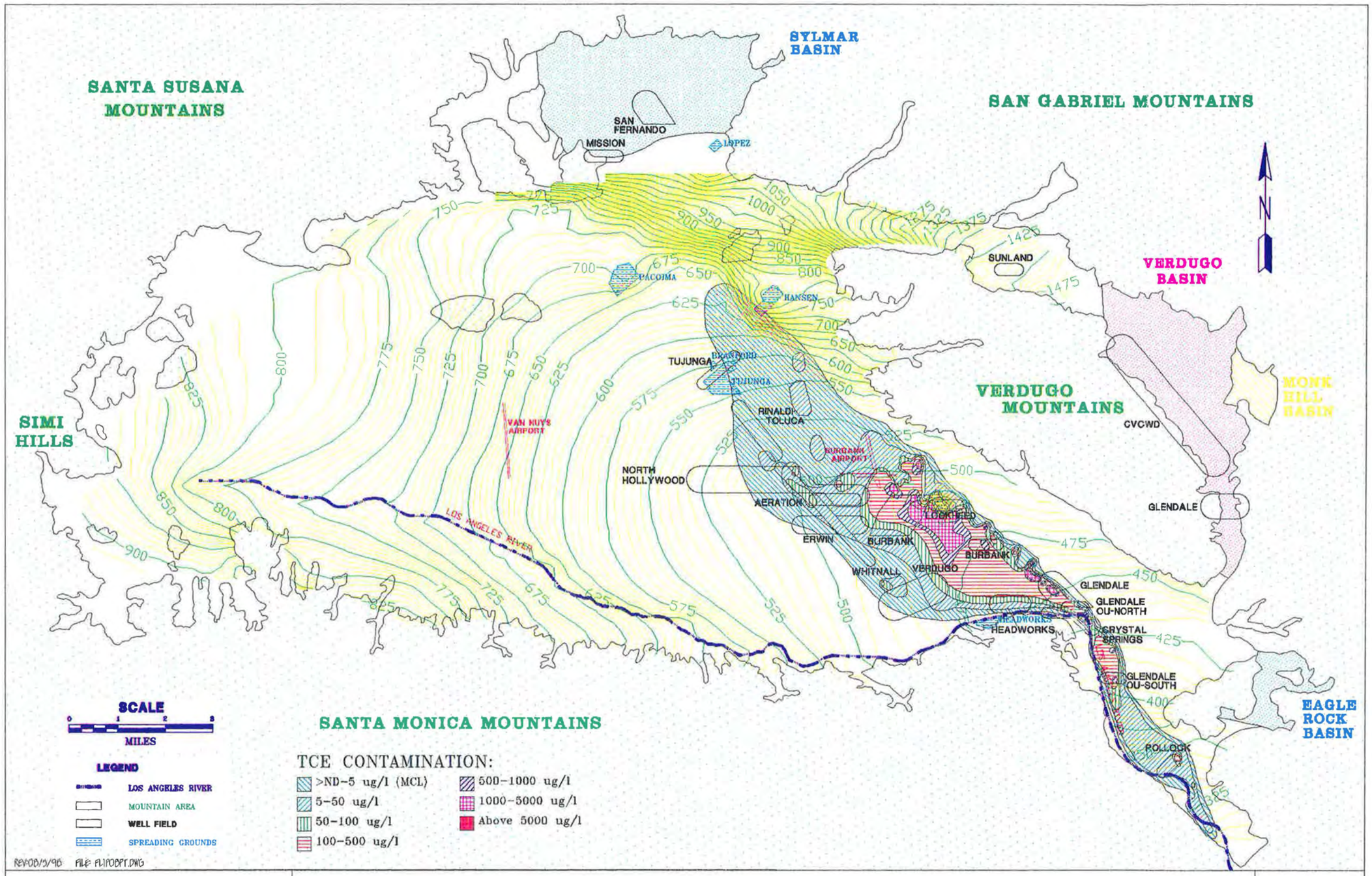
PLATE
6



PROJECT: WATERMASTER
PROJECT NO.: WM96001

Change in Groundwater Elevation - Model Layer 2
Fall 1996 - Fall 1999

PLATE
7



PROJECT: WATERMASTER
PROJECT NO.: WM96001

Simulated Groundwater Contour and TCE Contamination
Model Layer 1 - FALL 1999

PLATE
8

SANTA SUSANA MOUNTAINS

SYLMAR BASIN

SAN GABRIEL MOUNTAINS

SAN FERNANDO

MISSION

LOPEZ

SUNLAND

VERDUGO BASIN

PACOIMA

HANSEN

TUJUNGA

BRANFORD

TUJUNGA

VERDUGO MOUNTAINS

MONK HILL BASIN

SIMI HILLS

VAN NUYS AIRPORT

RINALDI-TOLUCA

CVCWD

LOS ANGELES RIVER

NORTH HOLLYWOOD

AERATION

LOCKHEED

GLENDALE

ERWIN

BURBANK

BURBANK

WHITNALL

VERDUGO

GLENDALE

GLENDALE OU-NORTH

HEADWORKS

HEADWORKS

CRYSTAL SPRINGS

GLENDALE OU-SOUTH

EAGLE ROCK BASIN

RIVER

POLLOCK

SANTA MONICA MOUNTAINS

SCALE

0 1 2 3

MILES

LEGEND

- LOS ANGELES RIVER
- MOUNTAIN AREA
- WELL FIELD
- SPREADING GROUNDS

PCE CONTAMINATION:

- >ND-5 ug/l (MCL)
- 5-50 ug/l
- 50-100 ug/l
- 100-500 ug/l
- 500-1000 ug/l
- 1000-5000 ug/l
- Above 5000 ug/l

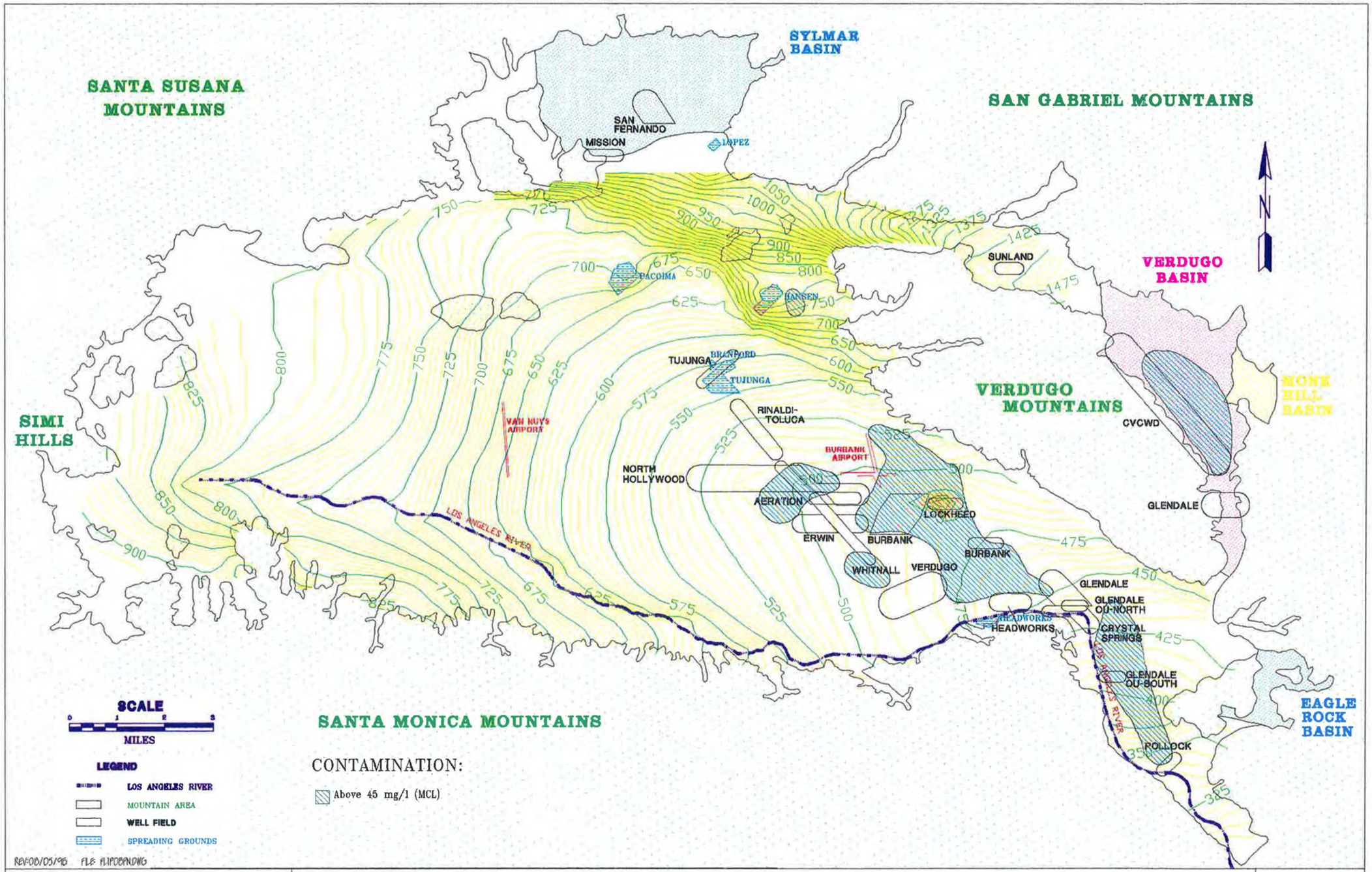
REV08/05/96 FLE FLIPCOPP.DWG

PROJECT: WATERMASTER
PROJECT NO.: WM96001

Simulated Groundwater Contour and PCE Contamination Model Layer - FALL 1999

PLATE

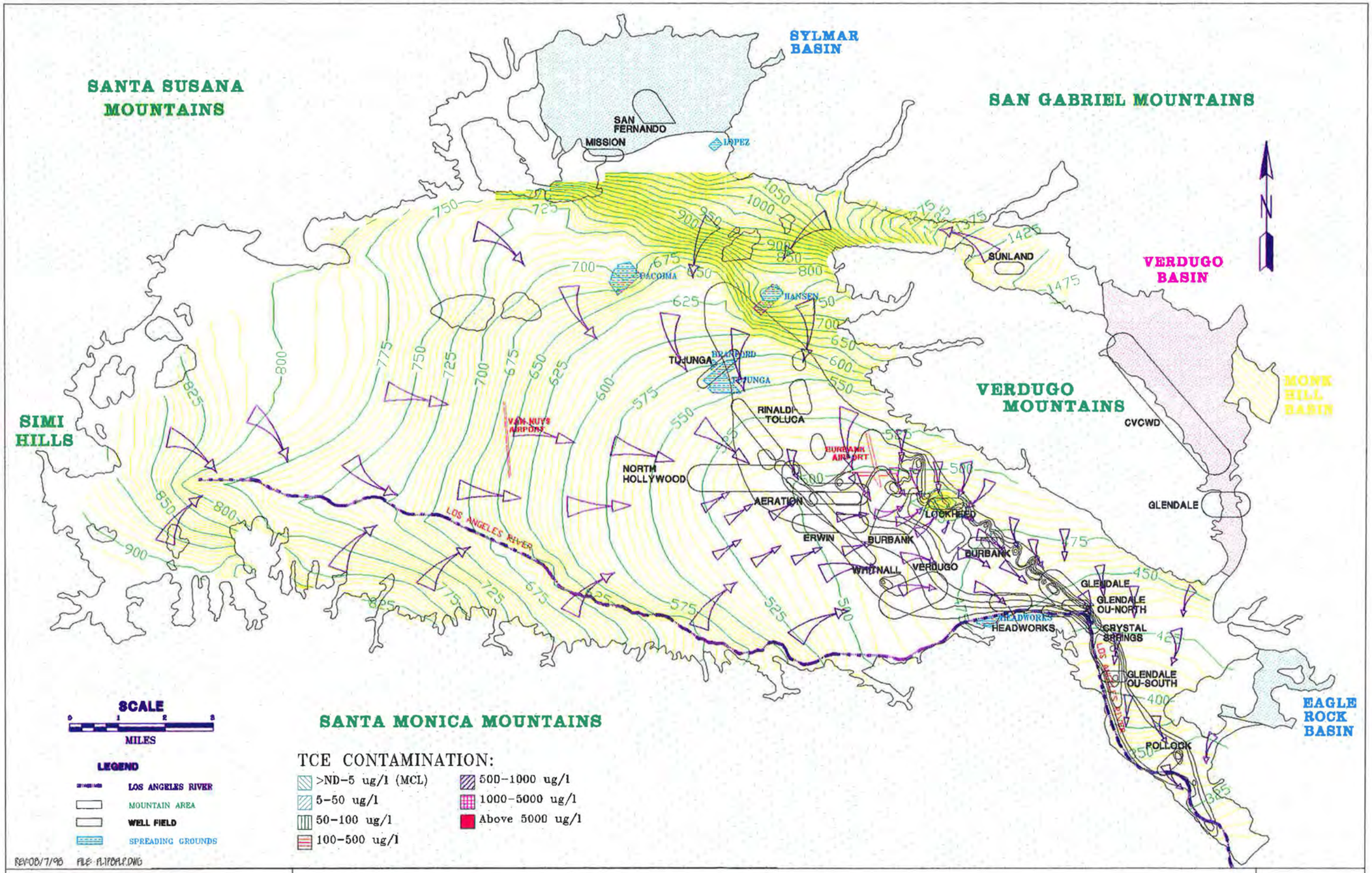
9



PROJECT: WATERMASTER
PROJECT NO.: WM96001

Simulated Groundwater Contour and NO_3 Contamination Model Layer 1 - FALL 1999

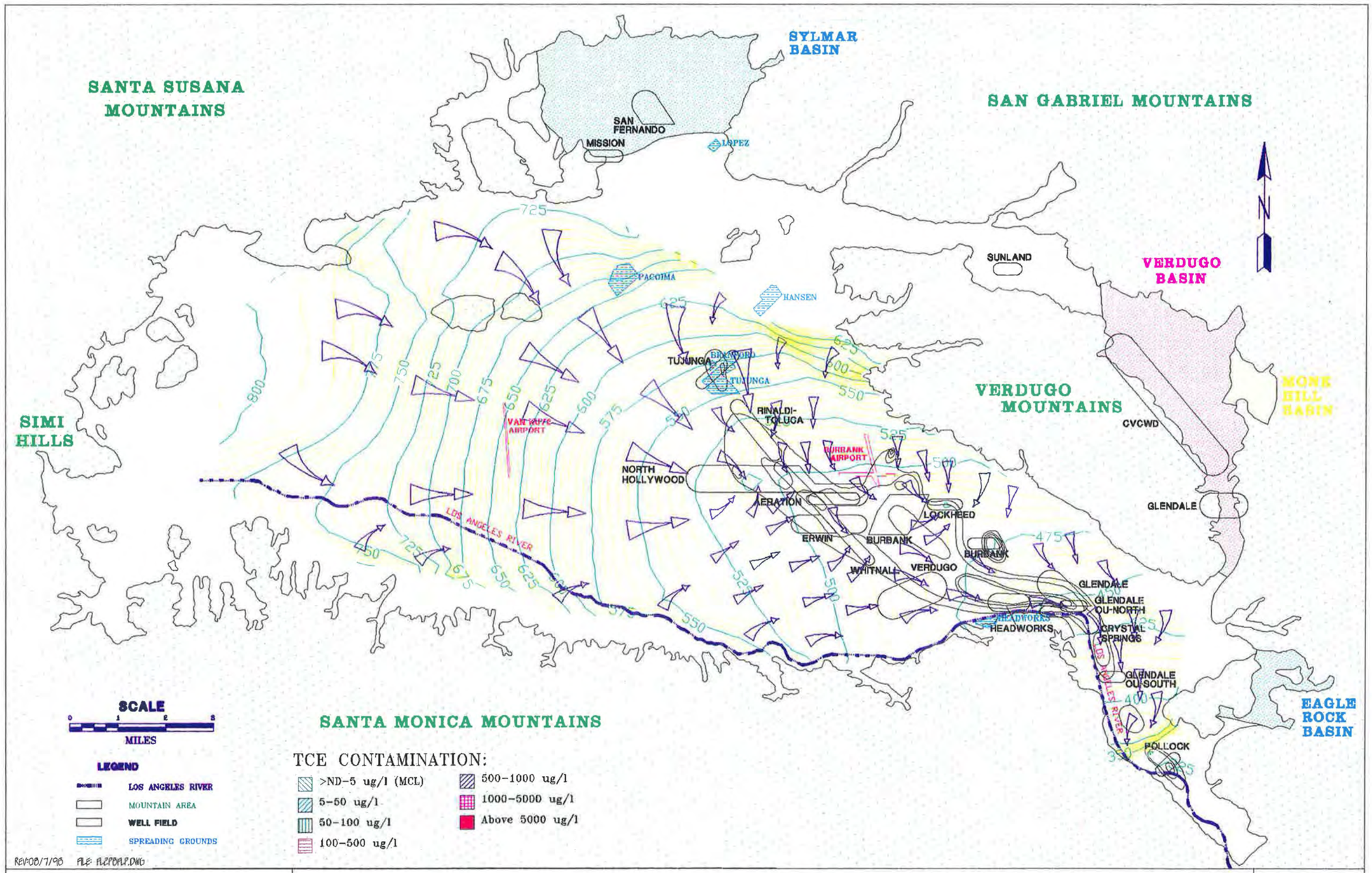
PLATE
10



PROJECT: WATERMASTER
PROJECT NO.: WM96001

Horizontal Groundwater Flow Direction - Model Layer 1
Fall 1999

PLATE
11



PROJECT: WATERMASTER
PROJECT NO.: WM96001

Horizontal Groundwater Flow Direction - Model Layer 2

Fall 1999

PLATE

12

APPENDIX A

CITY OF LOS ANGELES

PUMPING AND SPREADING PLAN

1995-96 Water Year

July 19, 1996

Mr. Melvin L. Blevins
ULARA Watermaster
111 N. Hope St., #1455
Los Angeles, CA 90012

Dear Mr. Blevins:

Annual Pumping and Spreading Plan

We are hereby transmitting to you Los Angeles' Pumping and Spreading Plan for the 1995-96 Water Year. This Plan satisfies the requirements set forth in the Upper Los Angeles River Area (ULARA) Watermaster Policies and Procedures Section 2.9.4.

We look forward to your evaluation of our plan and its integration into the 1995-96 ULARA Pumping and Spreading Plan.

Sincerely,

ORIGINAL SIGNED BY:
GERALD A. GEWE for

ROBERT Y. YOSHIMURA
Director
Water Supply Division

PTK:ww

Enclosure

bc w/o enclosure:
Bruce W. Kuebler
Robert Y. Yoshimura
Robert L. Simmons
Gerald A. Gewe
Ernest F. Wong
Richard A. Nagel
Patricia T. Kiechler

ULARA Watermaster

718a-APSP.DOC

CITY OF LOS ANGELES
GROUNDWATER PUMPING AND SPREADING PLAN
IN THE UPPER LOS ANGELES RIVER AREA
FOR THE 1995-1996 WATER YEAR

JULY 1996

Prepared by:
Groundwater Group
Water Resources Section
WATER SUPPLY DIVISION
Los Angeles Department of Water and Power

TABLE OF CONTENTS

Introduction

The water rights in the Upper Los Angeles River Area (ULARA) were set forth in a Final Judgment, entered on January 26, 1979, ending litigation that lasted over 20 years. The ULARA Watermaster's Policies and Procedures give a summary of the decreed extraction rights within ULARA, together with a detailed statement describing the ULARA Administrative Committee operations, reports to and by the Watermaster and necessary measuring tests and inspection programs. The ULARA Policies and Procedures have been revised several times since the original issuance, to reflect current groundwater management thinking.

In Section 2.9.4 of the ULARA Policies and Procedures as amended in July 1993, it is stated that:

> *"...each party or non-party who produces groundwater will submit to the ULARA Watermaster annually (on or before May 1 of the current water year), a Ground Water Pumping and Spreading Plan. This will include information on projected pumping and spreading rates and volumes, and recent water quality information on each well. In order to obtain the information needed to project future contamination levels, a monitoring program should be included."*

This report constitutes Los Angeles's Ground Water Pumping and Spreading Plan for the 1995-96 Water Year.

Section 1: Facilities Description

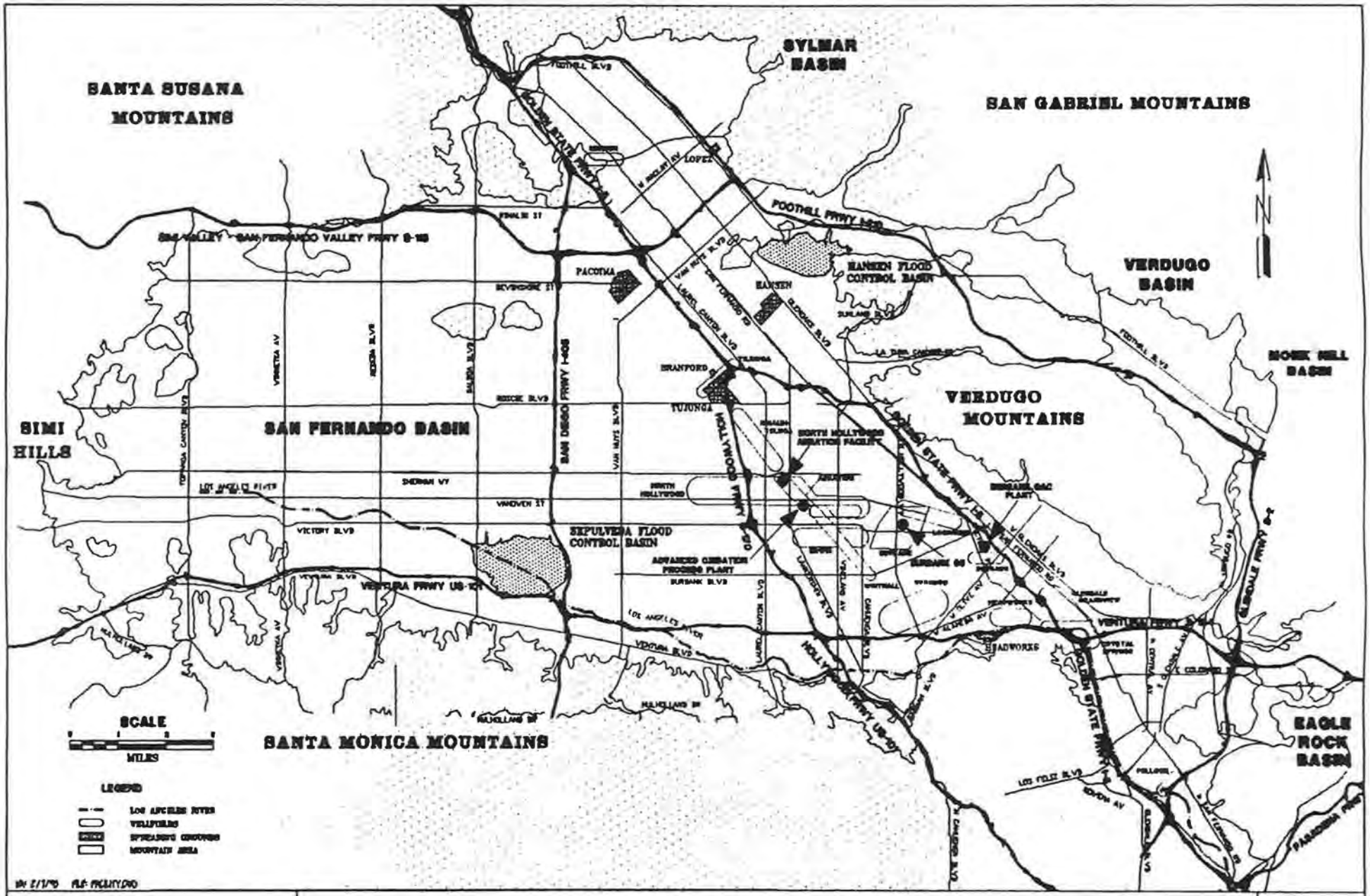
This section describes facilities that influence groundwater conditions in ULARA and relate to Los Angeles.

a. Spreading Grounds: There are six spreading ground facilities that are used for groundwater recharge of native water in ULARA. The Los Angeles County Department of Public Works (LACDPW) operates the Branford, Hansen, Lopez, and Pacoima spreading grounds; the City of Los Angeles Department of Water and Power (LADWP) operates the Headworks spreading grounds. LACDPW and LADWP operate the Tujunga spreading grounds cooperatively. Estimated capacities for these are shown in Table 1-1 and their locations are shown in Figure 1-1.

Table 1-1

Estimates Capacities of ULARA Spreading Grounds			
Spreading Ground	Type	Total wetted area [ac]	Capacity [ac-ft/yr.]
Operated by LACDPW			
Branford	Deep basin	8	1,000
Hansen	Shallow basins	110	36,000
Lopez	Shallow basins	13	5,000
Pacoima	Med. depth basins	111	29,000
Operated by LADWP			
Headworks	Shallow basins	28	22,000
Operated by LACDPW and LADWP			
Tujunga	Shallow basins	130	58,000
TOTAL:			151,000

b. Extraction Wells: The LADWP has ten well fields in the San Fernando Basin, and one in the Sylmar Basin. The well fields are shown in Figure 1-1, and their estimated capacities are shown in Table 1-2. The listed capacities are approximate and may vary depending on the water levels and maintenance schedule of the available pumping equipment.



1995-96 Water Year
Pumping & Spreading Plan
City of Los Angeles

Upper Los Angeles River Area:
Spreading Grounds, LADWP Well Fields,
and Ground Water Treatment Facilities

FIGURE 1-1

Table 1-2

Estimated Capacities of LADWP Well Fields in ULARA		
Well field	Number of wells	Estimated Initial Capacity [cfs]
San Fernando Basin		
Aeration	7	3
Crystal Springs	0	0
Erwin	4	10
Headworks	6	25
North Hollywood	30	129
Pollock	2	4
Rinaldi-Toluca	15	112
Tujunga	12	112
Verdugo	6	12
Whitnall	6	15
Sylmar Basin		
Mission	3	9
TOTAL:	91	431

c. Groundwater Treatment Facilities: The LADWP operates two groundwater treatment facilities. Water treated at these facilities is delivered to the water distribution system for consumption. The locations of these facilities are shown in Figure 1-1.

Advanced Oxidation Process Plant: This plant is designed to process up to 4,000 gallons per minute (gpm) of groundwater by employing an ozone and hydrogen peroxide treatment method to remove volatile organic compounds (VOCs) from the water.

North Hollywood Operable Unit: This plant is designed to process up to 2,000 gpm of groundwater containing VOCs by using aeration for the liquid phase and granular activated carbon for off-gas treatment.

Section 2: Annual Pumping And Spreading Projections

a. Pumping Projections for the 1995-96 Water Year: The supply to the City of Los Angeles has three components. Water is either imported from the Owens Valley/Mono Basin area, purchased from the Metropolitan Water District of Southern California (MWD), or extracted from local groundwater basins. The MWD sources of supply are the State Water Project and the Colorado River Aqueduct. Local supplies originate from the Central, San Fernando and Sylmar Groundwater Basins. Groundwater extractions fluctuate to meet demands as the imported water amount varies due to climatic and operational constraints.

Table 2-1 shows the amount of groundwater extractions that is expected during the 1995-96 Water Year from the San Fernando and Sylmar Basins. Actual quantities are given from October 1995 through May 1996 and are estimated for June through September 1996. Appendix B provides groundwater extraction projections from 1996 to 2000. These projects are based upon assumed demand and Los Angeles Aqueduct flows and are subject to yearly adjustments.

Table 2-1

CITY OF LOS ANGELES PUMPING PROJECTION FOR WY 95-96
(Acre-Feet)

San Fernando Basin

		Actuals								Estimates			
	TOTAL	Oct-95	Nov-95	Dec-95	Jan-96	Feb-96	Mar-96	Apr-96	May-96	Jun-96	Jul-96	Aug-96	Sep-96
AERATION	1,075	168	0	27	67	121	127	91	74	100	100	100	100
CRYSTAL SPRINGS	0	0	0	0	0	0	0	0	0	0	0	0	0
ERWIN	2,911	152	152	204	150	17	0	0	62	535	552	552	535
HEADWORKS	15	0	0	0	3	12	0	0	0	0	0	0	0
No HOLLYWOOD	17,435	1,429	111	0	263	322	1,168	0	2,975	3,800	3,130	2,455	1,782
POLLOCK	0	0	0	0	0	0	0	0	0	0	0	0	0
RINALDI-TOLUCA	24,267	0	3,418	6,269	4,391	838	0	0	2,846	3,680	2,825	0	0
TUJUNGA	4,416	2	0	1,202	3,212	0	0	0	0	0	0	0	0
VERDUGO	3,600	377	403	437	385	242	0	0	308	238	245	490	475
WHITNALL	4,039	163	82	275	130	85	0	0	164	772	798	798	772
TOTAL:	57,759	2,291	4,166	8,414	8,601	1,637	1,296	91	6,429	9,125	7,650	4,395	3,664
Sylmar Basin													
MISSION	3,527	503	14	0	0	0	224	463	509	175	552	552	535
ULARA TOTAL:	27,700	2,794	4,180	8,414	8,601	1,637	1,520	554	6,938	9,300	8,202	4,947	4,199

b. Spreading Projections for the 1995-96 Water Year: Native groundwater recharge from captured storm runoff occurs primarily as a result of the use of man-made spreading grounds. Spreading grounds operations are primarily controlled by the LACDPW. Table 2-2 represents the anticipated spreading volumes for 1995-96. The East Valley Water Recycling Project in Phase IA will add recycled water to the Hansen Spreading Grounds beginning approximately December 1998 with an amount anticipated at 10,000 AFY. Phase IB will carry recycled water to the Pacoima Spreading Grounds.

Table 2-2

Projected Spreading in ULARA Spreading Grounds in 1995-96						
	Operated by:					
	LACDPW				LADWP	LACDPW and LADWP
Month	Branford	Hansen	Lopez	Pacoima	Headworks	Tujunga
Oct 95	14	0	0	0	0	372
Nov 95	18	0	0	0	0	498
Dec 95	89	689	0	61	0	277
Jan 96	105	1,060	0	250	0	26
Feb 96	283	2,720	69	1,544	0	1,742
Mar 96	30	1,230	102	2,170	0	3,250
Apr 96	0	1,350	172	505	0	0
May 96	14	554	25	0	0	750
June 96	0	0	0.4	0	0	0
---	---	---	Projections	---	---	---
Jul 96	0	100	0	0	0	100
Aug 96	0	100	0	0	0	100
Sep 96	0	100	0	0	0	100
TOTAL:	553	7,903	368	4,530	0	7,215

Section 3: Water Quality Monitoring Program Description

All of LADWP's 89 active wells in ULARA are sampled at least once every three years. State regulations require the following types of sampling regimens:

1. Inorganic monitoring
2. Organic monitoring
3. Phase II and V Initial monitoring
4. Radiological monitoring
5. Quarterly Organics monitoring

Every three years, each well is monitored for a full range of inorganic and organic compounds. Phase II and V Initial monitoring involves analysis for newly regulated organic compounds at all wells. Each well must be sampled for four consecutive quarters within a three-year period. Quarterly organics monitoring involves organic compound analysis four times a year for each well where organic compounds have been detected. A complete list of the parameters that must be tested for is contained in Title 22 of the California Code of Regulations.

The 89 wells are divided into clusters each consisting of three to six wells. The clusters are organized in three sampling groups to allow for efficient sample collection. Appendix A contains the 1995-96 TCE, PCE, and nitrate data that are representative of each cluster.

Section 4: Groundwater Treatment Facilities Operations Summary

North Hollywood Advanced Oxidation Process Plant: During 1995 the facility was operated for limited short term tests to evaluate the efficiency of the treatment facility.

Hollywood Operable Unit (NHOU): The NHOU was out of service from October 10, 1995 to December 21, 1995 because of repair work at the North Hollywood sump and the eastbound collector line. Provided below is a summary of facility operations.

	Aeration Well No.							Average Flow to Facility	Influent to Facility TCE/PCE	Effluent from Facility TCE/PCE
Mon/Yr	2	3	4	5	6	7	8	(gpm)	(in ug/L)	(in ug/L)
6/95	174	318	299	136	294	296	323	1660	54/12	1/ND
7/95	180	318	250	---	302	297	324	1605	73/14	2/ND
8/95	180	---	320	---	299	301	328	1243	61/17	2/ND
9/95	180	318	315	---	301	283	328	1119	59/20	1/ND
10/95	179	318	358	---	282	278	314	1280	---	---
11/95	---	---	---	---	---	---	---	---	---	---
12/95	---	224	---	---	---	300	323	540	---	---
1/96	294	323	320	---	296	306	366	1171	102/20	1/ND
2/96	297	322	320	---	296	143	330	1016	80/21	1/ND
3/96	429	268	298	138	301	309	311	1050	77/17	1/ND
4/96	162	318	288	161	---	316	311	884	59/2.3	0.7/ND
5/96	178	320	309	---	---	318	314	980	54/3.5	ND/ND

Section 5: Plans For Facilities Modifications

This section describes any plans for modifications to existing facilities, or plans to construct new facilities in the 1995-96 Water Year, as of the printing of this report (August 1995).

a. Spreading Grounds: There are no plans for modifications that would change the capacity of existing spreading grounds, or for the construction of new facilities in the 1995-96 Water Year.

b. Extraction Wells: There are no plans for modifications that would change the capacity or zone of extraction of any existing wells, or for the construction of new wells in the 1995-96 Water Year. Crystal Springs Well No. 47 was destroyed during 1995 and Crystal Springs Well Nos. 44, 45, and 46 were destroyed in February 1996 in accordance with State guidelines.

c. Groundwater Treatment Facilities: The LADWP is proceeding with Pollock Wells Treatment Plant to restore two of the existing Pollock production wells to operation by treating the groundwater to remove VOCs and then blending for nitrate reduction. The scope of project includes four 750 gpm liquid phase GAC units to remove VOCs from the water. Groundbreaking is anticipated for November 1996.

Reactivation of the Headworks well field is currently being studied. The well field has been out of service due to TCE and PCE contamination since the early 1980s and consists of six wells that produce approximately 2,500 gpm each. Conceptual design, preferred alternative analysis and environmental documentation is slated to be completed by 1997.

APPENDIX A:
1995-96 Water Quality Sampling Results

ULARA WELLS

Number	Cluster	Well	Date	PCE (ug/L)	TCE (ug/L)	NO^3 (mg/L)
1	11	AERATION #2	4/24/96	2.90	185.00	
2	11	AERATION #3	5/23/96	3.20	80.00	
3	10	AERATION #4	5/23/96	3.10	42.00	
4	9	AERATION #5	3/15/96	37.00	34.00	
5	9	AERATION #6	3/15/96	---	---	
6	8	AERATION #7	5/23/96	5.00	51.00	
7	8	AERATION #8	3/15/96	72.00	50.00	
8	6	ERWIN #1	---			
9	7	ERWIN #2	5/4/95	4.30	13.20	
10	6	ERWIN #3	---			
11	7	ERWIN #4	---			
12	7	ERWIN #6	---			
13	7	ERWIN #10	---			
14	20	MISSION #5	3/20/96	ND	2.20	
15	21	MISSION #6	---			
16	21	MISSION #7	---			
17	12	NORTH HOLLYWOOD #2	9/21/95	3.10	254.00	
18	14	NORTH HOLLYWOOD #4	9/21/95	2.70	42.10	
19	15	NORTH HOLLYWOOD #7	2/28/96	ND	ND	
20	10	NORTH HOLLYWOOD #11	---			
21	14	NORTH HOLLYWOOD #15	---			
22	9	NORTH HOLLYWOOD #16	5/23/96	12.60	2.70	16.30
23	9	NORTH HOLLYWOOD #17	---			
24	8	NORTH HOLLYWOOD #18	9/14/95	1.80	3.60	
25	8	NORTH HOLLYWOOD #20	3/22/95	2.40	28.30	28.44
26	7	NORTH HOLLYWOOD #21	---			
27	12	NORTH HOLLYWOOD #22	5.23/96	ND	ND	21.93
28	12	NORTH HOLLYWOOD #23	5/23/96	ND	0.60	21.88
29	14	NORTH HOLLYWOOD #25	2/28/96	ND	ND	
30	12	NORTH HOLLYWOOD #26	8/2/95	ND	ND	18.78
31	9	NORTH HOLLYWOOD #27	---			
32	10	NORTH HOLLYWOOD #28	5/9/95	ND	1.00	6.38
33	12	NORTH HOLLYWOOD #30	---			
34	15	NORTH HOLLYWOOD #32	2/28/96	ND	ND	
35	14	NORTH HOLLYWOOD #33	9/26/95	ND	ND	
36	13	NORTH HOLLYWOOD #34	5/23/96	2.10	4.00	14.26
37	8	NORTH HOLLYWOOD #35	2/28/96	1.60	2.20	
38	14	NORTH HOLLYWOOD #36	---			
39	13	NORTH HOLLYWOOD #37	5/23/96	ND	1.20	20.73
40	10	NORTH HOLLYWOOD #38	---			
41	10	NORTH HOLLYWOOD #39	---			
42	11	NORTH HOLLYWOOD #40	7/28/95	ND	4.60	
43	11	NORTH HOLLYWOOD #41	9/26/95	ND	6.20	
44	11	NORTH HOLLYWOOD #42	7/28/95	ND	30.30	
45	13	NORTH HOLLYWOOD #43A	2/28/96	ND	ND	
46	13	NORTH HOLLYWOOD #44	2/28/96	ND	ND	
47	13	NORTH HOLLYWOOD #45	5/23/96	ND	ND	17.76

NOTE: ND = non-detect
--- not tested (refer to p.8)

ULARA WELLS

Number	Cluster	Well	Date	PCE (ug/L)	TCE (ug/L)	NO^3 (mg/L)
48	3	POLLOCK #4	---			
49	3	POLLOCK #6	---			
50	3	POLLOCK #7	---			
51	15	RINALDI-TOLUCA #1	---			
52	16	RINALDI-TOLUCA #2	8/10/95	ND	0.70	
53	17	RINALDI-TOLUCA #3	8/10/95	ND	1.00	
54	17	RINALDI-TOLUCA #4	8/10/95	ND	1.70	
55	17	RINALDI-TOLUCA #5	2/9/95	ND	1.30	
56	17	RINALDI-TOLUCA #6	8/10/95	ND	1.10	
57	17	RINALDI-TOLUCA #7	8/10/95	ND	0.60	
58	18	RINALDI-TOLUCA #8	8/10/95	ND	ND	
59	18	RINALDI-TOLUCA #9	11/30/95	ND	ND	
60	16	RINALDI-TOLUCA #10	6/22/95	ND	ND	
61	16	RINALDI-TOLUCA #11	8/10/95	ND	ND	
62	16	RINALDI-TOLUCA #12	8/10/95	ND	ND	
63	16	RINALDI-TOLUCA #13	8/10/95	ND	ND	
64	15	RINALDI-TOLUCA #14	---			
65	15	RINALDI-TOLUCA #15	---			
66	18	TUJUNGA #1	12/12/95	ND	ND	14.75
67	18	TUJUNGA #2	12/12/95	ND	ND	16.92
68	18	TUJUNGA #3	12/7/95	ND	2.20	25.61
69	19	TUJUNGA #4	12/7/95	ND	4.50	30.66
70	19	TUJUNGA #5	12/7/95	ND	8.20	43.06
71	19	TUJUNGA #6	12/4/95	ND	4.90	40.05
72	19	TUJUNGA #7	12/7/95	ND	3.50	48.73
73	19	TUJUNGA #8	12/7/95	ND	2.30	39.12
74	20	TUJUNGA #9	12/12/95	ND	ND	4.61
75	20	TUJUNGA #10	12/12/95	ND	ND	3.85
76	20	TUJUNGA #11	12/12/95	ND	ND	4.34
77	20	TUJUNGA #12	12/21/95	ND	1.40	9.17
78	4	VERDUGO #1	---			
79	4	VERDUGO #2	---			
80	4	VERDUGO #4	5/2/96	7.90	19.50	24.76
81	4	VERDUGO #11	5/2/96	ND	3.40	10.54
82	5	VERDUGO #13	---			
83	5	VERDUGO #24	3/26/96	ND	ND	
84	6	WHITNALL #4	8/23/95	ND	0.90	
85	6	WHITNALL #5	8/23/95	ND	0.70	
86	6	WHITNALL #6A	6/28/95	1.20	ND	
87	5	WHITNALL #7	7/28/95	0.90	4.20	
88	5	WHITNALL #8	---			
89	5	WHITNALL #9	---			
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NOTE: ND = non-detect
--- not tested (refer to p.8)

APPENDIX B:
Groundwater Extraction Projections 1996-2000

GROUNDWATER EXTRACTION PROJECTIONS
WATER YEARS 1996-97 THROUGH 1999-2000

	Total Groundwater Extractions From Water Ctrl 5-yr Projection	Sylmar Basin Extractions	Central Basin Extractions	San Fernando Basin Extractions
Oct-96	6,200	518	1,670	4,012
Nov-96	19,300	0	1,670	17,630
Dec-96	20,000	0	0	20,000
Jan-97	15,700	0	0	15,700
Feb-97	15,500	0	0	15,500
Mar-97	18,200	0	1,670	16,530
Apr-97	5,000	0	1,670	3,330
May-97	5,165	518	1,670	2,977
Jun-97	4,700	518	1,670	2,512
Jul-97	6,800	518	1,670	4,612
Aug-97	9,000	518	1,670	6,812
Sep-97	6,600	518	1,670	4,412
Totals	132,165	3,108	15,030	114,027
Oct-97	13,100	518	1,670	10,912
Nov-97	13100	0	1,670	11,430
Dec-97	6,200	0	0	6,200
Jan-98	6,200	0	0	6,200
Feb-98	5,400	0	0	5,400
Mar-98	12,800	0	1,670	11,130
Apr-98	13,000	0	1,670	11,330
May-98	8,000	518	1,670	5,812
Jun-98	10,000	518	1,670	7,812
Jul-98	7,300	518	1,670	5,112
Aug-98	9,500	518	1,670	7,312
Sep-98	7,100	518	1,670	4,912
Totals	111,700	3,108	15,030	93,562

Note: Projections are based upon assumed demand and Los Angeles Aqueduct flows, and are very rough estimates.

	Total Groundwtr Extractions From Water Ctrl 5-yr Projection	Sylmar Basin Extractions	Central Basin Extractions	San Fernando Basin Extractions
Oct-98	12,700	518	1,670	10,512
Nov-98	11,200	0	1,670	9,530
Dec-98	6,200	0	0	6,200
Jan-99	6,200	0	0	6,200
Feb-99	5,400	0	0	5,400
Mar-99	10,900	0	1,670	9,230
Apr-99	13,000	0	1,670	11,330
May-99	10,050	518	1,670	7,862
Jun-99	10,500	518	1,670	8,312
Jul-99	8,300	518	1,670	6,112
Aug-99	10,500	518	1,670	8,312
Sep-99	8,050	518	1,670	5,862
Totals	113,000	3,108	15,030	94,862
Oct-99	20,828	518	1,670	18,640
Nov-99	11,000	0	1,670	9,330
Dec-99	6,200	0	0	6,200
Jan-00	6,200	0	0	6,200
Feb-00	5,400	0	0	5,400
Mar-00	8,500	0	1,670	6,830
Apr-00	11,800	0	1,670	10,130
May-00	10,800	518	1,670	8,612
Jun-00	11,400	518	1,670	9,212
Jul-00	9,050	518	1,670	6,862
Aug-00	11,350	518	1,670	9,162
Sep-00	8,800	518	1,670	6,612
Totals	121,328	3,108	15,030	103,190

Note: Projections are based upon assumed demand and Los Angeles Aqueduct flows, and are very rough estimates.

APPENDIX B

CITY OF BURBANK

PUMPING AND SPREADING PLAN

1995-96 Water Year

GROUNDWATER PUMPING

AND

SPREADING PLAN

WATER YEAR
OCTOBER 1, 1995 TO SEPTEMBER 30, 1996

Prepared by

PUBLIC SERVICE DEPARTMENT
WATER DIVISION
CITY OF BURBANK

MARCH 1996

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TABLES

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I. INTRODUCTION

The groundwater rights of the City of Burbank were defined by the JUDGEMENT in Superior Court Case No. 650079, entitled "The City of Los Angeles, a Municipal Corporation, Plaintiff, vs. City of San Fernando, et. al., Defendants". The Final Judgement was signed on January 26, 1979.

In 1993, significant revisions were made to the Upper Los Angeles River Area (ULARA) Policies and Procedures with the addition of Section 2.9, Groundwater Quality Management. This addition has been made by the Watermaster and the Administrative Committee to affirm its commitments to participate in the cleanup and limiting the spread of contamination in the San Fernando Valley. This report is in response to Section 2.9.4, Draft Groundwater Pumping and Spreading Plan.

The Groundwater Pumping and Spreading Plan is based on the water year, October 1 to September 30. The Draft Plan for Burbank will be submitted in March to the Watermaster for the current water year.

II. WATER DEMAND

The annual total water demand for the last five years and the projected annual water demand for the next five years is shown in Table 2.1.

Water demand during 1990 to 1993 was affected by drought conditions in California. The City of Burbank imposed mandatory conservation from April, 1991 to April, 1992. Voluntary conservation was in effect prior to, and since, this period. Significant "hard conservation" in the form of retrofit showerheads and ultra-low flush toilet installations has been made.

Projected water demands for the next five years is expected to increase only slightly from the 1989-90 base year. The increase is not from residential growth, but as a rebound from the drought conditions and re-establishment of commercial-industrial demand.

The projected water demand may vary significantly due to weather conditions, economic conditions and/or social conditions in the Burbank area. A variance of $\pm 10\%$ can be expected.

III. WATER SUPPLY

The water supply for the City of Burbank is composed of purchased water from the Metropolitan Water District of Southern California (MWD), locally produced and treated groundwater, and reclaimed water from the Burbank Wastewater Treatment Plant.

A. MWD

The amount of treated water purchased from the MWD is expected to be reduced over the next five years as the result of bringing several water resource projects on line. Burbank will be purchasing additional quantities of untreated water for basin replenishment. See Section IV. Historic and projected use of MWD water is shown in Table 3.1

B. EPA CONSENT DECREE

The EPA Consent Decree project was expected to become operational on March 25, 1994. Due to delays by the Administrative Order Parties, the operation date was postponed until January 3, 1996. The source of water will be from wells operated by Lockheed. The City of Burbank will account for the production beneficially used by Burbank. Projected use of EPA Consent Decree water produced by Lockheed is shown in Table 3.3.

C. GAC TREATMENT PLANT

The City placed a granular activated carbon (GAC) Treatment Plant in service in November 1992. Historic and proposed production from this plant is shown in Table 3.2. The GAC Treatment Plant will be taken out of service periodically for carbon change-out of the contactors. Mechanical maintenance will be performed during the change-out period. The GAC Treatment Plant uses the groundwater production of Well No. 7 and Well No. 15.

D. RECLAIMED WATER

The City has used reclaimed water for its power plant cooling for more than 20 years. An expansion of the reclaimed water system is nearing completion. Major services will be added during the 1995-96 water year. Historic and proposed use of reclaimed water is shown in Table 3.4.

E. PRODUCTION WELLS

The City has seven wells that are mechanically and electrically operable. Five (5) wells are on "Inactive" status with the DHS. We do not plan to operate the inactive wells unless an emergency develops in the 1995-96 water year.

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IV. JUDGEMENT CONSIDERATIONS

A. PHYSICAL SOLUTION

The City has a physical solution right of 4,200 acre- feet per year in addition to its extraction rights and use of stored water credits. The City will charge the following physical solution right holders for water used and claim the extraction against the City's rights:

Physical Solution Producers

Valhalla	300 Acre-feet
Lockheed	25 Acre-feet

Table 3.3 lists the past and projected extractions by Valhalla. Table 3.4 lists the past and projected extractions by Lockheed.

B. STORED WATER CREDIT

The City has a stored water credit of 55,180 acre-feet as of October 1, 1994.

C. ALLOWANCE FOR PUMPING

The extraction right for the 1994-95 water year is 4,913 acre-feet. This amount is exclusive of additional extractions allowed due to the City's stored water credits, physical solution right or pumping for groundwater clean-up.

Estimated allowable future pumping, based on 20,000 acre-feet of delivered water, will be 4,000 acre-feet per year.

D. SPREADING OPERATIONS

The City has purchased water for basin replenishment since 1989. The water has been typically spread at the Pacoima Spreading Grounds by L.A. County Public Works Department with the assistance of the L.A.D.W.P. The L.A.D.W.P. water pipelines to the Pacoima Spreading Ground were damaged during the 1994 Northridge earthquake. Replenishment water, beginning in water year 1994-95, will be taken "in lieu" through the L.A. Treatment Plant. The historic and projected spreading water is shown in Table 4.1.

V. CAPITAL IMPROVEMENTS

A. WELLS

BURBANK

No capital improvements or modifications are planned for the Burbank water wells. We plan to continue the use of Well No. 7 and No. 15 for the GAC Treatment Plant.

Burbank will allow Lockheed to use Well No. 10, No. 11A, and No. 12 for aquifer testing. See Figure 5.1. Lockheed may use these wells for Phase II EPA Consent Decree production. Additional testing may be conducted during the year.

LOCKHEED-MARTIN

Lockheed will operate seven (7) wells for the production capability of the EPA Consent Decree Project. See Figure 5.1. The well field will produce from 3,000 GPM to 6,000 GPM for a two-year period beginning January 3, 1996 (Phase I).

B. GROUNDWATER TREATMENT FACILITIES

EPA PROJECT

Burbank completed construction and testing of its EPA Consent Decree facilities. Coordinated testing with the Administrative Order Parties' Blending Facilities began August 21, 1995 and was completed January 3, 1996.

Coordinated testing of the combined facilities (City, Blending, Lockheed) began on January 3, 1996 and was completed March 3, 1996.

The EPA Consent Decree Project became fully operational on January 3, 1996.

Lockheed stopped its operation of the Aqua Detox Treatment System in June 1994.

Lockheed continued limited production and treatment for start-up and testing of the EPA Consent Decree Project until December 30, 1995. Production and

treatment of 4,000 gpm to 9,000 gpm is expected through September, 1996.

GAC TREATMENT PLANT

Burbank will reduce the production of the GAC Treatment Plant to 1,000 GPM during the period of January 1, 1996 through April 30, 1996. The plant will be operated in the series configuration. The GAC Treatment Plant will again operate at 2,000 GPM beginning in May, parallel configuration, to assist in meeting summer demands.

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TABLE 2.1
FIVE-YEAR PROJECTED WATER DEMAND

WATER YEAR	ACRE-FEET
88-89	23,863
89-90	23,053
90-91	20,269
91-92	20,930
92-93	21,839
93-94	24,175
94-95	22,541
95-96*	22,700
96-97*	22,700
97-98*	22,700
98-99*	22,700
99-00*	23,000

* Projected

NOTES:

(1) Water demand equals the total delivered water. (Extractions (GAC & EPA), MWD, Reclaimed)

(2) Values above include Valhalla extractions.

TABLE 3.1
FIVE-YEAR PROJECTED USE OF MWD TREATED WATER

WATER YEAR	ACRE-FEET
88-89	22,936
89-90	22,397
90-91	17,773
91-92	18,830
92-93	18,005
93-94	18,074
94-95	17,173
95-96*	9,000
96-97*	9,000
97-98*	9,000
98-99*	9,000
99-00*	9,000

* Projected

NOTES:

(1) All values shown above are for treated water.

TABLE 3.2
FIVE-YEAR PROJECTED USE OF GAC TREATED WATER

WATER YEAR	ACRE-FEET
92-93	1,205
93-94	2,395
94-95	2,590
95-96*	2,000
96-97*	1,000
97-98*	1,000
98-99*	1,000
99-00*	1,000

* Projected

NOTES:

(1) The GAC Treatment Plant has a capacity of 2,000 GPM.

(2) Wells No. 7 and No. 15 are the source of supply for the GAC Treatment Plant. Proposed production rates are as follows:

Well No. 7 1250 GPM
Well No. 15 750 GPM

(3) Treatment Plant production will be reduced beginning in water year 1995-96 in order to meet monthly minimums required by the EPA Consent Decree project.

(4) The GAC Treatment Plant was operated in series at 1,000 GPM from January through April 1996.

TABLE 3.3
FIVE YEAR PROJECTED EXTRACTIONS OF GROUNDWATER BY LOCKHEED

WATER YEAR	ACRE-FEET
93-94	803 (4)
94-95	462 (6)
95-96*	6,000 (6)
96-97*	8,000
97-98*	8,000
98-99*	8,000
99-00*	8,000

* Projected

NOTES:

(1) Burbank includes extractions by Lockheed in its pumping rights.

(2) Lockheed has Physical Solution right of 25 AF/year.

(3) Lockheed stopped its operation of the Aqua Detox Treatment System in June 1994. (BOU378 + AD450 - 25) = 803

(4) The "Policies and Procedures" allow a 50 acre-foot reduction for well development and testing.

(5) Re-injected water has been excluded from the above values.

(6) During the water years 1993-94, 1994-95 and 1995-96 Lockheed-Martin produced water for testing of the EPA Consent Decree Project. See Appendix C.

1993-94	378 Acre-feet
1994-95	462 Acre-feet
1995-96	34 Acre-feet, October through December

The Watermaster will not charge Burbank for these amounts.

(7) Beginning January of water year 1995-96, all extractions will be treated for VOC removal and beneficially used by Burbank.

TABLE 3.4
FIVE YEAR PROJECTED EXTRACTIONS OF GROUNDWATER BY VALHALLA

WATER YEAR	ACRE-FEET
89-90	293
90-91	239
91-92	376
92-93	391
93-94	391
94-95	298
95-96*	300
96-97*	300
97-98*	300
98-99*	300
99-00*	300

* Projected

NOTES:

(1) Burbank includes extractions by Valhalla in its pumping rights.

(2) Valhalla has Physical Solution right of 300 AF/year.

TABLE 3.5
FIVE YEAR PROJECTED USE OF RECLAIMED WATER

WATER YEAR	ACRE-FEET
88-89	927
89-90	656
90-91	1,234
91-92	2,100
92-93	2,629
93-94	3,706
94-95	2,480
95-96*	3,500
96-97*	3,500
97-98*	3,500
98-99*	3,500
99-00*	4,000

* Projected

NOTES:

(1) The source of reclaimed water is the Burbank Wastewater Treatment Plant.

(2) The Upper and Lower landfill areas were provided reclaimed water service in water year 1994-95.

(3) The DeBell Golf Course and Par-3 Course were provided reclaimed water service in water year 1995-96. The PS-1 Booster at the wastewater treatment plant was placed into service.

TABLE 4.1
FIVE YEAR PROJECTED SPREADING OPERATIONS

WATER YEAR	ACRE-FEET
88-89	0
89-90	378 (1)
90-91	504 (1)
91-92	503 (1)
92-93	500 (2)
93-94	0 (3)
94-95	2,000 (2)
95-96*	2,000
96-97*	2,000
97-98*	2,000
98-99*	2,000
99-00*	2,000

* Projected

NOTES:

(1) MWD water spread at the Pacoima Spreading Grounds.

(2) MWD water taken at the Los Angeles Treatment Plant (LA-35). In-lieu credit to Burbank by the L.A.D.W.P.

(3) The Maclay pipeline was damaged in the 1994 Northridge earthquake. Deliveries to the Pacoima Spreading Grounds are precluded until repaired by the L.A.D.W.P.

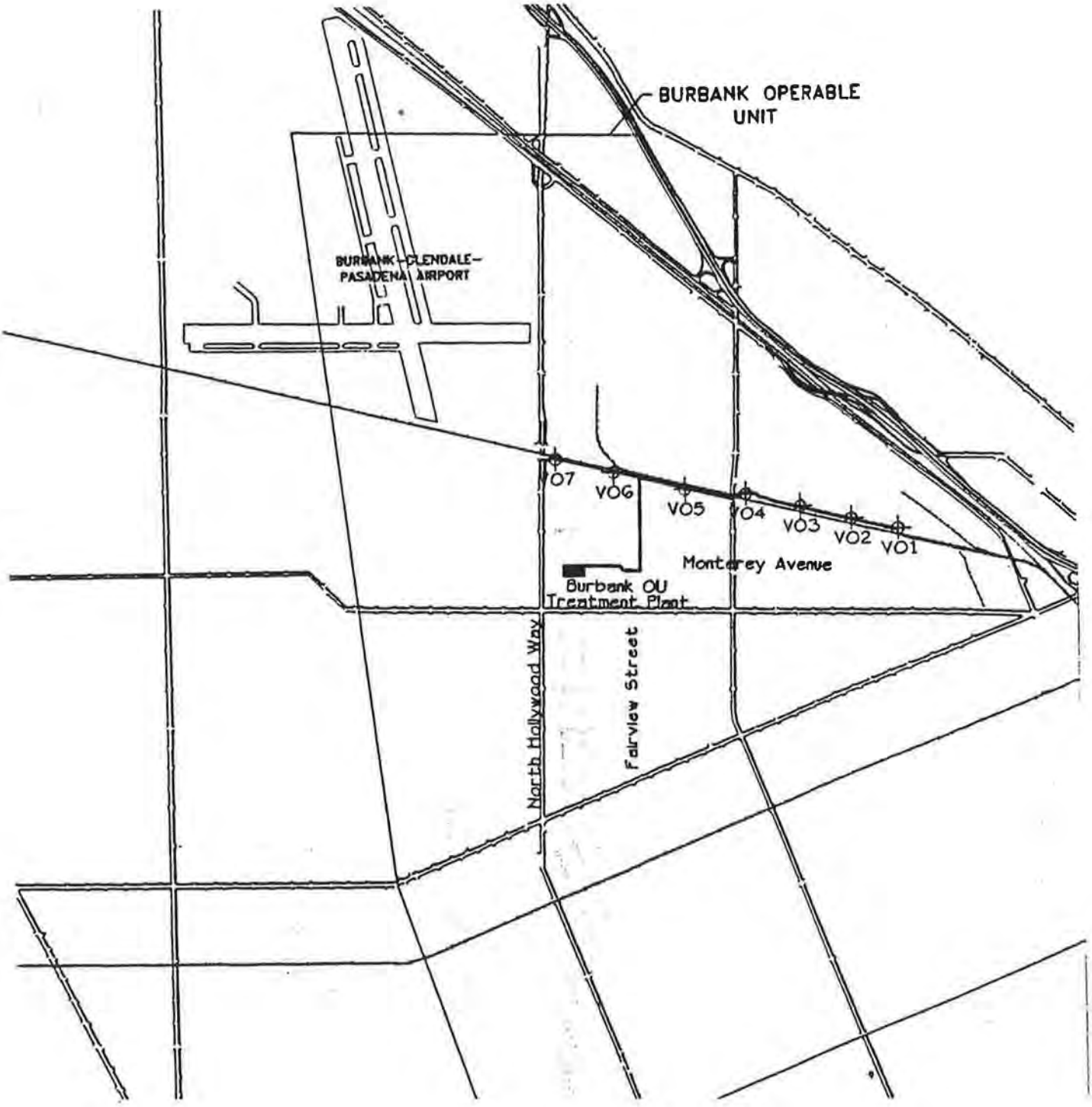

FIGURE 3.1
EPA CONSENT DECREE EXTRACTION WELLS

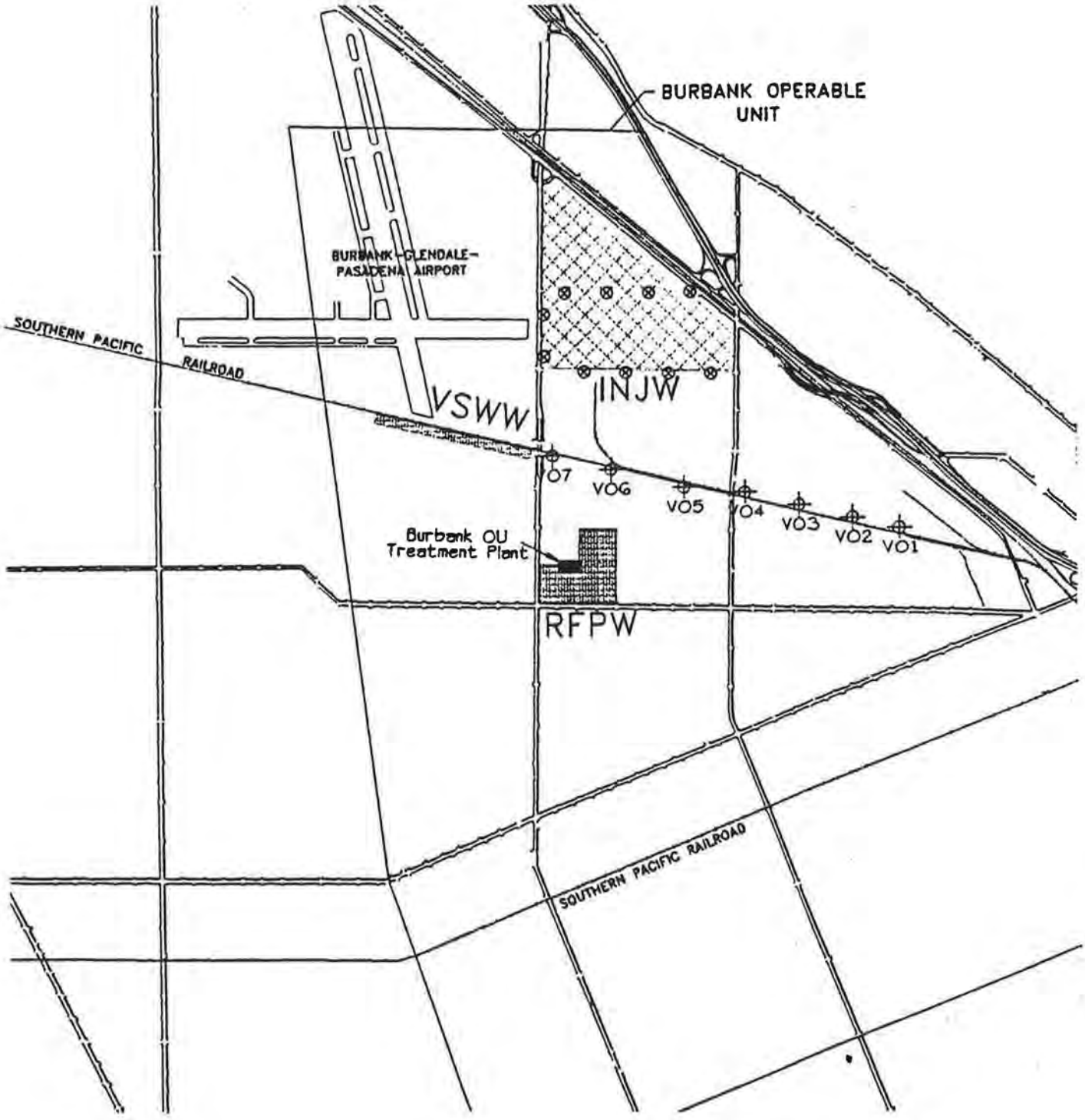

FIGURE 5.1
EPA PHASE II EXTRACTION WELLS

APPENDIX A

WATER QUALITY DATA

BURBANK WELLS

- WELL NO. 7
- WELL NO. 15

WATER QUALITY DATA FOR WATER YEAR 1994-95 HAS BEEN INCLUDED WITH THIS REPORT.

LOCKHEED WELLS

- NO. 1
- NO. 2
- NO. 3
- NO. 4
- NO. 5
- NO. 6
- NO. 7

NOTE: WATER QUALITY TEST DATA FOR LOCKHEED WELLS WILL BE PROVIDED ON SPECIFIC REQUEST, AND IS NOT INCLUDED WITH THIS REPORT

CITY OF BURBANK
PUBLIC SERVICE DEPARTMENT
WATER DIVISION

GAC TREATMENT PLANT DATA
WATER YEAR 1994-95

MONTH	VOC - COMBINED INFLUENT µg / l				PRODUCTION (INTO SYSTEM) A.F.
	TCE	PCE	c-1,2-DCE	1,2-DCA	
October, 1994	113.0	5.02	4.01	0.71	283.21
November	102.0	4.70	4.05	0.80	215.79
December	107.0	7.86	4.38	0.56	151.08
January, 1995	116.0	7.57	4.72	0.65	225.13
February	99.0	6.94	4.38	0.76	198.35
March	107.0	8.91	4.85	0.95	278.88
April	103.0	9.07	5.02	0.98	190.41
May	93.7	8.63	4.38	0.57	266.90
June	86.9	9.80	4.90	ND	170.49
July					225.14
August	97.4	10.80	4.77	ND	268.24
September	87.4	10.00	4.32	ND	123.35
				TOTAL:	2,596.97

CARBON CHANGE-OUT DATES:

8/27/94	4/20/95
12/5/94	7/5/95
2/17/95	9/16/95

PRODUCTION WELLS:

NO. 7 NO. 15

GACDATA.XLS (WY 94-95)
2/29/96

APPENDIX B

WATER TREATMENT FACILITIES

LAKE STREET GAC TREATMENT PLANT

320 LAKE STREET
BURBANK, CA 91503

OPERATOR:

CITY OF BURBANK
PUBLIC SERVICE DEPARTMENT, WATER DIVISION

BILL SMITH, PRODUCTION/OPERATIONS SUPERINTENDENT

QUANTITY TREATED (10/1/94 THROUGH 9/30/95):

2,597 Acre-Feet

WATER QUALITY:

Contaminant VOC'S: TCE, PCE, 1,2-DCE, 1,2-DCA

DISPOSAL:

Burbank Water System
Potable Water

EPA CONSENT DECREE PROJECT

2030 N. Hollywood Way
Burbank, CA 91505

OPERATOR:

CITY OF BURBANK
PUBLIC SERVICE DEPARTMENT, WATER DIVISION

BILL SMITH, WATER PRODUCTION/OPERATIONS SUPERINTENDENT

QUANTITY TREATED (10/1/94 THROUGH 9/30/95):

462 ACRE-FEET FOR TESTING; 0 ACRE-FEET FOR DOMESTIC USE.

WATER QUALITY:

N/A

DISPOSAL:

(1) TEST WATER - WASTE

(2) BURBANK WATER SYSTEM
Potable water after blending

APPENDIX C

MISCELLANEOUS

TABLE 3-1
EXTRACTION WELL FLOW RATE SETPOINTS
(For Odd Months if Flow is Maintained Continuously at a Given Production Requirement)
All Values are Gallons Per Minute (gpm).

Production Requirement	VO-1	VO-2	VO-3	VO-4	VO-5	VO-6	VO-7
650-1600	–	–	–	–	850-1600	[1]	[2]
1700-2300	–	–	–	–	[1]	1700-2300	[2]
2400	(1)	1200	(2)	1200	–	–	–
2500	(1)	1200	(2)	1300	–	–	–
2600	(1)	1300	(2)	1300	–	–	–
2700	(1)	1300	(2)	1400	–	–	–
2800	(1)	1400	(2)	1400	–	–	–
2900	(1)	1400	(2)	1500	–	–	–
3000	(1)	1500	(2)	1500	–	–	–
3100	(1)	1500	(2)	1600	–	–	–
3200	(2)	1500	(3)	(1)	[1]	1700	[2]
3300	(2)	1500	(3)	(1)	[1]	1800	[2]
3400	(2)	1500	(3)	(1)	[1]	1900	[2]
3500	(2)	1500	(3)	(1)	[1]	2000	[2]
3600	(2)	1500	(3)	(1)	[1]	2100	[2]
3700	1000	(1)	1000	(2)	1700	[1]	[2]
3800	1000	(1)	1000	(2)	1800	[1]	[2]
3900	1100	(1)	1000	(2)	1800	[1]	[2]
4000	1100	(1)	1100	(2)	1800	[1]	[2]
4100	(1)	1200	(2)	1200	[1]	1700	[2]
4200	(1)	1200	(2)	1200	[1]	1800	[2]
4300	(1)	1200	(2)	1200	[1]	1900	[2]
4400	(1)	1200	(2)	1300	[1]	1900	[2]
4500	(1)	1300	(2)	1300	[1]	1900	[2]
4600	(1)	1300	(2)	1400	[1]	1900	[2]
4700	(1)	1300	(2)	1500	[1]	1900	[2]
4800	(1)	1400	(2)	1500	[1]	1900	[2]
4900	(1)	1500	(2)	1500	[1]	1900	[2]
5000	(1)	1500	(2)	1500	[1]	2000	[2]
5100	(1)	1500	(2)	1600	[1]	2000	[2]
5200	(1)	1500	(2)	1600	[1]	2100	[2]
5300	1000	1200	(1)	1400	[1]	1700	[2]
5400	1000	(1)	1000	(2)	1700	[1]	1700
5500	1100	1200	(1)	1400	[1]	1800	[2]
5600	1000	(1)	1000	(2)	1900	[1]	1700
5700	1200	1200	(1)	1400	[1]	1900	[2]
5800	1200	(1)	1100	(2)	1800	[1]	1700
5900	1200	1300	(1)	1500	[1]	1900	[2]
6000	1200	(1)	1100	(2)	1900	[1]	1800
6100	1200	1400	(1)	1500	[1]	2000	[2]
6200	1200	(1)	1100	(2)	1900	2000	[1]
6300	(1)	1300	(2)	1300	1800	1900	[1]
6400	(1)	1300	(2)	1300	1800	2000	[1]
6500	(1)	1400	(2)	1300	1800	2000	[1]
6600	(1)	1400	(2)	1400	1800	2000	[1]
6700	(1)	1400	(2)	1400	1900	2000	[1]
6800	(1)	1500	(2)	1400	1900	2000	[1]
6900	(1)	1500	(2)	1500	1900	2000	[1]
7000	1100	1200	(2)	1300	1700	1700	[1]

( ) Indicates priority of alternate well operation for 200-hp pumps.

[ ] Indicates priority of alternate well operation for 250-hp pumps.

TABLE 3-2
EXTRACTION WELL FLOW RATE SETPOINTS
(For Even Months if Flow is Maintained Continuously at a Given Production Requirement)
All values are Gallons Per Minute (gpm).

Production Requirement	VO-1	VO-2	VO-3	VO-4	VO-5	VO-6	VO-7
650-1600	–	–	–	–	[1]	850-1600	[2]
1700-2300	–	–	–	–	1700-2300	[1]	[2]
2400	(1)	1200	(2)	1200	–	–	–
2500	(1)	1200	(2)	1300	–	–	–
2600	(1)	1300	(2)	1300	–	–	–
2700	(1)	1300	(2)	1400	–	–	–
2800	1400	(1)	(2)	1400	–	–	–
2900	1400	(1)	(2)	1500	–	–	–
3000	1500	(1)	(2)	1500	–	–	–
3100	1500	(1)	(2)	1600	–	–	–
3200	1500	(1)	(3)	(2)	1700	[1]	[2]
3300	1500	(1)	(3)	(2)	1800	[1]	[2]
3400	1500	(1)	(3)	(2)	1900	[1]	[2]
3500	1500	(1)	(3)	(2)	2000	[1]	[2]
3600	1500	(1)	(3)	(2)	2100	[1]	[2]
3700	(1)	1000	(2)	1000	[1]	1700	[2]
3800	(1)	1000	(2)	1000	[1]	1800	[2]
3900	(1)	1100	(2)	1000	[1]	1800	[2]
4000	(1)	1100	(2)	1000	[1]	1800	[2]
4100	(1)	1200	(2)	1200	[1]	1700	[2]
4200	(1)	1200	(2)	1200	[1]	1800	[2]
4300	(1)	1200	(2)	1200	[1]	1900	[2]
4400	(1)	1200	(2)	1300	[1]	1900	[2]
4500	(1)	1300	(2)	1300	[1]	1900	[2]
4600	(1)	1300	(2)	1400	[1]	1900	[2]
4700	(1)	1300	(2)	1500	[1]	1900	[2]
4800	1000	(1)	(3)	(2)	1900	[1]	1900
4900	1100	(1)	(3)	(2)	1900	[1]	1900
5000	1200	(1)	(3)	(2)	1900	[1]	1900
5100	1200	(1)	(3)	(2)	2000	[1]	1900
5200	1200	(1)	(3)	(2)	2000	[1]	2000
5300	1200	(1)	1000	(2)	1600	[1]	1700
5400	1000	(1)	1000	(2)	1700	[1]	1700
5500	1100	1200	(1)	1400	[1]	1800	[2]
5600	1000	(1)	1000	(2)	1900	[1]	1700
5700	1200	1200	(1)	1400	[1]	1900	[2]
5800	1200	(1)	1100	(2)	1800	[1]	1700
5900	1200	1300	(1)	1500	[1]	1900	[2]
6000	1200	(1)	1100	(2)	1900	[1]	1800
6100	1200	1400	(1)	1500	[1]	2000	[2]
6200	1200	(1)	1100	(2)	1900	2000	[1]
6300	1100	(1)	1100	(2)	1800	1900	[1]
6400	(1)	1300	(2)	1300	1800	2000	[1]
6500	(1)	1400	(2)	1300	1800	2000	[1]
6600	(1)	1400	(2)	1400	1800	2000	[1]
6700	(1)	1400	(2)	1400	1900	2000	[1]
6800	(1)	1500	(2)	1400	1900	2000	[1]
6900	(1)	1500	(2)	1500	1900	2000	[1]
7000	1100	1200	(2)	1300	1700	1700	[1]

( ) Indicates priority of alternate well operation for 200-hp pumps.

[ ] Indicates priority of alternate well operation for 250-hp pumps.

APPENDIX C

CITY OF GLENDALE

PUMPING AND SPREADING PLAN

1995-96 Water Year

CITY OF GLENDALE

WATER RESOURCE PLAN

PUBLIC SERVICE DEPARTMENT

WATER SECTION

FEBRUARY, 1996

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INTRODUCTION

The City of Glendale has developed a plan to reduce the City's dependence on imported water supplies from northern California and the Colorado River via the Metropolitan Water District (Metropolitan) by using more local resources. This trend in local water resource development is occurring throughout the southern California water community.

Fundamentally, it is imprudent for a city of 190,000 people to be almost totally dependent on water supplies (90 percent of demands) originating hundreds of miles away that Glendale has little control over. The purpose of this document is to discuss the City's Water Resource Plan designed to develop more local water resources. The implementation of this plan will cost about $50 million. Of this amount, $20 million has been spent to date.

This report discusses existing water supplies available to Glendale, future water demands in Glendale, and alternative sources of local water available to reduce dependance on imported water. This information is needed by a wide group of individuals and organizations including Glendale's City Manager and Council Members, regulatory agencies, and others interested in Glendale's water resource future.

EXISTING WATER SOURCES

The City has four sources of water available to meet demands. Each of these sources are described below, as well as the quantity of water available. The location of these sources is shown in Figure 1. Over the past 10-years, there has been a significant change in the mix of supplies used to meet water demands in the City. These changes are discussed in the next section of this report.

San Fernando Basin - The City's right to San Fernando Basin supplies is defined in "The City of Los Angeles vs. The City of San Fernando, et. al. (1979) (Judgement) and consists of a return flow credit, which is a water right. Additionally, there is a secondary right to produce additional water subject to a payment obligation to the City of Los Angeles based primarily on the cost of Metropolitan supplies. This right to produce water in excess of the return flow credit is a significant factor in relation to the proposed U. S. Environmental Protection Agency (EPA) Superfund treatment facility in Glendale, discussed later in this report. The various San Fernando Basin supplies are:

Return Flow Credit - Glendale is entitled to a return flow credit of 20 percent of all delivered water (including reclaimed water) in the San Fernando Basin and its tributary hill and mountain area. It is calculated by determining the amount of total water used in the City less 105 percent of total sales by Glendale to Verdugo Basin and its tributary hills. This credit ranges from about 5,000 acre-feet per year (AFY) to 5,400 AFY depending on actual water use. This is the City's primary water right in the San Fernando Basin.

Physical Solution Water - Glendale has limited rights to extract water chargeable to the rights of the City of Los Angeles upon the payment of specified charges generally tied to Metropolitan's water rates. Glendale's physical solution right is 5,500 AFY.

Pumping for Groundwater Cleanup - Section 2.5 of the Upper Los Angeles River Area's Policies and Procedures, dated July, 1993, provides for the unlimited extraction of basin water for SUPERFUND activities, subject to payment of specified charges similar to physical solution water. This right will be a significant factor with the proposed EPA treatment facility.

Carry-Over Extractions - In addition to current extractions of return flow water and stored water (discussed later), Glendale may, in any one year, extract from the San Fernando Basin an amount not to exceed ten percent (10%) of its last annual credit for import return water, subject to an obligation to replace such over-extraction by reduced extraction during the next water year. This provides an important year-to-year flexibility in meeting water demands.

For the San Fernando Basin, the rights describe above give the City the right to extract from a practical point of view, subject to certain conditions and payment in some cases, any quantity of water anticipated to be needed for the City's future water resource program. Each water right used to produce from the San Fernando Basin has its own costs and availability.

Verdugo Basin - The Judgement described above gave Glendale the right to extract 3,856 AFY from the Verdugo Basin. Crescenta Valley County Water District also has water rights and is the only other entity allowed to extract water from the Verdugo Basin.

Metropolitan Water District - As a member agency of the Metropolitan Water District, Glendale has the right to purchase, without limitation, but subject to supply availability and cost factors, any amount of water. The Metropolitan water delivered to Glendale is delivered through three service connections. The service connection number and capacity is summarized in Table 1.

TABLE 1
METROPOLITAN CONNECTIONS AND CAPACITY

Service Connection Number	Capacity (cfs)
G-1	48
G-2	10
G-3	12

Reclaimed Water - The City has been delivering reclaimed water from the Los Angeles/Glendale Water Reclamation Plant (LAGWRP) since the late 1970's. The first deliveries of reclaimed water were to the Glendale Power Plant for use in the cooling towers and to Caltrans for irrigation of a portion of Route 134 Freeway. In 1992, the City began delivering reclaimed water for irrigation purposes to Forest Lawn Memorial Park. The total deliveries to these existing users is about 800 AFY. To the extent reclaimed water is used, there is a corresponding reduction in the amount of water purchased from Metropolitan. The capacity of LAGWRP is 20 MGD with indefinite plans for expansion to 50 MGD, and Glendale is entitled to 50 percent of any effluent produced at the plant.

Summary of Supplies - The current use of local resources available to the City is substantially less than rights primarily because of water quality problems (discussed later herein). A general summary of the City's rights to local water resources compared to the amount currently being used is shown on Table 2.

TABLE 2
LOCAL WATER USE (AFY)

Potential Source	Right	Current Use	Future Use
San Fernando Basin[1]	5,000-5,400	100 AFY	5,000
Verdugo Basin	3,856	1,200 AFY	3,856
Reclaimed Water	10,000	800 AFY	3,000

In order to develop the "Potential Future Use," significant capital expenditures are required primarily for water treatment, extraction, and distribution facilities.

---

(1) Return flow credit only.

PAST WATER USE TRENDS

The water quality problems in the San Fernando and Verdugo Basins and ground water levels in the Verdugo Basin have severely impacted the ability of the City to produce water from the Basins. Glendale has not been able to fully utilize its rights to these water supplies for many years. The U. S. Environmental Protection Agency (EPA) has designated the San Fernando Basin as a Superfund site and will begin clean-up operations within the next two years.

The City currently has three active production wells in each of the San Fernando (Grandview Wells) and Verdugo Basins (Glorietta Wells) plus standby wells in the San Fernando Basin. Some of the wells were installed prior to 1920 and need replacement.

Historically, the City used ground water to meet a varying portion of its water demands. In the 1940's and 1950's essentially all of the City's water needs were obtained from the San Fernando and the Verdugo Basins with limited supplies from Metropolitan. In the 1960's, production from the San Fernando Basin reached a peak of about 17,000 acre-feet per year (AFY). The Grandview well water collection system in the San Fernando Basin and the Grandview Pumping Plant has a peak capacity of about 24,000 gpm (34.6 million gallons per day-MGD) to pump San Fernando Basin water supplies into the potable water system.

In the mid-1970's, the City limited production from the San Fernando Basin to about 12,000 AFY as part of a court decree arising from a lawsuit by the City of Los Angeles. In 1975, the California Supreme Court judgement in the City of Los Angles vs. the City of San Fernando further limited the City's production right. The current right is about 5,000 to 5,400 AFY based on a return flow credit right and water use.

Other limitations to ground water use occurred in the late 1970's, when production from the Verdugo Pick-up System in the Verdugo Basin was discontinued because of possible water quality problems.

In late 1979, Assembly Bill 1803 required that all water agencies using ground water must conduct tests for the presence of certain industrial solvents. The tests indicated that "volatile organic compounds" (VOC's) such as trichlorethylene (TCE) and perchloroethylene (PCE) were present in the San Fernando Basin ground water supplies in concentrations exceeding State Health Department maximum contaminant levels (MCL). Both of these chemicals were used extensively in the past as degreasers in manufacturing. At that time, the hazards to the water supplies were not known. As a result, Glendale had to further limit its use of San Fernando Basin supplies. Currently, the City has almost totally suspended production from the basin because of the difficulty of producing supplies meeting the MCL's for the VOC's. Except for a small quantity used at the Glendale Power Plant for cooling tower make-up water, no San Fernando Valley water is currently used in Glendale.

The historic and projected water use from the various sources is plotted on Figure 2 and shows the significant reduction in production from the San Fernando Basin and corresponding increase in imported water supplies from Metropolitan. The annual water use in Glendale for fiscal year 1993-94 was 29,448 AFY. In 1989-90, the use was about 32,600 AFY. The recent drought and many water conservation measures have resulted in reduced water use in Glendale. The 29,448 AFY is equivalent to an average daily use of 26 million gallons per day (MGD).

PROJECTED WATER DEMANDS

Projection Methodology - Metropolitan has calibrated the U.S. Army Corps of Engineers IWR-MAIN (Municipal and Industrial Needs) water demand forecasting system for 51 of the larger cities in Metropolitan's service area, which includes Glendale. The model is used to project water demands incorporating a wide range of economic, demographic, and climatic factors. The specific date includes projected population, housing mix, household occupancy, housing values, weather conditions, and conservation measures. The forecasts generate expected demands during a year of normal weather conditions. This modelling is considered the state-of-the-art approach in projecting demands and is being used by an increasing number of major cities in the country for water demand forecasting. The model calibrated for use in Metropolitan's service area is called MWD-MAIN, a water demand forecasting model.

Projected Water Use - The projected water demand using MWD-MAIN calibrated for Glendale shows a year 2000 demand of 32,003 AFY and a year 2010 demand of 33,215 AFY. These figures were based on incorporating projected population, housing, and employment data into the MWD-MAIN water demand forecasting model for Glendale along with a weather variable. The year 2010 demand reflects a 7 percent increase over current use, or a modest annual increase of 0.4 percent. These projections incorporate the 1981 and 1992 California plumbing codes changes requiring ultra-low flush toilets beginning in 1992, along with a continuation of current drought oriented public education and information programs. As additional conservation measures are implemented, there could be still more reductions in projected use.

Future Water Sources - The basic objective of the plan is to develop more local supplies and the facilities required to increase the use of local resources thereby reducing the need for imported water. The cost of these new facilities is estimated to be $50 million. Currently, about 90 percent of the potable water used in the City comes from Metropolitan. With the proposed supplies and facilities, the goal is to reduce dependence on Metropolitan to 60 percent of demand. This will be accomplished by building new facilities for expanding production from the San Fernando and Verdugo Basins, and increased reclaimed water use.

PROPOSED WATER FACILITIES

The various features to be constructed as part of this water resource plan are shown on Figure 3 and described below.

San Fernando Basin/EPA Treatment Facility - San Fernando Basin production is currently limited because of the volitle organic compounds in the groundwater. The entire San Fernando Valley is part of a federal SUPERFUND clean-up program with many proposed water treatment plants constructed or to be constructed in the basin. Now the Environmental Protection Agency (EPA) is focusing on the construction of cleanup facilities in Glendale. The treated water from these facilities will be conveyed to the Glendale potable water system.

Under the Record of Decision (ROD) for the South Glendale and North Glendale Operable Units, many new facilities will be constructed consisting of: shallow extraction wells, a combined 5,000 gpm water treatment plant, piping to convey the untreated water from the wells to the treatment plant, a conveyance system from the treatment plant to Glendale potable distribution system, a facility to blend the treated groundwater with water from the Metropolitan Water District to reduce nitrate levels, and a disinfection facility. A general layout of facilities being proposed is shown on Figure 4. Also, shown on the figure is an assumed new connection to the Metropolitan water system to blend with the treated groundwater to reduce the nitrate levels in the groundwater to acceptable limits.

The major agreements between Glendale, the Responsible Parties (PRP's), and the EPA have been signed. The PRPs have retained CDM Consulting Engineers to design the required facilities. Construction should be completed in the 1997-98 time frame.

In addition, the City proposes to construct wells to provide water from the lower San Fernando Aquifer. It is anticipated that these wells would be constructed in the 1996-97 time frame. The City's basic water right of 5,400 AFY will meet about 18 percent of projected near-term water demands based on an annual use in the City of 30,000 AFY.

Verdugo Basin - Historically, the City's use of these supplies has been limited because of water quality problems, water levels, and extraction capacity. The City has completed construction of the Verdugo Park Water Treatment Plant (VPWTP). This facility is expected to be operational in the summer of 1996. This facility will have a capacity of 1,150 gpm and will treat water from the two new low capacity wells (referred to as Glorietta Wells A & B) and the water supplies in the old Verdugo Pickup horizontal infiltration system. The three existing wells and the Verdugo Park Water Treatment Plant alone will not permit the use of the City's rights to the basin supplies. Additional extraction capacity in the Verdugo Basin will be required. The existing wells and VPWTP will produce about 2,700 AFY with the remaining 1,000 AF coming from other basin sources not currently identified. It is anticipated that the City will be looking at other sources of supply in the Verdugo Basin. If the City were able to utilize its full rights to these supplies, about 12 percent of demands could be met from this Basin.

Reclaimed Water - The City has been using reclaimed water from the Los Angeles/Glendale Water Reclamation Plant for the past 10 years at the Glendale Power Plant for make-up water use in the cooling towers and along the Route 134 Freeway in the City for irrigation. In 1992, the City began delivering reclaimed water to Forest Lawn Memorial Park in Glendale for irrigation.

The City is now constructing a "backbone" distribution system consisting of pipelines, pumping plants, and storage tanks to deliver reclaimed water to many new users in and outside of the City. The objective is to increase the use of reclaimed water to meet 10 percent of demands.

The specific features of this program are shown in more detail on Figure 5. The users from the various reclaimed water projects are tabulated on Figure 6. This will give the reader a general idea of the scope of the expansion program. The expected deliveries from the various projects are shown on Table 3.

TABLE 3
RECLAIMED WATER USE (AFY)

PROJECTS	1995	2000	2005	2010
Brand Park	0	160	170	170
Forest Lawn Pipeline	350	350	350	350
Power Plant Pipeline	450	450	450	450
Verdugo-Scholl Pipeline	674	832	935	1054
Other Potential Projects	0	0	0	0
TOTAL	1474	1792	1905	2024

Metropolitan Water District - The City currently has three treated water connections to the Metropolitan water system in the City. The cities of Los Angles, Burbank and Glendale have looked at a 150 cfs, equally divided, untreated water connection on the San Fernando Tunnel to percolate water into the San Fernando Basin. With this additional water delivered into groundwater storage, the City would be entitled to produce more water from the San Fernando Basin. Also, the water could be delivered at a lower cost because it is untreated compared to the current sources. Also, it may be possible to purchase this water under a different pricing program by taking advantage of special pricing for Metropolitan supplies that are periodically available (seasonal storage). The replenishment water would be taken generally during the wetter years for a storage credit in the basin and extracted in later years during drought conditions when treated Metropolitan supplies are limited. It is anticipated that about 3,000 AFY will be replenished from this source on the average.

TABLE 4
HISTORIC AND PROJECTED WATER USE IN GLENDALE (AF)

Water Year	San Fernando Basin	Verdugo Basin	Reclaimed Water	MWD Water	Total
1989-90	2,041	1,635	333	28,848	32,857
1990-91	2,932	1,132	432	25,354	29,850
1991-92	1,577	732	551	23,003	25,863
1992-93	447	904	770	25,905	28,026
1993-94	554	1,226	625	27,043	29,448
1994-95	441	1,667	574	26,215	28,897
1995-96	500	2,700	1,474	27,000	31,674
1996-97	500	2,700	1,664	26,910	31,774
1997-98	500	2,700	1,709	26,965	31,874
1998-99	5,500	3,300	1,748	21,991	31,939
1999-00	7,700	3,356	1,792	19,211	32,003

SUMMARY OF WATER SUPPLIES

The above information describes the many projects proposed for construction in the City at a cost of $50 million. The money will come from City sources, others benefitting from these facilities, and the parties responsible for groundwater contamination in the San Fernando Basin through the SUPERFUND Clean-Up Program.

RELATED INFORMATION ON WATER USE

Detailed information on historic and projected water use in Glendale is shown on Table B-1. From a practical sense, water use in the water year is equivalent to water use in a fiscal year. Table 4 is a tabular version of Table B-1.

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Figure B-1

GLENDALE WATER SUPPLY AND DEMAND (AF/YR)

(Use MWD Direct Deliveries for Blending)

Date: 4-Jan-96

	Fiscal Year	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	2000	2005	2010
(1)	**Water Demands (a)**	31,953	32,857	29,850	25,863	28,026	29,448	28,897	31,674	31,774	31,874	31,939	32,003	32,626	33,215
	Water Supplies:														
(2)	**San Fernando Basin**														
(3)	Water Rights	5,591	5,771	5,170	4,373	4,805	5,090	4,979	5,535	5,555	5,575	5,588	5,601	5,725	5,843
(3A)	Physical Solution Pmts (LADWP)														
	Water Production														
(4)	City Production	1,411	1,564	2,445	1,080	78	140	65	100	100	100	100	100	100	100
(5)	EPA Treat. Plant (b)											5,000	7,200	7,200	7,200
(6)	Physical Solution	467	477	487	497	369	414	376	400	400	400	400	400	400	400
(7)	**Total:**	1,878	2,041	2,932	1,577	447	554	441	500	500	500	5,500	7,700	7,700	7,700
	Verdugo Basin														
(8)	Wells 3, 4, & 6	2,287	1,635	1,132	732	904	1,226	1,667	1,700	1,700	1,700	1,700	1,700	1,700	1,700
(9)	VPWTP								1,000	1,000	1,000	1,000	1,000	1,000	1,000
(10)	Other Production												600	656	656
(11)	**Total:**	2,287	1,635	1,132	732	904	1,226	1,667	2,700	2,700	2,700	2,700	3,300	3,356	3,356
	Reclaimed Water														
	Brand Park Project									150	155	155	160	170	170
	Forest Lawn Project					348	299	280	350	350	350	350	350	350	350
	Power Plant Project	233	333	432	551	422	326	260	450	450	450	450	450	450	450
	Verdugo-Scholl Project							34	674	714	754	793	832	935	1,054
	Other Potential Projects														
(12)	**Total:**	233	333	432	551	770	625	574	1,474	1,664	1,709	1,748	1,792	1,905	2,024
	Metropolitan Water														
(13)	Direct Deliveries (G1,G2, & G3)	27,555	28,848	25,354	23,003	25,905	27,043	26,215	27,000	26,910	26,965	21,991	19,211	19,665	20,135
(15)	Replenishment Deliveries (G4)														
(16)	**Total**	27,555	28,848	25,354	23,003	25,905	27,043	26,215	27,000	26,910	26,965	21,991	19,211	19,665	20,135
(17)	**Total Water Supplies**	31,953	32,857	29,850	25,863	28,026	29,448	28,897	31,674	31,774	31,874	31,939	32,003	32,626	33,215

3) [(1) - 4,000 AF] * 20% return flow

5) 5,000 gpm @90%

6) Forest Lawn, et. al.

13) (1) - (7) - (11)-(12)

3A) (7) - (3) - (15)

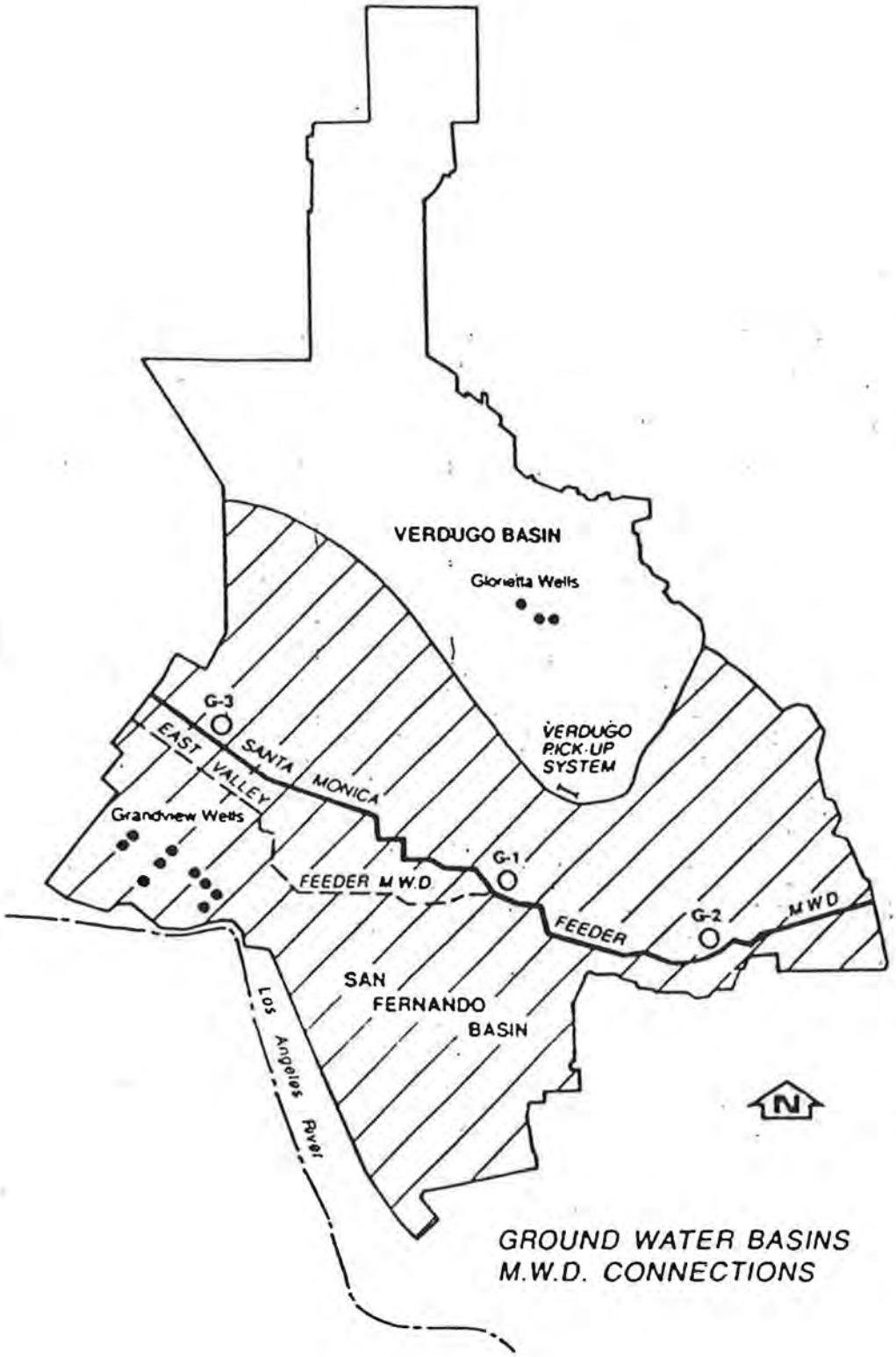
16) (1) - (7) - (11) - (12)

(a) Projected demands from MWD

(b) Assume operational date October, 1998

FIGURE 1

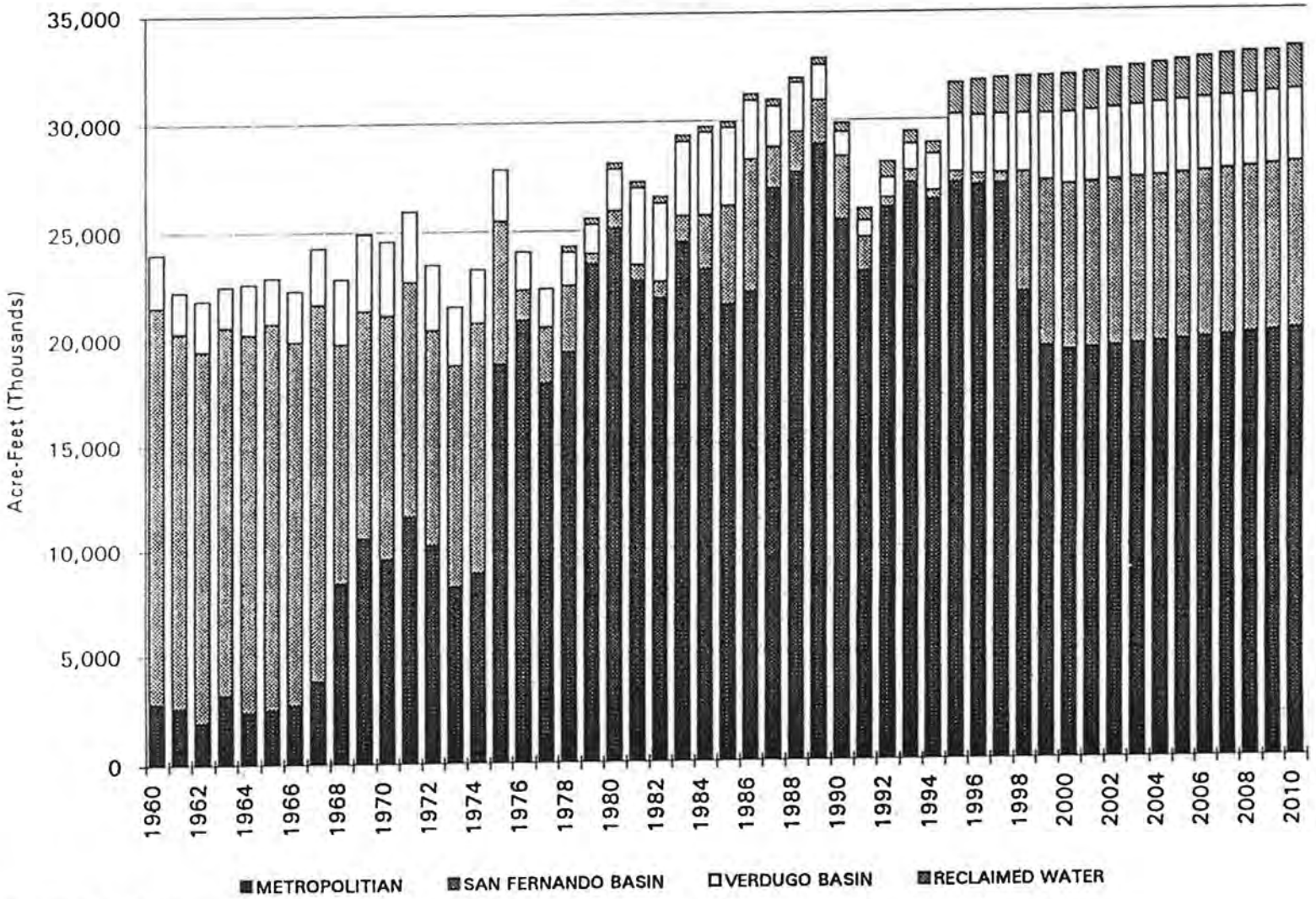
SOURCES OF SUPPLY



GROUND WATER BASINS
M.W.D. CONNECTIONS

CITY OF GLENDALE

SOURCES OF WATER SUPPLY



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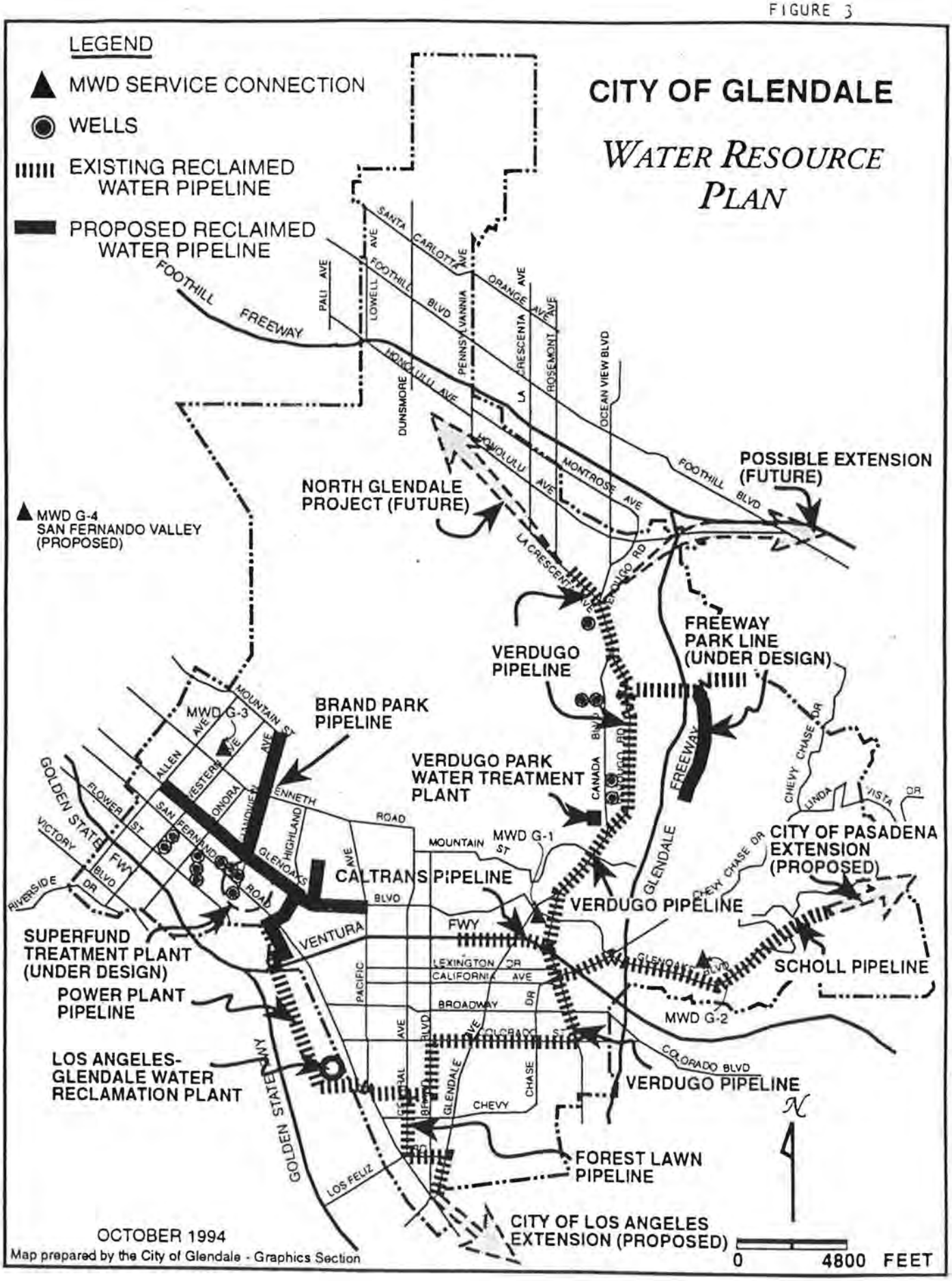
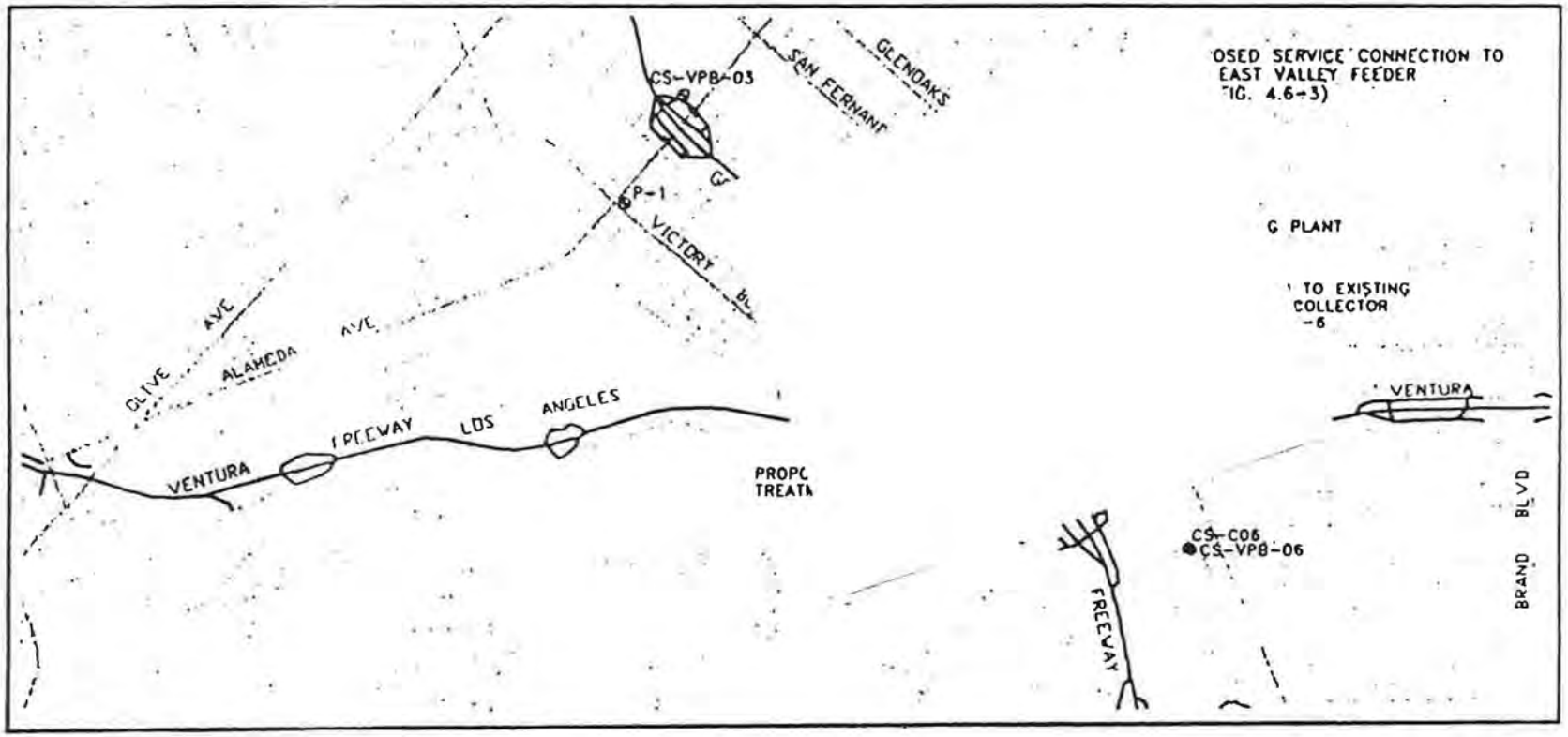
(Revised 02/12/98)

FIGURE 2

FIGURE 3


LEGEND
MWD SERVICE CONNECTION
WELLS
EXISTING RECLAIMED WATER PIPELINE
PROPOSED RECLAIMED WATER PIPELINE
CITY OF GLENDALE
WATER RESOURCE PLAN
FOOTHILL FREEWAY
SANTA CARLOTTA AVE
FOOTHILL BLVD
ORANGE AVE
PALI AVE
LOWELL AVE
PENNSYLVANIA AVE
LA CRESCENTA AVE
ROSEMONT AVE
OCEAN VIEW BLVD
DUNSMORE
HONOLULU AVE
MONTROSE AVE
POSSIBLE EXTENSION (FUTURE)
NORTH GLENDALE PROJECT (FUTURE)
MWD G-4
SAN FERNANDO VALLEY
(PROPOSED)
VERDUGO RD
VERDUGO PIPELINE
FREEWAY PARK LINE (UNDER DESIGN)
MWD G-3
MOUNTAIN ST
BRAND PARK PIPELINE
ALLEN AVE
WESTERN AVE
SONORA AVE
SAN FERNANDO ROAD
GLENOAKS BLVD
HIGHLAND AVE
KENNETH ROAD
GOLDEN STATE FWY
FLOWER ST
VICTORY BLVD
RIVERSIDE DR
VERDUGO PARK WATER TREATMENT PLANT
CANADA BLVD
FREEWAY
CHEVY CHASE DR
LINDA VISTA DR
MOUNTAIN ST
MWD G-1
CALTRANS PIPELINE
CITY OF PASADENA EXTENSION (PROPOSED)
VERDUGO PIPELINE
GLENDALE BLVD
SUPERFUND TREATMENT PLANT (UNDER DESIGN)
VENTURA FWY
SCHOLL PIPELINE
POWER PLANT PIPELINE
LEXINGTON DR
CALIFORNIA AVE
PACIFIC AVE
BROADWAY
MWD G-2
COLORADO BLVD
LOS ANGELES-GLENDALE WATER RECLAMATION PLANT
GLENDALE FWY
CHEVY CHASE
VERDUGO PIPELINE
FOREST LAWN PIPELINE
LOS FELIZ
CITY OF LOS ANGELES EXTENSION (PROPOSED)
N
0
4800 FEET
OCTOBER 1994
Map prepared by the City of Glendale - Graphics Section



LEGEND

- MONITORING WELL
- ABANDONED WELL
- REHABILITATED WELL
- EXTRACTION SITE
- 12" PIPELINE
- 16" PIPELINE
- 30" PIPELINE (existing)

ALTERNATIVE 2

- 3,000 gpm Extraction (Scenario 4)
- Dual-Stage AS with Vapor-Phase GAC
- Blending
- Use as Potable Supply

0 2000 4000
FEET

N

NORTH PLUME OPERABLE UNIT
FEASIBILITY STUDY

FIGURE 6.2-2
LOCATION OF EXTRACTION, TREATMENT, DISPOSAL AND MONITORING FACILITIES-ALTERNATIVE 2

GDUALTS6 FIG6.2-2 REV. 04/09/92

FIGURE 4

FIGURE 5

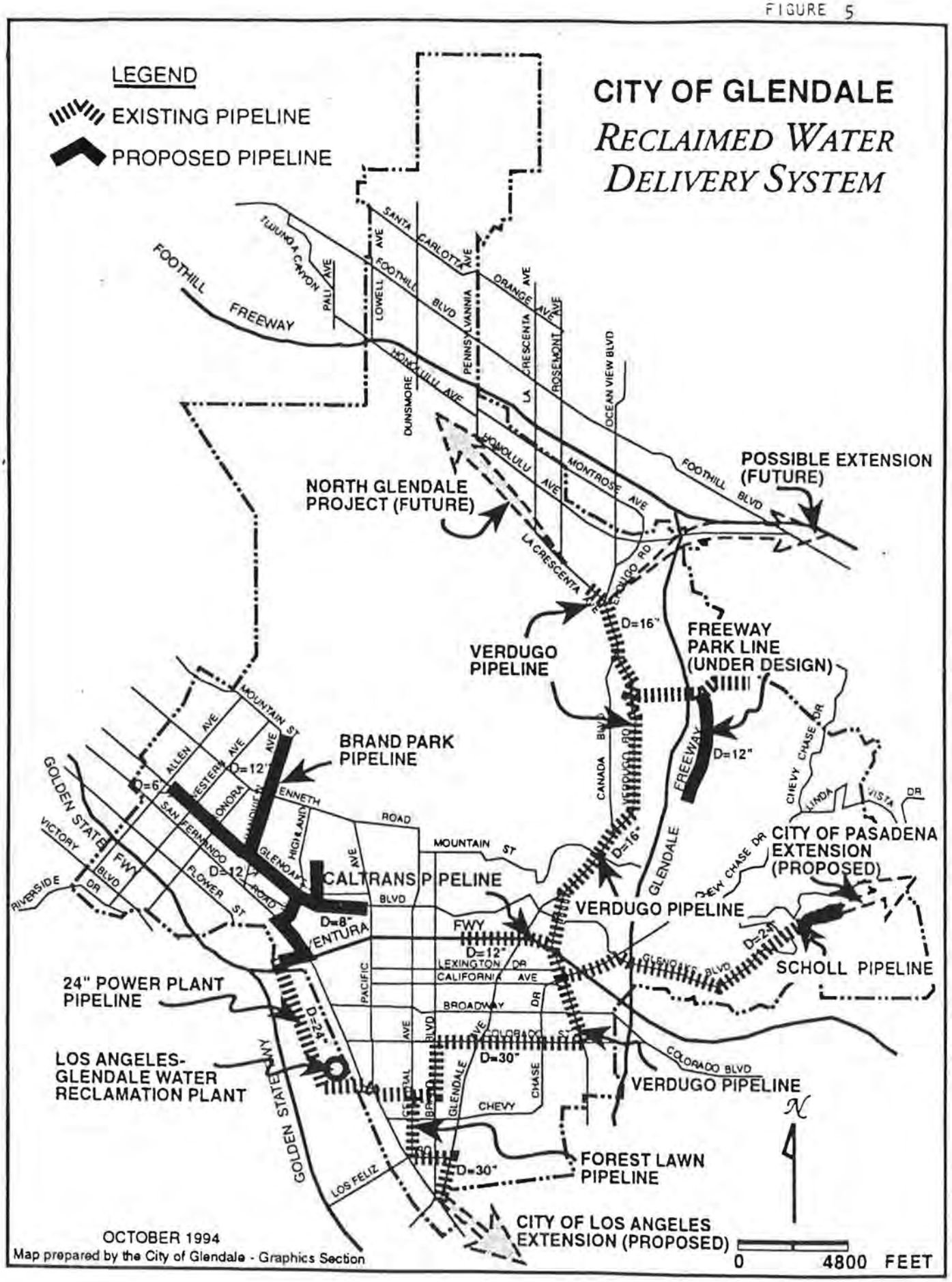

LEGEND
EXISTING PIPELINE
PROPOSED PIPELINE
CITY OF GLENDALE
RECLAIMED WATER
DELIVERY SYSTEM
FOOTHILL FREEWAY
TUJUNGA CANYON
PALI AVE
LOWELL AVE
FOOTHILL BLVD
SANTA CARLOTTA AVE
PENNSYLVANIA AVE
ORANGE AVE
LA CRESCENTA AVE
ROSEMONT AVE
OCEAN VIEW BLVD
DUNSMORE AVE
HONOLULU AVE
MONTROSE AVE
FOOTHILL BLVD
POSSIBLE EXTENSION (FUTURE)
NORTH GLENDALE PROJECT (FUTURE)
LA CRESCENTA
RIMROCK RD
D=16"
VERDUGO PIPELINE
FREEWAY PARK LINE (UNDER DESIGN)
D=12"
CANADA BLVD
FREEWAY
GLENDALE
D=16"
CHEVY CHASE DR
LINDA VISTA DR
CITY OF PASADENA EXTENSION (PROPOSED)
CHEW CHASE DR
VERDUGO PIPELINE
D=24"
SCHOLL PIPELINE
GLENOAKS BLVD
MOUNTAIN ST
BRAND PARK PIPELINE
D=12"
D=6"
ALLEN AVE
WESTERN AVE
SONORA AVE
HONOLULU AVE
ENNETH ROAD
HIGHLAND AVE
GLENOAKS BLVD
SAN FERNANDO ROAD
FLOWER ST
GOLDEN STATE FWY
VICTORY BLVD
RIVERSIDE DR
D=12"
CALTRANS PIPELINE
D=8"
VENTURA FWY
D=12"
LEXINGTON DR
CALIFORNIA AVE
BROADWAY
COLORADO ST
COLORADO BLVD
PACIFIC AVE
CENTRAL AVE
BRAND BLVD
GLENDALE AVE
CHASE
CHEVY
D=30"
VERDUGO PIPELINE
24" POWER PLANT PIPELINE
D=24"
LOS ANGELES-GLENDALE WATER RECLAMATION PLANT
GOLDEN STATE FWY
LOS FELIZ
D=30"
FOREST LAWN PIPELINE
CITY OF LOS ANGELES EXTENSION (PROPOSED)
N
0
4800 FEET
OCTOBER 1994
Map prepared by the City of Glendale - Graphics Section

Figure 6

RECLAIMED WATER USER STATUS

User	2/96 Anticipated/Actual Delivery Date	User Agreement	Meters	Quantity AF/YR[1]
CITY OF GLENDALE FACILITIES				
Glendale Power Plant	1978	Yes	1	400
Parks:				
Glendale Median (Highland)	1995	Yes	1	12
Glenoaks Median	1995			4
Verdugo Road Median	1995			10
Civic Auditorium	1996			15
Lower Scholl Canyon Park	1996			12
Scholl Canyon Ball Fields	1996			17
Scholl Canyon Golf Course (Proposed)	1996			100
Mayor's Park				6
Park Site A (Proposed)				69
Park Site B (Proposed)	1996			99
Park Site C (Proposed)				54
Adult Recreation Center	1995	Yes	1	5
South Brand Median	1995	Yes	2	2
Central Library	1995	Yes	1	4
Brand Park	1996			60
Pelanconi Park	1996			8
Public Works	1978	No		
Glendale Unified School District:				
Glendale High	1995	Yes	1	15
Wilson Jr. High	1995	Yes	1	7
Hoover High	1995			12
Toll Jr. High	1995			6
Kepple School	1995			2
Glendale Community College	1995			25
Cal-Trans:				
5/134 Interchange Area	1978	Yes	1	60
Route 134, 134/2 Interchange	1995	Yes	5	100
Others:				
Forest Lawn Memorial Park	1992	Yes	1	300-600
Glendale Adventist Medical Center	1995			8
Scholl Canyon Landfill (LACSD)	1995	Yes		100
Oakmont Country Club	1995	Yes	1	200
Pasadena	1996			4,000-6,000
Grand View Memorial Park	1995			50
TOTAL CUSTOMERS/METERS		**8**	**16**	

[1] Acre-feet per year.

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APPENDIX D

CITY OF SAN FERNANDO

PUMPING AND SPREADING PLAN

1995-96 Water Year

CITY OF SAN FERNANDO

Public Works Department
117 Macneil Street
San Fernando, CA 91340-2993
(818) 898-1222

March 12, 1996

Mr. Melvin Blevins
ULARA WATERMASTER
P.O. Box 111, Room 1466
Los Angeles, California 90051

Subject: City of San Fernando Groundwater Pumping and Spreading Plan

Dear Mr. Blevins:

Herewith is the draft Groundwater Pumping and Spreading Plan for the City of San Fernando as required.

Should you have any questions or need more information, please give me a call at 818/898-1222.

Sincerely,

MICHAEL S. DRAKE
Public Works Director

LTR-879.PW

DRAFT

CITY OF SAN FERNANDO GROUNDWATER PUMPING AND SPREADING PLAN

1994-95 WATER YEAR

October 1, 1994 to September 1995

Prepared by:

PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
117 Macneil Street
San Fernando, California 91340

APRIL 1996

TABLE OF CONTENTS

GROUNDWATER PUMPING AND SPREADING PLAN

I. INTRODUCTION

The ground water rights of the City of San Fernando were defined by the JUDGMENT in Superior Court Case No. 650079, entitled "The City of Los Angeles, a Municipal Corporation, Plaintiff, vs City of San Fernando, et.al., Defendants." The Final Judgment was signed on January 26, 1979.

On August 26, 1983, the Watermaster reported to the court pursuant to Section 10.2 of the Judgment that the Sylmar Basin was in condition of overdraft. As of October 1, 1984, San Fernando and Los Angeles were assigned equal rights to pump the safe yield of the Basin (6,120 acre-feet) thus, San Fernando and Los Angeles are each allowed to pump approximately 3,105 acre-feet per year.

In 1993, significant revisions were made to the Upper Los Angeles River Area (ULARA) Policies and Procedures with the addition of Section 2.9, Groundwater Quality Management. This addition has been made by the Watermaster and the Administrative Committee to affirm its commitments to participate in the cleanup and limiting the spread of contamination in the San Fernando Valley. This report is in response to Section 2.9.4, Groundwater Pumping and Spreading Plan.

The Groundwater Pumping and Spreading Plan is based on the water year, October 1 to September 30. The Draft Plan for San Fernando will be submitted in April to the Watermaster for the current water year.

II. WATER DEMAND

The annual total water demand for the last five years and the projected annual water demand for the next five years is shown on Table 2.1.

Water demand during the last five years has been affected by drought conditions in California. The City of San Fernando imposed voluntary conservation since 1977.

Projected water demands for the next five years is expected to increase only slightly from the 1992-93 base year. The increase is not from residential growth, but as a rebound from the drought conditions and re-establishment of commercial-industrial demand.

The projected water demand may vary significantly due to weather conditions, economic conditions and/or social conditions in the San Fernando area. A variance of $\pm$ 10 percent can be expected.

III. WATER SUPPLY

The water supply for the City of San Fernando is composed of purchased water from the Metropolitan Water District of Southern California (MWD), and locally produced and treated groundwater. In case of emergency, there is an existing 6-inch water connection to the City of Los Angeles (DWP) water system at 12900 Dronfield Avenue, in Sylmar.

A. MWD The amount of treated water purchased from the MWD is expected to remain the

same over the next five years. Historic and projected use of MWD water is shown in Table 2.1.

B. Production Wells The City of San Fernando owns and operates four (4) wells that are on "active status" with the Department of Health Services as indicated below:

1. ***Well 2A***
   Location: 14060 Sayre Street, Sylmar
   Capacity: 2000 GPM

2. ***Well 3***
   Location: 13003 Borden Avenue, Sylmar
   Capacity: 1280 GPM

3. ***Well 4A***
   Location: 12900 Dronfield Avenue, Sylmar
   Capacity: 400 GPM

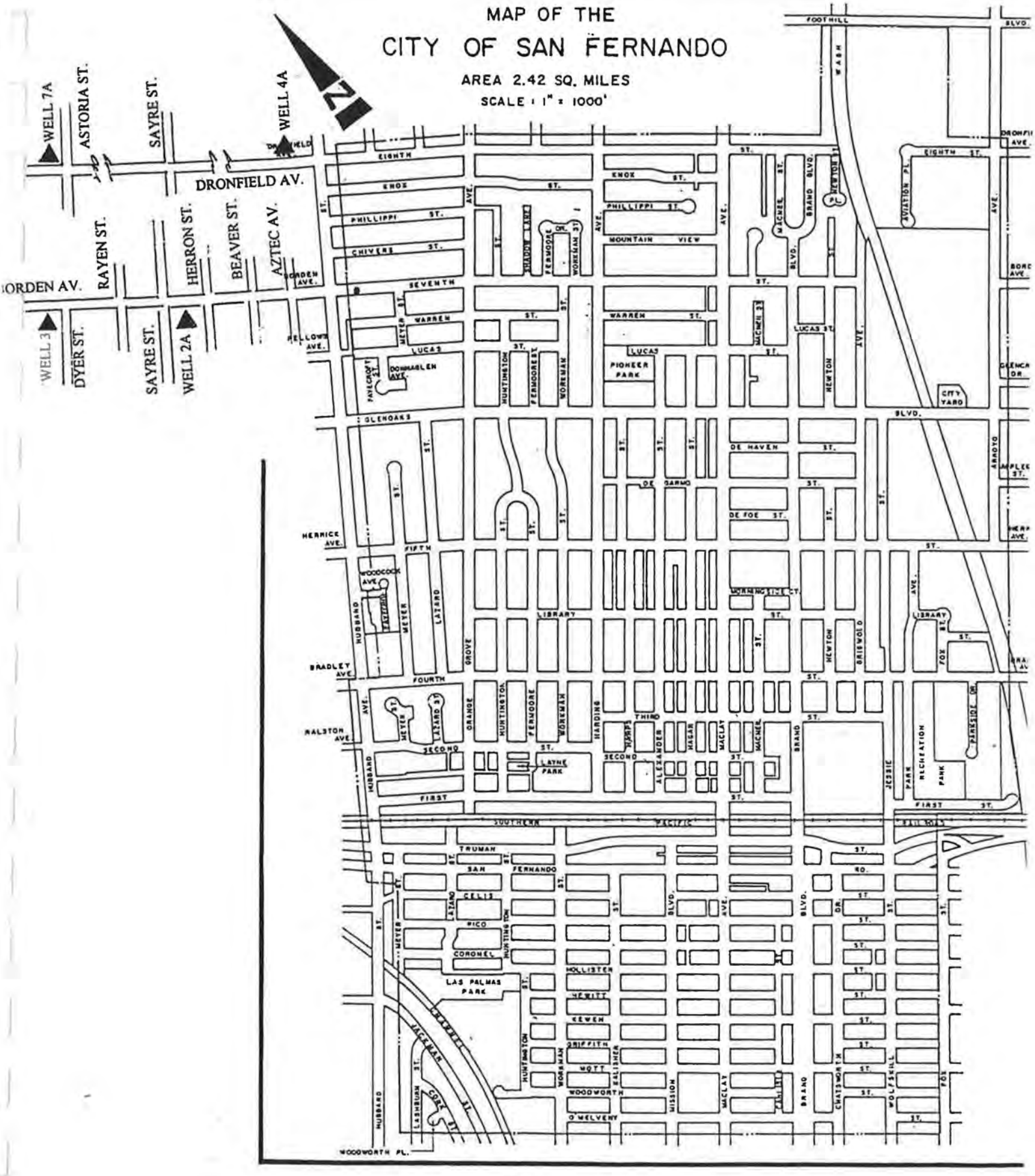
4. ***Well 7A***
   Location: 13180 Dronfield Avenue, Sylmar
   Capacity: 480 GPM

C. Quantity (Acre-Feet) of Water Pumped From Each Well (1994-95)

1.	Well 2A -	2313.25
2.	Well 3 -	806.60
3.	Well 4A -	301.50
4.	Well 7A -	00.00

D. Wells Groundwater Level Data

1.	Well 2A -	1068.50'	Taken 10/95
2.	Well 3 -	1062.50	Taken 10/95
3.	Well 4A -	1063.01'	Taken 10/95
4.	Well 7A -	1064.29'	Taken 10/95



LOCATION MAP

IV JUDGMENT CONSIDERATIONS

A. Native and Imported Return Water The cities of San Fernando and Los Angeles have equal rights to pump the safe yield of the Sylmar Basin (6,210 acre-feet) after subtracting the overlaying pumping of two private parties. San Fernando and Los Angeles are each allowed to pump approximately 3,105 acre-feet per year.

B. Stored Water Credit San Fernando and Los Angeles each have the right to store water in the Sylmar Basin and the right to extract equivalent amounts.

San Fernando has a stored water credit of 194 acre-feet as of January 1996.

TABLE 2.1
FIVE-YEAR HISTORIC AND PROJECTED WATER DEMAND
PUMPED AND IMPORTED WATER
CITY OF SAN FERNANDO

(Acre-Feet)

DEMAND	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-2000
WELLS	2265	2826	2145	3398	3411.47	2600	2600	2600	2600	2600
MWD	1122	568	1285	93	9.53	900	900	900	900	900
TOTAL	3387	3394	3430	3491	3421	3500	3500	3500	3500	3500
	ACTUAL					PROJECTED				

APPENDIX A

WATER QUALITY DATA

1995

CITY OF SAN FERNANDO

- WELL NO. 2A
- WELL NO. 3
- WELL NO. 4A
- WELL NO. 7A

APPENDIX E

CRESCENTA VALLEY COUNTY WATER DISTRICT

PUMPING AND SPREADING PLAN

1995-96 Water Year

GROUNDWATER PUMPING

PLAN

WATER YEAR
OCTOBER 1, 1995 TO SEPTEMBER 30, 1996

Prepared by
CRESCENTA VALLEY COUNTY
WATER DISTRICT

MARCH 1996

TABLE OF CONTENTS

TABLES

I. INTRODUCTION

The ground water rights of the Crescenta Valley County Water District (CVCWD) were defined by the JUDGEMENT in Superior Court Case No. 650079, entitled "The City of Los Angeles, a Municipal Corporation, Plaintiff, vs. City of San Fernando, et. al., Defendants". The Final Judgement was signed on January 26, 1979.

In 1993, significant revisions were made to the Upper Los Angeles River Area (ULARA) Policies and Procedures with the addition of Section 2.9, Groundwater Quality Management. This addition has been made by the Watermaster and the Administrative Committee to affirm its commitments to participate in the cleanup and limiting the spread of contamination in the San Fernando Valley. This report is in response to Section 2.4, Draft Groundwater Pumping and Spreading Plan. Since no groundwater spreading has been performed or is planned at this time by the CVCWD, only plans/projections for groundwater pumping and treatment are discussed in this report.

The Groundwater Pumping Plan is based on the water year, October 1 to September 30. The Draft Plan for CVCWD will be submitted in March or April to the Watermaster for the current water year.

II. WATER DEMAND

The annual total water demand for the last five years and the projected annual water demand for the next five years is shown in Table 2.1.

Water demand during the last five years has been affected by both dry and wet conditions in California. The CVCWD enacted voluntary water conservation in 1990, and this resolution is still in effect. Also, an emergency water shortage ordinance is on file and the District's Board of Directors can enact its provisions at any time deemed necessary. Moderate "hard conservation" in the form of retrofit "low-flow" showerhead giveaways and an ultra-low flush toilet program has been or is currently being provided.

Projected water demands for the next five years is expected to increase only slightly (0.5%) from the 1994-95 base year. The increase is expected mainly from residential growth. However, it is seen from Table 2.1 that water use increased dramatically in 1993-94 and has continued at this high rate, probably due to consumer's habits returning to less-water conserving, pre-drought days.

The projected water demand may vary significantly due to weather conditions, economic conditions and/or social conditions in the CVCWD service area. A variance of $\pm$10% can be expected.

III. WATER SUPPLY

The water supply for the CVCWD is composed of an locally produced and treated groundwater and water from the Metropolitan Water District of Southern California (MWD) purchased on a retail basis from the Foothill Municipal (FMWD)

A. PRODUCTION WELLS

The CVCWD has eleven wells that are currently in operation. Historic and projected production from these wells is shown in Table 3.1 The CVCWD wells produce water which contains nitrate concentrations above the 45mg/L maximum contaminant level (MCL) set by the U.S. Environmental Protection Agency (EPA) and State of California Department of Health Services (DHS). As a result, an ion exchange process, the Glenwood Nitrate Removal Plant, is used to treat a portion of the produced water. Untreated water and water treated at the Glenwood Plant are blended to produce water with less than the nitrate MCL. The blended water is distributed by the CVCWD system.

B. GLENWOOD NITRATE REMOVAL PLANT

The Glenwood ion exchange nitrate removal plant began operation in January 1990. The plant remained in operation until August 1992 when repairs were necessary. In May 1993 the plant was put back in operation. The historic and projected production from the Glenwood Plant is shown in Table 3.2.

C. PICKENS GRAVITY TUNNEL PRODUCTION

A small portion of the total CVCWD demand is supplied by the Pickens Gravity Tunnel. Historic and projected production from Pickens Tunnel is shown in Table 3.3.

D. MWD

The amount of treated water purchased from the MWD via FMWD is expected to decrease slightly over the next five years. Historic and projected use of MWD water is shown in Table 3.4.

IV. JUDGEMENT CONSIDERATIONS

The allowable pumping for CVCWD's share of the Verdugo Basin is 3,294 acre-feet annually. Estimated future pumping is expected to realize this adjudicated quantity assuming continued full operation of the Nitrate Removal Plant and relatively stable levels of Verdugo Basin Groundwater. In the past two water years (93/94 and 94/95), the Watermaster, with approval from the ULARA Administrative Committee, has allowed CVCWD to over-pump their rights in the Basin, as shown in Table 3.1. This will continue for 1995-96. Future consideration for excess pumping will take into account the City of Glendale's ability to pump their prescriptive right along with overall hydrogeologic conditions within the Verdugo Basin.

TABLE 2.1
HISTORIC AND PROJECTED WATER DEMAND

(Acre-Feet)

90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-2000
3968	4232	4249	4806	4686	4709	4733	4757	4780	4804
ACTUAL					PROJECTED				

TABLE 3.1
HISTORIC AND PROJECTED COMBINED WELL
AND TUNNEL GROUNDWATER PRODUCTION

(Acre-Feet)

90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-2000
2615	2630	2555	3631	3707	3694	3294	3294	3294	3294
ACTUAL					PROJECTED				

TABLE 3.2
HISTORIC AND PROJECTED GLENWOOD NITRATE REMOVAL PLANT PRODUCTION
BEFORE BLENDING

(Acre-Feet)

89-90	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-2000
604	960	847	337	1550	1626	1580	1320	1320	1320	1320
ACTUAL						PROJECTED				

NOTES:

(1) The Glenwood Treatment Plant has a capacity of 2.7 MGD of blended water.

(2) The Glenwood Treatment Plant began operation January 1990.

TABLE 3.3
HISTORIC AND PROJECTED PICKENS TUNNEL WATER PRODUCTION

(Acre-Feet)

90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-2000
46	49	60	67	65	60	60	60	60	60
ACTUAL					PROJECTED				

TABLE 3.4
HISTORIC AND PROJECTED USE OF MWD TREATED WATER

(Acre-Feet)

89-90	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-2000
1807	1353	1602	1694	1175	979	1015	1439	1463	1486	1510
ACTUAL						PROJECTED				

NOTES:

(1) All values shown above are for treated water.

APPENDIX F

WELL ABANDONMENT REQUEST: BURBANK

1995-96 Water Year

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 1455
Los Angeles, CA 90012
TELEPHONE: (213) 367-1020
FAX: (213) 367-1131

MAILING ADDRESS:
ULARA WATERMASTER
P.O. Box 111, Room 1455
Los Angeles, CA 90051-0100

July 23, 1996

Mr. Fred Lantz
City of Burbank
Public Service Department
164 W. Magnolia Blvd.
Burbank, CA 91502

Dear Mr. Lantz:

Well Abandonment Request

The Watermaster's Office has reviewed your request to abandon or decommission Burbank Supply Well Nos. 10, 11A, 12, 13A, 14A, 17, and 18. We understand that these wells have been out-of-service for at least five years due to volatile organic groundwater contamination. Your request to abandon these wells suggest that the start-up of the Burbank Operable Unit and, in addition, the degradation of water quality at the supply wells, preclude the use of them in the near term and in your terms are redundant or unnecessary for water supply needs.

The Watermaster's Office has evaluated the utility of preserving these wells for water level and water quality purposes versus complete decommissioning. These wells were constructed between 1942-69 and all but two were drilled with the cable tool method and perforated in multiple aquifer zones with a mills knife. Two wells, 13A and 14A, were drilled by a rotary drilling method.

The limited nature of the data collected from these wells for water level and water quality purposes can be adequately replaced by data obtained from other nearby monitoring wells. Therefore, the Watermaster's Office recommends the full decommissioning of the specified Burbank Wells.

Decommissioning procedures should follow those described in Section 23 of the Department of Water Resources Bulletin 74-81 "Water Well Standards: State of California". The Watermaster's office recommends one slight modification to the procedures in that the *entire* depth of each well should be filled with a cement or bentonite slurry. Pressure grouting for the cable tool wells is unnecessary because the wells lack annular packing material. However, appropriate measures should be applied to ensure that the annular material (gravel pack) for well Nos. 13A and 14A is

properly sealed. This could be accomplished by pressure grouting the gravel pack zone or by pulling the well casing and flushing the gravel pack material from the well borehole prior to adding the cement slurry.

If you have any questions, please do not hesitate to contact me at (213) 367-1020 or my assistant, Mr. Richard A. Nagel at (213) 367-0906.

Sincerely,

MELVIN L. BLEVINS
ULARA Watermaster

RAN:ww

c: Administrative Committee
Upper Los Angeles River Area (ULARA)
Mr. Michael Sovich
Crescenta Valley County
Water District
Mr. Michael Drake
City of San Fernando
Mr. Donald Froelich
City of Glendale
Mr. Robert Yoshimura
City of Los Angeles

Mr. Hank Yacoub, RWQCB
Mr. Tom Kremer, USEPA
Mr. Richard A. Nagel

bc: James F. Wickser/
Norman L. Buehring
Melvin L. Blevins
Robert L. Simmons
Gerald A. Gewe
Ernest F. Wong
Patricia T. Kiechler

ULARA Watermaster
City of Burbank

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