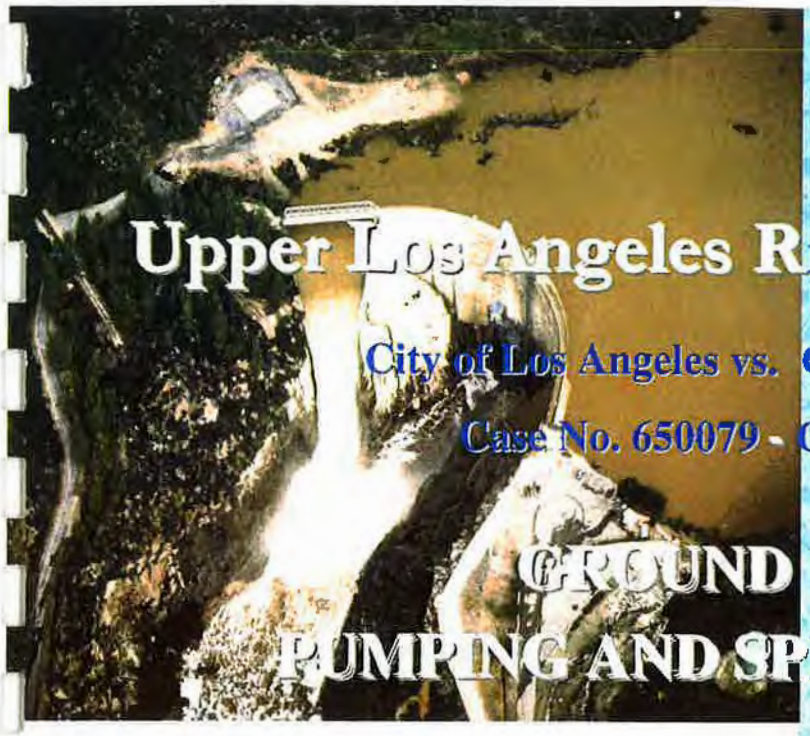


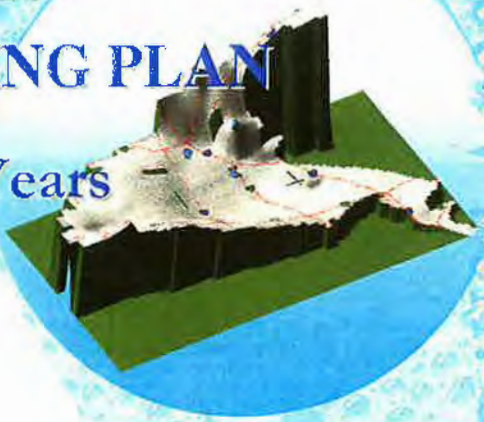
Upper Los Angeles River Area Watermaster

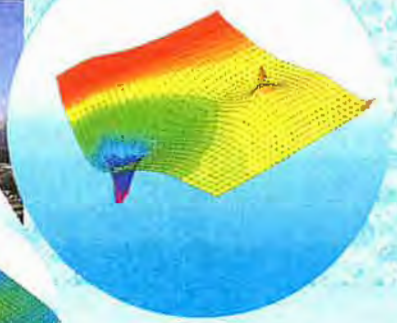
City of Los Angeles vs. City of San Fernando, et al.

Case No. 650079 - County of Los Angeles

GROUND WATER PUMPING AND SPREADING PLAN

2005-2010 Water Years





July 2006

Upper Los Angeles River Area Watermaster

Upper Los Angeles River Area Watermaster

UPPER LOS ANGELES RIVER AREA WATERMASTER

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

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GROUNDWATER PUMPING AND SPREADING PLAN FOR THE UPPER LOS ANGELES RIVER AREA LOS ANGELES COUNTY, CALIFORNIA

2005-2010 WATER YEARS

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JULY 2006

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I. EXECUTIVE SUMMARY

As Watermaster for the Upper Los Angeles River Area (ULARA), I am pleased to submit the 2006 ULARA Pumping and Spreading Plan. This report is prepared in compliance with Section 5.4 of the ULARA Watermaster's Policies and Procedures that established the Watermaster's responsibility for management of the ULARA groundwater basins. The Pumping and Spreading Plan includes the individual plans submitted by the five major pumping parties, which incorporates changes in recharge, spreading, and pumping, or pumping patterns, especially in relation to the present and future plans for groundwater cleanup.

In the Sylmar Basin, the City of San Fernando will pump less than its full groundwater rights. The City of Los Angeles also plans to pump less than its full right in this Water Year. In the San Fernando Basin (SFB) Burbank will pump its full adjudication, but Los Angeles is planning to pump less than its adjudicated amount. Glendale plans to pump its full adjudicated amount in the SFB, but it has limited pumping capacity in the Verdugo Basin. Crescenta Valley Water District (CVWD), with approval from Glendale and the Watermaster, may be able to pump more than its assigned water rights from the Verdugo Basin. In addition, CVWD is completing a study to evaluate the potential to sustain increased pumping through stormwater retention and drilling of new wells.

Currently, there are five groundwater cleanup plants in operation: the City of Los Angeles' North Hollywood Operable Unit (OU) and the Pollock Wells Treatment Plant, the Burbank OU, CVWD's Glenwood Nitrate Removal Plant, and the Glendale OU.

The Watermaster will continue to address the declining water table in the SFB. The Watermaster has been working with the County and City of Los Angeles to find ways to maximize spreading in the Hansen and Tujunga Spreading Grounds and to explore spreading in new areas. A methane gas mitigation plan for the Tujunga Spreading Grounds may be implemented in the near future. Thanks to the enormous effort of the Los Angeles County Department of Public Works (LACDPW) a significant amount of native water was captured to recharge the SFB during the 2004-05 and 2005-06 rainfall seasons.

The groundwater model this year simulates the effect on groundwater elevations of projected pumping in the SFB for the next five years. The most significant features continue to be the pumping cones of depression formed in Layer I (Upper Zone) as a result of pumping at Los Angeles' Tujunga and Rinaldi-Toluca wells and the Burbank OU (Plate 3), and the rebound of

groundwater levels due to above-normal recharge during the 2004-05 Water Year and anticipated spreading of imported supplies by Burbank.

I wish to acknowledge and express appreciation to the parties who have provided information and data that were essential to the completion of this report.

MARK G. MACKOWSKI
ULARA Watermaster

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 to prevent further degradation of groundwater quality and to limit the spread of contamination in the ULARA basins. The Policies and Procedures were revised again in February 1998 to organize the material into a more accessible and complete document.

Section 5.4 of the Policies and Procedures assigns the responsibility for this annual Pumping and Spreading Plan to any municipal party who produces groundwater. Each municipal pumper 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 five-year projected groundwater pumping and spreading amounts, recent water quality data on each well, and facility modification plans.

The ULARA Watermaster is required to evaluate and report on the impact of the combined pumping and spreading of each party as it relates to the implementation of the San Fernando 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, and the Administrative Committee is to review and approve the plan by July 1 of the current Water Year.

This is the July 2006 Groundwater Pumping and Spreading Plan for ULARA, prepared according to the Policies and Procedures. This report provides guidance to the Administrative Committee for use in protecting water quality within ULARA, improving basin management, and providing protection of each party's water right.

III. PLANS FOR THE 2005-2010 WATER YEARS

A. Projected Groundwater Pumping for 2005-06 Water Year

The total 2005-06 ULARA pumping is projected at 70,680 acre-feet (AF) (Table 3-1B), 26,761 AF below the 26-year average (1979-2005). The estimated pumping for 2006-07 is 119,837 AF, a 22,396 AF increase from the historical average (Appendices A-E).

In 2005-06, the City of Burbank plans to pump 9,461 AF (Table 3-1B) from all its groundwater sources, 87 AF less than its five-year average. As of October 1, 2005, Burbank had a storage credit of 20,191 AF. Burbank's annual return water credit of 20 percent is approximately 5,000 AF/Y, and its right to purchase Physical Solution water from Los Angeles is 4,200 AF/Y. The BOU plant capacity is 9,000 gpm (14,000 AF/Y). Pumping in excess of Burbank's annual return water credit can come from its banked storage or Physical Solution purchases from Los Angeles. Burbank may also purchase and import water from the Metropolitan Water District (MWD) and store it in the SFB for later extraction, or obtain stored water credit from other water rights holders in the SFB.

CVWD plans to pump 3,294 AF in 2005-06, which is an increase of 501 AF compared to its average pumping since 1979, and an increase of 214 AF from its five-year average. In past years CVWD has pumped a portion of Glendale's allocation of the Verdugo Basin safe yield, which Glendale was unable to pump. This additional pumping was approved by the Watermaster. CVWD and Glendale are discussing an arrangement that would allow CVWD to pump a portion of Glendale's water right in future years.

The City of Glendale resumed significant pumping from the SFB when the Glendale North and South OUs began operating in September 2000. In the SFB, Glendale accumulates 20 percent return credit for water delivered to its entire service area within the SFB. In addition, Glendale has the right to purchase from Los Angeles up to 5,500 AF/Y of Physical Solution water. Glendale had storage credit of 64,103 AF in the SFB as of October 1, 2005. Glendale plans to pump 7,625 AF from the SFB in the 2005-06 Water Year. Glendale plans to extract 2,208 AF from the Verdugo Basin in 2005-06, a decrease of 59 AF over its 26-year historical average, and 119 AF more than the average of the past five years.

The City of Los Angeles plans to pump 42,472 AF this year from the SFB, 37,107 AF below its 1979-2005 annual average and 22,191 AF less than the average municipal pumping of the past five years. A total of 2,366 AF of groundwater will be pumped from the Sylmar Basin, 523 AF less than the 1979-2005 average. As of October 1, 2005, Los Angeles had a storage credit of 325,739 AF in the SFB and 8,448 AF in the Sylmar Basin.

In 2005-06 the City of San Fernando plans to pump 3,100 AF from the Sylmar Basin, 383 AF less than its average pumping for the past five years and 19 AF more than the past 26 year average. San Fernando has storage credit of 339 AF as of October 1, 2005.

Estimated capacities of ULARA well fields are provided in Table 3-1. Actual and projected amounts of pumping and spreading by the major parties during 2005-06 are shown in Tables 3-1A, 3-1B, and 5-1A.

B. Constraints on Pumping as of 2005-06

SAN FERNANDO BASIN

City of Burbank - In January 1996, a portion of Burbank's pumping capability was restored when the Lockheed-Burbank Operable Unit (Burbank OU) was activated under Phase I of the Consent Decree with the United States Environmental Protection Agency (USEPA). The City assumed the 18-year operation of the facility on March 12, 2001 under provisions of the Second Consent Decree. Although the USEPA turned over operating control of the facility to the City of Burbank, negotiations continue with Lockheed Martin (Lockheed) over several issues including the pumping capacity of the eight supply wells.

In January 2002, USEPA approved a mode of operation using the existing wells and blending the output with MWD water to keep total chromium levels at 5 parts per billion (ppb) or less, the goal established by the Burbank City Council for the City's delivered water. Part of the pumping plan includes the voluntary shut down of the Lake Street/GAC wells, which could not be blended down to 5 ppb. The Lake Street/GAC wells continue to be off-line.

The Burbank OU will pump approximately 9,161 AF of groundwater during the 2005-06 Water Year, a reduction from its design capacity of 14,000 AF/Y. The cause of the

reduced pumping was the subject of a study by Burbank. Montgomery Watson Harza performed the Performance Attainment Study to evaluate the well field and appurtenant facilities in an effort to bring production up to 9,000 gpm. The Well Field Performance Attainment Study was completed and reviewed by the USEPA and Lockheed-Martin. A plan is being developed to implement a program that may include temporary deflation of existing well packers.

City of Glendale – The Glendale OU began operating in September 2000. Subsequently, hexavalent chromium contamination was detected in the groundwater. However, the Glendale OU was not designed to treat for chromium, so Glendale blends the treated water with imported supplies from MWD to keep hexavalent chromium levels below 6 ppb, a goal set by the Glendale City Council.

Glendale has received more than $1 million from federal appropriations and the American Water Works Association Research Foundation (AWWARF) to investigate technology capable of large-scale treatment of hexavalent chromium. Phase I and II are completed. Phase II provided vendors the opportunity to demonstrate the capabilities of their systems to treat hexavalent chromium from the technologies selected in Phase I. Glendale is now in Phase III of the chromium studies to test the technology on one well with a 500 gpm flow rate. This study will also benefit other pumpers in the SFB including the cities of Burbank and Los Angeles, as well as water purveyors from other parts of the country. Glendale has received money to proceed with Phase III and now is seeking additional funding in order to apply the technology to the entire GOU production.

City of Los Angeles - All of the well fields within the SFB have been impacted because of groundwater contamination, primarily from VOCs such as TCE and PCE. The Pollock Well Field was partially restored when the Pollock Wells Treatment Plant was placed into service March 17, 1999. The Tujunga and Rinald-Toluca Well Fields have also experienced levels of TCE, PCE, and nitrates above the Maximum Contaminant Level (MCL) at the wellheads and are being evaluated. Low levels of perchlorates have been detected in both the Rinaldi-Toluca and Tujunga Well Fields.

LADWP is considering adding up to eight new 8-cubic feet per second (cfs) wells in the North Hollywood Well Field-West Branch to restore capacity resulting from contamination and obsolescence of some existing wells.

In 2003 LADWP began a five-year project to convert the disinfection of all water in the system from chlorine to chloramines. The conversion is necessary to meet the more stringent MCLs for total trihalomethanes (THMs) and Haloacetic Acids (HAA) that have been recently established under the Disinfection Byproduct (DBP) Rule.

SYLMAR BASIN

City of San Fernando - All of San Fernando's groundwater is pumped from the Sylmar Basin, where there are no limitations related to contamination. However, elevated nitrate levels have been observed in San Fernando's wells. Old septic systems, and possibly past agricultural practices, are the likely cause(s) of the high nitrate levels.

City of Los Angeles - The Mission Wells will not be pumping Los Angeles' full entitlement during 2005-06.

The ULARA Watermaster has performed a safe yield re-evaluation of the Sylmar Basin that recommends a higher safe yield amount with a corresponding increase in the cities' water rights under certain provisions and restrictions.

VERDUGO BASIN

Crescenta Valley Water District - All of CVWD's groundwater rights are in the Verdugo Basin. Contamination from VOCs is minimal, however, nitrate contamination is widespread. High nitrate levels are reduced in the supply by treating a portion of the groundwater by anion exchange at the Glenwood Nitrate Removal Plant, and blending untreated groundwater with treated groundwater and/or MWD supplies to meet drinking water standards.

In past years CVWD has been given permission on an annual basis by the Watermaster to pump in excess of its right until the City of Glendale is able to pump its entire right. During Water Year 2004-05 CVWD pumped 16 AF in excess of its adjudication. The water agencies are working to resolve the matter since permission to over-pump was neither requested nor appoved prior to the end of the Water Year.

CVWD has received three AB303 Local Groundwater Assistance grants to study declining groundwater levels in the Verdugo Basin. The first grant funded a monitoring

well study to locate new production wells. The results of the study showed that these well sites would also produce low-capacity wells. The second grant has been used to investigate the feasibility of recharging the basin with stormwater. The Verdugo Basin Groundwater Recharge, Storage and Conjunctive Use Feasibility Study has demonstrated that is is possible to capture and store additional stormwater in the Verdugo Basin. The third grant is being used to perform a geophysical survey of the Verdugo Basin. This study will be completed in approximately June 2006.

City of Glendale - The City of Glendale currently does not have the capability of pumping its entire adjudicated right from the Verdugo Basin. Glendale has been studying and evaluating various alternatives to increase its pumping capacity and will be drilling two new wells in the next few years. Limitations in pumping are caused by the lack of wells, rather than contamination problems, as well as the limited availability of groundwater in the basin which is highly variable and based significantly on rainfall.

TABLE 3-1: ESTIMATED CAPACITIES OF ULARA WELL FIELDS

Party/Well Field	Number Standby Wells	Number Active Wells	Estimated Capacity (All Wells) (cfs)
SAN FERNANDO BASIN			
City of Los Angeles			
Aeration	---	7	2.4
Erwin	---	2	4.8
North Hollywood	---	17	76.2
Pollock	---	2	5.8
Rinaldi-Toluca	---	15	107.8
Tujunga	---	12	105.9
Verdugo	---	2	8.3
Whitnall	---	4	18.9
City of Burbank	2	8	24.5
City of Glendale	---	8	11.0
TOTAL	2	77	365.6
SYLMAR BASIN			
City of Los Angeles	---	2	6.0
City of San Fernando	---	4	8.5
TOTAL		6	14.5
VERDUGO BASIN			
CVWD	---	12	7.2
City of Glendale	---	5	5.0
TOTAL		17	12.2

TABLE 3-1A: 2005-06 ACTUAL AND PROJECTED GROUNDWATER EXTRACTIONS

(acre-feet)

Party/Well Field	Total	2005			2006								
		Oct.	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
							SAN FERNANDO BASIN						
City of Los Angeles													
AERATION	1,686	127	184	151	170	114	105	143	148	143	135	135	131
ERWIN	1,570	71	0	0	42	0	0	0	295	286	295	295	286
No HOLLYWOOD	11,167	1,347	3	3	0	488	240	0	369	357	2,817	2,817	2,726
POLLOCK	1,845	106	145	177	147	205	12	173	178	173	178	178	173
RINALDI-TOLUCA	12,548	580	357	158	227	1,599	431	298	738	714	2,509	2,509	2,428
TUJUNGA	9,557	843	2	560	221	1,616	0	0	0	0	2,128	2,128	2,059
VERDUGO	2,690	0	0	0	0	0	123	292	461	446	461	461	446
WHITNALL	1,409	1	1	1	38	1	0	0	277	268	277	277	268
TOTAL:	42,472	3,075	692	1,050	845	4,023	911	906	2,466	2,387	8,800	8,800	8,517
City of Burbank	300	50	21	21	12	12	12	29	29	29	29	29	29
Burbank OU	9,161	777	394	981	909	550	535	836	836	836	836	836	836
City of Glendale	7,625	481	355	552	644	590	715	715	715	715	715	715	715
TOTAL:	59,558	1,308	770	1,554	1,566	1,152	1,262	1,579	1,579	1,579	1,579	1,579	1,579
							SYLMAR BASIN						
City of Los Angeles	2,366	353	116	0	76	0	0	0	369	357	369	369	357
City of San Fernando	3,100	246	8	7	55	249	233	227	415	415	415	415	415
TOTAL:	5,466	599	124	7	131	249	233	227	784	772	784	784	772
							VERDUGO BASIN						
Crescenta Valley Water Dist.	3,294	326	330	333	297	295	263	242	242	242	242	242	242
City of Glendale	2,208	160	117	138	119	241	205	205	205	205	205	205	205
TOTAL:	5,502	486	447	471	415	536	468	446	446	446	446	446	446
ULARA TOTAL:	70,525	5,467	2,033	3,082	2,957	5,960	2,873	3,158	5,275	5,184	11,609	11,609	11,314

TABLE 3-1B. HISTORICAL AVERAGE PUMPING
(acre-feet)

Party/Wellfield	Historic Average Pumping			Projected Groundwater Pumping			
			SAN FERNANDO BASIN				
City of Los Angeles	1979-2005 (A)	2000-2005 (B)	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
AERATION (16 yrs)	-	1,224	1,686	1,500	1,500	1,500	1,500
ERWIN	-	1,215	1,571	2,886	2,886	2,886	2,886
No HOLLYWOOD	-	15,704	11,167	22,408	22,408	22,408	22,408
POLLOCK (18yrs)	-	1,502	1,845	2,000	2,000	2,000	2,000
RINALDI-TOLUCA (18yrs.)	-	17,541	12,548	27,134	27,134	27,134	27,134
TUJUNGA (13 yrs)	-	21,998	9,557	23,413	23,413	23,413	23,413
VERDUGO	-	3,503	2,690	4,905	4,905	4,905	4,905
WHITNALL	-	1,976	1,408	2,754	2,754	2,754	2,754
TOTAL City of Los Angeles	**79,579**	**64,663**	**42,472**	**87,000**	**87,000**	**87,000**	**87,000**
City of Burbank (C)	4,286	568	300	300	300	300	300
BURBANK OU (12yrs)	-	8,980	9,161	10,162	11,000	11,000	11,000
City of Glendale (C)	2,546	7,898	7,625	7,625	7,625	7,625	7,625
TOTAL San Fernando Basin	**86,411**	**82,109**	**59,558**	**105,087**	**105,925**	**105,925**	**105,925**
			SYLMAR BASIN				
City of Los Angeles	2,889	2,308	2,366	4,345	4,345	4,345	4,345
City of San Fernando	3,081	3,483	3,100	3,100	3,100	3,100	3,100
TOTAL Sylmar Basin	**5,970**	**5,791**	**5,466**	**7,445**	**7,445**	**7,445**	**7,445**
			VERDUGO BASIN				
Crescenta Valley Water Dist.	2,793	3,080	3,294	3,294	3,294	3,294	3,294
City of Glendale	2,267	2,089	2,208	3,856	3,856	3,856	3,856
TOTAL Verdugo Basin	**5,060**	**5,169**	**5,502**	**7,150**	**7,150**	**7,150**	**7,150**
TOTAL ULARA	97,441	93,069	70,525	119,682	120,520	120,520	120,520

A. 26 year average of municipal well field pumping (Appendix F). 1979-2005 total pumping includes wells that are no longer in service.

B. 5-year average.

C. Includes Forest Lawn and GOU pumping for Glendale and Valhalla pumping for Burbank.

IV. GROUNDWATER PUMPING AND TREATMENT FACILITIES

A. Well Fields

There are ten production well fields located in the SFB, two in the Sylmar Basin, and two in the Verdugo Basin. The locations of the well fields are shown on Plate 3, and their estimated capacities are provided in Table 3-1.

B. Active Groundwater Pumping and Treatment Facilities

Glendale OU

The Glendale OU has been producing and treating groundwater for VOCs since September 2000. On April 23, 2001, the City of Glendale assumed operation of the Glendale Water Treatment Plant. Prior to that time the Glendale Respondents Group had operated the plant through a contract with Camp Dresser & McKee.

The Glendale OU is comprised of a treatment plant, eight groundwater extraction wells, a pumping plant, disinfection facility, and associated piping (Appendix C, Figure 4). The treatment facility is designed to treat groundwater contaminated by trichloroethylene (TCE) and perchloroethylene (PCE) at a rate of 5,000 gpm using aeration and granulated activated carbon (GAC). The treated water is blended with imported supplies to control nitrate levels. Currently, the wells are being pumped in a manner to limit hexavalent chromium to six ppb or less in the treated, blended effluent.

Burbank OU

The remediation of groundwater contamination in the SFB has been significantly enhanced by the startup of the Burbank OU on January 3, 1996. The Burbank OU, consisting of air-stripping towers followed by liquid and gaseous phase GAC, has a design capacity of 9,000 gpm (14,000 AF annually). Under the terms of the Second Consent Decree, Burbank assumed operation of the Burbank OU on March 12, 2001 as the long-term primary operator for the next 18 years. Although the USEPA has turned over operation of the facility to the City of Burbank, there have been continuing negotiations with Lockheed over several issues including the pumping capacity of the eight wells. These issues are being resolved and the design and maintenance problems are being corrected.

GAC Treatment Plant - City of Burbank

This facility was operated by the City of Burbank from 1992-2001. Two Lake Street Wells can deliver water at 2,000 gpm to the liquid-phase GAC plant for removal of VOCs. When the plant is in use the treated water supplements production from the Burbank OU and can be delivered to the Burbank distribution system. However, current plans are to keep the plant shut down due to elevated chromium levels in the groundwater.

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

This facility is designed to treat up to 2,000 gpm of VOC-contaminated groundwater by air-stripping and deliver the treated water to Los Augeles' water distribution system. The facility operates below design capacity due to a declining water table. The USEPA and the LADWP have been discussing a proposal for the NHOU to increase production by deepening existing wells in order to remove contaminants at a faster rate and reduce the opportunity for the plume to migrate to other SFB well fields. The decision is complicated by the presence of hexavalent chromium upgradient of the wells. The USEPA, LADWP, and the Watermaster are currently evaluating additional treatment and funding alternatives.

The USEPA five-year review of the NHOU published September 2003 found that the interim remedy of the NHOU "currently protects human health and the environment because the concentration of TCE and PCE in treated groundwater is less than the Record of Decision (ROD) selected cleanup goals and no other Contaminants of Concern (COC) currently exceed health-based standards." The USEPA has a concern about the future ability of the NHOU to control contaminant plume migration for VOCs and COCs, so that the USEPA undertook a Focused Feasibility Study to investigate long-term requirements for continued mass removal. The study will be completed in June 2006.

Pollock Wells Treatment Plant - City of Los Angeles

Pollock Wells Treatment Plant, with a capacity of 3,000 gpm, began operating in March 1999. This project is funded, owned, and operated by the City of Los Angeles. The Pollock Wells Treatment Plant reduces rising groundwater flowing out of ULARA and enhances the overall groundwater cleanup program in the Los Angeles River Narrows area of the SFB. The groundwater is processed through liquid-phase GAC vessels for VOC removal, followed by chlorination and blending of the treated groundwater to reduce nitrate levels. The treated water is then delivered to LADWP's distribution system.

Glenwood Nitrate Removal Plant - CVWD

Groundwater pumped from CVWD's wells is high in nitrates. A portion of the pumped groundwater is treated by ion-exchange and blended with untreated water and/or imported MWD water to reduce nitrate levels below the MCL. In the 2003-04 Water Year the plant was operated below design capacity because overall groundwater production was down due to basin level decline, resulting in more imported water, thereby reducing the need for treatment. However, near record rainfall in 2004-05 followed by near-average rainfall in 2005-06 have raised well production and CVWD has increased its use of the nitrate plant.

TREATED GROUNDWATER IN ULARA TABLE 4-1 ACTUAL GROUNDWATER TREATMENT								
Water Year	Burbank GAC	Lockheed Aqua Detox	Burbank OU	Glendale North/South OU	CVWD Glenwood Nitrate Removal Plant	North Hollywood OU	Pollock Wells Treatment Plant	Annual Total AF
1985-86		1						1
1986-87		1						1
1987-88		1						1
1988-89		924						924
1989-90		1,108				1,148		2,256
1990-91		747				1,438		2,185
1991-92		917			847	786		2,550
1992-93	1,205	692			337	1,279		3,513
1993-94	2,395	425	378		1,550	726		5,474
1994-95	2,590		462		1,626	1,626		6,304
1995-96	2,295		5,772		1,419	1,182		10,668
1996-97	1,620		9,280		1,562	1,448		13,910
1997-98	1,384		2,580		1,391	2,166		7,521
1998-99	1,555		9,184		1,281	1,515	1,513	15,048
1999-00	1,096		11,451	979	1,137	1,213	1,851	17,727
2000-01	995		9,133	6,345	989	1,092	1,256	19,810
2001-02	0		10,540	6,567	515	998	1,643	20,263
2002-03	0		9,170	7,508	216	1,838	1,720	20,452
2003-04	0		9,660	6,941	164	1,150	1,137	19,052
2004-05	0		6,399	7,541	782	1,042	1,752	17,517
Total AF	**15,135**	**4,815**	**84,009**	**35,881**	**13,816**	**20,647**	**10,873**	**185,176**

TABLE 4-2 PROJECTED GROUNDWATER TREATMENT							
	Burbank GAC	Burbank OU	Glendale North/South OUs	CVWD Glenwood Nitrate Removal Plant	North Hollywood OU	Los Angeles' Pollock Wells Treatment Plant	Annual Total AF
2005-06	0	9,161	7,200	850	1,686	1,845	20,742
2006-07	0	10,162	7,200	900	1,500	2,000	21,762
2007-08	0	11,000	7,200	950	1,500	2,000	22,650
2008-09	0	11,000	7,200	950	1,500	2,000	22,650
2009-10	0	11,000	7,200	950	1,500	2,000	22,650
Total AF	**0**	**52,323**	**36,000**	**4,600**	**7,686**	**9,845**	**110,454**

C. Projected Groundwater Pumping Facilities

North Hollywood Well Field Restoration Project

LADWP is evaluating the possibility of adding new North Hollywood Wells in the west branch to restore capacity lost due to contamination and age.

D. Other Groundwater Remediation Projects

Many privately owned properties in the eastern SFB have been found to have groundwater contamination, and some are under Cleanup and Abatement Orders from the Regional Water Quality Control Board (RWQCB). Each site typically has monitoring wells and some have extraction wells and treatment facilities. The RWQCB is also in the process of evaluating and closing a significant number of cases in the underground tank program.

The USEPA began including hexavalent chromium in the quarterly sampling from its monitoring wells to characterize the plume as a step in containment and cleanup of this contaminant. A Total Dissolved Chromium plume map is shown on Plate 10.

E. Dewatering Operations

Temporary Construction Dewatering

Temporary construction excavations, such as building foundations and pipelines, sometimes require dewatering in areas that have a high groundwater table. Water that is discharged is required to be accounted for by the Watermaster, and is deducted from the water right holder.

Permanent Dewatering Operations

Some facilities along the southern and western boundaries of the SFB have deep foundations in areas of high groundwater that require permanent dewatering. The amount of groundwater pumped is required to be reported to the Watermaster on a monthly basis. These activities are subject to approval by the affected Administrative Committee party, and the dewaterer is required to pay for the replacement cost of the extracted groundwater. The pumped groundwater is subtracted from the affected party's water right.

F. Unauthorized Pumping in the County

Unauthorized Pumping

There are a significant number of individuals, primarily within the unincorporated hill and mountain area, who are pumping groundwater without reporting the production to the Watermaster. This groundwater has been adjudicated and is the property of the City of Los Angeles. Although the volume produced by each pumper is probably small, the cumulative effect may be significant. Working in cooperation with the County Department of Health

Services and County Planning, the Watermaster and the LADWP have developed a process to identify and monitor water usage through a water license agreement. The Watermaster Office has also identified pumping by lessees on U.S. Forest Service (USFS) land within ULARA. The USFS began conducting an evaluation of water sources for each residence in the area below the Big Tujunga Dam beginning in 2004.

V. GROUNDWATER RECHARGE FACILITIES AND PROGRAMS

A. Existing Spreading Operations

There are five active spreading facilities located in the SFB (Plate 1). The Los Angeles County Department of Public Works (LACDPW) operates the Branford, Hansen, Lopez, and Pacoima Spreading Grounds. The LACDPW, in cooperation with the City of Los Angeles, operates the Tujunga Spreading Grounds. The spreading facilities are used for spreading native and imported water. Plans are being considered to deepen and modernize the Hansen Spreading Grounds. An analysis is being made by the LACDPW, LADWP, and the Watermaster to identify ways to maximize spreading. Estimated capacities are shown in Table 5-2.

B. Other Spreading Operations

Boulevard Pit

Vulcan Materials, CalMat Division, is currently mining sand and gravel from its Boulevard Pit, located between the existing Hansen and Tujunga Spreading Grounds. The LADWP, LACDPW, and the Watermaster are investigating the feasibility of acquiring the Boulevard Pit for conversion into a new stormwater retention and/or recharge facility.

Sheldon Pit

Vulcan Materials also owns Sheldon Pit, the former site of gravel mining located northeast of Hansen Spreading Grounds. Sheldon Pit is being considered in the Los Angeles County Sun Valley Watershed Management Plan as a potential stormwater retention facility.

C. Actual and Projected Spreading

Table 5-1A shows the actual and projected spread volumes for the 2005-06 Water Year. Approximately 40,784 AF of native runoff will be spread compared to the 37-year historical average of 34,665 AF of native runoff and imported water, and compared to the past five-year average of 24,239 AF. Precipitation on the valley fill is estimated at 14 inches for 2005-06 compared to the long-term average of 18.56 inches per year and the previous five-year average of 19.4 inches per year.

TABLE 5-1A SPREADING OPERATIONS

(acre-feet)

Actual and Projected Spreading in ULARA Spreading Grounds 2005-06							
	Operated by:						
	LACDPW				LADWP	LACDPW and LADWP	
Month	Branford	Hansen	Lopez	Pacoima*	Headworks**	Tujunga***	Total
Oct-05	76	1,240	0	225		30	1,571
Nov-05	21	1,680	88	0		4	1,793
Dec-05	51	981	68	133		470	1,703
Jan-06	54	2,890	0	848		639	4,431
Feb-06	76	544	0	470		1,660	2,750
Mar-06	82	3,218	0	1,548		3,843	8,691
Apr-06	100	5,000	270	2,200		5,500	13,070
May-06	15	600	0	1,320		0	1,935
Jun-06	15	400	0	1,320		0	1,735
Jul-06	15	200	0	1,320		0	1,535
Aug-06	15	0	0	770		0	785
Sep-06	15	0	0	770		0	785
TOTAL	535	16,753	426	10,924	-	12,146	40,784
1968-2005 Average	544	14,325	540	6,750	2,010	10,496	34,665
2000-2005 Average	769	12,438	355	5,450	-	5,227	24,239

* Projected spreading includes 6,000 AF by the City of Burbank.

** Out of service since 1981-82.

***Includes native and imported water.

TABLE 5-1B HISTORICAL PRECIPITATION ON THE VALLEY FILL

(inches per year)

1968-05	2000-05	2000-01	2001-02*	2002-03	2003-04	2004-05	2005-06**
18.56	19.4	19.52	5.95	19.41	9.52	42.64	14.0

* Historic Low

** 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	7	1,000
Hansen	Shallow basin	105	35,000
Lopez	Shallow basin	12	2,000
Pacoima	Med. Depth basin	107	23,000
	Operated by LACDPW and LADWP		
Tujunga	Shallow basin	83	43,000
	TOTAL	314	104,000

D. San Fernando Basin Recharge Task Force (former Hansen and Tujunga Spreading Grounds Task Force)

During the 1997-98 Water Year, precipitation in ULARA was 225 percent of normal. This resulted in an above-average volume of stormwater runoff that could be captured in upstream reservoirs and diverted into spreading grounds. In April 1998, the Watermaster Office received notice from the LACDPW that spreading at both the Hansen and Tujunga Spreading Grounds would be temporarily suspended. The basis for curtailing spreading was that the groundwater table had risen to a level that threatened to inundate the base of the Bradley-East Landfill near the Hansen Spreading Grounds, and methane gas was migrating from the Sheldon-Arleta Landfill adjacent to the Tujunga Spreading Grounds toward a high school. At that time, Los Angeles County's reservoirs were completely full, meaning that thousands of acre-feet of runoff would be spilled and lost to the ocean. The suspended spreading activities spanned over one month. The recent heavy rains during 2004-05 caused some similar restrictions on spreading operations.

In response to this undesirable condition, in May 1998 the Watermaster Office formed the Tujunga and Hansen Spreading Grounds Task Force. The task force was comprised of representatives from the LACDPW, LADWP, Los Angeles Bureau of Sanitation and the Watermaster Office. After a series of meetings, the task force developed preliminary mitigation measures to improve the utilization of both spreading grounds, particularly during years of above-normal runoff.

- Hansen Spreading Grounds Mitigation Plan

Above-average recharge at the Hansen Spreading Grounds (HSG) affects the Bradley-East Landfill, located approximately 3,000 feet downgradient. The RWQCB and the Watermaster Office prohibit groundwater inundation of the unlined landfill. The groundwater table is allowed to rise to a designated level, and then spreading is temporarily suspended until the groundwater table recedes to a safe level. This occurs only in years when above-average runoff is available. To assure the safety of the landfill, a groundwater alert level, with a 25-foot buffer zone, was established in the late 1990s. The Hansen Spreading Grounds Mitigation Plan established an improved location to monitor the groundwater levels – 1,000 feet further downgradient from its previous location and adjacent to the existing Bradley-East Landfill. The Watermaster Office estimated that this change should improve the volume of groundwater recharge by at least 25 percent, or approximately 7,000 AF/Y, during a wet year.

Heavy spreading was possible at HSG during 2004-05 as a result of near record high rainfall. In January 2005, seepage and erosion was observed in a cut slope at the northerly end of Boulevard Pit, located near the south end of HSG. Vulcan Materials Company (Vulcan) currently mines sand and gravel at Boulevard Pit. The seepage was determined by LACDPW to be directly related to the heavy spreading. LACDPW, LADWP, and the Watermaster were concerned that the seepage could further weaken the slope and cause a large landslide that might affect San Fernando Road. The City of Los Angeles Department of Building and Safety (Building and Safety) was notified, and it subsequently issued a letter requiring Vulcan to perform a slope stability analysis. In the meantime, LACDPW curtailed spreading at HSG to reduce the chance of slope failure. Although 33,301 AF were spread at HSG, a significant amount of runoff could not be conserved and was wasted to the ocean. Vulcan's slope stability report was eventually approved by Building and Safety. In March 2006 LACDPW agreed to resume full spreading at the Hansen Spreading Grounds. It is projected that in the near-average rainfall year of 2005-06 about 16,753 AF will be spread there.

- Tujunga Spreading Grounds Mitigation Plan

The Tujunga Spreading Grounds are located adjacent to the Sheldon-Arleta Landfill. Methane gas is produced by the landfill, which is a source of environmental concern.

During the spreading of surface water, water moves through the underlying soil column and displaces the air from voids within the soil matrix. The resulting lateral migration of air mass

has the potential to displace methane gas out of the adjacent landfill. In recent years, the methane has occasionally migrated and caused elevated levels at a nearby high school, and in at least one instance, forced an evacuation of the school grounds. In order to avoid these episodes, a methane gas monitoring system was constructed. When methane gas is detected at specific concentrations, the spreading activities are suspended, resulting in local storm water runoff being lost to the ocean.

The Tujunga Spreading Grounds Mitigation Plan consists of continuous operation of the perimeter methane gas flare system, situated around the landfill, prior to and during spreading of surface water. This improves containment of the methane gas within the landfill, and halts its migration out of the landfill. The plan requires close coordination between the Los Angeles Bureau of Sanitation, the operators of the existing perimeter flare system, and the LACDPW. The goal is to contain methane gas within the landfill and restore the historic spreading capacity of 250 cfs. A test was conducted in May 2003 by the consultant, GeoSyntec. The results were encouraging at a spreading rate of 100 cfs. Delays in implementing plans to contain the methane gas resulted in a significant amount of runoff being wasted to the ocean during 2004-05. The project will be advertised in August 2006 with an award date anticipated in November 2006.

E. Big Tujunga Dam/Endangered Species

Big Tujunga Dam was constructed by LACDPW in the 1930s on an easement on USFS property. In the 1970s a seismic analysis of the dam was performed, and it was found to be susceptible to damage in the event of a large earthquake. Since then, the dam has been operated at a reduced storage capacity for safety reasons. LACDPW has proposed a seismic retrofit of the dam to restore the storage capacity.

In February 2004, the United States Fish and Wildlife Service (USFWS) published in the Federal Register a rule designating the area along Big Tujunga Creek from Big Tujunga Dam to Hansen Dam a "critical habitat" for the Santa Ana Sucker (SAS), an endangered species of fish. USFWS is requiring that flow releases from the dam consider the impact on the SAS, and is concerned that large releases could jeopardize the SAS.

This native runoff belongs to the City of Los Angeles under its pueblo right, and is used to recharge the San Fernando Basin at the Hansen and Tujunga Spreading Grounds. Relatively large releases are required for the water to reach the spreading grounds. Unfortunately, the period of maximum flow during the spring occurs during the spawning season of the SAS. In

addition, the USFWS is also requiring that small releases occur throughout the dry summer months to periodically refresh the pools along the creek.

LACDPW, USFS, USFWS, LADWP, and the Watermaster are attempting to reach a compromise that balances the needs of flood protection and water conservation, while being protective of the SAS. Working together this past year the agencies were successful in appealing to FEMA to reinstate dam construction funding that had been withdrawn.

Delays in the retrofit have seen the escalation of construction costs to $78 million. To date, a total of $12 million has been secured, and LACDPW has requested additional funding from the California Department of Water Resosurces and from the City of Los Angeles Proposition O funds. Due to the significantly higher construction costs there is some uncertainty whether this project will be built. Once construction begins, the project could be completed in about three years.

VI. BASIN MANAGEMENT ACTIVITIES AND INVESTIGATIONS

A. Groundwater Investigation Programs

Pacoima Area Groundwater Investigation

A significant groundwater VOC contaminant plume exists in the Pacoima area near the intersection of San Fernando Road and the Simi Valley Freeway (118 Freeway). This area is located approximately 2.5 miles north and upgradient of the LADWP's Tujunga Well Field. There are four primary VOCs present in the groundwater beneath the Pacoima area: PCE, TCE, 1,1-TCA and 1,1 DCE. Concentrations of TCE were found to be as high as 24,000 ppb in this area, which is the highest level found in the San Fernando Valley.

To help characterize the extent of contaminant migration, LADWP installed two monitoring wells: PA-01, approximately 0.5 mile downgradient, and PA-02, approximately 1.25 miles downgradient of the suspected source area.

The Brenntag/Holchem site is under the jurisdiction of the Department of Toxic Substances Control (DTSC). Brenntag is operating a soil vapor extraction system and has installed monitoring wells both on and off site. In May 2005 Brenntag was directed by DTSC to begin delineating the off-site groundwater plume.

The Price-Pfister site is located nearby, and is under the jurisdiction of the RWQCB. Price-Pfister has installed several monitoring wells on site and has also performed soil vapor extraction. Due to the close proximity of these sites, DTSC and RWQCB are coordinating their oversight efforts.

Chromium Investigations

The RWQCB, funded in part with a grant from the United States Environmental Protection Agency (USEPA), reviewed 4,040 sites for potential hexavalent chromium contamination and published its findings in December 2002. After this review, 255 suspected hexavalent chromium sites were identified and inspected. As a result of these inspections, the RWQCB recommended closure for 150 sites and further assessment for 105 sites. In addition, the RWQCB has issued Cleanup and Abatement orders to B.F. Goodrich (formerly Menasco Aerospace Division), PRC-Desoto (formerly Courtauld), Drilube, Honeywell (formerly Allied Signal), Lockheed (2), ITT,

and Excello Plating, and may issue several more. The Cleanup and Abatement Orders require a responsible party to assess, clean up, and abate the effects of contamination discharged to soil and groundwater.

A new Public Health Goal (PHG) for hexavalent chromium should be established by the Office of Environmental Health Hazard Assessment (OEHHA) in the near future. A MCL will subsequently be issued by the California Department of Health Services (DHS).

The Watermaster meets regularly with the Regional Board and the USEPA to monitor investigations and enforcement of cleanup.

VII. ULARA WATERMASTER MODELING ACTIVITIES

A. Introduction

The purpose of the groundwater modeling study presented herein is to evaluate the effects of groundwater pumping and recharge in the SFB, as projected over a five-year period. The projected pumping values were extracted from the "Year 2005-10 Pumping and Spreading Plans" submitted by each party pursuant to the provisions established in the revised February 1998 Policies and Procedures.

The groundwater flow model used for this study is a comprehensive three-dimensional computer model that was developed originally for the USEPA during the Remedial Investigation Study of the San Fernando Valley (December 1992). The model is a tool to estimate the future response to pumping and spreading in the San Fernando Basin for the next five years. Up-to-date groundwater elevations for specific locations can be obtained by contacting the Watermaster Office at (213) 367-0921.

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 San Fernando Basin Goundwater Flow Model. This model consists of 64 rows, 86 columns, and up to four layers to reflect the varying geologic and hydrogeologic characteristics of the SFB in three dimensions. In the deepest portion of the SFB the model is subdivided into four layers, each layer characterizing a specific zone. The model has a variable horizontal grid that ranges from 1,000 by 1,000 feet near the southeastern SFB to 3,000 by 3,000 feet in the northwestern SFB (Figure 7-1) or where less data are available. The model is regularly updated.

B. Model Input

The input data for this model is illustrated in Table 7-1. Table 7-1A is the Basin Recharge, which consists of precipitation, delivered water, hill and mountain runoff, spreading, and sub-surface inflow. Table 7-1B is the Basin Extraction of major producers - the City of Los Angeles, City of Burbank, City of Glendale, and other individual producers. Both tables show projected values for the five-year study, from Fall 2005 to Fall 2010, except for the first half of Water Year 2005-06 where the actual values are known.

In Table 7-1A, the percolation and spreading values were derived by using the long-term average rainfall and recharge conditions projected over the five-year study period except for the first half

of Water Year 2005-06 where actual values are known. The LACDPW estimated the spreading values for the second half of the current water year. Anticipated spreading at PSG by the City of Burbank will help to improve the recovery of the water table in the area above the Tujunga Well Field. The values of the sub-surface inflow from the adjacent basins are assumed to be constant throughout the five-year study.

All Table 7-1B values were derived from the "Pumping and Spreading Plans" submitted by the municipal producers. Each well field's total extraction was allocated among individual wells, then each well was assigned a percentage of pumping to each model layer based on the percentage of the well's perforations contained within each layer.

The model's initial head values (groundwater elevations) were derived from the actual data from Water Year 2004-05, during which the SFB experienced a rebound in groundwater elevation as a result of high precipitation (the weighted average of both valley and mountain areas was 232 percent of the 100-year mean) combined with a high artificial recharge and low pumping. The spreading recharge for the same year was 282 percent of the long-term average.

At the close of every Water Year, the Watermaster staff updates the model input files with the actual Basin Recharge and Extraction data. This activity has been performed each year since 1981.

C: <u>Simulated Groundwater Elevations and Flow Directions</u>

After running the model for five stress periods (Water Years 2005-2010), each lasting 365 days, MODFLOW generated numerical data: the head (groundwater elevations), the drawdown (change in groundwater elevations), and the cell-by-cell flow (vector or flow direction data). These numerical data were used to develop the following Figures and Plates:

- The simulated groundwater (water table) contour results for Model Layer 1 are shown on Plate 1, and for Layer 2 on Plate 2.

- The change in groundwater elevation contours were generated from the drawdown data from the Fall 2005 to Fall 2010 stress period and is shown on Plate 3 for Layer 1 and Plate 4 for Layer 2.

- The horizontal groundwater flow directions are shown on Plate 5 for Layer 1 and Plate 6 for Layer 2.

- Plates 7-10 depict the most recent TCE, PCE, NO_3, and Total Dissolved Chromium contaminant plumes superimposed onto the Layer 1 horizontal groundwater flow direction.

D. Evaluation of Model Results

Plate 1: Simulated Groundwater Contour Model Layer 1 – Fall 2010

- The most noticeable feature is the cone of depression (pumping cone) that has developed around the Burbank OU. These extractions are derived primarily from Layer 1, although Layer 2 does provide some recharge to Layer 1. The Burbank OU projected pumping for the period from 2005 though 2010 is about 11,000 AF/Y. The radius of influence extends as far as 5,000 feet in the downgradient (southeasterly) direction. An upgradient radius of influence is usually larger than the downgradient radius of influence.

- In a more subtle manner, Plate 1 illustrates the pumping influence of the North Hollywood Operable Unit Aeration Wells (AE), North Hollywood West Wells, Glendale OU and Pollock Treatment Plant Wells.

Plate 2: Simulated Groundwater Contour Model Layer 2 – Fall 2010

- The most significant features are the cones of depression near the Rinaldi-Toluca (R-T), Tujunga (TJ), North Hollywood-West (NHW), and Burbank OU. Over 75 percent of the R-T, TJ, and NHW pumping is derived from Layers 2-4.

Plate 3: Change in Groundwater Elevation Model Layer 1 – Fall 2005 to Fall 2010

- As shown in Plate 3, the areas in the vicinity of the pumping well fields of the SFB and downgradient of the Hansen Spreading Grounds (HSG) show a minor decline in the groundwater elevations over the last four years of the study period (Water Year 2006-07 to Water Year 2009-2010). The areas west of the 405 Freeway and in the vicinity of the PSG and upgradient of the HSG show a minor increase in groundwater elevations. In general, the basin shows a minor increase in groundwater elevation during the first year of simulation (Water Year 2005-06) and then starts to show a decline mostly in the areas of pumping activities.
- The primary reason for the minor decline in water levels in the east side of the SFB (vicinity of the well fields and downgradient of HSG) was due to the increase in the volume of the

groundwater discharge over the volume of recharge during the last four years of the study period. This difference is estimated to be an excess of 7,300 AF of projected extractions over recharge for the period and does not include the discharge to the Los Angeles River of rising groundwater nor discharge from subsurface outflow. The minor increase in the water levels in the other areas of the SFB is due to the following reasons:

1. Additional spreading of about 27,000 AF of projected imported water by Burbank to the PSG in addition to the normal recharge activity by LACDPW of native water.
2. Most of the areas experiencing a minor increase in water levels are located in the vicinity or upgradient of spreading grounds and/or located outside the radius of influence of pumping activities.

- The water table within the cone of depression at the Rinaldi-Toluca Well Field declines by about eight feet, and the groundwater level near the Burbank OU declines by about two feet.

- The water table near the Glendale North and South OU wells will decline about one foot. The North OU Wells will pump 5,184 AF/Y and the South OU Wells 2,016 AF/Y.

- The area upgradient of the Tujunga and Rinaldi-Toluca Well Fields will experience about ten feet of recovery in the water table due to the projected recharge by the City of Burbank at the Pacoima Spreading Grounds. The areas near the North Hollywood, Erwin, and Whitnall Well Fields will experience a one to two foot decrease in the water table.

Plate 4: Change in Groundwater Elevation Model Layer 2 – Fall 2005 to Fall 2010

- The area near the Rinaldi-Toluca and North Hollywood – West well fields will experience a two to six foot decline in the water table. The area near the North Hollywood East Branch, Erwin, Whitnall and Verdugo Well Fields will experience a two foot decline in the water table. The area upgradient of the Tujunga Well Field will experience about eight feet of decline in the water table.

Plate 5: Simulated Groundwater Flow Direction Model Layer 1 – Fall 2010

- This plate consists of superimposed groundwater flow direction arrows to illustrate the general movement of groundwater flow in Layer 1.

- The Rinaldi-Toluca, North Hollywood, Glendale OU, and Burbank OU Well Fields and the Hansen and Pacoima Spreading Grounds cause the most pronounced effect on the direction of groundwater movement. In particular, the Burbank OU creates such a significant pumping cone that groundwater flows toward the well field from all directions (radial flow).

- A groundwater divide apparently develops just north of the Verdugo Wells and south of the Whitnall, Erwin, and Burbank OU Wells. This is primarily due to the 'pumping trough' formed by the Burbank OU and North Hollywood Well Field extractions.

Plate 6: Simulated Groundwater Flow Direction Model Layer 2 – Fall 2010

- Similar to Plate 5, a groundwater divide forms between the Verdugo Wells and the Burbank OU, Erwin and Whitnall Wells. The effect of the Rinaldi-Toluca, North Hollywood, and Burbank OU pumping creates the most significant impact to the natural direction of groundwater movement.

Plates 7 – 10: Simulated Groundwater Flow Direction and TCE, PCE, and NO_3, and Chromium Contamination Model Layer 1 – Fall 2010

- Plates 7-10 depict the most recent TCE, PCE, NO_3 and Cr contaminant plumes that are superimposed onto the horizontal direction of groundwater movement for Layer 1, Fall 2010. The Burbank OU appears to contain the 1,000 to 5,000 µg/L TCE and PCE plumes and a large portion of the 500 – 1,000 µg/L TCE and PCE plumes. The uncaptured portion of these plumes will migrate southeasterly in the direction of the Los Angeles River Narrows area and toward the Glendale OU.

- The Burbank OU pumping (11,000 AF/Y) tends to flatten the horizontal gradient in a southeasterly direction and slows the natural movement of groundwater southeasterly of the Burbank OU area plume.

- The Glendale North and South OU Wells capture a portion of the plumes uncaptured by Burbank OU Wells.

- The Pollock Wells (2,000 AF/Y) have a less pronounced effect on Layer 1 because 75 percent of the Pollock pumping originates from Layer 2.

- Plate 9 (NO_3 contamination) indicates that Layer 1 extractions by the Burbank and Glendale OU facilities may be impacted by NO_3.

- Plate 10 (Total Dissolved Chromium) indicates that Layer 1 extractions by North Hollywood OU, Burbank OU, and Glendale OU facilities may be impacted by chromium contamination.

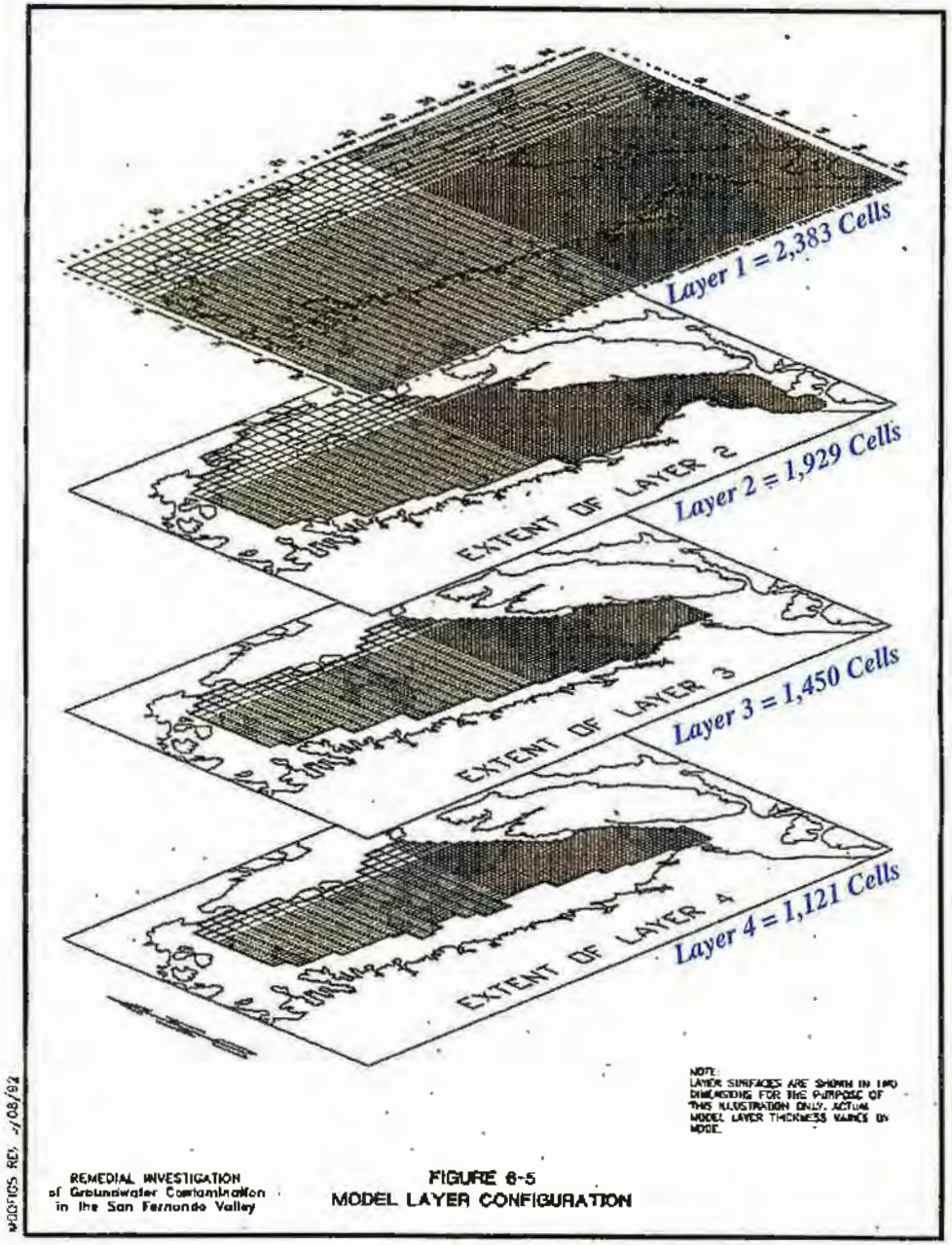
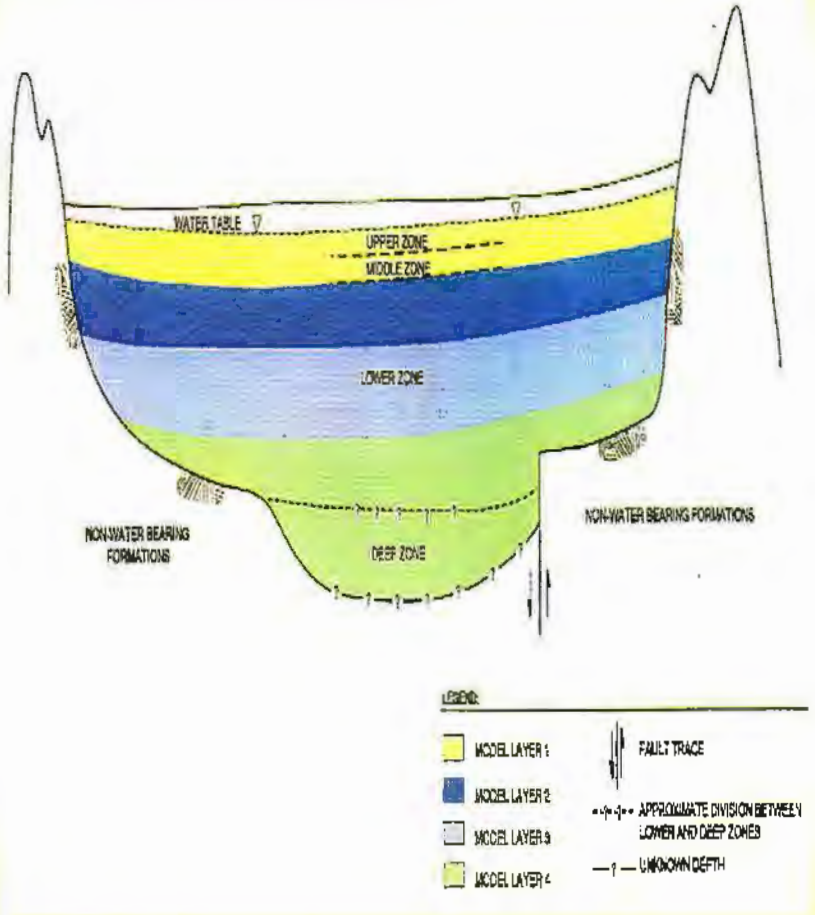


Figure 7.1
Model Layers and Cell Configurations



Source: Remedial Investigation Report of Groundwater Contamination in the San Fernando Valley, December 1992

TABLE 7-1
MODEL INPUT
Pumping and Spreading Scenario
Water Years 2005 - 2010

Table 7-1A

	SAN FERNANDO BASIN RECHARGE (AF/Y)																	
	RAINFALL (IN/Y)		PERCOLATION (A)			H&M (B)	SPREADING GROUNDS (B)							SUB-SURFACE INFLOW (B)				
WATER YEAR	VALLEY	HILL & MTN	VALLEY FILL	RETURN WATER	SUB TOTAL	HILL & MTN	BRANFORD	HANSEN	HW	LOPEZ	PACOIMA	TUJUNGA	SUB-TOTAL	PACOIMA	SYLMAR	VERDUGO	SUB-TOTAL	TOTAL RECHARGE
2005-06	13.00	16.70	9,031	55,757	64,788	2,852	535	16,753	-	426	10,924	12,146	40,784	350	400	70	820	109,244
2006-07	18.57	23.06	12,874	55,085	67,959	3,939	438	12,973	-	579	11,177	6,696	31,863	350	400	70	820	104,581
2007-08	18.57	23.06	12,874	55,085	67,959	3,939	438	12,973	-	579	12,127	6,696	32,813	350	400	70	820	105,531
2008-09	18.57	23.06	12,874	55,085	67,959	3,939	438	12,973	-	579	12,327	6,696	33,013	350	400	70	820	105,731
2009-10	18.57	23.06	12,874	55,085	67,959	3,939	438	12,973	-	579	12,327	6,696	33,013	350	400	70	820	105,731

Table 7-1B

	SAN FERNANDO BASIN EXTRACTION (AF/Y)																	
	LADWP (C)										BURBANK (C)			GLENDALE (C)			OTHERS (C)		
WATER YEAR	AE	EW	HW	NH	PO	RT	TJ	VD	WH	TOTAL LADWP	GAC	BOU	NON-BURBANK (VMP)	CITY OF GLENDALE	OU-NORTH	OU-SOUTH	TOTAL NON-LADWP	TOTAL NON-GLENDALE (E. LAWN)	TOTAL EXTRACTION
2005-06	-1,686	-1,571	0	-11,167	-1,845	-12,548	-9,557	-2,690	-1,408	-42,472		-9,161	-300	-25	-5,184	-2,016	-1,494	-400	-61,052
2006-07	-1,500	-2,886	0	-22,408	-2,000	-27,134	-23,413	-4,905	-2,754	-87,000	0	-10,162	-300	-25	-5,184	-2,016	-1,494	-400	-106,581
2007-08	-1,500	-2,886	0	-22,408	-2,000	-27,134	-23,413	-4,905	-2,754	-87,000	0	-11,000	-300	-25	-5,184	-2,016	-1,494	-400	-107,419
2008-09	-1,500	-2,886	0	-22,408	-2,000	-27,134	-23,413	-4,905	-2,754	-87,000	0	-11,000	-300	-25	-5,184	-2,016	-1,494	-400	-107,419
2009-10	-1,500	-2,886	0	-22,408	-2,000	-27,134	-23,413	-4,905	-2,754	-87,000	0	-11,000	-300	-25	-5,184	-2,016	-1,494	-400	-107,419

NOTES: (A) Model Recharge Package (Aerial)
(B) Model Well Package (Source)
(C) Model Well Package (Sink)

PROJECT: *WATERMASTER*
PROJECT NO.: *PS05-10*
DATE: 6/5/2006

VIII. WATERMASTER'S EVALUATION AND RECOMMENDATIONS

The Watermaster is encouraged by the five year projected pumping and spreading plan because of the progress of the groundwater cleanup program which has restored Burbank's and Glendale's groundwater pumping capability in the San Fernando Basin. Unfortunately, during the past several years hexavalent chromium contamination has become an issue that may adversely affect existing treatment facilities. The Watermaster is concerned that chromium contamination near the Glendale OU, Burbank OU, and the North Hollywood OU could eventually overwhelm the cities' abilities to blend the treated groundwater to acceptable levels. If that happens, the cities may be forced to reduce the treatment rate or shut down the facilities, which could adversely impact VOC containment and removal.

In order to avoid this potential conflict, the Watermaster continues to recommend an assertive approach by the USEPA to add chromium to the list of contaminants that must be cleaned up by the Responsible Parties, and by the RWQCB to issue and enforce Cleanup and Abatement Orders.

The Watermaster continues to be concerned about a general long-term decline in San Fernando Basin groundwater levels since the early 1980s combined with an accumulated 410,033 AF of stored water credits. Probable causes include continued heavy pumping and reduced recharge of the groundwater aquifer. However, basin recharge is projected to exceed extractions by 40,928 AF over the next five years. The Watermaster will continue to monitor the situation closely and will seek the advice and guidance of the Parties to the Judgment in reversing this decline.

City of Los Angeles

Los Angeles' projected average annual pumping from the SFB will be approximately 78,095 AF/Y for Water Years 2005-06 to 2009-10. This is approximately 1,484 AF/Y less than the 1979-2005 average but 13,432 AF/Y more than the average over the last five years (2000-2005). As of October 1, 2005 Los Angeles' accumulated stored water credit was 325,739 AF in the SFB.

The loss in the 1980s of Burbank's and Glendale's wells and Los Angeles' Headworks, Crystal Springs, and Pollock Well Fields due to VOC contamination caused increased rising groundwater levels in the Los Angeles River Narrows area. The Watermaster is pleased by the partial restoration of pumping in this area by the Pollock Wells Treatment Plant, and encourages Los Angeles to operate this facility at least 2,000 AF/Y to minimize the loss of water from ULARA due to underflow and excess rising groundwater.

In the Sylmar Basin, Los Angeles plans to pump an average of 3,949 AF/Y for Water Years 2005-06 through 2009-10. This represents an increase of 1,060 AF/Y over the long-term average (1979-2005), and is also higher than the average of 2,308 AF/Y during the past five years (2000-2005). As of October 1, 2005 Los Angeles' stored water credits were 8,448 AF in the Sylmar Basin.

City of Burbank

Burbank plans to pump an average of 10,765 AF/Y over the next five years. The Watermaster is pleased that Burbank's pumping capability has been restored through the construction of the Burbank OU. However, Burbank's stored water credit is showing the impact of this pumping, dropping from 50,771 AF on October 1, 1999 to 20,191 AF on October 1, 2005. At current pumping rates Burbank's stored water will be depleted in a few years, eventually requiring arrangements to purchase or replace extractions that are in excess of Burbank's return flow credits and physical solution purchase rights. The Watermaster strongly supports Burbank's proposed plan to import approximately 6,000 AF/Y through MWD's Foothill Feeder Tunnel and spread it at Pacoima Spreading Grounds.

City of Glendale

Glendale plans to pump an average of 7,625 AF/Y from the SFB. Since its start-up on September 26, 2000, the Glendale OU has pumped and treated approximately 39,682 AF from the SFB as of May 1, 2006. Glendale's stored water credits are 64,103 AF as of October 1, 2005.

In the Verdugo Basin, Glendale expects to pump an average of 3,685 AF/Y for the next five years. The long-term average (1979-2006) is 2,267 AF/Y, and the five-year average (2000-2005) is 2,089 AF/Y.

City of San Fernando

San Fernando expects to pump an average of 3,100 AF/Y over the next five years from the Sylmar Basin. The long-term average (1979-2005) is 3,081 AF/Y, and the five year average (2000-2005) is 3,483 AF/Y. As of October 1, 2005 San Fernando's stored water credit was 339 AF in the Sylmar Basin.

Crescenta Valley Water District (CVWD)

CVWD expects to pump an average of 3,294 AF/Y during the next five years. The long-term average (1979-2005) is 2,793 AF/Y, and the five-year average (2000-2005) is 3,080 AF/Y. Declining groundwater levels in the Verdugo Basin have limited CVWD's pumping in recent years. However, groundwater levels have started to rebound due to above-normal rainfall and

recharge during the 2004-05 Water Year. CVWD will be investigating areas within the basin for artificial stormwater recharge over the next few years.

Model Simulation

The model simulations indicate that a significant portion of the TCE and PCE contamination plumes in the Burbank area will be captured by the Burbank OU wells. The remaining uncaptured portion will migrate toward the Los Angeles River Narrows area, where the Glendale OU and the Pollock Wells Treatment Plant will capture much of this remaining contamination.

The model predicts a minor increase in groundwater elevation in the SFB during the first year of simulation for Water Year 2005-06. For the projected Water Years of 2006-07 to 2009-10 the model results show a minor decline in water levels in the vicinity of the pumping well fields and downgradient of the HSG. In Model Layer 1, the water table decreases approximately eight feet near the Rinaldi-Toluca Well Field, two feet near the North Hollywood Well Field, two feet near the Burbank OU and one foot near the Glendale North and South OU Well Fields. The area west of the 405 Freeway and in the vicinity of the PSG and upgradient of the HSG shows a minor increase in groundwater elevations. The water table upgradient of the Tujunga and Rinaldi-Toluca Well Fields rises approximately ten feet due to the projected recharge by the City of Burbank at the PSG.

Pacoima Area Contamination

The Pacoima area groundwater contamination concerns the Watermaster because it is only 2.5 miles upgradient of the Tujunga Well Field. The Watermaster continues to urge the DTSC and RWQCB to expedite the investigation and cleanup of these VOC plumes.

Tujunga Spreading Grounds

The Watermaster continues to recommend implementing without further delay the program to control methane gas migration from the Sheldon-Arleta Landfill. The goal of this project is to restore Tujunga Spreading Grounds to its historic capacity of 250 cfs. Until this project is completed, stormwater runoff will continue to be wasted unnecessarily, especially during normal to above-normal rainfall years.

Boulevard Pit and Sheldon Pit

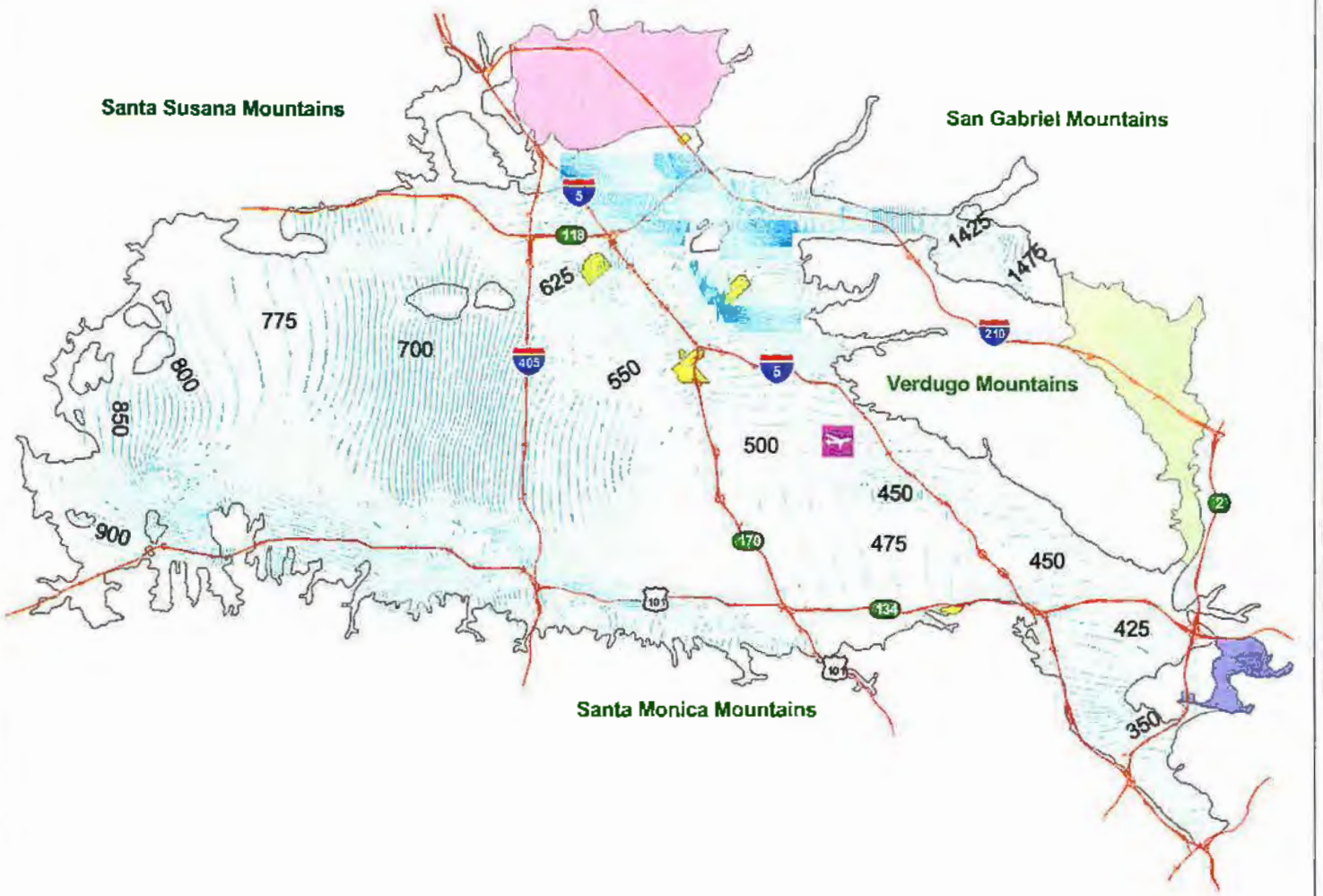
The Boulevard Pit and Sheldon Pit are owned by Vulcan Materials. The Watermaster encourages LADWP and LACDPW to continue investigating the potential for obtaining these properties and converting them to stormwater spreading and/or storage facilities. These facilities could provide significant new opportunities to enhance basin recharge for the City of Los

Angeles and provide additional flood protection for the County, especially during above-normal rainfall events.

PLATES

PLATE 1

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2005 - 2010 Water Years



LEGEND

- Groundwater Contour
- Spreading Grounds
- Bob Hope Airport

Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

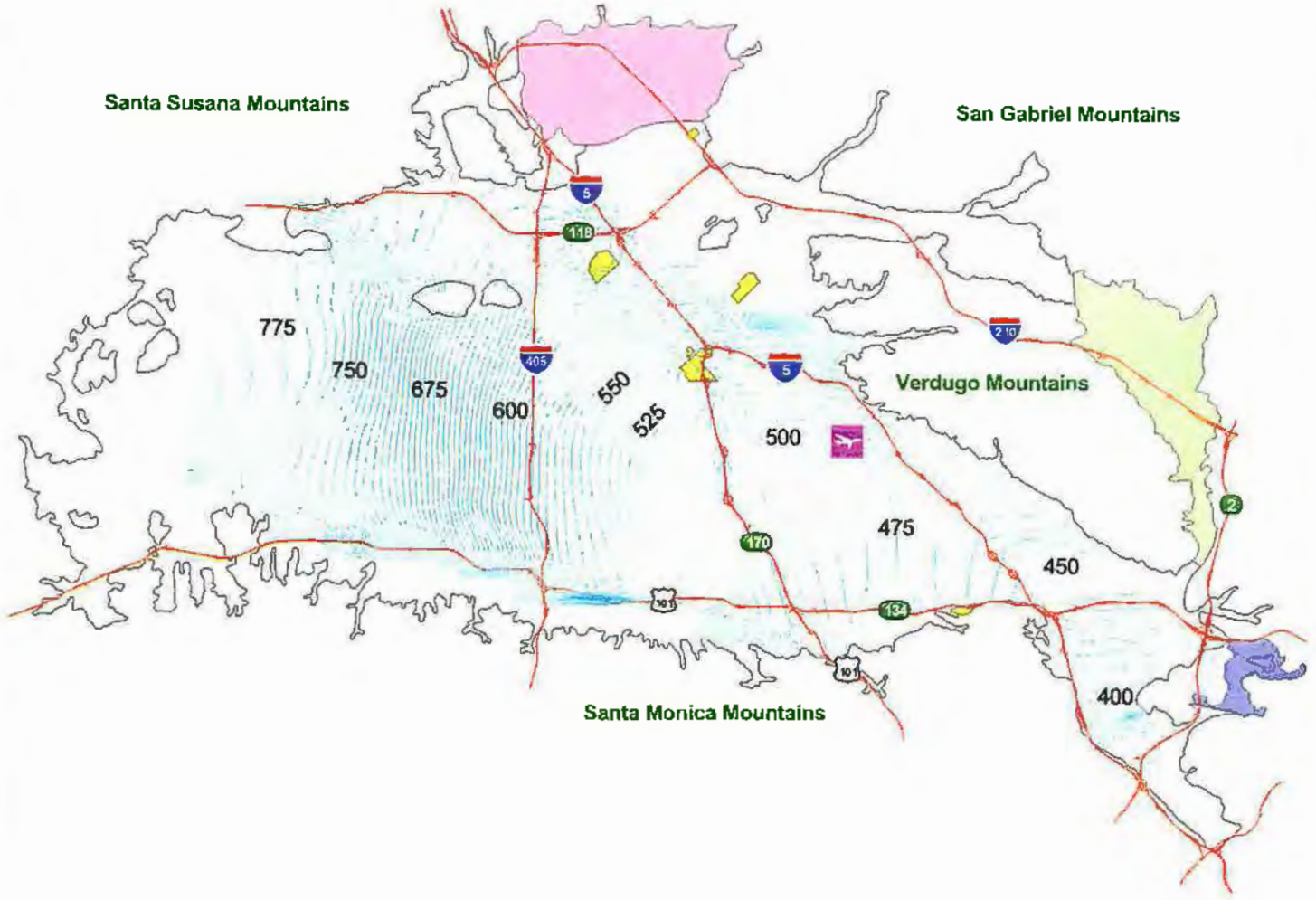
N

2 0 2 Miles

Simulated Groundwater Contours - Model Layer 1
FALL 2010

PLATE 2

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2005 - 2010 Water Years



LEGEND

- Groundwater Contour
- Spreading Grounds
- Bob Hope Airport

Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

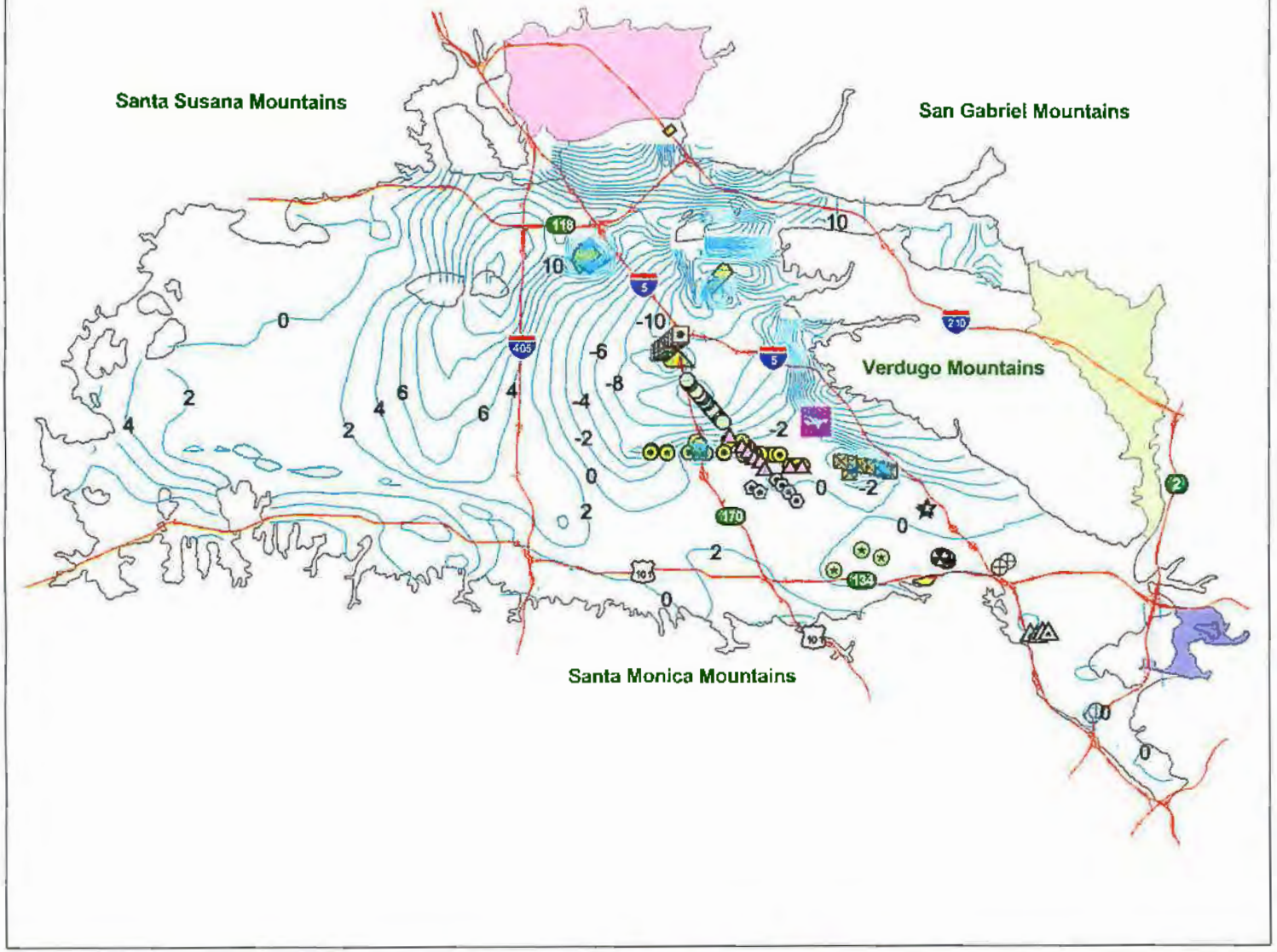
N

2 0 2 Miles

Simulated Groundwater Contours - Model Layer 2
FALL 2010

PLATE 3

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2005 - 2010 Water Years



LEGEND

Well Fields

- Burbank OU
- Glendale North OU
- Glendale South OU
- Burbank GAC
- Headworks
- North Hollywood OU
- Pollock
- Tujunga
- Rinaldi - Toluca
- North Hollywood
- Whitnall
- Erwin
- Verdugo
- Change in GW Elev.
- Spreading Grounds
- Bob Hope Airport

Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

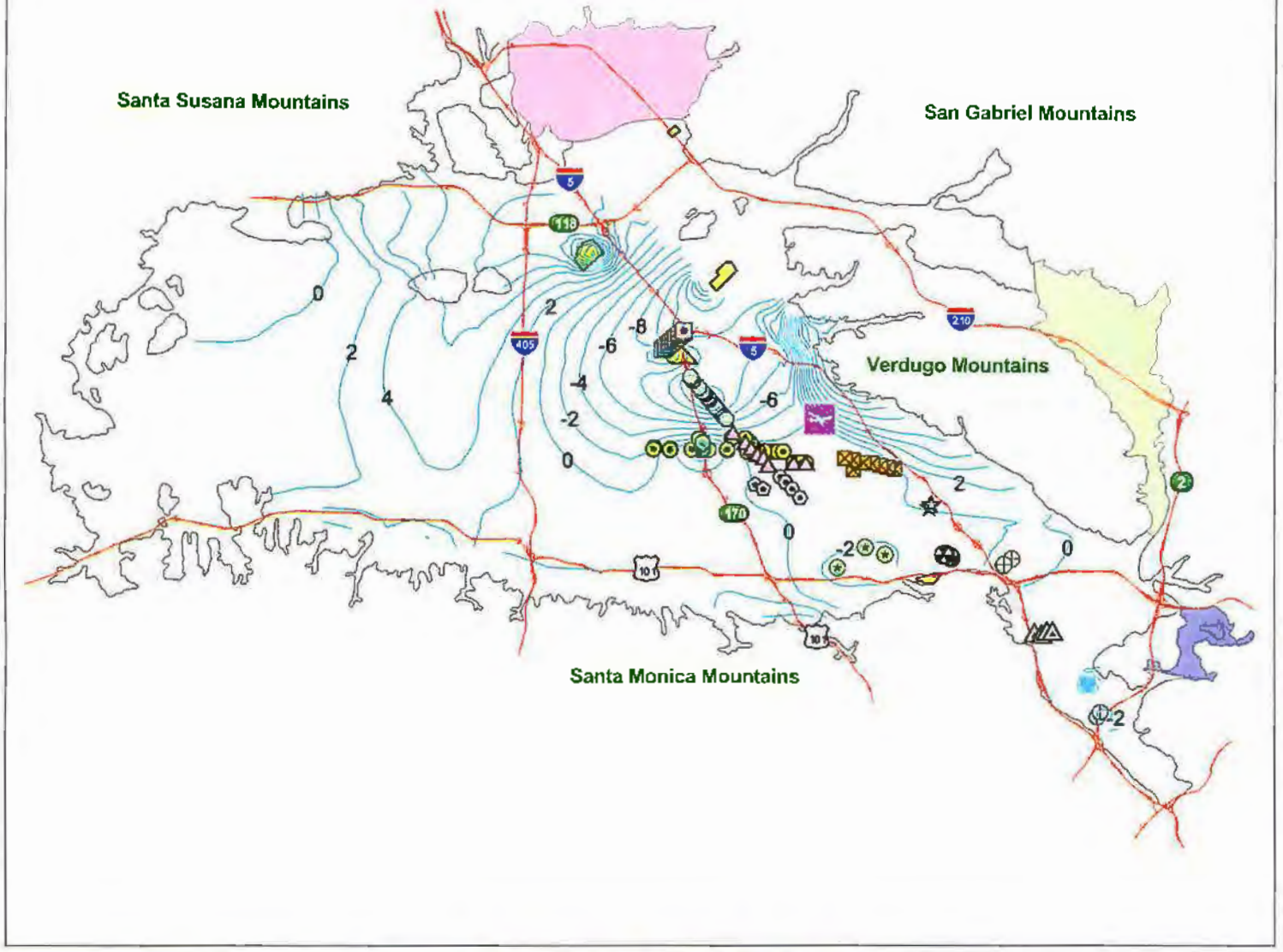
N

2 0 2 Miles

Change in Groundwater Elevation - Model Layer 1
Fall 2005 - Fall 2010

PLATE 4

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2005 - 2010 Water Years



LEGEND

Well Fields

- Burbank OU
- Glendale North OU
- Glendale South OU
- Burbank GAC
- Headworks
- North Hollywood OU
- Pollock
- Tujunga
- Rinaldi - Toluca
- North Hollywood
- Whitnall
- Erwin
- Verdugo

Change in GW Elev.

Spreading Grounds

Bob Hope Airport

Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

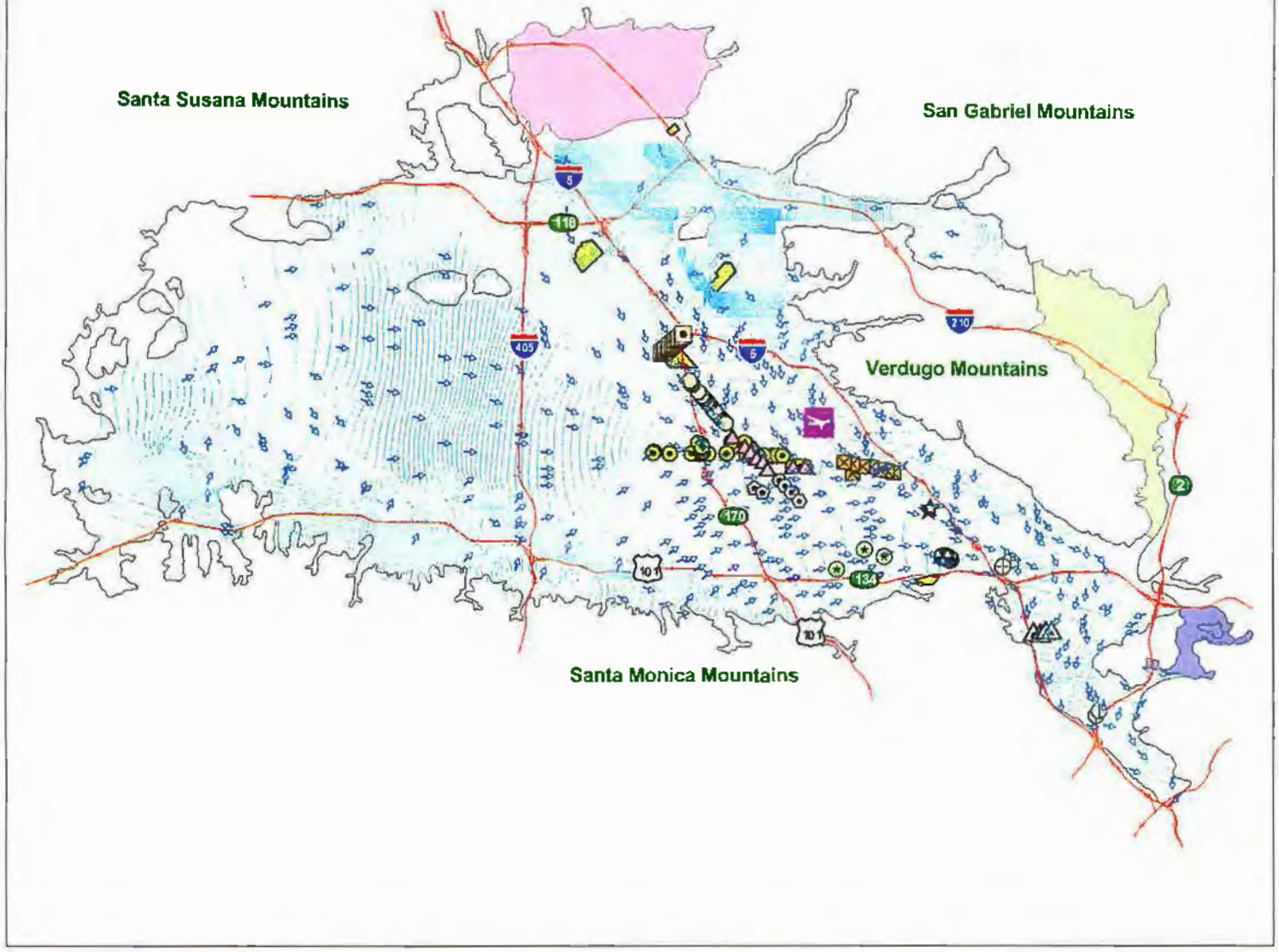
N

2 0 2 Miles

Change in Groundwater Elevation - Model Layer 2
Fall 2005 - Fall 2010

PLATE 5

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2005 - 2010 Water Years



LEGEND

Well Fields

- Burbank OU
- Glendale North OU
- Glendale South OU
- Burbank GAC
- Headworks
- North Hollywood OU
- Pollock
- Tujunga
- Rinaldi - Toluca
- North Hollywood
- Whitnall
- Erwin
- Verdugo

Groundwater Flow Direction

Groundwater Contour

Spreading Grounds

Bob Hope Airport

Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

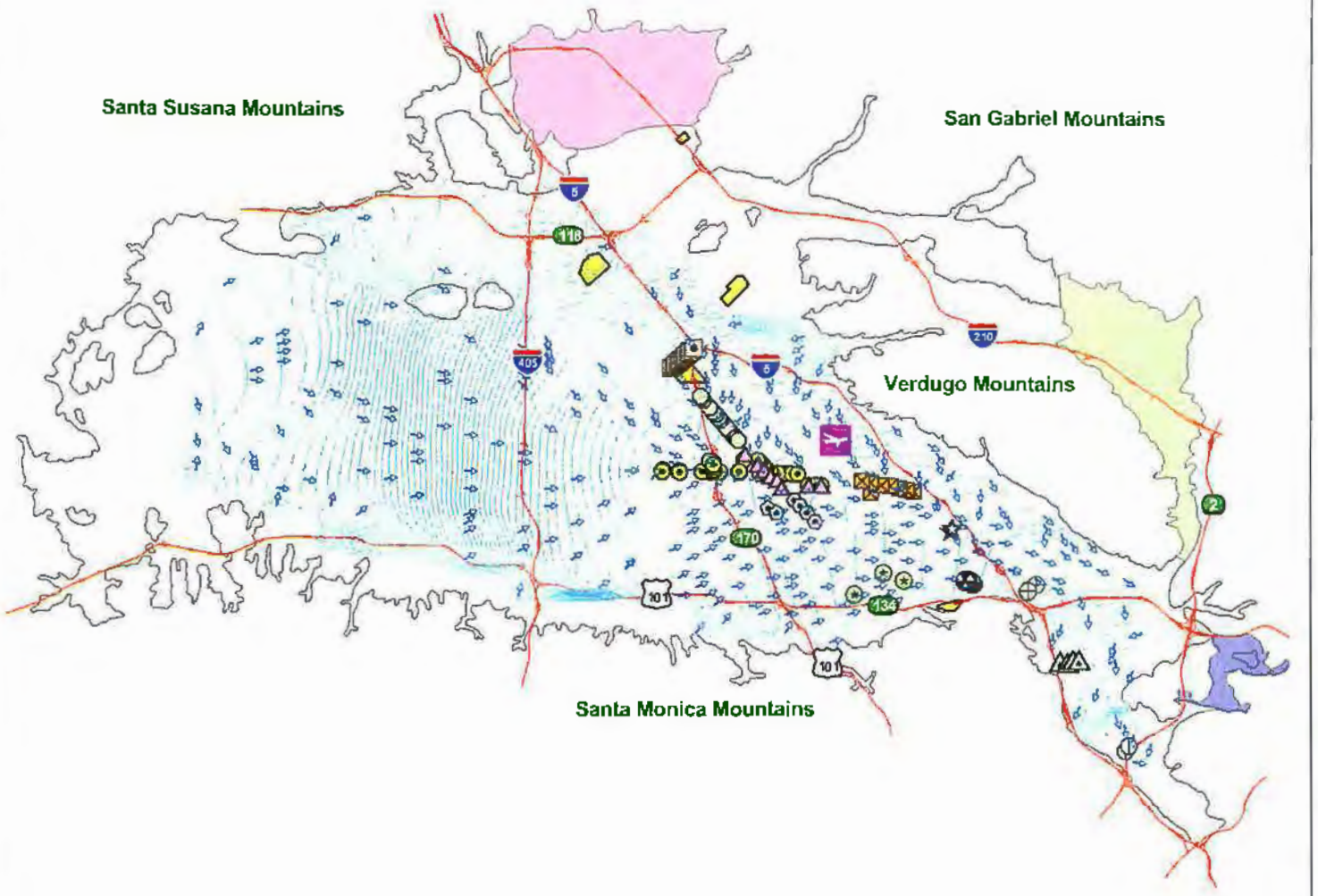
N

2 0 2 Miles

Simulated Groundwater Flow Direction - Model Layer 1
FALL 2010

PLATE 6

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2005 - 2010 Water Years



LEGEND

Well Fields

- Burbank OU
- Glendale North OU
- Glendale South OU
- Burbank GAC
- Headworks
- North Hollywood OU
- Pollock
- Tujunga
- Rinaldi - Toluca
- North Hollywood
- Whitnall
- Erwin
- Verdugo

Groundwater Flow Direction

Groundwater Contour

Spreading Grounds

Bob Hope Airport

Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

N

2 0 2 Miles

Simulated Groundwater Flow Direction - Model Layer 2
FALL 2010

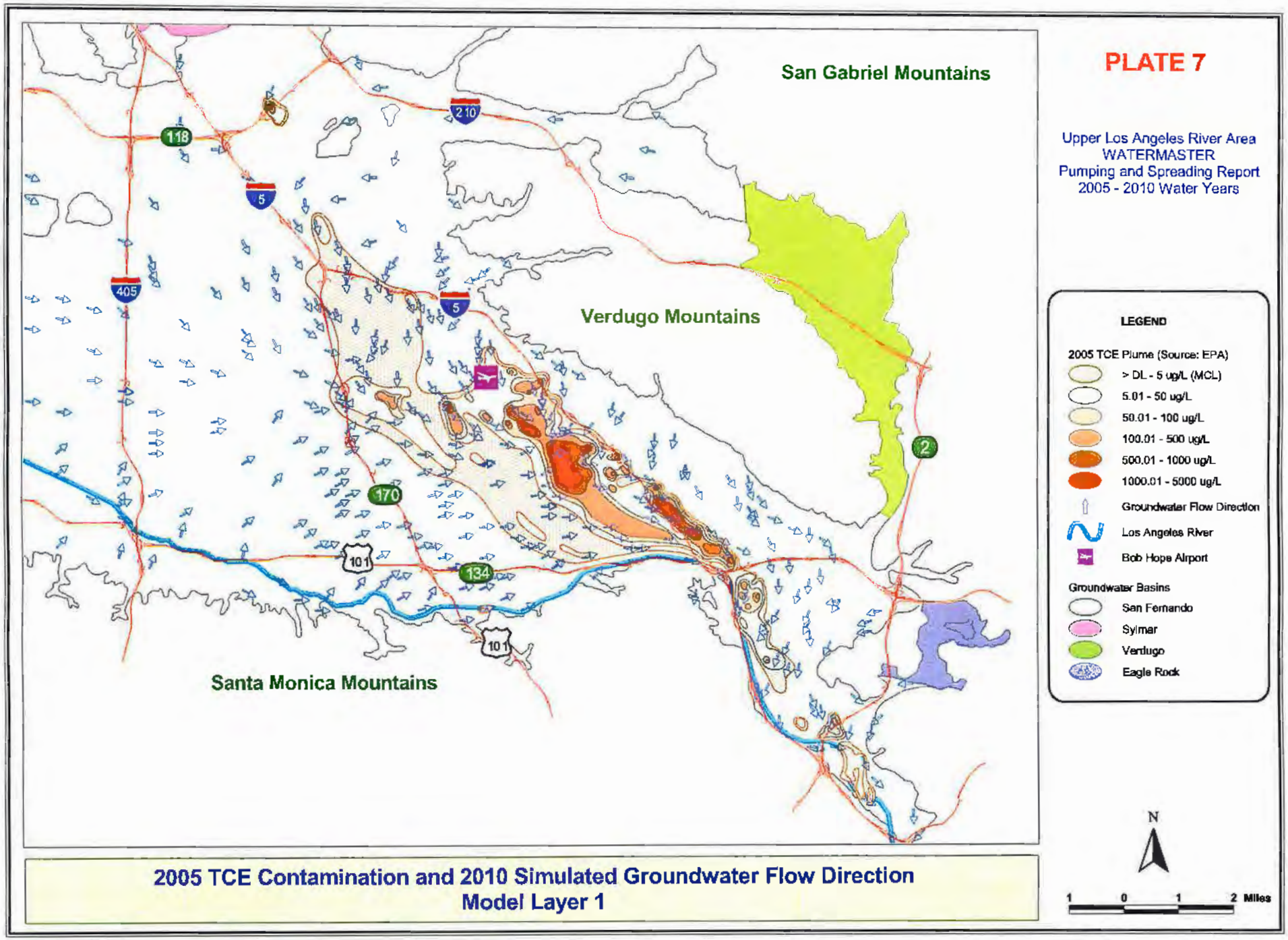


PLATE 7
Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2005 - 2010 Water Years
San Gabriel Mountains
Verdugo Mountains
Santa Monica Mountains
118
210
5
405
170
101
134
2
LEGEND
2005 TCE Plume (Source: EPA)
> DL - 5 ug/L (MCL)
5.01 - 50 ug/L
50.01 - 100 ug/L
100.01 - 500 ug/L
500.01 - 1000 ug/L
1000.01 - 5000 ug/L
Groundwater Flow Direction
Los Angeles River
Bob Hope Airport
Groundwater Basins
San Fernando
Sylmar
Verdugo
Eagle Rock
N
1 0 1 2 Miles
2005 TCE Contamination and 2010 Simulated Groundwater Flow Direction
Model Layer 1

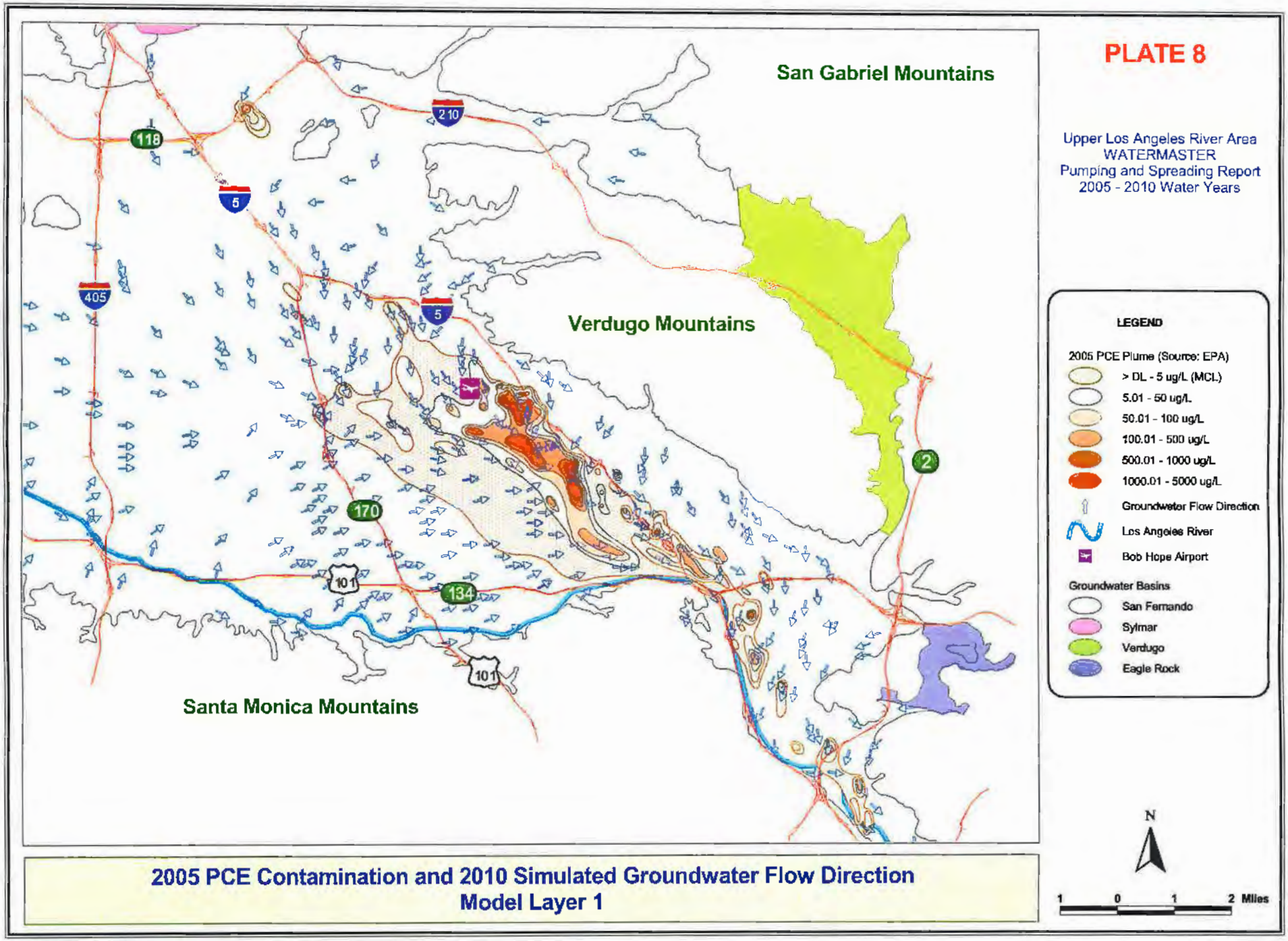
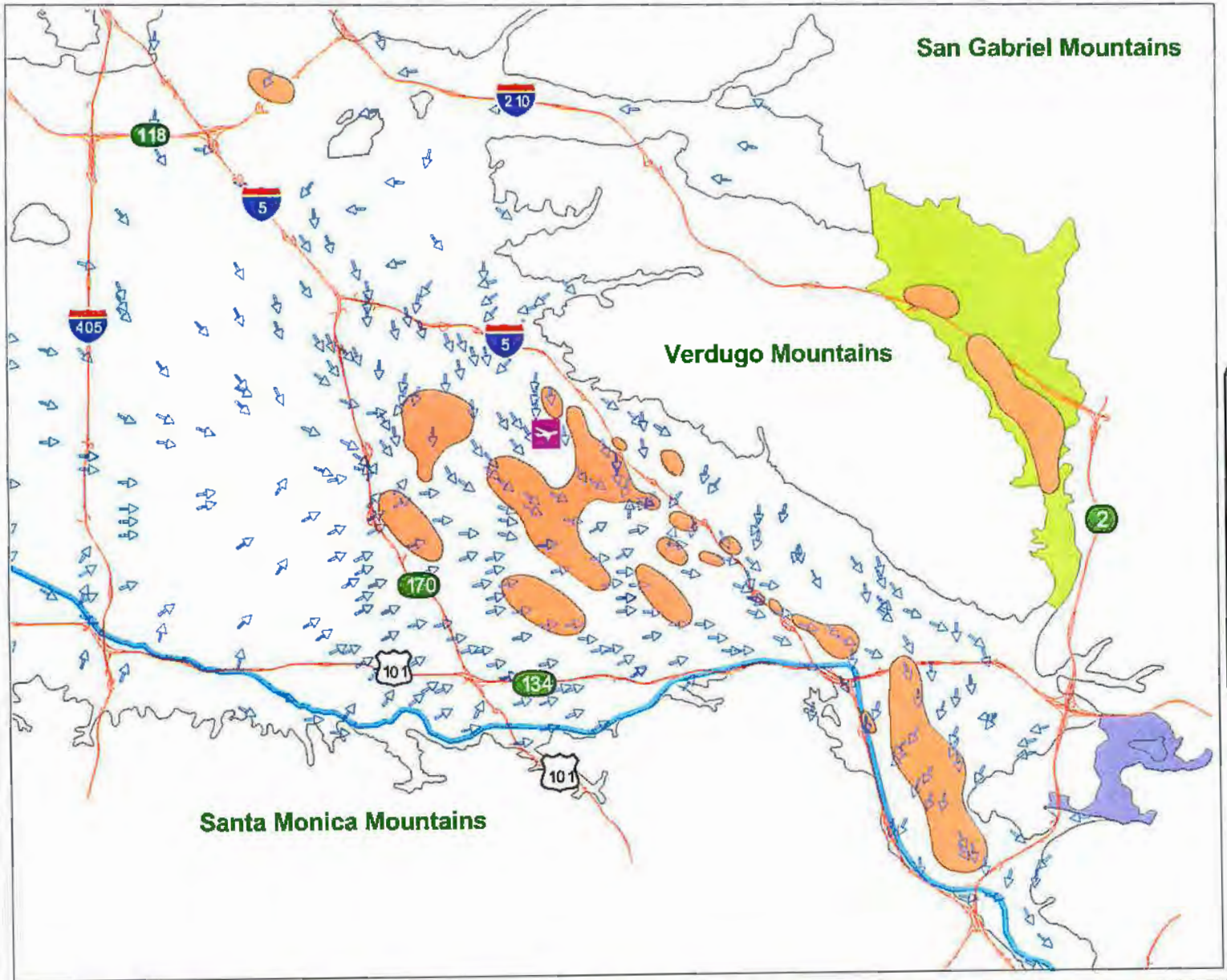


PLATE 8
Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2005 - 2010 Water Years
San Gabriel Mountains
Verdugo Mountains
Santa Monica Mountains
LEGEND
2005 PCE Plume (Source: EPA)
> DL - 5 ug/L (MCL)
5.01 - 50 ug/L
50.01 - 100 ug/L
100.01 - 500 ug/L
500.01 - 1000 ug/L
1000.01 - 5000 ug/L
Groundwater Flow Direction
Los Angeles River
Bob Hope Airport
Groundwater Basins
San Fernando
Sylmar
Verdugo
Eagle Rock
N
1 0 1 2 Miles
2005 PCE Contamination and 2010 Simulated Groundwater Flow Direction
Model Layer 1

PLATE 9

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2005 - 2010 Water Years



LEGEND

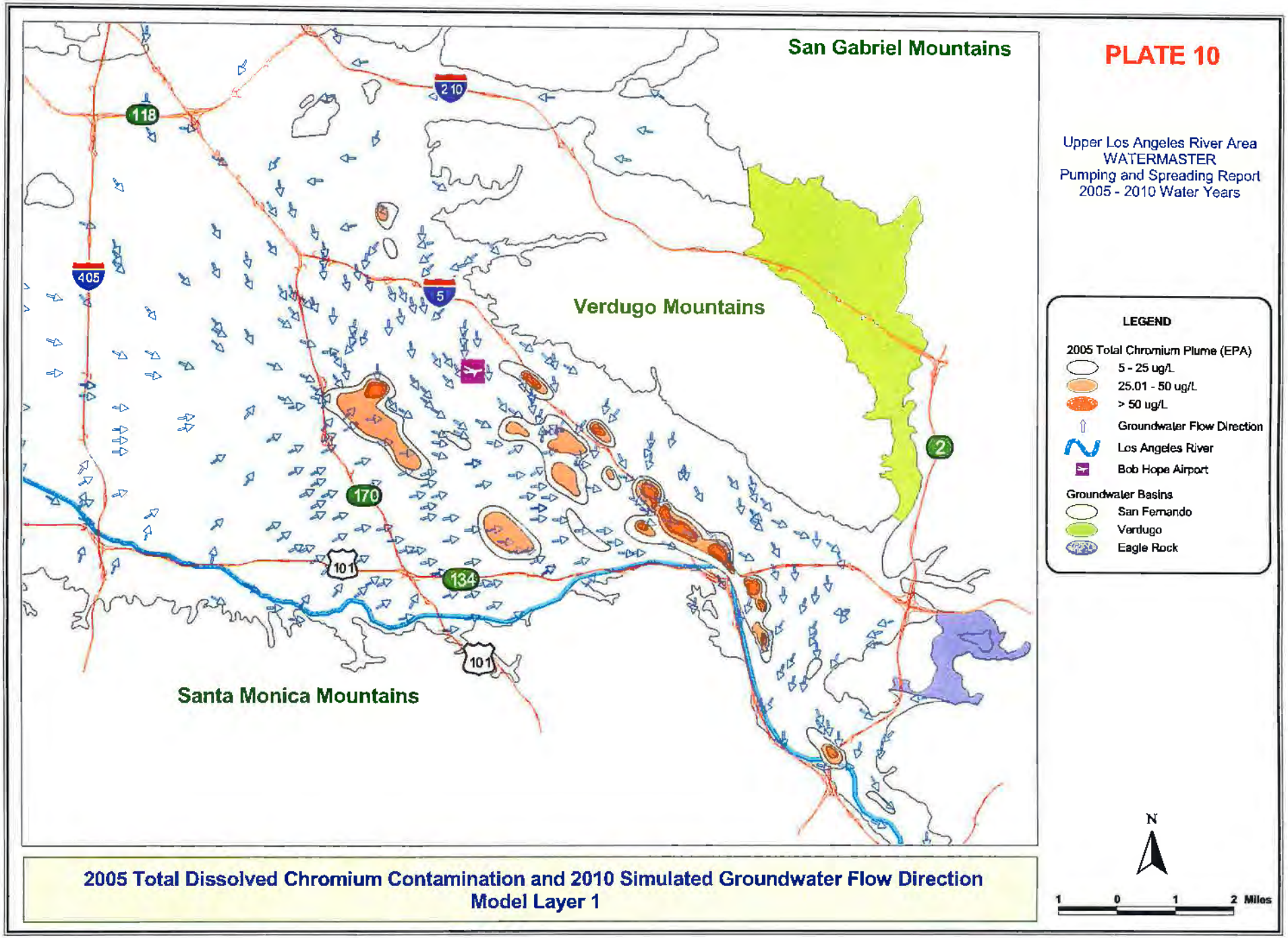
2005 NO3 Plume (Source: EPA)
- Above 45 mg/L
- Groundwater Flow Direction
- Los Angeles River
- Bob Hope Airport

Groundwater Basins
- San Fernando
- Verdugo
- Eagle Rock

N

1 0 1 2 Miles

2005 Nitrate (as NO3) Contamination and 2010 Simulated Groundwater Flow Direction
Model Layer 1



2005 Total Dissolved Chromium Contamination and 2010 Simulated Groundwater Flow Direction
Model Layer 1

APPENDIX A

CITY OF LOS ANGELES

PUMPING AND SPREADING PLAN

2005-2010 Water Years

CITY OF LOS ANGELES
GROUNDWATER PUMPING AND SPREADING PLAN
IN THE UPPER LOS ANGELES RIVER AREA
FOR THE 2005-2010 WATER YEARS

APRIL 2006

Prepared by:
Groundwater Group
WATER RESOURCES BUSINESS UNIT
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 5.4 of the ULARA Policies and Procedures as amended in February 1998, it is stated that:

> *"...all parties or non-parties who pump groundwater are required to submit annual reports by May 1 to the Watermaster that include the following:*
>
> - *A 5-year projection of annual groundwater pumping rates and volumes.*
> - *A 5-year projection of annual spreading rates and volumes.*
> - *The most recent water quality data for each well."*

This report constitutes Los Angeles' 2006 Groundwater Pumping and Spreading Plan for the Water Years 2005 - 2010.

Section 1: Facilities Description

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

a.) Spreading Grounds: There are five spreading ground facilities that can be 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.. 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	7	1,000
Hansen	Shallow basins	105	35,000
Lopez	Shallow basins	12	2,000
Pacoima	Med. depth basins	107	23,000
Operated by LACDPW and LADWP			
Tujunga	Shallow basins	83	43,000
TOTAL:			104,000

b.) Extraction Wells: The LADWP has nine well fields in the San Fernando Basin, and one in the Sylmar Basin. The well fields are shown in Figure 1-1, and their rated capacities are shown in Table 1-2. The rated capacities are approximate as operating capacities vary depending on the water levels. Actual groundwater pumping is dependent on maintenance schedules and water quality for each well.

Table 1-2

Rated Capacities of LADWP Well Fields in ULARA				
Well Field	Number of Wells			Rated Capacity (cfs)
San Fernando Basin	Active	Stand-by	Total	cfs
Aeration	7	---	7	2.4
Crystal Springs (A)	---	---	---	---
Erwin	2	0	2	5
Headworks			---	---
North Hollywood	17	0	17	74.3
Pollock	2	0	2	6.3
Rinaldi-Toluca	15	---	15	108.8
Tujunga	12	---	12	104.6
Verdugo	2	---	2	8.3
Whitnall	4	---	4	19.5
Sylmar Basin				
Mission	2	---	2	6.2
TOTAL	63	0	63	335.4

(A) Wellfield has been abandoned pursuant to sale of property to DreamWorks, Inc.

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.

North Hollywood Groundwater Treatment Facility: This plant was placed into service in December 1989 to treat up to 2,000 gpm of groundwater to remove VOCs by using aeration with granular activated carbon (GAC) for off-gas treatment. This facility is a part of the North Hollywood Operable Unit (NHOU) that also includes a system of shallow wells. The NHOU is financed, in part, by the U.S. Environmental Protection Agency.

Pollock Wells Treatment Plant: This plant was placed into service in March 1999 to remove VOCs from the groundwater at a rate up to 3,000 gpm from the Pollock Well Field. The facility features the use of liquid-phase GAC, restores the use of Pollock Wells, and addresses the excessive rising groundwater discharges from the San Fernando Basin into the Los Angeles River.

Section 2: Annual Pumping And Spreading Projections

a.) Pumping Projections for the Water Years 2005-2010: The City of Los Angeles has the following three sources of water supply: 1.) Los Angeles Aqueduct supply imported from the Owens Valley/Mono Basin area, 2.) Local groundwater supply from the Central, San Fernando, and Sylmar Basins, 3.) Purchased water from the Metropolitan Water District of Southern California (MWD). The MWD sources of supply are the State Water Project and the Colorado River Aqueduct. Use of San Fernando Basin groundwater can fluctuate annually depending on the availability of imported water which varies due to climatic and operational constraints.

The San Fernando Basin and Sylmar Basin provide most of the City's local groundwater supply. The City of Los Angeles has the following average annual water rights which comprise approximately 15% of the City's supply:

San Fernando Basin	87,000 AF
Sylmar Basin	3,255 AF

Table 2-1 shows the amount of groundwater extractions that are expected during the 2005-06 Water Year from the San Fernando and Sylmar Basins. Appendix B provides groundwater extraction projections from 2005 to 2010. These projections are based upon assumed demand and Los Angeles Aqueduct flows, and are subject to yearly adjustments.

Table 2-1

CITY OF LOS ANGELES
ACTUAL AND PROJECTED PUMPING FOR WY 05-06

San Fernando Basin		Actual Extraction (Acre-Feet)						Projected Extraction (Acre-Feet)					
	TOTAL	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06
AERATION	1,686	127	184	151	170	114	105	143	148	143	135	135	131
ERWIN	1,571	71	0	0	42	0	0	0	295	286	295	295	286
HEADWORKS	0	0	0	0	0	0	0	0	0	0	0	0	0
NORTH HOLLYWOOD	11,167	1,347	3	3	0	488	240	0	369	357	2,817	2,817	2,726
POLLOCK	1,845	106	145	177	147	205	12	173	178	173	178	178	173
RINALDI-TOLUCA	12,548	580	357	158	227	1,599	431	298	738	714	2,509	2,509	2,428
TUJUNGA	9,557	843	2	560	221	1,616	0	0	0	0	2,128	2,128	2,059
VERDUGO	2,690	0	0	0	0	0	123	292	461	446	461	461	446
WHITNALL	1,408	1	1	1	38	1	0	0	277	268	277	277	268
SAN FERNANDO BASIN TOTAL:	42,473	3,076	692	1,051	844	4,024	910	906	2,466	2,387	8,800	8,800	8,517
Sylmar Basin													
MISSION	2,366	353	116	0	76	0	0	0	369	357	369	369	357
ULARA TOTAL:	44,839	3,429	808	1,051	920	4,024	910	906	2,835	2,744	9,169	9,169	8,874

b.) Spreading Projections for the 2005-06 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 2005-06.

Table 2-2

Actual and Projected Spreading in ULARA Spreading Grounds in 2005-06 (in acre-feet)						
	Operated by:					
	LACDPW				LACDPW and LADWP	Monthly Total
Month	Branford	Hansen	Lopez	Pacoima	Tujunga	
Oct-05	76	1240	0	225	30	1571
Nov-05	21	1680	88	0	4	1793
Dec-05	51	981	68	133	470	1703
Jan-06	54	2890	0	848	639	4431
Feb-06	76	544	0	470	1660	2750
Mar-06	82	3218	0	1548	3843	8691
Projected						
Apr-06	100	5000	270	2200	5500	13070
May-06	15	600	0	550	0	1165
Jun-06	15	400	0	550	0	965
Jul-06	15	200	0	550	0	765
Aug-06	15	0	0	0	0	15
Sep-06	15	0	0	0	0	15
Total	535	16753	426	7074	12146	36934

Section 3: Water Quality Monitoring Program Description

All of LADWP's 63 active wells in ULARA are monitored in conformance with the requirements set forth in Title 22, California Code of Regulations. For all active wells, monitoring is required whether the well is in production or not. State regulations require the following types of monitoring regimens:

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

Each well, whether on active or standby status, is monitored every three years 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 organic compounds analysis monitoring are performed 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. Appendix A provides a recent report for TCE, PCE, and nitrates in Los Angeles' San Fernando and Sylmar Basins wells.

Section 4: Groundwater Treatment Facilities Operations Summary

North Hollywood Operable Unit (NHOU): In April 2005 the Aeration Facility was shut down to repair a water leak in the chlorinator injectior water service line. Throughout the winter 2006 wells 5, 6, 7 were out of service for various mechnical and electrical problems. Throughout the year there were problems with reduced water table impacting suction at the wells particulary Well No. 4 so that the system could not operate at design capacity.

	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)	(ug/L)	(ug/L)
4/05	127	99	75	46	220	104	244	1055	NS/NS	NS/NS
5/05	128	99	69	43	220	176	244	1193	63.2/9.8	ND/ND
6/05	128	99	102	49	220	219	246	1165	61.7/9.5	ND/ND
7/05	130	139	97	47	221	227	249	1204	70.3/9.8	ND/ND
8/05	130	141	94	49	219	211	248	1069	75.0/10.5	ND/ND
9/05	131	164	94	96	217	210	252	1125	61.7/9.5	ND/ND
10/05	131	198	130	63	217	259	299	1197	84.4/11.4	ND/ND
11/05	139	208	122	62	217	269	258	1461	68.5/8.9	ND/ND
12/05	135	228	161	62	217	289	267	1201	84.3/9.2	ND/ND
1/06	138	227	158	---	217	292	262	1010	73.6/7.73	ND/ND
2/06	140	237	186	---	---	435	266	985	89.6/6.5	ND/ND
3/06	179	232	186	35	---	296	266	1136	95.0/8.7	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 2005-2006 Water Year, as of the printing of this report (April 2006).

a.) Spreading Grounds:. LADWP plans to restore the full groundwater recharge capacity of the Tujunga Spreading Grounds by developing and implementing a mitigation action plan to control the methane gas migration from Sheldon-Arleta Landfill to the local neighborhood as a result of recharge. The Headworks Spreading Grounds is the site of multi-objective projects to improve water quality and storage, and to provide the community with an opportunity for passive recreation. The project includes a buried 110-million gallon reservoir for potable water storage. Construction is planned to commence in January 2007. The other Headworks component is the proposed wetlands project that is a joint effort between LADWP and the Army Corps of Engineers.

b.) Extraction Wells: LADWP is planning to add up to eight new North Hollywood Wells in the west branch to restore diminished capacity resulting from contamination and obsolescence of some existing wells.

c.) Groundwater Treatment Facilities:

North Hollywood Operable Unit. A feasibility study to improve the sustained production capacity of the NHOU well system to 2,000 gpm, to enhance the NHOU capture zone, and to improve the reliability of the NHOU to remain in operation is being reviewed by the USEPA. This plan possibly includes the improving of existing wells to the development of two or three new wells northwesterly of the NHOU. The USEPA, the City of Los Angeles, and the RWQCB are also investigating the source of the hexavalent chromium contamination in the area.

Reclamation Projects in the San Fernando Valley. The LADWP has plans to connect large recycled water customers over the next decade including the Hansen Dam Recreation Area, Valley Generating Station and Angeles National Golf Course in the eastern portion of the *Valley,* and the Sepulveda Basin and Pierce College in the southern portion of the Valley. The present goal is to be able to fully utilize the 10,000 acre feet per year (AF/Y) originally intended for

groundwater recharge as part of the East Valley Water Recycling Project. Tertiary treated recycled water from the Donald C. Tillman Water Reclamation Plant will be used, but only for non-potable projects. The Hansen Area Water Recycling Project Phase I, scheduled to be in service by early 2006.

APPENDIX A:
2005-2006 Water Quality Sampling Results

ULARA WELLS

	Owner Name	Well Name	Well	Date	PCE 5 ppb	TCE 5 ppb	NO3 45 ppm
1	NHE-1	3800E	NH AERATION WELL-001	6/17/98	3.66	240.00	
2	NHE-2	3810U	NH AERATION WELL-002	11/29/05	9.68	288.00	35.00
3	NHE-3	3810V	NH AERATION WELL-003	11/29/05	4.44	15.40	23.70
4	NHE-4	3810W	NH AERATION WELL-004	11/29/05	13.60	31.90	32.40
5	NHE-5	3820H	NH AERATION WELL-005	11/29/05	11.30	18.00	23.50
6	NHE-6	3821J	NH AERATION WELL-006	10/6/05	11.00	16.00	25.70
7	NHE-7	3830P	NH AERATION WELL-007	11/29/05	7.20	108.00	26.70
8	NHE-8	3831K	NH AERATION WELL-008	11/29/05	9.34	32.30	34.60
9	EW-1	3831H	ERWIN-001	10/22/97	0.72	-99.00	
10	EW-2	3821G	ERWIN-002	5/4/95	4.30	13.20	
11	EW-3	3831G	ERWIN-003	7/30/96	1.40	24.00	14.66
12	EW-4	3821F	ERWIN-004	4/7/97	0.60	8.10	4.43
13	EW-6	3821H	ERWIN-006	5/3/05	0.78	2.29	24.80
14	EW-10	3811F	ERWIN-010	11/18/05	-99.00	-99.00	3.81
15	M-5	4840J	MISSION-005		-99.00	5.15	27.60
16	M-6	4840K	MISSION-006	10/5/05	-99.00	-99.00	9.44
17	M-7	4840S	MISSION-007	10/5/05	-99.00	4.48	22.60
18	NH-02	3800	NORTH HOLLYWOOD-002	9/28/99	5.06	38.60	32.40
19	NH-04	3780A	NORTH HOLLYWOOD-004	9/12/05	-99.00	-99.00	8.55
20	NH-07	3770	NORTH HOLLYWOOD-007	11/3/05	-99.00	-99.00	10.50
21	NH-11	3810	NORTH HOLLYWOOD-011	5/4/04	17.70	16.80	25.50
22	NH-15	3790B	NORTH HOLLYWOOD-015				
23	NH-16	3820D	NORTH HOLLYWOOD-016	5/23/96	12.60	2.70	16.30
24	NH-17	3820C	NORTH HOLLYWOOD-017	12/9/97	6.16	1.65	11.92
25	NH-18	3820B	NORTH HOLLYWOOD-018	11/10/99	8.18	83.70	36.90
26	NH-20	3830C	NORTH HOLLYWOOD-020	7/21/99	3.00	9.58	39.50
27	NH-21	3830B	NORTH HOLLYWOOD-021	3/23/01			10.94
28	NH-22	3790C	NORTH HOLLYWOOD-022	9/12/05	-99.00	-99.00	21.60
29	NH-23	3790D	NORTH HOLLYWOOD-023	10/7/05	2.89	8.09	35.60
30	NH-25	3790F	NORTH HOLLYWOOD-025	10/7/05	-99.00	-99.00	18.30
31	NH-26	3790E	NORTH HOLLYWOOD-026	11/22/05	0.70	0.95	11.70
32	NH-27	3820F	NORTH HOLLYWOOD-027	4/23/02	-99.00	-99.00	10.40
33	NH-28	3810K	NORTH HOLLYWOOD-028	5/4/04	18.00	17.00	25.70
34	NH-30	3800D	NORTH HOLLYWOOD-030	6/18/03	1.12	8.08	25.00
35	NH-32	3770C	NORTH HOLLYWOOD-032	11/3/05	-99.00	-99.00	2.00
36	NH-33	3780C	NORTH HOLLYWOOD-033	11/3/05	-99.00	-99.00	3.15
37	NH-34	3790G	NORTH HOLLYWOOD-034	11/9/05	-99.00	-99.00	8.65
38	NH-35	3830N	NORTH HOLLYWOOD-035	11/15/01	2.81	1.22	10.40
39	NH-36	3790H	NORTH HOLLYWOOD-036	8/25/05	-99.00	1.38	16.30
40	NH-37	3790J	NORTH HOLLYWOOD-037	11/22/05	-99.00	-99.00	9.57
41	NH-38	3810M	NORTH HOLLYWOOD-038				
42	NH-39	3810N	NORTH HOLLYWOOD-039				
43	NH-40	3810P	NORTH HOLLYWOOD-040	5/4/04	1.85	1.63	9.30
44	NH-41	3810Q	NORTH HOLLYWOOD-041	5/8/01	5.63	47.20	14.13
45	NH-42	3810R	NORTH HOLLYWOOD-042	5/12/99	5.73	88.50	24.50
46	NH-43A	3790K	NORTH HOLLYWOOD-043A	11/9/05	-99.00	-99.00	8.02
47	NH-44	3790L	NORTH HOLLYWOOD-044	11/9/05	-99.00	-99.00	6.47
48	NH-45	3790M	NORTH HOLLYWOOD-045	11/9/05	-99.00	-99.00	9.92
49	P-4	3959E	POLLOCK-004	4/13/05	2.45	3.61	38.10
50	P-6	3958H	POLLOCK-006	11/15/05	10.10	7.28	35.30

NOTE: -99 = non-detect
- - - = not tested (refer to p.8)
= above MCL

November 2005

	Owner Name	Well Name	Well	Date	PCE 5 ppb	TCE 5 ppb	NO3 45 ppm
51	P-7	3958J	POLLOCK-007	6/2/03	-99.00	-99.00	13.50
52	RT-1	4909E	RINALDI-TOLUCA-001	11/17/05	-99.00	2.09	10.10
53	RT-2	4898A	RINALDI-TOLUCA-002	11/17/05	-99.00	-99.00	13.20
54	RT-3	4898B	RINALDI-TOLUCA-003	11/22/05	-99.00	-99.00	13.70
55	RT-4	4898C	RINALDI-TOLUCA-004	11/22/05	-99.00	0.50	15.10
56	RT-5	4898D	RINALDI-TOLUCA-005	11/22/05	-99.00	0.66	15.70
57	RT-6	4898E	RINALDI-TOLUCA-006	11/22/05	-99.00	0.56	16.80
58	RT-7	4898F	RINALDI-TOLUCA-007	11/16/05	-99.00	0.93	17.80
59	RT-8	4898G	RINALDI-TOLUCA-008	11/16/05	-99.00	-99.00	16.20
60	RT-9	4898H	RINALDI-TOLUCA-009	11/16/05	-99.00	-99.00	14.40
61	RT-10	4909G	RINALDI-TOLUCA-010	11/17/05	-99.00	4.61	12.30
62	RT-11	4909K	RINALDI-TOLUCA-011	11/17/05	-99.00	0.51	8.20
63	RT-12	4909H	RINALDI-TOLUCA-012	11/17/05	-99.00	-99.00	8.46
64	RT-13	4909J	RINALDI-TOLUCA-013	11/17/05	-99.00	-99.00	7.97
65	RT-14	4909L	RINALDI-TOLUCA-014	11/17/05	1.50	6.40	11.70
66	RT-15	4909M	RINALDI-TOLUCA-015	11/17/05	-99.00	-99.00	7.35
67	TJ-01	4887C	TUJUNGA-001	11/23/05	-99.00	-99.00	8.95
68	TJ-02	4887D	TUJUNGA-002	10/18/05	-99.00	-99.00	13.90
69	TJ-03	4887E	TUJUNGA-003	9/8/05	3.55	5.45	16.00
70	TJ-04	4887F	TUJUNGA-004	11/23/05	4.76	7.07	14.50
71	TJ-05	4887G	TUJUNGA-005	11/23/05	8.47	11.70	18.20
72	TJ-06	4887H	TUJUNGA-006	11/23/05	3.66	4.96	12.50
73	TJ-07	4887J	TUJUNGA-007	1/12/05	3.28	15.90	45.60
74	TJ-08	4887K	TUJUNGA-008	11/23/05	3.41	3.75	13.40
75	TJ-09	4886B	TUJUNGA-009	11/23/05	0.68	1.23	14.10
76	TJ-10	4886C	TUJUNGA-010	11/23/05	0.69	1.91	12.30
77	TJ-11	4886D	TUJUNGA-011	11/23/05	1.22	3.97	14.30
78	TJ-12	4886E	TUJUNGA-012	11/23/05	-99.00	6.43	8.20
79	V-1	3863H	VERDUGO-001	8/3/05	0.54	0.95	3.65
80	V-2	3863P	VERDUGO-002	2/26/03	0.78	18.30	38.70
80	V-2	3853F	VERDUGO-002	3/21/03	-99.00	3.60	36.10
81	V-4	3863J	VERDUGO-004	1/13/98	6.47	17.90	1.92
82	V-11	3863L	VERDUGO-011	5/12/05	-99.00	-99.00	9.13
83	V-13	3853G	VERDUGO-013				
84	V-24	3844R	VERDUGO-024	8/16/05	-99.00	-99.00	7.93
85	WH-4	3821D	WHITNALL-004	11/10/05	0.55	0.96	10.30
86	WH-5	3821E	WHITNALL-005	11/10/05	2.81	8.62	16.00
87	WH-6A	3831J	WHITNALL-006A	11/10/05	-99.00	-99.00	2.44
88	WH-7	3832K	WHITNALL-007	11/10/05	-99.00	1.56	3.50
89	WH-8	3832L	WHITNALL-008	10/22/96	4.60	10.20	
90	WH-9	3832M	WHITNALL-009				

NOTE: -99 = non-detect
--- = not tested (refer to p.8)
= above MCL

APPENDIX B:
Groundwater Extraction Projections 2005-2010

PROJECTED PUMPING BY THE CITY OF LOS ANGELES IN THE SAN FERNANDO BASIN FOR THE NEXT 5 YEARS (IN ACRE-FEET)

WELL FIELD	WATER YEAR				
	2005-06	2006-07	2007-08	2008-09	2009-10
AERATION	1,686	1,500	1,500	1,500	1,500
ERWIN	1,571	2,886	2,886	2,886	2,886
HEADWORKS	0	0	0	0	0
NO HOLLYWOOD	11,167	22,408	22,408	22,408	22,408
POLLOCK	1,845	2,000	2,000	2,000	2,000
RINALDI-TOLUCA	12,548	27,134	27,134	27,134	27,134
TUJUNGA	9,557	23,413	23,413	23,413	23,413
VERDUGO	2,690	4,905	4,905	4,905	4,905
WHITNAL	1,408	2,754	2,754	2,754	2,754
TOTAL ACRE-FEET	42,473	87,000	87,000	87,000	87,000

Sylmar Basin	2,366	4,345	4,345	4,345	4,345

APPENDIX B

CITY OF BURBANK

PUMPING AND SPREADING PLAN

2005-2010 Water Years

GROUNDWATER PUMPING AND SPREADING PLAN

FIVE WATER YEARS
OCTOBER 1, 2005 TO SEPTEMBER 30, 2010

Prepared by

BURBANK WATER AND POWER
WATER DIVISION

May 2006

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APPENDICES

I. INTRODUCTION

The groundwater rights of the City of Burbank are 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.

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 Burbank will be submitted in May to the Watermaster for the current water year.

II. WATER DEMAND

The annual total water demand for the last ten years and the projected annual water demand for the next five years are 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.

Potable water demand is expected to increase only one percent per year for the next five years. The increase is mostly from multifamily residential and commercial redevelopment with increased density. The projected water demand may vary significantly due to weather and/or economic conditions in the Burbank area. A variance of ±5% may be expected. Recycled water use increased when the Magnolia Power Project began operation in September 2005.

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 recycled water from the Burbank Water Reclamation Plant.

A. MWD

The amount of treated water purchased from the MWD has been reduced as the result of bringing several water resource projects on-line. Burbank may purchase 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. GAC TREATMENT PLANT

The City placed a granular activated carbon (GAC) Treatment Plant in service in November 1992. Historic and projected production from this plant is shown in Table 3.2. The GAC Treatment Plant would normally be operated during the summer season from May to October. However, current plans are to keep the plant shut down, except for emergencies, because of hexavalent chromium in the well water. The GAC treatment process does not remove chromium, and blending facilities are not available. Total chromium in the plant effluent would exceed the limit of five parts per billion (ppb) set by Burbank City Council policy for water delivered to the distribution system. New chromium regulations (MCL and PHG) due in 2005-06 will lead to decisions on the future use of the water. When the plant is operated, shutdowns for carbon change-out can be expected every two months. Mechanical maintenance will be performed when the plant is out of service during the winter season. The GAC Treatment Plant uses the groundwater produced from Well No. 7 and Well No. 15 (Figure 3.1). The plant capacity is 2,000 gpm.

Additionally, Lockheed Martin has arranged to utilize the capacity of the GAC Treatment Plant to augment the production of the Burbank Operable Unit (BOU) to reach the required annual average of 9,000 gpm. Lockheed Martin will pay a share of the operation and maintenance cost of the GAC in proportion with the volume of water which is credited toward the 9,000 gpm.

C. EPA CONSENT DECREE

The EPA Consent Decree Project became operational January 3, 1996. The source of water is wells VO-1 through VO-8 (Figure 3.1). The Second Consent Decree was entered on June 22, 1998. The plant was out of service from December 15, 1997 to December 13, 1998. The plant capacity is 9,000 gpm. Historic and projected water production from the Burbank Operable Unit (BOU) is shown in Table 3.3.

D. RECYCLED WATER

The City has used reclaimed water for its power plant cooling since 1967. An expansion of the recycled water system to DeBell Golf Course was completed in 1996. Incremental expansion of the recycled water system has been ongoing since 2001 and is projected to continue for the next 20 years. Historic and proposed use of recycled water is shown in Table 3.4.

E. PRODUCTION WELLS

The City has five wells that are mechanically and electrically operable, plus the eight wells of the BOU. Two wells are on "Active" status and three are on "Inactive" status with the California Department of Health Services (DHS). Three others have had equipment pulled. We do not plan to operate the inactive wells unless an emergency develops in the 2005-2006 water year. Wells 17 and 18 are scheduled for destruction during 2006.

Active Wells	Inactive Wells	Well Casings
No. 7 No. 15	No. 6A No. 13A No. 18*	No. 11A No. 12 No. 17

*No transformer; cannot be operated.

IV. JUDGMENT CONSIDERATIONS

A. PHYSICAL SOLUTION

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

Physical Solution Producers	
Valhalla	300 acre-feet
Lockheed Martin	25 acre-feet

Table 3.3 lists the extractions by Lockheed Martin. Table 4.1 lists the extractions by Valhalla.

B. STORED WATER CREDIT

The City has a stored water credit of 20,191 acre-feet as of October 1, 2005.

C. ALLOWANCE FOR PUMPING

The import return water extraction right (20 percent of water delivered the prior year) for the 2005-2006 water year is 4,350 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 23,000 acre-feet of delivered water, will be 4,600 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 Los Angeles Department of Water and Power (LADWP). The LADWP water pipelines to the Pacoima Spreading Ground were damaged during the 1994 Northridge earthquake. Replenishment water, beginning in water year 1994-95, has been taken "in lieu" through MWD service connection LA-35 at the L.A. Treatment Plant. The historic and projected spreading water is shown in Table 4.2.

Burbank is currently preparing to construct an MWD connection at the end of the Foothill Feeder Tunnel. (See Figure 4.1.) The connection will be capable of delivering 50 cubic feet per second (cfs). This will allow spreading of 6,000 to 8,000 acre-feet per year of purchased untreated replenishment water at the Pacoima Spreading Grounds as soon as it can be completed. MWD is currently working on draining the tunnel for inspection. The connection could be in operation by 2007.

V. CAPITAL IMPROVEMENTS

A. WELLS

Burbank: Burbank has retained the services of a consultant to conduct an efficiency study of the BOU wells and well water transmission system. Proposed capital improvements may result from the Well Field Performance Attainment Study now underway.

We plan to continue the use of Wells No. 7 and No. 15 for the GAC Treatment Plant when it is operated.

Maintenance Activity- Wells 14A, 17 and 18: These wells are planned to be destroyed in accordance with County standards. Well 14A was destroyed in July 2003. Wells 17 and 18 will be destroyed during Fiscal Year 2006-07.

B. GROUNDWATER TREATMENT FACILITIES

EPA Project: The EPA Consent Decree Project became fully operational on January 3, 1996. Production and treatment of 3,000 gpm to 8,000 gpm was performed through mid-September 1996.

The EPA Consent Decree Project was removed from production on December 15, 1997 for plant modifications required under the Second Consent Decree.

Due to problems in obtaining a new operating permit from DHS, the treatment plant did not resume operations until December 12, 1998. During the outage, water was pumped and treated only for production testing. Production from December 1998 through September 1999 increased from 5,000 gpm to 9,000 gpm as the plant came fully on-line.

In late June 2000, the treatment plant went off-line due to a breakthrough of 1,2,3- trichloropropane (TCP) in the plant effluent. The plant did not return to service until DHS had approved an operation and sampling plan and the carbon was changed out in the wet phase contactors. Well VO-6 was removed from service at that time because it had high concentrations of 1,2,3-TCP. The overall production of the BOU was also reduced at this time due to general mechanical problems in the BOU, including the vapor phase GAC screens, the wearing of well pumps/motors and the failure of well level sensors. While these problems were being analyzed, Lockheed Martin invoked a "*force majeure*"

provision of the Second Consent Decree in October 2001. EPA has ruled against the *force majeure* claim. The results of the Well Field Performance Attainment Study will guide the next step in optimizing the BOU well field to reliably produce 9,000 gpm.

Replacement of distribution headers and underdrains in the liquid phase carbon contactors was completed in December of 2003. Design of replacement screens for the vapor phase carbon contactors is in progress. Construction is projected for late 2006.

The City has had responsibility for full operation of the BOU since March 12, 2001. United Water Services was the contract operator of the BOU from March 12, 2001 through November 20, 2005. Eco Resources became the contract operator on December 1, 2005.

GAC Treatment Plant: Burbank does not plan to use the production and treatment facilities of the GAC Treatment Plant during the 2005-2006 water year. The plant will remain on an active status, but will not be operated except for emergencies.

TABLE 2.1
ACTUAL AND PROJECTED WATER DEMAND

Water Year	Acre – Feet
95-96	23,124
96-97	24,888
97-98	22,447
98-99	22,672
99-00	26,313
00-01	25,619
01-02	24,937
02-03	23,129
03-04	24,357
04-05	21,790
05-06*	24,355
06-07*	25,076
07-08*	25,856
08-09*	26,088
09-10*	26,322

* Projected

NOTES:

(1) Water demand equals the total of MWD, extractions (GAC & Valley/BOU), Valhalla, and recycled.

(2) The last five year average water demand was 23,966 acre-feet.

TABLE 3.1
ACTUAL AND PROJECTED MWD TREATED WATER DELIVERIES

Water Year	Acre-Feet
95-96	12,937
96-97	10,525
97-98	16,972
98-99	10,536
99-00	10,471
00-01	12,447
01-02	12,086
02-03	13,158
03-04	13,751
04-05	14,415
05-06*	13,314
06-07*	12,814
07-08*	12,206
08-09*	12,438
09-10*	12,672

*Projected

NOTES:

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

TABLE 3.2
ACTUAL AND PROJECTED LAKE STREET GAC TREATMENT PLANT PRODUCTION

Water Year	Acre-Feet
95-96	2,295
96-97	1,620
97-98	1,348
98-99	1,542
99-00	1,086
00-01	987
01-02	0
02-03	0
03-04	0
04-05	0
05-06*	0
06-07*	0
07-08*	0
08-09*	0
09-10*	0

*Projected

NOTES:

(1) The Lake Street GAC Treatment Plant has a treatment capacity of 2,000 gpm.

(2) Wells No. 7 and No. 15 supply water for the GAC Treatment Plant. Proposed production rates (if the plant is used) are as follows:

Well No. 7	1,050 gpm
Well No. 15	850 gpm

(3) GAC Treatment Plant production was reduced beginning in water year 1996-97 to accept the required flows from the EPA Consent Decree Project.

(4) The GAC Treatment Plant has been shut down since March 2001 because of chromium 6 concerns.

TABLE 3.3
ACTUAL AND PROJECTED VALLEY/ BOU TREATED GROUNDWATER PRODUCTION

Water Year	Acre-Feet
95-96	5,737 (3)
96-97	9,280
97-98	2,102
98-99	9,042
99-00	11,345
00-01	9,046
01-02	10,402
02-03	9,100
03-04	9,660
04-05	6,399
05-06*	9,161
06-07*	10,162
07-08*	11,000
08-09*	11,000
09-10*	11,000

*Projected

NOTES:

(1) Burbank includes BOU extractions in its pumping rights.

(2) Lockheed Martin has a physical solution right of 25 AF/year.

(3) Table 3.3 shows extractions charged to Burbank. During the water years 1993-94, 1994-95 and 1995-96, Lockheed-Martin produced water for testing of the EPA Consent Decree Project. The Watermaster did not charge Burbank for these amounts shown below. Production for municipal use began in January 1996. GAC flushing and treatment bypass were accounted for separately and charged to a 'basin account' (following table), but beginning June 2003, most such losses are charged to Burbank as "non-municipal use" and included above. Non-municipal use is not included in deliveries used to calculate the 20% return water credit.

Water Year	AF	Water Year	AF	Water Year	AF	Water Year	AF
1994-95	462	1997-98	478	2000-01	88	2003-04	0
1995-96	34	1998-99	142	2001-02	138	2004-05	0
1996-97	320	1999-2000	107	2002-03	70		

(4) The City of Burbank is currently using water from the BOU under an Operation Permit, issued in October 2000, from the California Department of Health Services.

TABLE 3.4
ACTUAL AND PROJECTED RECYCLED WATER DELIVERIES

Water Year	Acre-Feet
95-96	1,880
96-97	3,120
97-98	1,744
98-99	1,210
99-00	2,979
00-01	2,732
01-02	2,087
02-03	488
03-04	549
04-05	681
05-06*	1,580
06-07*	1,800
07-08*	2,350
08-09*	2,350
09-10*	2,350

*Projected

NOTES:

1) The source of recycled water is the Burbank Water Reclamation Plant.
2) The Magnolia Power Project began using recycled water in September 2005.

TABLE 4.1
ACTUAL AND PROJECTED EXTRACTIONS OF GROUNDWATER BY VALHALLA

Water Year	Acre- Feet
95-96	339
96-97	343
97-98	281
98-99	342
99-00	432
00-01	407
01-02	362
02-03	383
03-04	397
04-05	295
05-06*	300
06-07*	300
07-08*	300
08-09*	300
09-10*	300

*Projected

NOTES:

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

(2) Valhalla has physical solution right of 300 AF/year.

TABLE 4.2
ACTUAL AND PROJECTED BURBANK SPREADING OPERATIONS

WATER YEAR	ACRE-FEET	
95-96	2,000	(2)
96-97	1,500	(2)
97-98	0	
98-99	2,000	(2)
99-00	0	
00-01	0	
01-02	0	
02-03	300	(2)
03-04	44	(3)
04-05	0	
05-06*	3,850	(4)
06-07*	5,050	
07-08*	6,000	
08-09*	6,200	
09-10*	6,200	

*Projected

NOTES:

1) The Maclay pipeline was damaged in the 1994 Northridge earthquake. Deliveries to the Pacoima Spreading Grounds are precluded until repaired by the LADWP.
2) The City exercised its physical solution right in water years 1994-95, 1995-96, 1996-97, 1998-99, and 2002-03 for basin replenishment.
3) In WY 2003-04, 44 AF of stored water credit was transferred from Glendale to Burbank to compensate for April 2004 water transfer via system interconnection.
4) A new connection to MWD is planned to allow the necessary spreading at Pacoima Spreading Grounds starting in 2007. (Figure 4.1) In-lieu transfer or replenishment is also an option.

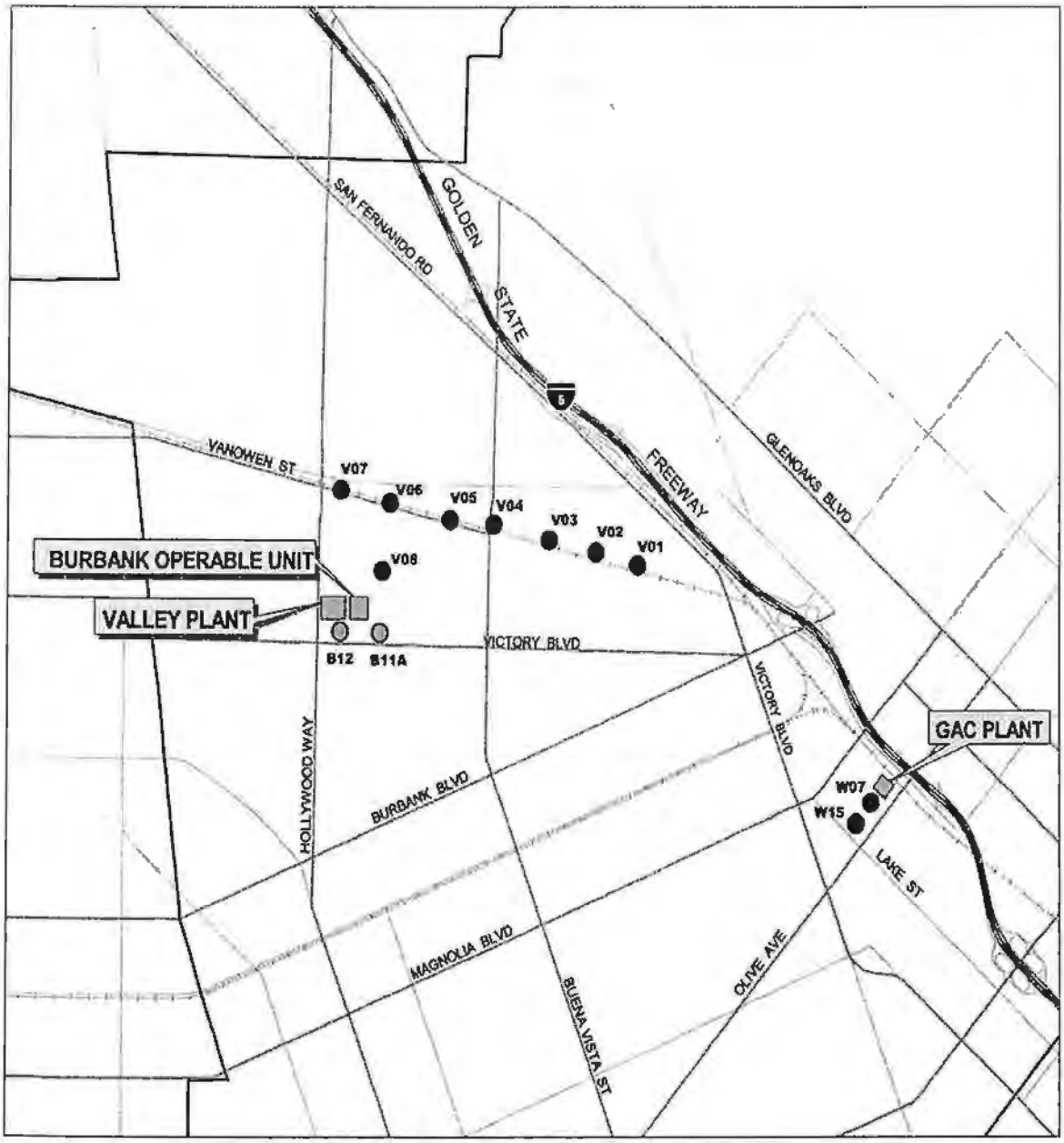


FIGURE 3.1
WELLS AND GROUNDWATER TREATMENT PLANTS

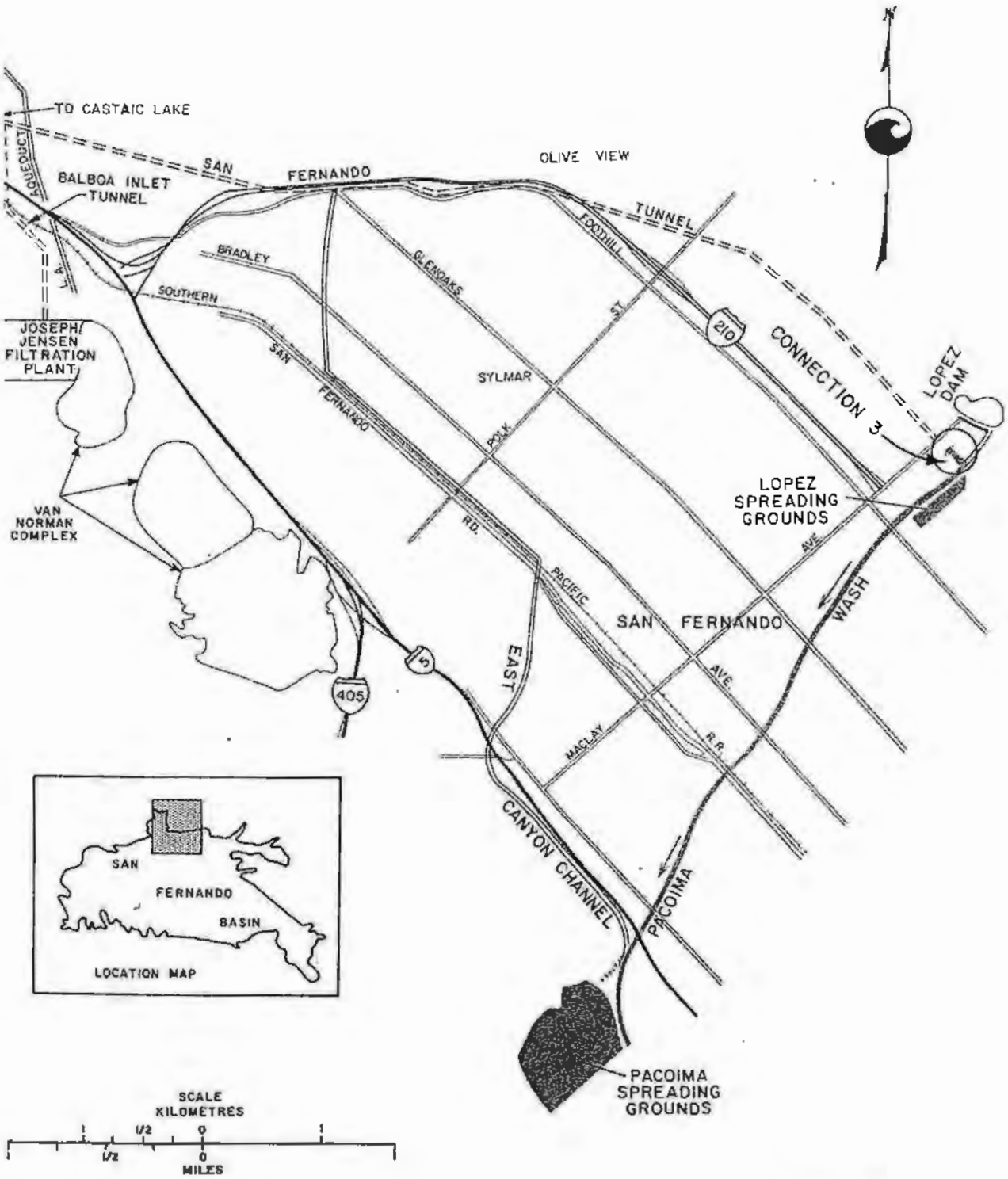


FIGURE 4.1
LOCATION OF PROPOSED MWD UNTREATED WATER CONNECTION

APPENDIX A

WATER QUALITY DATA

The 2005 Annual Water Quality Report is not yet available. Water Quality monitoring and testing of supply sources is not included with this report.

APPENDIX B

WATER TREATMENT FACILITIES

LAKE STREET GAC TREATMENT PLANT

320 North Lake Street
Burbank CA 91502

OPERATOR:

City of Burbank
Burbank Water and Power, Water Division

Albert Lopez, Water Production/ Operations Superintendent

QUANTITY TREATED (10/1/04 through 10/1/05):

None—plant remained on standby

WATER QUALITY:

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

DISPOSITION:

Burbank Water System
Potable Water

EPA CONSENT DECREE PROJECT – BURBANK OPERABLE UNIT

2030 North Hollywood Way
Burbank CA 91505

OPERATOR:

City of Burbank
Burbank Water and Power, Water Division

Albert Lopez, Water Production/ Operations Superintendent

QUANTITY TREATED (10/1/04 through 10/1/05):

6,358 Acre-Feet for domestic use

WATER QUALITY:

Contaminants: VOCs, Nitrate, Chromium, 1,2,3-TCP

DISPOSITION:

(1) Test Water- Waste

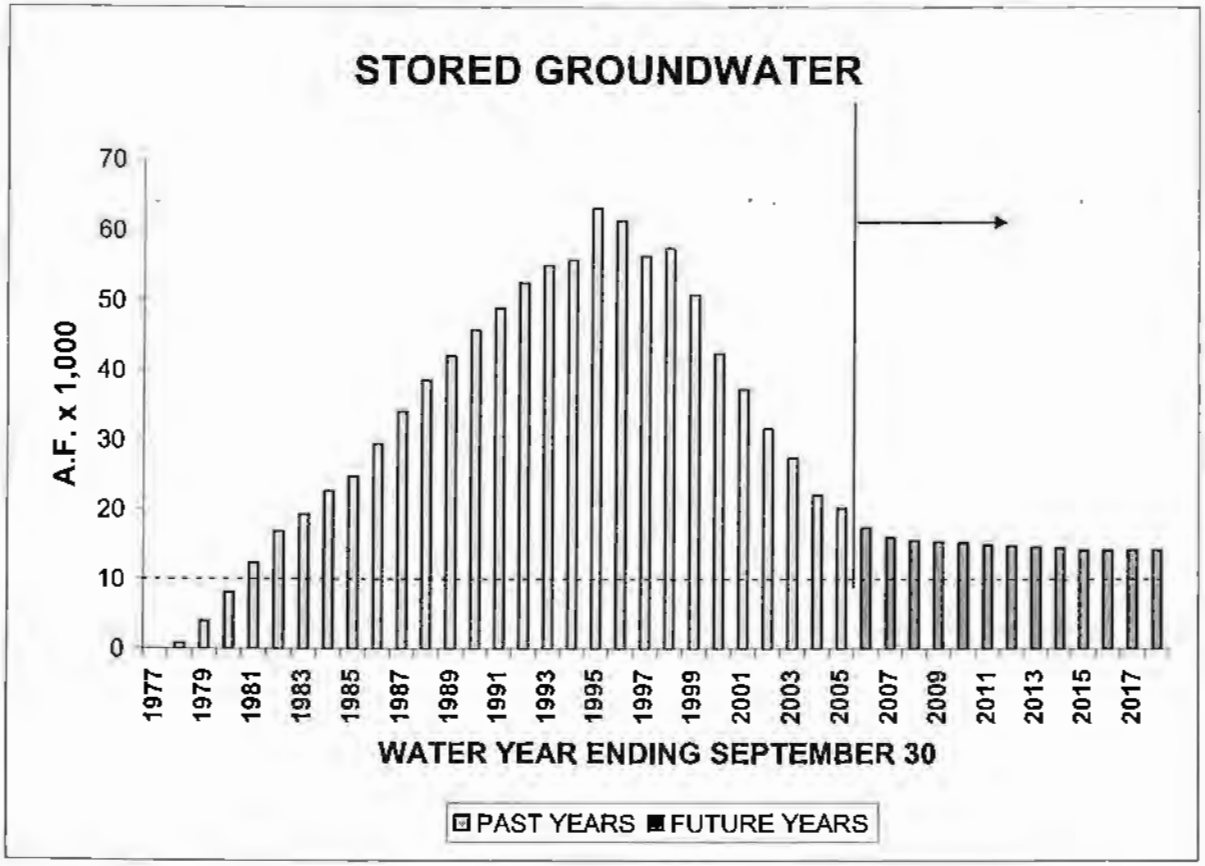
(2) Operation Water (backwash, etc.) - Waste

(3) Burbank Water System-
Potable water after blending

APPENDIX C

STORED GROUNDWATER

BURBANK WATER AND POWER
WATER DIVISION
WY 2004/05



NOTES:

- 10,000 AF RECOMMENDED AS BASIN BALANCE. THIS EQUATES TO ABOUT ONE YEAR OF DOMESTIC SYSTEM PRODUCTION IF REPLENISHMENT NOT AVAILABLE FROM MWD.
- DRAW DOWN STORED WATER BY PRODUCTION EXCEEDING THE RETURN FLOW CREDIT (~4,600 AF) PLUS SPREAD WATER OR PHYSICAL SOLUTION CREDITS.
- GROUNDWATER PRODUCTION EQUALS EPA (10,700 AF) AND VALHALLA (300 AF).
- RAMP UP SPREADING WATER PURCHASES BEGINNING WATER YEAR 2004-05 TO MAINTAIN BASIN BALANCE.

CITY OF BURBANK WATER AND POWER
WATER DIVISION

BURBANK'S STORED GROUNDWATER

70% EPA - With Ramp

WATER YEAR	DELIVERED WATER AF	RETURN FLOW CREDIT AF	SPREAD WATER AF	PUMPED GROUNDWATER AF	STORED WATER CREDIT AF
1976-77	22,743	4,549			
1977-78	22,513	4,503		3,767	(1) 782
1978-79	24,234	4,847		1,356	(2) 3,947
1979-80	24,184	4,837		677	8,117
1980-81	25,202	5,040		595	12,359
1981-82	22,120	4,424		523	16,876
1982-83	22,118	4,424		2,002	19,298
1983-84	24,927	4,985		1,063	22,659
1984-85	23,641	4,728		2,863	24,781
1985-86	23,180	4,636		123	29,386
1986-87	23,649	4,730		0	34,022
1987-88	23,712	4,742		253	38,498
1988-89	23,863	4,773		1,213	42,027
1989-90	23,053	4,611	378	1,401	45,777
1990-91	20,270	4,054	504	2,032	48,860
1991-92	20,930	4,186	503	936	52,479
1992-93	21,839	4,368	500	(3) 2,184	54,981
1993-94	24,566	4,913	0	(3) 3,539	55,810
1994-95	22,541	4,508	5,380	2,868	63,215
1995-96	23,124	4,625	2,000	8,308	61,415
1996-97	24,888	4,977	1,500	11,243	56,297
1997-98	22,447	4,489	0	3,731	57,543
1998-99	22,671	4,534	2,000	13,262	50,770
1999-2000	26,312	5,262	0	12,862	42,442
2000-01	25,619	5,124	0	10,440	37,264
2001-02	24,937	4,987	0	10,784	31,624
2002-03	23,108	4,622	300	9,483	27,428
2003-04	24,235	4,847	44	10,057	22,037
2004-05	21,749	4,350	0	6,694	20,190
2005-06	23,000	4,600	3,850	11,000	17,390
2006-07	23,000	4,600	5,050	11,000	16,040
2007-08	23,000	4,600	6,000	11,000	15,640
2008-09	23,000	4,600	6,200	11,000	15,440
2009-10	23,000	4,600	6,200	11,000	15,240
2010-11	23,000	4,600	6,200	11,000	15,040
2011-12	23,000	4,600	6,200	11,000	14,840
2012-13	23,000	4,600	6,200	11,000	14,640
2013-14	23,000	4,600	6,200	11,000	14,440
2014-15	23,000	4,600	6,200	11,000	14,240
2015-16	23,000	4,600	6,400	11,000	14,240
2016-17	23,000	4,600	6,400	11,000	14,240
2017-18	23,000	4,600	6,400	11,000	14,240

NOTES:
(1) STORED WATER AS OF OCTOBER 1, 1978
(2) STORED WATER AS OF OCTOBER 1, 1979
(3) EXCLUDES 150 A.F. OF PUMPING FOR TESTING.
SPREAD WATER INCLUDES PHYSICAL SOLUTION PURCHASES, IN-LIEU STORAGE, AND OTHER TRANSFERS
COLUMNS (1) THROUGH (5) - FROM ULARA WATERMASTER REPORTS
COLUMN (2) = 20% OF COL. (1)
COLUMN (5) = COL.(2) PREV. YR. - COL.(4) CUR. YR. + COL.(5) PREV. YR. + COL.(3) CUR. YR.
PUMPED GROUNDWATER INCLUDES CITY, VALHALLA, LOCKHEED, & DISNEY.
SHADED AREAS OF TABLE ARE PROJECTED VALUES .

APPENDIX C

CITY OF GLENDALE

PUMPING AND SPREADING PLAN

2005-2010 Water Years

CITY OF GLENDALE

GROUNDWATER PUMPING AND SPREADING PLAN

WATER YEARS 2005-2010

City of Glendale Water & Power

Reliable • Competitive • Trusted

Prepared By

GLENDALE WATER & POWER

MAY 2006

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Introduction

This report discusses water supplies to Glendale, future water demands, and projections in local water resource available to meet demands and to reduce dependency 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, others interested in Glendale's water resource future.

Executive Summary

Glendale receives its groundwater supply from San Fernando Basin and Verdugo Basin. The following table illustrates the projected pumping activities in the two basins between 2005 and 2010. Glendale currently does not have any spreading facility.

PROJECTED PUMPING ACTIVITIES IN 2005 - 2010 (AFY)

Source	2005	2006	2007	2008	2009	2010
San Fernando Basin	7,200	7,200	7,200	7,200	7,200	7,200
Verdugo Basin	2,360	3,000	3,856	3,856	3,856	3,856

Existing Water Sources and Supplies

The City of Glendale (refer as "City") currently has four sources of water available to meet demands: San Fernando Basin, Verdugo Basin, Metropolitan Water District (imported water) and recycled water from the Los Angeles/Glendale Water Reclamation Plant (LAGWRP). Each of these sources is described below. The entry points in the Glendale water system for the various supplies are shown in Figure 1. Over the past 40 years, there has been a change in the mix of supplies used to meet water demands in the City. In the future, we project minor changes in water supplies. These changes and sources are discussed below.

1. San Fernando Basin

The City's water right to San Fernando Basin supplies is defined by the judgment in the matter entitled "The City of Los Angeles vs. the City of San Fernando, et al." (1979) (the "Judgement"). It consists of a return flow credit, a type of water right based on the assumption that a percentage of water used in the City is returned to the groundwater basin. Additionally, the City has a right to accumulate its credits annually if its water rights are not used. In the water years of 2003-04 and 2004-05, the City had a storage credit of 74,213 AF and 64,103 AF, respectively, within the basin. Also, there is a right to produce excess water subject to a payment obligation to the City of Los Angeles based

primarily on the cost of MWD alternative supplies. This option to produce additional water in excess of the return flow credit and the accumulated credits is a significant factor in relation to the water production at the Glendale Water Treatment Plant (GWTP), which is part of a U.S. Environmental Protection Agency (EPA) Superfund clean-up project in Glendale. The project consists of a 5,000 gallon-per-minute (gpm) facility and eight wells that supply the plant. The project currently delivers approximately 7,200 AFY to the City and provides about 23 percent of the City's total demand. Further discussion of this can be found 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 recycled water) in the San Fernando Basin and its tributary hill and mountain area. A location map is shown in Figure 2. The return flow credit 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 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 an agreement to extract excess water chargeable against the rights of the City of Los Angeles upon payment of specified charges generally tied to MWD's water rates. Glendale's physical solution right is 5,000 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 became a significant factor with the completion of the Glendale Water Treatment Plant (GWTP) in 2000.

Carry-over extractions - In addition to current extractions of return flow water and stored water, Glendale may, in any one year, extract from the San Fernando Basin an amount not to exceed 10 percent 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 important year-to-year flexibility in meeting water demands.

San Fernando Basin production has been limited over the past 20 years and was eventually eliminated for a time because of the volatile organic compounds (VOCs) in the groundwater. The entire San Fernando Valley is part of a U. S. Environmental Protection Agency (EPA) Superfund cleanup program. Over the past ten years, many water treatment plants had been constructed in the San Fernando Valley to remove VOCs from the groundwater. EPA had focused on the construction of cleanup facilities in Glendale. The Glendale Water Treatment Plant and eight extraction wells had been constructed to pump, treat and deliver the water to Glendale via its Grandview

Pumping Station. Significant production from the basin and delivery to Glendale started in January 2002.

The cleanup facilities consist of seven shallow extraction wells and one deep well; the 5,000 gpm Glendale Water Treatment Plant to remove the VOCs; piping to convey the untreated water from the wells to the water treatment plant; a system to convey water from the treatment plant to the Glendale potable distribution system; a facility to blend the treated groundwater with water from Metropolitan, and a disinfection facility. A general layout of these facilities is shown on Figure 3.

The major agreements between City of Glendale and Glendale Respondents Group (GRG), which represents forty plus industries identified by the EPA as potentially responsible for the groundwater contamination, and the EPA were signed in the year 2000. GRG retained CDM Consulting Engineers, Inc. to design and construct the required facilities. Construction has been completed and the State Department of Health Services issued a permit for Glendale to operate the facilities in July 2000. Glendale started taking small quantities of water from this facility on July 23, 2001. The delivery of the water to Glendale was initially limited because of Glendale's concerns with taking water with higher chromium 6 levels than in the current water supply, even though such water met all water quality standards. In January 2002, the Council authorized Glendale to start delivering 5,000 gpm from the treatment facility into Glendale's potable water system with a target to minimize the concentration of chromium 6 in the water. This source now provides about 7,200 AFY to Glendale, and will meet about 22 percent of projected near-term water demands. There is additional groundwater production of 400 AFY by Forest Lawn Memorial Park for irrigation purposes, and 25 AFY for use of the cooling towers at the Glendale Power Plant, for a total of 7,625 AFY.

Additionally, Glendale can pump and treat more groundwater in times of imported water shortages based on accumulated pumping credits discussed earlier in this section. As discussed previously, Glendale as of October 2005 has 64,103 AF in accumulated pumping credits in the San Fernando Basin. In order to achieve 7,625 AF of San Fernando Basin production per year, Glendale must utilize its return flow credit of 5,500 AF per year as well as 2,125 AF per year of its accumulated pumping credits. Additional usage of accumulated groundwater credits could be used to meet unexpected demands or in cases of emergency. The usage of additional amounts of accumulated groundwater pumping credits was not considered in the supply-demand analysis of this Water Supply Evaluation, but rather would be in addition to the amounts of available water supplies detailed in that analysis. That these additional amounts of groundwater were not included in the supply-demand analysis further ensures that there are sufficient supplies to meet Plan demands.

2. Verdugo Basin

Historically, groundwater supplies from the Verdugo Basin contributed a small portion to the City's water supplies via five wells and an underground water infiltration system. The Judgment gives Glendale the right to extract 3,856 AFY (see page 15 of Judgment)

from the Verdugo Basin. Crescenta Valley Water District also has water rights and is the only other entity allowed to extract water from the Verdugo Basin.

Use of these supplies has been limited over the past five years due to water quality problems, groundwater levels, and limited extraction capacity. In order to increase the use of these supplies, the City completed construction of the Verdugo Park Water Treatment Plant (VPWTP) in 1996. This facility has a capacity of 1,150 gpm and treats water from the two low capacity wells (referred to as Glorietta Wells A & B) and from the water supplies in the old Verdugo Pickup, a horizontal infiltration system. Actual flows from these sources range between 500-550 gpm. The three existing wells referred to as Glorietta Wells 3, 4, and 6 and the Verdugo Park Water Treatment Plant alone will not fully utilize the City's entire water rights to the Verdugo Basin supplies and additional extraction capacity in the Verdugo Basin will be required to reach the water right capacity. The existing wells and VPWTP produce about 2,200 AFY and account for about five percent of Glendale's total demand. The City has immediate plans to increase its extraction capacity so that it can utilize its full adjudicated water right from the Verdugo Basin, to the extent possible given the basin's hydrology. To that end, the City has hired Geomatrix Consultants, Inc. to determine possible sites for additional water extraction from the basin. Being an urban area, there are many issues to be resolved in finding desirable well sites. If the City is able to utilize its full rights to these supplies, about 12 percent of the City's total water demand can be obtained from this Basin, which is an increase of 9 percent of current water production. The location of the VPWTP and existing wells are shown on Figure 1.

Historically, the only water quality parameter of concern in the Verdugo Basin is high concentration of nitrates from septic tanks in the La Crescenta area and agricultural activities in the Basin. Septic systems have all been disconnected and the sources are connected to the sanitary sewer system. A significant drop in nitrates has been observed. However, large quantities of imported water from MWD are blended with the groundwater so that the nitrate levels do not impact the usability of this groundwater source.

3. Metropolitan Water District

The Metropolitan Water District of Southern California (MWD or "Metropolitan") is a public agency organized in 1928 by a vote of the electorates of 13 Southern California cities which included Glendale. The first function of MWD was building the Colorado River Aqueduct to import water from the Colorado River. Water deliveries through the aqueduct began in the early 1940's. This imported water supplemented the local water supplies of the original 13 Southern California member cities. In 1972, to meet growing water demands in its service area, MWD started receiving additional water supplies from the State Water Project. The State Water Project is owned and operated by the State of California Department of Water Resources (DWR). MWD currently imports water from these two sources: (1) the Colorado River via the Colorado River Aqueduct and (2) the State Water Project via the California Aqueduct.

The locations of the above facilities are shown in Figure 4. MWD's service area includes the Southern California coastal plain. It extends about 200 miles along the Pacific Ocean from the city of Oxnard on the north to the Mexican on the south, and it reaches 70 miles inland from the coast. MWD is currently composed of 27 member agencies, including 14 cities, 12 municipal water districts, and one county water authority.

3a. Colorado River Water

The Colorado River Aqueduct conveys water 242 miles from the W.P. Whisett Pumping Plant Intake Facility at Lake Havasu, on the Colorado River, to its point of termination at Lake Matthews Reservoir, near the city of Riverside. From this reservoir, water is distributed to its 27 Member agencies throughout Southern California.

California is one of the seven states that have rights to divert water from the Colorado River. MWD is one of six California entities that have rights to Colorado River water. Most of this water is used for irrigating agriculture in the Imperial Valley. California has a right to the Colorado River at 4.4 million acre-feet per year. MWD's basic right to California's share of Colorado River Water is 550,000 acre-feet per year. Historically, California has been using about 5.3 million acre-feet of Colorado River water per year of water. Additional water has been used primarily by MWD. This has always been a concern to the other states that have rights to Colorado River water. Since MWD has the least right to Colorado River water within the State of California and because of the concerns by other Colorado River Basin states, efforts are underway to reduce California's use of its right to 4.4 million acre-feet per year. A variety of programs have been designed to increase conservation of water supplies and storage supplies while still keeping the Colorado River Aqueduct full. Some of the programs are listed below. Detailed information on these many programs is provided in MWD's Regional Urban Water Management Plan.

- **Diamond Valley Lake** – the completion of Diamond Valley Lake nearly doubled the area's surface water storage capacity;
- **Groundwater Storage Program in Upper Coachella Valley;**
- **Water Conservation Program in the Imperial Valley** to improve irrigation efficiency in return for the right to divert the water conserved by the programs;
- **Test Land Fallowing in the Palos Verde Valley;**
- **Demonstration Groundwater Storage Program in Central Arizona;**
- **Imperial Irrigation District – San Diego County Water Authority Transfer** and **Metropolitan – San Diego County Water Authority Exchange;**

- **All American Canal and Coachella Canal Lining.**

3b. State Water Project

The second source of imported water for MWD is the State Water Project (SWP). SWP facilities comprise 32 storage facilities (reservoirs and lakes), 662 miles of aqueduct, and 25 power and pumping plants. The SWP originates at Lake Oroville, which is located on the Feather River in Northern California. That water, along with all additional unused water from the watershed flows into Sacramento/San Joaquin Delta. Water from the Delta is then pumped to water users in the San Francisco Bay area, transported through the California Aqueduct to water users in California, or flows through the Delta to San Francisco Bay and ultimately the Pacific Ocean.

DWR contracted to deliver water in stages to 29 SWP contractors, with an ultimate delivery of 4.23 million AF per year. Currently, DWR is delivering water to 29 SWP contractors. MWD is the largest, with a contracted entitlement of 2,011,500 AF per year, or approximately 48 percent of the total contracted entitlement. MWD receives deliveries of SWP supplies via the California Aqueduct at Castaic Lake in Los Angeles County, Devil Canyon Afterbay in San Bernardino County, and Box Springs Turnout and Lake Perris in Riverside County. The first delivery of SWP water to Metropolitan occurred in 1972.

The initial facilities of the SWP, completed in the early 1970's, were designed to meet the early needs of the SWP contractors. It was intended that additional SWP facilities, including water supply facilities, would be built over time to meet projected increases in contractors' delivery needs. Each contractor's SWP contract provided for a buildup in entitlement over time, with most contractors reaching their maximum annual entitlement by the year 1990. However, no major water supply improvements have been added to the project since the completion of the initial SWP facilities in the early 1970's primarily due to the environmental issues.

In particular environmental issues the Bay-Delta have limited the operations to pass water from Northern California through the Bay-Delta to the southern part of the state. The California Bay-Delta Authority (previously known as CALFED) is an association of State and federal agencies. It has been assigned the task of balancing the competing needs and developing options to provide a long-term solution to the Bay-Delta Program and pledges to restore the Bay-Delta ecosystem, improve water quality, enhance water supply reliability and assure long-term stability for agriculture, urban and environmental uses.

As a CALFED Implementing Agency, MWD had implemented a number of CALFED programs to improve the SWP delivery reliability and quality, such as:

- **Delta Improvement Package (DIP)** allow SWP to increase its permitted export pumping capacity from the existing 6,680 to 8,500 cfs at the Banks Pumping Plant in the Delta, a key factor in MWD's supply reliability goal. It also increases water supply for regional

groundwater and surface water storage initiatives to 130,000 acre-feet per year.

- **CALFED Levees Program** coordinates Delta levee maintenance and improvement activities. Its goal is to protect water supplies needed for the environment, agriculture and urban uses by reducing the threat of levee failure and seawater intrusion.

MWD also initiated many programs to improve the reliability of the State Water Project supplies outside of the CALFED process. Some are:

- **Semitropic Water Storage Desert Agreement** to store SWP supplies in Semitropic groundwater basin. This water is stored during times of surplus and withdrawn during times of drought in the MWD service area.

- **Arvin Edison Water Management Program** operates similar to the Semitropic Program.

To date, MWD has stored significant quantities of water in these San Joaquin Valley groundwater basins storage projects, with more intended.

3c. Glendale-MWD Delivery Points

Glendale receives MWD water through three service connections as shown on Figure 1. The service connection number and capacity are summarized in Table 1 below. In total, MWD has a total delivery capacity of 70 cubic feet-per-second (cfs). During hot summer days, it is common for Glendale to utilize the full capacity of the facilities. Any significant increase in demands on MWD could require another service connection.

TABLE 1
METROPOLITAN CONNECTIONS AND CAPACITY

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

** To increase to 20 cfs by mid 2006*

Over the years, MWD has provided high level of reliability in meeting Glendale's supplemental water supply needs. It is believed that the reliability of water supply to the City will continue in the future as a result of the many water resource programs under way and the proposed future programs now being considered based on MWD's Water Surplus and Drought Management (WSDM) Plan and Integrated Resources Plan (IRP). This source will always be a major

factor in meeting the water needs of the City. The City closely follows the planning activities at MWD to assure that it has adequate supplies to meet the needs of its member agencies.

4. Recycled Water

The City of Glendale has been delivering recycled water from the Los Angeles/Glendale Water Reclamation Plant (LAGWRP) since the late 1970's. This is a 20 million gallon-per-day (MGD) facility owned by the Cities of Los Angeles and Glendale. Based on a 1970 contract between the Cities of Los Angeles and Glendale, Glendale is entitled to 50% of any effluent produced at the plant, which is more than sufficient to for all recycled water use within City of Glendale. Treated wastewater that is not used in either the Glendale or Los Angeles system is discharged to the Los Angeles River and eventually reaches the ocean. As a result of the Los Angeles Integrated Resource Plan (IRP) process currently underway, Glendale is working with Los Angeles on a future new arrangement for LAGWRP which enhances the reliability and quality of the Recycled water supplies.

In order to improve its production reliability, the plant has undergone construction-rehabilitation of the aeration and settling basins. Fifty percent of the plant was out of service between April 11 and August 31 of 2005 due to construction. During the construction period, a two week reduction of production to 4 MGD and several plant shut-downs were experienced. In view of these, improvements of providing alternative water source to customers were considered for any future recycled water service interruption.

LADWP provides an emergency potable water supply for the Griffith Park Tank for any future system shutdown. The City also considering the installation of swivel-el connection on major recycled water users (mainly for irrigation) to make the supply more reliable and assured. Other ways to provide alternative source of water for emergency use are also being considered.

Currently, Glendale has forty-two (42) recycled water users. These include two golf courses, a landfill, eight recreation parks, two cemeteries, one high school, one junior high school, one elementary school, and other irrigation areas. Also, three high-rise buildings, Glendale's new Police Headquarters and the new buildings at Glendale Community College are dual-plumbed to use recycled water for sanitary flushing purposes when facilities are in place to provide the water (Figure 6). In the next five years, approximately eighteen (18) new recycled water users will be added for irrigation and dual-plumbing, some of which have already been completed. Figure 6A provides a general idea of the scope of the expansion program. The amount of potable water purchased from Metropolitan is expected to have a corresponding reduction.

In the 1990's Glendale Water Department began to require all new high-rise buildings (5-story or higher) to install dual-plumbing system within the Glendale Downtown area. Recycled water customers are solely responsible for funding and installing the connectors from the recycled water pipeline in the public streets to the customer's

property, and for all on-site facilities to distribute recycled water to the ultimate use. Glendale's existing recycled water system is adjacent to the southern area of DSP at Colorado Avenue and Brand Boulevard. The main recycled water distribution pipelines and existing recycled water facilities are shown in more detail in Figure 5. The requirement of dual-plumbing along with the new building standards of DSP will greatly facilitate delivery of recycled water to the Downtown vicinity for landscaping irrigation and sanitary use. The expected deliveries from the various projects are shown in Table 2.

TABLE 2
RECYCLED WATER USE (AFY)

PROJECTS	2000 Projection for 2005	2005*	2010	2015	2020	2025
Brand Park Pipeline	170	86	170	170	170	170
Forest Lawn Pipeline	350	264	350	350	350	350
Power Plant Pipeline	450	333	450	450	450	450
Verdugo-Scholl Pipeline	1020	615	1,040	1060	1,080	1,080
TOTAL	**1,990**	**1,298**	**2,010**	**2030**	**2,050**	**2,050**

* *Plant shutdowns experienced due to plant construction reduced recycled water usage.*

5. Summary of Local Supplies

The current use of local resources available to the City is substantially less than rights because of water quality and extraction problems. A general summary of the City's rights to local water resources compared to the amount currently being used is shown on Table 3.

TABLE 3
LOCAL WATER PROJECTS AND USE (AFY)

Potential Source	Right	Current Use	Future Use
San Fernando Basin	5,000 - 5,400	7,800 AFY	7,800
Verdugo Basin	3,856	2,200 AFY	3,856
Recycled Water	10,000	1,500 AFY	2,050

Note : Include Glendale Physical Solution Water Right and Use

Past Water Use and Trends

In the past, the water quality problems in the San Fernando Basin and groundwater levels in the Verdugo Basin have impacted the ability of Glendale to produce water from these Basins. Glendale has only recently been able to better utilize its rights to the San Fernando Basin water supplies accumulated for many years. The EPA has designated several locations in the San Fernando Basin as Superfund sites and required construction of cleanup treatment facilities by the industry group responsible for the contamination. The Glendale cleanup project is the last in a series of EPA-required cleanup facilities and is now complete. The project consists of eight (8) production wells and a water treatment facility.

The Glendale water treatment facility was built to treat VOCs (volatile organic compounds). In December 2000, Glendale started operating the treatment plant. But because of the chromium 6 issue, only a small quantity was initially pumped and delivered. Full operation started on January 6, 2002. A study is being made regarding removal of chromium 6.

Glendale currently has five (5) active production wells and a pick-up system (infiltration galleries) in the Verdugo Basin, along with the VPWTP. The lower water levels have reduced supplies for this source, and accordingly, Glendale has reduced its projections of supply from this source as well.

Historically, Glendale used groundwater to meet a varying portion of its water demand. In the 1940s and 1950s essentially all of Glendale'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 AFY. The Grandview well water collection system in the San Fernando Basin and the Grandview Pumping Plant originally pumped a peak capacity of about 24,000 gpm (34.6 million gallons per day (MGD)) from San Fernando Basin directly into Glendale's potable water system.

In the mid-1970s, Glendale limited production from the San Fernando Basin to about 12,000 AFY as part of a court decree arising from a Water Rights lawsuit by the City of Los Angeles. In 1975, the California Supreme Court judgment in City of Los Angeles vs. City of San Fernando further limited Glendale's production right. The current right is about 5,500 AFY based on a Return Flow Credit right from water use in Glendale, with certain additional rights as described above.

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

In late 1979, Assembly Bill 1803 required that all water agencies using groundwater must conduct tests for the presence of certain industrial solvents. The tests indicated that VOCs such as trichlorethylene (TCE) and perchloroethylene (PCE) were present in the San Fernando Basin groundwater supplies in concentrations exceeding State

Department of Health Services' maximum contaminant levels (MCL). Both chemicals were used extensively in the past as degreasers in manufacturing industries.

At that time, the presence and hazards to the water supplies were identified. As a result, Glendale had to further limit its use of San Fernando Basin supplies. From 1980 to 1992, Glendale reduced production; and from 1992 to 2000, Glendale totally suspended production from the basin because of the presence of VOCs. During this 20-year period of reduced production, Glendale continued to accumulate the groundwater storage credits that could be used in the future. Glendale's storage account balance is 63,646 AF, as of 2004-05 Upper Los Angeles River Area Watermaster Annual Report.

Projection Water Demand In Glendale

Projection Methodology

To forecast retail water demands, Metropolitan uses an econometric mode, the MWD-MAIN Water Use Forecasting System, which relates water use to independent variables such as housing, employment, income, price, and weather. Many water resource agencies across the country use a similar version of this model including the U. S. Army Corps of Engineers, the U. S. Geological Survey, the state of New York, the cities of Phoenix, Las Vegas, and Portland, and some of Metropolitan's member agencies.

The model's demographic and economic variables are based on the Southern California Association of Governments (SCAG) Regional Transportation Plan and the San Diego Association of Government (SANDAG) 2020 Forecast. Metropolitan contracted with the Center for Continuing Study of the California Economy (CCSCE) and SCAG to extend these projections to 2050. SCAG and SANDAG demographic projections are supported by environmental impact reports and based on city, county and regional general plans. Glendale uses the results of the MWD modeling effort in developing long-term water demands in the City.

Water Demand

Water use by customer category in year 2004 is shown in Figure 8. We observe:

- Four-fifths of total water use is associated with residential water use:
  - 44 % with single family
  - 37 % with multi family
- Commercial users consumed 15 %
- Irrigation users, include both residential and commercial, used 2 %, and
- The remaining 2 % was consumed by industrial users

The projected water demand, in Table 4, using MWD-MAIN calibrated for Glendale shows the overall "normal water" demand for year 2010 to be 33,824 AFY, and for year 2025 demand of 38,600 AFY. These water use projections are based on projected population, housing, and employment, as incorporated in the Glendale General Plan. The data obtained from the Glendale Planning Department and those of the Southern California Association of Government were programmed into the MWD-MAIN water

demand forecasting model for Glendale including variable weather conditions. The year 2025 demand reflects a modest increase over current use on the order of 10 percent as Glendale is essentially "built-out". These projections incorporate the 1981 and 1992 California plumbing code 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 carried out, there could be still more reductions in projected use.

TABLE 4
HISTORIC AND PROJECTED SOURCES OF WATER SUPPLY (AF)

Water Year	San Fernando Basin	Verdugo Basin	Recycled Water	MWD Water	Total Supply
1998-99	409	2,720	1,458	26,605	31,192
1999-00	516	2,451	1,742	28,851	33,560
2000-01	673	2,105	1,664	29,033	33,475
2001-02	4,013	2,120	1,500	26,264	33,897
2002-03	8,495	1,551	1,376	21,896	33,318
2003-04	7,872	2,174	1,517	23,774	35,337
2004-05	6,466	2,208	1,298	22,666	32,638
2010	7,625	2,300	2,010	21,889	33,824
2015	7,625	2,300	2,030	23,136	35,091
2020	7,625	2,300	2,050	24,846	36,821
2025	7,625	2,300	2,050	26,625	38,600

Note : MWD-MAIN calibrated for Glendale were used in projections

The major increase in San Fernando Basin water supplies reflects operation of the Glendale Water Treatment Plant (GWTP). Based on present demands, this supply would provide for about 23 percent of the water used in the City. But due to the chromium 6 issue in the San Fernando Basin, the ability to continue fully utilize the San Fernando Basin water supply is uncertain. To resolve the problem, Glendale is currently developing a chromium 6 removal treatment process at the GWTP to meet the EPA water quality standard.

Water Demands based on Hydrology

The UWMP and SB 221/610 require discussion of the sufficiency of water supplies for various hydrologic conditions such as average, wet, single dry, and multiple-year dry periods.

The specifics of each hydrologic event included are:

Multi-year dry period. A repeat of the 1990 to 1992 multi-year drought condition that occurred twice during the historic 77-year record, thus having a probability of occurrence of 2.6%,

Single dry year. A repeat of 1977 below-normal conditions that occurred once during the historic 77-year record, thus having a probability of occurrence of 1.3%

Average (Normal) year. Statistical average of 77 historical hydrological conditions when combined with above-normal conditions (wet-years) having a probability of occurrence of 73%, and

Wet year. A repeat of 1985 and 2005 above-normal conditions.

Based on historic water use experience in Glendale, the "single dry year" demand is assumed to be six percent greater than the "normal demand," wet year demand is assumed to be six percent lower than the "normal year." This differs from the percentage increase in demand that the Metropolitan projects in its single dry year analysis. There are a number of reasons for this. First, increases in water demand in dry years are not as dramatic in Glendale due to the fact that it is an urbanized city. The types of land uses that are the most sensitive to fluctuations in climate are agricultural, open-space, and landscaping-type uses. The portion of Glendale that is occupied by such land uses is relatively small, especially when compared with the service area of Metropolitan, which is large and includes a greater proportion of open space and agriculture than Glendale does. Consequently, the Metropolitan is prone to see more dramatic increases in water demands than Glendale. Second, the urban uses that make up the bulk of Glendale result in water demands that do not fluctuate much with changes in climate from year to year. Third, Metropolitan water is typically used to cover the portions of a member agency's water budget that local supplies cannot meet. As a result, whatever increases in demand a member agency experiences in a dry year are met solely by Metropolitan, and this is reflected in the high percentage increases in demand Metropolitan predicts in dry year scenarios. The fact that the increase in projected demands in the single-dry year scenario is six percent for Glendale and ten percent for Metropolitan (data based on MWD 2005 Regional Urban Water Management Plan (RUWMP) Table II-4 and Table II-6) as a whole is not an inconsistency, but is rather indicative of the nature of Glendale and the status of Metropolitan as a regional wholesaler of water.

A summary of water demands under various hydrologic conditions (i.e., normal, wet, dry, and multi-year dry periods) is shown in Table 5. As noted, the projected water demands for a single dry year and each year in a multi-year dry period are the same. Experience has shown that cumulative dry years in a developed city like Glendale do not result in a greater annual demand for water as the dry period continues. As detailed above, Glendale is an urban city with land uses that are comparatively resistant to dry climatic periods in terms of their water demands. Residential, commercial, and industrial uses will generally use the same amount of water during droughts as during normal years, with perhaps a nominal increase in irrigation for landscaping. Because open space and agricultural uses are not dominant, the drier conditions of a multiple-year drought will not result in higher demands in Glendale as compared to a single-year drought. Water use for the Downtown Specific Plan will incorporated into Glendale's current water demand projections as shown on Table 5A.

TABLE 5
PROJECTED WATER DEMANDS FOR VARIOUS HYDROLOGIC CONDITIONS WITHOUT DOWNTOWN SPECIFIC PLAN WITHIN GLENDALE'S PROJECTED WATER DEMANDS (AFY)

Year	Normal	Wet	Single Dry Year	Single Year within Multiple-Year Dry Period
2010	30,920	29,065	32,775	32,775
2015	32,143	30,214	34,072	34,072
2020	33,367	31,365	35,369	35,369
2025	34,592	32,516	36,668	36,668
2030	35,817	33,668	37,966	37,966

TABLE 5A
PROJECTED WATER DEMANDS FOR VARIOUS HYDROLOGIC CONDITIONS WITH DOWNTOWN SPECIFIC PLAN WITHIN GLENDALE'S PROJECTED WATER DEMANDS (AFY)

Year	Normal	Wet	Single Dry Year	Single Year within Multiple-Year Dry Period
2010	31,954	30,047	33,893	33,893
2015	33,177	31,196	35,190	35,190
2020	34,401	32,347	36,487	36,487
2025	35,626	33,498	37,786	37,786
2030	36,851	34,650	39,084	39,084

A summary of Glendale's projected 20-year water needs for normal and dry conditions is provided in Table 6, showing the changes in water sources over the next 20 years (Figure 7). Also, Glendale's historic and projected water use and source of supply is presented in Figure 9. Water supplies are expected to meet water demands on a very reliable basis. The "dry year" demand is assumed to be 6 percent higher than the "normal demand" based on experience in the City. A key conclusion from Table 6 is

that higher demands in the City will be met by increased purchases from MWD. The City is actively working with MWD to assure there are adequate future supplies.

TABLE 6
GLENDALE'S WATER DEMANDS AND SOURCES OF SUPPLY TO MEET DEMANDS DURING NORMAL AND DRY YEARS
(ACRE-FEET)

	Normal Year					*Dry Year*				
SOURCE	2005*	2010	2015	2020	2025	2005	2010	2015	2020	2025
San Fernando Wells	6,466	7,625	7,625	7,625	7,625	6,854	7,625	7,625	7,625	7,625
Verdugo Wells	2,208	3,856	3,856	3,856	3,856	2,208	3,856	3,856	3,856	3,856
Metropolitan Water District	22,666	21,739	22,986	24,696	26,975	24,027	23,768	25,091	26,905	28,791
Recycled Water	1,298	2,010	2,030	2,050	2,050	1,375	2,010	2,030	2,050	2,050
Total Projected Demand	**32,638**	**33,824**	**35,091**	**36,821**	**38,600**	**34,596**	**35,853**	**37,196**	**39,030**	**40,916**

** MWD usage increased and recycled water use declined due to construction at LAGWRP and plant shut-downs.*

The specifics of the Glendale mandatory water conservation program are included in the Glendale Municipal Code. The stated purpose of the program reads as follows:

> "The purpose of this chapter is to provide a mandatory water conservation plan to minimize the effect of a shortage of water to the customers of Glendale and, by means of this chapter, to adopt provisions that will significantly reduce the consumption of water over an extended period of time thereby extending the available water required for the customers of Glendale, to protect basic human health, safety and quality of life, to share the impacts caused by the water shortage in accord with the severity of the water shortage, and to minimize the hardship to Glendale and the general public to the greatest extent possible."

In particular, Glendale has implemented Best Management Practices identified by the water industry, as presented in a program described in the 2005 Glendale UWMP, Section VII. Water Conservation. A review shows a wide variety of continuing conservation efforts in implementing the BMPs and responding to dry periods in Glendale, as done in the past. This includes such programs as plumbing retrofits to low

water usage appliances, audits of water use, school programs, toilet replacements, and water waste prohibitions.

Glendale's Projected Metropolitan Water Demands

As previously discussed, Glendale's need for Metropolitan water supplies are highly variable depending on hydrologic conditions as Metropolitan is the "swing" water supply. Tables 5 and 5A identify total water demands under various hydrologic conditions. The annual local water supplies are assumed to be constant for various types of hydrologic conditions, as they come from a reliable groundwater source of supply that should not vary from year to year based on current storage level. The need for Metropolitan supplies can change from year to year based on hydrologic conditions and resulting demands. Figure 10 shows the projected water demand of MWD water in the next 20 years. A series of tables has been prepared to identify Glendale's demands for Metropolitan supplies under various hydrologic conditions. It shows that the demands for Metropolitan water supplies by the year 2025 can range from 24,000 AF to 29,000 AF, as shown in Table 6.

Glendale's Ability To Meet Demands

Reliability of water supplies is a key item for review in this document. Glendale depends greatly on Metropolitan supplies. Consequently, the reliability of Metropolitan water supplies to meet Glendale water needs as well as the needs of its other twenty-five member agencies becomes exceptionally crucial. The MWD's RUWMP provides significant information on providing a reliable supply of water to its member agencies such as Glendale. The MWD's Water Surplus and Drought Management (WSDM) Plan is the key document in their effort to do so. For Glendale, MWD is the supplier of "last resort" in meeting the needs of our citizens. For this reason, the WSDM Plan is summarized below.

In April of 1999, Metropolitan's Board of Directors adopted the WSDM Plan. This plan guides management of regional water supplies to achieve the reliability goals of Southern California's Integrated Resources Plan (IRP). Through effective management of its water supply, Metropolitan fully expects to be one hundred percent reliable in meeting all non-interruptible demands throughout the next ten years. After ten years, reliability maintenance efforts will require additional water resource programs, which are explained in this report.

Unlike Metropolitan's previous shortage management plans, the WSDM Plan recognizes the link between surpluses and shortages, and it integrates planned operational activities with respect to both conditions. The WSDM Plan continues Metropolitan's commitment to the regional planning approaches initiated in the IRP.

The guiding principle of the WSDM Plan is to manage Metropolitan's water resources and management programs to minimize adverse impacts of water shortages to retail customers. From this guiding principle, the following supporting principles have been developed.

- Encourage efficient water use and economical local resource programs,
- Coordinate operations with member agencies to make as much surplus water as possible available for use in dry years,
- Pursue innovative transfer and banking programs to secure more imported water for use in dry years,
- Increase public awareness about water supply issues.

The WSDM Plan also declared that, should mandatory imported water allocations be necessary, those allocations would be calculated on the basis of need, as opposed to any type of historical purchases. The WSDM Plan contains the following considerations that would go into an allocation of imported water:

- Impact on retail consumers and regional economy,
- Investments in local resources, including recycling and conservation,
- Population growth,
- Changes and/or losses in local supplies,
- Participation in Metropolitan's Non-firm (interruptible) programs,
- Investment in Metropolitan's facilities.

The WSDM Plan also defines five surplus management stages and seven shortage management stages to guide resource management activities. These stages are not defined merely by shortfalls in imported water supply, but also by the water balances in Metropolitan's storage programs. Thus, a ten percent shortfall in imported supplies could be a stage one shortage if storage levels are high. If storage levels are already depleted, the same shortfall in imported supplies could potentially be defined as a more severe shortage. Each year, Metropolitan evaluates the level of supplies available and existing levels of water in storage to determine the appropriate management stage for that year.

When MWD must make net withdrawals from storage to meet demands, it is considered to be in a shortage condition. Under most of these stages, it is still able to meet all end-use demands for water. The following summaries describe water management actions to be taken under each of the seven shortage stages.

Glendale Water System Improvements

To assure the reliability and quality of water served to our water users, Glendale Water Department has been dedicated in improving the water system, which includes components such as water treatment plant, reservoirs, tanks, pump stations, communication system and pipelines. The major improvements are discussed below.

1. Glendale Water Treatment Plant

The City has continued to expand the use of its local water supplies with the addition of the Glendale Water Treatment Plant (GWTP). The GWTP, which began delivering water to the community in the middle of 2000, has been operating at full capacity despite issues related to chromium 6 and has yielded an average production rate of 7 MGD.

2. Proposed Chevy Chase 968 Reservoir Project

In 1997 during a routine inspection of the reservoir, City staff observed cracks in the column foundation which were believed to be the result of the 1994 Northridge earthquake. Temporary repairs have been done and, if continued, will be costly. It became apparent the most cost-effective solution is to replace the entire reservoir in a relatively short time.

The proposed project is divided into three major tasks:

(1) Developing potential alternative sites (2004-2005) - Alternatives have been presented to the community and golf course owner. A proposed site was identified in Spring of 2005 and environmental documentation is being prepared.

(2) Environmental impact analysis, engineering design, and soil analyses (2005-2006) - After the site selection, final design, detailed soil analysis, structural engineering, hydraulic analysis and cost estimate would be performed and presented to the community.

(3) Construction of the reservoir (2006-2009) - If the City Council elects to proceed with the reservoir replacement, construction of the new 15-million gallon reservoir is projected to begin in 2006 and be completed by 2009.

If the City Council approves this proposed project, Glendale *Water and Power* will be working closely with the Fire and Police Departments to ensure that any emergency services are readily available throughout all phases of the project.

3. Water Main Replacement Program

Another program to improve the water system is the Water Main Replacement. Work completed in the last five years is listed below:

Hillcrest (FY 2003-04 Project I) - Installation of 1.3 miles of new 8" water main, replacing old 4" main.

Cascadia (FY 2003-04 Project II) - Installation of over 1.2 miles of new 8" water main, replacing old 4" main.

Rossmoyne/Adams Hill (FY 2003-04 Project III) - Installation of over 1.3 miles of new 8" water main, replacing old 4" main.

Rossmoyne (FY 2004-05 Project I) – Installation of 1.6 miles of new 8" water main including 14 new fire hydrants.

Moncado (FY 2004-05 Project II) – Installation of 1.7 miles of new 8" water main.

Irving (FY 2004-05 Project III) – Installation of 0.8 miles of new 8" water main.

In Fiscal Years 2003-04 and 2004-05, about 3.8 miles and 4.1 miles of 4" mains, respectively, have been replaced including new service connections and additional fire hydrants.

4. Water Main Cleaning and Lining Program

Water main cleaning and lining has been an on-going effort for more than ten years. The Department has a standing policy that the minimum size of distribution lines in the system is 8 inches. Smaller sizes have been replaced to increase capacity to meet the increasing demand for water. Works completed in the last 5 years are:

1. Sunset Road (and nearby streets) - Completed in January 2004
2. Doran Street – Completed in May 2005
3. Chevy Chase Canyon Drive – Completed in June 2004

5. Pumping Stations Improvement Program

The Department has continuously rehabilitated or replaced inefficient pumps and motors at all our pumping stations. The priority needs have been established and the following works completed have been the most recent:

1. Western Pumping Station – Installation of new motors
2. Park Manor Pumping Stations – New boosters, electric motors and starter installed
3. Glorietta Park Pump Station – Completed the design of new switchgear and motor control starters, installed new pumps and motor
4. Melwood Pumping Station – New motor
5. Emerald Isle 1666 PS – New end suction pump
6. Glorietta Well No. 3 – New motor and pump
7. Glenoaks 968 PS – New pump installed
8. Grandview Pumping Station – Large compressor, rebuilt pump and motor, new clay valve installed
9. Markridge PS – New pump and two motors
10. Verdugo 1&2 – Rebuilt pump and motor
11. Metro 1 – Rebuilt pump and motor
12. Metro 2 – Repair turbine meter and installed new butterfly valve

6. Installation of Pressure Reducing Stations

In an effort to enhance reliability, the Water Department has installed several Pressure Reducing Valve (PRV) Stations throughout the distribution system. These new stations offer the system a much greater degree of redundancy during high demand periods and also make it easier to take reservoirs out of service for maintenance purposes.

7. Groundwater Extraction Facility Replacement

The Glendale *Water & Power* Department is in process of siting, drilling and equipping a replacement well in the Verdugo Basin. The existing wells are not producing the expected production in spite of rehabilitation work which was completed in 2004-05. A decrease in the groundwater production has been noted in recent years and a new well will be the best alternative. Maximizing its ability to extract water from the Verdugo Basin is a priority for Glendale. The new well will reduce the City's dependency on MWD water.

8. Water System Analysis (Hydraulic Modeling)

In May of 2005, the City of Glendale employed the services of Carollo Engineers to begin Phase I of the City's Water Hydraulic Model Development Program. It is expected to be completed by May 2006. The objectives are to continue the analysis including water flows, pressure, etc. This will give a better understanding of the system and optimized operation. It will help to determine areas with water quality problem, assess causes of service interruptions, and assist in meeting new regulations such as the Disinfection By-product Rule.

9. Water Supervisory Control & Data Acquisition System (SCADA) Upgrade

In October of 2003, the City began a program to upgrade its Supervisory Control And Data Acquisition System (SCADA). The work included the replacement of 16 Programmable Logic Controllers (PLC's) as well as Radio Transmission System upgrades for many of the City's Water Pumping Facilities. The work to upgrade the SCADA system at the remaining pump stations is ongoing and is scheduled for completion within the next year.

10. Metropolitan Water District G-03 Service Connection Upgrade

A contract between the City and MWD has been signed to increase the delivery capacity from 12 cfs to 20 cfs of the MWD G-03 service connection to the Glendale's water system. This will improve the blending capability and reliability of the MWD supply.

11. Future Los Angeles Interconnections

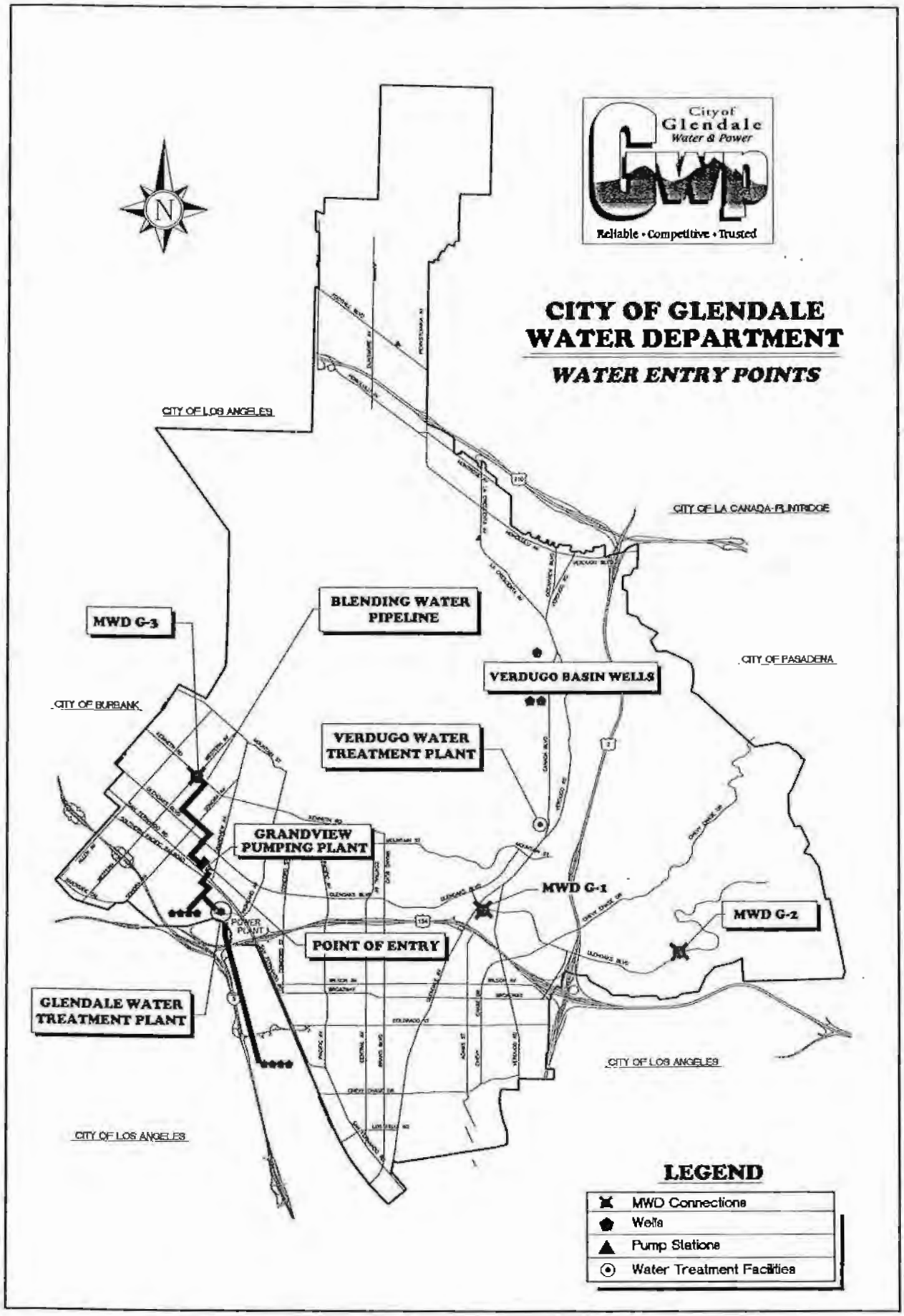
Glendale is working with City of Los Angeles, Department of Water and Power to establish two (2) interconnections between the two systems. These will increase Glendale's reliability by providing an emergency source of supply.

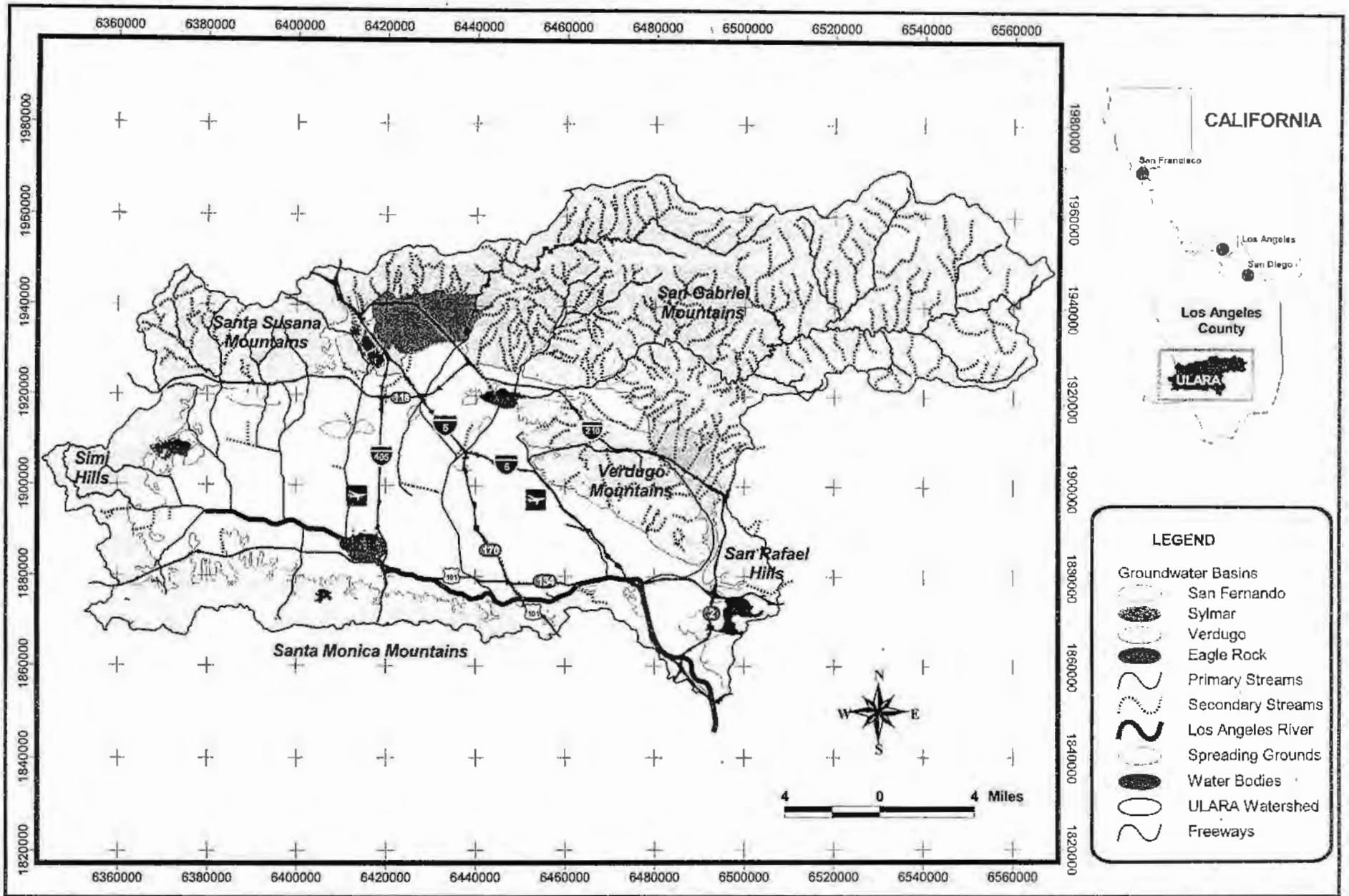
Future Goals

The City expanded the use of its local water supplies with operation of the Glendale Water Treatment Plant (GWTP). However, because of the chromium 6 related issues, the reliability of this water supply cannot be guaranteed into the future until a chromium-removal treatment is put into operation. Glendale is working with the Cities of Los Angeles and Burbank, with the help of EPA and American Water Works Research Foundation (AwwaRF), to develop a new treatment technology for chromium 6. The plan is to have a complete treatment facility in place by the year 2008. Currently, seventy percent of the water used in the City is provided by MWD. The Water Department is planning to increase water production in the Verdugo Basin by constructing a new well within the basin and increase the recycled water use by adding small users and expand the marketing effort to neighboring agencies. Also, Glendale is committed to aggressively advocate the use of recycled water for irrigation & toilet flushing, which will help increased the conservation of potable water and reduced the dependency on imported supplies. The Glendale Water Department goal is to reduce the City's water purchase from MWD to sixty-five percent of total water use by the year 2010.

FIGURES

FIGURE 1


City of Glendale Water & Power
Reliable • Competitive • Trusted
CITY OF GLENDALE
WATER DEPARTMENT
WATER ENTRY POINTS
CITY OF LOS ANGELES
CITY OF LA CANADA-FLINTRIDGE
CITY OF PASADENA
CITY OF BURBANK
CITY OF LOS ANGELES
CITY OF LOS ANGELES
MWD G-3
BLENDING WATER PIPELINE
VERDUGO BASIN WELLS
VERDUGO WATER TREATMENT PLANT
GRANDVIEW PUMPING PLANT
POWER PLANT 1
POINT OF ENTRY
MWD G-1
MWD G-2
GLENDALE WATER TREATMENT PLANT
LEGEND
MWD Connections
Wells
Pump Stations
Water Treatment Facilities



2002-03 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Vicinity and Location Map	PLATE 1

FIGURE 2

FIGURE 3

GLENDALE WATER TREATMENT PLANT
SYSTEM LAYOUT

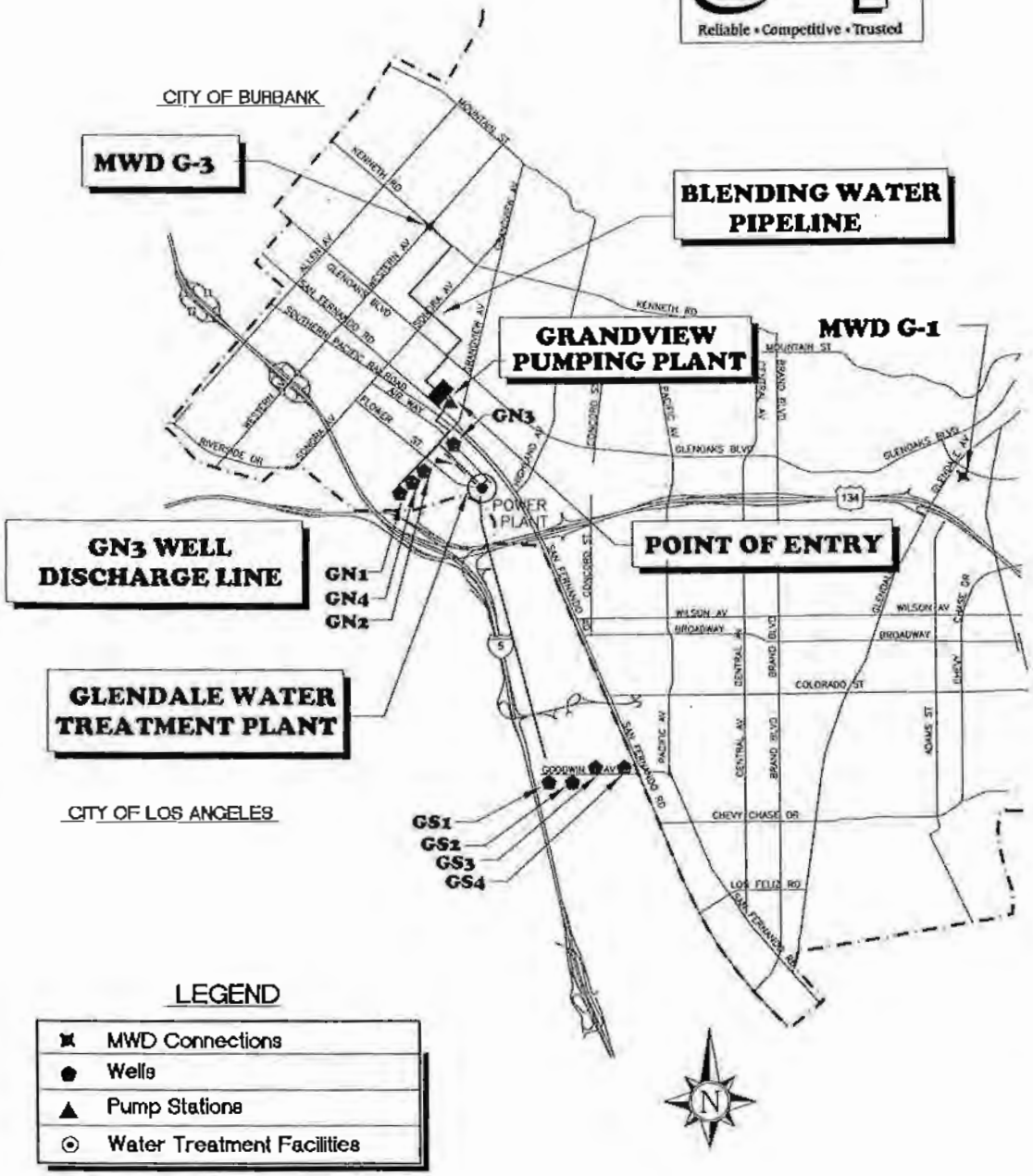
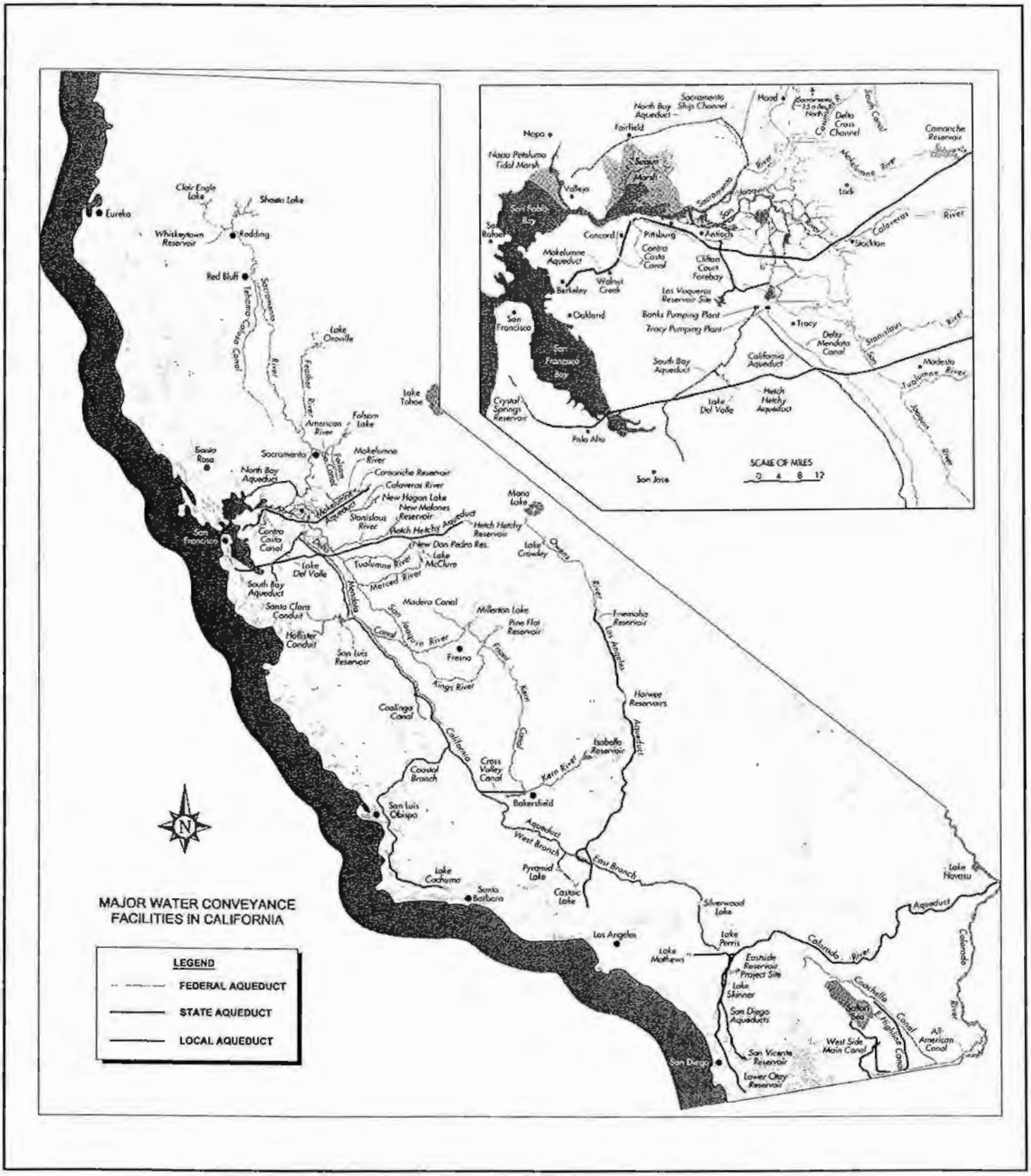


FIGURE 4


MAJOR WATER CONVEYANCE FACILITIES IN CALIFORNIA
LEGEND
FEDERAL AQUEDUCT
STATE AQUEDUCT
LOCAL AQUEDUCT
SCALE OF MILES
0 4 8 12
Eureka
Clair Engle Lake
Shasta Lake
Whiskeytown Reservoir
Redding
Red Bluff
Tehama Colusa Canal
Sacramento River
Lake Oroville
Feather River
Lake Tahoe
American River
Folsom Lake
Sacramento
Folsom South Canal
Mokelumne River
Comanche Reservoir
Calaveras River
New Hogan Lake
New Melones Reservoir
Stanislaus River
Santa Rosa
North Bay Aqueduct
San Francisco
Contra Costa Canal
Delta
Hetch Hetchy Aqueduct
Hetch Hetchy Reservoir
New Don Pedro Res.
Lake McClure
Tuolumne River
Merced River
Lake Del Valle
South Bay Aqueduct
Santa Clara Conduit
Hollister Conduit
San Luis Reservoir
Madera Canal
San Joaquin River
Millerton Lake
Pine Flat Reservoir
Fresno
Kings River
Coalinga Canal
Mono Lake
Lake Crowley
Owens River
Los Angeles Aqueduct
Haiwee Reservoirs
Fremont Reservoir
Kern River
Isabella Reservoir
California Aqueduct
Coastal Branch
Cross Valley Canal
Bakersfield
San Luis Obispo
Santa Barbara
Lake Cachuma
Pyramid Lake
Castaic Lake
West Branch
East Branch
Silverwood Lake
Lake Perris
Los Angeles
Lake Mathews
Eastside Reservoir Project Site
Lake Skinner
San Diego Aqueducts
San Diego
San Vicente Reservoir
Lower Otay Reservoir
Coachella Canal
All-American Canal
West Side Main Canal
Colorado River Aqueduct
Lake Havasu
Colorado River
Sacramento River
North Bay Aqueduct
Napa
Fairfield
Napa Petaluma Tidal Marsh
Suisun Marsh
Vallejo
San Pablo Bay
San Rafael
Concord
Pittsburg
Antioch
Sacramento River
San Joaquin River
Mokelumne Aqueduct
Contra Costa Canal
Clifton Court Forebay
Berkeley
Walnut Creek
Los Vaqueros Reservoir Site
Oakland
San Francisco
Banks Pumping Plant
Tracy Pumping Plant
Tracy
Delta Mendota Canal
Stanislaus River
San Francisco Bay
South Bay Aqueduct
California Aqueduct
Modesto
Tuolumne River
Crystal Springs Reservoir
Lake Del Valle
Hetch Hetchy Aqueduct
Palo Alto
San Jose
Joaquin River
Mead
Sacramento River Deep Water Ship Channel
Delta Cross Channel
South Canal
Comanche Reservoir
Mokelumne River
Calaveras River
Lodi
Stockton

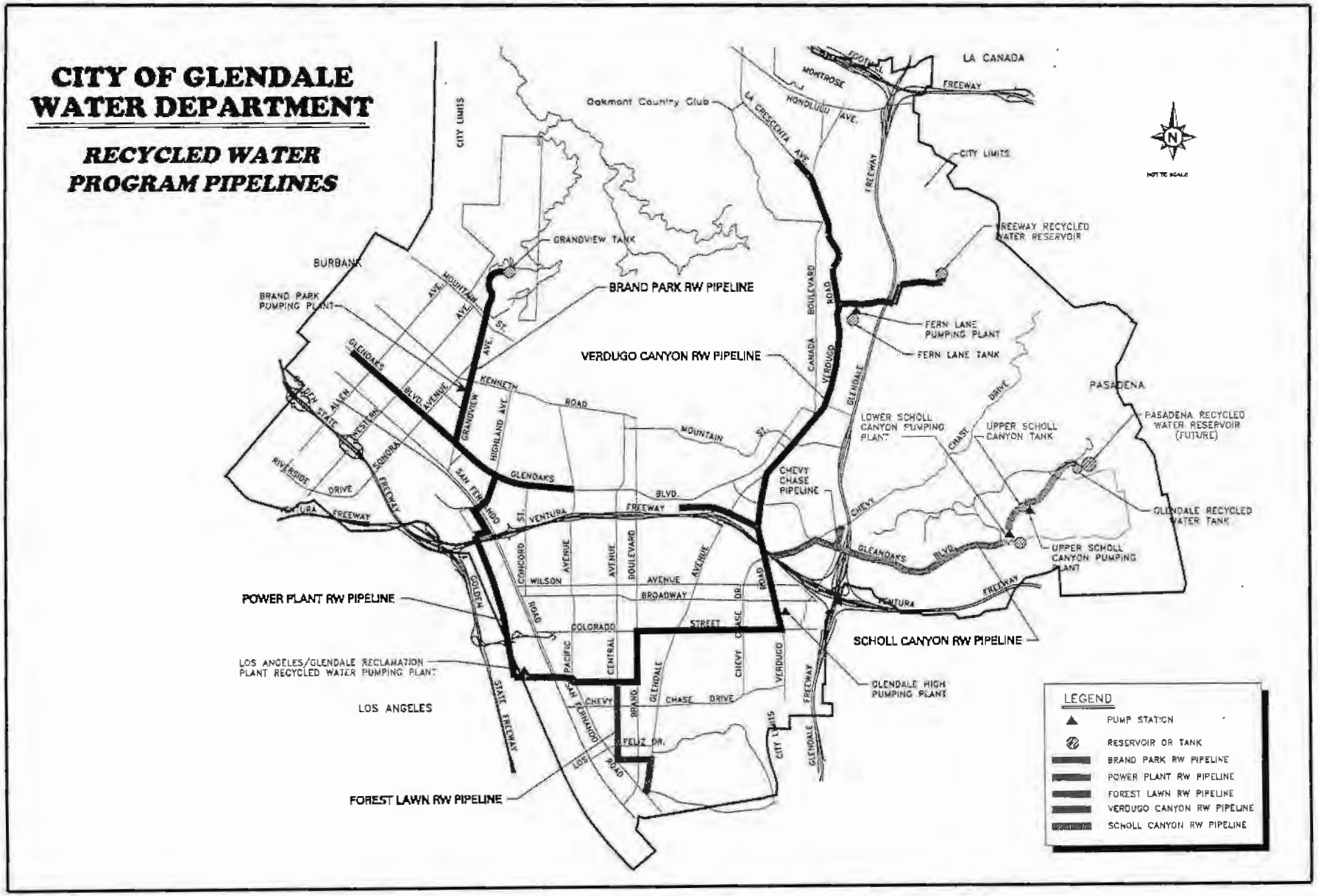

CITY OF GLENDALE
WATER DEPARTMENT
RECYCLED WATER
PROGRAM PIPELINES
BRAND PARK RW PIPELINE
VERDUGO CANYON RW PIPELINE
POWER PLANT RW PIPELINE
SCHOLL CANYON RW PIPELINE
FOREST LAWN RW PIPELINE
GRANDVIEW TANK
BRAND PARK PUMPING PLANT
FREEWAY RECYCLED WATER RESERVOIR
FERN LANE PUMPING PLANT
FERN LANE TANK
LOWER SCHOLL CANYON PUMPING PLANT
UPPER SCHOLL CANYON TANK
PASADENA RECYCLED WATER RESERVOIR (FUTURE)
GLENDALE RECYCLED WATER TANK
UPPER SCHOLL CANYON PUMPING PLANT
CHEVY CHASE PIPELINE
GLENDALE HIGH PUMPING PLANT
LOS ANGELES/GLENDALE RECLAMATION PLANT RECYCLED WATER PUMPING PLANT
LA CANADA
PASADENA
LOS ANGELES
BURBANK
Oakmont Country Club
CITY LIMITS
NOT TO SCALE
LEGEND
PUMP STATION
RESERVOIR OR TANK
BRAND PARK RW PIPELINE
POWER PLANT RW PIPELINE
FOREST LAWN RW PIPELINE
VERDUGO CANYON RW PIPELINE
SCHOLL CANYON RW PIPELINE

FIGURE 5

FIGURE 6

CITY OF GLENDALE
CURRENT RECYCLED WATER USERS - SN 1990008
As of December 2005

LOC. NO.	RECYCLED WATER USER / PROJECT	Actual Delivery Date	User	Quantity A.F./year	Type of Use
	FOREST LAWN PROJECT				
1	Forest Lawn Memorial Park	1992	YES	200-400	Irrigation
2	1600 South Brand Median	1995	YES	6	Irrigation
4	323 W Garfield Avenue	2000	YES	2	Irrigation
	POWER PLANT PROJECT				
5	Caltrans - 943 West Doran Street	1978	YES	40-60	Irrigation
6	Glendale Grayson Power Plant	1978	YES	400-600	Cooling Towers
	VERDUGO SCHOLL PROJECT				
	PARKS and RECREATION - City of Glendale				
22	Adult Recreation Center	1995	YES	10	Irrigation
24	Armory	1996	YES	4	Irrigation
30	Central Library	1995	YES	4	Irrigation
31	City of Glendale - Fern Lane	1997	YES	60	Irrigation
32	Civic Auditorium	1996	YES	15	Irrigation
48	Colorado Boulevard - Parkway Irrigation	1997	YES	5	Irrigation
47	North Verdugo Road Median/La Cresenta Avenue	1996	YES	10	Irrigation
37	Glenoaks Park	1995	YES	5	Irrigation
40	Montecito Park	1995	YES	1	Irrigation
44	701 North Glendale Avenue - Median @ Monterey Road	1995	YES	6	Irrigation
43	741 S Brand Median	1995	YES	4	Irrigation
49	Parque Vaquero	1998	YES	2	Irrigation
51	Scholl Canyon Ballfield	1997	YES	20	Irrigation
50	Scholl Canyon Park	1996	YES	12	Irrigation
53	Sports Complex (Completed)	1998	YES	99	Irrigation
46	Verdugo Rd/Canada (South) Overpass	1995	YES	0.5	Irrigation
45	Verdugo Rd/Canada (North Median)	1996	YES	1.5	Irrigation
43	Fern Lane Medians-Irrigation	2003	YES	0.5-1.5	Irrigation
	CALTRANS (5 Meters):				
25	1970 E Glenoaks Boulevard (E/S)	1995	YES	15	Irrigation
25	1970 E Glenoaks Boulevard (W/S I2)	1995	YES	10	Irrigation
26	406 N Verdugo Road @ Chevy Chase	1995	YES	35	Irrigation
27	709 Howard Street @ Monterey Road	1995	YES	12	Irrigation
28	2000 E Chevy Chase Drive @ Harvey	1995	YES	4	Irrigation
	GLENDALE UNIFIED SCHOOL DISTRICT.				
35	Glendale High School	1995	YES	30	Irrigation
36	Glenoaks Elementary School	1998	YES	2	Irrigation
55	Wilson Junior High School	1995	YES	15	Irrigation
	OTHERS:				
33	Glendale Adventist Memorial Hospital	1997	YES(Partially)	20	Irrigation
42	Oakmont Country Club	1996	YES	250-350	Irrigation
23	Scholl Canyon Golf Course	1998	YES	150-250	Irrigation
39	Scholl Canyon Landfill (LACSD)	1997	YES	120	Dust Control/Soil Compaction
52	Scholl Canyon Landfill (PW)	1996	YES	25	Irrigation/Soil Compaction
54	Upper Scholl Pump Station	1996	YES	10	Irrigation
	Dual Plumbing:				
34	Glendale Community College	1996	YES(Partially) Flush 4-04	25-35	Irrigation/Flushing Toilets
3	*PUBLIC WORKS - City of Glendale*	1978	YES	1.5	Street Cleaning
	BRAND PARK PROJECT				
7	Brand Park	1997	YES	55-65	Irrigation
8-16	Glenoaks Median (9 Meters)	1996	YES	30	Irrigation
17	Grand View Memorial Park	2001	YES(Partially)	50	Irrigation
20	Pelanconi Park	1996	YES	8	Irrigation
	TOTAL **NUMBER of METERS**	**43**		***1,775 - 2,415***	

CITY OF GLENDALE

FUTURE RECYCLED WATER USERS - SN 19990008

As of December 2005

LOC. NO.	RECYCLED WATER USERS PROJECT	Anticipated Delivery Date	User	Quantity A.F./year	Type of Use
	FOREST LAWN PROJECT				
	LOS ANGELES		NO		
61	S Central Avenue*	Completed	NO	5	Irrigation
62	Edison School*	Completed	NO	15	Irrigation
63	Cerritos School*	Completed	NO	10	Irrigation
	*Dual Plumbing:**				
56	Glendale Plaza - 655 N Central Avenue	Completed	NO		Flushing Toilets
57	Building - 400 N Brand	Completed	NO		Flushing Toilets
58	Building - 450 N Brand	Completed	NO		Flushing Toilets
59	Police Building - Isabel Street	Completed	NO		Flushing Toilets
60	Building - 611 N Brand	Planning Stage	NO		Flushing Toilets
73	Glendale Town Center	*Under Construction*	NO		Irrigation
	POWER PLANT PROJECT				
	San Fernando Road Landscape Irrigation	*Under Construction*	2005-06		
	VERDUGO SCHOLL PROJECT				
	PASADENA		NO		
64	John Marshall School*	Completed	NO	15	Irrigation
65	Fire Station No. 21*	Completed	NO	10	Irrigation
66	Mayor's Park (Proposed)	Unknown	NO	6	Irrigation
67	Park Site C (Proposed)	Unknown	NO	54	Irrigation
68	Park Site A (Proposed)	Unknown	NO	69	Irrigation
29	Carr Park	Planning Stage	NO	5	Irrigation
38	Glorietta Pump Station	2002	NO	5	Irrigation
41	Monterey Road Median - WJH	2002	NO	1	Irrigation
	PARKS and RECREATION - City of Glendale				
74	Deukmejian Wilderness Park	*Under Construction*	NO		Irrigation
	BRAND PARK PROJECT				
69	W Glenoaks Boulevard*	Completed	NO	5	Irrigation
70	Toll Jr High	Planning Stage	NO	10	Irrigation
71	Hoover High School	Planning Stage	NO	20	Irrigation
72	Keppel High School	Planning Stage	NO	10	Irrigation
	PARKS and RECREATION - City of Glendale				
75	Pacific Park	Completed	NO		Irrigation
	TOTAL			***100***	
	Grand Total		**	***2,015 - 2,655***	

** RW main service not yet available.*

*** Pasadena and Los Angeles Demand not included*

HISTORICAL AND PROJECTED
WATER USE IN THE CITY OF GLENDALE

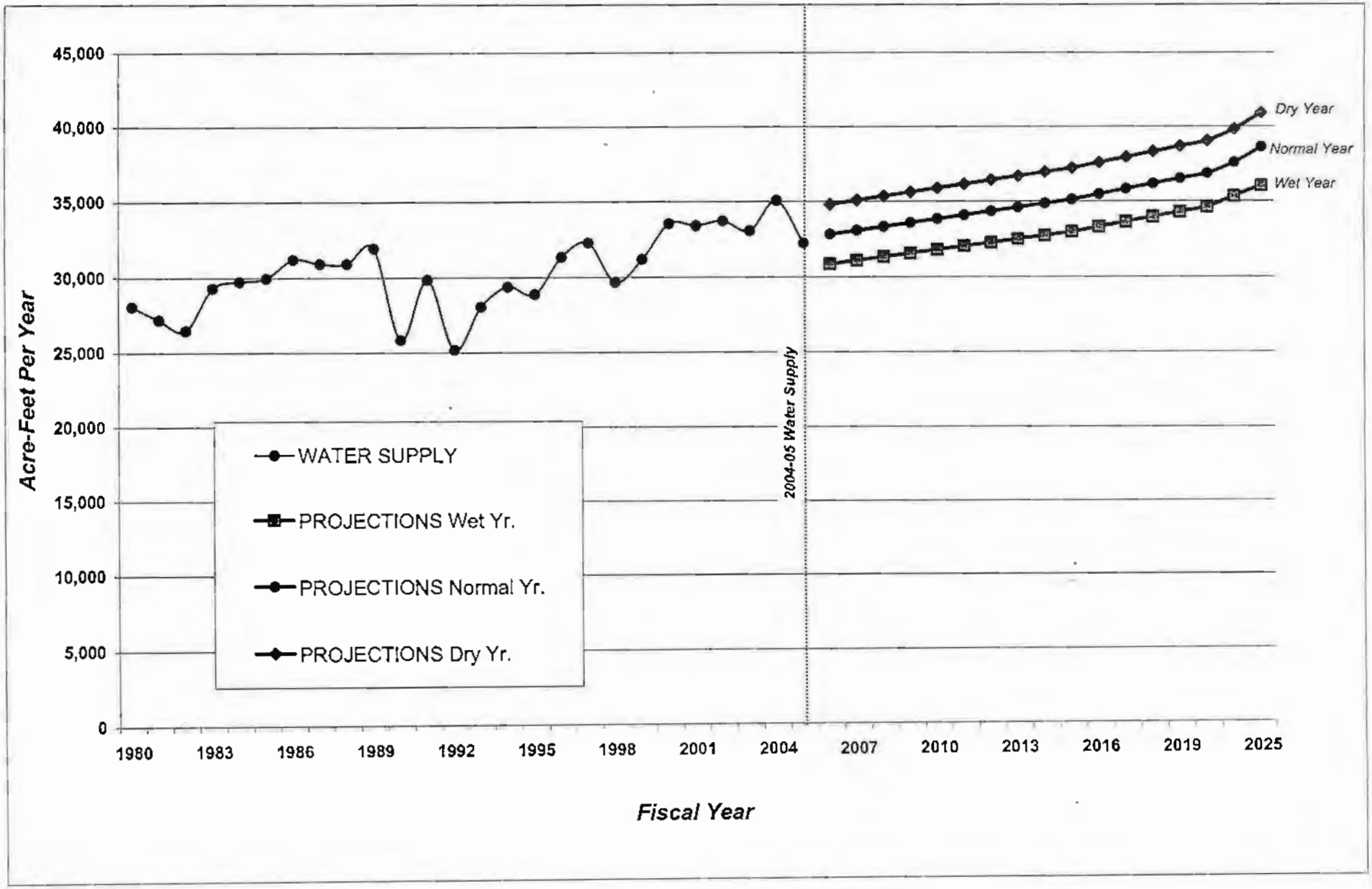


FIGURE 7

WATER CONSUMPTION (IN ACRE-FEET)
CALENDAR YEAR 2004

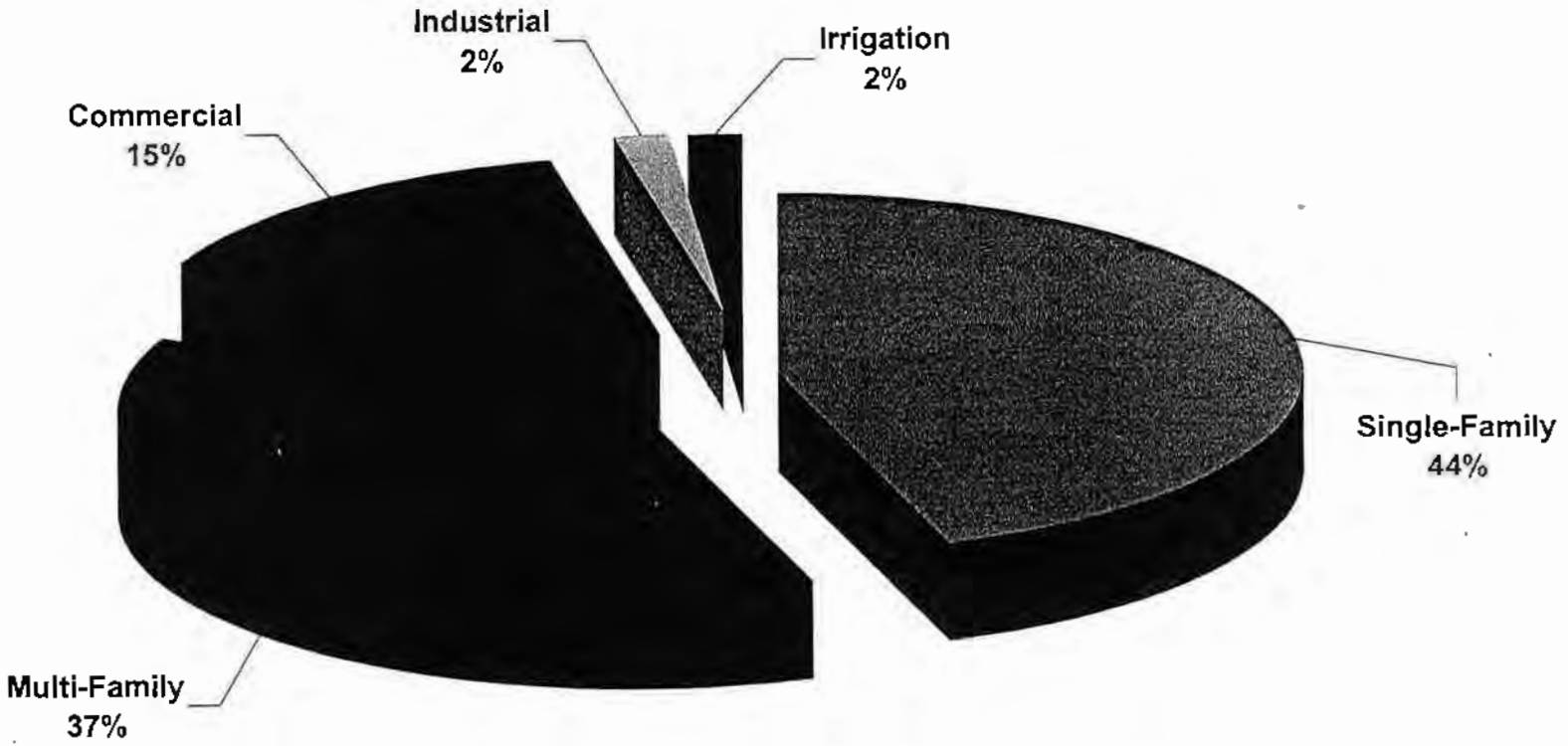


FIGURE 8

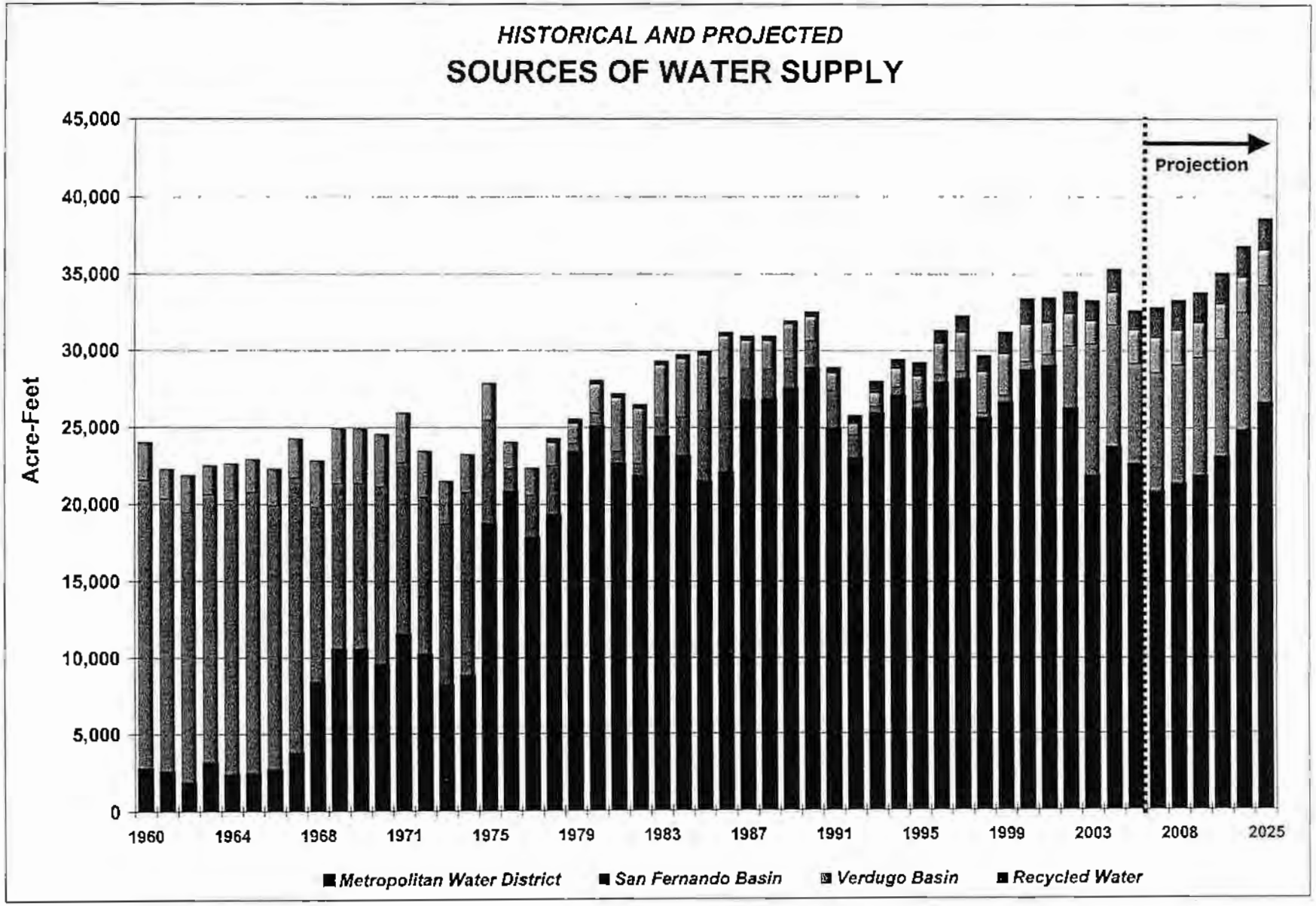

HISTORICAL AND PROJECTED
SOURCES OF WATER SUPPLY
Acre-Feet
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Projection
1960
1964
1968
1971
1975
1979
1983
1987
1991
1995
1999
2003
2008
2025
Metropolitan Water District
San Fernando Basin
Verdugo Basin
Recycled Water

FIGURE 9

City of Glendale

2005 - 2030 FORECAST OF MWD WATER DEMAND

	2005	2010	2015	2020	2025	2030
Total Demand						
Retail M&I	34,303	34,733	35,094	35,439	35,275	35,282
Retail Agricultural	0	0	0	0	0	0
Other Demand	0	0	0	0	0	0
Total Demand	**34,303**	**34,733**	**35,094**	**35,439**	**35,275**	**35,282**
Local Supplies						
Groundwater Production	2,725	2,725	2,725	2,725	2,725	2,725
Groundwater Recovery	7,200	7,200	7,200	7,200	7,200	7,200
Recycling	1,719	2,094	2,400	2,400	2,400	2,400
Recycling - M&I	1,719	2,094	2,400	2,400	2,400	2,400
Recycling - Replenishment	0	0	0	0	0	0
Recycling - Seawater Barrier	0	0	0	0	0	0
Other Non-Metropolitan Imports	0	0	0	0	0	0
Total Local Supplies	**11,644**	**12,019**	**12,325**	**12,325**	**12,325**	**12,325**
Net Demand On Metropolitan						
Full Service Rate	22,659	22,714	22,769	23,114	22,950	22,957
Full Service - Consumptive Use	22,659	22,714	22,769	23,114	22,950	22,957
Full Service - Seawater Barrier	0	0	0	0	0	0
Seasonal Rate	0	0	0	0	0	0
Agricultural Rate	0	0	0	0	0	0
Total Net Demand on Metropolitan	**22,659**	**22,714**	**22,769**	**23,114**	**22,950**	**22,957**

Data Source: MWD 2004 System Overview Study

FIGURE 10

APPENDIX D

CITY OF SAN FERNANDO

PUMPING AND SPREADING PLAN

2005-2010 Water Years

CITY OF SAN FERNANDO

GROUNDWATER PUMPING AND SPREADING PLAN

OCTOBER 1, 2005 TO SEPTEMBER 30, 2010

2005-2006 Water Year

Prepared by:

Public Works Department

Engineering Division

117 Macneil Street

San Fernando, California 91340

May 2006

TABLE OF CONTENTS

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. On October 1, 1984, San Fernando and Los Angeles were assigned equal rights to pump the safe yield of the Basin (6,210 acre-feet) thus, San Fernando and Los Angeles were each allowed to pump approximately 3,105 acre-feet per year. Thereafter, on October 1, 1996, the safe yield of the Basin was determined to be 6,510 acre-feet per year. Therefore, San Fernando and Los Angeles are now allowed to each pump approximately 3,255 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 are shown on Table 2.1.

Water demand during the early 1990's was affected by drought conditions in the Southern California region. However, the City of San Fernando has imposed voluntary conservation since 1977.

Projected water demands for the next five years is expected to slightly increase from the 1992-93 base year since public opinion is that drought conditions no longer exist and conservation habits will undoubtedly regress. The increase is therefore not from residential growth, but from a rebound of drought conditions and a re-establishment of commercial and 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 locally produced and treated groundwater. Supplemental water is purchased from the Metropolitan Water District of Southern California (MWD). 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 has been changed beginning in 1997-98 through 2001 as reflected in the Historic and projected use of MWD water as 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 Strect, Sylmar
   Capacity: 2100 GPM

2. ***Well 3***
   Location: 13003 Borden Avenue, Sylmar
   Capacity: 1100 GPM (Well 3 is currently offline. Future capacity of this well is at this time unknown, but is not expected to exceed 1100 GPM.)

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

4. ***Well 7A***
   Location: 13180 Dronfield Avenue, Sylmar
   Capacity: 800 GPM

C. Quantity (Acre-Feet) of Water Pumped From Each Well (2004-2005)

1.	Well 2A	1514.43
2.	Well 3	856.49
3.	Well 4A	201.06
4.	Well 7A	571.06
	Total	3143.04

D. Wells Groundwater Level Data

1.	Well 2A	1083.0	Taken 07/05
2.	Well 3	1089.7	Taken 07/05
3.	Well 4A	1090.1	Taken 07/05
4.	Well 7A	1065.3	Taken 07/05

E. Well Locations

Well 2A - 14060 Sayre Street, Sylmar

Well 3 - 13300 Borden Street, Sylmar

Well 4A - 12900 Dronfield Avenue, Sylmar

Well 7A 13180 Dronfield Avenue, Sylmar

IV JUDGMENT CONSIDERATIONS

A. Native and Imported Return Water

The safe yield of the Sylmar Basin is 6,510 acre-feet and the cities of San Fernando and Los Angeles have equal rights to pump from this basin. After subtracting the overlaying pumping rights of two private parties, San Fernando and Los Angeles are each allowed to pump approximately 3,255 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.

As of September 30, 2005 the City of San Fernando has a stored water credit of 338.96 acre-feet accumulated during previous years through the 04-05 water year.

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

(Acre – Feet)

FY	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
DEMAND										
WELLS	3,686.60	3,765.72	3,357.50	3,454	3,143.04	3,100	3,100	3,100	3,100	3,100
MWD	0		382	508	499.9	900	900	900	900	900
TOTAL	3,686.60	3765.72	3739.50	3,954	3,642.94	4,000	4,000	4,000	4,000	4,000
ACTUAL						PROJECTED				

APPENDIX A

WATER QUALITY DATA

SEE ATTACHED WATER QUALITY REPORT, 2005

CITY OF SAN FERNANDO

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

Continuing Our Commitment

Once again we proudly present our annual water quality report. This edition covers all testing completed from January through December 2005. We are pleased to inform you that our compliance with all state and federal drinking water laws remains exemplary. As in the past, we are committed to delivering the best quality drinking water to you our customers. We remain vigilant in meeting the challenges of source water protection, water conservation, and community education while continuing to serve the needs of all of our water users. If you have any health concerns relating to the information in this report, we encourage you to contact your health care provider.

If you should have any questions relating to your drinking water, or for additional information regarding this report you may contact Public Works Superintendent Tony Salazar at (818) 898-1298.

Community Participation

You are invited to participate at our city council meetings and voice your concerns about your drinking water. The city council meets every first and third Monday of each month beginning at 6 p.m. at City Hall, 117 Macneil Street, San Fernando, CA.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791.

How Is My Water Treated and Purified?

The treatment process consists of some basic steps. First, groundwater is drawn from the Sylmar basin; then chlorine is injected in a sodium hypochlorite solution of 0.8% for disinfection (as a precaution against any bacteria that may be present). All of the city's wells utilize an on-site chlorine generation (OSG) system, in which the 0.8% of sodium hypochlorite solution is used as a disinfectant agent. Through an electrolytic process, the OSG operates automatically, requiring only salt, water (softened) and electricity to produce the sodium hypochlorite solution. We carefully monitor on a daily basis the amount of chlorine injected at each well site. Water is then pumped to reservoirs, where it is gravity fed through the distribution system into your home or business. Likewise, chlorine residuals are monitored from the distribution system daily in order to ensure a reliable supply of drinking water.

Where Does My Water Come From?

The City of San Fernando, incorporated in 1911, provides water service to an area of approximately 2.42 square miles with an approximate population of 24,600 residents. Annually, the city serves 1 billion gallons of water to our customers. San Fernando residents are fortunate to have three sources of water: (1) Local groundwater wells that draw water from the Sylmar basin; (2) Imported water from the Metropolitan Water District (MWD), which delivers surface water from the Joseph Jensen Plant; and (3) A connection from the City of Los Angeles distribution system that is used only in extreme emergencies. In 2005, the City of San Fernando received about 81% of its water supply from local groundwater and the other 19% from MWD surface water.

In this report you will find a summary of water quality data for MWD. However, you may obtain a complete MWD Water Quality Report by calling (818) 898-1298, or by visiting the MWD Web site at www.mwdh2o.com (click on the link for the Annual Water Quality Report).

Working Hard for You

Under the Safe Drinking Water Act (SDWA), the U.S. Environmental Protection Agency (U.S. EPA) is responsible for setting national limits for hundreds of substances in drinking water and also specifies various treatments that water systems must use to remove these substances. Each system continually monitors for these substances and reports their findings to the U.S. EPA. The U.S. EPA uses these data to ensure that consumers are receiving clean water.

This publication conforms to the regulation under SDWA requiring water utilities to provide detailed water quality information to each of their customers annually. We are committed to providing you with this information about your water supply because customers who are well informed are our best allies in supporting improvements necessary to maintain the highest drinking water standards.

Source Water Assessment

In August 2002 the California Department of Health Services, Drinking Water Field Operations Branch, Central District, conducted a Drinking Water Source Assessment for the City of San Fernando Water Division. The purpose of the assessment was to determine the vulnerability of our water sources to "possible contaminating activities." The following are the results for wells 2A, 3, 4A, and 7A.

Source	Vulnerability Associated With Detected Contaminants	Vulnerability Not Associated With Any Detected Contaminants
Well 2A	Housing-high density; Parks; Septic systems-high density; Apartments and condominiums	Sewer collection systems
Well 3	Housing-high density; Parks Septic systems-high density; Apartments and condominiums	Sewer collection systems; Automobile gas stations, Dry cleaners
Well 4A	Sewer collection systems Dry cleaners	None
Well 7A	Housing-high density; Septic systems-high density; Apartments and condominiums	Automobile gas stations

Substances That Might Be in Drinking Water

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

In order to ensure that tap water is safe to drink, the U.S. EPA and the State Department of Health Service (Department) prescribe regulations that limit the amount of certain substances in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some substances. The presence of contaminants does not necessarily indicate that water poses a health risk.

Substances that may be present in source water include:

Microbial Contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife;

Inorganic Contaminants, such as salts and metals, which can be naturally occurring or can result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;

Pesticides and Herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses;

Organic Chemical Contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and which can also come from gas stations, urban stormwater runoff, agricultural applications, and septic systems;

Radioactive Contaminants, which can be naturally occurring or can be the result of oil and gas production and mining activities.

More information about contaminants and potential health effects can be obtained by calling the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

City of San Fernando
117 Macneil Street
San Fernando, CA 91340

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

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CA1451

Sampling Results

During the past year we have taken numerous water samples in order to determine the presence of any radioactive, biological, inorganic, volatile organic or synthetic organic contaminants. The table below shows only those contaminants that were detected in the water. Although all of the substances listed here are under the Maximum Contaminant Level (MCL), we feel it is important that you know exactly what was detected and how much of the substance was present in the water.

Primary Drinking Water Standard (Regulated In Order To Protect Against Possible Adverse Health Effects)

				San Fernando		MWD			
SUBSTANCE (UNITS)	YEAR SAMPLED	MCL [MRDL]	PHG (MCLG) [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Aluminum (ppm)	2005	1	0.6	NA	NA	0.055	ND-0.118	No	Erosion of natural deposits; residue from some surface water treatment processes
Bromate (ppb)	2005	10	0	NA	NA	6.8	4.8-8.8	No	By-product of drinking water disinfection
Fluoride [naturally occurring] (ppm)	2005	2.0	1	NA	NA	0.22	0.11-0.27	No	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
Free Chlorine Residual (ppm)	2005	[4.0]	[4]	1.04	0.01-2.2	NA	NA	No	Drinking water disinfectant added for treatment
Haloacetic Acids *five* (HAA5) (ppb)	2005	60	NA	0.4	ND-8.5	15	4.6-28	No	By-product of drinking water disinfection
Nitrate (as nitrate, NO_3) (ppm)[1]	2005	45	45	30.25	16-40	NA	NA	No	Runoff and leaching from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrate and Nitrite (as nitrogen) (ppm)[1]	2005	10	10	NA	NA	0.54	ND-0.61	No	Runoff and leaching from fertilizer use; sewage; natural erosion
Tetrachloroethylene [PCE] (ppb)	2005	5	0.06	0.6	0.6-0.6	ND	NA	No	Discharge from factories, dry cleaners and auto shops (metal degreaser)
Total Chlorine Residual (ppm)	2005	[4.0]	[4]	1.46	0.01-2.7	2.4	1.5-2.8	No	Drinking water disinfectant added for treatment
Total Chromium (ppb)	2005	50	(100)	3.34	ND-4.2	NA	NA	No	Discharge from steel and pulp mills; erosion of natural deposits
TTHMs [Total Trihalomethanes] (ppb)	2005	80	NA	4.5	ND-30	41	10-75	No	By-product of drinking water chlorination

Tap water samples were collected for lead and copper analyses from 30 homes throughout the service area

SUBSTANCE (UNITS)	YEAR SAMPLED	ACTION LEVEL	PHG (MCLG)	AMOUNT DETECTED (90TH %TILE)	HOMES ABOVE ACTION LEVEL	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2002	1.3	0.17	0.19	0	No	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Lead (ppb)	2002	15	2	1.9	0	No	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits

Secondary Drinking Water Standard (Regulated In Order To Protect The Odor, Taste And Appearance Of Drinking Water)

				San Fernando		MWD			
SUBSTANCE (UNITS)	YEAR SAMPLED	SMCL	PHG (MCLG)	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Chloride (ppm)	2005	500	NS	NA	NA	52	47-65	No	Runoff/leaching from natural deposits; seawater influence
Color (Units)	2005	15	NS	NA	NA	2	1-4	No	Naturally occurring organic materials
Corrosivity (Units)	2005	Non-corrosive	NS	NA	NA	0.14	0.05-0.25	No	Natural or industrially influenced balance of hydrogen, carbon and oxygen in the water; affected by temperature and other factors
Odor--Threshold (Units)	2005	3	NS	NA	NA	2	2-2	No	Naturally occurring organic materials
Specific Conductance (µmhos/cm)	2005	1,600	NS	NA	NA	525	477-564	No	Substances that form ions when in water; seawater influence
Sulfate (ppm)	2005	500	NS	NA	NA	82	55-102	No	Runoff/leaching from natural deposits; industrial wastes
Total Dissolved Solids [TDS] (ppm)	2005	1,000	NS	NA	NA	302	270-328	No	Runoff/leaching from natural deposits
Turbidity (Units)	2005	5	NS	0.17	ND-0.85	0.05	0.04-0.06	No	Soil runoff

UNREGULATED SUBSTANCES

		San Fernando		MWD		
SUBSTANCE (UNITS)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Alkalinity (ppm)	2005	NA	NA	89	79-94	NA
Boron (ppb)	2005	NA	NA	190	170-220	Runoff/leaching from natural deposits; industrial waste
Bromodichloromethane (ppb)	2005	1.24	ND-5.3	NA	NA	By-products of drinking water disinfection
Bromoform (ppb)	2005	0.95	ND-12	NA	NA	By-product of drinking water disinfection
Calcium (ppm)	2005	NA	NA	32	24-37	Erosion/leaching of natural deposits
Chloroform (ppb)	2005	0.70	ND-2.0	NA	NA	By-product of drinking water disinfection
Dibromoacetic Acid (ppb)	2005	0.17	ND-4.6	NA	NA	By-product of drinking water disinfection
Dibromochloromethane (ppb)	2005	1.64	ND-11	NA	NA	By-product of drinking water disinfection
Dichloroacetic Acid (ppb)	2005	0.12	ND-2.7	NA	NA	By-product of drinking water disinfection
Hardness (ppm)	2005	NA	NA	138	109-156	Erosion/leaching of natural deposits
Magnesium (ppm)	2005	NA	NA	14	12-15.5	Erosion/leaching of natural deposits
N-Nitrosodimethylamine (NDMA) (ppt)	2005	NA	NA	8.0	ND-8.0	NA
pH (Units)	2005	NA	NA	8.2	8.1-8.3	NA
Potassium (ppm)	2005	NA	NA	2.9	2.7-3.0	Erosion/leaching of natural deposits
Sodium (ppm)	2005	NA	NA	48	42-52	Erosion/leaching of natural deposits; sea water influence
TOC (ppm)	2005	NA	NA	2.6	1.9-3.0	Various natural and manmade sources
Trichloroacetic Acid (ppb)	2005	0.03	ND-1.20	NA	NA	By-product of drinking water disinfection

Footnote:

[1] Nitrate in drinking water at levels above 45 ppm is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of the skin. Nitrate levels above 45 ppm may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant, or you are pregnant, you should ask advice from your health care provider.

Table Definitions

AL (Action Level): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

MCL (Maximum Contaminant Level): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs (SMCLs) are set to protect the odor, taste and appearance of drinking water.

MCLG (Maximum Contaminant Level Goal): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. EPA.

MRDL (Maximum Residual Disinfectant Level): The level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap.

MRDLG (Maximum Residual Disinfectant Level Goal): The level of a disinfectant added for water treatment below which there is no known or expected risk to health. MRDLGs are set by the U.S. Environmental Protection Agency.

NA: Not applicable

ND: Not detected

NS: No standard

PDWS (Primary Drinking Water Standard): MCLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

PHG (Public Health Goal): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California EPA.

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).

ppt (parts per trillion): One part substance per trillion parts water (or nanograms per liter).

TT (Treatment Technique): A required process intended to reduce the level of a contaminant in drinking water.

µmhos/cm (micromhos per centimeter): A measure of electrical conductance.

APPENDIX B

POLICIES AND PROCEDURES

(By ULARA)

WATERMASTER SERVICE

UPPER LOS ANGELES RIVER AREA

POLICIES AND PROCEDURES

February 1998

APPENDIX E

CRESCENTA VALLEY WATER DISTRICT

PUMPING AND SPREADING PLAN

2005-2010 Water Years

CRESCENTA VALLEY WATER DISTRICT

GROUNDWATER PUMPING & SPREADING PLAN

FOR

WATER YEARS

OCTOBER 1, 2005 TO SEPTEMBER 30, 2010

Prepared by:
David S. Gould, P.E.,
District Engineer

Prepared for:
ULARA Watermaster's Office

APRIL 2006

I. INTRODUCTION

The ground water rights of the Crescenta Valley Water District (CVWD) 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 Judgment was signed on January 26, 1979.

In 1993 and in February 1998, significant revisions were made to the Upper Los Angeles River Area (ULARA) Policies and Procedures with the addition of Sections or Groundwater Quality Management and various new reports and appendices. 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 as prepared by CVWD is in response to Section 5.4, Groundwater Pumping and Spreading Plan. Since no groundwater spreading has been performed by the CVWD at this time, only plans/projections for groundwater pumping and treatment are discussed in this report. Please note that CVWD's Verdugo Basin Groundwater Recharge, Storage and Conjunctive Use Feasibility Study, which was completed in 2005 has recommended methods of stormwater recharge and storage within the basin and this issue will be investigated more in the future.

The Groundwater Pumping Plan is based on the water year, October 1 to September 30. The Draft Plan for CVWD 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 are shown in Table 2.1.

Water demand during the last five years (00/01 – 05/06) have been affected by less than normal amounts of rainfall in the Crescenta Valley from 1997-98 through 2003-04 and the near record rainfall in 2004-05. The 2003-04 water year concluded six (6) consecutive years of below average rainfall in the Crescenta Valley, which was an average of 16.4 inches over this period. However, starting in 2004/05, the Southern California area saw near record rainfall and the Crescenta Valley rainfall total reached over 50 inches. In 2005/06, rainfall is projected to be slightly below the 30 year average of 24.3 inches. We have also observed the shift of weather patterns from the raining season in winter time, to the early spring, the water demands have remain fairly constant. However, water demands may increase this summer if weather conditions change to a higher than normal temperature.

CVWD's Board of Director elected this year to continue with a voluntary water conservation program utilizing a water conservation alert system. CVWD saw a marginal decrease in water usage (3%-4%) in the summer of 2005, which was probably attributed to a mild summer and public awareness.

Water conservation incentives in the form of rebates for turf replacement, ultra-low flush toilets, and high efficiency clothes washers are being provided along with continuous water conservation information that was posted on CVWD's website to CVWD's customers. In addition, CVWD has been working with MWD on an ET irrigation controller exchange program.

In 2004-05, we observed a significant increase in production as compared to 2003-2004. CVWD's wells produced 3,310 ac-ft, which was 16 ac-ft over the adjudicated rights of 3,294 AFY. It appears that CVWD's annual water demand has stabilized in the 5600-5900 AFY range, hopefully due to our water conservation and public education efforts. The localized drought from 1998 – 2004 had serious implications for the Verdugo Basin groundwater supply and CVWD has been looking at additional ways to augment its water supply. The District, while working with Foothill Municipal Water District (FMWD) had increased its ability for more imported water and recently completed an emergency water supply interconnection with the City of Glendale. CVWD is finalizing a new emergency water supply interconnection with the City of Los Angeles, Department of Water and Power (LADWP) as part of a grant funded under Proposition 50, Chapter 3 for construction of the new facility.

Regardless of water conservation programs, the water demand seems to vary significantly due to weather conditions in the CVWD service area. This can be attributed to the residential character of the District and the large percentage of water consumption for outdoor landscaping. An increase in water demand of approximately 2% per year can be expected over the next five (5) years.

III. WATER SUPPLY

The water supply for the CVWD is composed of locally produced and treated groundwater, water from the Metropolitan Water District of Southern California (MWD) purchased on a wholesale basis from FMWD and a water supply interconnection with the City of Glendale.

A. PRODUCTION WELLS

The CVWD has eleven active wells that are currently in operation. Historic and projected production from these wells is shown in Table 3.1. The CVWD wells produce water which typically contains nitrate concentrations above the 45 mg/L maximum contaminant level (MCL) set by the EPA and 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 CVWD system. In the 2005-06, the ion-exchange plant was in operation for the majority of the year since there was an increase in well levels and well production due to the higher rainfall levels.

The District's active wells range in age from 3 to 75 years and are mostly beyond their useful life. The District' started in 2000 with a well replacement program with the goal of replacing existing groundwater production capacity with new, modern wells over the next 10 years. However, Well 15 had a very low capacity and a second well drilled (Well 17) did not produce enough during development of the well to be put into production. As the capacity of the new wells appears to be far less than we originally anticipated, CVWD received an AB303 local groundwater assistance grant for the Verdugo Basin monitoring well study to locate new production wells. The results of the study showed that these monitoring well sites would also produce low-capacity well. The District then received a second AB303 local groundwater assistance grant to perform a groundwater model and look at the feasibility of recharging the basin. This feasibility study was completed in 2005 and the recommendations were that it is possible to store stormwater in the basin to increase groundwater levels and water production. To continue with CVWD's work in the basin, CVWD was awarded a third AB303 local groundwater assistance grant to perform a geophysical survey of the Verdugo Basin. This study began in September 2005 and will be completed in June 2006. The preliminary results from geophysical survey showed a different configuration of the subsurface and the new data will be inputted into the model to assist CVWD and Glendale with management of the basin.

CVWD has seen a dramatic increase in water levels and water production in its groundwater wells due to the record rainfall received in the Crescenta Valley in 2004/05. Water production has increased from a maximum capacity to 4.5 MGD. While we believe that this year (05/06), we should see an increase in the overall groundwater production, this situation may not be long-term if the below normal rainfall cycle continues in future years.

Starting in 2005/06, CVWD is planning to make active Well #2 and to complete the equipping of Well #17. The goal of activating theses wells is to increase the potential well capacity of the entire system, when lower groundwater levels are experienced and there is also a decrease in well production. Well #2 is anticipated to be on-line by the end of 2006.

Well #2 has been inactive since 1976 due to high nitrate levels and the inability to treat the water. In recent years, CVWD has been tracking nitrate levels in Well #2 and the levels have been at or below the MCL. CVWD is working with a consultant to preparing a blending plan with DHS and activate this well by the end of 2006. We anticipate a maximum capacity of 150 gpm.

Well #17 was drilled in 2002, well production was less than 20 gpm and at that time, it was decided not to complete the well. CVWD is working with a consultant on possible methods to increase water production and install a small pump for water production. Well # 17 is anticipated to be on-line by Spring 2007.

CVWD will continue performing well rehabilitation on its existing wells until the completion of the geophysical study to determine possible locations of new wells.

B. GLENWOOD NITRATE REMOVAL PLANT

The Glenwood ion exchange nitrate removal plant began operation in January 1990. The plant has been out of operation for extended periods in 1992–93 and in 1997 when repairs were necessary. In the past year, the plant was in operation because overall groundwater production was up due to basin level increase, thereby increasing the need for treatment. This trend continued in 2005/06 as the near record rainfall in 04/05 has allowed CWVD to increase usage of the plant. 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 CVWD demand is supplied by the Pickens Gravity Tunnel. Historic and projected production from Pickens Tunnel is shown in Table 3.3.

D. MWD

In 2004/05, the amount of treated water purchased from MWD via FMWD was less than previous years as we experienced an increase groundwater production capacity and customer demand. In 2005/06, the recent rains have allowed CVWD to decrease the amount of import water it receives from FMWD, however, this maybe a short-term situation that could increase in future years. Historic and projected use of FMWD water is shown in Table 3.4.

E. City of Glendale Interconnection

In 2003/04, CVWD completed the installation of a new water supply interconnection with the City of Glendale. This connection allowed CVWD to increase its water supply capacity by 5.0 cfs or 1.1 mgd. An agreement between City of Glendale, FMWD and CVWD was signed in 2004, where CVWD will pay FMWD for the water and Glendale for the maintenance and operation of bring the water to CVWD. CVWD's usages of the Glendale/CVWD interconnect (GCI) was used only during periods of outages from FMWD. It is not anticipated to be used in 2005/06 unless there is another outage from FMWD or demand or weather conditions change.

IV. JUDGEMENT CONSIDERATIONS

The allowable pumping for CVWD's share of the Verdugo Basin is 3,294 acre-feet annually. In the past six years, basin production was declining and 2001-02 was the first in over ten years CVWD was less than the full adjudication. However, in 2004/05, CVWD experience an increase in water production and was able to pump its entire adjudication plus 16 ac-ft. Estimated pumping in 2005/06 is expected to the same as last year and this will be reviewed on an annual basis.

The unusually higher than normal rainfall condition that occurred last year has increased the groundwater levels and production capacity in the Verdugo Basin, but this may not be a long-term trend and well levels and production may decrease in future years. A more conservative approach is taken in the estimates provided here. In prior years, the Watermaster, with approval from the ULARA Administrative Committee, has allowed CVWD to over-pump their rights in the Basin. This will probably not be an issue in the near future. In any case, future consideration for excess pumping in the Verdugo Basin is now addressed in the February 1998 "Policies and Procedures", Section 2.3.4. Either party, Glendale or CVWD, may pump in excess of their adjudication as long as total production does not exceed 7150 AF/year, as reviewed on an annual basis by the Watermaster.

TABLE 2.1

HISTORIC AND PROJECTED WATER DEMAND

(Acre-Feet)

2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
5614	5832	5710	5874	5220	5400	5522	5586	5695	5805
ACTUAL					PROJECTED				

TABLE 3.1
HISTORIC AND PROJECTED COMBINED WELL AND TUNNEL GROUNDWATER PRODUCTION
(Acre-Feet)

2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
3,412	3,276	2,842	2,575	3,310	3,294	3,294	3,294	3,294	3,294
ACTUAL					PROJECTED				

TABLE 3.2
HISTORIC AND PROJECTED GLENWOOD NITRATE REMOVAL PLANT PRODUCTION BEFORE BLENDING
(Acre-Feet)

2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
989	515	216	164	782	850	900	950	950	950
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)

2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
61	59	56	51	64	69	67	60	60	60
ACTUAL					PROJECTED				

TABLE 3.4
HISTORIC AND PROJECTED USE OF MWD TREATED WATER
(Acre-Feet)

2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
2,202	2,556	2,868	3,299	1,909	2,107	2,224	2,292	2,401	2,511
ACTUAL					PROJECTED				

NOTES:

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

APPENDIX F

ANNUAL MUNICIPAL EXTRACTIONS IN ULARA

1979 - 2005

ANNUAL MUNICIPAL EXTRACTIONS IN ULARA
1979-80 through 2004-05
(acre-feet)

Water Year	San Fernando Basin*				Sylmar Basin			Verdugo Basin			ULARA TOTAL
	Burbank	Glendale	Los Angeles	TOTAL	Los Angeles	San Fernando	TOTAL	CVWD	Glendale	TOTAL	
2004-05	6,399	7,792	49,085	63,276	1,110.0	3143	4,253	3310	2358	5,668	73,197
2003-04	9,660	7,282	68,626	85,568	3,033	3,454	6,487	2,568	2,117	4,685	96,740
2002-03	9,170	8,507	73,676	91,353	3,549	3,357	6,906	2,836	1,613	4,449	102,708
2001-02	10,540	6,838	66,823	84,201	1,240	3,766	5,005	3,266	2,129	5,396	94,602
2000-01	12,547	6,886	65,409	84,843	2,606	3,696	6,301	3,422	2,227	5,649	96,793
1999-00	12,547	1,023	98,016	111,586	2,634	3,807	6,441	3,699	2,727	6,426	124,453
1998-99	10,729	31	123,207	133,966	4,536	3,528	8,064	3,797	2,627	6,424	148,455
1997-98	3,964	28	85,292	89,284	3,642	3,308	6,950	3,747	2,820	6,567	102,802
1996-97	11,171	20	89,935	101,126	2,482	3,259	5,741	3,672	2,674	6,346	113,213
1995-96	8,067	26	72,286	80,379	2,766	2,985	5,752	3,705	2,133	5,838	91,969
1994-95	3,052	53	55,478	58,583	2,311	3,421	5,732	3,708	1,633	5,341	69,656
1993-94	2,773	115	60,480	63,368	2,052	3,398	5,451	3,634	1,402	5,037	73,855
1992-93	1,354	91	34,973	36,419	1,369	2,145	3,514	2,557	990	3,547	43,480
1991-92	39	489	75,684	76,213	3,292	2,826	6,118	2,631	633	3,264	85,596
1990-91	1,278	2,755	67,032	71,065	3,281	2,266	5,546	2,615	1,230	3,845	80,456
1989-90	16	1,500	79,949	81,465	2,626	2,763	5,389	2,903	1,329	4,232	91,086
1988-89	29	1,315	126,630	127,974	3,259	2,199	5,459	2,285	2,064	4,349	137,781
1987-88	30	1,020	104,419	105,470	3,133	777	3,911	2,268	2,096	4,364	113,745
1986-87	29	5,758	85,845	91,632	3,113	3,026	6,139	2,255	2,619	4,874	102,645
1985-86	123	5,819	80,963	86,904	3,075	3,166	6,241	2,075	3,418	5,493	98,639
1984-85	2,863	3,086	95,641	101,591	3,130	3,102	6,232	1,997	3,837	5,834	113,657
1983-84	1,083	1,708	112,840	115,611	3,106	3,907	7,013	2,009	3,551	5,560	128,184
1982-83	2,187	1,028	65,178	68,394	3,048	3,133	6,181	1,759	3,427	5,187	79,761
1981-82	523	952	83,207	84,682	3,486	3,290	6,775	1,876	3,732	5,607	97,065
1980-81	595	1,129	91,067	92,791	4,117	3,380	7,497	2,140	2,122	4,262	104,550
1979-80	677	934	57,304	58,915	3,111	2,991	6,102	1,873	1,434	3,307	68,325
Average	4,286	2,546	79,579	86,410	2,889	3,081	5,969	2,793	2,267	5,060	97,439

*Includes municipal pumping only. Does not include any physical solution pumping in the cities of Burbank, Glendale, or Los Angeles.