ANNUAL REPORT

Upper Los Angeles River Area Watermaster

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

Superior Court Case No. 650079 – County of Los Angeles

WATERMASTER SERVICE

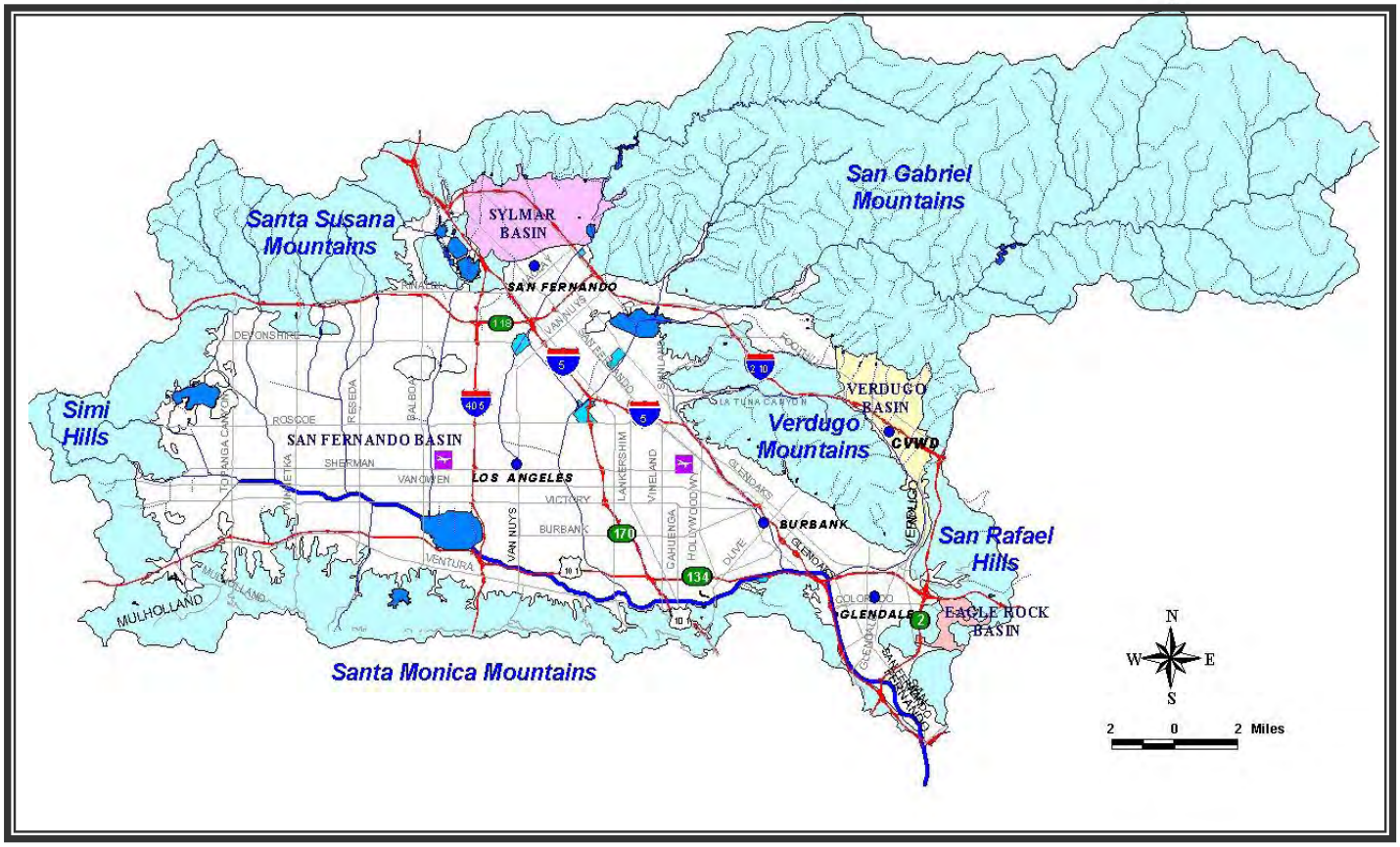
IN THE

UPPER LOS ANGELES RIVER AREA

LOS ANGELES COUNTY, CALIFORNIA

2013-14 WATER YEAR

OCTOBER 1, 2013 – SEPTEMBER 30, 2014



DECEMBER 2015

ANNUAL REPORT
UPPER LOS ANGELES RIVER AREA WATERMASTER

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Copies of this report may be viewed and downloaded from the ULARA Watermaster website located at http://ularawatermaster.com/

December 2015

FOREWORD

As Watermaster, I am pleased to present the Annual Watermaster Report for the Upper Los Angeles River Area (ULARA) for the 2013-14 Water Year (i.e., from October 1, 2013 through September 30, 2014). Please note that this Annual Watermaster Report is being submitted to the Court later than its anticipated May 2015 filing date. Due to various technical and personnel issues at the Watermaster's office, the report is being provided to the Court in January 2017. However, to avoid confusion with the submittal to the Court later this year of the Annual Watermaster Report for Water Year 2014-15, this current report has been purposely dated December 2015.

This report has been prepared by Watermaster staff and myself in general accordance with the provisions of the Judgment, dated January 26, 1979, in regard to the Court-defined water rights case of the Superior Court for the County of Los Angeles (i.e., City of Los Angeles vs. City of San Fernando, et al, Case No. 650079). Four distinct groundwater basins and their adjoining hill and mountain watershed areas comprise ULARA. From largest to smallest in surface area, these four groundwater basins are known as the San Fernando, the Sylmar, the Verdugo and the Eagle Rock basins.

Described in this Annual Watermaster Report are the water rights of each Party in each of the four ULARA groundwater basins, and the volume of groundwater in storage to the credit of each Party, as of October 1, 2014. This report also provides basic background information on the history of the San Fernando Case and information regarding the four ULARA groundwater basins such as their: respective locations and basin boundaries; local geologic conditions; local water supply; groundwater extractions; changes in groundwater levels over time; estimates of the change in groundwater in storage; imported water use; recharge operations; water quality; and other pertinent information for the 2013-14 Water Year.

Based on available information, key challenges in ULARA over the long-term will continue to be: the accumulation of stored water credits in the San Fernando Basin; new and/or ongoing contamination of groundwater in the San Fernando, Verdugo and Sylmar basins; and the need to increase recharge into the local groundwater basins by different methods, at different

locations and depths, and by using different sources of water. This need for increased recharge is particularly important for the San Fernando Basin.

In late-2007, the cities of Glendale, Burbank, and Los Angeles entered into a 10-year agreement which was oriented to help reverse the long-term decline of groundwater in storage and the concurrent accumulation of a large quantity of unsupported stored water credits in the San Fernando Basin. That agreement contains several important provisions, including: restrictions on pumping of stored water credits; the joint efforts of the City of Los Angeles and the County of Los Angeles Department of Public Works to rehabilitate existing facilities and/or construct new facilities to help increase recharge of stormwater runoff; and working to reduce future losses from the basin due to rising groundwater and underflow out of ULARA.

Groundwater contamination from volatile organic compounds (VOCs), hexavalent chromium, and certain other, newly-emerging contaminants continues to be a serious problem for water-supply in ULARA, but particularly in the eastern portion of the San Fernando Basin. The cities of Burbank, Glendale and Los Angeles continue to enlist the assistance of key regulatory agencies including the United States Environmental Protection Agency (USEPA), the California Department of Toxic Substances Control (DTSC) and the Regional Water Quality Control Board – Los Angeles (RWQCB-LA) to help further characterize and expedite the cleanup of the contaminated soils and aquifers within San Fernando Basin. Pumping of excessive concentrations of chromium by certain wells and limitations of existing treatment facilities to treat those excessive concentrations have also become more recent problems. In addition, various gasoline components have previously impacted and/or have threatened one or more municipal-supply water wells owned by the Crescenta Valley Water District in the Verdugo Basin. In the Sylmar Basin, nitrate concentrations have been increasing in recent years in wells operated by the City of San Fernando; Los Angeles has one or more wells that have been impacted by TCE in this basin. A number of the municipal-supply water wells have had to be removed from active service due to excessive concentrations of various contaminants, mainly in the San Fernando Basin, but also in the Sylmar and Verdugo basins.

An ongoing activity of the Watermaster continues to review and provide an opinion of the plans for the possible infiltration of stormwater collected at all new development and/or redevelopment projects within the San Fernando Basin portion that lies within the City of Los Angeles. These

stormwater collection plans, as prepared by the engineer for the developer, have been part of the Low Impact Development (LID) program by the RWQCB-LA.

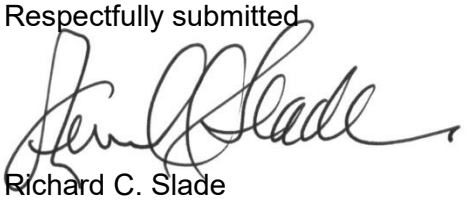
To provide ongoing groundwater management within the four ULARA groundwater basins, the Watermaster and the Administrative Committee continued to meet on a quarterly basis during 2014-15. The Watermaster continued to provide updates of key ULARA issues at occasional status conferences with Judge Susan Bryant-Deason, Judge of the Los Angeles County Superior Court.

On July 1, 2014, the California Department of Public Health (CDPH) Drinking Water Program transferred from CDPH to the State Water Resources Control Board (SWRCB). The transferred program is now known as the Division of Drinking Water (DDW). For the purpose of this report, any references herein to CDPH should be understood as referring to the new DDW.

This will be the last year the report appears in this format. For the upcoming 2014-15 Water Year, the ULARA Administrative Committee has been working with the Watermaster to provide a newer, more "streamlined" format. The purpose of the change is to increase the usability of the Annual Watermaster Report, to help assure that the report meets the necessary reporting conditions of California's new Sustainable Groundwater Management Act, and to aid in the timely production and delivery of the report.

For this current Annual Watermaster Report, I want to acknowledge and personally thank the Watermaster Support Staff at LADWP for their continued efforts in creating many of the data tables, figures and maps, and for conducting computer model simulations that continue to be vital to the preparation and submittal of this report to the Court on a timely basis. Among those at LADWP whose efforts continue to be particularly notable are: Ms. Sarah LaCombe, Mr. Mark Ching, Mr. Chris Repp Ms. Fatema Akhter, Mr. Hadi Jonny, and Mr. Gregory Reed.

Respectfully submitted,



Richard C. Slade
ULARA Watermaster

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1. INTRODUCTION

1.1 Background

The Upper Los Angeles River Area (ULARA) encompasses the entire hill and mountain watershed and the topographically-lower and intervening valley floor areas of the Los Angeles River and its tributaries above (north of) a runoff gage in the river designated by the Los Angeles County Department of Public Works (LACDPW) as Gaging Station F-57C-R; this gage lies near the junction of the Los Angeles River and the Arroyo Seco (see Plate 1, "ULARA Location Map"). The entire ULARA region encompasses an approximate total of 328,500 acres of hill and mountain areas and intervening valley fill areas. Of this total region, approximately 122,800 acres represent the valley fill that form the four groundwater basins, whereas the remaining 205,700 acres are comprised by the tributary hills and mountains in the watershed. ULARA is bordered on the north and northwest by the Santa Susana Mountains; on the north and northeast by the San Gabriel Mountains; on the east by the San Rafael Hills; on the west by the Simi Hills and Chatsworth Hills; and on the south by the Santa Monica Mountains.

Four distinct groundwater basins were defined within the valley fill areas by the ULARA Judgment of 1979; these include, from largest to smallest, the San Fernando, Sylmar, Verdugo and Eagle Rock basins (refer to Plate 1). The groundwater reservoir comprising each of these basins is separated from the others, but each basin is considered to be replenished (recharged) by the following sources: deep percolation from direct rainfall; infiltration of surface water runoff; and infiltration of excess irrigation of a portion of the water that is delivered for use within these basins. Artificial recharge also occurs in the San Fernando Basin via the ongoing use of existing spreading basins whenever excess rainfall and runoff are available.

The basic characteristics of the four ULARA groundwater basins are briefly described in the paragraphs below. Noteworthy is that Bulletin 118 Update 2003, prepared by the California Department of Water Resources (DWR, October 2003) defined a groundwater basin as: "an alluvial aquifer or a stacked series of alluvial aquifers with reasonably well-defined boundaries in a lateral direction and having a definable bottom." This Watermaster, as a result of a large number of prior groundwater projects as a groundwater consultant, has used the following as a more detailed definition of a typical groundwater basin: a three dimensional region that has reasonably-definable surface and subsurface boundaries and that contains layers and lenses of potentially water-

bearing sediments which are capable of yielding groundwater in useable quantities and of acceptable quality for beneficial use. In short, a groundwater basin could be considered to typically represent an area underlain by permeable sediments capable of storing and yielding a substantial amount of groundwater to water-supply wells. For the four ULARA groundwater basins, the potentially water-bearing sediments are comprised by various young and old alluvial fan-type deposits. In the San Fernando and Sylmar basins, the potentially water-bearing sediments also include various strata, assigned to the Saugus Formation, that are known to underlie all geologically younger and older alluvial-type deposits within these two groundwater basins.

Exposed at ground surface in all of the topographically-elevated hill and mountain watershed areas of ULARA, and also known to directly underlie all potentially water-bearing sediments (including the Saugus Formation, where present) beneath the four ULARA groundwater basins, are geologically older sedimentary rocks (i.e., sedimentary bedrock) and even older crystalline, metamorphic and igneous rocks (i.e., crystalline basement rock). These geologically older rocks are either well-lithified, cemented and/or crystalline in nature, and as such, they are considered to display only secondary porosity; their permeability is low to very low. Because of their lithified and/or cemented and/or crystalline character, these rocks do not contain water in the interstices (i.e., the pore spaces) between the individual sand or gravel grains (as occurs in the potentially water-bearing deposits), but rather the groundwater is contained solely within fractures, joints, and/or along bedding planes in these types of rocks. Hence, the groundwater storage capacity of these rocks is low and their long-term sustainable yield is unpredictable; as a result, only limited quantities of water can be yielded to wells. For these reasons, all of these geologically older rocks are classified as nonwater-bearing for municipal-supply purposes in ULARA, and none of these older sedimentary or crystalline rocks are considered to be part of the four groundwater basins within ULARA.

THE SAN FERNANDO BASIN (SFB) is the largest groundwater basin in ULARA in terms of its surface area. SFB directly underlies the San Fernando Valley, has a surface area of approximately 112,000 acres, and displays a maximum estimated thickness of potentially water-bearing sediments of ±1200 ft. The surface area of SFB represents 91.2 percent of the total surface of all four groundwater basins (i.e., the total of all valley fill areas) within ULARA. The lateral or ground surface boundaries of this basin are formed by nonwater-bearing sedimentary bedrock and/or crystalline

basement rock in the adjoining hills/mountains, as follows: on the east and northeast by the San Rafael Hills, the Verdugo Mountains, and the San Gabriel Mountains; on the north by the San Gabriel Mountains and the eroded south limb of the Little Tujunga syncline which separates it from the Sylmar Basin on the north; on the northwest and west by the Santa Susana Mountains, the Simi Hills and the Chatsworth Hills; and on the south by the Santa Monica Mountains. Plate 1A, "San Fernando Groundwater Basin Map," illustrates the approximate ground surface boundaries of the SFB (as originally interpreted for the Report of Referee and/or by prior Watermasters, and as subsequently converted to GIS format by LADWP personnel); also shown on Plate 1A are the general locations of key wellfields owned by the cities of Burbank, Glendale and Los Angeles in this basin.

THE SYLMAR BASIN (SB) lies just northeast of SFB, and its surface area of approximately 5,600 acres makes it the second largest groundwater basin in ULARA. SB may have a maximum thickness of potentially useable water-bearing sediments of at least 1000 ft. According to the Report of Referee (1962), Sylmar Basin is bounded by the nonwater-bearing sedimentary bedrock and/or basement rock in the adjoining hills/mountains, as follows: on the north and east by the San Gabriel Mountains; on the west by a topographic divide in the valley fill between the Mission Hills and the San Gabriel Mountains; on the southwest by the Mission Hills; on the east by the older portion of the Saugus Formation along the east bank of Pacoima Wash; and on the south by the eroded south limb of the Little Tujunga syncline, which separates it from the SFB to the south. Plate 1B, "Sylmar Groundwater Basin Map," illustrates: the approximate ground surface boundaries of Sylmar Basin (as originally interpreted for the Report of Referee and/or by prior Watermasters, and as subsequently converted to GIS format by LADWP personnel). Also shown on this plate are the approximate locations of water-supply wells owned by the cities of Los Angeles and San Fernando in SB.

THE VERDUGO BASIN (VB), which lies north and east of the Verdugo Mountains, has an approximate surface area of 4,400 acres and a maximum thickness of potentially water-bearing sediments of perhaps 250 to 300 ft. The surface area of this basin comprises 3.6 percent of the total valley fill area in ULARA. VB is bounded on the north by nonwater-bearing basement rock in San Gabriel Mountains; by a groundwater divide on the northwest which separates VB from the SFB; by a groundwater divide separating it from the Monk Hill Subarea of the Raymond

Groundwater Basin to the east; on the southeast by sedimentary bedrock in the San Rafael Hills; and on the south and southwest by the crystalline basement rock within the Verdugo Mountains. Plate 1C, "Verdugo Groundwater Basin Map," shows the boundaries of Verdugo Basin (as originally interpreted for the Report of Referee and/or by prior Watermasters, and as subsequently converted to GIS format by LADWP personnel); also illustrated are the approximate locations of the water-supply wells owned by the City of Glendale and the Crescenta Valley Water District.

THE EAGLE ROCK BASIN (EB), lies in the extreme southeast corner of ULARA, and its 800-acre surface area makes it the smallest basin in ULARA (it comprises only 0.6 percent of the total valley fill in ULARA). Within EB, the maximum thickness of potentially water-bearing sediments may be on the order of only ±200 ft. The approximate ground surface boundaries of this small basin (as originally interpreted for the Report of Referee and/or by prior Watermasters, and as subsequently converted to GIS format by LADWP personnel) are shown on Plate 1D, "Eagle Rock Groundwater Basin Map"; note that there are no existing municipal-supply water wells in this basin.

1.2 History of Adjudication

Water rights in ULARA were finally established by the JUDGMENT AFTER TRIAL BY COURT in Los Angeles County Superior Court Case No. 650079. Results of this case (known as The City of Los Angeles, a Municipal Corporation, Plaintiff, vs. City of San Fernando, et al., Defendants), were originally determined and signed on March 14, 1968 by the Honorable Edmund M. Moor, Judge of the Superior Court. Numerous pre-trial conferences were held subsequent to the filing of the action by the City of Los Angeles in 1955 and also before the trial commenced on March 1, 1966.

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

A Final Report of Referee was approved on July 27, 1962 and filed with the Court. The Report of Referee provided the results of a detailed study of the surface and subsurface geology, the occurrence and movement of groundwater, aquifer characteristics, and the surface hydrology. In addition, investigations for that report were made regarding the history of: channels of the Los Angeles River and its tributaries; the general directions of groundwater flow within each of the four ULARA groundwater basins; the groundwater quality and the historic extractions of groundwater in each of the four groundwater basins; and all sources of water, whether they be diverted, extracted, imported, etc within those four basins. The Report of Referee served as the principal basis for the geological, hydrogeological and hydrological facts for the original Trial Court Judgment in 1968, for the Decision of the Supreme Court in 1975 (14 Cal 3d 199, 123 Cal Rept 1), and for the Trial Court Final Judgment on remand dated January 26, 1979.

The Trial Court issued its opinion on March 15, 1968. The City of Los Angeles filed an appeal from the Judgment of the Trial Court with the Court of Appeal, where after the City of Los Angeles participated in a hearing on November 9, 1972 conducted by the Court of Appeal. The opinion prepared by Judge Compton, was issued on November 22, 1972, and was concurred with by Judges Roth and Fleming. It provided a reversal, with direction, of the original Judgment handed down by Judge Moor on March 14, 1968. In essence, this reversed opinion gave rights to the City of Los Angeles for all water in ULARA, including the use of the groundwater in the local groundwater basins, along with some limited entitlements to other waters. The defendants, however, were given the right to capture "import return water", which was considered to be that portion of the treated surface water purchased and imported to the area by the City of Los Angeles from the Metropolitan Water District of Southern California (MWD) that could percolate back into the local groundwater basin.

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

On May 12, 1975, the California Supreme Court filed its opinion on the then-current 20 year-long San Fernando Groundwater Basin litigation. This opinion, which became final on August 1, 1975, upheld the Pueblo Water Right of the City of Los Angeles to all groundwater in the SFB derived from precipitation within ULARA (infiltration of direct

rainfall plus surface water runoff). The Pueblo Water Rights of Los Angeles were not allowed to extend to and/or include the groundwater in the Sylmar, Verdugo or Eagle Rock basins. However, all surface water runoff and groundwater underflows from these adjoining groundwater basins were considered to be a part of the Pueblo Water Rights of the City of Los Angeles.

The California Superior Court opinion also provided the City of Los Angeles with rights to all groundwater in the SFB that was derived from water imported by the City from outside ULARA that was eventually spread or delivered within the SFB. The cities of Glendale and Burbank were also given rights to all SFB groundwater derived from water that each imports from outside ULARA and delivered within ULARA. Because the City of San Fernando was not a member of MWD until the end of 1971, and because that city had never imported any water from outside ULARA prior to 1971, the City of San Fernando was given no return flow rights based on a March 22, 1984 stipulation between the cities of Los Angeles and San Fernando.

The California Supreme Court reversed the principal judgment of the March 15, 1968 Trial Court opinion and remanded the case back to the Superior Court for further proceedings consistent with the Supreme Court's opinion. On remand, the case was assigned to the Honorable Harry L. Hupp, Judge of the Superior Court of Los Angeles County. The Final Judgment (Judgment), signed by Judge Hupp, was entered on January 26, 1979; copies of this Judgment are available from the ULARA Watermaster website (http://ularawatermaster.com). Importantly, the water rights set forth in the Judgment are generally consistent with the opinion of the Supreme Court as described above, with the exception of a provision regarding the calculation of Import Return Credit. That is, contrary to the Supreme Court opinion, in 1978 the cities of Burbank, Glendale and Los Angeles agreed to use all delivered water, instead of only imported water, in the calculation of their Import Return Credit. This agreement among these cities has had a significant but adverse impact on groundwater in storage in the San Fernando Basin, as discussed later in this report.

In addition, the January 26, 1979 Final Judgment includes provisions and stipulations regarding water rights, storage of water, stored water credits, and arrangements for physical solution water for certain parties as recommended by the Supreme Court.

A separate stipulation was filed in Superior Court on January 26, 1979 appointing Mr. Melvin L. Blevins of LADWP as the original ULARA Watermaster under the Judgment. On September 1, 2003, Mr. Mark G. Mackowski, also of LADWP, was appointed as the second ULARA Watermaster by the Superior Court, succeeding Mr. Blevins after his 24 years of service. On January 1, 2009, Mr. Richard C. Slade, Principal Groundwater Geologist for Richard C. Slade and Associates LLC, Consulting Groundwater Geologists, was appointed as the first completely independent ULARA Watermaster, thereby succeeding Mr. Mackowski after his 5 years of service.

On August 26, 1983, the original ULARA Watermaster (Mr. Blevins) reported to the Court, pursuant to Section 10.2 of the Judgment, that the Sylmar Basin was in a condition of overdraft. In response to that Watermaster's letter and a Minute Order of the Court, the cities of Los Angeles and San Fernando responded by letter to the Court, agreeing with the Watermaster that overdraft existed in the Sylmar Basin at that time. On March 22, 1984, Judge Hupp signed a stipulation effective October 1, 1984, ordering that the cities of Los Angeles and San Fernando (including any rights exercised by private parties) would be limited in their pumping from the Sylmar Basin in order to bring their total groundwater extractions within the safe yield of this basin.

Pursuant to Judgment Section 8.2.10, the original Watermaster (Mr. Blevins) increased the safe yield of the Sylmar Basin on a temporary basis in 1996, from 6,210 acre-feet per year (AFY) to 6,510 AFY. On October 1, 2005 this temporary increase expired, and the then-current Watermaster (Mr. Mackowski) conducted his re-evaluation of the safe yield of the Sylmar Basin, using the same basic method as had been utilized previously by his predecessor, Mr. Blevins. Based on this new re-evaluation, a recommendation, along with certain conditions, was made by that Watermaster in 2006 to increase the total safe yield of this basin to 6,810 AFY (3,405 AFY each for the cities of Los Angeles and San Fernando). The Court approved the new Stipulation after its hearing on December 13, 2006.

A new and updated re-assessment of the safe yield of Sylmar Basin was conducted by the current Watermaster in 2012, again using the same basic method used previously by both Mr. Blevins and Mr. Mackowski. This 2012-dated re-assessment resulted in the following conclusions: Sylmar Basin is not in a current state of overdraft; the new safe yield of this basin can be temporarily and conditionally increased to 7,140 AFY (3,570 AF each for the cities of Los Angeles and San Fernando); and these pumping amounts

may continue for the five Water Years of 2011-12 through 2015-16, unless in-progress data evaluation by the Watermaster reveals that Sylmar Basin is being adversely affected by the increased pumping by these Parties. This recent re-assessment of the safe yield of Sylmar Basin by the current Watermaster was filed with the Court in June 2013.

In September 2007, the cities of Burbank, Glendale, and Los Angeles entered into a 10-year Stipulated Agreement to address the long-term decline in stored groundwater in the San Fernando Basin (see Section 2.9 of this report and Appendix G). This 10-year interim agreement restricted the pumping of Stored Water Credits, helped account for basin losses, and provided for the support of Los Angeles for enhancing the recharge of native water within this basin. It also provided for a re-evaluation of the safe yield of the San Fernando Basin, but that project was never completed.

Table 1-1, "Judges of Record," lists the judges (and their respective date of appointment) who have succeeded the original Superior Court Judge (Judge Hupp, who signed the Final Judgment in this case as Judge of Record for the San Fernando Judgment dated January 26, 1979).

TABLE 1-1: JUDGES OF RECORD

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

1.3 Extraction Rights

The extraction rights under the January 26, 1979 Final Judgment for the four ULARA groundwater basins and the separate August 26, 1983 (and subsequent) Sylmar Basin Stipulations are as follows:

1.3A San Fernando Groundwater Basin

Native Water

The City of Los Angeles has an exclusive right to extract and utilize all of the native safe yield water in the San Fernando Basin; refer to Plate 1A for the boundaries of this basin. This native safe yield, which was originally determined to be an average of 43,660 AFY, represents the Pueblo Water Right of the City of Los Angeles under the Final Judgment dated January 26, 1979.

Import Return Water

The cities of, Burbank, Glendale, and Los Angeles each have a right to extract the following amounts of groundwater from the SFB.

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

Glendale: 20.0 percent of all delivered water, including recycled water, to the valley fill lands of the SFB and all of its tributary hill and mountain areas.

Los Angeles: 20.8 percent of all delivered water, including recycled water, to the valley fill lands of the SFB and all of its tributary hill and mountain areas.

Physical Solution Water

Several private entities have been granted limited entitlement to extract groundwater from the SFB but each such entitlement is chargeable by the Watermaster to the rights of the respective Party; that specific entity must then

pay that Party for the resulting costs of the pumped water. Table 1-2 “Physical Solution Parties,” lists the various private pumping entities and their maximum physical solution pumping volumes per year.

TABLE 1-2: PHYSICAL SOLUTION PARTIES

Chargeable Party	Pumping Party	Allowable Pumping (acre-feet)
City of Burbank	Valhalla	300
	Lockheed-Martin	25
City of Glendale	Forest Lawn	400
	Angelica Healthcare[1]	75
City of Los Angeles	City of Glendale	5,500
	City of Burbank	4,200
	Middle Ranch	50
	Hallelujah Prayer Center[2]	60
	Van de Kamp[3]	120
	Toluca Lake	100
	Sportsmen’s Lodge	25
	Water Licenses	83

1. Angelica Healthcare no longer pumps its physical solution rights
2. Formerly Hathaway-Sycamore Children's Home
3. Van de Kamp has never pumped its physical solution right.

Stored Water

Each of the cities of Burbank, Glendale, and Los Angeles has a right to store groundwater and the right to extract equivalent amounts of groundwater from the SFB.

1.3B Sylmar Groundwater Basin

Native and Import Return Water

The March 22, 1984 Stipulation assigned the cities of Los Angeles and San Fernando equal rights to the then-current total safe yield value of 6,210 AFY for the Sylmar Basin (see basin boundaries on Plate 1B). On July 16, 1996, the original Watermaster (Mr. Blevins) re-evaluated this safe yield value and established a temporary increase (for a 10-year period) in the safe yield of this

basin from 6,210 AFY to 6,510 AFY. This temporary 10-year period ended on October 1, 2005, and triggered a re-evaluation of the safe yield of this basin by the then-current Watermaster (Mr. Mackowski). This re-assessment work was once again performed to be consistent with Section 8.2.10 of the Judgment. That re-assessment by the Watermaster (Mr. Mackowski) and by the special Consultant to the Watermaster (Mr. Blevins) resulted in a new Stipulation which was approved by the Court on December 13, 2006. This updated safe yield assessment permitted a temporary increase in the safe yield of the Sylmar Basin to 6,810 AFY, beginning October 1, 2006. That Stipulation also noted that the safe yield of the Sylmar Basin "shall be re-evaluated within 5 years after adoption of the Stipulation."

The most recent safe yield re-assessment of Sylmar Basin was conducted in 2012 by the current Watermaster. This 2012 study concluded: there is currently no overdraft in Sylmar Basin; the current safe yield, subject to various conditions, shall be 7,140 AFY; this value is to be equally divided between the cities of Los Angeles and San Fernando; and another safe yield update of this basin may be performed in 5 years (during or immediately following the 2016-17 Water Year). A new Stipulation was filed with the Court in June 2013 for this 2012-dated safe yield re-assessment of the Sylmar Basin.

The only potentially active, but private, party with overlying rights within the Sylmar Basin is Santiago Estates, a successor to Meurer Engineering, M.H.C. Inc. Any future pumping by Santiago Estates would be deducted from the total safe yield of this basin and the cities of Los Angeles and San Fernando would then be permitted to equally divide the remainder of the current safe yield value of this basin. However, for many years, no deductions have been needed because Santiago Estates has not pumped any groundwater from Sylmar Basin since the 1998-99 Water Year.

Stored Water

Each of the cities of Los Angeles and San Fernando has a right to store groundwater by in-lieu practices and also a right to extract equivalent amounts of groundwater from the Sylmar Basin.

1.3C Verdugo Groundwater Basin

Native Water

The City of Glendale and the Crescenta Valley Water District (CVWD) have appropriative and prescriptive rights to extract 3,856 and 3,294 AFY of groundwater, respectively, from Verdugo Basin; refer to Plate 1C for the boundaries of this basin.

Import Return Water

The City of Los Angeles may have a right to recapture its delivered (imported) water in this basin upon application to the Watermaster and on subsequent order after a hearing by the Court pursuant to Section 5.2.3.2 of the Judgment.

Stored Water

There are no storage rights for any party in the Verdugo Basin based on the Judgment.

1.3D Eagle Rock Groundwater Basin

Native Water

The Eagle Rock Basin has only a limited native safe yield. Plate 1D provides the approximate boundaries of this small groundwater basin.

Imported Return Water

The City of Los Angeles delivers imported water to lands overlying this groundwater basin, and return flow from this delivered water is considered to constitute the majority of the safe yield of this groundwater basin. Los Angeles has the right to extract, or to allow to be extracted, the entire safe yield of this basin.

Physical Solution Water

DS Waters (successor to Sparkletts and Deep Rock water companies) has a physical solution right to extract groundwater from Eagle Rock Basin pursuant to

a stipulation with the City of Los Angeles, and as provided for in Section 9.2.1 of the Judgment.

Stored Water

There are no storage rights for any party in the Eagle Rock Basin, based on the Judgment, dated January 26, 1979.

1.4 Watermaster Service and Administrative Committee

In preparing this Annual Watermaster Report, the Watermaster support staff at LADWP continued to collect and record a large amount of information relating to the water supply, water use and disposal, groundwater levels, water quality, and the ownership and location of all new water-supply wells within ULARA. Groundwater pumpers are required to report their extractions on a monthly basis to the Watermaster. This allows the Watermaster staff at LADWP and the Assistant Watermaster to update all required water production accounts on a monthly basis, from which the allowable pumping by each Party for the remainder of the year can be determined by the Watermaster.

Section 8.3 of the Judgment established an Administrative Committee for the purpose of advising the Watermaster in the administration of his duties. As of August 6, 2014, the duly appointed members of the Committee are:

CITY OF BURBANK
Bill Mace (Committee Chair)
Matt Elsner (Alternate)

CITY OF GLENDALE
Ramon Abueg
Raja Takidin (Alternate)

CITY OF SAN FERNANDO
Ron Ruiz
Tony Salazar (Alternate)

CITY OF LOS ANGELES
David Pettijohn
Greg Reed (Alternate)

CRESCENTA VALLEY WATER DISTRICT
Dennis Erdman
David Gould (Alternate and Committee Vice-Chair)

The Watermaster may convene the Administrative Committee at any time in order to seek its advice although, typically, meetings are held quarterly each year. The Watermaster met with the Administrative Committee on October 9, 2013, and also on

February 5, April 16, and August 6, 2014 of the 2013-14 Water Year. Each year the Administrative Committee is also responsible for reviewing and approving a Draft of the proposed Annual Report prepared by the Watermaster. As discussed in this report's "Foreword," the Administrative Committee approved this current 2013-14 Watermaster Report on January 18, 2017, even though the report is dated December 2015.

1.5 Significant Events through April 2015

Groundwater System Improvement Study (GSIS)

Since 2009, the Los Angeles Department of Water and Power (LADWP) has been moving forward with a $34 million Groundwater System Improvement Study (GSIS) to fully characterize the SFB, as necessary, to develop conceptual plans for short- and long-term strategies for remediation, containment, clean-up and removal of the contaminated groundwater from this basin. As a part of the GSIS for the SFB, the LADWP drilled an additional 25 monitoring wells, performed water quality sampling from 94 wells, and completed the raw water quality characterization. The initial phase of the study was completed in early-2015, and the conceptual planning of potential remediation facilities for the groundwater cleanup is on-going. A high-level concept plan and cost estimate were developed for the remediation facilities necessary to clean-up 123,000 AF of contaminated groundwater per year from the SFB. The magnitude of the cost for facility construction is up to $600 million. LADWP will refine this estimate as the remediation facility project progresses through the final planning and design phases.

Burbank Operable Unit (BOU)

The BOU, operated by Burbank under a contract with TerranearPMC, LLC and funded by Lockheed-Martin, removes volatile organic compounds (VOCs) from the local groundwater in the SFB. The City of Burbank, in cooperation with the United States Environmental Protection Agency (USEPA) and Lockheed-Martin, continued with design improvements and operational changes to make the facility more mechanically reliable at its design capacity of 9,000 gallons per minute (gpm). During the 2013-14 Water Year, a total of 10,148 AF of groundwater were pumped and treated at the BOU; this volume is about 1,239 AF less than the volume treated in the prior Water Year. As a requirement of the Consent Decree, the City of Burbank also reduces the concentrations of nitrate in its pumped groundwater through its blending facility using imported supplies purchased from MWD before delivery to customers in Burbank.

Montgomery Watson Harza (MWH) was previously retained by Burbank to perform a Well Field Performance Attainment Study that evaluated the BOU wellfield and related facilities in an effort to increase groundwater extractions to 9,000 gpm. As a part of this work, a 60-day "stress test" was requested by the EPA, and completed in 2010; it entailed a total combined discharge rate of 9,000 gpm from six BOU wells for a period of 60 days. EPA used observations from this pumping test to update values for hydraulic conductivity, transmissivity and storativity in the aquifer systems beneath the BOU for use in updating the EPA basin-wide groundwater model.

Glendale Operable Unit (GOU)

The GOU was designed, in conjunction with the USEPA, to remove VOCs in the local groundwater, and it has the capacity to treat up to a total of ±5,000 gpm from its two existing wellfields in the SFB: the Glendale North Wellfield; and the Glendale South Wellfield. Pumped groundwater is treated and then blended with imported MWD supplies to reduce the concentrations of nitrate and hexavalent chromium. The GOU treated 7,231 AF of pumped groundwater during the 2013-14 Water Year.

As reported by Glendale, one of the biggest challenges in operating the GOU is maintaining the operational pumping capacities of the 8 total wells in the GOU (4 wells in each of two local wellfields). While the wells are intended to operate full-time (i.e., 24 hours a day, 365 days a year), they are in their 13th year of operation. As a result of declining production, a few of these wells have recently been subjected to re-development operations to help restore their original capacity. Also, issues with power and communications reliability in the GOU wellfield have resulted in additional interruptions to well production.

In an effort to control hexavalent chromium concentrations in the local groundwater, the GOU operates under a modified pumping plan approved by the USEPA that varies from the original Consent Decree. The modified pumping plan allows reduced pumping from certain GOU wells containing high concentrations of hexavalent chromium, and increased pumping from other GOU wells displaying lower hexavalent chromium concentrations. The original Consent Decree expired in November 2012, and was extended to November 30, 2018. The motion to extend the decree was approved by the Court on August 19, 2013. In April 2012, the Final version of the Remedial Investigation Work Plan for the Glendale Chromium Operable Unit (GCOU) was issued. Remedial investigation work will include the construction of groundwater monitoring wells that will

allow EPA to obtain additional data to continue to evaluate the nature and extent of the hexavalent chromium in groundwater in the GCOU.

On February 28, 2013, Glendale released the Final version of the "Hexavalent Chromium Removal Research Project" Report to the California Department of Public Health (CDPH). That report details Glendale's research efforts to identify viable treatment technologies for the removal of hexavalent chromium in its local groundwater. Glendale also continues to serve on the American Water Research Foundation (AWRF) technical advisory committee on hexavalent chromium in groundwater.

The wellhead treatment system at Well GS-3 (one of the GOU wells in the South Wellfield), known as the Weak-Base Anion Exchange (WBA) Chromium Removal Demonstration facility, has been effective at removing chromium from the local groundwater to concentrations below 5 micrograms per liter (μg/L, where 1 μg/L is equivalent to 1 part per billion).

North Hollywood Operable Unit (NHOU)

LADWP continues to work with the USEPA and the Potentially Responsible Parties (PRPs) on implementing the 2nd Interim Remedy (2IR) for the NHOU. An amendment to the Record of Decision (ROD) for the 2IR was approved on January 10, 2014. The key change was the addition of a re-injection option for the 4,923 AFY of treated water that is contemplated as part of the 2IR. However, the LADWP, USEPA, and the PRPs are working on a Cooperative Containment Concept that will more than double the amount of treated water to an anticipated 10,500 AFY and also allow for receiving the treated water into LADWP's drinking water system as the preferred option over the reinjection alternative. If all issues can be agreed upon, design will start as early as August 2015.

North Hollywood Wellfield West Branch 1,4, Dioxane Issue

LADWP had to shut down seven wells (North Hollywood West Branch Well Nos. 23, 34, 36, 37, 43A, 44, 45) in 2014 due to the detection of 1,4 dioxane above the current Notification Level (NL) of 1 microgram per liter (ug/L) for this constituent. The combined production capacity for these seven wells is in excess of 8,900 gpm. LADWP is currently working on a conceptual plan to bring these wells back on-line with treatment, and is also working with the PRPs in an area identified to be located upgradient from the affected wells.

Verdugo Park Water Treatment Plant

The City of Glendale Verdugo Park Water Treatment Plant (VPWTP) treats groundwater pumped from the Verdugo Basin for turbidity and bacteria, but has been operating significantly below its expected rate of 700 gpm; methods to increase the treatment rate are still being investigated. The City of Glendale is not able to attain the treatment capacity for its VPWTP due to the lack of production capacity from its two Verdugo wells that were constructed in 1992. No groundwater was treated at the VPWTP in the 2013-14 Water Year.

Glenwood Nitrate Removal Plant

The Glenwood Nitrate Removal Plant uses ion exchange to remove nitrate from groundwater pumped by CVWD-owned water wells. CVWD increased its utilization of this plant to increase the amount of groundwater produced. The facility treated 150 AF of groundwater during the 2013-14 Water Year, a decrease of 338 AF from the volume treated in the 2012-13 Water Year. In addition, the treatment plant has occasionally been taken out of service to replace the ion exchange resin. Use of a newer resin typically permits longer batch runs, and a lower overall salt content in the wastewater, which ultimately results in a lower volume of wastewater to be discharged to the Los Angeles sewer system.

Plans to Increase Glendale's Pumping Capacity from Verdugo Basin

Glendale has never pumped its full water right of 3,856 AFY from the Verdugo Basin. In the past few years, Glendale has been actively trying to identify possible new water well sites to increase its groundwater production capacity from this basin. Currently, a majority of Glendale's groundwater extractions are from its eight GOU wells in SFB. In 2007, Glendale drilled two pilot boreholes in the Verdugo Basin and conducted isolated aquifer zone testing in each borehole. Due to the poor results of the zone tests (i.e., low flow rates), one of the boreholes was permanently destroyed in March 2008. Glendale also drilled a third pilot hole in the Montrose area in February 2009.

In October 2007, Glendale initiated the rehabilitation of its Foothill Well and this work was completed in 2010. Currently, the Foothill well is online, and produces groundwater

at a rate of approximately 130 gpm. Drilling and construction of the City's Rockhaven well, located at the Rockhaven Sanitarium site, was completed in April 2011; However, the nitrate concentration in the wellblend from this new well exceeds the Primary MCL of 45 mg/L for this constituent. Glendale and CVWD are currently exploring options for a cooperative effort to address the elevated nitrate concentrations in this well. The Watermaster appreciates Glendale's effort in drilling and testing exploratory boreholes and in rehabilitating existing wells to increase its pumping from the Verdugo Basin; the Watermaster particularly appreciates the cooperation between the two Parties in trying to negotiate a successful joint resolution to the elevated nitrate in groundwater pumped from the Rockhaven well.

City of San Fernando Nitrate Removal

Elevated nitrate concentrations are a problem in some wells operated by the City of San Fernando in Sylmar Basin. Specifically, at least two of its four wells have had to be shut-down over time due to elevated nitrate concentrations. San Fernando issued an RFP and selected a consultant to design a nitrate removal system and a new transmission line. Engineering and construction of the treatment plant are near completion, and are awaiting final permitting before placing the facility online.

Mission Wellfield Rehabilitation

LADWP is continuing to pursue capital improvements at its Mission Wellfield in the Sylmar Basin, and restore the capacity needed to fully utilize its entitlement to groundwater in this basin. These improvements will address the decline in pumping capacity caused by mechanical deterioration and water quality problems that have restricted use of this wellfield. Phase 1 of the project completed the replacement of a water storage tank and related control systems. LADWP is now conducting Phase 2 work, which will construct three new water-supply wells, destroy at least two of the deteriorated/older Mission wells, and construct additionally-required infrastructure to include a chlorination and ammoniation station. The three replacement wells have been drilled and well development has been completed; the wells now await pumping tests and the construction of surface facilities, as well as distribution infrastructure.

Mission Wellfield Groundwater Remediation

LADWP is pursuing the construction of offsite groundwater monitoring wells to investigate contamination affecting this local area of Sylmar Basin. Currently, the primary contaminant of concern is the VOC known as trichloroethylene (TCE). Based on the extent of contamination present in the groundwater, LADWP may expedite the development of facilities to remediate, cleanup, and remove the contamination and prevent further loss of Sylmar Basin groundwater. Information gained from the monitoring wells will be provided to environmental regulators to support their investigation of potentially responsible parties who may be held responsible for the cleanup costs. To date, LADWP has constructed one offsite monitoring well nearby its Mission wellfield. Preliminary test results from this monitoring well have not detected TCE, although TCE was detected at a concentration above 50 ug/L in water samples collected at approximately 400 feet below ground surface within the pilot borehole of one of the three new replacement supply wells. Further analysis is being performed in the wellfield, and should result in the eventual siting of a second monitoring well.

Pacoima B-6, MWD Foothill Feeder Replenishment Project

The MWD Foothill Feeder connection enables the City of Burbank to import surplus water from the State Water Project into the SFB for artificial recharge at the Pacoima Spreading Grounds. This relatively new source of water offers Burbank flexibility to purchase MWD water for spreading as opposed to purchasing physical solution water. The first delivery of MWD water occurred on April 26, 2010 through the new Pacoima B-6 MWD connection; at that time, 33.6 AF of water were delivered for groundwater recharge into the Pacoima Spreading Grounds. During this 2013-14 Water Year, a total volume of 7,000 AF of MWD water was spread by Burbank in the Pacoima Spreading Grounds.

Van Norman Complex Groundwater Exploration

An exploratory boring was drilled in the Van Norman Complex property, adjacent to the Los Angeles Aqueduct Filtration Plant (LAAFP) intake channel, to investigate the Saugus Formation beneath the property and the viability of using groundwater pumped from this formation to supplement LADWP's local groundwater portfolio. Following the drilling and geophysical electric logging of the borehole, casing was installed; depth-

specific groundwater sampling and laboratory analyses will be performed soon. A second exploratory boring may be advanced in the same area to further characterize and confirm the local hydrogeology.

LADWP-Burbank Water and Power (BWP) Interconnect Project

The LADWP-BWP Interim Interconnection Project will construct approximately 100 linear feet of 10- and 12-inch diameter pipeline from BWP's transmission system to LADWP through its River Supply Conduit (RSC). BWP blends treated groundwater from the BOU with imported water from MWD at its Valley Pumping Plant before delivering it to the transmission system. Since BWP blends all the groundwater produced at the BOU, BWP is unable to deliver only treated groundwater to LADWP. Water conveyed to LADWP through the interim connection, will be blended water. This will allow BWP to operate the BOU at or close to its rated capacity of 9,000 gpm optimizing groundwater production. By optimizing groundwater extraction, more contaminated groundwater will be removed from the SFB. BWP has committed to deliver 500 AFY to LADWP but expects to regularly deliver more than the 500 AFY. Deliveries will be seasonal with higher deliveries in the winter due to lower demand in the BWP system. The interim connection will remain in place until the replacement River Supply Tunnel is completed. At that time, LADWP will decommission the RSC and the interconnection will cease operations. A permanent interconnection between BWP and LADWP is in the planning stages.

LADWP Water Recycling Programs in the San Fernando Valley

LADWP's most recent Urban Water Management Plan (2010 UWMP) established a goal of increasing recycled water use to 59,000 AFY by 2035. LADWP's Recycled Water Master Planning (RWMP) documents, finalized in 2012, provided a suite of opportunities to reach the 59,000 AFY goal by using recycled water for groundwater replenishment and non-potable reuse.

Of the 59,000 AFY, LADWP expects to deliver as much as 29,000 AF of recycled water annually for non-potable reuse within the City of Los Angeles, which includes delivering 5,000 AFY to customers within the SFB originating from the Donald C. Tillman (DCT) and Los Angeles-Glendale (LAG) water reclamation plants. This would provide 3,500 AFY of recycled water for irrigation and 1,500 AFY for industrial cooling.

Distribution facilities are also being designed to deliver approximately 200 AFY and 500 AFY of recycled water to Woodley Park and to the Hansen Dam Golf Course, respectively. Woodley Park began irrigating with recycled water in 2012, whereas the recycled water facilities for the Hansen Dam Golf Course were placed into service in February 2015.

For the period from October 1, 2013 to September 30, 2014 the following highlights are noted:

- LADWP Signed a Memorandum of Understanding with the City of Los Angeles Department of Recreation and Parks (RAP) to provide capital funds and design assistance to retrofit Elysian Park with recycled water from the Los Angeles-Glendale Water Reclamation Plant (LAG).
- The recycled water line originating from the City of Burbank has been extended to the border of Los Angeles to serve Woodbury University. LADWP staff is working with Los Angeles County Department of Public Health and the university to complete on-site retrofit requirements. This project has an expected recycled water demand of 10 AFY.
- LADWP and RAP partnered to install a new irrigation system at the Los Feliz Golf Course and this golf course is now supplied by recycled water from the LAG. This project will offset potable demand and deliveries of 20 AFY of recycled water are expected.
- LADWP and Glendale partnered to extend the recycled water line supplied by the LAG through Glendale to Bette Davis Park. Glendale had completed over 3,500 feet of pipeline by September 2014. LADWP will install the remaining 500 feet of this pipeline and the appropriate recycled water meters by June 2015. This project will offset potable demand and consume up to 35 AFY of recycled water.
- LADWP constructed 430 feet of pipeline to serve Ed P. Reyes River Greenway located near the confluence of the Los Angeles River and the Arroyo Seco, adjacent to Elysian Park. The greenway went online in August 2014 and accepts delivery of up to 5 AFY.

Headworks Reservoir Project

The former Headworks Spreading Grounds in the SFB is the site of a multi-objective project to improve water quality, provide the community with an opportunity for passive recreation, and restore a portion of the wetlands along the nearby portion of the Los Angeles River. The primary objective of this project is to comply with the Long Term 2 Enhanced Surface Water Treatment Rule and the Stage 2 Disinfectants and Disinfection Byproducts Rule; these regulations were recently promulgated by the USEPA.

LADWP's Silver Lake and Ivanhoe Reservoirs located within the Central Basin have been removed from service, thereby removing two sources of open reservoir storage from its water distribution system and the vulnerability to surface runoff contamination at these reservoirs. The regulatory storage provided by these two reservoirs is being replaced by the buried reservoirs of the Headworks Reservoir Project located at the former Headworks Spreading Grounds site; this will provide a combined storage capacity of 110 million gallons (338 AF). The project is divided into an east and west reservoir, with each reservoir providing 55 million gallons of storage. The east reservoir began operation on December 3, 2014. The design of the west reservoir is still underway.

Located along the Los Angeles River just west of the intersection of the 134 and 5 Freeways, the project includes plans to install a hydroelectric power plant that will generate approximately four megawatts of green power. LADWP is also working jointly with the U.S. Army Corps of Engineers to develop wetlands on a portion of the site.

Stormwater Capture Program

Stormwater runoff from urban areas is an underutilized resource for the City of Los Angeles. Local groundwater replenished naturally by infiltration of rainfall as surface water runoff now receive less recharge than in past years due to increased hardscape and engineered drainage systems resulting from decades of urbanization in the San Fernando Valley. In addition, such runoff can collect and carry harmful pollutants into the Los Angeles River and eventually to the ocean, where sensitive marine ecosystems exist.

Several stormwater spreading facilities owned and operated by LADWP and the Los Angeles County Flood Control District (LACFCD) are located adjacent to local drainage

channels in the northwestern portion of the SFB. During normal and below-normal rain events, these spreading facilities are able to capture large amounts of stormwater diverted from the adjacent channels. However, during above-normal and more severe rain events, a significant portion of the stormwater flows past these spreading facilities and directly into the Los Angeles River; thus, these large runoff flows are unable to be conserved within the basin. Highly variable weather patterns increase the difficulty for achieving stormwater conservation, and the frequency and variability of severe storm events may worsen these conditions in the future.

To enhance the ability to capture more native stormwater for recharge into the SFB, LADWP and LACFCD have partnered on a program of various projects that are oriented to modify existing flood control dams, centralized spreading ground facilities, and tributary drainage channels in the easterly portion of the SFB. Within the next five years, various projects implemented under this program are anticipated to increase the capacity for groundwater recharge to the SFB by an estimated 30,000 AFY.

Stormwater Capture Master Plan

In the fall of 2013, LADWP began development of its Stormwater Capture Master Plan to provide a comprehensive evaluation of the potential to capture stormwater and urban runoff within the city boundaries of Los Angeles. This includes evaluating the potential viability of distributed and centralized recharge facilities, as well as programs which promote onsite and sub-regional direct use of stormwater via cisterns and rain barrels. Public involvement by interested community groups and stakeholders has provided considerable input and feedback, and LADWP expects to produce its final plan by mid-2015. This Master Plan will provide a “road map” of strategic investments that will enable the City to achieve its water supply reliability goals as set forth in LADWP’s Urban Water Management Plan and the Mayoral Executive Directive No. 5.

Big Tujunga Dam Sediment Removal Project

The Big Tujunga Dam Sediment Removal Project in the hill and mountain area east of SFB will remove approximately 2.3 to 4.4 million cubic yards of sediment which has accumulated behind the dam over time, and, more recently, as a result of the 2009 Station Fire in the Angeles National Forest. Construction is expected to occur from 2016 through 2021. LADWP will provide $10 million for design and construction of the

$33 million total project cost. This project, led by the LACFCD, will restore lost reservoir capacity by approximately 4,500 AFY.

Pacoima Dam Sediment Removal Project

The Pacoima Dam Sediment Removal Project, also located in the hill and mountain area east of SFB, will remove a minimum of 2.4 to 5.2 million cubic yards of the sediment which has accumulated behind the dam over time as a result of the Marek, Sayre, and Station fires. Construction is expected to occur from 2017 through 2022. LADWP will provide $10 million for design and construction of the $85 million total project cost. This project, led by the LACFCD, will restore lost reservoir capacity by approximately 3,225 AFY.

Tujunga Spreading Grounds Upgrade

Owned by LADWP and operated by LACFCD, the Tujunga Spreading Grounds is a 188-acre parcel located along the Tujunga Wash Channel at its confluence with the Pacoima Wash Channel in the SFB. Construction is estimated to begin in October 2015 to enhance the facility by: relocating and automating the current intake structure on Tujunga Wash; installing a second automated intake to receive flows from the Pacoima Wash; and reconfiguring the existing spreading basins. Other enhancements include recreational walking trails, native habitat, and educational facilities.

LADWP is fully funding the $27.2 million total project cost for design and construction by the LACFCD. It is expected that this project will increase stormwater capture by approximately 8,000 AFY.

Pacoima Spreading Grounds Upgrade

The 169-acre Pacoima Spreading Grounds, owned and operated by LACFCD, is located downstream of the Pacoima Dam and Reservoir along both sides of the old Pacoima Wash Channel in the SFB. LADWP and LACFCD are currently working cooperatively to improve stormwater capture by upgrading and automating its intake facility and revitalizing its recharge basins.

Final designs are scheduled to be completed by end of 2015, to be followed by construction from 2016 through 2019. LADWP will provide up to $15 million for design

and construction of the $30 million total project cost. This project is expected to increase average stormwater capture at this facility by approximately 10,500 AFY.

Branford Spreading Basin Upgrade

This project proposes to install a pump station at the Branford Spreading Basin, a pipeline bridge across the Tujunga Wash Channel, and a discharge outlet into Tujunga Spreading Grounds in an effort to facilitate transfer of stormwater from the one spreading basin to the other. These changes will improve groundwater recharge, flood protection, and water quality in this portion of the SFB. Final designs are scheduled to be completed by end of 2015, and are to be followed by construction from 2016 through 2018. LADWP will provide up to $2 million for design and construction of the $4 million total project cost. This project is expected to increase average stormwater capture by approximately 650 AFY.

Branford Spreading Basin has significantly lower percolation rates compared to those at Tujunga Spreading Grounds. The total wetted area of the spreading grounds is 7 acres with a maximum intake of 1540 cfs and storage capacity of 137 AF. The average annual recharge for the facility is approximately 550 AF based on historical LACFCD records. The maximum annual recharge volume at this facility was 2,142 AF (in 1977-78 WY).

Lopez Spreading Grounds Upgrade

The 73-acre Lopez Spreading Grounds, owned and operated by LACFCD, is located just downstream of Lopez Dam adjacent to Pacoima Wash in the northeast portion of the SFB. LADWP and LACFCD are currently working cooperatively to improve stormwater capture by upgrading and automating the intake facility and revitalizing the recharge basins.

Final designs are scheduled to be completed by end of 2015, to be followed by construction from 2016 through 2018. LADWP is funding 50% of the $4 million total project cost, and the work is expected to increase average stormwater capture by approximately 500 AFY.

Rory M. Shaw (formerly Strathern Pit) Wetlands Park Project

The Rory M. Shaw Wetlands Park Project in the SFB is a LACFCD-led project which consists of constructing stormwater capture and treatment facilities within this former 46-acre site that was used as a gravel borrow pit. This project has the potential to provide groundwater recharge, flood protection, water quality enhancements, habitat restoration, and recreational opportunities. LADWP provided $600,000 for the design of the project which is currently about 60% complete. Construction is expected to occur beginning from 2017 through 2020 and is anticipated to increase average stormwater capture by approximately 590 AFY.

Valley Generating Station Stormwater Capture Project

The scope of this project includes capturing and directing stormwater runoff through a series of recharge basins, swales and overflow culverts to strategic onsite points within LADWP's Valley Generation Station in the SFB. At an estimated cost of $1.62 million, the project is expected to increase regional average stormwater recharge by approximately 120 AFY, and construction is anticipated to begin in 2016.

Whitnall Highway Power Line Easement Stormwater Capture Project

This project includes capturing stormwater runoff at several locations along the power line easement and directing the captured runoff into a network of swales, culverts, hydrodynamic separators and infiltration basins for pre-treatment and infiltration within LADWP's power line easement in the SFB. At a cost of $8.8 million, the project is expected to increase regional average stormwater recharge by approximately 110 AFY; construction is anticipated to begin in 2016.

Distributed Stormwater Capture Projects and Programs

LADWP is developing partnerships to implement additional projects, programs, and policies that promote infiltration of rainfall and urban runoff closer to their points of origin. Such practices benefit the Los Angeles River system by reducing the amount of pollutants carried into the river while providing the added benefit of conserving more stormwater for recharge into the SFB. LADWP's partners in this effort include LACFCD, TreePeople, Council for Watershed Health, Los Angeles Beautification Team (LABT), The River Project, and MWD.

Examples of distributed projects and programs include: residential onsite infiltration using rain gardens; development of "green streets" using permeable street pavement, infiltration medians, and parkways within the public right-of-way; sub-regional neighborhood installations of infiltration basins and galleries; and removal and replacement of large impermeable surfaces (such as at parking lots) with the use of permeable pavers. Engineered and vegetated filtration systems can be deployed where appropriate to help ensure removal of pollutants before urban runoff is infiltrated into the basins. Distributed projects completed to date have provided approximately 250 AF of additional annual recharge capacity in SFB. Within the next five years, the implementation of more distributed projects is expected to provide an estimated 450 AF per year of additional recharge capacity. Completed and future distributed projects are provided in Tables A and B, respectively, below.

Table A - Completed Distributed Projects

Project Name	Benefit (AFY)	Completion Date	Project Cost (millions)
Sun Valley Park Stormwater Infiltration Project	30	2010	$3.88
Garvanza Park Stormwater Capture Project	51	2012	$2.54
Elmer Avenue Neighborhood Green Street	41	2011	$0.63
Elmer Paseo Green Alley		2012	$0.72
North Hollywood Alley Retrofit	29	2013	$0.61
Glenoaks-Sunland Stormwater Infiltration Project	28	2013	$3.40
Woodman Avenue Median Stormwater Infiltration Project	55	2014	$3.79
Los Angeles Beautification Team (LABT) Projects	20	2015	$2.54

Table B - Future Distributed Projects

Project Name	Benefit (AFY)	Anticipated Start Date	Project Cost (millions)
Laurel Canyon Boulevard Green Street Project	40	2015	$3.00
Burbank Boulevard Stormwater Capture Project	53	2015	$8.30
Sun Valley Public Improvement Project	93	2015	$6.40
Arundo donax Removal Project	20	2016	$7.20
LAUSD Conserving for Our Kids Program	55	2016	$3.00
Victory-Encino Stormwater Infiltration Project	25	2016	$2.30
Victory-Goodland Median Stormwater Capture Project	25	2018	$1.60
Glenoaks-Nettleton Stormwater Infiltration Project	37	2016	$1.30
Van Nuys Boulevard Stormwater Capture Project	35	2018	$2.00
Glenoaks-Filmore Stormwater Capture Project	75	2018	TBD

One Water LA 2040 Plan (One Water LA)

The One Water Los Angeles 2040 Plan (One Water LA) originated from the success of the Los Angeles Water Integrated Resources Plan (Water IRP) which was founded in 1999 and adopted by the Los Angeles City Council in 2006. The Water IRP represented a new way of managing the City's water infrastructure and resources in a more sustainable and holistic manner through the year 2020. Similarly, the goal of One Water LA is to cooperatively develop an integrated framework and to identify synergies for collaboration within the City and all of its City departments related to wastewater facilities, watersheds, water facilities and water resource efforts.

Coordinated by the Los Angeles Bureau of Sanitation (LASAN), One Water LA is being developed in partnership with other City departments which manage water-related functions, and is to be in collaboration with a diverse representation of LA's stakeholders. Scheduled to be completed in early-spring of 2015, Phase I will develop the initial planning baselines, a vision statement, and project objectives, as well as establish guiding principles for coordinated water management and citywide facilities planning. Phase II will develop a comprehensive plan that coordinates City departments and staff, from which opportunities for collaboration on single and joint departmental

projects and funding strategies will be identified for project implementation. It is estimated that Phase II will be completed within 2-3 years.

The following are updates related to the recycled water strategies of One Water LA:

- Groundwater Replenishment (GWR) Project – Los Angeles is currently pursuing the implementation of the GWR project to replenish up to 30,000 AFY of highly-purified recycled water at existing spreading basins, and also possibly new injection wells in the SFB in order to supplement local groundwater supplies. The environmental analysis of the project and the preparation of the Donald C. Tillman Water Reclamation Plant/Advanced Water Purification Facility Engineering Report are both currently underway; outreach efforts of the project will continue.
- Non-Potable Reuse (NPR) Projects - The Non-Potable Reuse Master Planning Report, which was completed in March 2012, outlined potential opportunities to expand the City's non-potable reuse (NPR) systems in order to provide recycled water to more LADWP customers for irrigation and industrial applications. In 2014, the recycled water distribution system delivered approximately 11,400 AFY of recycled water. Additional infrastructure expansion projects are underway.
- Recycled Water Advisory Group (RWAG) and Stakeholder Engagement - Formed in December 2009, the RWAG consists of approximately 60 stakeholders representing diverse interests and demographics throughout the City of Los Angeles; this group has provided input during the development of the Recycled Water Master Planning (RWMP) Documents. The RWAG continues to provide input while the RWMP strategies (including the GWR), are implemented. In addition, stakeholder engagement efforts have included stakeholder meetings, elected official briefings, and presentations to Neighborhood Councils and community groups.

Low Impact Development (LID) Stormwater Mitigation Plans

The municipal stormwater National Pollution Discharge Elimination System Permit (NPDES Permit No. CAS004001) was issued by the LARWQCB on December 13, 2001. As a result, the County of Los Angeles and 84 cities that were now subject to the region-wide permit developed and adopted policies and/or ordinances for Low Impact Development (LID) Stormwater Mitigation Plans (formerly referred to as Standard Urban

Stormwater Mitigation Plans, or SUSMPs) within their respective jurisdictions to address stormwater. Under LID ordinances, all new privately-owned development and redevelopment projects within the City of Los Angeles may be required to implement certain Best Management Practices and/or stormwater mitigation measures to contain or treat the first ¾-inch of rainfall and/or runoff from every storm, and to implement onsite stormwater infiltration. The City of Los Angeles-Watershed Protection Division refers projects to the ULARA Watermaster that are undergoing a LID evaluation within the City-portion of the SFB. The Watermaster reviews the LID mitigation measures and provides his approval or denial of the infiltration portion of each LID, based on its potential impact to local groundwater quality. The Watermaster encourages infiltration of collected stormwater whenever feasible, but is concerned about encouraging recharge in areas having known soil contamination and/or plumes of groundwater contamination, and/or any areas having ongoing groundwater remediation.

Dewaterers

Depths to groundwater are relatively close to ground surface in a few portions of the SFB (particularly along Ventura Blvd on the south side of the basin). As a result, permanent dewatering is common for certain types of building foundations or structures with deep underground parking; active dewatering at such sites helps to artificially lower and maintain groundwater levels at depths that are several feet below the building foundations and/or the bottoms of the subterranean parking structures. Wherever such dewatering is needed, the building owner (i.e., the “dewaterer”) is required to meter the extracted groundwater (i.e., the rates and volumes of discharge), report those extractions to the ULARA Watermaster, and enter into an agreement with the affected Party for payment for this extraction. The Watermaster requires and regularly receives groundwater production reports from several dewaterers in the SFB (see Table 2-5).

The Watermaster has participated in a few meetings with the City’s Department of Building and Safety to explore ways in which the Watermaster can be notified when any new dewatering project might begin in ULARA in the future. The goal of those meetings has been to develop a mechanism at the plan check counter at the Department of Building and Safety by which the owners or agents of new temporary or permanent dewatering operation are required to notify the Watermaster before dewatering begins.

Water Licenses

Most unincorporated portions of the hill and mountain areas of ULARA are without a public water service. Working in cooperation with the County Department of Public Health and the County Planning Department, prior Watermasters and LADWP have tried to develop a process oriented to identify the locations of the properties and their onsite, privately-owned water wells, and monitor water groundwater pumpage through a water license agreement (see Table 2-5). Those agreements allow the use of groundwater on the overlying property until a water service becomes available to the property owner. The agreements also establish maximum annual groundwater usage, and require the monthly reporting of groundwater production to the Watermaster and annual payment to the City of Los Angeles (the owner of the water rights in these unincorporated areas).

Salt and Nutrient Management Plan Development

The State Water Resources Control Board adopted a Recycled Water Policy in February 2009. That Policy required that Salt and Nutrient Management Plans (SNMP) be developed for groundwater basins in the state to "facilitate basin-wide management of salts and nutrients from all sources in a manner that optimizes recycled water use while ensuring protection of groundwater supply and beneficial uses, agricultural beneficial uses, and human health." In accordance with the Recycled Water Policy, a SNMP is being developed for the four ULARA groundwater basins by the ULARA Watermaster.

An initial public information meeting regarding the development of the SNMP for the ULARA groundwater basins was held on November 19, 2013 at the LADWP Valley Center in the Van Nuys area of the City of Los Angeles. On December 4, 2014, the Annual Salt and Nutrient Management Plan Development Workshop was held during the Los Angeles Regional Water Quality Control Board's public meeting. During that meeting, representatives from six groundwater basins in the Los Angeles region presented a brief SNMP summary for their basin and a status update on their in-progress SNMP work; the ULARA Watermaster was one of the presenters.

Information presented and distributed at both of the above-noted meetings can be accessed through the ULARA Watermaster website via www.ULARAwatermaster.com/SNMP. Information on the ongoing development of the SNMP for ULARA will be distributed periodically via that website throughout the SNMP development process.

1.6 Summary of Water Operations in ULARA

Highlights of all elements of water operations within ULARA for the Water Years 2012-13 and 2013-14 are summarized in Table 1-3. Details of WY 2013-14 operations and hydrologic conditions are provided in Section 2. Locations of the four ULARA groundwater basins, the water service areas of the parties and individual producers in each basin, and other pertinent hydrologic facilities that measure precipitation, runoff, and water levels are provided on Plates 1 through 8.

Average Rainfall

Average precipitation determined for all listed raingages (stations) on all valley floor areas during the 2013-14 Water Year in ULARA was 6.3 inches; this value represents 38 percent of the calculated 100-year mean (16.48 inches) for all of these stations that has been used for the original ULARA safe yield calculations. Average precipitation for all listed stations in the hill and mountain areas within ULARA in the 2013-14 Water Year was 9.03 inches; this value is 42 percent of the calculated 100-year mean (21.76 inches) for all of these stations. The weighted average of 7.98 inches of precipitation for all stations throughout ULARA was 41 percent of the 100-year mean (19.64 inches).

Spreading Operations

A total of 10,443 AF of water was spread in ULARA in Water Year 2013-14; 7,000 AF of this total amount was water imported into ULARA. The average annual spreading of water during the period 1968 through 2013 is calculated to be 31,608 AF.

Groundwater Extractions

Total groundwater extractions in WY 2013-14 in all four groundwater basins were 107,580 AF. Specific extractions were: 99,702 AF in San Fernando Basin; 4,020 AF in Sylmar Basin; 3,649 AF in Verdugo Basin; and 209 AF in Eagle Rock Basin. This current total represents an increase of 24,161 AF compared to the total extractions from these four groundwater basins in WY 2012-13, but is less than the long-term (1968-2014) average of 99,509 AFY. Of the total production for the 2013-14 WY, 1,207 AF of groundwater were pumped for non-consumptive use. The Groundwater Extractions Report provided in Appendix A summarizes the groundwater extractions for the 2013-14 WY by all ULARA pumpers.

Imports

Gross imports (including pass-through water) for WY 2013-14 totaled 482,733 AF; this represents a decrease of 16,341 AF from the WY 2012-13 total. Net imports used within ULARA in WY 2013-14 amounted to 289,245 AF (a decrease of 7,602 AF from the volume in the 2012-13 WY).

Exports

A total of 263,748 AF of water was exported from ULARA in WY 2013-14. Of these total exports, 70,260 AF were from groundwater extractions, whereas the remaining 193,488 AF were from imported supplies (pass-through water).

Treated Wastewater

A total of 80,246 AF of wastewater was treated in ULARA in WY 2013-14. The majority of this treated water volume, 52,636 AF, was discharged to the Los Angeles River. A portion of this treated water was also exported from ULARA and delivered to the Hyperion Treatment Plant located in Playa Del Rey. The remaining portion of the annual total (approximately 15,981 AF) was used as recycled water, as discussed below.

Recycled Water

Total recycled water used in WY 2013-14 in ULARA was 15,981 AF. This represents an increase of 1,756 AF from the value in the 2013-14 Water Year. The recycled water is used for landscape irrigation, golf course irrigation, in-plant use, power plant use (i.e., cooling), and other industrial uses.

Groundwater in Storage

Groundwater in storage in the SFB decreased by 59,010 AF during WY 2013-14. This decrease is much larger than the decrease in storage of 12,157 AF that occurred in the 2012-13 Water Year. This large decrease is attributed to another successive year of below-average rainfall and the resulting decrease in stormwater spreading, coupled with an increase in groundwater extractions within the SFB. Compared to the groundwater in storage in WY 2012-13, the estimated increases in groundwater in storage for the Sylmar and Verdugo basins were 2,870 AF and 3,457 AF, respectively, for WY 2013-14. For Eagle Rock Basin, a decrease in storage of 115 AF is estimated for WY 2013-14.

Construction/Destruction of Water Wells

Five wells were destroyed by LADWP in Water Year 2013-14, as follows:

- Erwin 8, in the North Hollywood area of ULARA, was destroyed in October 2013
- Langmuir 1, was destroyed in January of 2014; this well was located in the Sunland/Tujunga area of Los Angeles
- Reseda Well Nos 5, 6, and 9 were destroyed in September 2014.

No other water wells were constructed or destroyed in any of the four groundwater basins in ULARA in WY 2013-14.

TABLE 1-3: SUMMARY OF OPERATIONS IN ULARA

Item	Water Year 2012-13	Water Year 2013-14
Active Pumpers (parties and nonparties)	36	36
Inactive Pumpers (parties)[1]	7	7
Annual Weighted Average Rainfall, in inches		
Valley Floor	7.71	6.30
Mountain Area	9.35	9.03
Total ULARA	8.72	7.98
Spreading Operations, in acre-feet	10,782	10,443
Extractions, in acre-feet	83,419	107,580
Gross Imports, in acre-feet		
Los Angeles Aqueduct Water	85,408	71,258
MWD Water	413,666	411,475
Total	**499,074**	**482,733**
Exports, in acre-feet		
Los Angeles Aqueduct Water	34,991	27,966
MWD Water	167,236	165,522
Groundwater	45,776	70,260
Total	**248,003**	**263,748**
Net Groundwater Used in ULARA, in acre-feet	37,643	37,320
Net Imports Used in ULARA, in acre-feet	296,847	289,245
Recycled Water Used, in acre-feet	14,225	15,981
Total Water Used in ULARA, in acre-feet [2]	348,715	342,546
Treated Wastewater, in acre-feet [3]	87,877	80,246

1. The seven inactive pumpers are Van de Kamp, Disney, Angelica, Santiago Estates, Greeff, Sears, and Waste Management.
2. Extractions used in ULARA plus Net Imports and Recycled Water.
3. Most treated wastewater is discharged to the Los Angeles River, whereas a portion is delivered to the Hyperion Plant or to other locations utilizing recycled water.

1.7 Allowable Pumping for the Forthcoming 2014-15 Water Year

Table 1-4 provides a summary of the groundwater extraction rights for the municipal-supply Parties in each of the three major groundwater basins in ULARA for the forthcoming 2014-15 WY, along with the Stored Water Credit (as of October 1, 2014), for the cities of Burbank, Glendale, Los Angeles, and San Fernando, and for the CVWD. The method to determine these values is described in more detail in Section 2.

TABLE 1-4: ALLOWABLE GROUNDWATER EXTRACTION RIGHTS
2014-15 WATER YEAR - ULARA
(Acre-feet)

	Native Safe Yield Credit [1]	Import Return Credit [2]	Total Native + Import	Available Stored Water Credit [3, 4] (as of Oct. 1, 2014)	Allowable Pumping 2014-15 Water Year [5]
San Fernando Basin					
City of Burbank	---	4,288	4,288	2,729	7,017
City of Glendale	---	4,827	4,827	9,470	14,297
City of Los Angeles	43,660	40,736	84,396	122,431	206,827
Total	43,660	49,851	93,511	134,630	228,141
Sylmar Basin					
City of Los Angeles	3,570	---	3,570	9,014	12,584
City of San Fernando	3,570	---	3,570	404	3,974
Total	7,140	---	7,140	9,418	16,558
Verdugo Basin					
CVWD	3,294	---	3,294	---	3,294
City of Glendale	3,856	---	3,856	---	3,856
Total	7,150	---	7,150	---	7,150

1) Native Safe Yield extraction right per page 11 of the Judgment.
2) Import Return extraction right per page 17 of the Judgment.
3) There is no Stored Water Credit assigned in Verdugo Basin.
4) See Table 2-11A for calculation of SFB Totals and Stored Water Credits in reserve; See Table 2-11B for Sylmar Basin credit calculation.
5) Allowable pumping in Sylmar Basin must not exceed the native safe yield by more than 1,200 AF in any given year. Pumping in excess of the Safe Yield must be reported to Watermaster as soon as reasonably practicable.

2. WATER SUPPLY, OPERATIONS, AND HYDROLOGIC CONDITIONS

2. WATER SUPPLY, OPERATIONS, AND HYDROLOGIC CONDITIONS

2.1 Precipitation

Precipitation varies considerably throughout ULARA depending on local factors such as topography and elevation. Mean annual precipitation ranges from about 14 inches at the western end of the San Fernando Valley to 33 inches near the higher elevations of the watershed in the San Gabriel Mountains in the northeasterly portion of ULARA. Approximately 80 percent of the annual rainfall in ULARA occurs from December through March.

During the 2013-14 Water Year, the weighted average rainfall from all rainfall stations on the valley floor areas was 6.3 inches (38 percent of the 100-year mean value that was calculated for the original safe yield determination), whereas the weighted average annual rainfall from all rainfall stations in the hill and mountain areas was 9.03 inches (42 percent of the 100-year mean). The weighted average from all rainfall stations on both the valley floor and the hill and mountain areas in the 2013-14 WY was 7.98 inches (41 percent of that 100-year mean). Table 2-1 provides rainfall data for several raingages on the valley floor areas and in the hill and mountain areas; Plate 5 illustrates the locations of these raingages (stations). Figure 2.1 shows the monthly rainfall totals on the valley floor and in the hill and mountain areas in ULARA for WY 2013-14 for the raingages mentioned above.

Because annual rainfall totals have a very important impact on groundwater levels and, hence, on the availability of and recharge to the groundwater in the four ULARA groundwater basins, the Watermaster acquired additional rainfall data available from the local City of Burbank Valley Pump Plant raingage (Gage No. 041194); the database for this gage extends from 1940 to the present. These rainfall data were accessed through the website of the Western Regional Climate Center (WRCC). The resulting data for this gage are shown as a bar graph of rainfall for each Water Year (i.e., October 1 of one year through September 30 of the next year) of available gage data on Figure 2.1A, “Yearly Rainfall Totals, Burbank Valley Pump Plant Gage”. As shown thereon, the long-term average annual rainfall for the period of record for this gage is 15.85 inches.

To help identify possible trends in annual rainfall for each water year at this raingage, the Watermaster further created the graph shown on Figures 2.1B, “Accumulated Rainfall Departure Curve”. This graph illustrates the accumulated departure of annual rainfall for each water year from the long-term average annual rainfall at this gage. On this graph, the accumulated rainfall

departure values have been plotted for each rainfall year relative to the long-term average annual rainfall for this Burbank raingage. The zero line on the accumulated departure curve represents the long-term average rainfall points; data points above this zero line represent years of excess precipitation whereas points below that line represent years of deficient precipitation, relative to the long-term average. The basic purpose of the accumulated departure curve is to illustrate temporal trends in the rainfall data over time.

To prepare this accumulated departure curve of annual rainfall, the following steps are taken:

1. Calculate the average annual rainfall for the period of record.
2. Begin with the initial year of rainfall in the period of record, and subtract that value from the long-term average rainfall.
3. Divide that difference by the long-term average annual rainfall. This quotient represents the value for the initial year of rainfall; it may be a negative or positive number, depending on whether the total rainfall in the initial year was less than, or greater than, respectively, the long-term average annual rainfall.
4. The percentage of departure from the long-term average is then calculated in a similar manner for each successive water year and this value is algebraically added to the result for the prior water year, and so on, through the final year of available data.

Interpretation of the accumulated departure curve presented on Figure 2.1B is as follows:

- Whenever the accumulated departure curve descends over time to the right, the total rainfall in each water year during that period was generally at or below the long-term average annual rainfall. Hence, such a period displayed generally deficient rainfall; in essence, a dry period or drought had been occurring. Examples of such dry periods on Figure 2.1B are: 1944-45 through 1976-77 and 1983-84 through 1991-92.
- In contrast, whenever the accumulated departure curve ascends over time to the right, the total rainfall in each water year during that period was generally at or above the long-term average annual rainfall. Thus, such a period displayed generally excess rainfall. In essence, a wet period had been occurring. Examples of such wet periods on Figure 2.1B are 1977-78 through 1984-85, and 1992-93 through 1998-99.

TABLE 2-1: WY 2013-14 PRECIPITATION

(inches)

Gage No.	LACDPW Rain Gage Stations	2013-14 Precipitation	100-Year Mean (1881-1981)	Percent of 100-Year Mean
	Valley Floor Stations			
13C	North Hollywood-Lakeside	5.83	16.63	35%
1107D	La Tuna Debris Station	5.75	14.98	38%
465C	Sepulveda Dam	7.16	15.30	47%
21B	Woodland Hills	5.82	14.60	40%
735H	Chatsworth Reservoir	4.49	15.19	30%
25C	Northridge-LADWP	4.80	15.16	32%
251C	La Crescenta	9.07	23.31	39%
AL464	Pacoima Wash Spreading Grounds	7.15	17.32	41%
	Weighted Average[1]	**6.30**	**16.48**	**38%**
	Hill & Mountain Stations			
10A	Bel Air Hotel	6.54	18.50	35%
17	Sepulveda Canyon at Mulholland	7.72	16.84	46%
33A	Pacoima Dam	7.74	19.64	39%
47D	Clear Creek - City School	16.50	33.01	50%
53D	Colby's Ranch	11.06	29.04	38%
54C	Loomis Ranch-Alder Creek	7.50	18.62	40%
210C	Brand Parks	5.12	19.97	26%
AL301	Brown's Canyon	7.01	17.52	40%
1074	Tujunga-Mill Creek	12.21	21.79	56%
	Weighted Average[1]	**9.03**	**21.76**	**42%**
	Weighted Average Valley/Mountain Areas[1]	**7.98**	**19.64**	**41%**

1. Weighted Averages calculated using methodology provided in the Report of Referee-July 1962. Hill & Mountain Station Weighted Average estimated due to incomplete data sets that exist in the 100-year period for which the average is calculated.

FIGURE 2.1: WY 2013-14 MONTHLY WEIGHTED AVERAGE RAINFALL

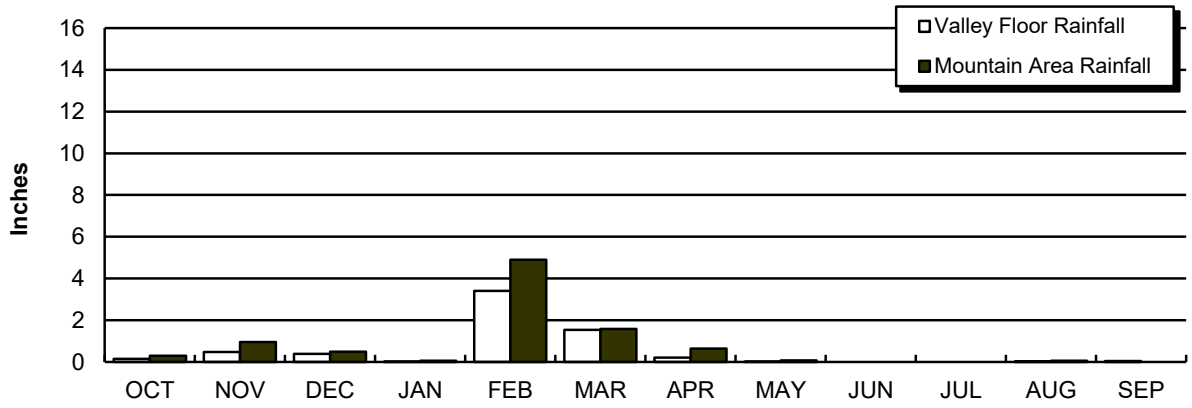
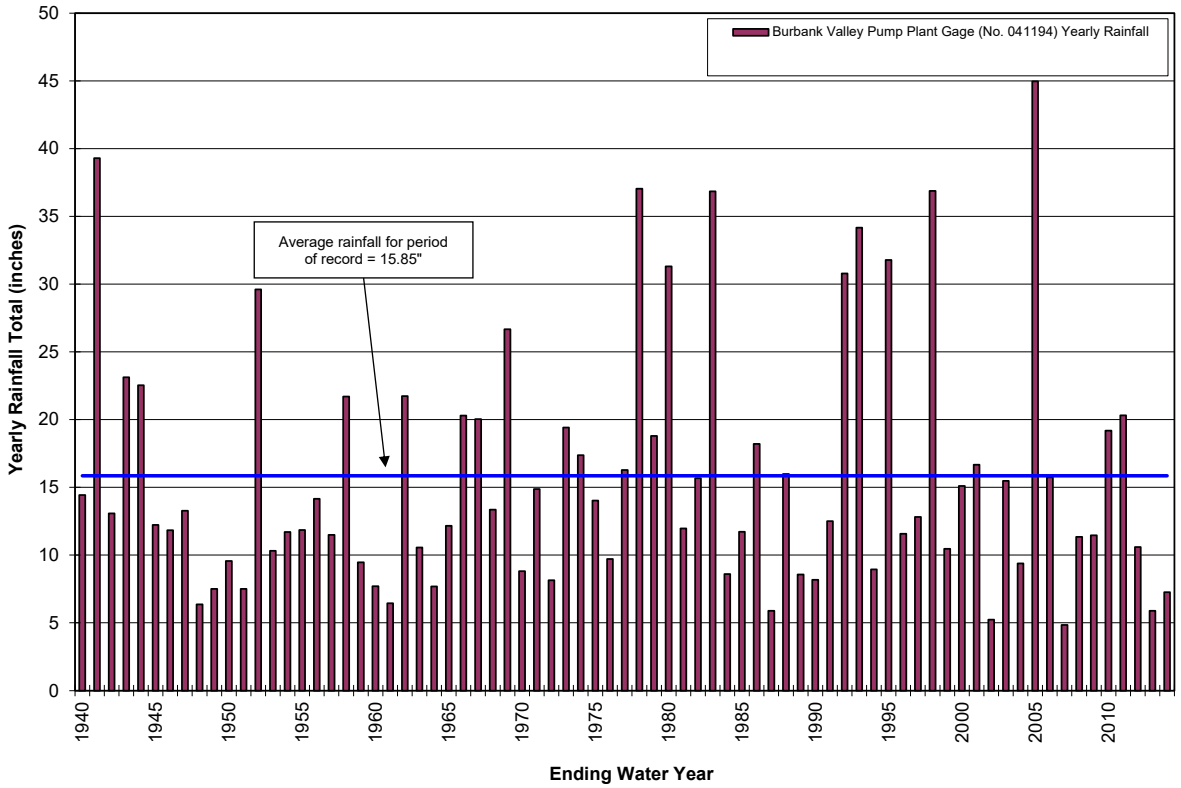
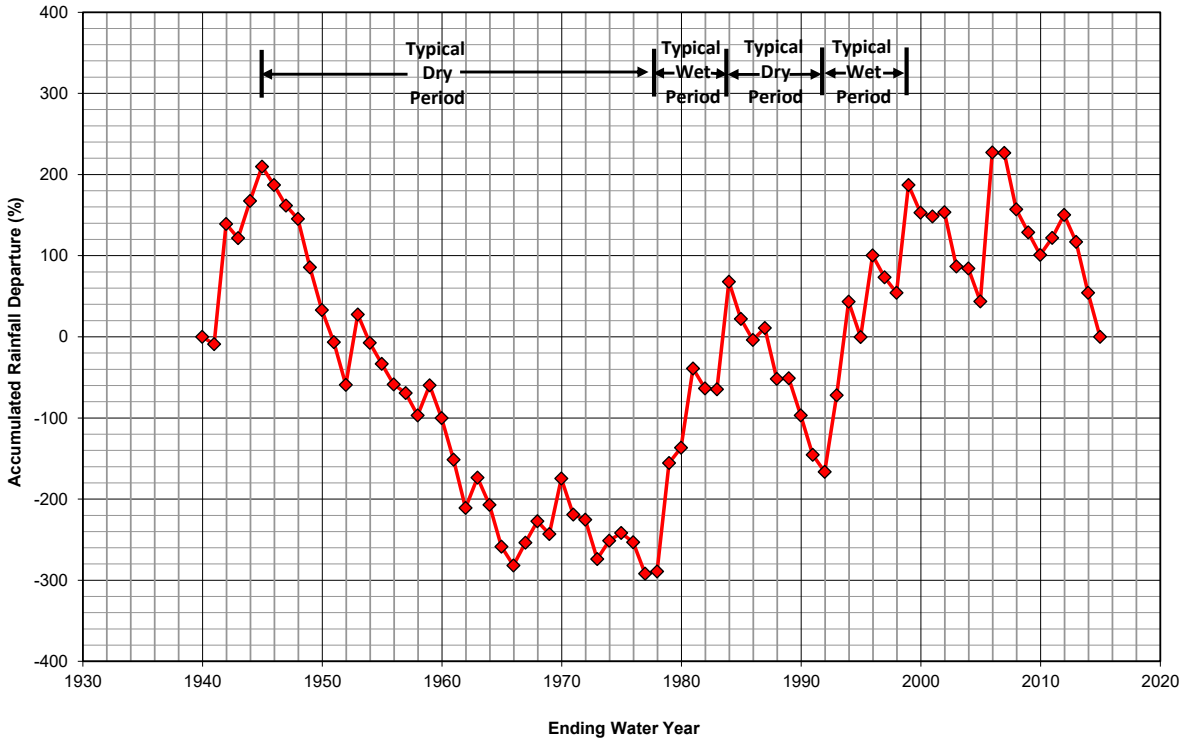


FIGURE 2.1A: YEARLY RAINFALL TOTALS, BURBANK VALLEY PUMP PLANT GAGE



1. Yearly Rainfall Data compiled from Western Regional Climate Center (WRCC)
2. Major divisions are equal to 5 years; minor divisions are equal to 1 year

FIGURE 2.1B: ACCUMULATED RAINFALL DEPARTURE CURVE, BURBANK VALLEY PUMP PLANT GAGE



2.2 Runoff and Outflow from ULARA

The entire ULARA watershed (including the surface areas of its four groundwater basins) contains 328,500 acres. Of this total, 205,700 acres lie within the tributary hill and mountain areas, whereas the remaining 122,800 acres represent the combined surface areas of the four groundwater basins within ULARA. The drainage system in ULARA is made up of the Los Angeles River and its tributaries. Surface flow in ULARA originates as: runoff from the hills and mountains; runoff from the impervious areas of the valley floor; industrial and sanitary waste discharges; domestic irrigation runoff; and rising groundwater.

A number of stream gaging stations are maintained throughout ULARA, either by the Los Angeles County Department of Public Works (LACDPW) or the United States Geological Survey (USGS). For the Annual Watermaster Report, six key gaging stations have been utilized over the years to illustrate surface water runoff from the main tributary areas of the ULARA watershed. From upstream to downstream, these six gaging stations (see locations on Plate 5) are as follows:

1. Station F-118C-R, which monitors all releases from Pacoima Dam. Runoff below this point flows to the Los Angeles River through lined channels, or it can be diverted to the Lopez and Pacoima spreading grounds for artificial recharge purposes. Note that new downstream Station F-118C-R replaced Station F-118B-R beginning in June 2012.

2. Station F-168B-R, which records all releases from Big Tujunga Dam. This dam collects runoff from the watershed which lies in the hill and mountain areas to the northeast. Runoff below this point flows to Hansen Dam and then to the Los Angeles River. These releases can be diverted for artificial recharge purposes to the Hansen or Tujunga spreading grounds. Note that Station F-168B-R replaced Station F-168-R beginning in June 2012.

3. Station F-300-R, which monitors all flow in the main channel of the Los Angeles River west of Lankershim Boulevard, includes the outflows from Pacoima and Hansen dams which are not otherwise diverted to the spreading grounds. These records also include flow through the Sepulveda Dam and releases of reclaimed wastewater discharged by the City of Los Angeles.

4. Station E-285-R, which monitors flow from the westerly slopes of the Verdugo Mountains and tributary areas in the ULARA watershed located east of Lankershim Boulevard. This station also records releases of reclaimed wastewater discharged by the City of Burbank.

5. Station F-252-R, which monitors flow from Verdugo Canyon, includes flows from Dunsmore and Pickens canyons.

6. Station F-57C-R, which lies in the main channel of the Los Angeles River and records all surface outflows from ULARA (see location also on Plates 1A and 5).

Table 2-2 summarizes the monthly runoff for these six stations for Water Years 2012-13 and 2013-14. The daily mean discharge volumes for the Water Year 2012-13 for these six stations are summarized in Appendix B.

TABLE 2-2: MONTHLY RUNOFF AT SELECTED GAGING STATIONS

(Acre-feet)

Station	Water Year	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
F-118C-R	2012-13	6	0	0	0	0	0	6	0	0	416	0	0	**427**
Pacoima Dam	2013-14	13	0	1	0	0	0	535	0	0	0	0	0	**549**
F-168B-R	2012-13	486	615	278	343	217	138	73	108	88	102	254	246	**2,948**
Big Tujunga Dam	2013-14	326	559	126	103	133	175	164	150	157	168	159	135	**2,355**
F-300-R	2012-13	3,820	7,290	12,300	11,600	5,930	8,180	4,420	6,790	4,630	4,860	4,390	4,170	**78,380**
L.A. River Tujunga Ave.	2013-14	4,300	4,580	4,160	3,550	16,300	7,250	3,590	3,110	3,110	3,240	3,180	3,150	**59,520**
E-285-R	2012-13	698	907	1,310	1,300	735	1,220	621	1,460	1,250	857	599	631	**11,588**
Burbank Storm Drain	2013-14	716	547	644	954	1,510	844	683	605	624	696	609	579	**9,011**
F-252-R	2012-13	238	306	440	312	202	253	156	206	133	117	102	90	**2,555**
Verdugo Wash	2013-14	121	254	308	136	1,010	290	120	184	183	169	127	104	**3,006**
F-57C-R	2012-13	7,800	8,460	11,440	12,970	6,820	9,770	6,540	7,160	6,210	6,880	7,270	6,000	**97,320**
L.A. River Arroyo Seco	2013-14	6,580	6,400	5,700	5,200	23,490	20,650	6,490	6,590	6,600	6,300	5,480	5,330	**104,810**

ND = No Data

2.3 Components of Surface Flow

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

1. Storm water runoff;
2. Treated wastewater from the Tillman, Burbank, and Los Angeles-Glendale water reclamation plants (WRPs);
3. Industrial discharges and domestic irrigation runoff; and,
4. Rising groundwater.

Storm flows are typically the largest component of the total surface flow recorded at Gage F-57C-R, and these storm flows occur principally in the winter months (Table 2-3 and Appendix B).

A significant factor affecting surface water runoff in the Los Angeles River has been the releases of treated wastewater over time by the 3 local WRPs mentioned above. Specifically, releases from the Los Angeles-Glendale WRP, the Burbank WRP, and the Tillman WRP appear to have begun in 1976-77, 1967, and 1985, respectively.

Industrial discharges and irrigation runoff upstream of Gage F-57C-R are relatively small, but cumulatively they contribute a moderate amount of surface flow to the Los Angeles River. Field inspection during 1998-99 confirmed year-round unmetered flows of domestic irrigation runoff from residential areas, golf courses and industrial sites.

Rising groundwater is a constant source of loss from the Verdugo and San Fernando groundwater basins. Rising groundwater occurs above the Verdugo Wash Narrows, and in the unlined reach of the Los Angeles River immediately upgradient from Gage F-57C-R. Outflow at Gage F-57C-R includes rising groundwater leaving the Verdugo Basin past Gage F-252-R (Table 2-3). In Water Year 2013-14, rising groundwater was estimated to be 2,253 AF at Gage F-252-R and 1,417 AF at the downstream Gage F-57C-R.

Releases of treated wastewater also have an influence on rising groundwater. These large year-round releases tend to keep the alluvium beneath the Los Angeles River saturated, even in dry years. Nevertheless, there is some opportunity for continuing percolation in the unlined reaches of the river, both upstream and downstream of the lined section near the confluence of the Verdugo Wash and the Los Angeles River. Water percolating in the unlined reach is thought to percolate through the shallow alluvial zones and to re-appear as rising groundwater along the river at a location downstream from Los Feliz Boulevard. Also, there are up to 3,000

AF of recharge per year from delivered water within the Los Angeles Narrows-Pollock Wellfield area that contributes to the rising groundwater condition.

In the Report of Referee (1962, Volume II, Appendix O), procedures were developed for calculating the volume of rising groundwater for the original safe yield base period of 1928-1958. Some of the important factors that were active at the time of that study but have since been discontinued include: releases of Owens River water; operation of the Chatsworth Reservoir; and operation of the Headworks Spreading Grounds. As shown on Figure O-2 of the Report of Referee (1962), excess rising groundwater was considered to have declined to essentially zero by the late-1950s. The January 1993 report by Brown and Caldwell, "Potential Infiltration of Chlorides from the Los Angeles River Narrows into the Groundwater Aquifer," assessed groundwater levels along the course of the Los Angeles River; the then-current Watermaster provided the data for that 1993 evaluation. As of the end of the drought period in 1977, groundwater levels in the Los Angeles River Narrows were very low; hence, there was very little potential for having excess rising groundwater at that time in that area. However, increased rainfall and runoff occurred during the 1978-83 period, which, combined with reduced pumping by the Los Angeles-owned Crystal Springs, Grandview, and Pollock wellfields, induced large rises in groundwater levels in the Los Angeles River Narrows. Such elevated groundwater levels that follow periods of heavy rainfall tend to increase the volumes of rising groundwater.

Finally, the methodology used to calculate rising groundwater (Table 2-3) needs to be improved. Over the years, many of the gaging stations along the Los Angeles River and its tributaries have been lost or abandoned. Actual data from these gaging stations have been replaced by estimates, and the LADWP-operated groundwater flow model has been used to check the results. Although the current methodology provides an approximation, it is considered to be less accurate than using actual gage data. To improve the calculation of rising groundwater, the abandoned, lost or inaccurate gaging stations need to be identified, and then these stations should be either rehabilitated or replaced entirely. The first step to be taken by the Watermaster would be a field visit to these types of facilities.

The first such visit occurred in March 2014, when the Watermaster made an initial visit to gage site F-57C-R with representatives from the LACFCD and LADWP. It was determined from this site visit that, beginning in 2005, LACFCD field monitoring staff had begun experiencing problems in obtaining accurate measurements of low flows in the bottom of the lined river channel at Gage F-57C-R. Some of these problems were also a result of vandalism and even theft of copper wires required for electrical supply to the gage. High flows (resulting from storm events) have been and continue to be collected by LACFCD using a staff gage on the vertical concrete sides of the lined river channel. In 2011, the City of Los Angeles Bureau of

Engineering also initiated construction of the nearby Riverside Drive Viaduct Replacement Project (including a new bridge). This new construction took place immediately above and surrounding Gage F-57C-R, and further impacting its operation. Project construction, which is principally due to seismic concerns for the original (existing) bridge, is expected to be completed in early-2016.

In an effort to help ensure accurate measurements of low flows at Gage F-57C-R, the Watermaster participated in several meetings with all parties involved. The Watermaster requested and obtained written status reports from both LACFCD and the City of Los Angeles in order to better understand the issues concerning Gage F-57C-R. Through this collaborative effort, both short- and long-term solutions have been developed to allow the ongoing collection of low flow measurements at the location of Gage F-57C-R. For the remaining duration of the construction project, battery-power instrumentation has been installed by LACFCD to provide the necessary electrical supply to the gage, and LACFCD has committed to make labor-intensive, semi-monthly manual readings when construction activities impede collection of low flow measurement data. After completion of the construction project, LACDPW will install a permanent electrical source and be responsible for the continued long-term maintenance and security of the gage to ensure accurate measurements are recorded.

As a result of the work described above, the Watermaster is satisfied that the low flow stream measurements now being recorded at Gage F-57C-R by LACFCD are sufficiently accurate for ULARA Watermaster purposes, and that this gage will be maintained in the future to continue providing accurate measurements. The Watermaster updated the Court on this matter in a Special Hearing on April 25, 2014.

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

(Acre-feet)

	F-57C-R				F-252-R		
Water Year	Rising Groundwater[1]	Waste Discharge	Storm Runoff	Total Outflow[2]	Rising Groundwater[3,4]	Storm Runoff[4]	Total Outflow
2013-14	1,417	61,260	21,456	84,133	2,553	457	3,010
2012-13	1,754	67,865	27,711	97,330	1,156	1,098	2,254
2011-12	3,121	69,176	36,603	108,900	2,068	2,662	4,730
2010-11	6,588	88,541	135,815	230,945	2,397	18,023	20,420
2009-10	5,814	74,736	75,150	155,700	2,394	11,936	14,330
2008-09	2,698	73,983	66,882	142,563	2,097	7,808	9,905
2007-08	3,905	76,287	96,548	176,740	1,212	8,700	9,912
2006-07	1,720	72,544	21,236	95,500	1,272	6,668	7,943
2005-06	5,441	74,256	77,063	156,760	1,414	12,717	14,131
2004-05	6,309	70,828	423,293	500,430	5,198	31,874	37,072
2003-04	3,330	90,377	42,153	135,860	2,468	2,851	5,319
2002-03	3,869	75,159	106,862	185,890	3,167	5,183	8,350
2001-02	2,126	74,737	43,937	120,800	1,819	5,721	7,540
2000-01	3,000	91,795	94,065	188,860	1,500	6,370	7,870
1999-00	1,980	78,009	62,202	142,190	824	4,243	8,470
1998-99	2,000	72,790	39,110	113,900	1,000	2,534	7,250
1997-98	4,000	97,681	245,079	346,730	4,000	12,140	16,140
1996-97	3,000	75,827	76,485	155,312	3,000	13,860	16,860
1995-96	3,841	86,127	61,188	151,156	2,577	10,946	13,523
1994-95	4,900	66,209	367,458	438,567	4,809	28,881	33,696
1993-94	2,952	60,594	73,149	136,695	1,387	6,156	7,543
1992-93	4,900	77,000	478,123	560,023	3,335	20,185	23,520
1991-92	3,000	120,789	197,040	320,829	1,412	13,209	14,621
1990-91	3,203	75,647	117,779	196,629	1,157	6,865	8,022
1989-90	3,000	76,789	55,811	167,639	1,182	2,938	4,120
1988-89	3,000	80,020	56,535	136,843	1,995	4,453	6,448
1987-88	3,000	81,920	74,074	156,204	3,548	10,493	14,041
1986-87	3,000	64,125	19,060	83,295	2,100	1,690	3,790
1985-86	3,880	48,370	102,840	155,090	2,470	6,270	8,740
1984-85	3,260	21,600	46,300	71,160	2,710	3,970	6,680
1983-84	3,000	17,780	49,090	69,870	4,000	n/a	n/a
1982-83	3,460	17,610	384,620	405,690	5,330	21,384	26,714
1981-82	1,280	18,180	80,000	99,460	3,710	5,367	9,077
1980-81	4,710	19,580	51,940	76,230	5,780	2,917	8,697
1979-80	5,500	16,500	n/a	n/a	5,150	7,752	12,902
1978-79	2,840	16,450	119,810	139,100	2,470	n/a	n/a
1977-78	1,331	7,449	357,883	366,663	1,168	23,571	24,739
1976-77	839	7,128	58,046	66,013	1,683	2,635	4,318
1975-76	261	6,741	32,723	39,725	2,170	2,380	4,550
1974-75	427	7,318	56,396	64,141	1,333	4,255	5,588
1973-74	2,694	6,366	79,587	88,878	1,772	5,613	7,385
1972-73	4,596	8,776	100,587	113,959	1,706	7,702	9,408
1971-72	---	---	---	---	2,050	2,513	4,563
Average	3,213	57,022	114,919	182,372	2,478	8,707	11,322

1. Includes the influence of treated waste water discharged to the Los Angeles River from the Los Angeles-Glendale Water Reclamation Plant (as of Water Year 1976-77) and the Donald C. Tillman Water Reclamation Plant (as of September 1985).
2. Gage F-57-C, the major measurement point of discharge to the Los Angeles River, is estimated beginning with the 2010-11 Water Year through the current Water Year due to measurement inaccuracies and/or disruptions.
3. Includes the influence of declining capacity at Verdugo Park Treatment Plant.
4. Includes influence of dry weather runoff and perennial stream flow.

2.4 Groundwater Recharge

Precipitation has a direct influence on groundwater recharge and, ultimately, on the amount of groundwater in storage in the local groundwater basins. Urban development in ULARA over time has resulted in a significant portion of the rainfall being collected and routed into storm drains and/or lined channels that discharge directly into the Los Angeles River. To partially offset the increased runoff due to urbanization, Pacoima, Big Tujunga and Hansen dams, originally built for flood control, are now being utilized to regulate storm flows and to allow recapture of a portion of the flow in downstream spreading basins operated by the LACDPW and the City of Los Angeles.

The LACDPW operates the Branford, Hansen, Lopez, and Pacoima spreading grounds. The LACDPW, in cooperation with the City of Los Angeles, operates the Tujunga Spreading Grounds (TSG). These spreading grounds are primarily used for the artificial recharge of native water (stormwater runoff). Table 2-4 summarizes the spreading operations at all spreading basins for the 2013-14 Water Year, whereas Table 2-4A summarizes recharge since the 1968-69 Water Year. Plate 8 shows the locations of these spreading grounds. As shown on Table 2-4 below, Burbank began spreading MWD water in the 2009-10 Water Year following completion of the Burbank MWD connection.

TABLE 2-4: WY 2013-14 SPREADING OPERATIONS IN THE SAN FERNANDO BASIN

(Acre-feet)

Agency	Spreading Facility	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
LACDPW														
	Branford	41	62	61	20	88	14	44	31	28	29	28	28	474
	Hansen	0	40	143	132	290	676	220	102	36	27	1	0	1,667
	Lopez [1]	151	220	287	0	0	0	1	1	0	0	0	0	661
	Pacoima [1]	2,350	2,160	1,710	179	527	159	357	0	0	0	0	0	7,442
	Tujunga	0	0	0	0	131	64	0	0	0	0	0	0	195
	Total	**2,542**	**2,482**	**2,201**	**331**	**1,036**	**913**	**622**	**134**	**64**	**56**	**29**	**28**	**10,439**
City of Los Angeles														
	Tujunga [2]	0.23	0.38	0.33	0.15	0.25	0.71	0.37	0.36	0.18	0.20	0.22	0.25	4
	Headworks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
	Total	**0.23**	**0.38**	**0.33**	**0.15**	**0.25**	**0.71**	**0.37**	**0.36**	**0.18**	**0.20**	**0.22**	**0.25**	**4**
	Basin Total	**2,542**	**2,482**	**2,201**	**331**	**1,036**	**914**	**622**	**134**	**64**	**56**	**29**	**28**	**10,443**
City of Burbank [1]		2,599	2,229	1,991	181	0	0	0	0	0	0	0	0	**7,000**

1. MWD water imported by Burbank & spread at Pacoima and/or Lopez Spreading Grounds is accounted for in the totals reported by LACDPW; the separate “City of Burbank” total reported below the “Basin Total” is for information purposes, and should not be added to the “Basin Total” as it is already accounted for.
2. This water derived from backwashing of the Tujunga GAC vessels and discharged into Tujunga spreading basin.

TABLE 2-4A: ANNUAL SPREADING OPERATIONS IN THE SAN FERNANDO BASIN

WY 1968-69 through WY 2013-14
(Acre-feet)

Water Year	Los Angeles County Department of Public Works (Native + Imported[1])						City of Los Angeles (Imported)			GRAND TOTAL	City of Burbank (Imported)[1]	Rainfall (inches)
	Branford	Hansen	Lopez	Pacoima	Tujunga	TOTAL	Headworks	Tujunga	TOTAL		Pacoima	Weighted Average Valley/Mtns.
2013-14	474	1,667	661	7,442	195	10,439	0	4	4	10,443	7,000	7.98
2012-13	570	1,758	501	7,015	927	10,771	0	11	11	10,782	6,703	8.72
2011-12	529	9,357	104	3,482	101	13,573	0	4	4	13,577	1,371	11.55
2010-11	690	19,064	3,922	24,164	31,476	79,316	0	4	4	79,320	11,187	25.21
2009-10	535	16,766	274	9,080	12,849	39,504	0	7,509	7,509	47,013	34	20.55
2008-09	706	0	1	2,000	7,233	9,940	0	0	0	9,940	---	12.58
2007-08	570	10,517	634	5,025	4,892	21,638	0	0	0	21,638	---	17.27
2006-07	532	5,762	44	436	1,200	7,974	0	0	0	7,974	---	5.36
2005-06	576	20,840	958	7,346	14,895	44,615	0	0	0	44,615	---	17.42
2004-05	1,448	33,301	940	17,394	21,115	74,198	0	0	0	74,198	---	45.66
2003-04	444	6,424	144	1,731	1,322	10,065	0	0	0	10,065	---	12.21
2002-03	932	9,427	518	3,539	1,914	16,330	0	0	0	16,330	---	21.22
2001-02	460	1,342	0	761	101	2,664	0	0	0	2,664	---	6.64
2000-01	562	11,694	172	3,826	1,685	17,939	0	0	0	17,939	---	22.29
1999-00	468	7,487	578	2,909	2,664	14,106	0	0	0	14,106	---	16.77
1998-99	547	8,949	536	696	3,934	14,662	0	0	0	14,662	---	10.83
1997-98	641	28,129	378	20,714	11,180	61,042	0	77	77	61,119	---	38.51
1996-97	415	9,808	724	5,768	6,406	23,121	0	51	51	23,172	---	17.65
1995-96	345	8,232	363	4,532	7,767	21,239	0	0	0	21,239	---	14.48
1994-95	585	35,137	1,086	14,064	18,236	69,108	0	0	0	69,108	---	33.08
1993-94	462	12,052	182	3,156	4,129	19,981	0	0	0	19,981	---	11.86
1992-93	389	26,186	1,312	17,001	19,656	64,544	114	0	114	64,658	---	41.26
1991-92	653	15,461	1,094	12,914	9,272	39,394	230	0	230	39,624	---	32.39
1990-91	509	11,489	241	3,940	2,487	18,666	52	0	52	18,718	---	7.69
1989-90	327	2,029	90	1,708	0	4,154	0	0	0	4,154	---	9.55
1988-89	255	3,844	308	1,306	0	5,713	0	0	0	5,713	---	9.72
1987-88	352	17,252	1,037	4,520	0	23,161	0	0	0	23,161	---	21.36
1986-87	0	7,311	141	467	0	7,919	0	33	33	7,952	---	7.70
1985-86	290	18,188	1,735	6,704	0	26,917	0	1,433	1,433	28,350	---	23.27
1984-85	244	13,274	104	3,375	0	16,997	0	5,496	5,496	22,493	---	13.31
1983-84	213	10,410	0	3,545	0	14,168	0	24,115	24,115	38,283	---	11.18
1982-83	883	35,192	1,051	22,972	10,580	70,678	10	32,237	32,247	102,925	---	46.07
1981-82	345	14,317	243	5,495	0	20,400	3,853	0	3,853	24,253	---	20.16
1980-81	245	14,470	335	3,169	0	18,219	4,652	9,020	13,672	31,891	---	12.89
1979-80	397	31,087	1,097	15,583	0	48,164	5,448	19,931	25,379	73,543	---	33.66
1978-79	295	24,697	1,018	12,036	0	38,046	2,463	31,945	34,408	72,454	---	24.07
1977-78	2,142	28,123	445	20,472	12,821	64,003	3,200	18,247	21,447	85,450	---	44.84
1976-77	377	2,656	63	1,943	0	5,039	3,142	16	3,158	8,197	---	16.02
1975-76	470	3,128	562	1,308	0	5,468	3,837	5,500	9,337	14,805	---	14.20
1974-75	681	5,423	915	2,476	0	9,495	4,070	9,221	13,291	22,786	---	---
1973-74	672	6,287	946	2,378	0	10,283	6,205	0	6,205	16,488	---	---
1972-73	1,271	9,272	0	6,343	2,274	19,160	5,182	0	5,182	24,342	---	---
1971-72	161	1,932	0	1,113	0	3,206	7,389	0	7,389	10,595	---	---
1970-71	507	11,657	727	4,049	0	16,940	6,804	399	7,203	24,143	---	---
1969-70	674	11,927	0	1,577	2,380	16,558	11,021	0	11,021	27,579	---	---
1968-69	461	32,464	893	14,262	13,052	61,132	6,698	3,676	10,374	71,506	---	---
AVG.	550	13,387	589	6,864	4,929	26,318	1,617	3,672	5,289	31,608	5,259	

1. Spreading by Burbank began in 2009-10 Water Year following completion of the Burbank MWD connection. These volumes are reported by LACDPW spreading data, and are therefore included in the “Grand Total” column.

2.5 Groundwater Extractions

The original Trial Court adjudication of groundwater rights in ULARA, effective October 1, 1968, restricted all groundwater extractions to a total maximum safe yield value of approximately 104,040 AFY for the four ULARA groundwater basins. This value amounted to a reduction of approximately 50,000 AF from the average groundwater extractions by all Parties for the six years prior to 1968. The State Supreme Court's opinion, as implemented on remand in the Judgment dated January 26, 1979, further restricted groundwater pumping from each groundwater basin, and by each Party within each basin.

Figure 2.2 illustrates the imported water used in ULARA and annual groundwater extractions, beginning with the 1954-55 Water Year. It can be noted that for the 14 years prior to pumping restrictions (WY 1954-55 to WY 1967-68), imported water volumes exceeded annual groundwater extractions by 50,000 to 90,000 AFY. In the more recent 46-year period (WY 1968-69 to WY 2013-14), annual imported water volumes exceeded extractions by approximately 100,000 AFY to 255,000 AFY.

A total of 107,559 AF of groundwater was pumped from the four ULARA groundwater basins during the 2013-14 WY, as follows: 99,681 AF from the SFB; 4,020 AF from the Sylmar Basin; 3,649 AF from the Verdugo Basin; and 209 AF from the Eagle Rock Basin. The respective extraction rights for the forthcoming 2014-15 WY for each basin are: 93,511 AF [Native Safe Yield of 43,660 AF plus an import return credit (or “return water extraction right”) of 49,851 AF] for the SFB; 7,140 AF for the Sylmar Basin; and 7,150 AF for the Verdugo Basin. The Groundwater Extractions Report provided in Appendix A summarizes the groundwater extractions by each Party during WY 2013-14. Plate 8 shows the general locations of the various wellfields owned by the five principal Parties in ULARA, whereas Plate 11 displays the computer-simulated changes in groundwater elevations in the local groundwater basins; these simulated groundwater elevations have resulted from changes in groundwater extractions and annual rainfall and recharge during WY 2013-14.

Of the total amount of groundwater pumped in ULARA (107,599 AF in WY 2013-14), the majority was extracted by the Parties to the Judgment; 1,204 AF are considered a non-consumptive use or minimal consumption; and 1,317 AF were pumped for physical solutions, groundwater cleanup, water well development and testing, and dewatering activities by other parties (Appendix E). Table 2-5 summarizes private party pumping in the SFB for WY 2013-14, whereas Plate 3 shows the locations of the individual producers.

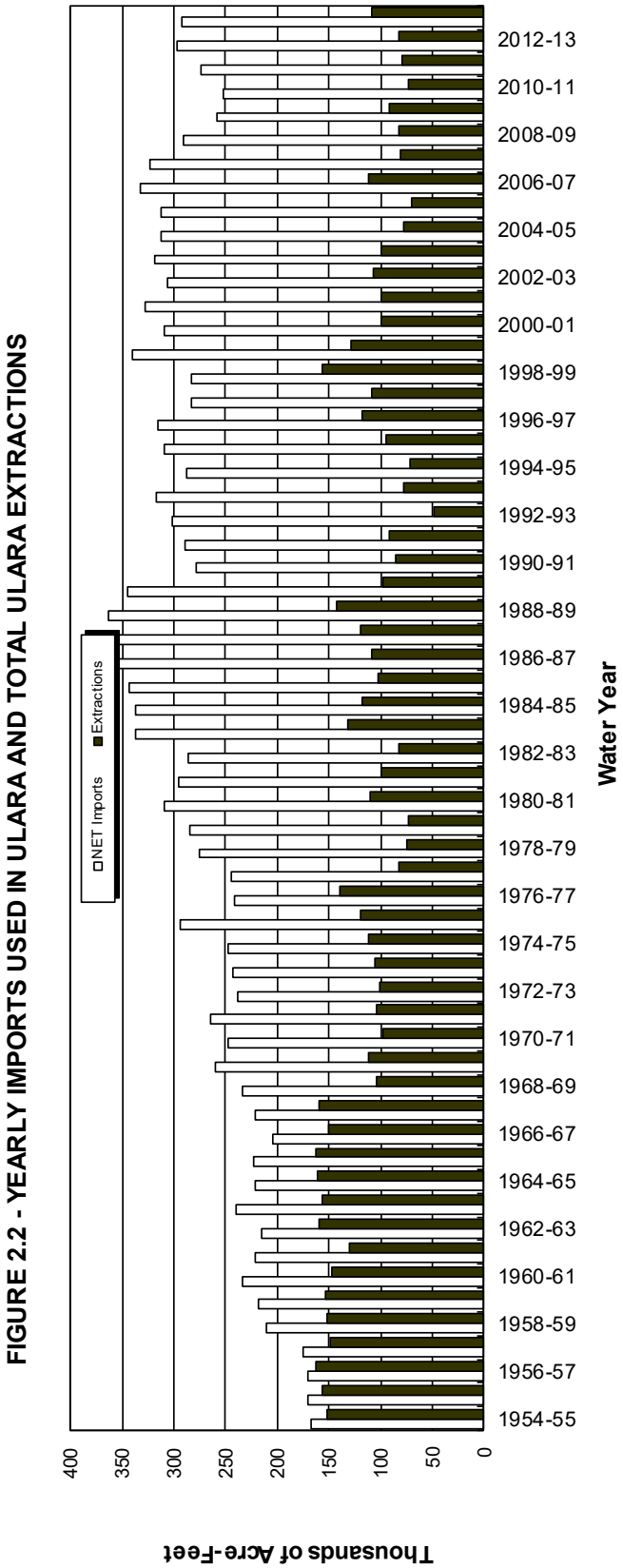


FIGURE 2.2 - YEARLY IMPORTS USED IN ULARA AND TOTAL ULARA EXTRACTIONS
NET Imports
Extractions
Water Year
2012-13
2010-11
2008-09
2006-07
2004-05
2002-03
2000-01
1998-99
1996-97
1994-95
1992-93
1990-91
1988-89
1986-87
1984-85
1982-83
1980-81
1978-79
1976-77
1974-75
1972-73
1970-71
1968-69
1966-67
1964-65
1962-63
1960-61
1958-59
1956-57
1954-55
400
350
300
250
200
150
100
50
0
Thousands of Acre-Feet

TABLE 2-5: WY 2013-14 PRIVATE PARTY PUMPING – SAN FERNANDO BASIN

(Acre-feet)

Nonconsumptive Use or Minimal Consumption	
Sears, Roebuck and Company (Air Conditioning; well disconnected 2000)	0.00
Sportsmens' Lodge	4.86
Toluca Lake Property Owners	10.03
Vulcan (CalMat) [1] (Gravel washing)	1,191.86
Walt Disney Productions (3 wells inactive/ Not abandoned)	0.00
Total	**1,206.75**

Groundwater Dewatering	
Charged to Los Angeles' water rights	
Avalon Encino	0.00
BFI Sunshine Canyon Landfill	70.09
Glenborough Realty (First Financial)	12.41
Mercedes Benz Encino (formerly known as Auto Stiegler)	0.37
Metropolitan Transportation Agency	38.34
Metropolitan Water District	113.40
Trillium Corporation	10.36
Warner Properties Plaza 6 and 3	14.85
Total	**259.82**

Groundwater Cleanup	
Charged to Burbank's water rights	
B.F.Goodrich (Menasco/Coltec)	0.01
Home Depot U.S.A. Inc.	0.00
Subtotal	*0.01*
Charged to Los Angeles' water rights	
3M-Pharmaceutical	28.54
Boeing Santa Susana Field Lab	0.00
Honeywell International, Inc.	187.09
Micro Matics USA, Inc.	0.00
Tesoro	0.00
Subtotal	*215.63*
Total	**215.64**

Physical Solution	
Charged to Burbank's water rights	
Valhalla Memorial Park	416.92
Subtotal	*416.92*
Charged to Glendale's water rights	
Forest Lawn Cemetery Assn.	398.70
Subtotal	*398.70*
Charged to Los Angeles' water rights	
Hallelujah Prayer Ctr (Hathaway/deMille)	9.48
Middle Ranch (deMille)	4.28
Toluca Lake Property Owners	30.00
Water Licenses	0.40
Wildlife Waystation	0.07
Subtotal	*44.23*
Total	**859.85**

Total Extractions	**2,542.06**

1. Water pumped by Vulcan (Calmat) excludes 187.72 AF of water lost through evaporation.

2.6 Imports and Exports of Water

The continued growth of residential, commercial, and industrial developments has required that more water be imported to supplement the local groundwater supplies in ULARA over time. Imported supplies to ULARA are from the Los Angeles Aqueduct and from MWD. Imported water in the Los Angeles Aqueduct consists of runoff from the Eastern Sierra Nevada and groundwater from Owens Valley. The imported MWD supplies consist of State Water Project and water from the Colorado River Aqueduct.

Exports from ULARA include water imported from the Los Angeles Aqueduct and from MWD (pass-through water), and groundwater extracted from the SFB by LADWP. Exports of wastewater not treated and released into the Los Angeles River are delivered via pipeline to the Hyperion Treatment Plant in the Playa Del Rey area of the City of Los Angeles.

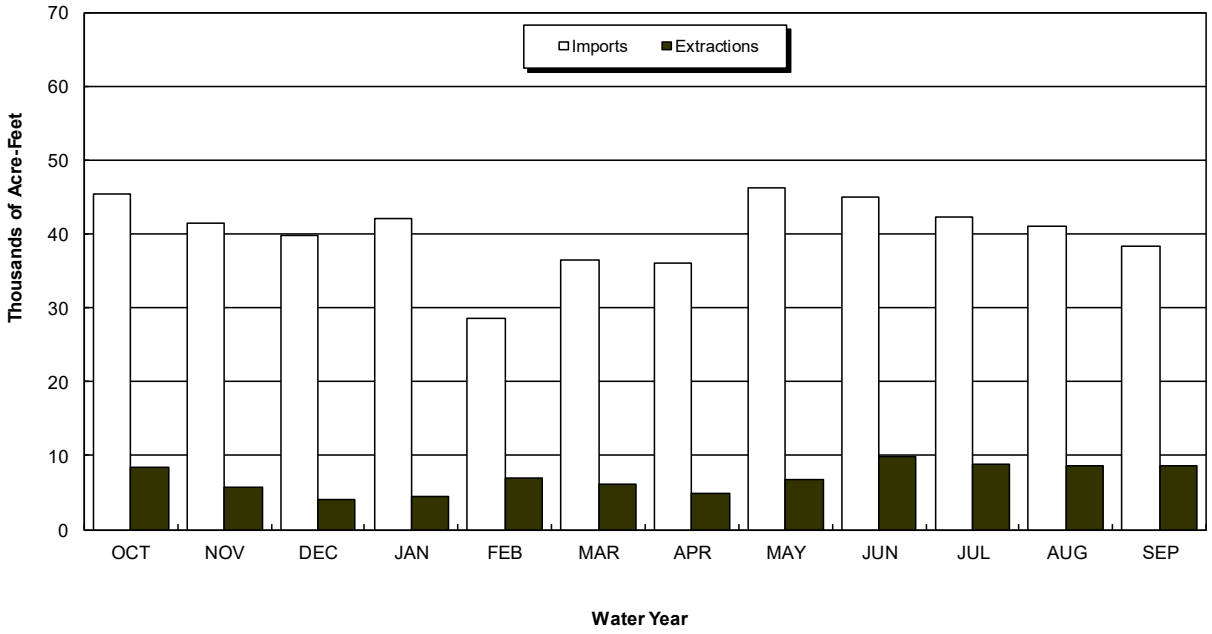
Table 2-6 summarizes the imports and exports from ULARA during the 2012-13 and 2013-14 WYs, whereas Figure 2.3 shows the monthly extractions and gross imports for WY 2013-14. Constraints on water supply sources available to Los Angeles from the Eastern Sierra Nevada and Owens Valley have reduced the amounts of water from these sources that can be imported into ULARA; however, the Parties have tried to manage this water supply challenge, in part, by enacting water conservation measures to help reduce the total overall water demand. In addition, due to operational changes and the addition of wellhead treatment in the Tujunga Wellfield, LADWP was able to increase groundwater extractions from the SFB during this current water year.

TABLE 2-6: ULARA WATER IMPORTS AND EXPORTS
(Acre-feet)

Source and Agency	Water Year 2012-13	Water Year 2013-14
Gross Imported Water		
Los Angeles Aqueduct		
City of Los Angeles	85,408	71,258
MWD Water		
City of Burbank [1]	14,210	15,901
Crescenta Valley Water District	1,682	2,349
City of Glendale	19,195	19,484
City of Los Angeles	369,214	364,163
La Canada Irrigation District [2]	1,150	1,205
Las Virgenes Municipal Water District [2]	8,133	8,364
City of San Fernando	82	9
MWD Total	**413,666**	**411,475**
Grand Total	**499,074**	**482,733**
Exported Water (Pass-Through)		
Los Angeles Aqueduct		
City of Los Angeles	34,991	27,966
MWD Water		
City of Los Angeles	167,236	165,522
Total	**202,227**	**193,488**
Net Imported Water	**296,847**	**289,245**

1. Total includes water imported for potable use and for groundwater replenishment (spreading).
2. Deliveries to those portions of these agency service areas that are within ULARA.

FIGURE 2.3 – TOTAL MONTHLY EXTRACTIONS AND GROSS IMPORTS



Note – "Imports" includes water imported for potable use and for groundwater replenishment (spreading).

2.7 Wastewater Recycling

Wastewater recycling currently provides an additional source of water for irrigation, and for industrial and recreational uses. In the future, wastewater recycling should be able to provide additional water for groundwater recharge at existing and/or new spreading basins, and/or possibly at new aquifer storage and recovery wells (ASR wells, a method to inject water directly into the aquifer systems). Four water reclamation plants (WRPs) are currently in operation in ULARA: the Tillman, Burbank, Los Angeles-Glendale, and the Las Virgenes Municipal Water District plants. The latter facility is located west of the southwestern boundary of ULARA but a part of the water treated at this facility is used in ULARA. Table 2-7 summarizes the operations at these four WRPs in Water Year 2013-14 whereas Plate 5 shows the locations of these facilities.

TABLE 2-7: WY 2013-14 WASTEWATER RECYCLING OPERATIONS

(Acre-feet)

Plant/Agency	Plant Influent [1]	Effluent to L.A. River	Flow to Hyperion	Recycled Water Use	Recycled Water Use [8] (%)	Recycled Water Delivered to SFB
City of Burbank	8,980	6,438	135	2,407 [4]	27%	2,407
Los Angeles-Glendale	21,249 [2]	11,370	2,483	5,562	26%	
Los Angeles				3,689 [5]		388
Glendale				1,827 [6]		1,630
Donald C. Tillman	50,017	34,828 [3]	13,054	6,325 [7]	13%	2,094
Las Virgenes MWD				1,687		1,687
Total	**80,246**	**52,636**	**15,672**	**15,981**		**8,206**

1. Does not include plant overflow/ by pass.
2. Plant influent does not equal to the effluent due to metering error and/or plant use.
3. Total effluent to LA River includes: 17,936 AF supplied to Balboa Lake; 5,366 AF supplied to Wildlife Lake; 4,339 AF supplied to the Japanese Garden; all of which is discharged to LA River after beneficial re-use, in addition to 7,187 AF plant effluent discharged directly to the L.A. River.
4. Of the total recycled water (2,407 AF), 1,248 AF was delivered to the Burbank power plant, 1,159 AF was used by CalTrans, Media City Center, landfill, DeBell Golf Course, Muir School, McCambridge Park, Burbank High School, AMC theater complex, Costco, Empire Center, Chandler Bikeway, Robert Gross Park, Empire landscape, Airport, M. David Paul, BWP Landscape, Castaway, Stough Park, Starlight Bowl, 5-Points Park, Wildwood Canyon Park, Northeastern extension, Northern extension, Valhalla extension, Studio District extension, and water trucks.
5. Total includes 996 AF for in-plant use; 977 AF delivery to Griffith Park for irrigation; 1,631 AF deliveries to CalTrans, Lakeside, Mt. Sinai Memorial Park, Forest Lawn H.H., and Universal City for irrigation; 4.0 AF delivery to former Headworks Spreading Grounds for construction dust control; and 81.0 AF exported from ULARA delivered to Taylor Yard for irrigation.
6. Recycled water was delivered to Glendale for use in Glendale's Power Plant and for irrigation water for CalTrans, Forest Lawn Memorial Park, Oakmont Country Club, Sports Complex, and miscellaneous usage by Glendale Public Works, and other recycled water users in the City of Glendale.
7. Includes deliveries of 2,094 AF to valley fill for irrigation, 3,407 AF of Tillman in-plant use discharged to Hyperion, and 825 AF delivered to Valley Generation Station discharged to Hyperion.
8. Recycled water use is calculated as a percentage (%) of plant effluent.

2.8 Groundwater Elevations and Hydrographs

Simulated groundwater elevation contour maps have been created by the ULARA Watermaster Support Staff at LADWP using the SFB Groundwater Flow Model for the Spring (April) and the Fall (September) of 2014 for the San Fernando Basin. The SFB model was initially developed during the Remedial Investigation (RI) study of groundwater contamination in the eastern portion of the San Fernando Valley in the early-1990s, and was funded through the USEPA's Superfund program.

The model is comprised of up to four hydrostratigraphic layers established by others in the deepest portion of the eastern SFB, and includes 6,883 cells, ranging in size from 1,000 by 1,000 feet to 3,000 by 3,000 feet. The model parameters were calibrated by matching the simulated hydraulic-head fluctuations with the historical water level fluctuations measured at selected key monitoring wells for a 10-year period. The simulated 2014 water level elevation contours for SFB were estimated by incorporating the actual monthly recharge (e.g., the amount of spread water, precipitation, etc.) and the groundwater extraction values for the 2013-14 Water Year as model input. The model was then run to simulate the actual operations in the SFB during the current Water Year (October 2013 to September 2014). The simulated head values (simulated groundwater elevations) at the end of the months of April and September of the 2013-14 Water Year for SFB were then plotted by utilizing groundwater contouring software.

The simulated Groundwater Elevation Contour Maps for Spring and Fall 2014 are shown on Plates 9 and 10, respectively, to depict the regional direction of groundwater flow within the SFB during each of these periods, as simulated by the LADWP flow model. Current groundwater elevations in different portions of the four ULARA groundwater basins may be obtained by contacting the Watermaster Support Staff at LADWP at (213) 367-2117. Additional water level data may also be available from Los Angeles County via http://gis.dpw.lacounty.gov/wells/viewer.asp.

Plate 11 has been prepared to illustrate the simulated change in groundwater elevations from Fall 2013 to Fall 2014 for the SFB. The decrease in the elevations of simulated groundwater in this one-year period ranged between 16 feet and 39 feet in the portion of the SFB near the Hansen, Pacoima, and Tujunga spreading grounds. This decrease is attributed to the relatively low volume (3,443 AF) of native runoff water that was able to be artificially spread at these spreading grounds during that time period. In addition, Burbank spread 7,000 AF of imported water from MWD at the Pacoima spreading grounds. The long-term average annual volume of native runoff water spread within SFB has been on the order of 26,671 AF.

Simulated groundwater elevations decreased by 6 ft to 31 ft from Fall 2013 to Fall 2014 near the LADWP-owned Rinaldi-Toluca and North Hollywood wellfields in SFB due to: the increase in total extractions from these two LADWP-owned wellfields; and the decreased volume of water that was able to be artificially spread and recharged at the spreading basins that lie upgradient from these wellfields. Specifically, pumping at these major wellfields during this same period was increased by 82 percent, from 20,178 AF in WY 2012-13 to 36,636 AF in WY 2013-14. The amount of recharge at these upgradient spreading basins decreased by about 3 percent, from 10,782 AF in WY 2012-13 to 10,443 AF in WY 2013-14.

Similarly, due to decreased recharge at the Tujunga and other upgradient spreading grounds, the simulated groundwater elevations near the LADWP-owned Tujunga wellfield decreased as much as 13 feet during the same one-year period.

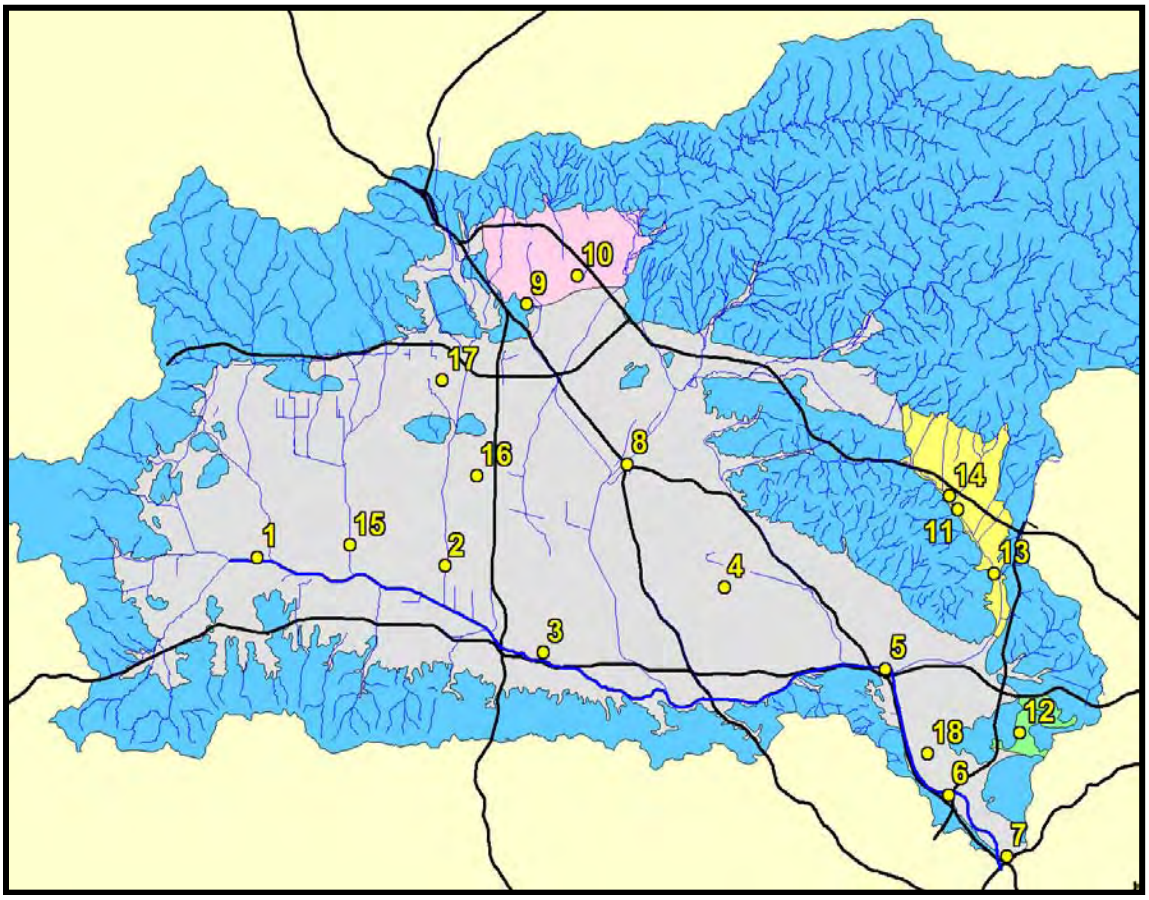
In general, simulated groundwater elevations decreased in most areas of the SFB, mainly due to a combination of: the below-average rainfall; the decrease in artificial recharge at the spreading grounds; and the major increase in municipal-supply groundwater extractions by the purveyors in Water Year 2013-14.

Over the years, water level data collected from 11 water level observation wells within the valley fill areas of ULARA have been used to create hydrographs; these graphs illustrate the fluctuations in water levels in these wells on a seasonal basis for each year and also on a year to year basis in response to variations in seasonal/annual groundwater extractions and annual recharge. Actual water levels for each well are plotted on the hydrographs as depth to water for each available data point; the ground surface elevation (GSE) of each well is listed on each respective hydrograph. Starting with the Annual Report for the 2009-2010 Water Year, the current Watermaster began to collect water level data for another ±20 wells in ULARA, as available from LADWP and the Los Angeles County Department of Public Works – Water Resources Division. Using available location data for each of those ±20 wells, the Watermaster staff plotted their locations and their respective period of available water level data on a map for in-house use; well depth and casing perforation records were also listed, if available, for each well. The locations and water level database for those ±20 additional wells were then reviewed and compared to the locations of the 11 original wells for which hydrographs have been presented for many years in the prior Annual Watermaster Reports.

As a result, the Watermaster now includes the hydrographs for 7 additional wells (a total now of 18 wells) in the four ULARA groundwater basins, beginning with the Annual Report for the 2009-10 Water Year. One of these additional and newly-plotted wells (shown as No. 12 on Figure 2.4) provides the fluctuations in water levels in the Eagle Rock Groundwater Basin. Figure 2.4

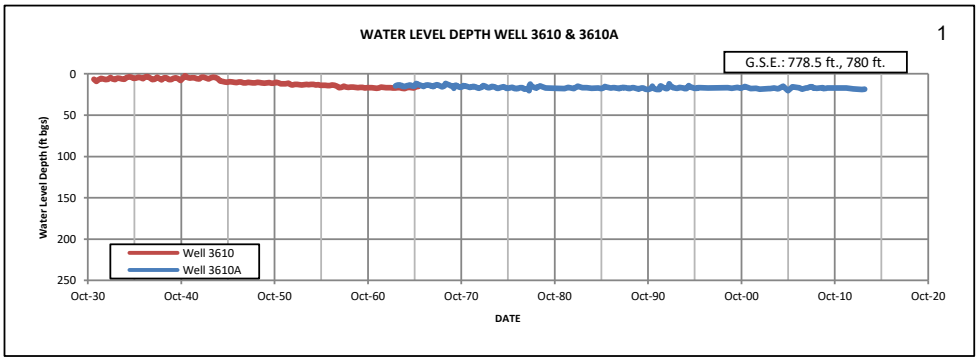
illustrates the locations of the 18 wells for which hydrographs are now being prepared, whereas the hydrographs for each respective well are shown on the following pages.

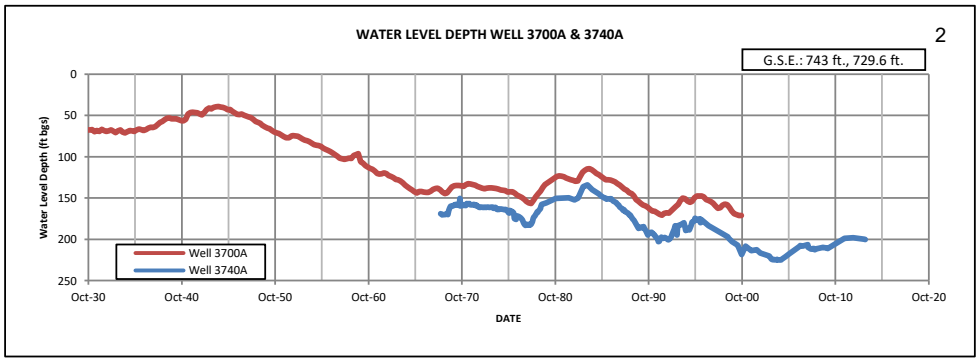
FIGURE 2.4 LOCATIONS OF WELLS WITH HYDROGRAPHS

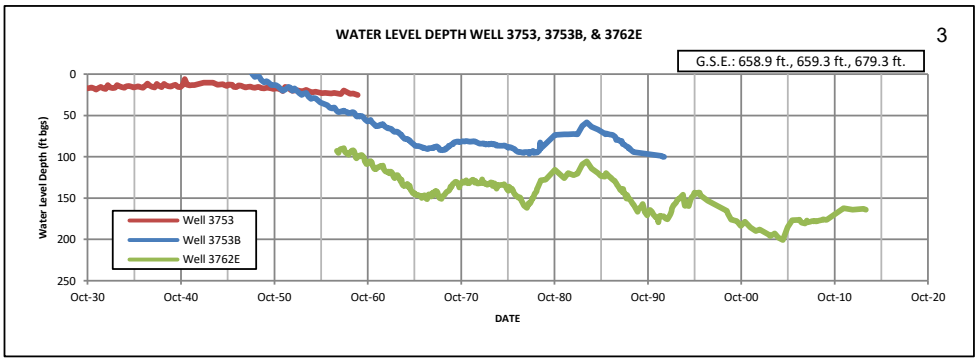


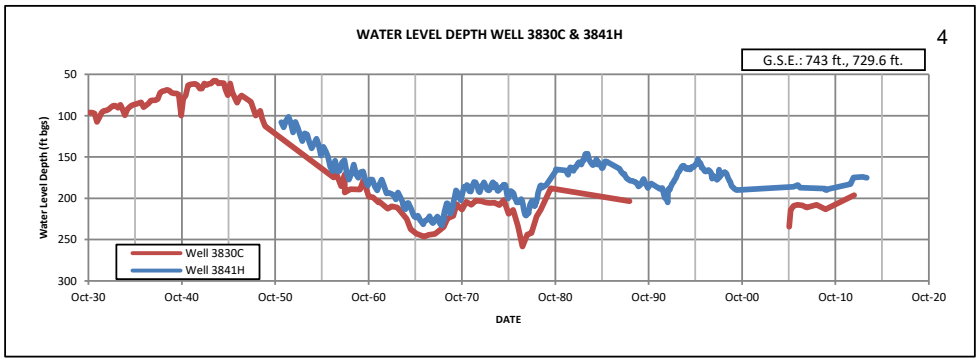
NOTE: See Hydrographs for each well shown above in the accompanying figures.

SAN FERNANDO BASIN









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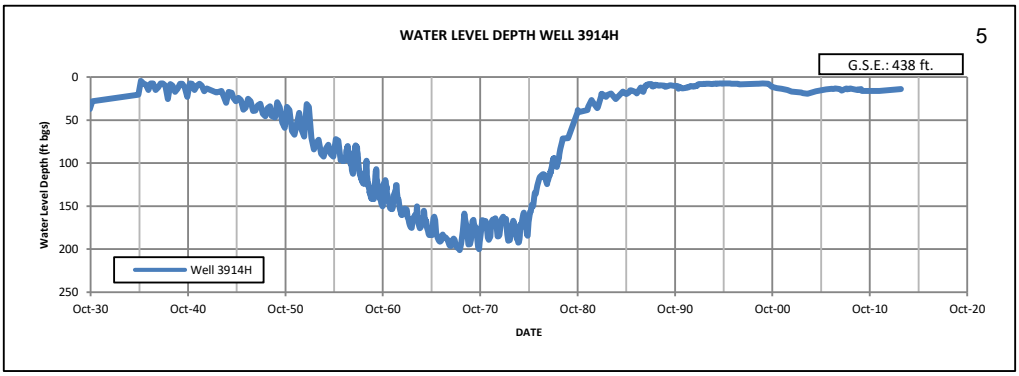

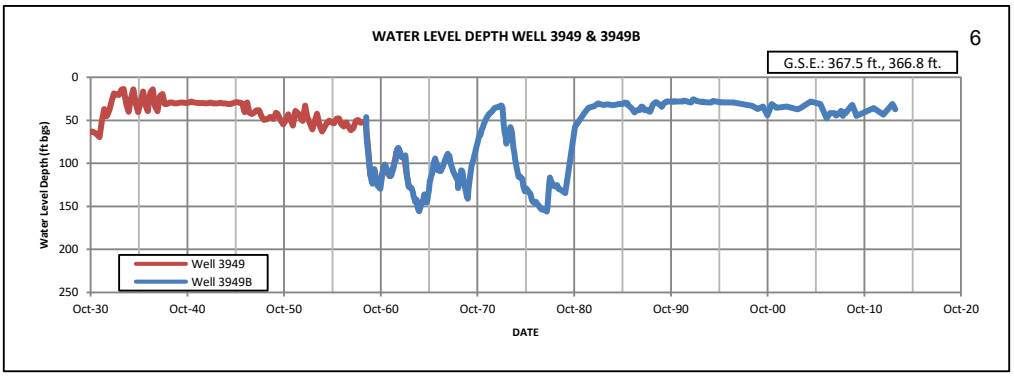

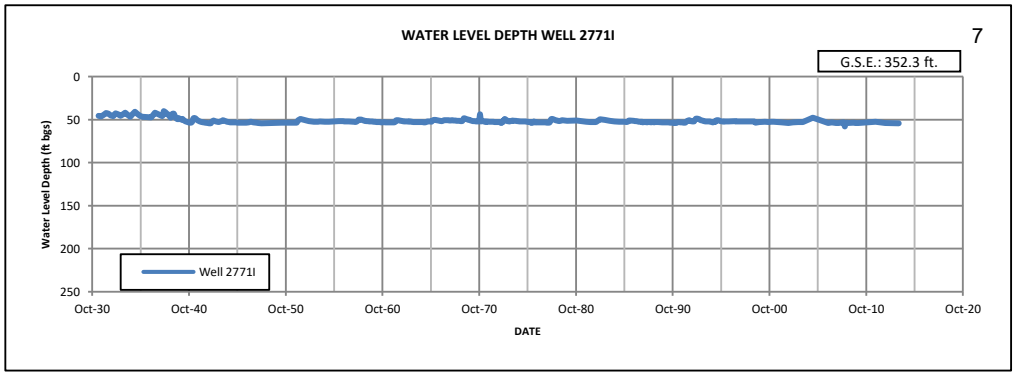

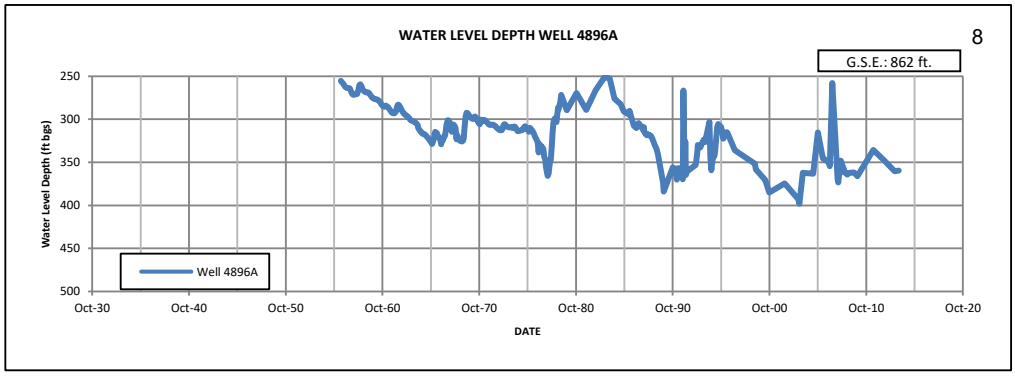

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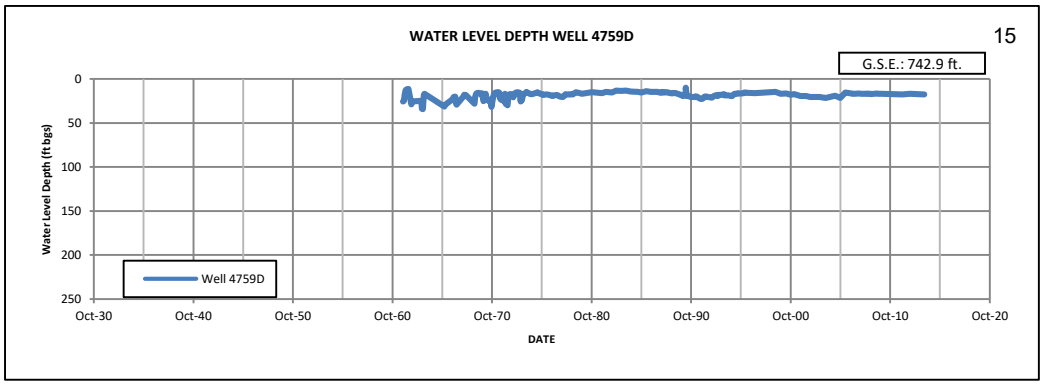
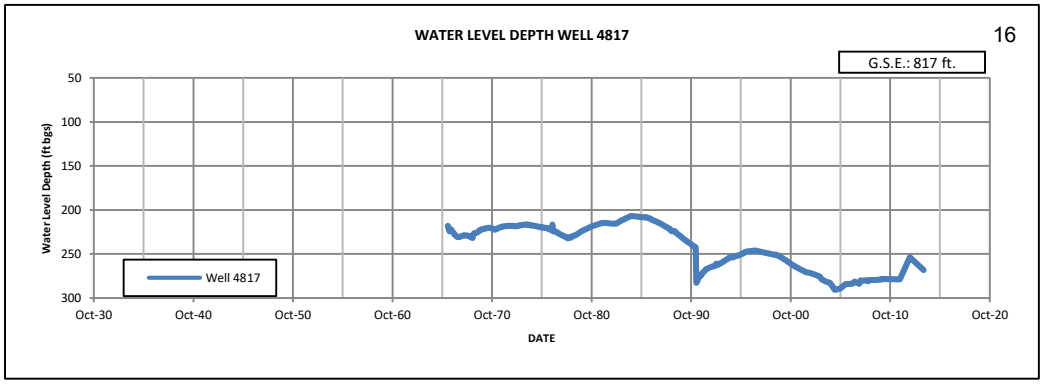
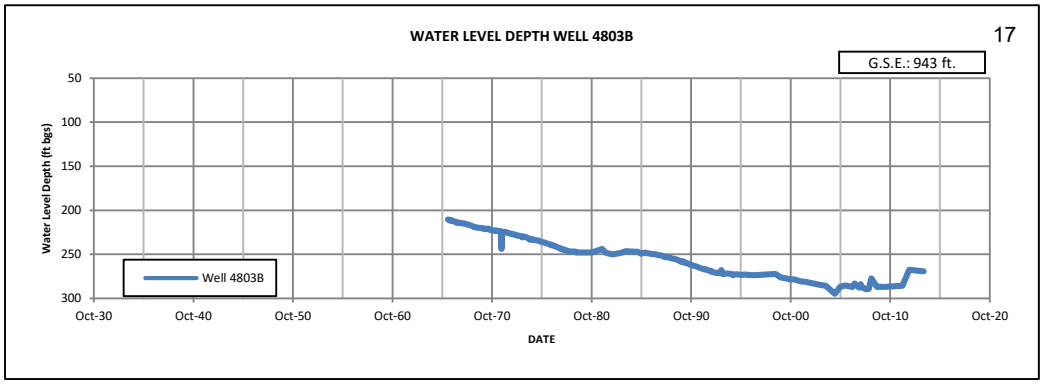
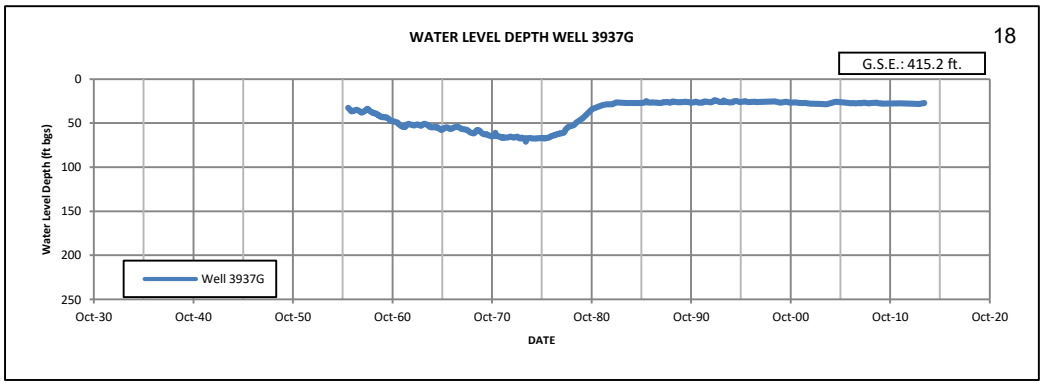
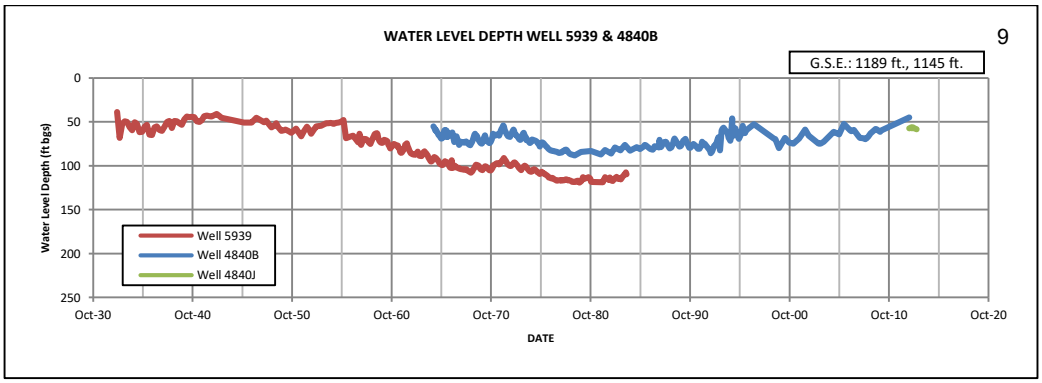


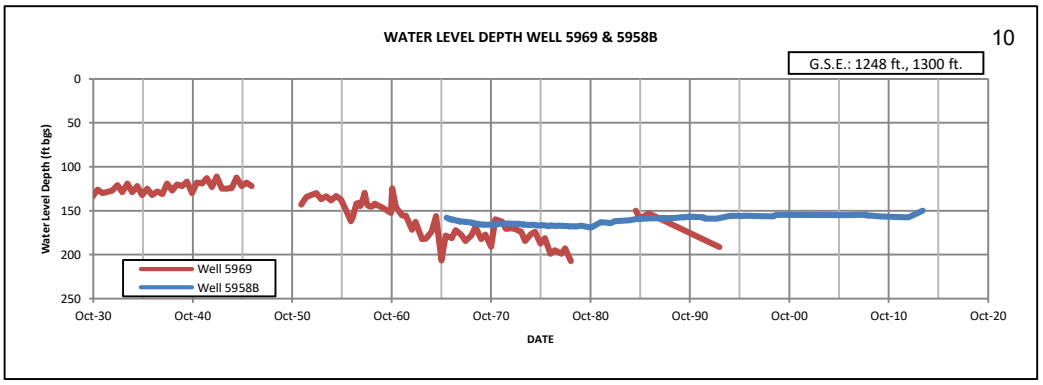




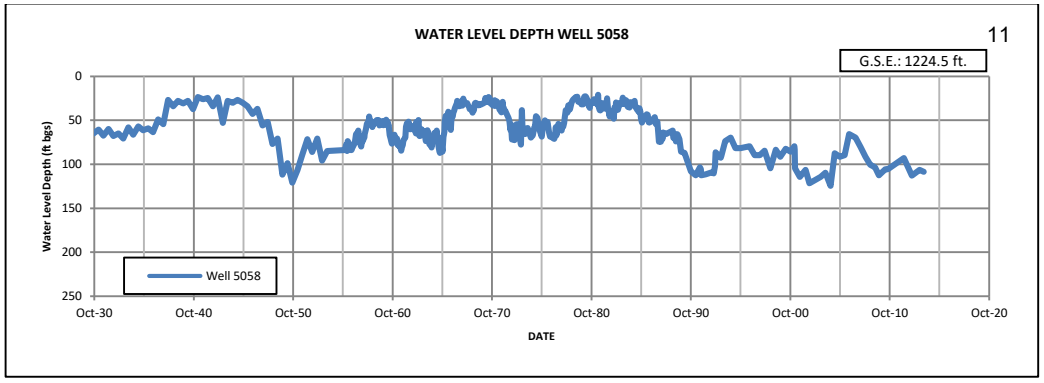


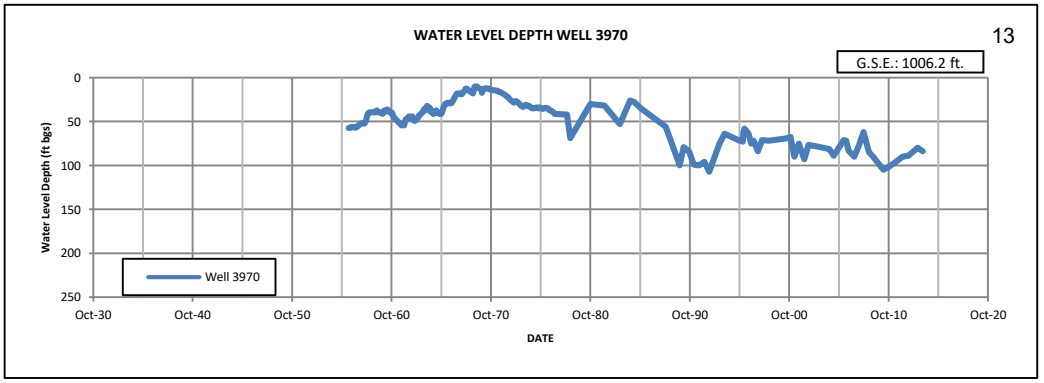
SYLMAR BASIN

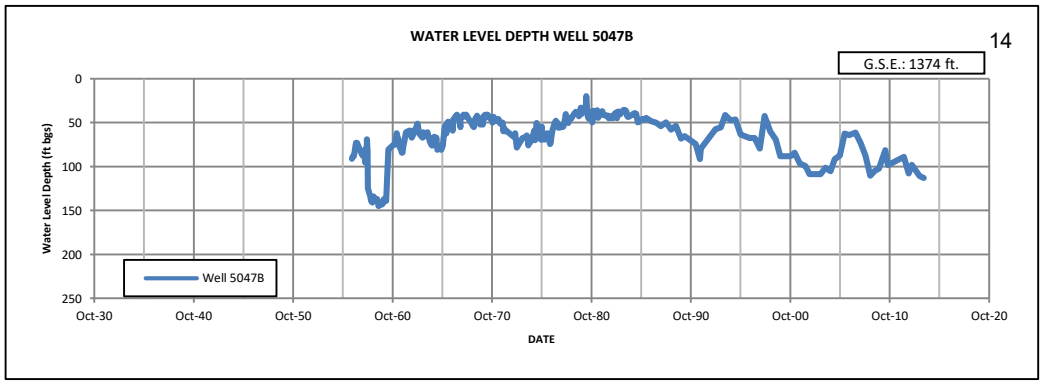




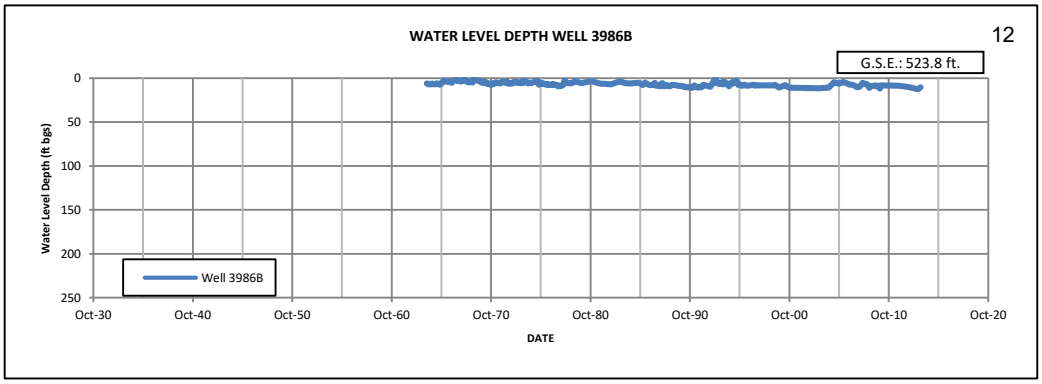
VERDUGO BASIN







EAGLE ROCK BASIN



2.9 Groundwater In Storage

San Fernando Basin

Each year, the change in the amount of groundwater stored in the SFB is evaluated in three ways: between the current water year and the previous water year; for the cumulative change since Safe Yield Operation began in 1968; and, for the cumulative change since 1928, the date at which sufficiently detailed records are considered to have become available for the original safe yield calculation.

In Fall 1968, following the Trial Court decision, Safe Yield Operation was implemented by the Court in an effort to halt the overdraft of the SFB that had begun in 1954 (refer to the blue-colored line on Plate 13). Methodology established by the State Water Rights Board, also referenced in Appendix R of the 1962 Report of Referee, was used to derive a regulatory requirement for groundwater in storage of 360,000 AF for the SFB that considered normal wet-dry cycles, operational flexibility, and annual pumping based on the calculated safe yield. The upper regulatory storage limit of 210,000 AF above the 1954 storage volume was established to help prevent excess rising groundwater from leaving the basin, whereas the lower regulatory storage limit of 150,000 AF below the 1954 storage level was established to help provide additional storage space for groundwater in wet years. It was determined that the amount of stored groundwater should be kept between the upper and lower limits of the regulatory storage range (indicated on Plate 13 by the horizontal-dashed red line). As shown on Plate 13, and with only a few brief exceptions, the SFB has rarely been operated within the regulatory storage range after 1968.

Among the important items illustrated on Plate 13 are the following:

1. The estimated change in groundwater in storage within the San Fernando Basin is presented graphically by the blue line on Plate 13, and in tabular form on Table 2-8. Each year, groundwater levels are measured in numerous wells throughout the SFB and these groundwater levels are used by LADWP staff to calculate the overall increase or decrease in the volume of groundwater stored in this basin; the resulting change in storage is plotted annually on the graph. This blue line on Plate 13 depicts the fluctuations in the calculated change in groundwater storage beginning in approximately 1980; the very slight but overall declining trend from 1980 to 2013-14 has occasionally been reversed during years of above-average rainfall and/or years of above-average spreading operations, and/or periods of decreased groundwater extractions. The overall long-term decline in groundwater in storage since 1944 (see Plate 13) has been caused by more water leaving the basin than has been recharged on a long-term average annual basis. Causes of this decline include: pumping in excess of long-term recharge;

reduced natural recharge caused by increased urbanization and runoff leaving the basin; additional amounts of groundwater underflow and rising groundwater leaving the basin; and reductions in the volumes of artificial recharge due to restrictions at the spreading grounds located on the northeastern side of SFB.

2. For the San Fernando Basin, the Judgment provides a right to the cities of Burbank, Glendale, and Los Angeles (the "Parties") to reduce their pumping and to store, or "carry over", any unused water rights into future years. These "un-pumped" water rights are accounted for as Stored Water Credits. The red line on Plate 13 represents the calculated change in storage minus the total combined Stored Water Credits that these three Parties have accumulated over time in SFB. In other words, the red line illustrates what the change in storage would have been in this basin had these Parties fully pumped their annual water rights each year beginning in 1968. As depicted by this scenario, groundwater levels in the SFB would be far below the level at which the Court declared Safe Yield Operation in 1968. This concept clearly demonstrates that the SFB cannot supply the total amounts of groundwater to which these Parties are entitled under the Judgment, and that there is a significant shortfall between water rights and actual hydrologic conditions.

Compounding this problem is the fact that the Judgment does not limit either the amount of Stored Water Credits that a Party can accumulate or the time period over which those Stored Water Credits are allowed to accumulate in SFB. As of October 1, 2014, the three Parties had accumulated a total of 572,279 AF of Stored Water Credits in SFB. If the Parties were to have pumped their full water rights beginning in 1968, the San Fernando Basin (as of October 1, 2014) would be 455,612 AF below the 1968 level at which the Court imposed Safe Yield Operation (Plate 13, red line); this would return SFB to a condition of overdraft. Clearly, basin recharge is not keeping up with the pumping rights defined in the 1979-dated Judgment. Because more than about 455,612 AF of these Stored Water Credits are below the level at which Safe Yield Operation was mandated by the Court in 1968, it has been the opinion of each Watermaster over time that this groundwater does not actually exist in the San Fernando Basin. These Stored Water Credits in question currently represent about 80% of the total credits accumulated over time by the cities of Burbank, Glendale, and Los Angeles.

The challenges facing the three Parties, the Watermaster, and the Court for the San Fernando Basin continue to be the following: an overall, long-term decline in the actual volume of stored groundwater; and an accumulation of a large quantity of Stored Water Credits for which there is an insufficient volume of "real" groundwater in storage in this basin. The three Parties and the

Watermaster continue to work proactively together on potential strategies for preserving the SFB water supplies.

Furthermore, in September 2007, the three Parties entered into a 10-year Stipulated Agreement entitled “Interim Agreement for the Preservation of the San Fernando Basin Water Supply” (“Agreement”) to begin to address the problems and to develop solutions to those issues where agreement had been attained. The Agreement, importantly, contained several key provisions designed to help address the imbalance between the decline in stored groundwater and the large accumulation of Stored Water Credits (a copy of this Stipulated Agreement is provided in Appendix G). Three key provisions of the Stipulated Agreement are the following:

- First, the Agreement, which is for 10 years, segregates total Stored Water Credits into ”Available Credits” and “Reserved Credits”. Reserved Credits are the amounts of Stored Water Credits that lie below the 1968 storage level (represented on Plate 13 by the horizontal-dashed brown line). Reserved Credits are not supported by actual groundwater in storage and, with the exception of the EPA OUs, emergencies, or operational events, such credits may not be pumped until stored water within the SFB recovers sufficiently to allow their use. Conversely, Available Credits are the amount of Stored Water Credits that lie above the 1968 storage level, and may be pumped by the Parties without restriction.
- Second, the Agreement memorializes the support of the City of Los Angeles to work closely with Los Angeles County to restore and enhance artificial recharge of stormwater runoff within the SFB. This program provides a benefit toward helping to increase water in storage and works toward possible future use of the stored water credits.
- Third, beginning October 1, 2007, an estimated volume of the loss from the SFB due to rising groundwater and underflow is being debited on an annual basis from the Stored Water Credits of each Party, in accordance with Section 8.2.9 of the Judgment. The importance of this provision of the Stipulated Agreement is to help bring the water rights of each Party back into balance with basin hydrology. These losses from the basin are estimated to be 1% of the total Stored Water Credits and the Stipulated Agreement provides that this amount is to be subtracted each year from all Stored Water Credits until the determination of the volume of rising groundwater is better defined.

Fortunately, in recent years, the City of Los Angeles (through LADWP) and the LACDPW have been working together to seismically retrofit and/or enlarge the reservoir capacity of certain dams and to rehabilitate and/or enlarge the existing spreading basins in the eastern portion of ULARA; refer to Chapter 1 of this report for additional details. These projects are oriented, in part, to capture and store additional amounts of surface water runoff in the eastern portion of the

SFB. Those agencies are also considering additional plans, such as optimizing the methods and/or timing for operating those reservoirs and spreading basins, to further enhance recharge opportunities.

Current programs already in progress between these two agencies and the respective annual volume of increased recharge at each facility are as follows:

Project	LADWP's Project Partner	Construction Start Date	Expected End Date	Expected Increase in Recharge (AFY)
Big Tujunga Dam Seismic Retrofit Project[1]	LACFCD	2007	Feb 2012[1]	4,500[2]
Hansen Spreading Grounds Enhancement	LACFCD	2008	Jan 2013	2,100
Tujunga Spreading Grounds Enhancement	LACFCD	2016	2018	8,000
Pacoima Spreading Grounds Enhancement	LACFCD	2017	2019	5,300
Sheldon-Arleta Project[3]	LACFCD	2007	Nov 2009	4,000
LADWP's Distributed Recharge Efforts	LACFCD	2009	Ongoing	200

1. Seismic retrofit work was completed in February 2012. Future work includes removal of sediment fill from behind dam.
2. This volume includes volume regained by removing sediment fill from behind dam.
3. Construction completed, remaining task includes facility performance testing.

The volume of groundwater in storage in SFB is estimated to have decreased by 59,010 AF between Water Years 2012-13 and 2013-14; this is a large decrease in storage compared to that in the prior water year. This is due, in part, to the below-average rainfall experienced as part of the ongoing drought in California, and a resultant decrease in stormwater spreading. Decreases in rainfall and stormwater spreading are expected to decrease groundwater in storage in the ULARA groundwater basins. Groundwater extractions also increased in the Water Year 2013-14. Based on the WY 2013-14 calculation for change in storage, there remains approximately 520,740 AF of groundwater storage space available in the SFB. This space can be used to capture and store additional native water or imported water supplies during wet (above-average rainfall) years. Basin storage space is a valuable resource, and it

has been the opinion of the former and current ULARA Watermasters that the use of this storage space should be available for use by the Parties.

TABLE 2-8: CHANGE IN GROUNDWATER IN STORAGE

SAN FERNANDO BASIN

Water Year	Valley Floor Precipitation (in)	Artificial Recharge (acre-feet)	Change in Storage (acre-feet)	Cumulative Change in Storage (acre-feet)	Groundwater Extractions (acre-feet)
2013-14	6.23	10,621	(59,010)	134,630	99,672
2012-13	7.71	10,780	(12,157)	193,640	73,710
2011-12	10.81	14,944	(10,338)	205,797	69,764
2010-11	24.44	90,502	71,081	216,135	64,313
2009-10	19.08	47,013	17,856	145,054	80,487
2008-09	11.64	9,940	(15,750)	127,198	72,140
2007-08	15.10	21,638	9,443	142,948	67,228
2006-07	4.39	7,974	(33,693)	133,505	94,430
2005-06	16.46	44,615	16,303	167,198	59,375
2004-05	42.64	74,198	66,476	150,895	67,865
2003-04	9.52	10,065	(22,367)	84,419	89,346
2002-03	19.41	16,330	(15,835)	106,786	95,431
2001-02	5.95	2,664	(27,094)	122,621	87,992
2000-01	19.52	17,939	(6,930)	149,715	86,946
1999-00	14.84	14,106	(31,044)	156,645	116,357
1998-99	9.81	14,662	(82,673)	187,689	141,757
1997-98	37.04	61,119	44,113	270,362	94,682
1996-97	15.17	23,172	(35,737)	226,249	105,899
1995-96	12.03	21,239	(49,223)	261,986	82,862
1994-95	33.36	69,108	79,132	311,209	58,121
1993-94	10.19	19,981	(22,238)	232,077	62,990
1992-93	36.62	64,658	106,317	254,315	36,419
1991-92	30.05	39,624	411	147,998	76,213
1990-91	14.38	18,718	(14,122)	147,587	71,065
1989-90	8.20	4,154	(29,941)	161,709	81,466
1988-89	9.12	5,713	(30,550)	191,650	127,973
1987-88	18.62	23,161	(5,000)	222,200	105,470
1986-87	5.99	7,952	(31,940)	227,200	91,632
1985-86	20.27	28,350	(7,980)	259,140	86,904
1984-85	11.00	22,493	(31,690)	267,120	101,591
1983-84	9.97	38,283	(63,180)	298,810	115,611
1982-83	39.64	102,925	121,090	361,990	68,394
1981-82	17.18	24,253	(530)	240,900	84,682
1980-81	11.04	31,891	(32,560)	241,430	92,791
1979-80	30.25	73,543	99,970	273,990	58,915
1978-79	21.76	72,454	78,080	174,020	59,843
1977-78	35.43	85,450	136,150	95,940	66,314
1976-77	14.19	8,197	(50,490)	(40,210)	125,445
1975-76	9.90	14,805	(30,090)	10,280	103,740
1974-75	14.74	22,786	(22,580)	40,370	95,830
1973-74	15.75	16,488	(21,820)	62,950	88,017
1972-73	20.65	24,342	17,020	84,770	82,004
1971-72	8.10	10,595	(17,090)	67,750	84,140
1970-71	15.57	24,143	15,340	84,840	79,010
1969-70	10.50	27,579	(9,740)	69,500	88,856
1968-69	29.00	71,506	79,240	79,240 [1]	84,186
45 Year Average	**17.46**	**31,884**	**2,927**		**85,389**

1. Accumulation of Storage commenced as of October 1, 1968.

Sylmar Basin

The groundwater storage capacity of the Sylmar Basin has been previously calculated by others to be approximately 310,000 AF. The volume of groundwater in storage in this basin is estimated to have increased by 2,870 AF between Water Years 2012-13 and 2013-14.

Verdugo Basin

The groundwater storage capacity of the Verdugo Basin, as previously determined by others, is approximately 160,000 AF; the volume of groundwater in storage in this basin is estimated to have increased by 3,457 AF between Water Years 2012-13 and 2013-14.

Eagle Rock Basin

The volume of groundwater in storage is estimated to have decreased by 115 AF between Water Years 2012-13 and 2013-14.

2.10 Water Supply and Disposal - Basin Summaries

Tables 2-9A, 2-9B, 2-9C, and 2-9D summarize water supply and disposal activities in the San Fernando, Sylmar, Verdugo, and Eagle Rock basins, respectively. Outflows are based on computations originally made by the State Water Rights Board in the 1962 Report of Referee.

TABLE 2-9A: SUMMARY OF WY 2013-14 WATER SUPPLY & DISPOSAL, SAN FERNANDO BASIN

(Acre-feet)

Water Source and Use	City of Burbank	City of Glendale	City of Los Angeles	City of San Fernando	All Others	Total
Extractions						
Municipal Use	10,150	7,241	79,768	---	0	97,159
Basin Account	---	---	---	---	0	0
Physical Solution	---	---	---	---	860 [1]	860
Cleanup/Dewaterers	---	---	---	---	476	476
Non-consumptive Use	---	---	---	---	1,207	1,207
Total	**10,150**	**7,241**	**79,768**	**0**	**2,543**	**99,702**
Imports						
LA Aqueduct Water	---	---	71,258	---	---	71,258
MWD Water	8,901 [2]	19,484	321,460	8	8,364 [3]	358,217
Groundwater from						
Sylmar Basin	---	---	668	3,051	---	3,719
Verdugo Basin	---	0	---	---	---	0
Total	**8,901**	**19,484**	**393,386**	**3,059**	**8,364**	**433,194**
Delivered Recycled Water [4]	2,407	1,447	2,482 [5]	0	1,687 [3]	8,023
Exports						
LA Aqueduct Water						
out of ULARA	---	---	27,966	---	---	27,966
to Verdugo Basin	---	---	126	---	---	126
to Sylmar Basin	---	---	1,699	---	---	1,699
to Eagle Rock Basin	---	---	59	---	---	59
MWD Water						
out of ULARA	---	---	126,159	---	---	126,159
to Verdugo Basin	---	3,298	567	---	---	3,865
to Sylmar Basin	---	---	7,664	---	---	7,664
to Eagle Rock Basin	---	---	266	---	---	266
Groundwater	16 [6]	739 [6]	69,296	---	---	70,051
Total	**16**	**4,037**	**233,802**	**0**	**0**	**237,855**
Delivered Water						
Hill & Mountain Areas	---	---	45,990	---	---	45,990
Total - All Areas	21,442	24,136	241,834	3,059	12,594	303,064
Water Outflow						
Storm Runoff (F-57C-R)	---	---	---	---	21,456	21,456
Rising Groundwater (F-57C-R)	---	---	---	---	1,417	1,417
Subsurface	---	---	---	---	391	391
Recycled Water to the LA River	6,438	4,286	41,912	---	0 [3]	52,636
Wastewater to Hyperion	135 [8]	936 [7]	14,601 [7]	---	---	15,672

1. Includes pumping from Hill and Mountain areas tributary to SFB.
2. Does not include water imported for groundwater replenishment (spreading)
3. Las Virgenes Municipal Water District (LVMWD); recycled water delivered primarily to the hill and mountain areas.
4. Referred to as “Reclaimed Water” in previous reports.
5. LA total recycled water is 11,841 AF of which 2,482 AF were delivered to valley fill and 9,359 AF were delivered to the hill and mountain areas and for other industrial uses.
6. Groundwater treated at the Glendale OU and Burbank OU is discharged to the Los Angeles River or the sewer.
7. Water discharged from Tillman and LA-Glendale plants. Annual cities’ portion from LAG based on proportion of reclaimed water.
8. Erroneous meter readings show a negative flow from Burbank to Hyperion. The Parties are aware of the problem and are seeking a solution. The value shown here is calculated as the difference between the reported BWRP influent and effluent (including recycled water), as shown on Table 2-7.

TABLE 2-9B: SUMMARY OF WY 2013-14 WATER SUPPLY & DISPOSAL SYLMAR BASIN

(Acre-feet)

Water Source and Use	City of Los Angeles	City of San Fernando	All Others	Total
Total Extractions	668	3,352	0 [1]	4,020
Imports				
LA Aqueduct Water	1,699	--	--	1,699
MWD Water	7,664	1	--	7,665
Total	**9,363**	**1**	**0**	**9,364**
Exports - Groundwater to San Fernando Basin	668	3,051	0	3,719
Total Delivered Water	9,363	302	0	9,665
Water Outflow				
Storm Runoff	5,000 [2]	--	--	5,000
Subsurface	250 [3]	--	--	250
Total	**5,250**	**0**	**0**	**5,250**

1. Pumping for landscape irrigation by Santiago Estates. The well was capped in 1999.
2. Surface outflow is not measured. Estimate based on Mr. F. Laverty – SF Exhibits 57 and 64.
3. Estimated in the Report of Referee, and later revised by the Watermaster.

TABLE 2-9C: SUMMARY OF WY 2013-14 WATER SUPPLY & DISPOSAL VERDUGO BASIN

(Acre-feet)

Water Source and Use	Crescenta Valley Water District	City of Glendale	La Canada Irrigation District	City of Los Angeles	Other	Total
Total Extractions	2,246	1,393	---	---	10 [1]	3,649
Imports						
LA Aqueduct Water	---	---	---	126		126
MWD Water	2,349	3,298	1,205	567		7,419
Total	2,349	3,298	1,205	693		7,545
Exports to San Fernando Basin	0	0	0	0		0
Delivered Recycled Water [2]		379				379
Total Delivered Water	4,595	5,070	1,205	693	10	11,573
Water Outflow						
Storm Runoff (Sta. F-252) [3]					457	457
Rising Groundwater (Sta. F-252)					2,553	2,553
Subsurface to:						
Monk Hill Basin	---	---	---	---	300 [4]	300
San Fernando Basin	---	---	---	---	80 [4]	80
Total	**0**	**0**	**0**	**0**	**3,390**	**3,390**

1. Private party extractions.
2. Referred to as “Reclaimed Water” in previous reports.
3. Includes rising groundwater
4. Estimated in the Report of Referee

TABLE 2-9D: SUMMARY OF WY 2013-14 WATER SUPPLY & DISPOSAL EAGLE ROCK BASIN

(Acre-feet)

Water Source and Use	City of Los Angeles	DS Waters	Total
Total Extractions	0	209 [1]	209
Imports			
LA Aqueduct Water from SFB	59	--	59
MWD Water (LA25+LA35) [3] from SFB	266		266
MWD Water (LA17) [3]	42,703		42,703
Groundwater from SFB	0	--	0
Total	**43,028**	**0**	**43,028**
Exports			
LA Aqueduct Water out of ULARA	0		0
MWD Water (LA17) [3] out of ULARA	39,363		39,363
MWD Water (LA25_LA35) [3] out of ULARA	0		0
Groundwater	0	209	209
Total	**39,363**	**209**	**39,572**
Total Delivered Water	3,665	0	3,665
Water Outflow			
Storm Runoff	--	--	--
Subsurface	50 [2]	--	50
Total	**50**	**0**	**50**

1. DS Waters (formed by the merger of Suntory/Deep Rock Water Co. and McKesson/Danone Water Products) is allowed to pump as successor to Deep Rock and Sparkletts, under a stipulated agreement with the City of Los Angeles and export equivalent amounts.
2. Estimated in Supplement No. 2 to Report of Referee.
3. LA25, LA35, and LA17 are connections between the MWD and LADWP water systems where MWD imported water is supplied to Los Angeles.

2.11 Extraction Rights and Stored Water Credits - Basin Summaries

San Fernando Basin

Tables 2-10A and 2-11A show the calculation of extraction rights for SFB for the 2014-15 Water Year and for Stored Water Credits (as of October 1, 2014), respectively, for the cities of Burbank, Glendale, and Los Angeles. All rights are based on the Judgment in City of Los Angeles vs. City of San Fernando, et al., dated January 26, 1979 and the "Interim Agreement for the Preservation of the San Fernando Basin Water Supply, 2008" (provided in Appendix G).

Sylmar Basin

Tables 2-10B, 2-11B and 2-11C show the calculation of Sylmar Basin extraction rights for the 2012-13 Water Year and Stored Water Credits (as of October 1, 2014), respectively, for the cities of Los Angeles and San Fernando. These rights are based on: the March 22, 1984 Stipulation between the City of San Fernando and the City of Los Angeles; and the action by the Administrative Committee on July 16, 1996 to temporarily increase the safe yield of this basin from 6,210 AFY to 6,510 AFY. The 1996 temporary increase expired on October 1, 2005 but the safe yield was re-evaluated by the then-Watermaster in 2006. Another stipulation was prepared by the then-Watermaster in December 13, 2006, and increased the safe yield of the Sylmar Basin to 6,810 AFY (effective October 1, 2006), subject to certain conditions and currently provides the basis for these water rights.

In July 2012, the current Watermaster prepared a new re-assessment of the safe yield of this basin titled "Final Report – Sylmar Basin Safe Yield, 5-Year Re-assessment"; the resulting document was filed with the Court in June 2013. A copy of that document is included in Appendix L of this report. In this recent re-assessment, the Watermaster temporarily and conditionally increased the total safe yield of Sylmar Basin from 6,810 AFY to 7,140 AFY. Each of the above-listed re-assessments of the safe yield of Sylmar Basin were performed using the same basic methodology originally devised by the first ULARA Watermaster, Mr. Melvin Blevins.

In addition to the increase in the safe yield value, the groundwater credit calculation previously used by the two former ULARA Watermasters had to be revised by the current Watermaster as part of his work for the July 2012 report. Specifically, groundwater credits in Sylmar Basin will be calculated directly according to the Judgment; that is, credits can no longer be carried over for more than 5 years (Judgment, January 26, 1979; Subsection 5.2.2.3, p. 19-20). Table 2-11C shows the new method of groundwater credit calculation for this basin.

To address the potential loss of credits accumulated over time via the method of credit calculation utilized in the past by the former Watermasters, and as described in the July 2012

re-evaluation report (see Appendix L), each Party will remain credited with "frozen" groundwater credits (9,014 AF and 404 AF for the City of Los Angeles and the City of San Fernando, respectively); the initial accounting of these "frozen credits" is shown on Table 2-11B. Both Parties will be able to exercise their right to use those accumulated but now "frozen" groundwater credits. However, neither City will be able to exercise its 5-year credits (shown on Table 2-11C), even if they do not or cannot pump their new safe yield value, until such time as their individual, newly "frozen" credits are used entirely. Note that, at any time, either Party may permanently abandon its "frozen" credits and begin accessing its stored water credits accrued via the 5-year credit calculation method.

Verdugo Basin

Glendale and CVWD have rights to extract 3,856 and 3,294 AFY, respectively, from this basin. Los Angeles has a right to extract its Import Return water in the Verdugo Basin, but has never exercised this right. No Stored Water Credits are currently permitted by the Judgment in the Verdugo Basin.

Eagle Rock

Los Angeles has the right to extract, or cause to be extracted, the entire safe yield of this basin. This safe yield consists mostly of return flows of delivered water by Los Angeles. Neither Los Angeles nor any other Parties pump groundwater from the Eagle Rock Basin. DS Waters, as successor to the Sparkletts and the Deep Rock water companies, has a physical solution right to extract groundwater to supply its bottled drinking water facility in this basin. DS Waters pumped 209 AF in the 2013-14 Water Year from this basin.

TABLE 2-10A: CALCULATION OF WY 2014-15 EXTRACTION RIGHTS SAN FERNANDO BASIN

(Acre-feet)

	City of Burbank	City of Glendale	City of Los Angeles
Total Delivered Water, 2013-14.	21,442	24,136	241,834
Water Delivered to Hill and Mountain Areas, 2013-14	---	---	45,990
Water Delivered to Valley Fill, 2013-14	21,442	24,136	195,844
Percent Recharge Credit	20.0%	20.0%	20.8%
Return Water Extraction Right	4,288	4,827	40,736
Native Safe Yield Credit	---	---	43,660
Annual Extraction Right for the 2014-15 Water Year[1]	**4,288**	**4,827**	**84,396**

1. Does not include Stored Water Credit and Physical Solution.

TABLE 2-10B: CALCULATION OF WY 2014-15 EXTRACTION RIGHTS SYLMAR BASIN

(Acre-feet)

	City of Los Angeles	City of San Fernando	All Others
Annual Extraction Right for the 2014-15 Water Year[1]	3,570	3,570	--- [2]

1. Does not include Stored Water Credit. The safe yield of the Sylmar Basin was increased to 7,140 AFY effective October 1, 2012. Effective October 1, 1984 safe yield less pumping by Santiago Estates is equally shared by Los Angeles and San Fernando.
2. Santiago Estates (Home Owners Group) capped well in 1999.

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

(Acre-feet)

Item Number and Description	City of Burbank	City of Glendale	City of Los Angeles
1. Stored Water Credit (as of Oct. 1, 2013)	11,190	43,289	537,453
1a. Credits and Debits	0	0	0
1b. Prior Year Adjustments	0	(62) [1]	62 [1]
2. Extraction Right for the 2013-14 Water Year	4,096	5,074	85,822
3. 2014-14 Extractions			
Party Extractions	10,150	7,241	79,768
Physical Solution Extractions	417	399	44
Clean-up/Dewaterers	0	0	476
Total	10,567	7,640	80,288
4. Spread Water 2013-14 Water Year	7,000	0	4
5. Stored Water Credits [2] per City (as of Oct. 1, 2014)	11,719	40,661	543,053
6. 1% Basin Loss Factor [3]	(117.19)	(406.61)	(5,430.53)
7. **Stored Water Credits** (less Basin Loss) **for each City** (as of Oct. 1, 2014)	**11,602**	**40,254**	**537,622**
8. **Total Stored Water Credits** (less Basin Loss)		**589,479**	
9. **Total Available Stored Water Credits 3** (from Plate 13)		**134,630**	
10. Percentage of Total Credits per City	1.968%	6.829%	91.203%
11. **Available Stored Water Credits for each City** (as of Oct. 1, 2014) (Item 9 x Item 10)	**2,650**	**9,194**	**122,787**
12. **Total Reserved Stored Water Credits 3** (Item 8 - Item 9)		**454,849**	
13. **Reserved Stored Water Credits for each City** (as of Oct. 1, 2014) (Item 7 - Item 11)	**8,952**	**31,061**	**414,836**

1. An exchange of 61.9 AF of stored water credits between Glendale and Los Angeles for groundwater pumping at Los Angeles County Waterworks District No. 21, Kagel Canyon in Water Year 2012-13.
2. Item 5 = 1 +1a + 1b + 1c + 1d + 2 – 3 + 4.
3. Basin Loss Factor, Available and Reserved Stored Water Credits are determined pursuant to Interim Agreement for the Preservation of the San Fernando Basin Water Supply, 2008 (see Appendix G)

TABLE 2-11B: CALCULATION OF "FROZEN" STORED WATER CREDITS SYLMAR BASIN

(Acre-feet)

	City of Los Angeles	City of San Fernando
1. "Frozen" Water Credit (as of Oct. 1, 2013)	9,014	404
2. Extraction Right for the 2013-14 Water Year [1]	3,570	3,570
3. Total 2013-14 Extractions	668	3,352
Santiago Estates[2]	0.0	0.0
4. Total Extractions Less Extraction Right (= Item 3 - Item 2)	(2,902)	(218)
5. Remaining "Frozen" Water Credits[3] (as of Oct. 1, 2014)	**9,014**	**404**

1. The total safe yield of the Sylmar Basin was increased to 7,140 AFY as of 10/1/12.
2. Santiago Estates pumping is subtracted equally from the rights of San Fernando and Los Angeles. Santiago Estates capped well in 1999.
3. If Item 4 > 0, then Item 4 is deducted from "Frozen" Water Credits, otherwise, "Frozen" Water Credits remain unchanged. Per the Sylmar Basin Safe Yield re-evaluation, "Frozen" Stored Water Credits no longer accumulate, and can only be consumed (See Appendix L)

TABLE 2-11C: CALCULATION OF STORED WATER CREDIT, 5-YEAR METHOD SYLMAR BASIN

(Acre-feet)

Party	Water Year	Annual Extraction Right (AF)	Total Extractions (AF)	Credits Consumed Due to Previous Year Overpumpage	Annual Volume of Accrued Credits (AF)	Remarks
City of Los Angeles	2009-10	3405	2544	0	861	Total extraction was less than annual extraction right.
	2010-11	3405	964	0	2441	Total extraction was less than annual extraction right.
	2011-12	3570	1093	0	2477	Total extraction was less than annual extraction right.
	2012-13	3570	1673	0	1897	Total extraction was less than annual extraction right.
	2013-14	3570	668	0	2902	Total extraction was less than annual extraction right.
			STORED WATER CREDITS (as of Oct. 1, 2014) =		10578	
City of San Fernando	2009-10	3405	3143	(68)	262	Total extraction was less than annual extraction right.
	2010-11	3405	3082	0	323	Total extraction was less than annual extraction right.
	2011-12	3570	3202	0	368	Total extraction was less than annual extraction right.
	2012-13	3570	3279	0	291	Total extraction was less than annual extraction right.
	2013-14	3570	3352	0	218	Total extraction was less than annual extraction right.
			STORED WATER CREDITS (as of Oct. 1, 2014) =		1394	

Note: Stored water credits in Table 2-11C are calculated by summing the "Annual Volume of Accrued Credits" column and subtracting the sum of the "Credits Consumed due to Previous Year Overpumpage" column.

3. WATER QUALITY, TREATMENT, AND REMEDIAL INVESTIGATION ACTIVITIES

3. WATER QUALITY, TREATMENT, AND REMEDIAL INVESTIGATION ACTIVITIES

3.1 Water Quality

Imported Water

1. *LOS ANGELES AQUEDUCT* water has a sodium bicarbonate character and is the highest quality water available to ULARA. Total Dissolved Solids (TDS) concentration in this water source typically averages about 210 milligrams per liter [mg/L; equivalent to parts per million, ppm]. The highest TDS value on record for Aqueduct water was 320 mg/L and this occurred in April, 1946. The average TDS concentration for the fiscal year 2012-2013 was 224 mg/L (no more recent data are available at this time).

2. *COLORADO RIVER* water is predominantly sodium-calcium sulfate in character, but the quality of this water supply changes to a sodium sulfate character after it has been treated to reduce total hardness. Samples taken at the MWD Burbank Turnout between 1941 and 1975 showed that TDS concentrations ranged from a high of 875 mg/L in August 1955, to a low of 625 mg/L in April 1959. The average TDS concentration over this 34-year period was approximately 740 mg/L. As reported by MWD, water from Lake Havasu (Colorado River Water), showed an average TDS concentration of 565 mg/L for fiscal year 2013-14.

3. *NORTHERN CALIFORNIA* Water (delivered via the State Water Project) is sodium bicarbonate-sulfate in character. It generally contains lower concentrations of TDS and is softer than either local groundwater or imported Colorado River water. Since the time that State Project water was first imported to southern California in 1972, the TDS concentrations of this water have ranged from a high of 410 mg/L to a low of 247 mg/L. Laboratory tests of this water conducted at the Joseph Jensen Filtration Plant showed an average TDS concentration of 308 mg/L during fiscal year 2013-14.

4. *COLORADO RIVER/NORTHERN CALIFORNIA* waters were first blended at the Weymouth Plant beginning in mid-1975. Blending ratios have varied over time, and laboratory tests conducted at the Weymouth Plant after treatment

and blending processes during fiscal year 2013-14 showed an average TDS concentration of 565 mg/L.

Surface Water

Surface runoff contains salts dissolved from the erosion of sediments and rocks in the tributary areas of ULARA and is considered to generally display a sodium-calcium to sulfate-bicarbonate water character. Laboratory testing of water samples collected in September 1995 from flows in the Los Angeles River at the Arroyo Seco showed a TDS concentration of 666 mg/L and a total hardness (TH) of 270 mg/L. These values also reflect the inclusion of rising groundwater in the Los Angeles River between Los Feliz Blvd and Gage F-57C-R.

Chlorides in Surface Water

In 1997 the Los Angeles Regional Water Quality Control Board (RWQCB-LA) adopted Resolution No. 97-02 in order to help develop a long-term solution to the chloride compliance problems stemming from elevated concentrations of chloride along the Los Angeles River in the SFB. These increased chloride concentrations were likely caused by drought conditions and the use of water softeners in water imported into the Los Angeles region. Water Quality Objectives promulgated by the RWQCB-LA for chloride within the reach of the Los Angeles River between Sepulveda Flood Control Basin and Figueroa Street (including Burbank Western Channel only) have been raised from 100 mg/L to 190 mg/L; chloride concentrations are reported in Appendix D.

Nitrogen in Surface Water

As part of a Total Maximum Daily Load (TMDL) program, the RWQCB-LA ordered the cities of Burbank and Los Angeles to determine the source of nitrogen in the Los Angeles River Narrows. The resulting studies, which included laboratory testing for nitrogen from rising groundwater into the Los Angeles River, were completed in 2007 by an outside consultant. The 2007 report concluded that nitrogen levels present in groundwater rising into the Los Angeles River were well below the target loadings for the receiving water and may be considered a *de minimus* source with no loading allocation necessary.

Groundwater

Total hardness in the groundwater in ULARA is considered to be moderately hard to very hard. The character of groundwater from the major water-bearing formations is of two general types, each reflecting the composition of the sediments and the surface runoff in each area. In the

western part of the SFB, the groundwater is generally calcium sulfate-bicarbonate in character, whereas in the eastern part of SFB (and also the Sylmar and Verdugo basins), groundwater generally displays a calcium bicarbonate character.

The overall quality of the groundwater in ULARA is generally within the recommended limits of the California Title 22 Drinking Water Standards, except for:

- areas in the eastern SFB which display high concentrations of trichloroethylene (TCE), perchloroethylene (PCE), hexavalent chromium, nitrate as NO_3, and 1,4-dioxane;
- areas in the western portion of the SFB which tend to have high concentrations of naturally-occurring sulfate and TDS;
- areas within the Verdugo Basin that have shown elevated concentrations of a gasoline additive, methyl-tertiary-butyl-ether (MTBE), and nitrate as NO_3;
- areas within the Sylmar Basin that have elevated concentrations of nitrate as NO_3 and certain VOCs.

In each area, the pumped groundwater is being treated or blended to meet State Drinking Water Standards, or the impacted wells in each specific basin have been temporarily removed from active service.

A summary of the TDS concentrations and the general mineral analyses of imported water, surface water and groundwater is contained in Appendix D.

3.2 Groundwater Quality Management Plan

A report titled "Groundwater Quality Management Plan - San Fernando Valley Basins" was issued in July 1983, in part to protect and improve the quality of stored water within the ULARA groundwater basins. Special emphasis on the overall management of these basins in that report was placed on monitoring and removing the VOCs (TCE and PCE), along with hexavalent chromium; these contaminants have been encountered in the local groundwater. Table 3-1 summarizes the number of ULARA wells that are currently considered to be contaminated; also shown are the concentrations of TCE and PCE that are above their common Primary MCL of 5 micrograms per liter (µg/L; where 1 µg/L is equivalent to one part per billion, ppb).

TABLE 3-1: NUMBER OF WELLS IN THE ULARA WELLFIELDS EXCEEDING STATE MCL FOR TCE AND PCE – 2013-14 WATER YEAR

	Number of Wells													
	City of Los Angeles[3]									Sub-	Others[2]			Grand
Wellfield	NH	RT	P	HW	E	W	TJ	V	AE	Total	B	G	C	Total
Total No. of Wells[2]	**21**	**15**	**2**	**0**	**4**	**4**	**12**	**2**	**7**	**67**	**14**	**14**	**12**	**107**
No. of Active Wells	**21**	**15**	**2**	**0**	**4**	**4**	**12**	**2**	**7**	**67**	**8**	**14**	**12**	**101**
No. of Wells Sampled	**13**	**15**	**2**	**0**	**2**	**3**	**12**	**2**	**6**	**55**	**8**	**14**	**12**	**89**
Number of Wells Exceeding Maximum Contaminant Level[1]														
TCE Levels ppb														
5-20	6	1	1	-	0	0	4	0	3	**15**	1	0	0	**16**
20-100	1	7	0	-	1	0	3	0	1	**13**	6	2	0	**21**
>100	0	0	0	-	0	0	0	0	2	**2**	1	5	0	**8**
Total	7	8	1	-	1	0	7	0	6	**30**	8	7	0	**45**
PCE Levels ppb														
5-20	3	0	1	-	0	0	2	0	3	**9**	0	2	0	**11**
20-100	0	0	0	-	0	0	2	0	1	**3**	3	2	0	**8**
>100	0	0	0	-	0	0	0	0	0	**0**	5	2	0	**7**
Total	3	0	1	-	0	0	4	0	4	**12**	8	6	0	**26**

1. Wells were included in these categories based upon the maximum concentrations of TCE and PCE measured during the 2012-13 Water Year.
2. Includes active, inactive, and standby wells
3. Wellfields:
   - NH - North Hollywood
   - P - Pollock
   - HW - Headworks
   - E - Erwin
   - W - Whitnall
   - RT Rinaldi Toluca
   - TJ - Tujunga
   - V - Verdugo
   - AE - LADWP Aeration Tower Wells
   - B - City of Burbank
   - G - City of Glendale
   - C - Crescenta Valley Water District

3.3 Underground Tanks, Sumps, and Pipelines

The main focus of the City of Los Angeles Fire Department (LAFD) Underground Storage Tank (UST) Program in ULARA has been the monitoring and removal of gasoline, diesel, and their related constituents from the soil to help prevent contamination of the underlying groundwater. If a site investigation indicates contamination of the underlying groundwater, then the site is referred by LAFD to the RWQCB-LA for further action.

Historically, the LAFD had implemented the State-mandated UST Program to bring the large number of underground tanks in the San Fernando Valley into compliance with the law. Recently, the State has been undergoing an overhaul of the UST regulatory program during Water Year 2013-14 as a result of Assembly Bill 1701. Currently, the oversight program has not completed transitioning and re-defining UST regulatory roles between LAFD and RWQCB. It is anticipated that the transition and data current to the reporting period will be complete and available for reporting in the WY2014-15 Annual Watermaster Report.

3.4 Private Sewage Disposal Systems (PSDS)

On September 17, 1985, in order to reduce the potential for groundwater contamination from septic tanks, the City of Los Angeles enacted Ordinance No. 160388, Los Angeles Municipal Code Section 64.26 [LAMC Section 64.26]. This ordinance is entitled “Mandatory Abandonment of Private Sewage Disposal Systems (PSDS).”

LAMC Section 64.26, requires all owners of industrial, commercial, and multiple dwelling residential [five or more units] properties, to connect to the public sewer, when the sewer becomes available, and discontinue use of their PSDS within one year of the date of the issuance of a "Notice to Connect" by the City of Los Angeles. In addition, LAMC Section 64.26 requires the Director of the Bureau of Sanitation (Director) to issue a "Reminder Notice" and a "Final Notice to Connect" to the owner of the property four (4) months and one (1) month, respectively, prior to the compliance deadlines. LAMC Section 64.26 further requires the Director to take the following actions whenever a property is found to be in violation of the Code requirements:

a) Request the City's Department of Water and Power to discontinue water service to the subject property,
b) Request the Superintendent of Buildings to order any building(s) on the subject property to be vacated; and,
c) Request the City Attorney to take the necessary legal action(s) against the property owner.

In 2014, Industrial Waste Management Division (IWMD) did not receive any referrals from the Financial Management Division and Wastewater Engineering Services Division to investigate properties and determine the applicability of the provisions of the LAMC 64.26. As of December 31, 2014, twenty Notice to Connect letters were returned to IWMD. Four properties were found to have no sewer available and the remaining 16 properties continue to be investigated by IWMD.

3.5 Landfills

The Solid Waste Assessment Test (SWAT) reports for major SWAT Rank 1 to Rank 4 landfills in the Los Angeles area have all been completed and previously submitted to the RWQCB-LA for approval. The reports reviewed by the RWQCB-LA are listed in Table 3-2. As stipulated by Article 5 of Title 27, a follow-up sampling program under an Evaluation Monitoring Plan was required for certain landfills due to the presence of VOCs in the underlying groundwater. Further updates to the SWAT would be triggered by post-closure land use. Landfill locations in ULARA are shown on Plate 6.

Bradley Landfill closed in April 2007 and construction of its final cover was completed in the summer of 2010. Waste Management, Inc., the owner of that landfill, is currently operating a green waste composting facility at the site. Furthermore, several groundwater monitoring wells at this landfill are actively monitored for water levels and water quality data in conformance with the existing RWQCB-LA Monitoring and Reporting Program No. 6434 for this facility.

TABLE 3-2: LANDFILLS WITH SWAT INVESTIGATIONS

Name	Rank	Current Owner	Location	SWAT Report Completed	Final SWAT Submitted	Phase II SWAT Req.	Approved by RWQCB	Site Leak -1	Type of Emission -2	Further Monitoring
Open										
CalMat (Sun Valley #3)	2	CalMat Properties	Sun Valley District, NE of Glenoaks Blvd	Jul-88	Nov-90		Jun-92	N	Inert site	N,7
Scholl Canyon	1	City of Glendale	San Rafael Hills, 1 mile West of Rose Bowl	Jul-87	Apr-88		Aug-90	G	NHA (I/O)	3
Stough Park	2	City of Burbank	Bel Air Drive & Cambridge Drive	Jun-88	Dec-88		Apr-90	G	NHA Inert Site	3
Sunshine Cyn. LA City/LA County	2	Browning - Ferris Industries	SE Santa Susana Mtns W of Golden State Fwy	Jul-88	Jul-89		Apr-94		MSW	6
Closed										
Bradley East	2	WMDSC	SE of Sheldon St	Jun-87	Nov-90		Apr-92	G	NHA (I/O)	4, 8
Bradley West	1	WMDSC	Sun Valley, SE of Sheldon St.	Jun-87	Nov-90		Apr-92	G	NHA (I/O)	3
Bradley West Extension	3	WMDSC	Near Canyon Blvd & Sheldon St	Jul-88	Jul-89		Apr-92	G	MSW	3, 8
Branford	2	City of Los Angeles Bureau of Sanitation	Sun Valley District, NW of Tujunga Wash	Jul-88	Oct-90	X	Jun-92		MSW	4,7
Gregg Pit/Bentz	2	CalMat Properties	Between Pendleton St & Tujunga Ave	Jul-89	Jul-89		Feb-90	G	NHA	4
Hewitt Pit	2	CalMat Properties	North Hollywood District Hollywood Fwy, Laurel	Jun-88	Jul-89		May-91	G	NHB (I)	N
Lopez Canyon	2	City of Los Angeles Bureau of Sanitation	N of Hansen Dam near Lopez and Kagel Cyn	Jun-88	Jun-88	X				8
Newberry	3	Los Angeles (LA By-Products Co.)	N of Strathern St, Tujunga Ave	Jun-88	Jul-89		Sep-89	G	NHB (I/O)	4
Pendleton St.	4	City of Los Angeles Bureau of Sanitation	Sun Valley, Pendelton St & Glenoaks Blvd	Jul-90	May-91		Jun-92	N	Inert Site	5
Penrose	2	Los Angeles (LA By-Products Co.)	N of Strathern St, Tujunga Ave	Jun-88	Jul-89		Sep-89	G	NHB (I/O)	4
Scholl Canyon	2	City of Glendale	San Rafael Hills, 1 mile West of Rose Bowl	Jul-87	Aug-90		Dec-93	G	NHA	5
Sheldon-Arleta	1	City of Los Angeles Bureau of Sanitation	Sun Valley District near Hollywood & Golden State Fwys	May-87	May-87		Feb-90	G	MSW	4,7
Sunshine Cyn. LA City	2	Browning - Ferris Industries	SE Santa Susana Mtns W of Golden State Fwy	Jul-88	Jul-89		Apr-94	G	MSW	6
Toyon Canyon	2	City of Los Angeles Bureau of Sanitation	Griffith Park	Jun-88	Mar-89		Apr-91	L	NHA (I/O MSW)	3
Tuxford Pit	2	Aadlin Bros. (LA By-Products Co.)	Sun Valley District, SW of Golden State Fwy & Tujunga Ave	Jun-88	Dec-90		Jun-92		MSW	4, 8, 9
Incomplete										
Strathern		Never completed. Application 12/88.	Strathern St. & Tujunga Ave							10

1. G – Gas, L – Liquid.
2. MSW – Municipal Solid Waste
   NHA - Non-Hazardous but above state drinking water regulatory levels
   NHB - Non-Hazardous but below state drinking water regulatory levels
   I – Inorganic, O – Organic; N-No, Y-Yes
3. Under Title 27 Corrective Action Program (CAP), after completion of EMP.
4. Closed landfills with groundwater monitoring required under Title 27. Monitoring results are submitted to the LARWQCB periodically.
5. Subject to SWAT requirements. Further monitoring may be required under Title 27.
6. All open landfills are required to have groundwater monitoring under Title 27. Monitoring results are submitted to the LARWQCB quarterly or semi-annually.
7. Semi-annual groundwater monitoring.
8. Groundwater contamination Evaluation Monitoring Program (EMP) required under Title 27.
9. USEPA involved in evaluation.
10. Under permit as Inert Landfill.

3.6 San Fernando Valley Remedial Investigation Activities

A remedial investigation (RI) was initiated in July 1987 by the USEPA to characterize groundwater conditions and groundwater quality in the San Fernando and the Verdugo groundwater basins due to the presence of TCE and PCE contamination in the soils and/or groundwater. The LADWP was selected by the USEPA to serve as the lead agency in conducting the RI and they entered into a cooperative agreement that provided over $22 million in federal funding to LADWP beginning July 1987. In August 1987, the LADWP selected James M. Montgomery, Consulting Engineers (JMM), to serve as its original consultant to perform various RI tasks.

The resulting JMM report, "Remedial Investigation of Groundwater Contamination in the San Fernando Valley," (December 1992) is a comprehensive, five-volume report that presented the findings and hydrogeologic characterization of the San Fernando and Verdugo basins with regard to their geologic and hydrogeologic conditions, and to the nature and possible extent of contamination known at that time. The RI report also provided: a description, along with the documentation, of the SFB Groundwater Flow Model; a summary of the RI field investigation activities; and an evaluation of potential risks to human health and the environment.

The existing SFB Groundwater Flow Model was developed as a part of the San Fernando Valley RI and is a comprehensive, three-dimensional, regional-scale model, which was developed using the MODFLOW (version 2005) software package. A three-dimensional mass transport model has also been developed for the SFB. The model has been utilized for various groundwater projects to help analyze the storage and physical characteristics of groundwater in the SFB. The main purposes for the development of the basin-wide model include:

- Helping to forecast the potential consequences of changes in groundwater management in the SFB (pumping and recharge regimes) by the major water purveyors.
- Assessing the potential for contaminated groundwater to impact production and extraction wells in SFB.
- Aiding in predicting groundwater elevation contours for projected basin-wide withdrawal and recharge (i.e., as a planning tool for LADWP and the Watermaster).

Since completion of the remedial investigation for the San Fernando Valley in 1992, EPA has continued to monitor groundwater contamination through its Basin wide Monitoring Program.

The monitoring program consists of quarterly sampling of over 500 wells located throughout the eastern portion of the valley.

The RI Report and the semi-annual sampling reports are available for public review at the Superfund Primary Information Repositories, which are located in the following local libraries: City of Glendale; City of Burbank; LADWP; California State University-Northridge; and the University of California at Los Angeles. Data are also available from the USEPA Region 9 Superfund website (http://www.epa.gov/region9/superfund/superfundsites.html).

The LADWP also maintains a current SFB database for use with the SFB groundwater flow model and continues to generate simulated groundwater elevation contour maps and contaminant plume maps for the SFB. EPA continues to provide updated groundwater quality data for incorporation into the LADWP database. The Watermaster has established a program to collect and scan geologic logs, driller's logs and electric logs of all groundwater monitoring wells constructed in ULARA, and also to collect and scan the electric logs of the numerous wildcat and producing oil wells drilled in the San Fernando Valley over the years. These scanned documents have been provided to EPA for inclusion in their electronic database for subsurface data within the ULARA groundwater basins.

3.7 Water Treatment

USEPA Operable Units

The USEPA is proceeding with enforcement actions against Potentially Responsible Parties (PRPs) as part of their overall, long-term groundwater remediation activities in the SFB. Below is a brief summary of the various USEPA Operable Units (OUs) in SFB:

1. *NORTH HOLLYWOOD OPERABLE UNIT (NHOU)* - The NHOU construction was funded by the USEPA, CDPH, and LADWP. Operations and Maintenance activities in the NHOU are funded by the USEPA and LADWP. In Water Year 2013-14, 16,670 AF of water were treated by the NHOU.

   LADWP continues to operate the NHOU under the direction of the USEPA pursuant to the Cooperative Agreement between these two agencies. While the facility was designed to contain and remediate highly concentrated VOC plumes, the remedy has failed to achieve this primary objective. High concentrations of VOC contaminants have reached to other LADWP supply wells, forcing their closure. New contaminants have also emerged, such as hexavalent chromium and 1,4 dioxane, which cannot be removed by the NHOU's air striping process.

The nearby hexavalent chromium plume has reached the NHOU facility. In the fall of 2006, chromium levels began to increase in North Hollywood Extraction Well No. 2 (NHE-2), forcing the closure of this OU extraction well. Suspected of being a major contributor to this chromium plume is the former Honeywell site in North Hollywood. Under a Cleanup and Abatement Order of the RWQCB-LA, Honeywell resumed operating NHE 2 in 2009 to help contain the plume, and began discharging the highly contaminated effluent to the sanitary sewer. Unfortunately this approach did not provide effective containment of the chromium plume. In the fourth quarter of 2012, the concentrations of hexavalent chromium in NHE 3 began exceeding the Maximum Contamination Level of 50 µg/L set by the State of California. This forced the closure of NHE 3, and requires further attention by the RWQCB-LA and the other state and federal regulators on this growing problem. Steps taken by Honeywell to address the chromium problem include submitting a Remedial Action Plan to the RWQCB-LA, and constructing groundwater monitoring wells to further characterize the water quality and hydrogeology in the eastern portion of the SFB.

The 15 year Consent Decree for the NHOU expired at the end of 2004. USEPA conducted a Focused Feasibility Study and issued its Record of Decision (ROD) for the NHOU Second Interim Remedy (NHOU2IR) in September 2009. This remedy replaces the existing facility by replacing several existing but more shallow OU extraction wells, adding new OU extraction wells, and providing groundwater remediation facilities that will treat the VOC's, as well as the other emerging contaminants of concern (including hexavalent chromium and 1,4 dioxane). The ROD also calls for construction of additional monitoring wells to further characterize the water quality and hydrogeology of the area. In January 2014, the ROD was amended to indicate re-injecting the treated water back into the aquifer as a preferred alternative. LADWP and the PRPs are working on a cooperative containment concept that will ensure the treated water continues to be delivered to the drinking water system.

The current remedy needs to be replaced on an expedited basis with the NHOU2IR. The proposed remedy should provide extractions at a substantially higher flow rate to ensure plume containment and to allow for groundwater extractions from deeper aquifers to address the entire vertical

profile of the contaminant mass. This, in combination with additional strategically-located extraction wells, should broaden the containment area and help to prevent the continuing escape of contaminants to the nearby LADWP wellfields.

2. *BURBANK OPERABLE UNIT (BOU)* - The BOU, funded by Lockheed-Martin under a USEPA Consent Decree is owned and operated by the City of Burbank at the expense of Lockheed Martin, uses air stripping and liquid-phase GAC to remove VOCs from groundwater (local groundwater also contains elevated concentrations of nitrate and chromium), and then blends the treated water with imported water from the MWD for delivery within the City of Burbank.

   Burbank assumed operation and maintenance of the BOU in 2001. Initially, the facility had difficulty in sustaining operation at the designed treatment rate of 9,000 gpm. Burbank, Lockheed-Martin, and the USEPA cooperated in efforts to determine the cause(s) of the reduced production. Over the past few years, several process enhancements and repairs have been made to the liquid-phase GAC vessels and to the vapor-phase GAC vessels at the factory.

   As part of the requirement to close the first consent decree, USEPA required the City of Burbank to demonstrate that the BOU would operate at its design capacity. In the summer of 2010, Burbank successfully completed a 60-day performance test at the BOU by pumping the wells at a combined rate of 9000 gpm. To ensure the effectiveness of the remedy, EPA monitored water level drawdown and the extent of the cone of depression by conducting a multi-well pumping test for 30 days during the demonstration time frame. EPA used water levels and pumping rate data monitored during this pumping test to update its values for the hydraulic conductivity, transmissivity, and storativity of the aquifers within the BOU area for the Basin wide Groundwater Model.

   The City of Burbank is also concerned about hexavalent chromium in groundwater produced by BOU wells and has been blending the pumped groundwater with imported water to keep the concentration of total chromium at or below 7 µg/L; the BOU treatment facility was not designed to treat chromium.

A total of 10,148 AF of contaminated groundwater was treated by the BOU in the 2013-14 WY, a decrease of 1,239 AF over the prior year's volume of treated groundwater by this facility.

3. *GLENDALE NORTH AND SOUTH OPERABLE UNITS (now referred to as one single "GOU")* – Construction of the GOU allowed for treated water to be available for delivery in August 2000. The system includes four Glendale North OU extraction wells (with a total pumping capacity of 3,300 gpm) and four Glendale South OU extraction wells (with a total capacity of 1,700 gpm). The treatment process uses aeration and liquid-phase GAC to treat VOC-contaminated groundwater and then blends the treated water with imported MWD water at the Grandview Pump Station. A total of 7,231 AF of contaminated groundwater was treated in WY 2013-14.

4. *GLENDALE CHROMIUM OPERABLE UNIT* – Established in 2007, the GCOU was created to help characterize the extent of chromium contamination in groundwater in the Glendale area, and to determine appropriate remedial action. The USEPA is working with the DTSC and the RWQCB-LA to identify and clean up sources of chromium contamination. Remedial investigation of chromium contamination in groundwater in the GCOU began in 2011. To date, at least 29 groundwater monitoring wells have been installed to help evaluate the location and extent of the chromium contamination in the area.

Other Treatment Facilities

1. *VERDUGO PARK WATER TREATMENT PLANT (VPWTP)* – Glendale's VPWTP serves as a filtration and disinfection facility. Due to low water levels, no groundwater was treated in the 2013-14 Water Year.

2. *GLENWOOD NITRATE WATER TREATMENT PLANT* - CVWD's Glenwood Nitrate Water Treatment Plant, which uses an ion-exchange process for nitrate removal, treated 150 AF in the 2013-14 Water Year.

3. *POLLOCK WELLS TREATMENT PLANT* (PWTP) – The 3,000-gpm PWTP was dedicated on March 17, 1999. This treatment plant uses four liquid phase GAC vessels to remove VOCs from Pollock Well Nos. 4 and. 6. The operation of these production wells helps reduce the amount of groundwater lost to the Los Angeles River by reducing the amount of groundwater rising into the unlined reaches of the drainage channel. To respond to the

emergence of hexavalent chromium near the Pollock Wellfield, LADWP will construct groundwater monitoring wells in the nearby areas to help characterize the horizontal and vertical extent of this and other contaminants of concern. Findings of this study may warrant an urgent response to augment the current treatment systems to provide additional technology that will remove hexavalent chromium from the Pollock Wells groundwater. In WY 2013-14, 2,580 AF of water were treated at PWTP.

4. *BURBANK GAC TREATMENT PLANT* - The City of Burbank GAC system (Lake St. wells) was shut down in March 2001 due to the elevated concentrations of hexavalent chromium in the groundwater and remained out of service through the 2007-08 Water Year. The plant saw limited use for non-potable purposes in Water Year 2008-09, whereas in Water Years 2009-10, 2010-11, 2011-12, and 2012-13 the plant was used only when necessary to obtain water quality data from the wells. In the 2013-14 WY, 1.2 AF of water was treated at the Lake Street GAC. The City of Burbank has a goal of accepting a maximum of 7 µg/L of total chromium after blending for distribution within its water system. If the plant is returned to service, production may be considered as part of the average pumping goal of 9,000 gpm for the Burbank OU.

5. *TEMPORARY TUJUNGA WELLFIELD TREATMENT STUDY PROJECT* – This project, which restored 12,000 AFY of pumping capacity that had become unavailable due to water quality constraints, provided for treatment of the two most contaminated production wells at the Tujunga wellfield with liquid-phase granular activated carbon. Each production well has five pairs (trains) of granular activated carbon treatment vessels. Approximately one-fifth of the produced groundwater flows through the first vessel (lead vessel) and then the second vessel (lag vessel) of each train. The treatment process removes VOCs like TCE, PCE, carbon tetrachloride, and 1,1 dichloroethene. Operational testing began in November 2009 and the CDPH permit for conveying treated groundwater into the distribution system was issued in May 2010. A total of approximately 38,300 AF of groundwater was treated by this project during the recent water year.

3.8 Groundwater Quality Investigations

There are numerous ongoing groundwater quality investigations in ULARA, particularly in the SFB. Some of the major sites and related activities are briefly summarized below. The reader can obtain current information and more details for the sites mentioned below, which are regulated by the RCQCB-LA, via that agency's Geotracker website.

http://geotracker.waterboards.ca.gov/

Boeing/Rocketdyne Santa Susana Field Lab, Simi Hills

This 2,850-acre former rocket engine and nuclear research facility, which was operated until the 1980s, is located in the hills above the western end of the San Fernando Valley. As a result of past site activities/operations, the soil, bedrock and groundwater became contaminated; key constituents of concern include VOCs, perchlorate, and radionuclides. A large number of groundwater monitoring wells have been constructed and these are monitored for water levels, and groundwater samples from these wells are collected and tested for key water quality constituents on a regular basis. Contaminated soil and groundwater are also being remediated at select locations throughout the site. Soil and groundwater characterization efforts are ongoing throughout the entire site, along with treatment of surface water runoff. Treatability testing for the In-Situ Chemical Oxidation (ISCO) for the treatment of VOCs in bedrock is ongoing as well.

For more details regarding the Santa Susana Field Lab, visit the website of the RWQCB-LA. The current contact at the RWQCB is Mr. Peter Raftery.

CVWD-MTBE Investigation

In February 2004, MTBE was detected in CVWD Well No. 5 during the annual VOC water quality sampling program of all CVWD active water-supply wells. MTBE is a gasoline additive that was used from 1990 to 2003; gasoline containing MTBE has reportedly leaked from underground storage tanks and over time, it has contaminated local soils and groundwater in portions of the Verdugo Basin.

For more information regarding this MTBE contamination problem, the reader may contact the RWQCB-LA; reportedly, Mr. Magdy Baiady, listed on the RWQCB website, is the main contact at the Board office for this site. Mr. David Gould, District Engineer, CVWD, is also very knowledgeable of the contamination problem and the results of ongoing litigation in Verdugo Basin involving this and other gasoline-related contaminants.

DriLube, 711 W. Broadway and 718 W. Wilson, Glendale

DriLube Company, a plating facility located in Glendale, was issued a Cleanup and Abatement Order (CAO) by the RWQCB-LA in 2002. DriLube was named a Responsible Party by the USEPA as the source responsible for discharging contaminants from its site into the groundwater affecting the Glendale South OU. The results of subsurface investigations to date have detected chlorinated solvents, petroleum hydrocarbons, PCBs, and heavy metals (including chromium) within the underlying soils and groundwater.

Although previously managed as a single site, this property was reportedly separated into two addresses for cleanup management purposes. USEPA, which previously managed the entire site, returned the 711 W. Broadway site back to the RWQCB-LA in August 2009. The site was determined to have no metals contamination, but rather has been reported contaminated only with VOCs. The site was transferred back to USEPA in October 2014 and USEPA will assume lead oversight responsibilities for the ongoing VOC cleanup.

Management of the 718 W. Wilson site remains within the purview of the USEPA due to chromium contamination; VOC contamination also exists at the site. In 2010, approximately 460 tons of hexavalent chromium-contaminated soils were removed from the site. During this removal work, infrastructure (piping) was installed to facilitate future in-situ remediation of the hexavalent chromium. This in-situ treatment will focus on adding amendments to the impacted source soils to reduce hexavalent chromium to trivalent chromium.

Based on information on the RWQCB-LA website, the key current contact for additional information for this site is Ms. Jillian Ly.

PRC-DeSoto (formerly Courtaulds Aerospace), 5430 San Fernando Road, Glendale

The RWQCB-LA issued a Cleanup and Abatement order (CAO) to PRC-DeSoto (formerly Courtaulds Aerospace) in August 2002. This facility has been named a Responsible Party and was identified by USEPA as a source for releasing chlorinated organic solvents within the groundwater in the Glendale South OU; this facility is considered a PRP for the Glendale OU. Historically, the facility's principal industrial activities involved chemical formulation of adhesives and sealants used by the U.S. Department of Defense for various aerospace applications. Trichloroethane (1,1,1-TCA), dichloroethane (DCA), TCE, PCE, chromium, hexavalent chromium, and nickel have been found in soil and groundwater beneath the facility. Groundwater monitoring continues on a quarterly basis as part of the CAO.

Cleanup operations regarding chromium and VOCs in soil have recently been completed. Work toward closure of the site in regard to soils contamination will begin with the RWQCB-LA.

Work regarding chromium contamination of the local groundwater will be transferred to the USEPA. PRC DeSoto has been identified as a PRP for the Chromium OU (CrOU).

Mr. Larry Moore of the RWQCB-LA is listed as the key current contact at the RWQCB-LA office for this site.

Excello Plating, 4057 Goodwin Ave., Los Angeles

The RWQCB-LA issued a CAO to Excello Plating in June, 2003, that was later revised and re-issued in June, 2005. The facility's owners were identified under CERCLA as having responsibility for releasing VOCs, hexavalent chromium, nickel, cadmium, zinc and lead into the subsurface. The purpose of this CAO was to ensure that Excello Plating completes the onsite and offsite assessment to help delineate the lateral and vertical extent of heavy metal contamination (specifically chromium) and, as necessary, undertake remediation. Additionally, the USEPA considers this site as a source of the contaminants that impact the GOU.

Updates on activities and cleanup operations at this Excello facility are available via the RWQCB-LA website; Mr. Larry Moore is listed as the key current contact at the RWQCB-LA office.

B.F. Goodrich (formerly Menasco/Coltec Industries, Inc.) 100 E. Cedar Ave., Burbank

The RWQCB-LA issued a CAO to Coltec Industries, Inc. on July 5, 2002. Through a series of acquisitions, the environmental liability of the facility is now owned by United Technologies. This facility was identified as a Responsible Party by the USEPA as a source of discharging contaminants to the groundwater, and affecting the Glendale North OU (GNOU). Additionally, the USEPA has issued a General Notice Letter and a 104E Letter to the site owners, and the facility is considered a PRP for the Glendale CrOU (GCrOU). The facility's former industrial activities involved machining, manufacturing, metal plating, and anodizing of parts and equipment used by the U.S. Department of Defense for various aerospace applications. VOCs including TCE, PCE, 1,1-DCE, 1,1,1¬-TCA, and even hexavalent chromium have been detected in the subsurface soils and in the groundwater underlying the site.

The site was purchased by IKEA, Inc in latter part of 2013. IKEA's intent is to redevelop the site into an IKEA furniture retail store. These redevelopment activities will be conducted as United Technologies continues with the environmental site cleanup.

Continuous soil vapor extraction (SVE) operations at the site between 1998 and 2004 removed VOCs to lower levels. The decommissioning of the SVE system was approved by RWQCB-LA in February 2014. Additionally, a groundwater extraction system and in-situ bioremediation treatment are being used to further remediate the shallow perched-groundwater zone.

For more information on this B.F. Goodrich site, the reader may contact Ms. Clarita Qudilla at the RWQCB-LA.

ITT/Home Depot, 1200 S. Flower St., Burbank

A few years ago, Home Depot completed construction of its large store and parking lot on the site of this former ITT Aerospace Controls property. By agreement between Home Depot and ITT, Home Depot is responsible for the soil assessment and remediation from ground surface down to the depth of an underlying continuous clay layer. The contamination beneath the clay layer, which includes the saturated zone (i.e., groundwater), has been the responsibility of ITT Aerospace Controls, a former parts manufacturer and metal finisher and plater. Groundwater contamination at the site consists of VOCs, petroleum hydrocarbons, nickel, and hexavalent chromium. In 2004, Home Depot built a slurry wall around the site to help prevent lateral migration of the shallow groundwater contamination. A naturally occurring low-permeability zone reportedly located 50 feet below ground surface has been expected to reduce vertical migration of the contaminants. ITT is responsible for cleanup of the area below the Home Depot's slurry wall barrier. Groundwater monitoring continues on a semi-annual basis; the USEPA considers this site to be a source of contamination affecting the GOU.

For more information concerning this ITT site, Mr. Larry Moore is listed as the key current contact at the RWQCB-LA office.

Honeywell (formerly Allied Signal/Bendix) 11600 Sherman Way, North Hollywood

Honeywell was issued a CAO on February 21, 2003 and an amended CAO followed in September 2004. The facility was directed to prepare a work plan for additional onsite and offsite subsurface assessment of soil and groundwater. This work plan was submitted and approved, and the field work has been completed. A final report has been submitted and is presently undergoing review by the RWQCB-LA. The facility prepared and submitted a Remedial Action Plan (RAP) for in-situ chromium remediation. The RAP has been approved and is being implemented in conjunction with the facility's General WDR permit. Construction of additional offsite groundwater monitoring wells was approved by the USEPA and RWQCB-LA, and these new monitoring wells have been constructed.

The facility was required to submit a wellhead treatment work plan for treating hexavalent chromium and 1,4-dioxane at LADWP’s extraction well NHE-2. This well was shut down by the LADWP because elevated concentrations of total chromium were detected in the pumped groundwater. Honeywell’s work plan was approved as well as their short-term remediation plan. Recently, Honeywell submitted their long-term remediation plan for the NHE-02 wellhead treatment to the RWQCB-LA for their review and comment/approval. However, the long-term

remediation plan was not approved or implemented, because Honeywell entered into negotiations with the USEPA, LADWP, and CDPH regarding the proposed remediation approach and its association with the USEPA's NHOU interim remedy approach. In January 2013, a second NHOU extraction well (NHE-3) was shut down by the LADWP because of elevated concentrations of total chromium and hexavalent chromium.

In September 2008, Honeywell began pumping NHE-2 and processing the groundwater through a wellhead treatment system to remove VOCs before discharging the effluent to the sanitary sewer system. Because the VOC and other contaminant concentrations were below the limits identified in the sewer discharge permit, Honeywell was allowed to remove the wellhead treatment system, and to discharge the effluent from well NHE-2 directly into the sanitary sewer. Honeywell is currently working with LADWP and CDPH to comply with CDPH Policy Memorandum 97-005 by preparing a Source Water Assessment and Treatment Report. This would recommend installation of a wellhead treatment system to remove VOCs and chromium such that the treated effluent is Title 22 compliant and the groundwater can then be distributed by LADWP.

Honeywell has utilized its consultant (MWH Global, Inc.) in the past few years to site, design and construct 31 groundwater monitoring wells to further characterize the water quality and hydrogeology in the eastern portion of the SFB.

Mr. Larry Moore of the RWQCB-LA Region is listed on the RWQCB-LA's website as the key current contact for additional information for this site.

Price Pfister site, 13500 Paxton St, Pacoima, California

The former Price Pfister site, located at 13500 Paxton Street, was used from the late-1950's to 2002 for manufacturing plumbing fixtures. Manufacturing processes involved casting, machining, and chrome plating, and required the use of various cleaning solvents such as perchloroethylene (PCE), lubricating and cutting oils, and metal plating solutions which, over the years, seeped into the soil and groundwater resulting in contamination.

Since 2002, the RWQCB-LA has been the lead agency overseeing the investigation, monitoring and remediation of the soil and groundwater contamination at this former Price Pfister site. On March 11, 2009, the Regional Board approved a No Further Action (NFA) for VOCs in soil in all the study areas beneath the site, with the exception of Area 7. The NFA was based on excavation/removal and soil vapor extraction of the VOC-contaminated soil. A significant quantity of soil contaminated with heavy metals such as hexavalent chromium, total petroleum hydrocarbons, and 1,4-dioxane was also removed during the excavation from different areas of

the site. This Brownfield site was re-developed in 2010 into a Costco, Lowe's, and a Best Buy shopping center.

Hexavalent chromium concentration of 8,300 µg/L was initially detected on August 19, 2010 in the groundwater beneath the former Plating Area of the Price Pfister site. In August 2007, 1,4-dioxane was detected at 950 µg/L. On June 17, 2014, the RWQCB-LA approved the remedial design/remedial action workplan for full-scale treatment of hexavalent chromium in groundwater. The remedial action will involve injection of a 3 percent solution of emulsified vegetable oil in potable water into 10 injection wells; the wells are currently being constructed. The remedial action will be conducted under the RWQCB-LA WDR Order No. R4-2007-0019. On August 28, 2013, the RWQCB-LA approved a 1,4-Dioxane Microcosm Study Workplan; the technical report of the study is due to RWQCB-LA by March 31, 2015.

The maximum onsite and offsite hexavalent chromium concentrations reported in the 3rd Quarter 2014 Groundwater Monitoring Report, dated 31 October 2014, were 196 and 27.9 µg/L, respectively. The onsite and offsite 1,4-dioxane concentrations reported in the 3rd Quarter 2014 Groundwater Monitoring Report (31 October 2014) were 4.3 and <1.0 µg/L, respectively.

Additional information for this former Price Pfister site may be obtained from the RWQCB-LA website; Mr. Mohammad Zaidi is listed as the key current contact.

General Electric (formerly Pacific Airmotive), 2940 and 2960 North Hollywood Way, Burbank

The site was formerly occupied by Pacific Airmotive (PAC) and is currently owned by General Electric. Activities conducted by PAC at the site included testing, maintenance, repair and overhaul of commercial and military aircraft engines, and those activities resulted in VOC impacts to soil and groundwater; contaminants at the site reportedly include PCE, TCE and 1,1,1-TCA. A soil vapor extraction system has been removing PCE soil vapor from underneath an adjacent property (2960 No. Hollywood Way). Confirmation sampling has not yet been completed at this site. The RWQCB-LA is overseeing the soil cleanup of the site; the groundwater cleanup is overseen by the USEPA. As of September 2011, PAC water quality data are now included in the Lockheed-Martin semi-annual groundwater report for the BOU.

On the RWQCB-LA website, Ms. Gloria Pak is listed as the key current contact for information concerning this site.

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

Contaminants at the site reportedly included 1,1-DCE, TCE, PCE, 2,4,6 trichloroanisole (TCA), benzene, toluene, ethyl benzene and zylene (BTEX), and 1,1-dichloroethane (DCA). Raytheon has expanded the Enhanced In-Situ Bioremediation program to continue treating the contaminants in the shallow groundwater beneath the site.

Additional information is available for this property via Ms. Emily Wong, the current contact person listed on the RWQCB-LA website.

3M Pharmaceuticals (formerly Riker Lab), 19901 Nordhoff St, Northridge

Contaminants at this site include chloroform, 1,2-DCE, 1,2-DCA, and Freon 11. A groundwater treatment system has been in operation since 1997. At least 15 groundwater extraction wells and two air-stripping towers in series capable of treating 60,000 gallons per day have been in operation at the site. In March 2005, 3M and its consultant, Weston Solutions, Inc. completed installation of a system to re-use the discharged portion of the treated groundwater for landscape irrigation. All of the treated groundwater is now beneficially used onsite for the cooling towers and landscape irrigation. Contaminants appear to be hydraulically controlled by the extraction wells and contaminant concentrations in groundwater are generally declining.

More current and detailed information regarding this 3M Pharmaceuticals site is available via the RWQCB-LA website and its current contact person, Mr. Peter Raftery.

Micro Matics USA Inc, 19791 Bahama St., Northridge

The soils and groundwater beneath a portion of this Micro Matics property have been contaminated with PCE and 1,1,1-TCA. One or more contaminant plumes have moved offsite to the west beneath a portion of the former 3M property, and also to the south beneath Bahama Street. The 3M parcel contaminated by Micro Matics was sold to a developer, Nordhoff Industrial, in December 2004.

Soil vapor extraction (SVE) was initiated in 2006 to remediate the VOC-impacted soil beneath the site and was continued for at least 29 months. Soil closure was requested in 2009 from the RWQCB-LA.

Interim groundwater remediation included pump and treat activities and injection of the hydrogen-donating compound (HRCTM) between 1999 and 2005. In October 2007, a containment treatment line using ozone gas was operating on the north side of Nordhoff Street.

In April 2009, a full-scale groundwater treatment system using ozone gas began operation. The full-scale system includes numerous ozone sparge points in the source area, and several treatment lines downgradient of the source area. Groundwater treatment continues using an expanded ozone gas injection system. Contaminant concentrations appear to be declining both onsite and offsite.

More current and detailed information for this site may be obtained via Mr. Peter Raftery, the contact person listed on the website of the RWQCB-LA.

Tesoro Petroleum (former Fast Fuel, 11051 Victory Blvd., N. Hollywood)

Tesoro Petroleum was the owner of a gasoline station in North Hollywood. A large, leaking underground tank caused a plume of gasoline hydrocarbons (MTBE) to move downward into the local groundwater. Over time, this contaminant plume has migrated offsite toward several municipal-supply wells in LADWP's Whitnall wellfield. Tesoro and its consultants continued to perform soil remediation using soil vapor extraction, etc.

In September 2011, the RWQCB-LA granted a low-risk closure for the site. During the entire process of the site investigation and cleanup, approximately 43 million gallons of contaminated groundwater and approximately 235,000 pounds of vapor hydrocarbon and/or oxygenates (such as MTBE) were reportedly removed from the site. All water treatment equipment has been decommissioned and removed from the site. Some of the groundwater monitoring wells have been destroyed and/or will be destroyed in the future.

The RWQCB-LA file for Tesoro Petroleum at 11051 Victory Blvd lists this site as "closed" as of October, 2011. Further details are available via the listed current contact at the RWQCB-LA site (Mr. Magdy Baiady).

Taylor Yard (Los Angeles River Narrows Area)

Taylor Yard is located on San Fernando Road between the Glendale Freeway and the Harbor Freeway. The 243-acre Taylor Yard site is divided into two areas: 1) the 174-acre Sale Parcel, formerly used mainly to classify and hook up rail cars, and 2) the 69-acre Active Yard, so named because it continues to be used for locomotive service and maintenance. These areas have been contaminated with petroleum hydrocarbons, organic solvents and metals. The Sale Parcel soil has been cleaned and acquired by the California Department of Parks and Recreation. Several types of activities have been performed on the Active Yard to remove contaminated soil. Spills were reportedly cleaned up by using absorbent blankets or pumps to collect the liquid, or by excavating the contaminated soils. Remediation is under the jurisdiction

of DTSC. A Draft Remedial Action Plan (RAP) was reviewed and approved by DTSC in February 2014; however, implementation has been delayed until October 2015, to allow for additional sampling activities to fill in data gaps..

Jessy Fierro is listed as the current contact person on the RWQCB-LA website for additional information concerning Taylor Yard.

Status on the Existence of Hexavalent Chromium in the San Fernando Basin

In January 2003, the original ULARA Watermaster published a report on hexavalent chromium contamination in the SFB. Later, the RWQCB-LA published a report based on its four-year investigation of hexavalent chromium. The presence of this contaminant threatens the use of SFB groundwater as a reliable source of water for Burbank, Glendale and Los Angeles, and also jeopardizes the remedy (i.e., the cleanup plan) and the treatment plants which had been constructed to clean up VOCs on a regional basis; none of the treatment plants that treat VOCs in the groundwater in the SFB were originally designed to treat chromium.

On July 1, 2014, a new Primary MCL for hexavalent chromium of 10 µg/L (or 10 ppb) was established in California by CDPH. The Federal and State drinking water MCLs for total chromium are currently 100 µg/L and 50 µg/L, respectively. There are no separate Federal standards for hexavalent chromium at this time.

Hexavalent chromium affects the operation of the treatment plants, because, as noted above, they were designed to treat only for VOCs. The Consent Decrees between the USEPA and the responsible parties require that certain pumping rates be maintained in the OUs to control VOC plume migration and to provide contaminant removal. As OU wells are pumped, the chromium plumes tend to migrate toward the wells, likely at a slower rate than the VOCs. Hexavalent chromium has now been detected in all of the OUs in the SFB. High hexavalent chromium concentrations have caused several wells to be pumped at reduced rates, and one or more wells in the NHOU have been shut down.

For more information on hexavalent chromium, the reader is directed to the USEPA's website (www.epa.gov/region9/superfund/chromium/index.html) and the SWRCB website (http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Chromium6.shtml).

Former Chase Chemical/Holchem Site, 13546 Desmond Street, Pacoima

A significant VOC contaminant plume was identified in the Pacoima area near the intersection of the 118 Freeway and San Fernando Road. This area is approximately 3 miles upgradient from LADWP's Tujunga wellfield; the wellfield can supply up to 47,000 gpm of groundwater. LADWP constructed two monitoring wells down gradient of the contaminant plume.

The former Chase Chemical/Holchem site is located on an approximate two-acre site. Chase Chemical Company reportedly used the site from 1967 to 1987 to store industrial chemicals in underground storage tanks, aboveground storage tanks and other containers for packaging and resale. Holchem, Inc. leased the property in 1987, purchased it in 1999, and continued the storage and re-sale of industrial chemicals; site operation ended in 2001. Quarterly groundwater monitoring is ongoing; PCE and TCE have been two of the main VOCs detected beneath the site. Additional VOCs, such as cis-1,2-DCE, 1,1, DCE and 1,4-dioxane, also continue to be detected.

Ms. Stephanie Lewis of DTSC is currently listed on the RWQCB-LA website as the current contact person for more information regarding this site.

3.9. EPA Shallow Zone Contamination Maps

The USEPA typically provides the Watermaster with contamination “plume” maps for the Shallow aquifer zone in the eastern portion of the SFB. Plates 14, 15, 16, and 17 show the generalized two-dimensional approximation of contaminant contours within the Shallow Aquifer Zone in SFB, as interpreted by EPA and/or their subcontractors, for the contaminants TCE, PCE, NO_3, and total chromium, respectively. The contour data shown on Plates 14, 15, 16, and 17 in this report are reportedly based on data through September 30, 2014.

3.10. LID Projects (Formerly SUSMP)– San Fernando and Sylmar Basins

Since becoming ULARA Watermaster in January 2009, this Watermaster has been reviewing information and reports from various private engineers and/or owners in regard to Standard Urban Stormwater Mitigation Plan (SUSMP) requirements for all proposed developments and re-developments of existing properties within those portions of the City of Los Angeles that overlie the San Fernando and Sylmar basins. Note that, in May 2012, the City of Los Angeles implemented a Low Impact Development (LID) Ordinance that expanded/revised the original SUSMP requirements; hence, SUSMP projects are now referred to as LID projects. Plate 18, “Locations of LID Projects – San Fernando & Sylmar Basins”, illustrates the approximate

locations of more than 200 such LID properties that have been reviewed by this Watermaster to date. The background of LID projects and the basic role of the Watermaster in the LID approval process are described below. LID projects in the cities of Burbank, Glendale and San Fernando have not been reviewed to date by this Watermaster, but rather only by representatives of those cities.

The RWQCB-LA promulgated its National Pollutant Discharge Elimination System (NPDES) permit process in 1990 to help minimize the impacts of stormwater and urban runoff on the receiving water bodies in its sphere of influence (i.e., local rivers and the Pacific Ocean). The goal of their NPDES process was to minimize the impacts on local rivers, and ultimately to the ocean, by reducing the amount and improving the quality of surface water runoff from each storm event. For the ULARA region, the main receiving waters are the Los Angeles River and the Pacific Ocean.

Several years after the implementation of the NPDES process, the City of Los Angeles, Department of Public Works, Bureau of Sanitation – Watershed Protection Division (LAWPD), promulgated a series of guidelines intended to increase onsite infiltration of stormwater at all proposed developments and re-developments throughout the City. These guidelines established the requirements and limitations for infiltration (and recharge) of onsite stormwater and also specified an order of preference (via a set of Best Management Practices---BMPs) for providing LID improvements at each development and/or re-development site in the City.

The specific order of the BMP preference list was established by the LAWPD to collect and provide basic “treatment” of onsite stormwater runoff, and to help increase the amount of infiltration (i.e., deep percolation) from the initial ¾-inch of rainfall from each storm event at all new development and re-development sites in the City. The end result is intended to reduce the volumes of stormwater runoff that enter the storm drain system (from each new storm event) and simultaneously help reduce the volume and enhance the quality of the runoff that enters the Los Angeles River and ultimately the Pacific Ocean. Potential urban-derived contaminants and turbidity in the captured runoff could be reduced by the “treatment” effects of the various stormwater infiltration systems proposed via the BMPs. From a hydrogeologic perspective, and in the opinion of this Watermaster, whenever and wherever deep percolation (infiltration) of “treated” stormwater can be appropriately enhanced, then recharge to the local groundwater basin may be beneficially increased.

Per the LID Information Guidelines of the LAWPD, the five BMP options, in order of preference, are:

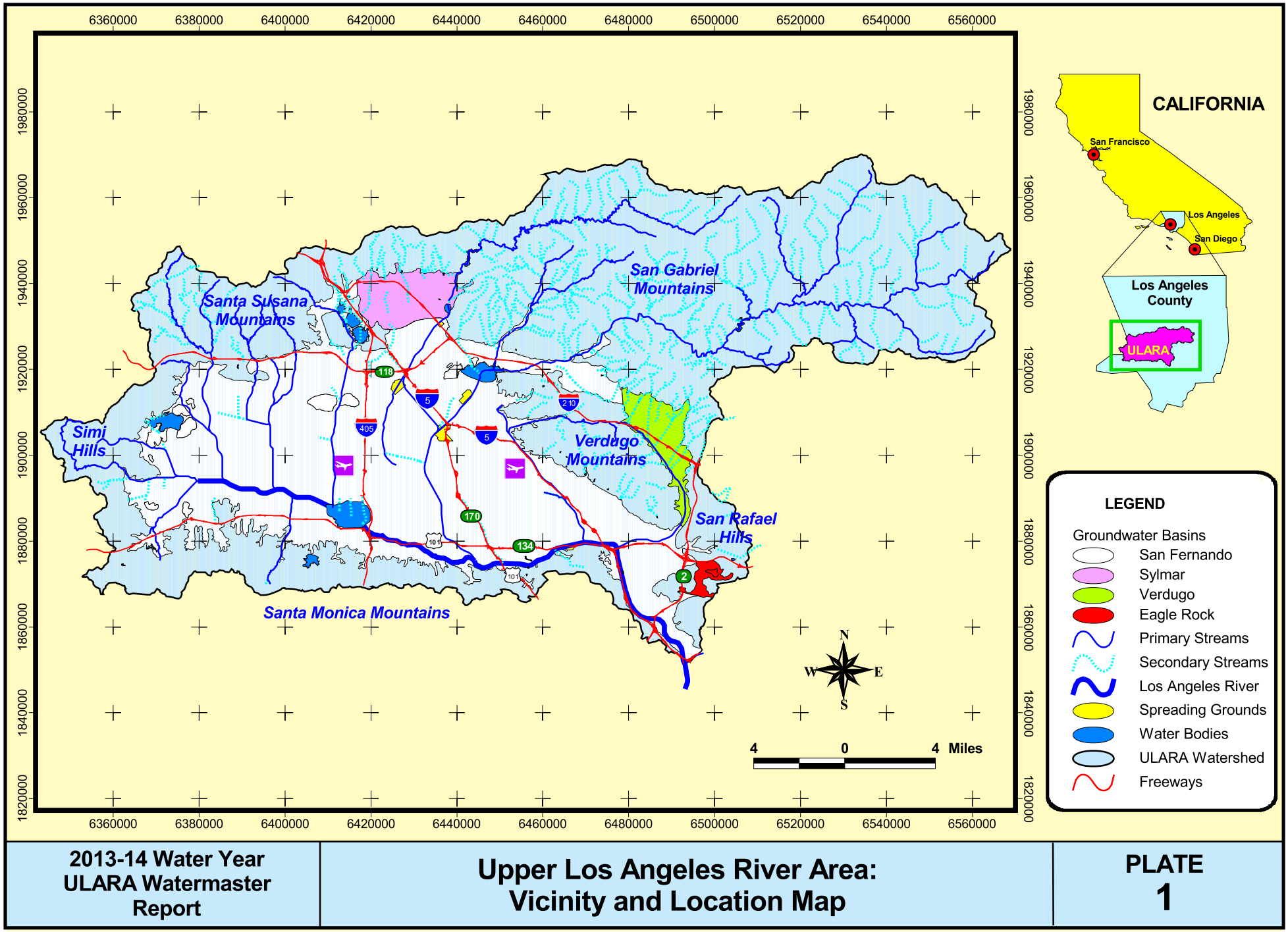
1. Infiltration Systems (design based on the volume of stormwater);

2. Bio-Filtration/Retention Systems (design based on flow of stormwater);
3. Stormwater Capture and Re-Use (optional; subject to County Health Department approval);
4. Mechanical/Hydrodynamic Units;
5. Combination of any of the above.

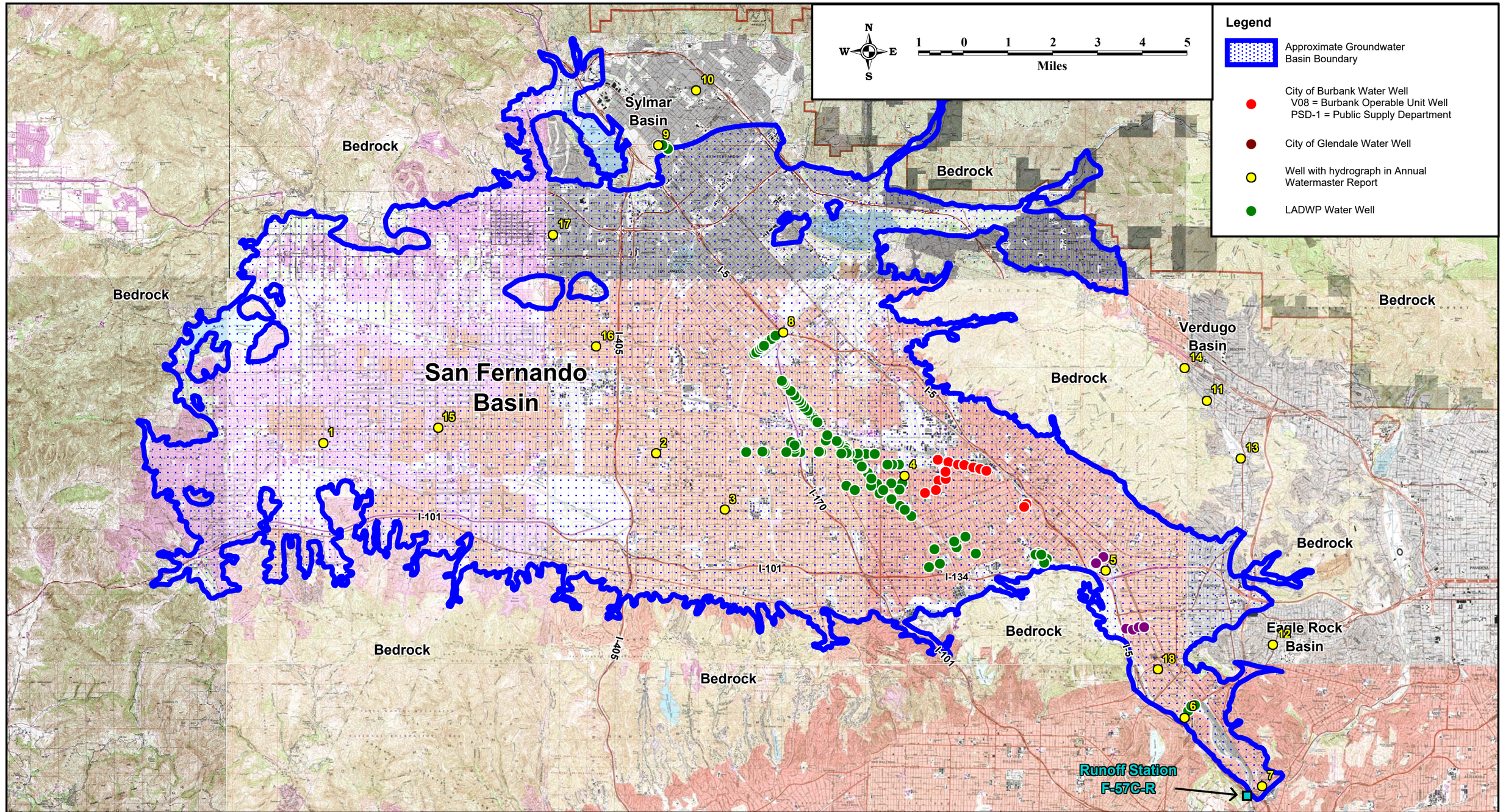
As a result, this Watermaster has been working with Mr. Ammar Eltawil of the LAWPD as part of the LID approval process for each new development/redevelopment site in those portions of the City of Los Angeles that overlie the San Fernando and Sylmar groundwater basins. Plate 18, as noted above, shows the approximate locations of the more than 200 LID sites reviewed to date by this Watermaster within those two groundwater basins. As part of the LID permit application process, Mr. Eltawil of LAWPD also provides each applicant with a 2-page Memorandum prepared by the Watermaster (current Watermaster version is dated December 18, 2012) that lists the types of data and reports requested by the Watermaster from each LID applicant. The approval process is basically as follows:

a. Applicant provides reports, data and LID-defined runoff calculations to the LAWPD.
b. LAWPD provides applicant with the current 2-page Watermaster data request Memorandum.
c. LAWPD reviews, evaluates and provides approval or denial of the specific LID and the runoff calculations provided by the applicant.
d. The Watermaster reviews the information on subsurface conditions, etc, as provided by the applicant, and provides an opinion letter with his approval or denial of the LID based on the potential of the infiltration potential of the LID to enhance recharge to the local groundwater basin without interfering with local groundwater quality, proximal area(s) of groundwater contamination and/or area(s) of groundwater remediation.

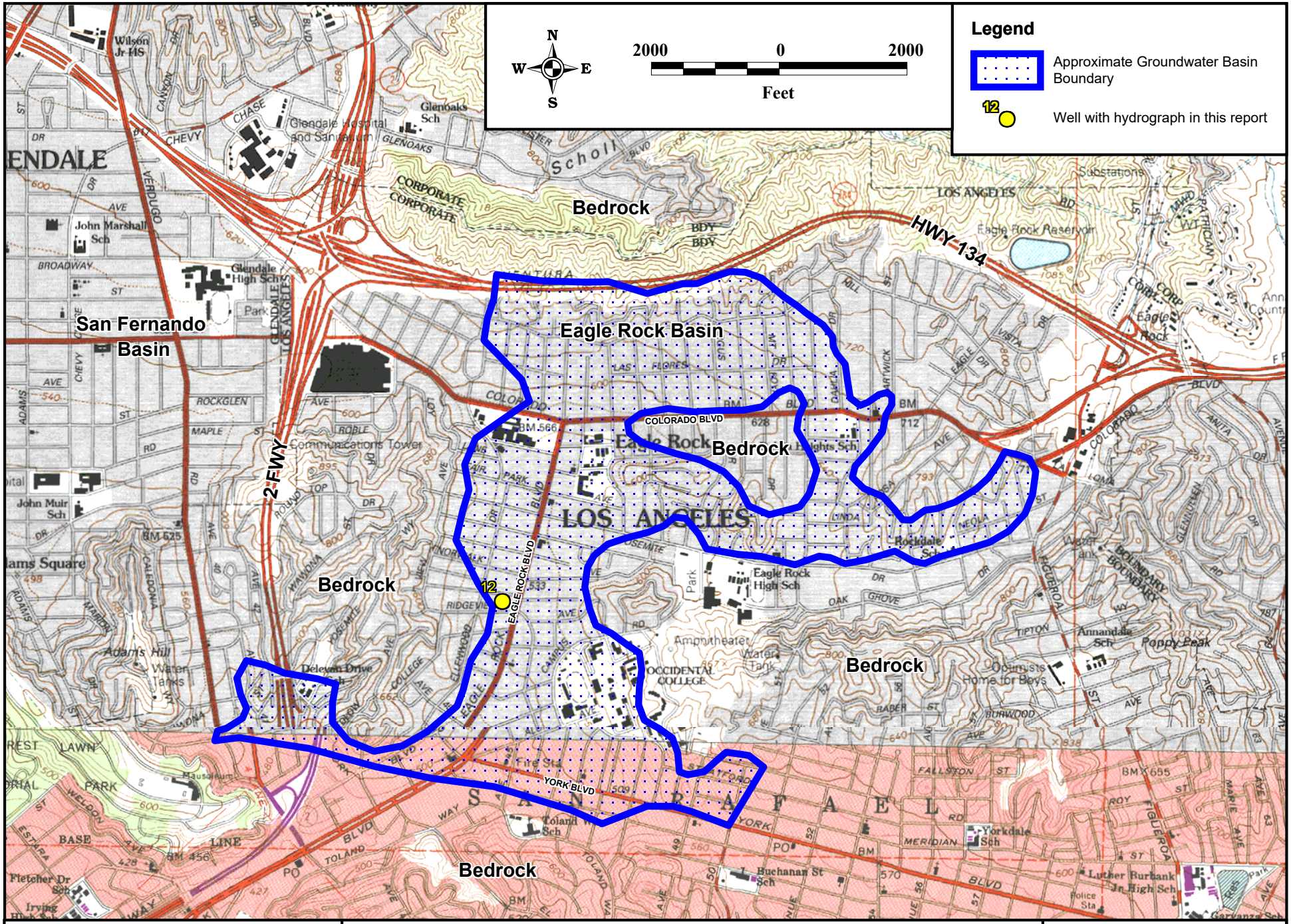
PLATES



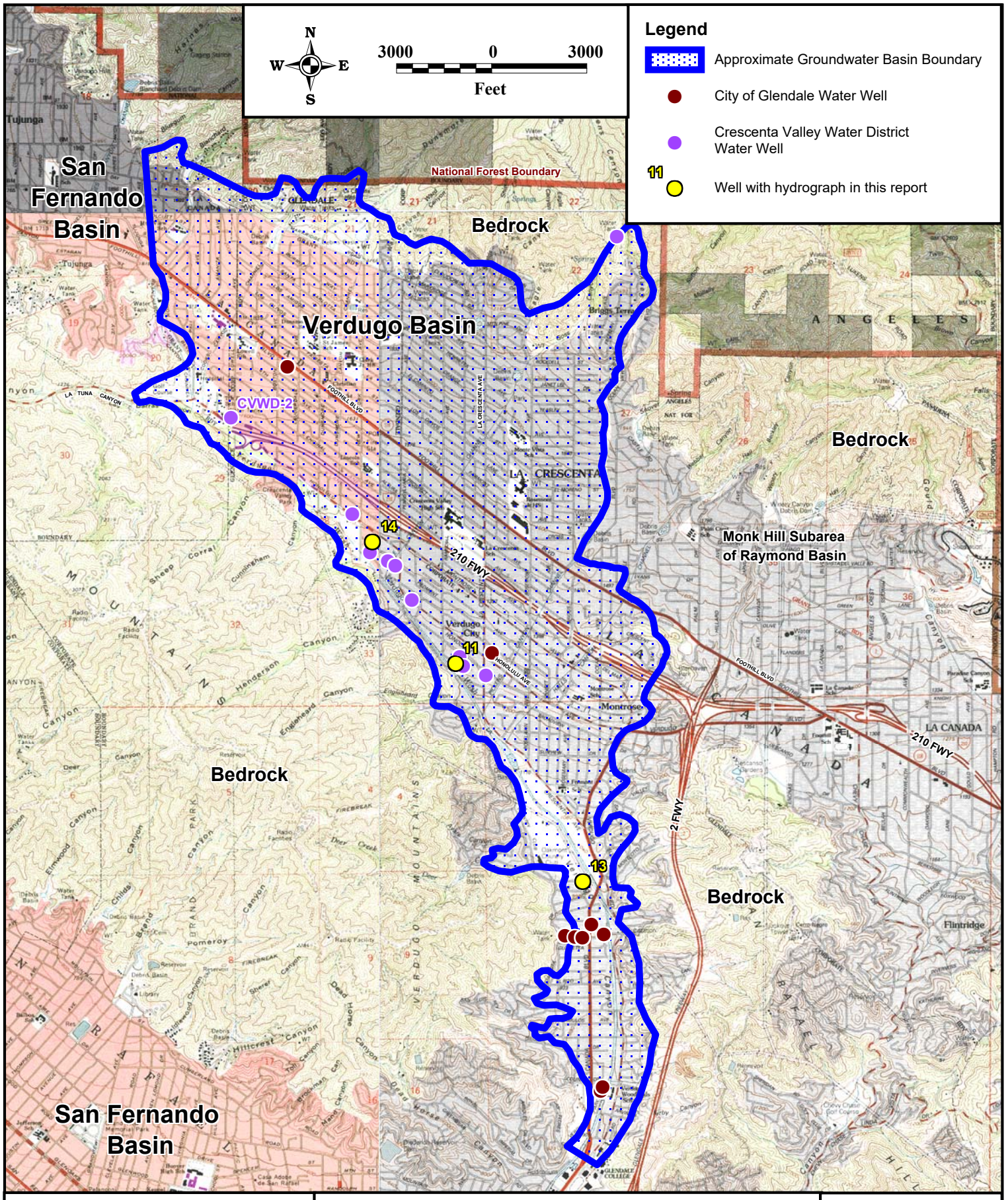
2013-14 Water Year ULARA Watermaster Report	**Upper Los Angeles River Area: Vicinity and Location Map**	**PLATE 1**



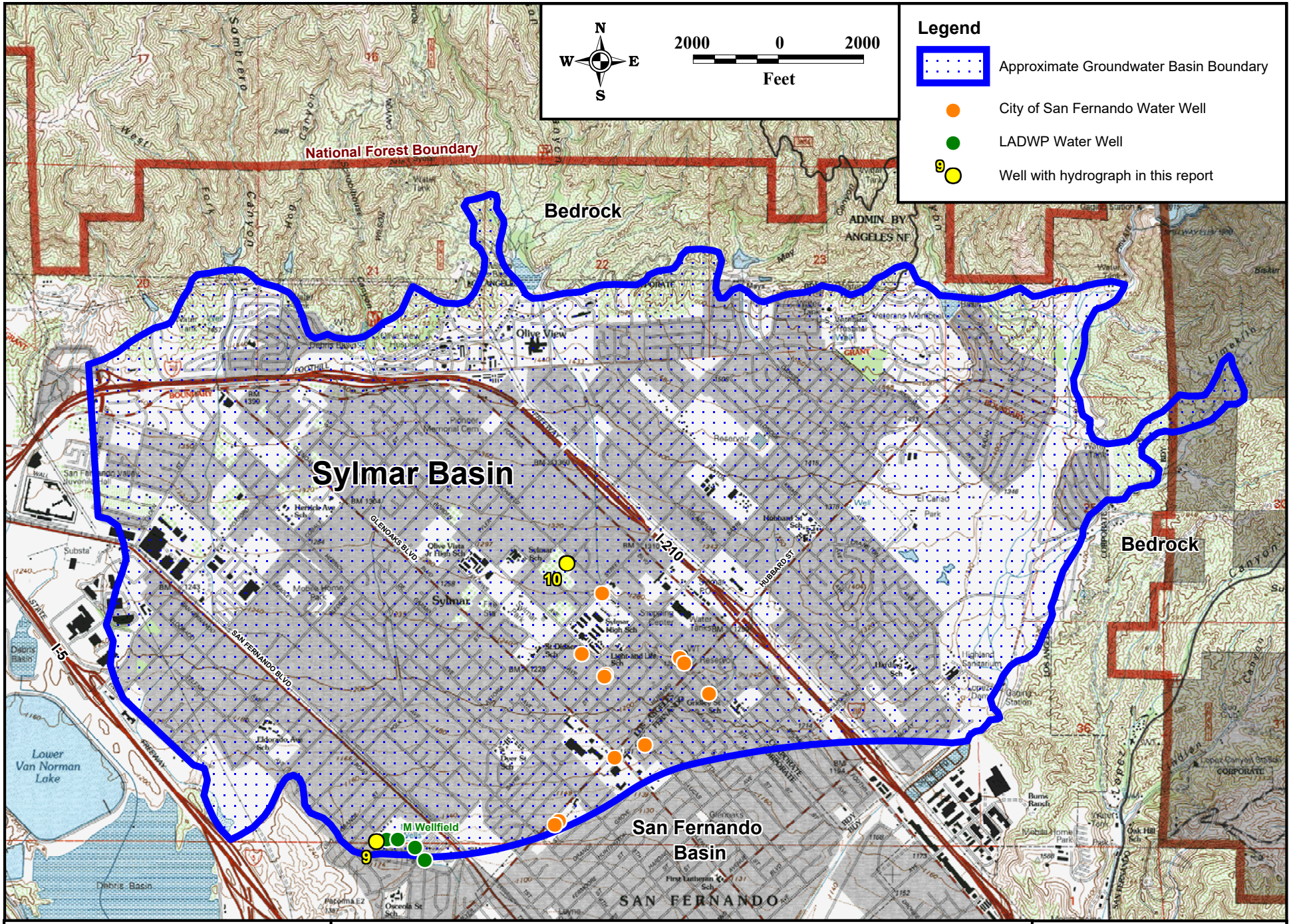
2013-2014 Water Year ULARA Wastermaster Report	Upper Los Angeles River Area: San Fernando Groundwater Basin Map	PLATE 1A



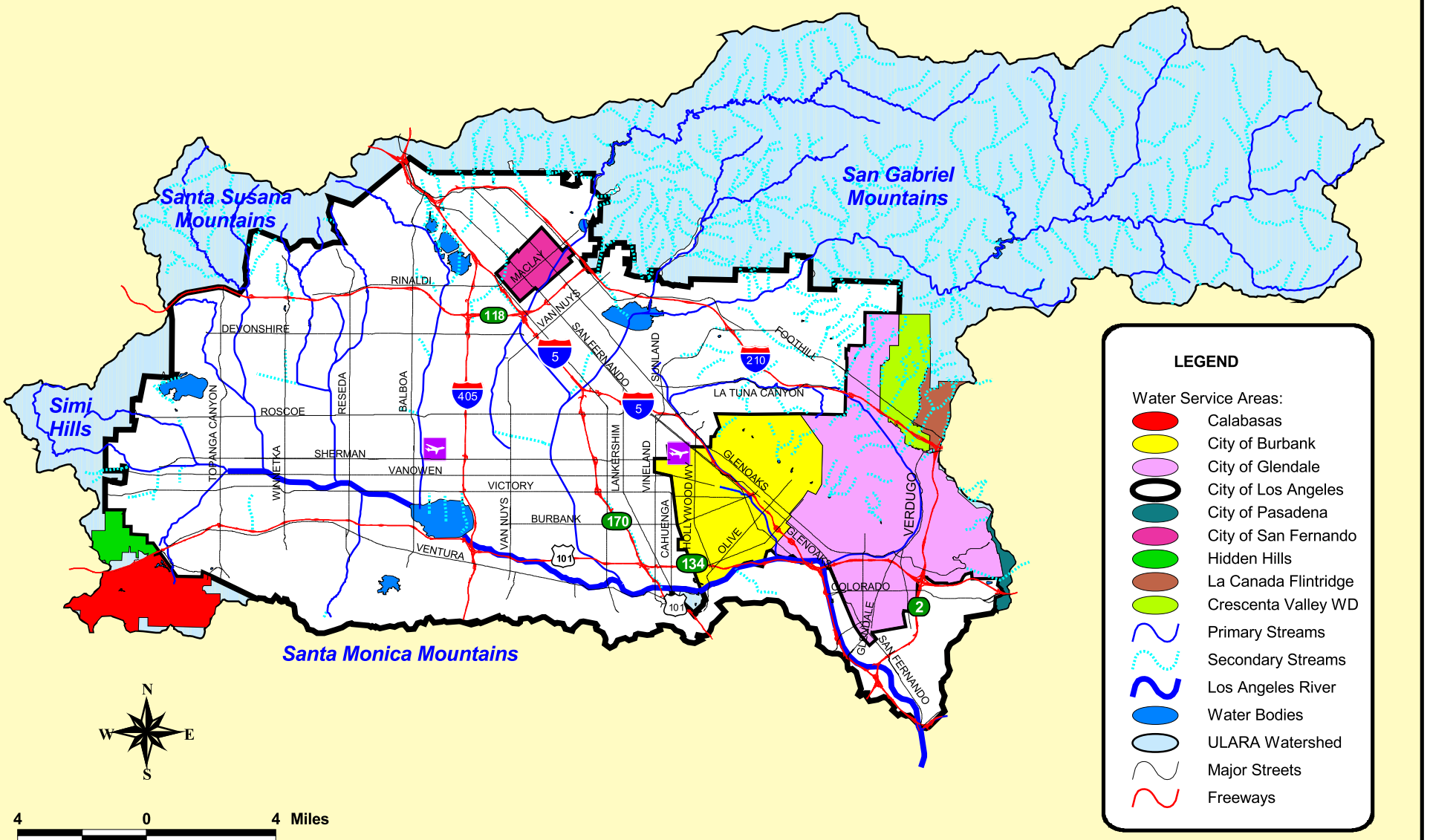
2013-2014 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Eagle Rock Groundwater Basin Map	PLATE 1D



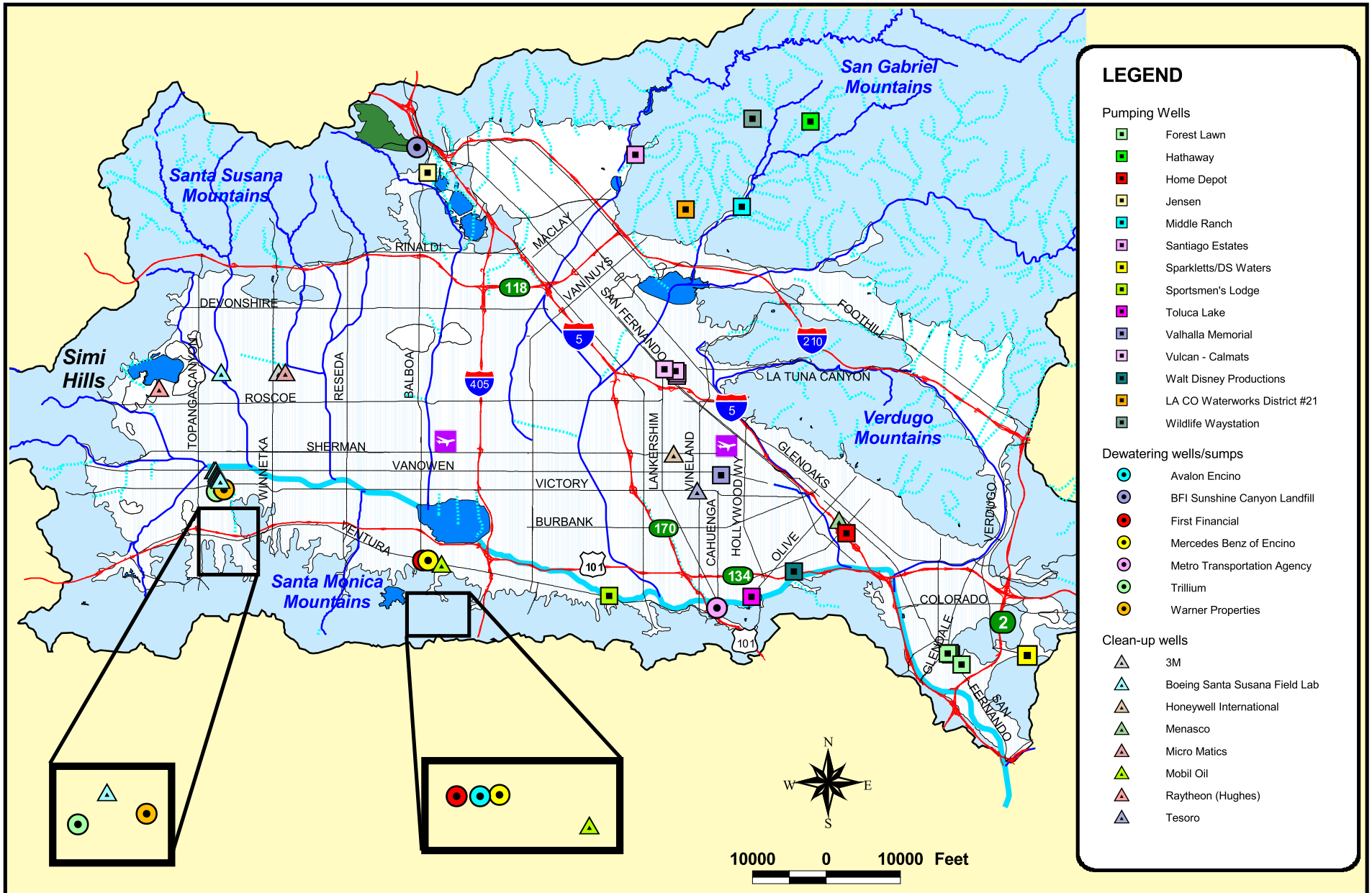
2013-2014 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Verdugo Groundwater Basin Map	PLATE 1C



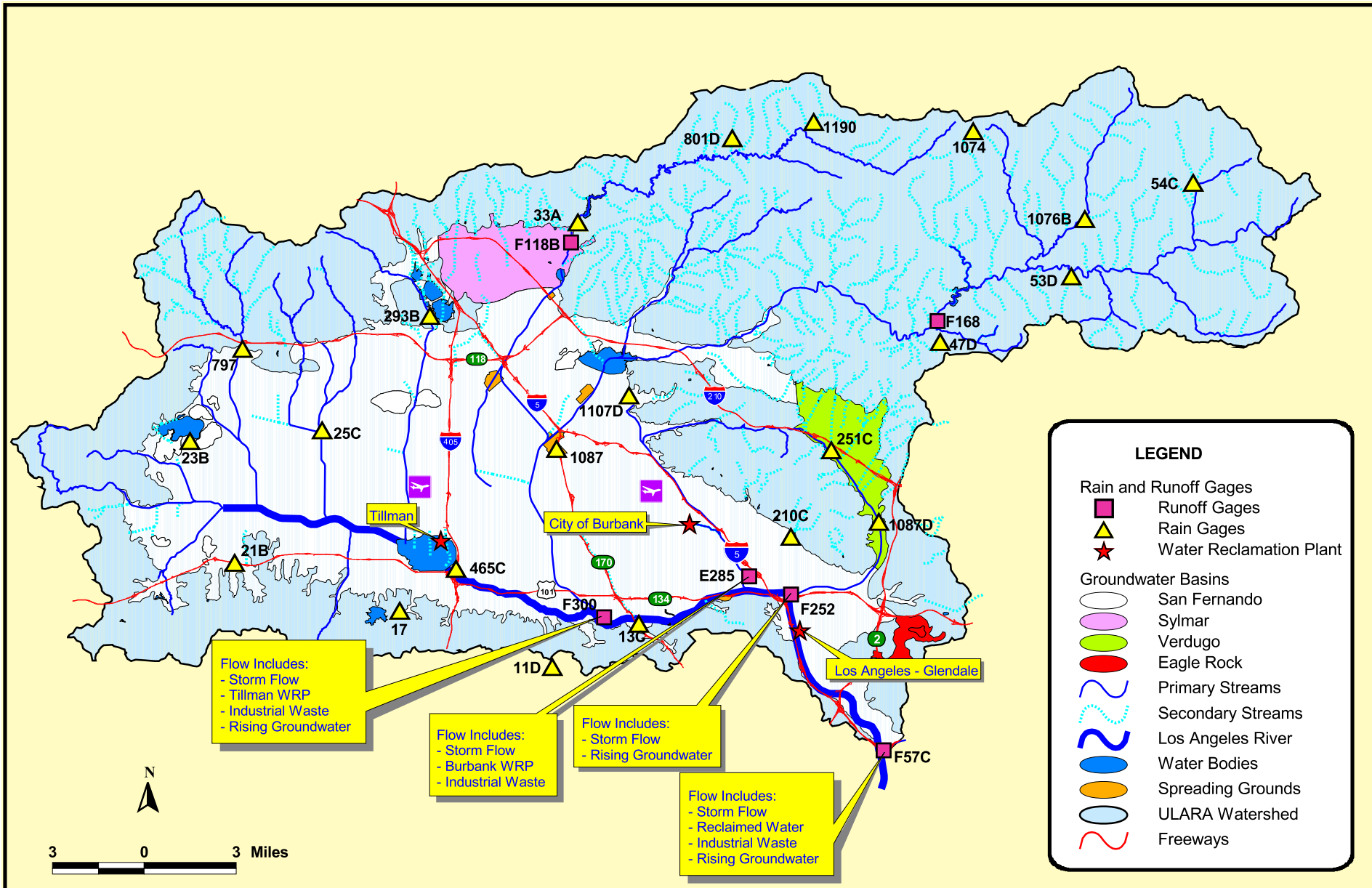
2013-2014 Water Year ULARA Watermaster Report	**Upper Los Angeles River Area: Sylmar Groundwater Basin Map**	**PLATE 1B**



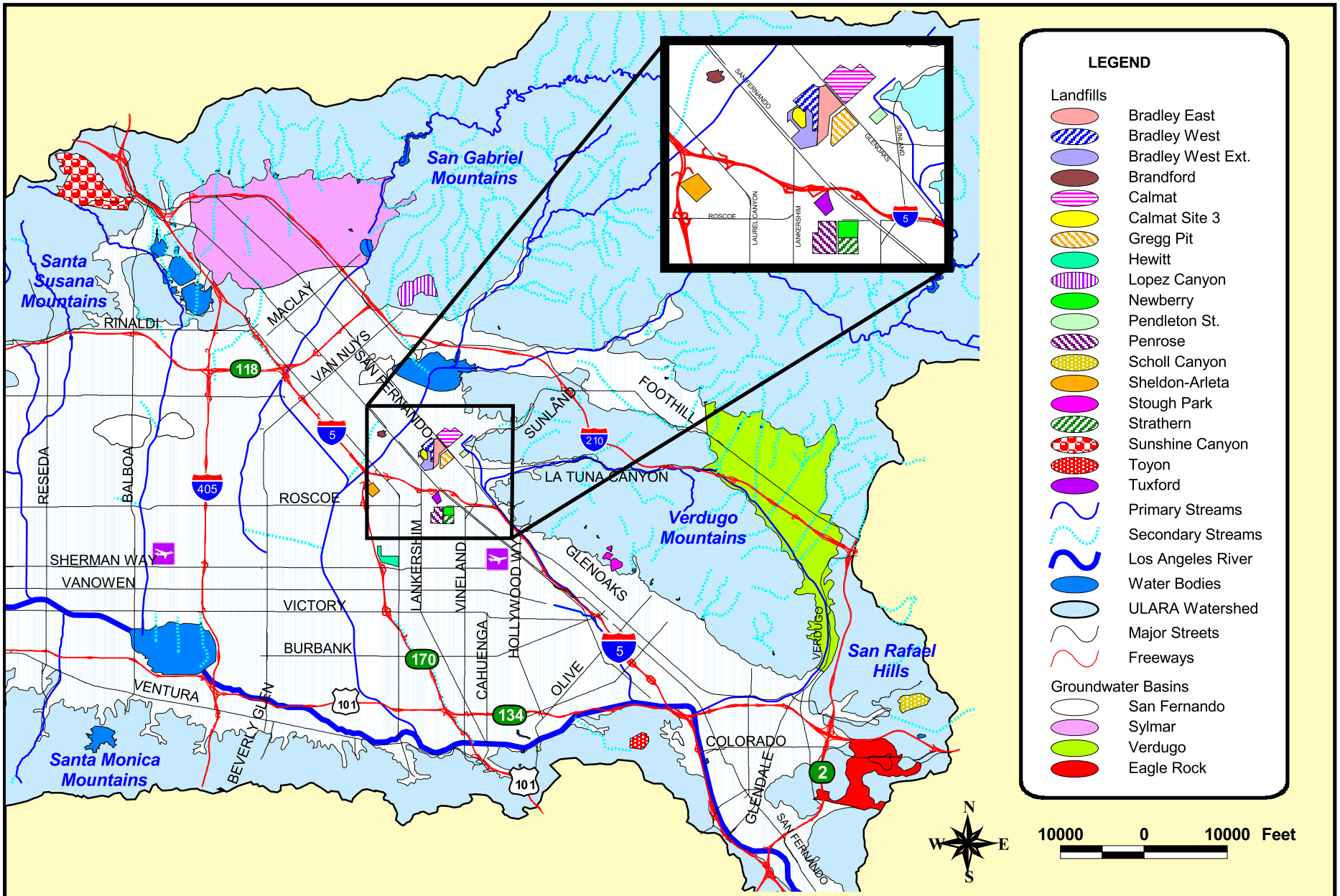
2013-14 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Water Service Areas of Public Agencies	PLATE 2



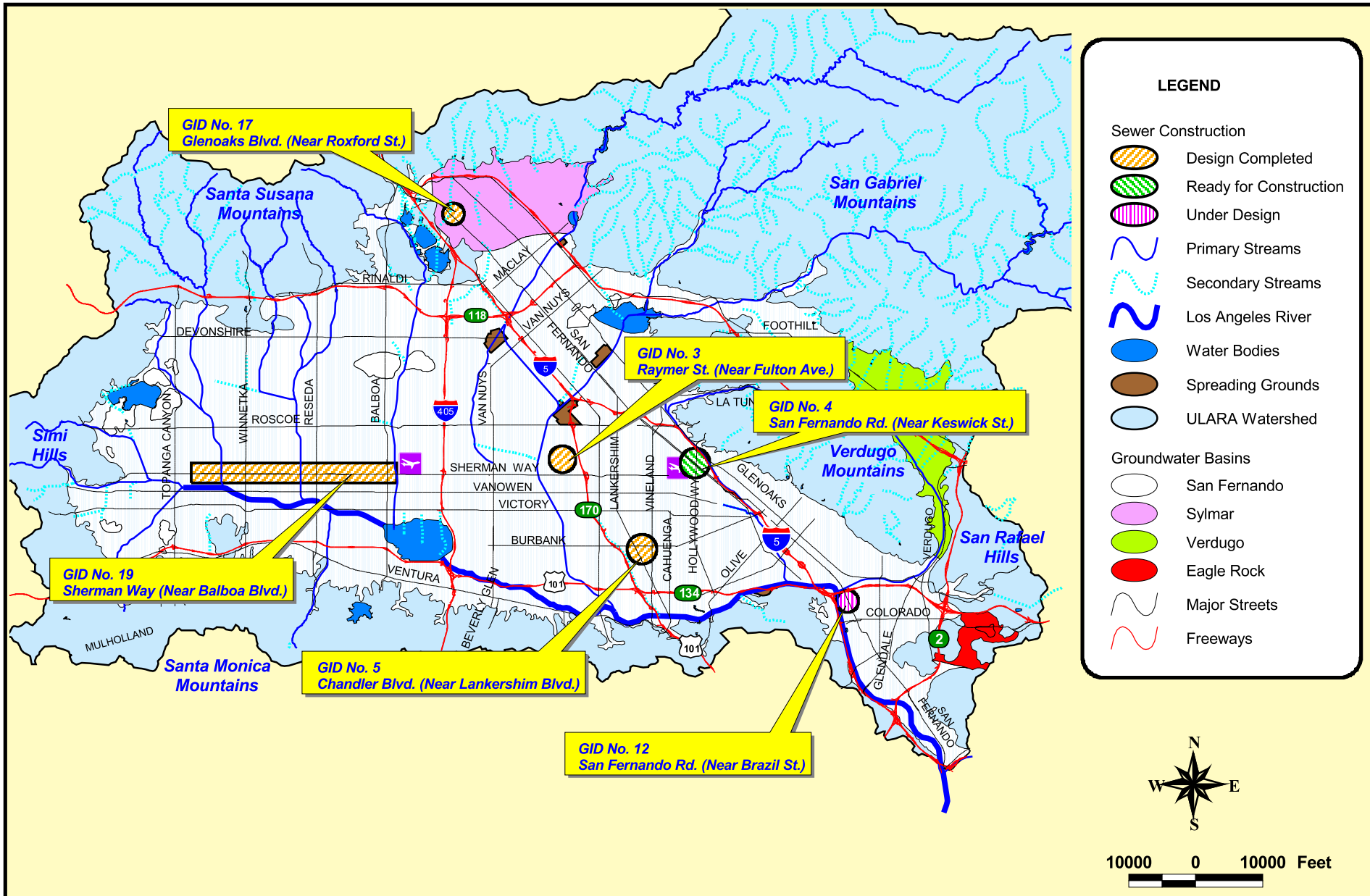
2013-14 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Location of Individual Producers	PLATE 3



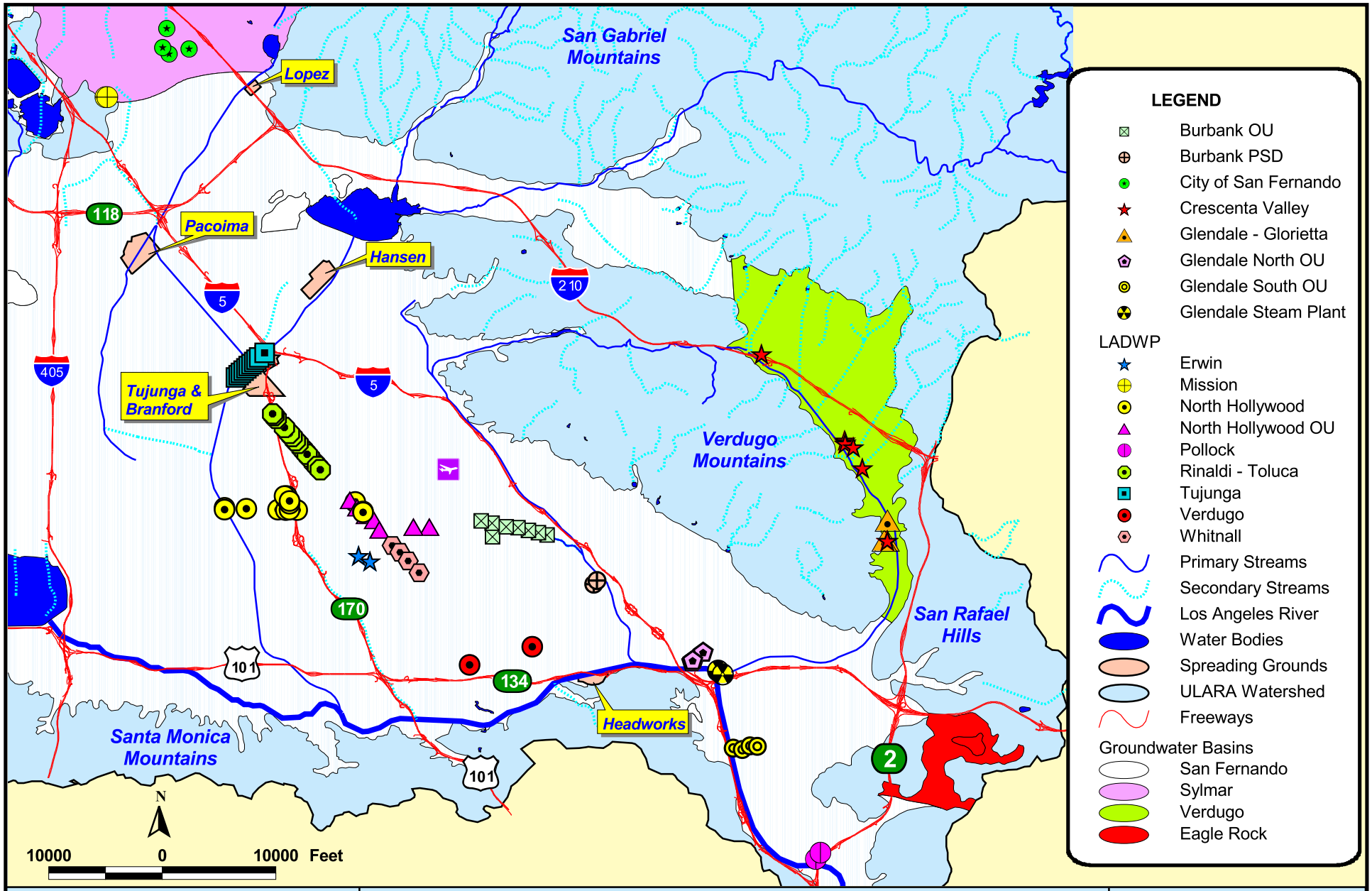
2013-14 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Components of Los Angeles River	PLATE 5



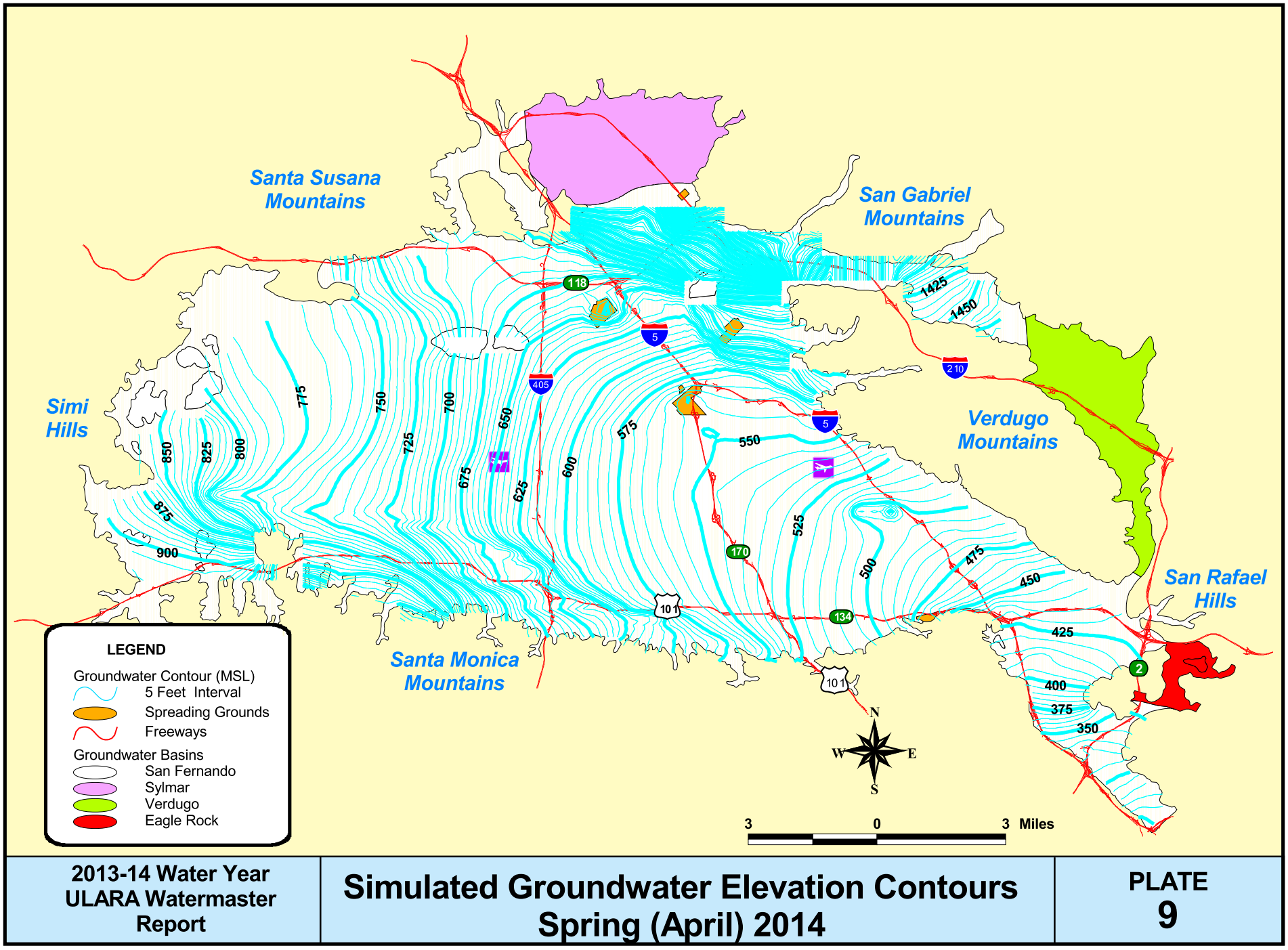
2013-14 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Landfill Locations	PLATE 6



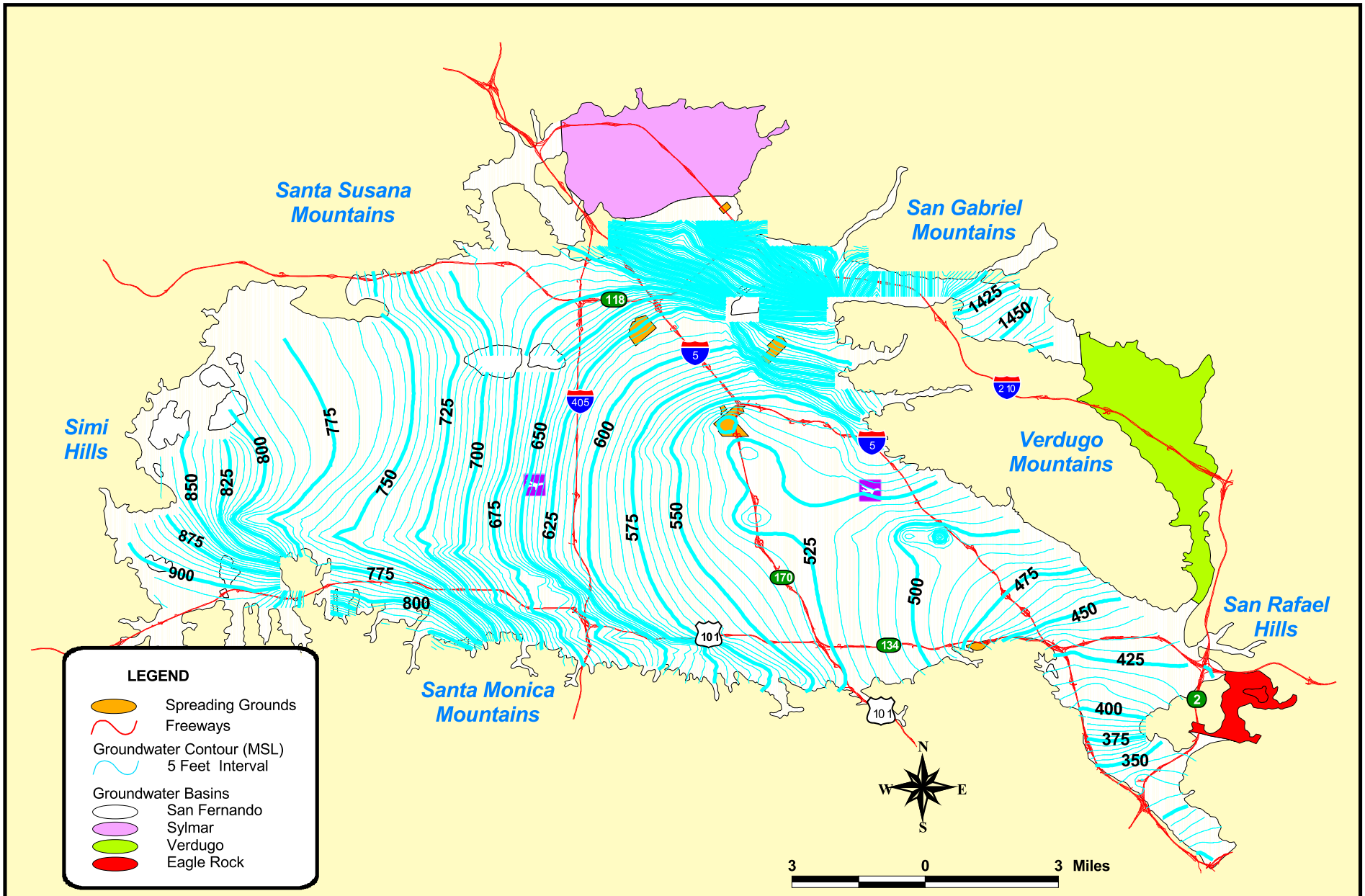
2013-14 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Los Angeles Bureau of Sanitation Sewer Construction Program for Commercial Parcels	PLATE 7



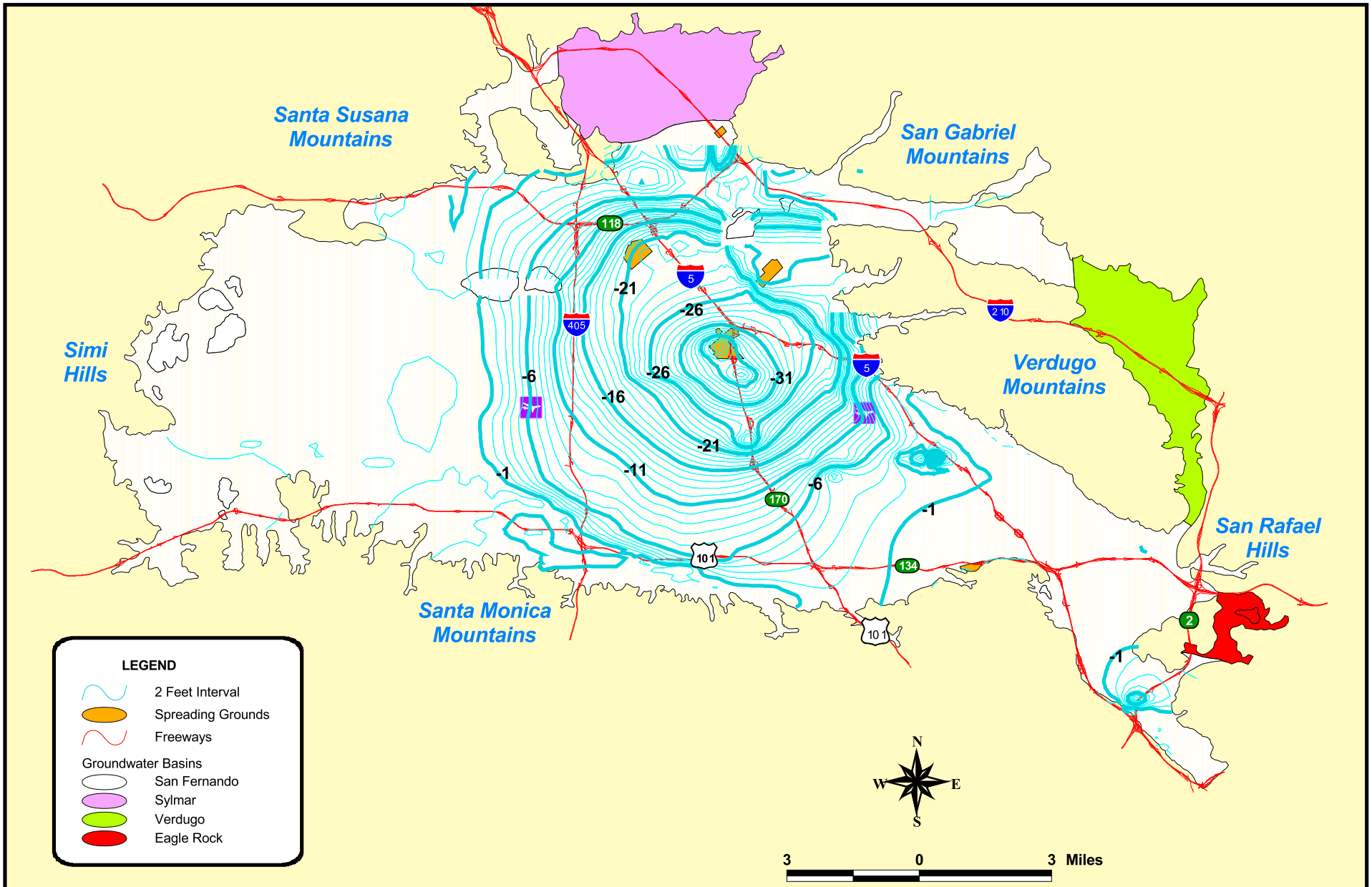
2013-14 Water Year ULARA Watermaster Report	**Upper Los Angeles River Area: Major Wellfields and Spreading Grounds**	**PLATE 8**



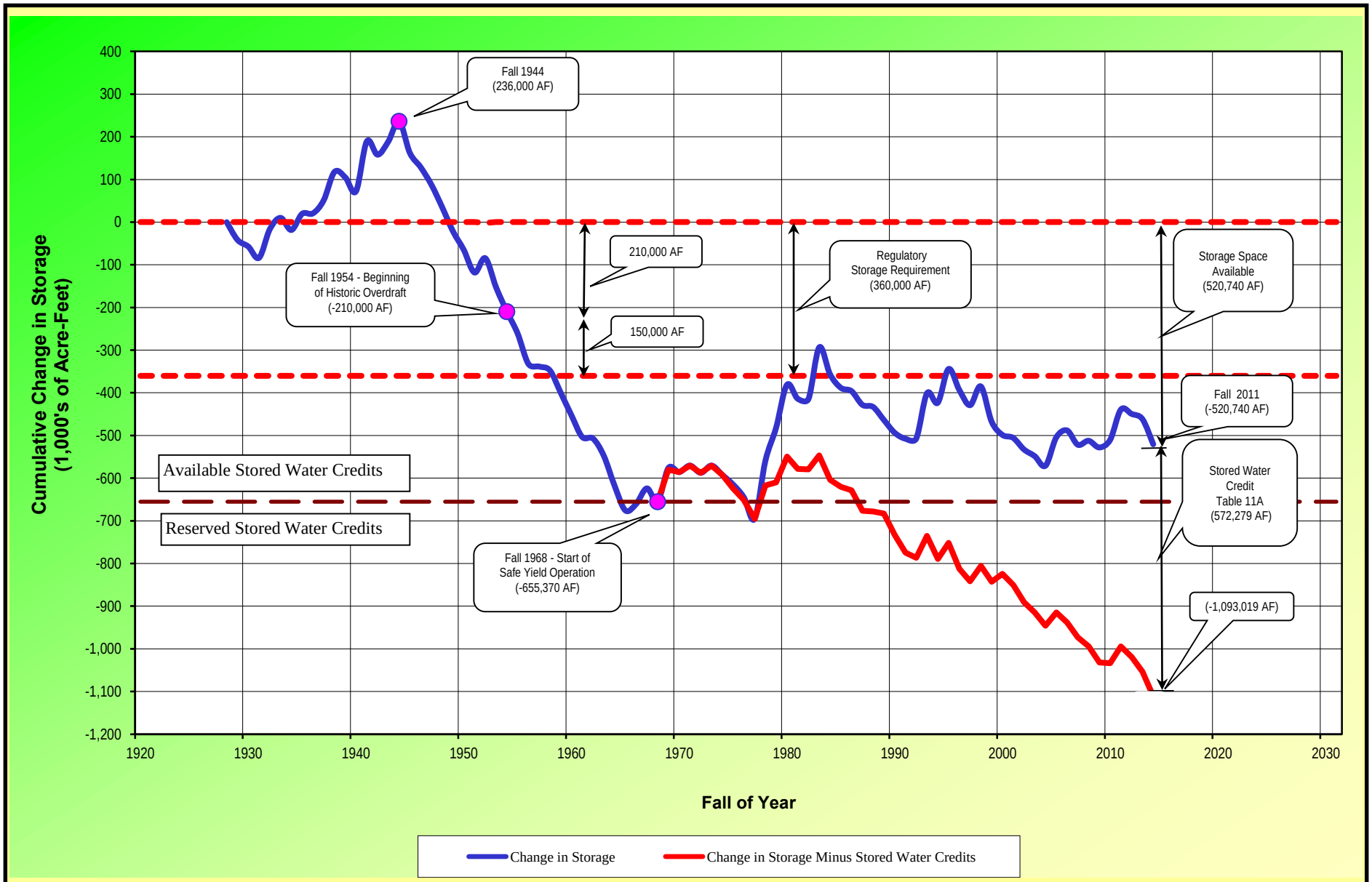
2013-14 Water Year ULARA Watermaster Report	Simulated Groundwater Elevation Contours Spring (April) 2014	PLATE 9



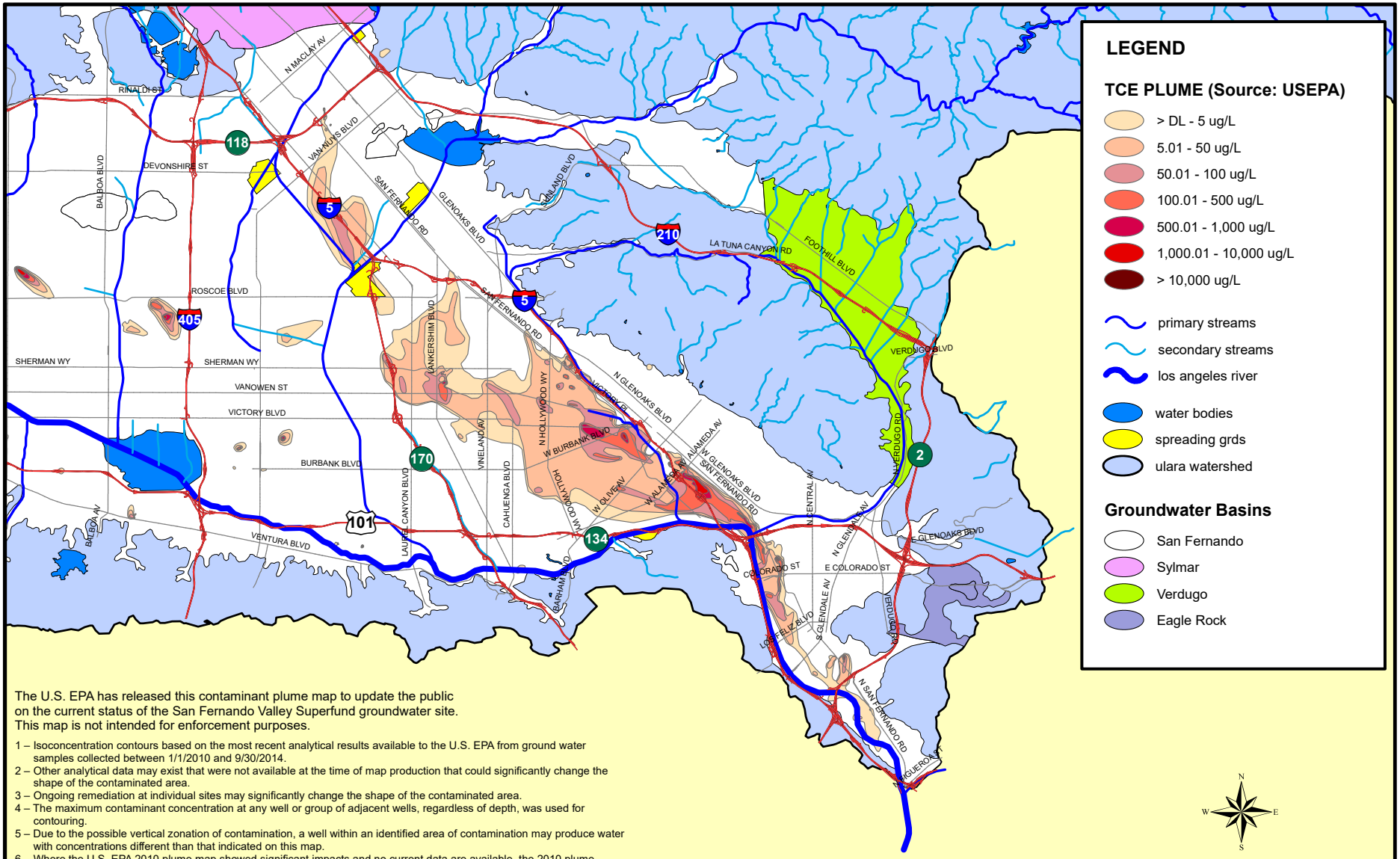
2013-14 Water Year ULARA Watermaster Report	Simulated Groundwater Elevation Contours Fall (September) 2014	PLATE 10



2013-14 Water Year ULARA Watermaster Report	Simulated Change in Groundwater Elevations Fall 2013 - Fall 2014	PLATE 11



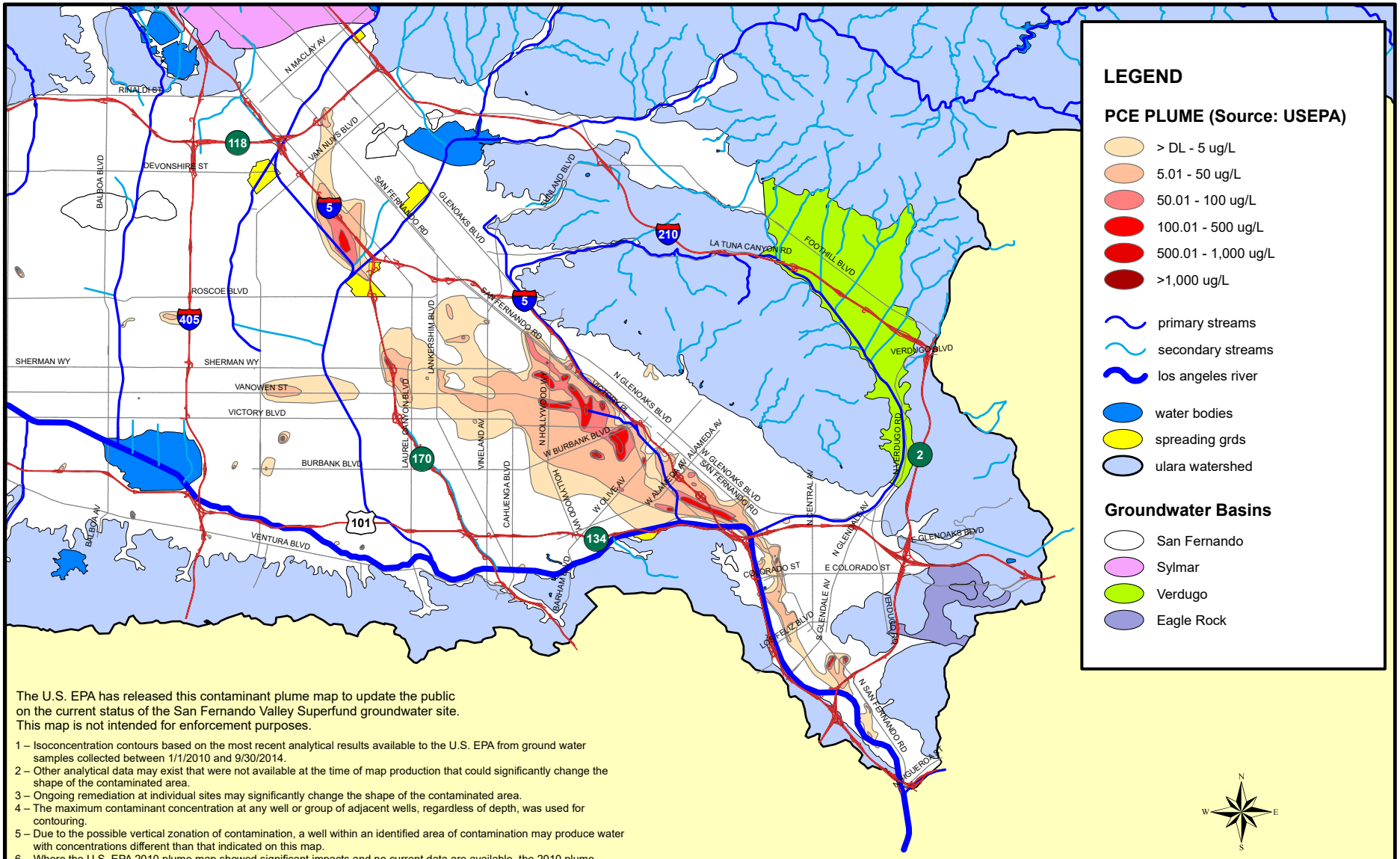
2013-14 Water Year ULARA Watermaster Report	**San Fernando Basin: Cumulative Change in Groundwater Storage**	**PLATE 13**



The U.S. EPA has released this contaminant plume map to update the public on the current status of the San Fernando Valley Superfund groundwater site. This map is not intended for enforcement purposes.

1 – Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from ground water samples collected between 1/1/2010 and 9/30/2014.
2 – Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3 – Ongoing remediation at individual sites may significantly change the shape of the contaminated area.
4 – The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
5 – Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
6 – Where the U.S. EPA 2010 plume map showed significant impacts and no current data are available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.
7 – Groundwater basin boundary is a combination of bulletin 118 boundaries and the one published by the Los Angeles County Department of Public Works.
8 – ug/L = micrograms per liter

2013-14 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: TCE Contamination (ug/L) 2014	PLATE 14



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1 – Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from ground water samples collected between 1/1/2010 and 9/30/2014.
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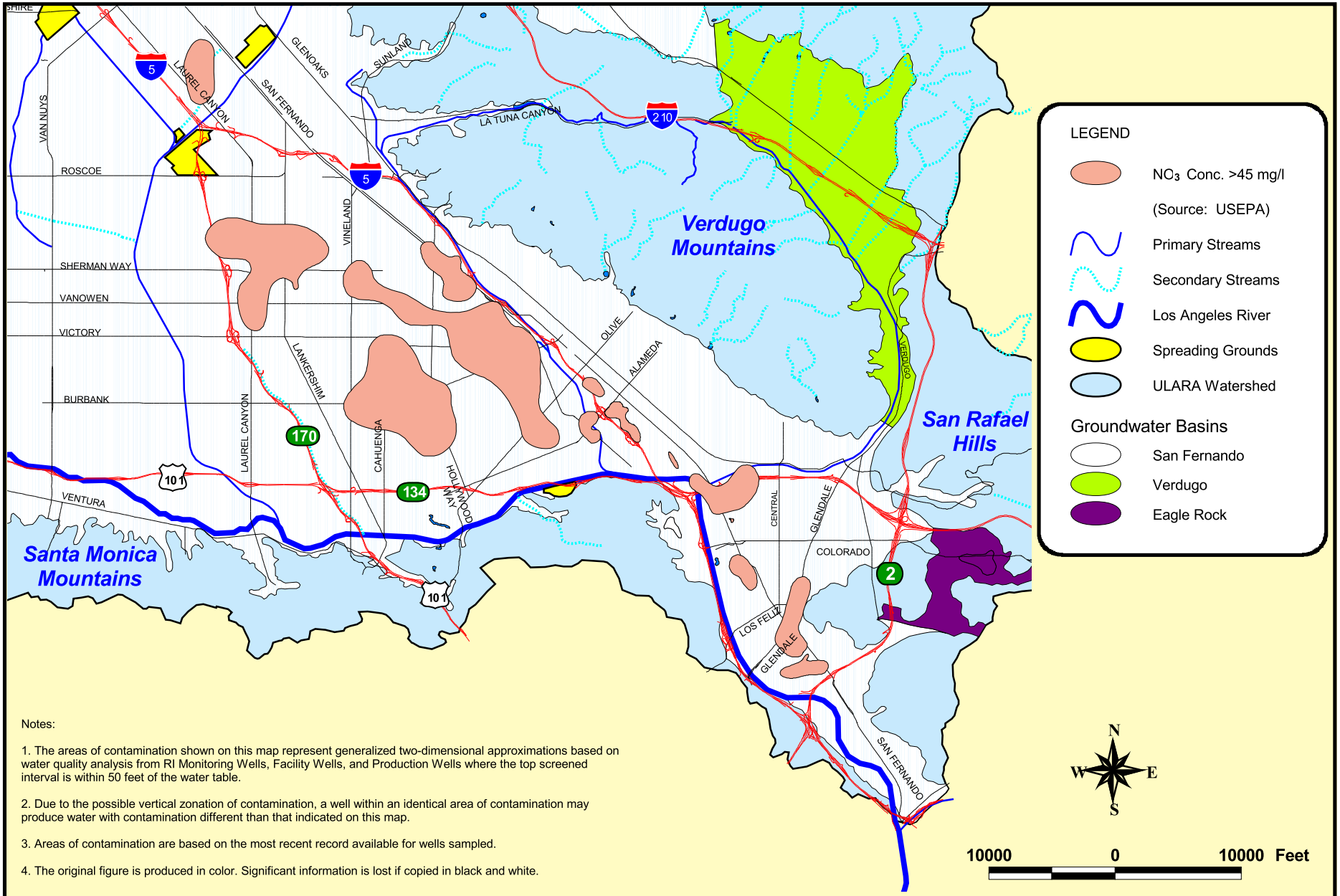
6 – Where the U.S. EPA 2010 plume map showed significant impacts and no current data are available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.
7 – Groundwater basin boundary is a combination of bulletin 118 boundaries and the one published by the Los Angeles County Department of Public Works.
8 – ug/L = micrograms per liter

2013-14 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: PCE Contamination (ug/L) 2014	PLATE 15



Notes:

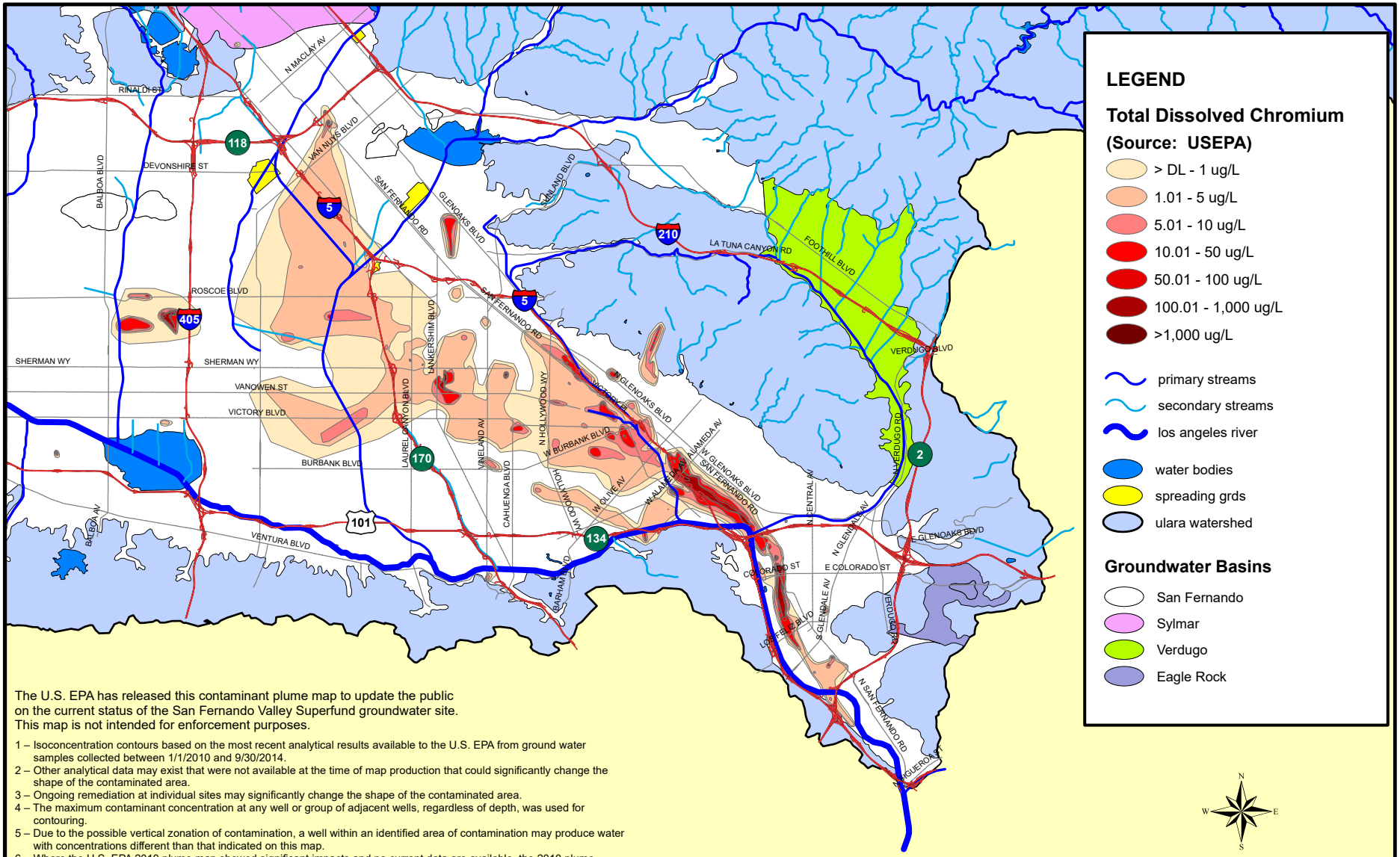
1. The areas of contamination shown on this map represent generalized two-dimensional approximations based on water quality analysis from RI Monitoring Wells, Facility Wells, and Production Wells where the top screened interval is within 50 feet of the water table.

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

3. Areas of contamination are based on the most recent record available for wells sampled.

4. The original figure is produced in color. Significant information is lost if copied in black and white.

2013-14 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: NO_3 Contamination (mg/L) in Shallow Zone 2010	PLATE 16



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1 – Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from ground water samples collected between 1/1/2010 and 9/30/2014.
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8 – ug/L = micrograms per liter

2013-14 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Total Dissolved Chromium Contamination (ug/L) 2014	PLATE 17

APPENDIX A
GROUNDWATER EXTRACTIONS

2013-14 WATER YEAR

(acre-feet)

LACDPW Well No.	Owner Well No.	2013 Oct.	Nov.	Dec.	2014 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin														
A. W. Warner Properties														
Plaza Six		0.65	0.63	0.69	0.64	0.73	0.71	0.75	0.82	0.70	0.59	0.56	0.59	8.06
A. W. Warner Properties														
Plaza Three		0.53	0.55	0.53	0.39	0.78	0.61	0.66	0.60	0.60	0.54	0.49	0.51	6.79
Angelica Healthcare Services				(abandoned 12/97)										
3934A	M050A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avalon Encino														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bally, Nico														
---	---	0.07	0.04	0.04	0.04	0.05	0.05	0.07	0.08	0.07	0.07	0.07	0.06	0.71
BFI Sunshine Canyon Landfill														
---	---	6.51	5.24	6.14	8.71	5.20	6.27	5.70	4.89	5.06	5.53	5.58	5.27	70.09
Boeing (Rockwell International No further pumping until 2000)														
---	E-1 to E-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Boeing Santa Susana Field Laboratory														
Delta	WS-09A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	RD-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	RD-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Burbank, City of														
3841C	6A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3882P	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.60
3851E	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3851K	13A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3882T	15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.60
3841G	18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	0.00	0.00	0.00	1.20
Burbank Operable Unit														
3871L	VO-1	87.57	45.08	48.67	81.55	42.30	39.58	75.23	91.87	121.47	92.10	119.26	125.41	970.09
3861G	VO-2	119.68	128.30	84.73	57.73	94.19	55.40	94.27	141.24	154.41	125.91	143.24	141.65	1,340.75
3861K	VO-3	51.41	43.81	47.85	53.05	29.11	46.86	38.28	41.94	97.49	85.47	67.02	66.44	668.73
3861L	VO-4	120.22	66.65	132.27	123.11	105.94	119.58	87.82	98.95	22.06	0.00	0.00	129.97	1,006.57
3850X	VO-5	135.95	195.58	130.18	63.94	102.69	60.20	94.79	138.29	132.35	142.00	137.87	71.76	1,405.60
3850Z	VO-6	123.21	0.08	45.43	187.31	92.96	90.81	78.11	130.21	105.02	150.79	175.33	126.11	1,305.37
3850AB	VO-7	180.49	175.69	120.30	62.62	63.54	113.83	152.80	135.60	135.69	155.21	158.39	118.40	1,572.56
3851C	V0-8	191.78	164.66	163.71	177.67	145.90	178.57	159.39	148.02	112.78	122.07	174.31	139.84	1,878.70
	Total:	1,010.31	819.85	773.14	806.98	676.63	704.83	780.69	926.12	881.27	873.55	975.42	919.58	10,148.37
Douglas Emmett Management, LLC (Trillium)														
Well #1	---	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	1.82	2.86
Well #2	---	0.40	0.28	1.28	1.34	1.24	1.49	0.01	0.01	0.17	0.39	0.82	0.07	7.50
	Total:	1.40	0.28	1.28	1.34	1.24	1.49	0.01	0.01	0.18	0.40	0.84	1.89	10.36
Fassberg Construction														
N/A		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
First Financial Plaza Site														
N/A	F.F.P.S.	0.75	0.88	0.90	0.99	1.20	1.80	1.47	0.78	1.15	0.77	0.82	0.90	12.41
Forest Lawn Memorial Park														
3947B	3	0.01	0.05	0.00	0.00	0.00	0.00	6.71	17.95	17.60	14.95	18.48	11.66	87.41
3947C	4	0.01	0.05	0.00	0.00	0.00	0.00	7.42	23.17	20.29	17.67	21.81	13.45	103.87
3947M	8	11.78	0.28	0.00	0.00	0.00	0.00	0.00	16.81	1.19	57.73	78.71	40.89	207.39
	Total:	11.80	0.38	0.00	0.00	0.00	0.00	14.13	57.93	39.08	90.35	119.00	66.00	398.67
San Fernando Basin (cont'd)														
Glendale, City of														
3924N	STPT 1	0.00	3.43	0.00	0.00	0.11	0.00	1.10	0.00	0.16	0.26	2.76	1.34	9.16
3924R	STPT 2	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
GVENT	GVENT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total:	0.02	3.43	0.00	0.00	0.11	0.00	1.10	0.00	0.16	0.26	2.76	1.34	9.18
Glendale North/South														

I found no inconsistencies here.

	GN-1	99.12	79.41	83.60	99.66	80.20	107.70	10.24	0.00	86.07	88.99	87.89	91.63	914.51
	GN-2	99.58	78.33	83.84	99.77	66.75	3.51	97.63	73.82	94.65	88.95	86.84	90.63	964.30
	GN-3	54.80	44.82	47.52	48.63	36.58	42.22	1.67	1.81	2.88	47.30	51.65	50.66	430.54
	GN-4	213.83	205.85	209.90	208.46	185.93	205.78	155.13	19.94	126.99	210.30	214.11	209.58	2,165.80
	GS-1	50.56	48.16	48.34	50.35	43.16	33.26	0.23	1.27	0.93	45.85	44.79	45.70	412.60
	GS-2	73.18	67.84	73.52	65.79	58.29	78.34	78.11	83.11	77.49	69.11	65.89	65.58	856.25
	GS-3	50.64	52.62	53.77	46.35	52.67	49.82	53.98	59.27	55.50	59.45	59.63	58.03	651.73
	GS-4	73.20	67.21	74.18	65.61	57.81	76.73	75.21	79.56	72.21	66.10	63.11	64.70	835.63
	Total:	714.91	644.24	674.67	684.62	581.39	597.36	472.20	318.78	516.72	676.05	673.91	676.51	7,231.36
Greiff Fabrics														
----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grigsby, Wood														
----	-----	0.05	0.02	0.02	0.02	0.02	0.02	0.04	0.04	0.04	0.04	0.05	0.05	0.41
Hallelujah Prayer Center of USA (Hathaway - successor to deMille)														
----	1	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	2.64
	2	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	6.84
	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total:	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	9.48
Home Depot U.S.A., Inc.														
----		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Honeywell International, Inc.														
----		17.42	18.22	15.27	17.30	13.61	16.15	18.19	16.80	17.16	16.75	14.39	5.83	187.09
Jose Diaz (010022)														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Khatcher Atamian (010006)														
----		0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.13
Lopez-Zamarripa (010007T)														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Menasco/Coltec Site														
---	---	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Mercedes Benz of Encino (Auto Stiegler)														
---	---	0.10	0.10	0.10	0.02	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.37
Metropolitan Transportation Authority														
---	1065	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
---	1075	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
---	1130	0.21	0.21	0.21	0.21	0.21	0.21	0.17	0.17	0.17	0.17	0.17	0.17	2.28
---	1140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
---	1150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
---	1070	3.21	3.21	3.21	3.21	3.21	3.21	2.80	2.80	2.80	2.80	2.80	2.80	36.06
---	1133	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total:	3.42	3.42	3.42	3.42	3.42	3.42	2.97	2.97	2.97	2.97	2.97	2.97	38.34

San Fernando Basin (cont'd)

Metropolitan Water District														
	Jensen	10.10	9.50	9.80	10.00	9.60	10.10	9.60	9.80	8.70	9.00	9.00	8.20	113.40
Micro Metics														
JEW	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JEW	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Middle Ranch (Successor to deMille)														
4931 x	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4940-1	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
new	5	0.00	0.00	0.00	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.11
4940-3	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4940-2	7	0.19	0.29	0.15	0.12	0.06	0.17	0.13	0.13	0.14	0.15	0.11	0.08	1.72
new	8	0.27	0.01	0.01	0.01	0.01	0.01	0.01	0.16	0.17	0.57	0.49	0.50	2.22
	Spring 1& 2	0.02	0.02	0.02	0.03	0.01	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.23
	Total	0.48	0.32	0.18	0.17	0.09	0.22	0.17	0.32	0.34	0.75	0.63	0.61	4.28
Mobil Oil Corporation														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(NEIS) Northeast Interceptor Sewer City of LA BOS														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Raytheon (Formerly Hughes Missile Systems)														
----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Quaranto, John (010004)														

----	----	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
Sears Roebuck & Co. (Well disconnected 10/2000)														
3945	3945	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sportsmen's Lodge														
3785A	1	0.43	0.42	0.43	0.43	0.39	0.28	0.55	0.87	0.34	0.19	0.25	0.30	4.86
Stallcup, Jackson & Susan (010021)														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3M-Pharmaceuticals														
---	---	2.50	2.37	1.87	3.14	2.47	3.05	2.84	3.17	2.22	1.60	3.31	0.00	28.54
Tesoro Petroleum Corporation														
---	MW-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Toluca Lake Property Owners Association														
3845F	3845F	0.24	3.47	1.14	1.71	2.00	1.07	5.94	4.91	4.70	4.13	5.55	5.17	40.03
Valhalla Memorial Park and Mortuary														
3840K	4	22.77	20.34	20.94	37.47	15.26	14.94	40.63	38.29	49.40	54.37	49.96	52.55	416.92
Vulcan Materials														
4916(x)	3	14.37	12.15	8.85	11.94	10.19	15.22	14.07	11.13	14.33	14.12	13.85	12.73	152.95
4916A	2	13.50	10.59	7.94	10.12	8.70	12.68	11.84	9.57	12.13	12.42	12.37	11.56	133.42
4916	1	24.18	20.25	14.90	19.40	17.50	26.87	25.13	19.69	25.66	25.58	23.40	23.76	266.32
Sheldon Pond		64.84	55.80	43.86	57.67	53.38	72.89	75.11	58.20	53.55	48.76	30.57	24.54	639.17
	Total:	116.89	98.79	75.55	99.13	89.77	127.66	126.15	95.59	105.67	100.88	80.19	72.59	1,191.86

San Fernando Basin (cont'd)

Waste Management Disposal Services of Calif.														
4916D		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Walt Disney Pictures and Television														
3874E	EAST	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3874F	WEST	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3874G	NORTH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Walt Disney Riverside Building														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waterworks District No. 21														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wildlife Waystation														
Rehab Canyon		0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Foreman Hill Spring		0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
	Total:	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Los Angeles, City of														
Aeration (A)														
3800E	A-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810U	A-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810V	A-3	0.00	0.00	0.00	0.00	1.29	0.00	0.00	0.00	0.02	0.07	0.00	0.00	1.38
3810W	A-4	0.00	0.00	0.00	0.00	1.79	11.18	12.21	8.61	16.76	0.00	0.00	0.00	50.55
3820H	A-5	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.02
3821J	A-6	0.00	0.00	0.00	0.00	23.32	32.07	39.97	25.62	55.67	20.41	40.38	49.08	286.52
3830P	A-7	0.00	0.00	0.00	0.00	27.30	40.29	46.90	28.51	58.52	20.91	39.33	42.54	304.30
3831K	A-8	0.00	0.00	0.00	0.00	29.84	42.49	49.79	30.03	64.19	20.84	41.35	46.83	325.36
	A Total:	0.00	0.00	0.00	0.00	83.54	126.03	148.89	92.77	195.16	62.23	121.06	138.45	968.13
Erwin (E)														
3831H	E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821I	E-2A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3831G	E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821F	E-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3831F	E-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821H	E-6	0.14	0.18	0.23	0.14	0.21	0.11	0.00	0.00	0.00	0.00	0.00	0.00	1.01
3811F	E-10	0.23	0.37	0.23	0.18	0.48	0.18	0.00	0.00	0.00	0.00	0.00	0.00	1.67
	E Total:	0.37	0.55	0.46	0.32	0.69	0.29	0.00	0.00	0.00	0.00	0.00	0.00	2.68
Headworks (H)	Inactive Well Field													
3893Q	H-27A	---	---	---	---	---	---	---	---	---	---	---	---	0.00
3893R	H-28A	---	---	---	---	---	---	---	---	---	---	---	---	0.00
3893S	H-29A	---	---	---	---	---	---	---	---	---	---	---	---	0.00
3893T	H-30A	---	---	---	---	---	---	---	---	---	---	---	---	0.00
	H Total:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

North Hollywood (NH)														
3800	NH-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3780A	NH-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.51	50.71	140.08	188.22	407.52
3770	NH-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810	NH-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810A	NH-13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810B	NH-14A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3790B	NH-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3820D	NH-16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3820C	NH-17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3820B	NH-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3830D	NH-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3830C	NH-20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3830B	NH-21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3790C	NH-22	0.00	0.00	0.00	0.00	61.64	0.16	0.00	65.15	251.22	84.27	230.74	308.17	1,001.35
3790D	NH-23	0.00	0.00	0.00	0.00	93.00	0.09	0.00	0.51	144.38	125.34	342.70	297.27	1,003.29
3800C	NH-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3790F	NH-25	0.00	0.00	0.00	0.07	116.80	132.48	237.19	322.75	162.63	52.53	144.01	201.61	1,370.07
3790E	NH-26	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.32	199.01	88.48	237.44	310.86	836.34
3820F	NH-27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810K	NH-28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810L	NH-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3800D	NH-30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3770C	NH-32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.68	51.77	145.36	207.39	438.20
3780C	NH-33	0.00	0.00	0.00	0.00	82.81	132.39	248.92	115.52	103.33	32.69	5.49	0.00	721.15
3790G	NH-34	0.00	0.00	0.32	0.39	86.66	137.58	262.33	212.28	187.01	68.32	187.21	249.70	1,391.80
3830N	NH-35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3790H	NH-36	364.12	128.47	0.30	135.77	131.43	0.00	0.00	76.79	296.28	97.41	254.94	292.19	1,777.70
3790J	NH-37	334.57	54.87	0.71	0.00	0.32	187.86	352.46	265.91	230.30	73.39	195.09	249.75	1,945.23
3810M	NH-38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810N	NH-39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810P	NH-40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810Q	NH-41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810R	NH-42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3790K	NH-43A	0.41	0.00	0.44	0.00	0.34	0.37	0.00	51.29	0.00	0.00	116.37	430.81	600.03
3790L	NH-44	476.58	78.67	0.37	0.00	161.43	0.00	0.00	388.73	379.84	129.09	357.64	483.17	2,455.52
3790M	NH-45	281.04	121.46	0.41	214.05	0.46	0.44	0.00	492.36	459.89	154.16	422.68	574.79	2,721.74
	NH Total:	1,456.72	383.47	2.55	350.28	734.89	591.37	1,101.13	1,991.61	2,476.08	1,008.16	2,779.75	3,793.93	16,669.94
Pollock (P)														
3959E	P-4	0.12	148.19	201.40	187.06	158.67	0.00	0.00	104.23	174.14	175.66	172.28	169.14	1,490.89
3958H	P-6	0.00	70.10	91.22	179.58	156.92	0.00	0.00	0.00	156.38	179.78	167.48	87.58	1,089.04
3958J	P-7	---	---	---	---	---	---	---	---	---	---	---	---	0.00
	P Total:	0.12	218.29	292.62	366.64	315.59	0.00	0.00	104.23	330.52	355.44	339.76	256.72	2,579.93
						San Fernando Basin (cont'd)								
Rinaldi-Toluca (RT)														
4909E	RT-1	0.46	0.44	0.39	0.39	0.53	0.51	0.00	0.64	0.55	0.60	0.92	1.01	6.44
4898A	RT-2	0.57	0.55	0.00	0.00	0.78	0.73	0.00	0.46	33.08	263.52	644.61	463.73	1,408.03
4898B	RT-3	13.82	0.48	0.55	0.00	48.39	0.41	0.00	2.92	147.36	229.25	537.01	327.50	1,307.69
4898C	RT-4	0.62	0.37	0.25	0.00	46.35	0.92	0.00	347.73	648.39	84.69	451.01	298.88	1,879.21
4898D	RT-5	0.46	0.51	46.30	0.00	288.61	321.37	595.78	369.49	592.86	212.97	483.38	325.83	3,237.56
4898E	RT-6	541.05	177.78	43.69	251.79	274.77	268.07	458.59	257.58	387.26	134.00	316.39	200.48	3,311.45
4898F	RT-7	0.48	0.46	0.46	0.00	47.36	0.60	0.00	329.66	607.85	233.84	71.49	363.31	1,655.51
4898G	RT-8	0.46	0.44	0.32	0.00	234.87	297.25	552.66	341.80	561.25	212.47	525.71	206.86	2,934.09
4898H	RT-9	302.87	16.94	0.32	266.18	298.71	335.42	620.57	388.75	641.37	244.61	604.43	439.99	4,160.16
4909G	RT-10	0.57	0.55	0.00	0.00	0.64	1.74	0.00	0.44	0.83	0.44	0.48	1.77	7.46
4909K	RT-11	0.48	0.48	0.48	0.51	0.67	0.64	0.00	0.64	0.46	0.44	32.05	1.19	38.04
4909H	RT-12	0.53	0.51	0.51	0.73	0.57	0.62	0.00	0.80	0.51	0.57	0.46	2.96	8.77
4909J	RT-13	0.53	0.60	0.57	0.90	0.51	0.55	0.00	0.53	0.46	0.51	0.00	1.42	6.58
4909L	RT-14	0.46	0.46	0.41	0.69	0.62	0.60	0.00	0.60	0.39	0.39	0.00	0.48	5.10
4909M	RT-15	0.05	0.05	0.05	0.05	0.07	0.05	0.00	0.05	0.05	0.05	0.00	0.07	0.54
	RT Total:	863.41	200.62	94.30	521.24	1,243.45	1,229.48	2,227.60	2,042.09	3,622.67	1,618.35	3,667.94	2,635.48	19,966.63
Tujunga (T)														
4887C	T-1	660.31	171.74	0.00	472.75	546.67	654.36	593.04	505.88	720.82	223.94	615.01	592.56	5,757.08
4887D	T-2	0.00	0.00	0.00	0.00	0.00	296.99	622.02	530.33	755.56	234.55	646.46	643.89	3,729.80
4887E	T-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	526.95	232.35	640.50	622.06	2,021.97
4887F	T-4	0.00	0.00	0.00	0.00	164.83	2.27	0.76	0.80	560.65	221.76	610.72	607.39	2,169.18
4887G	T-5	328.01	166.55	0.00	146.19	535.28	624.72	226.91	0.73	261.80	225.46	603.63	572.70	3,691.98
4887H	T-6	647.27	509.76	465.01	503.26	545.87	645.27	602.13	490.06	664.65	191.37	523.46	534.44	6,322.55
4887J	T-7	551.70	429.36	381.82	416.32	464.26	540.61	531.52	422.02	606.38	189.74	519.47	518.39	5,571.59
4887K	T-8	0.57	0.37	0.00	0.71	0.53	1.58	5.92	0.44	23.42	0.46	453.47	587.01	1,074.48
4886B	T-9	3,573.97	518.04	458.08	34.60	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,585.47
4886C	T-10	4.45	0.73	0.00	0.73	0.73	1.49	0.00	1.49	1.49	0.00	0.73	0.00	11.84
4886D	T-11	2.09	0.69	0.00	0.69	0.00	0.00	0.00	1.38	0.69	0.00	1.40	0.00	6.94
4886E	T-12	634.46	461.55	0.00	0.00	409.09	0.73	0.00	0.73	337.70	230.58	642.65	643.39	3,360.88
	T Total:	6,402.83	2,258.79	1,304.91	1,575.25	2,668.04	2,768.02	2,582.30	1,953.97	4,460.11	1,750.21	5,257.50	5,321.83	38,303.76
Verdugo (V)														
3863H	V-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3863P	V-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3863J	V-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3863L	V-11	152.94	53.40	0.16	0.32	0.62	0.32	0.00	0.00	0.00	0.00	0.00	0.00	207.76
3853G	V-13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3854F	V-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3844R	V-24	0.00	0.00	0.00	148.69	200.16	114.26	182.23	0.00	0.00	0.00	0.00	0.00	645.34
	V Total:	152.94	53.40	0.16	149.01	200.78	114.58	182.23	0.00	0.00	0.00	0.00	0.00	853.10
						San Fernando Basin (cont'd)								
Whitnall (W)														
3820E	W-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821B	W-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821C	W-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821D	W-4	245.06	0.37	0.30	0.28	0.25	0.11	0.00	0.00	0.00	0.00	0.00	0.00	246.37
3821E	W-5	173.44	0.21	0.44	0.16	0.07	0.23	0.00	0.23	0.00	0.00	0.00	0.00	174.78
3831J	W-6A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3832K	W-7	0.18	0.11	0.16	0.09	0.76	1.12	0.00	0.00	0.00	0.00	0.00	0.00	2.42
3832L	W-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3832M	W-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3842E	W-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	W Total:	418.68	0.69	0.90	0.53	1.08	1.46	0.00	0.23	0.00	0.00	0.00	0.00	423.57
	Los Angeles, City of Total:	9,295.07	3,115.81	1,695.90	2,963.27	5,248.06	4,831.23	6,242.15	6,184.90	11,084.54	4,794.39	12,166.01	12,146.41	79,767.74
	San Fernando Basin Total:	11,217.30	4,749.10	3,282.81	4,640.58	6,652.83	6,322.06	7,726.81	7,668.47	12,723.07	6,633.99	14,112.58	13,968.15	99,700.74
						Sylmar Basin								
Los Angeles, City of														
Plant	Mission	---	---	---	---	---	---	---	---	---	---	---	---	0.00
4840J	5	---	---	---	---	---	---	---	---	---	---	---	---	0.00
4840K	6	0.00	0.00	115.01	165.61	146.19	48.83	168.23	22.80	0.00	0.30	0.00	0.00	666.97
4840S	7	0.00	0.00	0.00	0.55	0.23	0.18	0.00	0.00	0.00	0.37	0.00	0.00	1.33
		0.00	0.00	115.01	166.16	146.42	49.01	168.23	22.80	0.00	0.67	0.00	0.00	668.30
Santiago Estates														
5998	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						Sylmar Basin (cont'd)								
San Fernando, City of														
5969D	2A	267.33	228.79	212.62	229.61	183.98	215.05	230.05	275.06	277.84	290.24	290.60	268.72	2,969.89
5959	3	0.12	0.00	0.00	0.15	0.00	0.00	0.15	0.04	0.00	0.15	0.00	0.03	0.64
5969	4	29.31	26.29	30.92	28.40	27.18	26.72	32.04	37.15	35.25	39.53	30.50	38.41	381.70
5968	7A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total:	296.76	255.08	243.54	258.16	211.16	241.77	262.24	312.25	313.09	329.92	321.10	307.16	3,352.23
	Sylmar Basin Total:	296.76	255.08	358.55	424.32	357.58	290.78	430.47	335.05	313.09	330.59	321.10	307.16	4,020.53
						Verdugo Basin								
Crescenta Valley County Water District														
5058B	1	11.96	0.00	17.12	18.28	12.41	15.53	16.80	19.27	21.39	11.85	10.07	7.78	162.46
5036A	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5058H	5	39.23	38.18	38.68	37.02	31.85	34.43	8.78	0.00	26.15	62.77	62.48	55.63	435.20
5058	6	10.70	9.57	10.55	11.28	9.89	9.88	9.98	7.06	5.39	4.36	4.29	3.21	96.16
5047B	7	35.33	25.24	31.85	35.45	27.13	30.84	34.18	33.52	35.53	33.88	31.45	28.64	383.04
5069J	8	23.92	22.89	23.50	23.89	20.73	22.74	21.04	19.25	6.72	0.00	0.11	32.43	217.22
5047D	9	14.63	12.66	12.38	5.33	0.00	11.76	15.11	14.91	15.10	14.03	13.76	12.34	142.01
5058D	10	29.06	27.91	27.44	27.65	24.38	26.24	17.78	24.54	17.12	14.68	11.08	10.12	258.00
5058E	11	16.91	16.26	16.65	16.26	14.34	14.87	14.35	16.41	16.47	15.75	16.35	11.51	186.13
5058J	12	0.00	0.00	0.02	0.00	0.00	0.00	0.89	9.60	14.04	12.58	11.14	11.82	60.09
5069F	14	20.30	21.24	20.55	22.44	19.57	22.03	21.03	22.20	23.24	21.49	21.28	20.72	256.09
	15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PICKENS (CVWD)	4.23	4.00	4.08	4.11	3.75	4.18	4.18	4.17	4.09	4.33	4.36	4.19	49.67
	Total:	206.27	177.95	202.82	201.71	164.05	192.50	164.12	170.93	185.24	195.72	186.37	198.39	2,246.07
Knowltons														
	PICKENS	0.82	0.82	0.82	0.96	0.74	0.74	0.74	0.74	0.80	0.82	0.82	0.82	9.64
Glendale, City of														
3961-3971	GL-3-4	55.32	80.56	68.72	55.74	69.14	71.57	61.30	58.20	56.93	53.33	56.91	54.51	742.23
3970	GL-6	57.83	47.24	44.66	43.06	37.67	35.85	35.89	35.97	37.15	33.92	36.72	34.52	480.48
---	VPCKP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
---	MM-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	FHM	15.73	15.56	15.44	14.96	12.79	14.44	13.44	13.92	13.76	13.77	13.41	12.99	170.21
	Total:	128.88	143.36	128.82	113.76	119.60	121.86	110.63	108.09	107.84	101.02	107.04	102.02	1,392.92
	Verdugo Basin Total:	335.97	322.13	332.46	316.43	284.39	315.10	275.49	279.76	293.88	297.56	294.23	301.23	3,648.63
							Eagle Rock Basin							
Sperkletts														
3987A	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3987B	2	4.76	5.24	3.13	4.97	3.88	6.28	4.75	5.21	3.57	5.45	5.85	5.50	58.59
3987F	3	3.18	3.33	2.14	3.43	2.46	4.22	3.02	3.42	2.21	4.00	3.52	3.89	38.82
3987G	4	8.91	9.34	6.23	10.05	6.89	8.87	11.75	9.73	6.31	12.20	9.95	11.50	111.73
	Total:	16.85	17.91	11.50	18.45	13.23	19.37	19.52	18.36	12.09	21.65	19.32	20.89	209.14
	Eagle Rock Basin Total:	16.85	17.91	11.50	18.45	13.23	19.37	19.52	18.36	12.09	21.65	19.32	20.89	209.14
	ULARA Total:	11,866.88	5,344.22	3,985.32	5,399.78	7,308.03	6,947.31	8,452.29	8,301.64	13,342.13	7,283.79	14,747.23	14,597.43	107,579.04

APPENDIX B
KEY GAGING STATIONS OF SURFACE RUNOFF

Los Angeles County Dept of Public Works

USDAY V91 Output 10/20/2014

Summary Report

Site: F57C Los Angeles River Above Arroyo Seco
USGS #:
Beginning Date: 10/01/2013
Ending Date: 09/30/2014

Daily Mean Discharge in Cubic feet/second Water Year Oct 2013 to Sep 2014

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	105F	107F	97.1F	98.6F	91.0F	6330F	351	97.5	112	116	84.3	93.4
2	106F	108F	94.6F	99.0F	91.2F	1220F	158	98.9	112	116	84.8	94.4
3	107F	108F	92.1F	99.5F	90.6F	96.7F	123	101	112	115	85.5	95.5
4	108F	109F	89.8F	99.9F	90.0F	96.7F	129	104	112	114	85.8	95.2
5	108F	109F	87.9F	100F	109F	96.7F	122	106	112	112	86.4	91.5
6	109F	110F	87.8F	101F	329F	96.7F	116	107	110	111	86.9	86.2
7	110F	110F	88.1F	101F	226F	96.7F	108	107	107	109	87.4	81.4
8	111F	111F	88.4F	100F	112F	96.7F	89.3	107	105	108	87.7	90.6
9	112F	111F	88.8F	91.5F	97.8F	96.7F	79.1	107	102	106	88.0	79.0
10	112F	111F	89.1F	88.8F	96.3F	96.7F	79.1	107	99.6	105	88.3	84.6
11	112F	112F	89.5F	86.3F	94.9F	96.7F	79.2	107	97.0	104	88.5	87.0
12	111F	112F	89.9F	84.0F	93.4F	96.7F	81.7	107	95.6	104	88.8	90.7
13	110F	108F	90.3F	81.7F	92.2F	96.7F	84.3	107	97.0	104	89.1	91.0
14	109F	104F	90.8F	79.4F	93.9F	96.7F	86.9	107	100	104	89.4	90.6
15	109F	107F	91.2F	77.2F	96.4F	96.7F	89.7	107	104	104	89.7	90.7
16	108F	107F	91.6F	76.5F	98.9F	96.7F	92.9	107	107	104	90.1	91.1
17	107F	107F	92.0F	81.6F	101F	96.7F	95.8	107	112	104	90.5	91.4
18	106F	107F	92.5F	79.2F	104F	96.7F	97.6	107	114	103	90.9	91.6
19	106F	107F	92.9F	76.8F	107F	96.7F	98.7	107	118	103	91.3	91.5
20	105F	107F	93.3F	74.4F	109F	96.7F	99.8	107	120	102	91.6	91.2
21	104F	107F	93.7F	72.1F	111F	96.7F	101	107	119	101	91.5	90.8
22	103F	107F	94.2F	69.8F	108F	96.7F	102	107	119	101	91.2	90.5
23	103F	107F	94.6F	70.2F	106F	96.7F	103	108	119	99.9	90.9	90.1
24	102F	107F	95.1F	75.4F	104F	96.7F	104	109	118	98.9	90.6	89.8
25	102F	107F	95.5F	76.1F	101F	101F	103	110	118	96.9	90.3	89.4
26	103F	107F	95.9F	76.8F	99.9F	107	102	110	118	94.4	90.0	88.9
27	104F	107F	96.4F	77.5F	2620F	105	101	111	117	91.8	89.7	88.4
28	105F	105F	96.8F	78.1F	6270F	105	100	112	117	89.5	89.7	87.8
29	105F	102F	97.3F	79.9F	------	107	99.0	112	117	87.4	90.3	87.3
30	106F	99.6F	97.7F	83.5F	------	104	97.9	112	116	85.4	91.3	86.7
31	107F	------	98.1F	87.3F	------	106	------	112	------	84.2	92.4	------
Total	3315	3227.6	2873.0	2623.1	11843.5	10412.4	3274.0	3322.4	3326.2	3178.4	2762.9	2688.3
Mean	107	108	92.7	84.6	423	336	109	107	111	103	89.1	89.6
Max	112	112	98.1	101	6270	6330	351	112	120	116	92.4	95.5
Min	102	99.6	87.8	69.8	90.0	96.7	79.1	97.5	95.6	84.2	84.3	79.0
Acre-Ft	6580	6400	5700	5200	23490	20650	6490	6590	6600	6300	5480	5330

Wtr Year 2014	Total	52846.8	Mean	145	Max	6330	Min	69.8	Inst Max	6940	Acre-Ft	104800
Cal Year 2013	Total	44034.5	Mean	121	Max	2350	Min	68.2	Inst Max	11500	Acre-Ft	87340

Summary Report

Site: F118C Pacoima Creek below Pacoima Dam
USGS #:
Beginning Date: 10/01/2013
Ending Date: 09/30/2014

10/16/14

Daily Mean Discharge in Cubic feet/second Water Year Oct 2013 to Sep 2014

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	.28	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	79.7	0	0	0	0	0
23	0	0	0	0	0	0	84.4	0	0	0	0	0
24	6.74	0	0	0	0	0	71.3	0	0	0	0	0
25	0	0	0	0	0	0	34.2	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	------	0	0	0	0	0	0	0
30	0	0	0	0	------	0	0	0	0	0	0	0
31	0	------	0	0	------	0	------	0	------	0	0	------
Total	6.74	0	0.28	0	0	0	269.6	0	0	0	0	0
Mean	.22	0	.009	0	0	0	8.99	0	0	0	0	0
Max	6.74	0	.28	0	0	0	84.4	0	0	0	0	0
Min	0	0	0	0	0	0	0	0	0	0	0	0
Acre-Ft	13	0	.56	0	0	0	535	0	0	0	0	0

GA

Wtr Year 2014	Total	276.62	Mean	.76	Max	84.4	Min	0	Inst Max	416	Acre-Ft	549
Cal Year 2013	Total	219.80	Mean	.60	Max	53.3	Min	0	Inst Max	416	Acre-Ft	436

Los Angeles County Dept of Public Works USDAY V91 Output 10/15/2014

Summary Report

Site: F300 Los Angeles River at Tujunga Avenue
USGS #:
Beginning Date: 10/01/2013
Ending Date: 09/30/2014

Daily Mean Discharge in Cubic feet/second Water Year Oct 2013 to Sep 2014

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	71.3	63.3	50.8	58.9	58.5	1820	270	29.9	52.8	53.3	53.1	50.1
2	74.2	64.9	53.9	59.2	57.5	148	72.5	50.1	52.5	54.0	52.3	52.5
3	78.5	64.2	51.9	59.5	61.5	90.4	56.2	55.0	52.8	52.8	60.0	52.8
4	76.1	61.7	50.9	59.2	62.3	69.0	54.5	53.3	52.7	52.0	55.3	51.6
5	73.3	61.5	51.5	58.9	62.2	62.9	56.4	57.4	51.5	51.5	52.3	50.5
6	66.9	60.1	51.6	58.2	235	55.9	54.1	48.3	52.2	54.9	54.7	50.1
7	70.2	63.4	207	56.6	123	58.4	55.0	46.8	52.4	54.1	53.3	51.8
8	71.7	65.1	58.8	56.0	64.0	56.8	57.4	50.4	52.6	50.8	45.7	87.8
9	208	63.1	50.3	57.7	58.7	56.7	53.1	51.7	53.2	52.7	54.2	47.7
10	74.1	60.7	48.9	56.2	65.5	64.6	53.8	51.1	52.4	50.4	53.7	52.9
11	69.6	57.8	49.1	56.4	75.5	59.6	54.1	49.2	51.8	52.9	54.6	52.4
12	73.1	60.6	49.2	57.1	70.8	57.1	53.8	47.3	51.9	52.8	52.0	51.1
13	67.0	56.4	49.7	56.8	69.1	55.3	54.7	47.1	51.6	53.1	51.3	51.2
14	69.5	56.0	50.1	56.6	69.5	60.5	59.1	47.2	51.0	54.7	50.5	52.1
15	65.2	58.2	50.4	56.6	68.2	52.5	57.4	46.6	50.5	55.9	50.5	50.1
16	64.8	57.3	51.4	56.4	68.6	53.9	53.2	49.1	50.7	53.9	51.0	50.4
17	62.2	56.3	53.0	57.3	67.0	56.0	50.6	51.7	50.7	54.1	50.5	49.9
18	62.7	59.7	53.7	58.0	67.2	55.4	56.2	52.1	50.0	43.5	51.6	50.3
19	61.7	63.3	309	56.3	68.1	56.1	53.4	51.5	52.1	52.9	52.1	53.0
20	63.3	61.7	67.2	56.6	65.4	54.6	53.2	56.5	53.5	54.9	54.3	53.3
21	51.6	545	57.6	57.4	64.2	56.6	51.5	53.2	52.8	55.4	53.6	53.1
22	43.9	63.1	57.4	58.1	63.4	54.3	52.6	53.2	52.4	52.9	52.6	54.4
23	36.5	58.4	59.6	57.9	63.6	45.2	52.6	52.5	55.7	52.3	48.3	51.9
24	58.6	54.8	58.7	57.8	64.1	52.9	53.7	52.5	51.9	49.6	49.9	51.5
25	60.9	57.8	55.5	57.7	64.6	52.6	52.3	53.0	52.9	53.3	51.2	50.1
26	62.9	58.5	55.4	56.8	65.6	60.5	53.7	51.3	55.1	52.1	50.1	50.3
27	66.4	56.3	57.0	58.4	797	57.5	56.0	53.8	50.9	54.9	50.5	53.0
28	61.9	59.1	58.4	59.2	5500	58.8	41.4	49.5	51.0	53.5	48.9	52.9
29	63.6	91.2	58.4	58.5	------	59.4	36.3	53.3	50.3	53.3	47.5	56.2
30	68.4	47.8	58.6	58.7	------	55.7	30.3	53.0	53.6	49.9	47.3	52.9
31	68.7	------	60.2	58.8	------	57.4	------	51.3	------	52.8	51.9	------
Total	2166.8	2307.3	2095.2	1787.8	8220.1	3654.6	1809.1	1568.9	1565.5	1635.2	1604.8	1587.9
Mean	69.9	76.9	67.6	57.7	294	118	60.3	50.6	52.2	52.7	51.8	52.9
Max	208	545	309	59.5	5500	1820	270	57.4	55.7	55.9	60.0	87.8
Min	36.5	47.8	48.9	56.0	57.5	45.2	30.3	29.9	50.0	43.5	45.7	47.7
Acre-Ft	4300	4580	4160	3550	16300	7250	3590	3110	3110	3240	3180	3150

Wtr Year 2014	Total	30003.2	Mean	82.2	Max	5500	Min	29.9	Inst Max	17100	Acre-Ft	59510
Cal Year 2013	Total	34291.1	Mean	93.9	Max	1790	Min	36.5	Inst Max	8670	Acre-Ft	68020

Los Angeles County Dept of Public Works

USDAY V91 Output 10/14/2014

Summary Report

Site: F168B Big Tujunga Creek below Big Tujunga Dam
USGS #:
Beginning Date: 10/01/2013
Ending Date: 09/30/2014

Daily Mean Discharge in Cubic feet/second Water Year Oct 2013 to Sep 2014

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.88	7.28	3.72	1.97	1.66	7.75	3.48	2.47	3.03	2.70	2.49	2.22
2	3.81	7.26	3.54	1.96	1.80	3.02	2.88	2.54	3.13	2.67	2.66	2.33
3	3.62	7.39	2.74	1.95	1.98	2.79	2.67	2.68	3.06	2.43	2.72	2.34
4	3.44	7.36	2.00	1.93	1.93	2.82	2.69	2.68	3.07	2.46	2.52	2.23
5	3.35	7.21	1.96	1.89	1.90	2.71	2.72	2.63	3.04	2.47	1.72	2.29
6	3.25	6.96	1.94	1.88	1.88	2.62	2.60	2.10	3.06	2.47	1.61	2.63
7	3.17	6.84	1.93	1.86	1.79	2.63	2.50	1.56	3.11	2.47	1.45	2.68
8	3.16	6.69	1.91	1.84	1.70	2.53	2.46	2.40	3.13	2.49	1.37	2.34
9	3.31	6.67	1.95	1.81	1.68	2.48	2.47	2.84	3.06	2.66	1.42	2.01
10	3.12	6.70	1.89	1.78	1.61	2.59	2.55	2.89	3.01	2.69	1.55	1.89
11	2.90	6.61	1.84	1.76	1.60	2.59	2.56	2.85	2.57	2.68	1.87	1.86
12	2.76	6.51	1.83	1.73	1.67	2.56	2.60	2.89	2.48	2.65	2.45	1.89
13	2.77	6.38	1.84	1.72	1.72	2.50	2.58	2.85	2.48	2.66	3.20	1.94
14	2.60	6.25	1.78	1.56	1.71	2.49	2.56	2.97	2.65	2.63	3.19	2.20
15	4.46	11.6	1.76	1.61	1.65	2.45	10.1	3.10	2.91	2.97	2.96	2.29
16	8.18	16.5	1.73	1.56	1.95	2.45	2.96	3.18	2.96	3.23	3.69	2.59
17	7.84	16.5	1.71	1.56	1.80	2.56	2.39	3.20	2.72	3.34	3.95	2.69
18	7.60	16.3	1.75	1.55	1.95	2.62	2.36	3.09	2.54	2.69	4.35	2.51
19	6.44	16.1	2.11	1.54	1.97	2.62	2.23	2.72	2.27	2.75	4.39	2.55
20	5.76	16.0	2.00	1.54	1.86	2.66	2.13	2.24	1.85	2.83	4.34	2.27
21	5.97	16.2	2.00	1.51	1.78	2.71	2.17	1.37	1.72	2.76	3.25	2.08
22	5.94	16.0	1.97	1.49	2.01	2.78	2.32	1.25	1.98	2.67	2.37	1.64
23	6.74	15.7	1.97	1.46	1.99	2.77	2.31	1.16	2.17	2.71	2.14	2.28
24	7.81	15.4	1.95	1.44	1.88	2.84	2.26	1.49	2.22	2.86	2.23	2.51
25	7.67	10.3	1.97	1.44	1.81	2.92	2.42	1.57	2.16	3.03	2.14	2.37
26	7.38	3.89	1.96	1.56	1.63	2.88	2.45	2.04	2.31	2.95	2.14	2.12
27	7.24	3.72	1.98	1.65	1.87	2.84	2.33	2.58	2.52	2.96	2.35	2.20
28	7.62	3.78	1.97	1.60	18.1	2.79	2.24	2.52	2.59	2.69	2.55	2.20
29	7.76	3.98	1.99	1.58	------	2.77	2.26	2.37	2.61	2.74	2.37	2.25
30	7.50	3.89	1.96	1.69	------	2.81	2.35	2.46	2.68	2.73	2.26	2.63
31	7.31	------	1.97	1.70	------	2.83	------	2.69	------	2.54	2.22	------
Total	164.36	281.97	63.62	52.12	66.88	88.38	82.60	75.38	79.09	84.58	79.92	68.03
Mean	5.30	9.40	2.05	1.68	2.39	2.85	2.75	2.43	2.64	2.73	2.58	2.27
Max	8.18	16.5	3.72	1.97	18.1	7.75	10.1	3.20	3.13	3.34	4.39	2.69
Min	2.60	3.72	1.71	1.44	1.60	2.45	2.13	1.16	1.72	2.43	1.37	1.64
Acre-Ft	326	559	126	103	133	175	164	150	157	168	159	135

Wtr Year 2014	Total	1186.93	Mean	3.25	Max	18.1	Min	1.16	Inst Max	54.0	Acre-Ft	2350
Cal Year 2013	Total	1300.88	Mean	3.56	Max	16.5	Min	.09	Inst Max	66.3	Acre-Ft	2580

Los Angeles County Dept of Public Works USDAY V91 Output 10/16/2014

Summary Report

Site: E285 Burbank-Western Storm Drain
USGS #:
Beginning Date: 10/01/2013
Ending Date: 09/30/2014

JL 10/16/14

Daily Mean Discharge in Cubic feet/second Water Year Oct 2013 to Sep 2014

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.3	9.58	8.60	12.0	18.6	145	15.1	6.72	9.05	12.7	11.2	9.84
2	11.0	9.69	11.2	10.9	18.6	48.4	15.3	6.27	9.05	12.8	11.1	10.3
3	8.45	10.4	13.6	13.6	19.7	19.5	14.0	6.27	9.05	11.9	11.3	10.2
4	9.94	12.5	14.8	13.4	20.5	10.8	13.1	6.50	9.05	11.0	11.7	10.2
5	10.2	11.2	14.4	13.9	20.5	7.17	12.6	7.11	9.43	10.3	12.8	10.2
6	12.2	11.6	12.4	15.1	21.6	5.93	12.1	7.40	9.84	10.2	12.8	10.2
7	12.0	10.3	9.78	14.7	6.72	5.33	11.4	9.82	9.84	10.2	12.2	10.2
8	11.0	10.4	7.59	14.0	5.64	5.12	10.3	12.5	9.66	10.4	11.7	10.2
9	32.9	12.4	5.84	14.7	5.69	5.22	9.50	14.1	9.61	10.8	11.5	10.2
10	10.5	11.5	4.01	14.8	6.24	5.32	9.22	14.1	10.1	11.3	11.0	10.2
11	10.5	10.6	4.01	12.7	7.16	5.42	9.30	14.1	10.3	11.4	11.2	10.2
12	11.0	9.80	5.51	13.4	7.75	5.49	9.55	12.9	10.1	11.3	8.73	10.2
13	11.2	8.98	5.97	15.6	9.31	5.47	9.80	12.0	9.96	11.2	6.88	10.2
14	12.1	8.20	5.62	15.8	9.02	5.37	10.1	10.9	9.78	11.1	6.91	10.2
15	12.1	7.55	5.98	15.9	8.98	5.34	10.3	9.97	9.72	11.5	7.12	10.2
16	11.5	7.01	6.10	15.8	8.20	5.27	10.0	9.46	9.85	12.1	7.64	10.2
17	11.5	6.47	6.34	16.9	8.46	5.21	9.12	8.90	10.2	12.1	8.27	10.2
18	11.4	5.92	7.89	15.7	9.22	5.89	10.1	9.17	11.6	11.5	8.84	10.2
19	8.48	5.38	52.9	17.2	8.39	5.87	11.4	9.01	11.0	11.1	9.05	10.2
20	10.2	7.50	9.45	17.3	8.38	5.86	11.7	8.42	10.6	11.2	9.05	9.70
21	10.8	15.0	9.06	18.7	8.31	6.52	12.8	8.73	10.8	11.3	9.05	9.10
22	10.9	8.33	9.89	16.4	7.78	6.54	13.5	9.36	11.0	11.5	9.05	9.12
23	10.5	7.41	10.5	15.0	8.38	7.18	13.8	10.0	11.2	10.7	9.34	10.2
24	11.0	8.74	10.0	15.6	9.86	7.45	14.0	10.0	11.4	10.2	9.71	10.9
25	9.91	9.10	9.39	15.5	10.9	8.97	13.5	11.1	11.6	10.4	10.1	9.39
26	10.2	9.56	9.14	15.7	13.4	12.3	14.1	12.0	11.8	11.3	10.1	8.19
27	11.4	8.01	9.95	17.7	18.6	12.8	13.1	9.49	11.9	12.3	9.77	8.35
28	11.7	9.58	10.8	17.0	454	12.8	9.98	10.2	12.1	12.1	9.71	7.74
29	12.1	7.06	10.5	19.2	------	12.8	7.90	10.1	12.3	11.6	10.0	7.83
30	10.1	5.90	11.5	18.4	------	12.2	7.50	9.36	12.5	11.8	9.75	7.90
31	11.7	------	11.8	18.3	------	12.8	------	9.05	------	11.8	9.70	------
Total	360.78	275.67	324.52	480.9	759.89	425.34	344.17	305.01	314.39	351.1	307.27	291.96
Mean	11.6	9.19	10.5	15.5	27.1	13.7	11.5	9.84	10.5	11.3	9.91	9.73
Max	32.9	15.0	52.9	19.2	454	145	15.3	14.1	12.5	12.8	12.8	10.9
Min	8.45	5.38	4.01	10.9	5.64	5.12	7.50	6.27	9.05	10.2	6.88	7.74
Acre-Ft	716	547	644	954	1510	844	683	605	624	696	609	579

GA

Wtr Year 2014	Total	4541.00	Mean	12.4	Max	454	Min	4.01	Inst Max	3690	Acre-Ft	9010
Cal Year 2013	Total	5328.94	Mean	14.6	Max	203	Min	4.01	Inst Max	1810	Acre-Ft	10570

Los Angeles County Dept of Public Works

USDAY V91 Output 10/14/2014

Summary Report

Site: F252 Verdugo Wash At Estelle Avenue
USGS #:
Beginning Date: 10/01/2013
Ending Date: 09/30/2014

Daily Mean Discharge in Cubic feet/second Water Year Oct 2013 to Sep 2014

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.07	2.16	3.21	2.91	3.13	92.7	13.4	1.04	3.57	2.58	2.28	1.81
2	2.14	2.03	3.07	2.75	1.65	9.76	12.7	.71	3.77	1.91	2.54	1.93
3	1.76	2.11	3.21	2.67	1.63	2.80	6.61	2.18	3.13	2.06	3.02	2.12
4	2.16	3.29	3.00	2.57	1.98	1.64	.60	1.75	3.17	2.27	2.70	2.27
5	2.21	2.36	3.09	2.57	1.98	1.03	.63	1.39	3.86	2.49	2.51	2.03
6	1.79	2.30	3.67	2.57	13.6	1.01	.70	3.64	2.84	2.56	2.42	1.76
7	2.87	2.39	7.04	2.64	5.89	1.01	.50	4.77	2.92	2.87	2.44	2.06
8	2.95	2.20	2.74	2.66	3.21	1.01	.45	2.70	3.58	2.99	2.68	1.83
9	11.5	2.14	2.90	2.57	3.21	1.01	.47	2.97	3.21	3.14	2.61	1.61
10	3.28	2.12	4.82	2.57	3.39	1.23	.52	2.37	3.40	3.17	2.79	1.46
11	1.22	2.28	2.96	2.67	3.15	1.01	.66	2.80	3.07	2.99	2.76	1.42
12	.83	2.35	5.89	2.57	3.21	1.28	.38	2.93	3.05	3.03	2.53	1.04
13	.78	2.68	2.95	2.57	2.99	1.77	.41	2.61	3.21	3.09	2.60	1.24
14	.75	2.44	2.75	2.46	2.89	1.46	.54	2.59	3.48	3.34	2.49	1.01
15	.68	2.08	3.16	1.98	2.84	1.46	.48	3.34	3.70	3.71	2.35	1.47
16	.67	2.10	6.58	2.02	2.78	1.47	.51	3.59	3.57	3.76	1.92	1.87
17	.74	2.01	6.41	1.98	2.79	1.48	.68	3.74	3.49	3.07	1.83	2.24
18	.86	2.05	7.28	1.98	2.92	1.46	.58	3.46	3.18	2.90	1.78	2.15
19	.87	2.27	47.1	1.98	2.91	1.46	1.54	4.13	3.50	2.98	1.91	2.02
20	.94	2.54	3.64	1.98	2.99	1.46	1.53	3.55	3.30	2.58	1.89	1.46
21	1.44	42.7	2.57	1.98	2.75	1.46	1.72	4.36	3.33	2.61	2.08	1.46
22	2.02	4.97	3.46	1.98	2.66	1.77	1.70	3.59	3.21	2.41	2.12	1.70
23	1.94	3.67	2.74	2.10	2.92	1.98	1.44	3.56	3.31	2.12	1.97	1.90
24	1.88	2.57	2.63	1.74	2.87	1.78	.83	3.24	2.98	2.29	1.98	1.69
25	1.83	2.88	2.57	1.67	2.80	1.96	1.82	3.66	2.73	2.27	1.90	1.66
26	1.72	3.80	2.99	1.63	5.59	4.59	3.85	2.75	1.97	2.47	1.91	1.66
27	1.76	2.71	2.57	1.46	48.0	1.33	1.43	2.76	2.15	2.65	1.88	1.54
28	2.03	2.42	2.60	1.74	370	.99	1.57	2.88	2.01	2.88	1.87	2.13
29	2.48	12.8	2.57	1.46	------	1.44	1.26	2.84	1.88	2.93	1.46	2.00
30	2.04	3.77	2.57	1.83	------	.66	1.14	3.59	1.79	2.71	1.83	2.03
31	2.00	------	2.57	2.08	------	.55	------	3.49	------	2.39	1.93	------
Total	61.21	128.19	155.31	68.34	506.73	146.02	60.65	92.98	92.36	85.22	68.98	52.57
Mean	1.97	4.27	5.01	2.20	18.1	4.71	2.02	3.00	3.08	2.75	2.23	1.75
Max	11.5	42.7	47.1	2.91	370	92.7	13.4	4.77	3.86	3.76	3.02	2.27
Min	.67	2.01	2.57	1.46	1.63	.55	.38	.71	1.79	1.91	1.46	1.01
Acre-Ft	121	254	308	136	1010	290	120	184	183	169	137	104

Wtr Year 2014	Total	1518.56	Mean	4.16	Max	370	Min	.38	Inst Max	2190	Acre-Ft	3010
Cal Year 2013	Total	1136.54	Mean	3.11	Max	54.1	Min	.63	Inst Max	306	Acre-Ft	2250

APPENDIX C
COMPONENTS OF LOS ANGELES RIVER FLOW

UPPER LOS ANGELES RIVER AREA: COMPONENTS OF LOS ANGELES RIVER FLOW			
2013-14 WATER YEAR			
TOTAL FLOW AT GAGE F-57C-R			F-57C-R: Storm, Reclaimed, Industrial, Rising Ground Water
			F300-R: Storm, Tillman, Industrial Waste, and Rising Water
Total:	84,133	(adjusted)	E285-R :Storm, Burbank WRP, Industrial Waste
			F252-R: Storm, Rising Water
I. RECLAIMED WATER DISCHARGED TO L.A. RIVER IN ULARA			
Tillman:	34,828	: Record	
L.A.-Glendale:	11,370	: Record	
Burbank WRP:	6,438	: Record	
Total:	**52,636**		
II. INDUSTRIAL WATER and STORM FLOWS DISCHARGED TO L.A. RIVER IN ULARA			
Upstream of F300-R			
Industrial Water	23	: From F300-R separation of flow	
F168	2,350		
F118	549		
Storm Flows @300	16,417	Storm flows less F168 and F118	
	19,339		
Between F300-R and E-285			
Burbank OU	15	Burbank Operable Unit	
MTA	21		
Storm Drains and Unaccounted water	3,370	: 6.7 cfs assumes 4,852	
Headworks:	0	: pilot project record	
Western Drain:	570	: From E285-R separation of flow	
Storm Flows @285	2,105		
	6,081		
Between E-285 and F57C-R			
Storm Flows, DryWeather Flow, perennial stream flow, VPWTP @ 252	65	: From F252-R separation of flow	
Glendale Operable Unit	739		
Eagle Rock Blow Off	0		
Pollock Treatment	0		
Sycamore Canyon	1,100	Estimated from historic flows	
Storm Drains and Unaccounted water	2,757	: 5.5 cfs assumes 3,982	
	4,660		
Total Part II	**30,080**		
III. RISING WATER IN L.A. RIVER IN ULARA			
Total:	1,417	: See Section 2.3 of the Watermaster's Report	

APPENDIX D
WATER QUALITY DATA

REPRESENTATIVE MINERAL ANALYSES OF WATER

Well Number or Source	Date Sampled	Spec. Cond. µS/cm	Mineral Constituents in milligrams per liter (mg/l)												TDS mg/l	Hardness as $CaCO_3$ mg/l
			pH	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	NO_3	F	B		
Imported Water																
Colorado River Water at Lake Havasu	2013/14 FY	925	8.1	72	25	82	4.3	-	165	216	79	1.3	0.3	-	570	283
State Water Project at Joseph Jensen Filtration Plant (effluent)	2013/14 FY	563	8.3	26	12	65	2.7	-	104	54	81	2.6	0.8	-	308	114
Colorado River/ State Water Project Blend Point at the Plant (effluent)	2013/14 FY	932	8.1	67	24	87	4.4	-	-	215	86	0.9	0.8	-	565	266
LA Aqueduct No 1. Influent	2012/13 FY	354	8.5	33	21.0	26	12.0	15	131	26	28	0.5	0.7	0.5	224	98
LA Aqueduct Filtration Plant Influent	2013/14 FY	464	8.1	27	11.5	58	3.6	ND	114	45	60	2.2	0.2	0.2	292	112
Surface Water																
Tillman Rec. Plant Discharge to LA River	2012/13 FY	-	7.3	-	-	-	-	-	-	91	123	6	0.8	0.5	550	154
Los Angeles River at Arroyo Seco	9/95	981	8.0	68	24	97	9.8	ND	171	191	108	7.4	0.3	0.6	666	270
LA/Glendale Rec. Plant Discharge to LA River	2012/13 FY	-	7.3	-	-	-	-	-	-	119	140	5.5	0.6	0.4	635	229
Groundwater																
(San Fernando Basin - Western Portion)																
4757C (Reseda No. 6)	2/19/2014	1020	7.2	125	31	43	2.7	ND	322	188	35	ND	0.3	0.2	684	439
(San Fernando Basin - Eastern Portion)																
3800 (No. Hollywood No. 33)	6/8/2013	1,180	7.5	82	27	119	4.2	ND	214	332	68	-	0.4	0.5	781	314
3851C V0-8/Burbank No. 10	2013/14 FY	730	7.9	87	23	32	4.9	<2.0	275	73	30	22	0.5	0.2	475	313
Glendale OU GN-1	2013/14 FY	910	7.6	100	26	43	4.6	<2	270	140	-	36	0.3	0.2	580	380
(San Fernando Basin - L.A. Narrows)																
3959E (Pollock No. 6)	11/19/2013	624	7.6	-	-	-	-	<2	227	76	37	14	0.3	0.1	378	240
(Sylmar Basin)																
4840K (Mission No. 6)	7/15/2014	720	7.4	78	16	39	5.2	ND	261	134	78	42	0.2	0.2	601	361
5969 (San Fernando No. 4A)	2011/12 FY	500	7.7	54	10	33	4.3	ND	180	50	21	22	0.3	-	320	180
(Verdugo Basin)																
3971 (Glorietta No. 3)	2013/14 FY	960	7.2	88	34	45	7.2	ND	200	130	0	35	0.2	-	650	380
5069F (CVWD No. 14)	8/5/2014	815	7.3	89	31	34	3.2	ND	190	110	73	40	0.3	0.1	530	350

APPENDIX E
DEWATERING AND REMEDIATION PROJECTS

DEWATERING PROJECTS

No.	Company	Contact	Address	Start Date
		Permanent Dewatering Required		
1	A H Warner Properties Plaza 3	Bernier, Dave	21650 Oxnard	June 4, 1997
2	A H Warner Properties Plaza 6	Bernier, Dave	21700 Oxnard	June 4, 1997
3	BFI Sunshine Canyon Landfill	Dave Hauser	14747 San Fernando Rd.	October 1, 2006
4	Brent & Miller	Brent, Stanley	4328 Mammoth Ave	January 13, 2000
5	Commercial Project	Helfman, Haloosim & Assoc.: Varadi, Ivan	5550 Topanga Canyon	June 19, 1989
6	Encino Spectrum Project	Helfman, Haloosim & Assoc.: Varadi, Ivan	15503 Ventura Blvd.	June 14, 1989
7	Glenborough Realty (First Financial)	Slade, Richard	16830 Ventura Blvd.	October 9, 1987
8	Home Savings of America	Eli Silon & Associates	13949 Ventura Blvd.	June 14, 1989
9	LAMCO	O'Neil, John	21300 Victory Blvd	April 27, 1988
10	La Reina Fashion Plaza	Blumenfeld, Dolores	14622 Ventura Blvd.	April 27, 1988
11	Mercedes Benz of Encino (formerly Auto Stiegler)	Bucnis, Mark	16721 Ventura Blvd.	October 31, 1987
12	Metropolitan Transportation Authority	Laury, Victor	Metro Red Line	April 1, 1995
13	Park Hill Medical Plaza	Anjomshoaa, Mahmoud	7303 Medical Center Dr.	December 27, 1989
14	Trillium	Arnold, Daryl	6310 Canoga Ave.	April 27, 1988
15	Warner Center Ent. Complex	Tsuchiyama and Kaino	5955 Owensmouth Ave.	June 26, 1989
		Potential for Future Dewatering		
1		Carter, Dennis	4547 Murietta Ave	
2		Eccleston, C. W.	22020 Clarendon St.	
3		Henkin, Doug	8806 Etiwanda Ave.	
4		Marks, Ronald	5348 Topanga Canyon	
5	Danalex Engineering		12050 Ventura Blvd.	
6	Danalax Engineering Corp.	Krell, Alex	11239 Ventura Blvd.	
7	Delta Tech. Engineering	Abbasi, Z. A.	12800 Ventura Blvd.	
8	Ellis Plumbing Co.	Ellis, Chris	4235 Mary Ellen Ave.	
9	Ellis Plumbing Co.	Ellis, Chris	19951 Roscoe Blvd.	
10	Helfman, Haloosim & Assoc.	Varadi, Ivan	21820 Burbank Blvd.	
11	Helfman, Haloosim & Associates	Varadi, Ivan	5350 White Oak Ave.	
12	Sherway Properties	Vasquez, Rodney	4477 Woodman Ave.	
13	Tarzana Office Plaza	Varadi Engineering	18701 Burbank Ave.	
14	T Violes Construction Company	Viole, Tim, Jr.	15840 Ventura Blvd.	
		Temporary Dewatering		
1	Avalon Bay	Rob Salkovitz	16350 Ventura Blvd	January 26, 2006
2	Eagle Rock Interceptor Sewer	Baron Miya	Bureau of Engineering	May 8, 2003
3	Fassberg Construction [2]	Jeff Hawthorne	16710 Ventura Blvd	May 1, 2009
4	Glendale Sewer Project	Andre Haghverdian	800 Air Way	October 17, 2007
5	MTA Underground Pedestrian Crossing	Tim Lindholm	MTA	November 1, 2001
6	MWD Sepulveda Feeder Pipeline Const.	David Dean	Jensen Plant	August 1, 1998
7	Northeast Interceptor Sewer	Nick Demos	Bureau of Engineering	October 1, 2001

Notes:

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

2) Fassberg Construction ended temporary dewatering operations during the 2010-11 Water Year

APPENDIX F
WHITE PAPER – "Is the San Fernando Groundwater Basin Undergoing a Long – Term Decline in Storage?"
(ATTACHMENTS ON FILE IN ULARA WATERMASTER OFFICE)

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SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

THE CITY OF LOS ANGELES, Plaintiff, v. CITY OF SAN FERNANDO, et al., Defendants.	Case No. C650 079 **NOTICE OF LODGING OF WATERMASTER WHITE PAPER RE: QUARTERLY STATUS CONFERENCE** Conference: Date: April 27, 2007 Time: 8:30 a.m. Dept: 52 Before the Hon. Susan Bryant-Deason

NOTICE IS HEREBY GIVEN that the court-appointed Watermaster hereby lodges with the Court the attached White Paper in connection with the quarterly Upper Los Angeles River Area Watermaster status conference scheduled for April 27, 2007, in Department 52 of the above-entitled Court.

DATED: March 23, 2007

NOSSAMAN, GUTHNER, KNOX & ELLIOTT, LLP
Frederic A. Fudacz
Alfred E. Smith

By: _____
Alfred E. Smith

Attorneys for Upper Los Angeles River Area Watermaster

PROOF OF SERVICE

The undersigned declares:

I am employed in the County of Los Angeles, State of California. I am over the age of 18 and am not a party to the within action; my business address is c/o Nossaman, Guthner, Knox & Elliott, LLP, 445 S. Figueroa Street, 31st Floor Los Angeles, California. 90071-1602.

On March 23, 2007, I served the foregoing **NOTICE OF LODGING OF WATERMASTER WHITE PAPER RE: QUARTERLY STATUS CONFERENCE** on parties to the within action by placing ( ) the original (x) a true copy thereof enclosed in a sealed envelope, addressed as shown on the attached service list.

(XX) (By U.S. Mail) On the same date, at my said place of business, said correspondence was sealed and placed for collection and mailing following the usual business practice of my said employer. I am readily familiar with my said employer's business practice for collection and processing of correspondence for mailing with the United States Postal Service, and, pursuant to that practice, the correspondence would be deposited with the United States Postal Service, with postage thereon fully prepaid, on the same date at Los Angeles, California.

( ) (By Facsimile) I served a true and correct copy by facsimile pursuant to C.C.P. 1013(e), to the number(s) listed on the attached sheet. Said transmission was reported complete and without error. A transmission report was properly issued by the transmitting facsimile machine, which report states the time and date of sending and the telephone number of the sending facsimile machine. A copy of that transmission report is attached hereto.

(.) (By Overnight Service) I served a true and correct copy by overnight delivery service for delivery on the next business day. Each copy was enclosed in an envelope or package designated by the express service carrier; deposited in a facility regularly maintained by the express service carrier or delivered to a courier or driver authorized to receive documents on its behalf; with delivery fees paid or provided for; addressed as shown on the accompanying service list.

Executed on _March 23, 2007.

(XX) (STATE) I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

( ) (FEDERAL) I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Charlyn Jones

ATTORNEYS OF RECORD

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UPPER LOS ANGELES RIVER AREA WATERMASTER

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

MARK G. MACKOWSKI – WATERMASTER

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Los Angeles, CA 90051-0100

March 22, 2007

The Honorable Susan Bryant-Deason
Judge of the Los Angeles County Superior Court
111 N. Hill Street, Dept. 52
Los Angeles, CA 90012

Dear Judge Bryant-Deason:

Subject: Meeting on April 27, 2007 to discuss the Decline in Storage in the San Fernando Groundwater Basin (basin)

At our last meeting with the Court on December 13, 2006 you generously offered to spend some time with the Watermaster and the Cities of Los Angeles, Burbank, and Glendale (Cities) to discuss the decline in groundwater storage in the basin during our next meeting on April 27.

As Watermaster for the Upper Los Angeles River Area (ULARA), I have been regularly informing the Court and the Cities regarding my growing concern over declining water levels and accumulating groundwater pumping credits in the basin.

In July 2005, I distributed a DRAFT White Paper to the Cities titled "Is the San Fernando Groundwater Basin Undergoing a Long-Term Decline in Storage?" describing the problems, causes, and some possible solutions. Since then, we have been meeting with the Cities in an attempt to resolve these issues.

In preparation for the April 27 meeting, I feel it is appropriate to share the enclosed White Paper with the Court so that you may become more familiar with the background and details regarding the decline in storage.

We look forward to meeting with you at 8:30 a.m. on April 27, 2007 to explore the challenges we face regarding the decline in groundwater storage in the basin.

If you have any questions or comments, please call me at (213) 367-0896.

Sincerely,

MARK G. MACKOWSKI
ULARA Watermaster

MGM:mm

c:
Mr. Bill Mace, City of Burbank
Mr. Peter Kavounas, City of Glendale
Mr. Thomas Erb, City of Los Angeles
Mr. Dennis Erdman, Crescenta Valley Water District
Mr. Ron Ruiz, City of San Fernando

Watermaster Staff
Mr. Mark G. Mackowski, Watermaster
Ms. Patricia T. Kiechler, Assistant Watermaster
Mr. Fred Fudacz, Special Counsel
Mr. Melvin Blevins, Consultant

Is the San Fernando Groundwater Basin Undergoing a Long-Term Decline in Storage?

by

Mark Mackowski, ULARA Watermaster

March 2007

Executive Summary

This report addresses the long-term decline in storage in the San Fernando Groundwater Basin (hereinafter SFB or "basin") caused by over-pumping due to an excessive allocation of water rights; reduced natural and artificial recharge; unaccounted underflow and rising groundwater leaving the basin; and unaccounted or under-accounted pumping by third parties. It also addresses the large accumulation of stored water credits for which there is insufficient actual water in storage, and makes recommendations to reverse these trends.

The Watermaster has discussed this issue in the Annual Watermaster Report for the last four years; has informed and updated the Court during the last two years; and in July 2005 presented a draft of this paper to the Cities of Los Angeles, Burbank, and Glendale (hereinafter "parties"). Subsequently, several workshops were held with the parties to answer their questions and discuss potential solutions.

The parties have responded by proposing to study several projects to increase long-term artificial recharge of the basin. The Watermaster fully supports those studies, but does not believe that the current proposed projects will be either timely enough or adequate to completely address the serious and ongoing decline in storage and avoid the potential for the basin to re-enter overdraft.

Introduction

This paper addresses the question: "Is the San Fernando Groundwater Basin undergoing a long-term decline in storage?"

Plate 13 (Attachment 1) of the 2004-05 Annual Watermaster Report illustrates the change in storage in the SFB between 1928 and Fall 2005.

It is clear that the SFB has experienced a progressive decline of real water in storage (Plate 13 blue line) since 1928. The decline began in 1944, and overdraft was eventually declared beginning in 1954 when water in storage had reached 210,000 acre-feet (AF) below the 1928 level. Litigation over water rights commenced in 1955, and continued until 1979 when the Judgment was entered. Section 4.2.6.1 of the Judgment states that the SFB **"...remained in overdraft continuously until 1968, when an injunction became effective. Thereafter, the basin was placed on safe yield operation."** (Safe yield operation means that extractions from the basin do not exceed recharge on a long-term average.) When safe yield operation was ordered by the Court in 1968 the basin was 655,370 AF below the 1928 level.

From 1968 until 1977, the amount of real water in storage (Plate 13 blue line) declined an additional 40,210 AF, to 695,580 AF below the 1928 level, despite the fact that the basin was supposedly under safe yield operation. Fall 1977 was the historically lowest level of basin storage.

Plate 13 shows a sharp increase in stored water beginning in 1977, suggesting that the basin began to recover. However, a large portion of the increase was due to water imported by Los Angeles to the SFB from outside sources such as the Owens Valley and spread at Tujunga Spreading Grounds, and was not part of the safe yield of the basin. Table 2-22 from Watermaster Relevant Data (Attachment 2) shows spreading from 1968-2005. Under the column "City of Los Angeles – Tujunga", 142,457 AF were spread from 1977-1987. Therefore, because Plate 13 (blue line) does not differentiate between various water sources that recharge the basin, the water level increase beginning in 1977 *does not* represent a significant recovery of the basin.

Furthermore, beginning in the late 1970s, groundwater extractions began to decline as a result of the decision in San Fernando that restricted pumping, especially by Glendale and Burbank, followed in the early 1980s by the discovery of widespread groundwater contamination that affected all the parties' ability to pump their full adjudicated rights (Relevant Data Table 2-1, Attachment 3). As a result, stored water credits began to accumulate rapidly, and continue to accrue whenever a party does not pump its full right. As of October 1, 2005 a combined total of 410,033 AF of stored water credits in the SFB belonged to Los Angeles, Burbank, and Glendale.

Section 8.2.10 of the Judgment requires the effects of stored water to be excluded from consideration when evaluating the safe yield. Judgment Section 8.2.10 states, **"Upon request of the Administrative Committee, or on motion of any party and subsequent Court order, Watermaster shall recalculate safe yield of any basin within ULARA. If there has been a material long-term change in storage over a base period (excluding any effects of stored water) in San Fernando Basin the safe yield shall be adjusted by making a corresponding change in native safe yield of the basin."**

The graph shown in red on Plate 13 is the result of subtracting stored water credits from the change in storage shown in blue, as required by Judgment Section 8.2.10. When stored water credits are subtracted from the change in storage, the basin is 914,508 AF below the 1928 level, and 259,138 AF below the 1968 level when safe yield operation was required to be implemented.

In summary, Plate 13 clearly shows that the SFB is undergoing a long-term decline in storage that is temporarily interrupted during above-normal rainfall or below-normal pumping. However, spread imported water from 1977-1987 and an ongoing large accumulation of stored water credits obscures this decline.

Import Return Credits

Import return water is defined by the Judgment as "Ground water derived from percolation attributable to delivered imported water."

The Judgment allows the parties to recapture a portion of delivered imported water based on the reasonable assumption that some of it percolates into the aquifer and is available for pumping once it reaches the groundwater table. This water accrues to the parties as import return credits using formulas provided in Section 5.2.1.3 of the Judgment.

The California Supreme Court decision (1975, Vol. 14-3d, p. 261-262, Attachment 4) states, **"Defendants contend that if any party is given rights to a return flow from delivered *imported* water, it is 'obvious' and 'axiomatic' that the same rights should be given to the return flow from delivered water derived from all other sources, including native water extracted from local wells. This argument misconceives the reason for the prior right to return flow from imports. Even though all deliveries produce a return flow, only deliveries derived from imported water add to the ground supply...Returns from deliveries of extracted native water do not add to the ground supply but only lessen the diminution occasioned by the extractions."**

Despite the unequivocal language in the Supreme Court decision, the Cities of Los Angeles, Burbank, and Glendale negotiated an agreement to use *all* delivered water in the formulas for calculating import return credits. In the "Memorandum re Proposed Settlement with Cities of Glendale and Burbank, City of Los Angeles v. City of San Fernando, et al., and Damage Cases" dated November 22, 1978, Item 4 on page 5 (Attachment 5) states, **"A fixed formula for determining Glendale and Burbank rights to return flow from delivered imported water, including recirculation rights, as being equivalent to 20% of all delivered water in the immediate watershed of the San Fernando Basin. This has been determined to be a better administrative method than the method based on 20.8% of delivered imported water to valley-fill lands, which method was presented to the Supreme Court and approved by that Court in this case. Los Angeles' return flow rights will be determined by a comparable fixed formula, also somewhat a [sic] variance with the Supreme Court language, but consistent with simple future administration."**

Furthermore, the language in the Judgment addressing import return credits is contradictory and appears to have been influenced by the aforementioned agreement. Section 5.2.1.1 states, **"Each of said parties has a right to extract from San Fernando Basin that portion of the safe yield attributable to such import return waters."** Section 5.2.1.3 states, **"The extraction rights of Los Angeles, Glendale, and Burbank...shall only extend to the amount of any accumulated import return water credit of such party by reason of imported water delivered after September 30, 1977."** The foregoing language is consistent with the Supreme Court decision, and implies that only delivered waters that are imported from outside the basin (such as from the Los Angeles/Owens Valley Aqueduct and the Metropolitan Water District) would

qualify for import return credits. However, the formulas in Judgment Section 5.2.1.3 for calculating import return credits apparently contradict the Supreme Court decision, namely, **"Los Angeles: 20.8% of all delivered water...Burbank: 20.0% of all delivered water...Glendale: 20.0% of all delivered water..."**

Since 1979 the Watermaster Office has used the latter, more generous interpretation of the Judgment, giving the parties import return credits for *all* water delivered to their applicable service areas regardless of its source. This has caused the pumping of groundwater that would not have been allowed under the Supreme Court decision, and has also contributed to the accumulation of a large amount of stored water credits that are not supported by actual water in storage.

Thus, the Supreme Court decision and the technical issues related to basin hydrology were misunderstood, or not fully considered, in an effort to simplify the administration of the parties' rights, resulting in excessive groundwater pumping and an accumulation of pumping credits for which there is insufficient actual water in storage.

Changed Conditions in the SFB

Probable causes of the decline in storage also include changes in land and water use in the SFB.

The Report of Referee (1962) was accepted as prima facie evidence in San Fernando. Data for the Report of Referee was obtained in the late 1950s and early 1960s, which was used to calculate the safe yield of the SFB.

At that time, a significant portion of the land in the San Fernando Valley was still being used for agricultural purposes, or had not yet been developed. Rainfall runoff and irrigation water had a much better opportunity to percolate and re-enter the groundwater basin compared to the present, when much of the land has subsequently been developed and covered by rooftops, sidewalks, streets, and other "hardscape".

In addition, at the time the Report of Referee was prepared sewers had not yet been installed in much of the San Fernando Valley, and overflow from cesspool/septic systems was a significant source of recharge to the basin aquifer. During the 1956-57 Water Year, the Report of Referee estimated that 16,750 acre-feet per year (AF/Y) re-entered the groundwater basin from septic systems located in the SFB west of Burbank (Appendix N, Table N-7, p. N-32). Nearly everywhere in the SFB septic systems have been replaced by sewers, with a resulting decrease in recharge from this source. This has had the beneficial effect of eliminating a significant source of nitrate contamination, but has also contributed to the decline in storage. We have observed a similar phenomenon in the Verdugo Basin.

Present-day land and water use have changed in the intervening 40-50 years since the Report of Referee was researched and written, but provisions in the Judgment require the basin to be managed as if those conditions still exist.

Reduced Artificial Recharge

Artificial recharge capacity has declined in the basin during the past 20-25 years. 'Artificial recharge' means collecting rainfall runoff or imported water and percolating it into the groundwater basin at spreading grounds designed for that purpose.

Headworks Spreading Grounds (Headworks) is located on the Los Angeles River near Griffith Park. Headworks was operated until the early 1980s, when volatile organic compound (VOC) contamination was discovered in the underlying groundwater, and treated sewage effluent began to be discharged from Tillman Treatment Plant into the Los Angeles River. Headworks has not been used as a spreading ground since approximately 1982.

In the late 1990s, methane gas was detected at a school adjacent to the Sheldon-Arleta Landfill (SAL) and Tujunga Spreading Grounds (TSG). When stormwater is spread heavily at TSG, it compresses the air within the underlying vadose zone. Some of this air moves laterally and displaces methane gas from the adjacent SAL. The methane migrates out of the SAL, and some of it surfaces in the nearby neighborhood. To control this methane migration, spreading at TSG has been restricted to less than 100 cubic feet per second (cfs), or about 40% of the historic spreading capacity of 250 cfs. When storms produce runoff in excess of 100 cfs in the adjacent Tujunga Wash, this extra water cannot be diverted into TSG and is instead wasted to the ocean.

In addition, during past wet years, the Los Angeles County Department of Public Works (LACDPW) has curtailed spreading at Hansen Spreading Grounds (HSG) to prevent rising groundwater from inundating trash in the nearby Bradley Landfill. Alert levels were established nearby monitoring wells to monitor groundwater levels near the landfill. During the exceptionally wet winter of 2004-05 these alert levels were reached and spreading at HSG was stopped for a while, resulting in additional runoff being wasted to the ocean.

As a result of the elimination of Headworks and reduced spreading at TSG and HSG, a significant amount of stormwater runoff cannot be recharged into the SFB and is wasted to the ocean, especially during above-average rainfall years.

Safe Yield and Native Safe Yield

Safe Yield is defined by the Judgment as "The maximum amount of water which can be extracted annually from a ground water basin under a given set of cultural conditions and extraction patterns, based on the long-term supply, without causing a continuing reduction of water in storage."

Safe yield in the SFB consists of two parts: the aforementioned import return credits, and the native safe yield consisting of "native water", which the Judgment defines as "Surface

and ground waters derived from precipitation within ULARA". The Judgment affirmed Los Angeles' exclusive Pueblo water right to all native groundwater in the SFB.

The safe yield and native safe yield of the basin were determined to be 90,680 AF/Y and 43,660 AF/Y, respectively, in 1964-65 (Judgment Section 4.2.4) but have not been re-evaluated since then.

Each year, the Judgment gives Los Angeles a native safe yield pumping credit of 43,660 AF/Y based on studies performed for the Report of Referee. In dry years, it is doubtful whether 43,660 AF actually recharge the SFB. In wet years the amount can be substantially larger. The long-term average native recharge is unknown. However, as previously mentioned, the hydrologic conditions that existed when the Report of Referee was written may no longer be present in the SFB today.

If the long-term native safe yield is lower than 43,660 AF/Y, it would contribute proportionally to the decline in storage we observe on Plate 13 (blue line) and an increase in stored water credits (Plate 13 red line) for which there is insufficient water in storage.

Basin Losses from Rising Groundwater and Underflow

Groundwater constantly flows out of the basin in two ways: via underflow in the Los Angeles River Narrows area, and through groundwater rising into the Los Angeles River channel that subsequently leaves the SFB as surface flow. (The City of Los Angeles recognized this, and constructed the Pollock Wells Treatment Plant to reduce the amount of excess rising groundwater leaving the basin by pumping and treating groundwater in the Narrows that is contaminated with VOCs.)

The average annual loss due to rising groundwater was approximately 3,442 AF/Y from 1979-2005. The average annual loss due to underflow through the Narrows area was approximately 400 AF/Y. The total average loss from the basin was therefore approximately 3,842 AF/Y from 1979-2005.

Although Judgment Section 8.2.9 requires the Watermaster to "...record and verify additions, extractions and losses..." there is no clear mechanism in the Judgment to debit the parties for groundwater that leaves the basin in ways other than through pumping. With the exception of minor losses debited from Los Angeles due to under-pumping at the Pollock Wells, losses due to rising groundwater and underflow have never been debited from the parties.

In summary, stored water credits accumulate indefinitely until they are pumped by the parties, but a portion of the actual groundwater is constantly leaving the SFB unaccounted through underflow and rising groundwater.

Hill and Mountain Pumping

Unauthorized pumping in the hill and mountain areas tributary to the SFB reduces the amount of underflow from these regions to the basin. The City of Los Angeles claims this native water as part of its Pueblo water right, and the Watermaster has begun a program to identify these pumpers, quantify their water use, and require them to enter a water license agreement with Los Angeles. Under the license agreement, licensees report their pumping to the Watermaster Office and pay Los Angeles for the amount pumped, and the Watermaster debits Los Angeles. There are unauthorized pumpers who do not have license agreements and who do not report their pumping to the Watermaster Office.

Dewatering

There are areas within the SFB that have a high water table. Projects within these areas sometimes pump groundwater to maintain dry excavations during construction. In addition, there are some dewatering operations that keep subterranean parking and other below-ground structures dry on a permanent basis. This water is typically discharged to the storm drain or sewer, and is thereby lost from the basin. The Watermaster has identified several permanent dewatering systems, and the owners of these properties report their pumping monthly to the Watermaster Office. However, our efforts to institute a reliable program to account for temporary construction dewatering within the basin have not been effective.

Conclusions

The Watermaster has historically calculated import return credits based on all delivered water. This is clearly inconsistent with the Supreme Court decision, and in the Watermaster's opinion is the single largest contributor to the imbalance between actual water in storage and the parties' stored water credits. The 1978 agreement among all three parties with respect to import return credits departed from the Supreme Court decision (Attachment 5) and, as applied under today's circumstances, is seemingly inconsistent with Section 5.2.1.1 of the Judgment.

Furthermore, import return credits of 20% may have been appropriate for hydrologic conditions in the late 1950s and early 1960s, but may now be too high considering the urbanization that has occurred in the San Fernando Valley during the last 40-50 years. However, Section 7.1 of the Judgment explicitly precludes the Watermaster, or even the Court, from modifying these formulas.

Although real water in storage has increased by 150,895 AF since safe yield operation was declared in 1968, stored water credits have accumulated to 410,033 AF since 1978. When stored water credits are subtracted from real storage (Plate 13 red line), the SFB is more than 914,000 AF below the 1928 level.

In other words, if the parties had pumped their full adjudicated rights, the basin would be more than 259,000 AF below the 1968 level at which safe yield operation was supposed to begin (Plate 13).

This clearly indicates that groundwater rights in the SFB are significantly "oversubscribed", and the basin is undergoing a long-term decline in storage that is effectively masked by the accumulation of stored water credits. An argument could be made that the basin re-entered a condition of overdraft in the late 1980s when the red line fell below the 1968 level.

The general downward trend of the change in real storage (Plate 13 blue line), beginning in the early 1980s and interrupted only temporarily during wet years, is also disturbing. Although we observed a significant rebound in basin storage in the 2004-05 Water Year due to above-normal rainfall and below-normal pumping by Los Angeles, similar occurrences in the past suggest that this effect will be temporary and short-lived.

The downward trend in real storage coincides with the cessation of spreading at Headworks Spreading Grounds in the early 1980s and has accelerated with a significant reduction of spreading capacity at Tujunga Spreading Grounds due to the migration of methane gas from the nearby Sheldon-Arleta Landfill. The decline in actual storage due to reduced basin recharge has been exacerbated because the parties have received pumping rights since their negotiated settlement in 1978 that the basin cannot support.

Recommendations

The Watermaster recommends that the safe yield of the SFB be re-evaluated. The 1979 San Fernando Judgment was based on a safe yield study conducted in 1964-65, more than 40 years ago. At that time, the SFB safe yield was calculated to be 90,680 AF/Y. However, basin hydrology can change significantly over time, and we do not know the existing safe yield of the SFB. If we are to resolve this problem and manage the basin properly in the future it is imperative that we re-evaluate the safe yield of the SFB, and continue to re-evaluate it periodically.

As a component of the safe yield, the native safe yield of 43,660 AF/Y may be too large, which would contribute to a continuing decline in stored water and exacerbate the imbalance between actual water in storage and stored water credits. A safe yield study, as recommended above, would determine whether the existing native safe yield is appropriate for current hydrologic conditions in the SFB.

The parties and the Watermaster could agree to allocate pumping rights consistent with the language and intent of the Supreme Court decision, namely, giving the parties import return credits only for the amount of *imported* water served to their customers.

Or, following a safe yield re-evaluation, the Watermaster could implement Judgment Section 8.2.10 to correct any imbalance in the basin by adjusting the native safe yield of the SFB. This solution would affect only Los Angeles' water rights, since it has the

exclusive right to the entire native safe yield of the SFB under its Pueblo right. However, it is the Watermaster's opinion that implementing Section 8.2.10 of the Judgment in this manner would fail to address the major hydrologic cause of the current imbalance, and that the parties would continue to be given rights to water that are inconsistent with the Supreme Court decision.

A hydrologic study should be performed in the Narrows area to determine the actual amount of water lost due to underflow and excess rising groundwater, and the Watermaster and the parties should consider ways to account for this lost water. To that end, in March 2007 the ULARA Administrative Committee requested the Watermaster to conduct a study to determine ways to improve the methodology for the calculation of losses from the basin due to rising groundwater and underflow. While it is not practical to stop all rising groundwater and underflow, keeping water levels low in the Narrows through diligent pumping and monitoring would minimize these losses. As a related matter, Los Angeles should operate the Pollock Wells Treatment Plant at least 2,000 AF/Y to reduce the amount of rising groundwater that leaves the basin.

Tujunga Spreading Grounds should be restored to its full capacity without delay. Additional spreading and/or storage facilities, such as Boulevard Pit, should be acquired whenever possible. They may not be needed during dry-to-normal rainfall years, but their additional capacity would be invaluable during years when runoff exceeds our ability to store it using existing infrastructure.

Modernizing and upgrading facilities and operations at the spreading grounds might result in increased basin recharge. The Watermaster, LADWP, and LACDPW have begun to explore these opportunities within the framework of the Basin Recharge Task Force.

The parties and Watermaster should take advantage of opportunities such as the upcoming Los Angeles River Revitalization Master Plan to build projects that enhance basin recharge.

Hill and mountain pumping should be fully accounted. It may not be politically feasible to restrict it, but it is probably a component, albeit a small one, of the decline in stored water in the basin.

Likewise, permanent and temporary construction dewatering should be fully accounted. The Watermaster and the cities of Los Angeles, Burbank, and Glendale should develop a program to more closely track water lost from the basin due to dewatering.

It is the duty of the Watermaster to inform the parties and the Court about issues affecting the groundwater basins in ULARA. We look forward to working closely with the parties to reverse the decline in storage and ensure the long-term reliability of the SFB.

APPENDIX G
INTERIM AGREEMENT FOR THE PRESERVATION OF THE SAN FERNANDO BASIN WATER SUPPLY, 2008

ORIGINAL

DEPT #52

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SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

THE CITY OF LOS ANGELES,

Plaintiff,

vs.

CITY OF SAN FERNANDO, et al.,

Defendants.

CASE NO. **C 650 079**

Assigned for All Purposes to the Honorable Susan Bryant-Deason

STIPULATION AND ~~[PROPOSED]~~ ORDER RE. INTERIM AGREEMENT FOR THE PRESERVATION OF THE SAN FERNANDO BASIN WATER SUPPLY

This Stipulation re. Interim Agreement for the Preservation of the San Fernando Basin Water Supply ("Stipulation") is entered into this 19th day of Sept., 2007, by and among the City of Los Angeles, the City of Glendale and the City of Burbank (individually, "Party," and collectively, the "Parties"), all of whom are parties to this action, with reference to the following facts:

WHEREAS, on September 20, 2007, the Parties have entered into the *Interim Agreement for the Preservation of the San Fernando Basin Water Supply* ("Agreement"), a true and correct copy of which is attached hereto as Exhibit A.

WHEREAS, the Agreement is consistent with the 1979 judgment entered by stipulation in this action ("Judgment").

NOW, THEREFORE, the Parties hereby stipulate as follows and respectfully request that the Court enter the proposed Order submitted herewith:

The Parties stipulate that they have entered into the Agreement, the terms of which are hereby adopted and incorporated by this reference as though fully set forth herein.

The Parties further stipulate that the terms of the Agreement shall be judicially enforceable.

The Parties further stipulate to, and request that, the Court enter an order the terms of which are the same as the Agreement.

IN WITNESS WHEREOF, this Stipulation is entered into as of the first date set forth above.

Dated: Sept. 20, 2007

HATCH & PARENT, A LAW CORPORATION

BY Ann Steinfeld FOR:
SCOTT S. SLATER
STEPHANIE OSLER HASTINGS
ATTORNEYS FOR DEFENDANTS, CITY OF BURBANK AND CITY OF GLENDALE

Dated: Sept 24, 2007

CITY OF BURBANK

By:
Carolyn A. Barnes

Dated: Sept. 24, 2007

CITY OF GLENDALE

By:
Christine A. Godinez

Dated: 24 Sept., 2007

CITY OF LOS ANGELES

ROCKARD J. DELGADILLO, City Attorney
RICHARD M. BROWN, General Counsel, Water and Power
JULIE CONBOY RILEY, Deputy City Attorney

By:
Julie Conboy Riley

INTERIM AGREEMENT
FOR THE PRESERVATION OF THE SAN FERNANDO BASIN WATER SUPPLY

This Interim Agreement for the Preservation of the San Fernando Basin Water Supply (Agreement) is entered into as of _____, 2007 between and among the City of Los Angeles acting by and through the Los Angeles Department of Water and Power (Los Angeles), the City of Glendale, a municipal corporation (Glendale) and the City of Burbank, a municipal corporation (Burbank) (each a Party and collectively, the Parties), with reference to the following facts and intentions, which the Parties agree are true and correct to the best of their knowledge and belief:

RECITALS

A. The Parties are parties to the 1979 judgment entered by stipulation in *City of Los Angeles v. City of San Fernando* (California Superior Court Case No. 650079) (the Judgment). Each Party holds rights in and to the San Fernando Basin (Basin), one of the several groundwater basins subject to the Judgment, as set forth in the Judgment. The Parties are also all of the voting members of the Administrative Committee of the Basin, which is authorized by Section 8.3 of the Judgment.

B. The Basin has been, and continues to be, operated in accordance with the terms and conditions of the Judgment. The Superior Court of the County of Los Angeles (Court) retains continuing jurisdiction over the Judgment and the parties to it.

C. On March 23, the Upper Los Angeles River Area Watermaster (Watermaster), which is authorized by Section 8 of the Judgment to assist the Court in its administration and enforcement of the provisions of the Judgment, filed a White Paper with the Court expressing two concerns that the Parties seek to redress by agreement: (i) a reduction in the stored water in the Basin; and (ii) the accumulation of Stored Water credits, as that term is defined in Section 5.2 of the Judgment, by the Parties in excess of the quantity of water available to be pumped by them.

D. The Parties wish to enter into this Agreement to promote a physical solution to the observed falling groundwater levels by promoting artificial replenishment of the Basin in a manner that ensures the viability of the Basin as a long-term reliable water supply. The Parties also wish to enter into this Agreement to provide interim guidelines on the Parties' exercise of their Stored Water credits so as to avoid harm to the Basin.

E. The Parties wish to coordinate their actions to circumvent unnecessary and potentially protracted litigation over the meaning and implementation of the Judgment.

AGREEMENT

NOW, THEREFORE, in consideration of the foregoing recitals, which are incorporated into the operative provisions of this Agreement by this reference, and for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the **PARTIES HERETO AGREE** as follows:

1. **Purpose.** The purpose of this Agreement is to address two issues: (a) reduction in the stored groundwater in the Basin; and (b) the accumulation of Stored Water credits by the Parties in excess of the quantity of water available to be pumped by them. By entering into this Agreement, and by undertaking the actions described herein, the Parties seek to ensure that necessary long-term improvements are made to capture and recharge sufficient quantities of rainfall whenever available to correct declining water levels and to guard against any short-term deficiencies in Basin replenishment as might be associated with drought conditions. In the interim, while these Projects are being implemented, the Parties also agree that some guidelines must be established to avoid harm to the Basin and all Parties.

2. **Term.** The term of this Agreement shall be ten years and shall commence with the 2007-08 Water Year (beginning October 1, 2007). The 2007-08 Water Year shall be Year 1; the 200 8-09 Water Year shall be Year 2, and so on. At the conclusion of the term of this Agreement, on or about September 30, 2017, the Parties, in coordination with the Watermaster, will evaluate the effectiveness of this Agreement including, but not limited to, the status of the Projects, and determine whether this Agreement shall be extended.

3. **Enhancement of Recharge Capacity.** Los Angeles has previously expressed its support for several artificial recharge projects. The Parties acknowledge that if implemented as planned, these projects, individually and collectively, will augment replenishment of the Basin in a manner that arrests the observed decline in groundwater levels. The projects presently being pursued include, but are not limited to: the Sheldon-Arleta Project, the Big Tujunga Dam Seismic Restoration Project, the Hansen Spreading Grounds Project, and the Tujunga Spreading Grounds Project (collectively, the Projects).

3.1 By the conclusion of Year 10, Los Angeles, in collaboration with the Los Angeles County Department of Public Works (a separate public agency which is not a party to this Agreement), intends to support and contribute resources towards the design, construction and implementation of the Projects in a manner that increases the Basin's total artificial recharge capacity over conditions existing as of the date of this Agreement. By taking these actions, Los Angeles anticipates that the long-term average native replenishment of the Basin may be increased by at least 12,000 acre-feet per year. Although the exact quantity of additional recharge that will be derived from these Projects, when completed, is unknown and is dependent ultimately on the quantity and variability of precipitation, it is reasonable to assume the additional recharge of the Basin made possible by these Projects will be substantial. While Los Angeles may also elect to contribute funding towards these Projects, this Agreement does not obligate Los Angeles to fund any of the Projects either in part or in whole.

3.2 Mutual Cooperation. Burbank and Glendale agree to coordinate and cooperate with Los Angeles and the Los Angeles County Department of Public Works as may be necessary to increase the likelihood of timely implementation of the Projects.

3.3 Reporting. Within 60 days of the conclusion of each Water Year during the term of this Agreement, Los Angeles shall file a report with the Administrative Committee, the Watermaster and the Court documenting the status of the Projects, including but not limited to the extent by which the Projects have increased the Basin's total artificial recharge capacity.

4. Pumping Limitation. For the term of this Agreement, the Parties agree not to pump their pro-rata share of the total Stored Water credits held by the Parties collectively that, if pumped, would cause the total quantity of water in storage to fall below -655,370 acre-feet (the 1968 level). The quantity of water that the Parties otherwise could have pumped pursuant to their respective Stored Water credits shall be placed in a reserve, and not lost, until such time as there is sufficient water in storage to permit the pumping of those credits without causing the quantity of water in storage to fall below the 1968 level.

4.1 Calculation of Available Stored Water Credits and Reserved Stored Water Credits. The Parties authorize the Watermaster to calculate, annually, the quantity of Stored Water credits available to be pumped by each Party (Available Stored Water credits) and the quantity of Stored Water credits reserved for later use by each Party (Reserved Stored Water credits), as agreed upon herein.

(a) For purposes of making this calculation, the Watermaster shall: (1) compute each Party's Stored Water credits as of the first day of each Water Year for the term of this Agreement, including the one percent (1%) loss described in Section 5 below; (2) assign a percentage to each Party that reflects the relative proportion of each Party's Stored Water credits to the total quantity of credits available to all Parties; (3) determine the quantity of Stored Water available to be pumped by all Parties and calculate each Party's relative proportion of that total quantity; and (4) calculate the quantity of Stored Water Credits not available to be pumped in that Water Year and reserved for later use. For the 2006-07 Water Year (beginning October 1, 2006), which is not subject to this Agreement, the calculation would be as follows:

Party	Stored Water Credits (AF), Minus 1% Losses	Percentage of Total Quantity of Stored Water Credits for Each Party	Available Stored Water Credits (AF)	Reserved Stored Water Credits (AF)
Los Angeles	370,350	83.146%	139,018	231,334
Glendale	61,215	13.743%	22,978	38,236
Burbank	13,859	3.111%	5,202	8,656
Total	**445,424**	**100%**	**167,198**	**278,226**

4.2 Exception to Satisfy Consent Decree Obligations. Nothing herein shall be construed as causing Burbank or Glendale to pump less groundwater from the Basin than required by the United States Environmental Protection Agency's Consent Decrees for the Burbank Operable Unit [Civil Action 91-4527-MRP (Tx), dated 06-22-1998] and the Glendale North and South Operable Units [CV99-00552 MRP (ANx), dated 05-17-2000], respectively, all of which are incorporated by this reference as if fully set forth herein, and as may be modified or amended from time to time during the term of this Agreement (collectively, Consent Decrees). In the event that the pumping limitations set forth in Section 4 above are triggered by a decline in storage, Burbank and Glendale may pump Reserved Stored Water credits to meet their Consent Decree obligations subject to the following conditions:

(a) In the event Los Angeles is able to produce the full quantity of its Extraction Right to meet the water requirements of its inhabitants for the Water Year in which Glendale's or Burbank's Available Stored Water Credits are not sufficient to meet that Party's Consent Decree obligations, Glendale or Burbank shall be required to purchase Physical Solution water pursuant to Section 9.4 of the Judgment as necessary to meet their respective Consent Decree obligations. For purposes of this Agreement, "Extraction Right" shall mean the total quantity of Los Angeles' Return Water Extraction Right plus Native Safe Yield Credit, as set forth in Table 2-1 1A of the Watermaster's most recent annual report prepared pursuant to section 8.2.11 of the Judgment.

(b) In the event the conditions of paragraph 4.2(a) above are not satisfied, Los Angeles may elect to exchange water or stored water credits with the Party requiring additional water to meet its Consent Decree obligations upon such terms and conditions as the affected Parties may agree upon. In the event an agreement to exchange water or stored water credits sufficient to permit either Glendale or Burbank to satisfy their Consent Decree obligations cannot be reached, Glendale or Burbank may pump Reserved Stored Water credits as necessary to meet their Consent Decree obligations, subject to Paragraph 4.2(c) below.

(c) Any pumping by Glendale and Burbank of Reserved Stored Water credits pursuant to this exception shall not exceed a maximum combined total of 2,000 acre-feet per year over the term of this Agreement. Any pumping in excess of a combined total of 2,000 acre-feet per year over the term of this Agreement shall be pursuant to Section 9.4 of the Judgment.

4.3 Exception for Unforeseen Circumstances. Additionally, to the extent that any Party is required to pump water in excess of that Party's Available Stored Water credits and in reliance upon that Party's Reserved Stored Water credits, to meet presently unspecified federal or state regulatory obligations that may be established in the future or unforeseen material changes in the Parties' operations or Basin conditions, the affected Party(ies) shall coordinate with the Administrative Committee and the Watermaster to determine whether and to what extent additional quantities of groundwater may be extracted in a manner that does not cause harm to the Basin or any other Party.

5. **Account for Groundwater Losses.** The Parties acknowledge that Stored Water losses may occur from the Basin. The Parties further acknowledge that Section 8.2.9 of the Judgment requires the calculation of such losses from Stored Water. The Parties estimate that as much as one percent (1%) of all Stored Water is lost from the Basin annually.

5.1 For the term of this Agreement, or until such time as the Basin loss calculation is re-evaluated, the Parties authorize Watermaster to deduct one percent (1%) annually from each Parties' respective Stored Water credits account.

6. **Basin Safe Yield Study.** The Parties acknowledge that, from time to time, it may be appropriate to study information regarding the hydrology of the Basin, including the Basin's Safe Yield, as that term is defined in the Judgment.

6.1 Within six months of the date of execution of this Agreement, the Parties, in coordination and consultation with the Watermaster, will develop a proposal for conducting a study of the Basin's Safe Yield. The proposal will include each of the following elements: (1) timing for designing, conducting and implementing the study and each of its phases, (2) trigger(s) and parameters for implementing the study, or any part or phase, (3) procedures for managing and allocating costs and for authorizing expenditures during and throughout the study; (4) methods and manner for conducting the study; and (5) anticipated goals or outcomes of the study. Thereafter, the Parties will commence a study of the Basin's Safe Yield that is consistent with the proposal required by this Section, as may be agreed upon by the Parties.

6.2 In the event the Parties are unable to agree to a proposal for studying the Basin's Safe Yield within six months of the date of execution of this Agreement, the Parties, individually or collectively, shall lodge their respective proposals, if any, with the Court. The Court, upon at least 30 days notice thereof and after a hearing, shall make such further or supplemental orders as may be necessary or appropriate and consistent with the Judgment.

7. **Recalculation of Safe Yield.** Regardless of any information collected or reports made pursuant to Section 6 above, the Parties agree to forebear from exercising any and all rights they may have arising under or related to Section 8.2.10 of the Judgment for the term of this Agreement, except as may be necessary to respond to, support or oppose any Watermaster recommendation or action that may be inconsistent with this Agreement, the provisions herein, or any Party's respective rights, remedies and defenses arising under the Judgment or applicable law. After the expiration of this Agreement, the rights of any and all Parties arising under or related to Section 8.2.10 will not be prejudiced by the existence of this Agreement or their agreement to forebear pursuant to its terms.

8. **Annual Accounting by Watermaster.** Watermaster will collect, record and verify, or otherwise arrange for the collection, recordation and verification of, any and all data and information as may be required or generated by this Agreement and as may be otherwise directed by the Administrative Committee or the Court. Upon written request by any Party, all such data and information shall be made available to the Parties. The

Watermaster shall include such data and information in its annual Watermaster Report, prepared pursuant to Section 8.2.11 of the Judgment, a copy of which is filed with the Court.

9. Administrative Committee and Watermaster Authority. Watermaster and the Administrative Committee are not Parties to this Agreement. This Agreement is made among the Parties and nothing herein shall be construed as a limitation on the powers and responsibilities of the Administrative Committee or the Watermaster arising under the Judgment.

10. Reservation of All Rights. Subject to Section 7 above, neither this Agreement, nor any provision herein, shall be construed as a waiver or limitation on any Party's respective rights, remedies and defenses arising under the Judgment or applicable law including, but not limited to, the right to respond to, support or oppose further Watermaster recommendations.

11. Consistency with Judgment and Continuing Jurisdiction. The actions contemplated by this Agreement, if implemented, facilitate a physical solution and are intended as measures that arise under, are consistent with, and in furtherance of, the Judgment. Accordingly, this Agreement shall be subject to the Court's continuing jurisdiction as provided by Section 7 of the Judgment.

12. Further Actions. The Parties contemplate that additional opportunities may arise to further augment the available yield of the Basin during the term of this Agreement. Upon a request by any Party, the Watermaster or the Administrative Committee, the Parties will exercise good faith to fairly evaluate opportunities to exchange water, enhance recharge, evaluate a replenishment program and conserve water. Further, Burbank is actively pursuing an inter-connection with the Metropolitan Water District of Southern California to permit the delivery of replenishment water to Burbank for storage in the Basin. Burbank will file annual status reports with the Watermaster, the Administrative Committee and the Court in a manner similar to Los Angeles' reporting as provided in Section 3.3 above.

13. General Provisions.

13.1 Assignment. This Agreement shall not be assigned by any Party.

13.2 Attorneys' Fees. Should legal action be instituted by any Party to this Agreement, to enforce or interpret any provision of this Agreement, each Party shall bear its own attorneys' fees.

13.3 Authorizations. All individuals executing this Agreement on behalf of the respective Parties certify and warrant that they have the capacity and have been duly authorized to so execute this Agreement on behalf of the entity so indicated.

13.4 Construction. The provisions of this Agreement shall be liberally construed to effectuate its purposes. The language of this Agreement shall be construed

simply according to its plain meaning and shall not be construed for or against any Party, as each Party has participated in the drafting of this Agreement.

13.5 Counterparts. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

13.6 Entire Agreement and Amendment. In conjunction with the matters considered herein, this Agreement contains the entire understanding and agreement of the Parties and there have been no promises, representations, agreements, warranties or undertakings by any of the Parties, either oral or written, of any character or nature binding except as stated herein. This Agreement may be modified, altered or amended only by an instrument in writing, executed by the Parties to this Agreement and by no other means. Each Party waives its right to claim, contest or assert that this Agreement was modified, canceled, superseded or changed by any oral agreement, course of conduct, waiver or estoppel.

13.7 Good Faith. The Parties agree to exercise their reasonable best efforts and utmost good faith to effectuate all the terms and conditions of this Agreement and to execute such further instruments and documents as are necessary or appropriate to effectuate all of the terms and conditions of this Agreement.

13.8 Notices. All notices, approvals, acceptances, demands and other communication required or permitted under this Agreement, to be effective, shall be in writing and delivered in person or by U.S. Mails (prepaid postage, certified, return receipt requested) or by overnight delivery service to the Party to whom the notice is directed at the addresses identified below:

To Los Angeles:

Director of Water Resources
Los Angeles Department of Water and Power
111 N. Hope Street, Room 1460
Los Angeles, CA 90012

With copy to:

Julie Conboy Riley, Deputy City Attorney
Office of the City Attorney
City of Los Angeles
111 N. Hope Street, Room 340
Los Angeles, CA 90012

To Glendale:

Peter Kavoumas, Water Services Administrator
Glendale Water and Power
City of Glendale
141 North Glendale Ave., 4th Level
Glendale, CA 9 1206-4496

With copy to:

Christine Godinez, Assistant City Attorney
City of Glendale
613 East Broadway, Suite 220
Glendale, CA 91206-4394

To Burbank:

William Mace, Assistant General Manager
Burbank Water and Power
City of Burbank
164 West Magnolia Boulevard
P.O. Box 631
Burbank, CA 91503-063 1

With copy to:

Carolyn Barnes, Senior Assistant City Attorney
City of Burbank
275 East Olive Avenue
Burbank, CA 91510-6459

To the Watermaster:

Mark Mackowski
Upper Los Angeles River Area Watermaster
111 N. Hope Street, Room 1450
Los Angeles, CA 90012

To the Court:

The Honorable Susan Bryant-Deason
Judge of the Los Angeles County Superior Court
111 N. Hill Street, Dept. 52
Los Angeles, CA 90012

Any written communication given by mail shall be deemed delivered two (2) business days after such mailing date. Any communication given by overnight delivery service

shall be deemed delivered one (1) business day after the dispatch date. Either Party may change its address by giving the other Party written notice of its new address as provided above.

13.9 Recitals. The recitals set forth at the beginning of this Agreement of any matters or facts shall be conclusive proof of the truthfulness thereof and the terms and conditions set forth therein shall be deemed a part of this Agreement.

13.10 Successors and Assigns. This Agreement shall be binding on and shall inure to the benefit of the Parties and their respective successors.

13.11 Court Approval. The Parties hereto shall seek Court approval of this Agreement prior to September 30, 2007.

14. Waiver. No waiver of any provision or consent to any action shall constitute a waiver of any other provision or consent to any other action, whether or not similar. No waiver or consent shall constitute a continuing waiver or consent or commit a Party to provide a waiver or consent in the future except to the extent specifically stated in writing. No waiver shall be binding unless executed in writing by the Party making the waiver, based on a full and complete disclosure of all material facts relevant to the waiver requested.

[continued on next page]

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement.

DEPARTMENT OF WATER AND POWER OF
THE CITY OF LOS ANGELES BY
BOARD OF WATER AND POWER COMMISSIONERS
OF THE CITY OF LOS ANGELES

Date: 9/19/07 By: _____
ROBERT K. ROZANSKI
Acting General Manager

And: Barbara E. Moseley
Secretary

AUTHORIZED BY RES. 008 046
SEP 04 2007

APPROVED AS TO FORM AND LEGALITY
ROCKARD J. DELGADILLO, CITY ATTORNEY

AUG 22 2007
BY _____
JULIE CONBOY RILEY
Deputy City Attorney

CITY OF GLENDALE

Date: 9/13/07

James E. Starbird, City Manager

Approved as to Form:

By _____
City Attorney

CITY OF BURBANK

Date: 9/13/07

Ronald E. Davis, General Manager,
Burbank Water and Power

Attest:

By _____
Margarita Campos, City Clerk

Approved as to Form:

By _____
Carolyn Barnes, Senior Assistant City Attorney

SB 440012 v1:011538.0001

ORDER

Having read and reviewed the foregoing stipulation, **IT IS HEREBY ORDERED** that the terms of the *Interim Agreement for the Preservation of the San Fernando Basin Water Supply*, dated September 20, 2007 ("Agreement"), which is entered into by and between the City of Los Angeles, the City of Glendale and the City of Burbank, all of whom are parties to this action, a copy of which is attached hereto and incorporated herein by this reference, shall be the Order of the Court. The Parties are hereby ordered to comply with the terms of the Agreement.

DATED: October 2, 2007 Judge Susan Bryant-Deason
JUDGE OF THE SUPERIOR COURT

PROOF OF SERVICE

I am employed in the County of Los Angeles; I am over the age of eighteen years and am not a party to the within entitled action; my business address is 111 North Hope Street, Suite 340, Los Angeles, California 90012-2694. On September 25, 2007, I served the within documents:

STIPULATION AND [PROPOSED] ORDER RE. INTERIM AGREEMENT FOR THE PRESERVATION OF THE SAN FERNANDO BASIN WATER SUPPLY

[ ] by transmitting via facsimile the document(s) listed above to the fax number(s) set forth below on this date.

[X] by placing the document(s) listed above in a sealed envelope with postage thereon fully prepaid, in the United States mail at Los Angeles, California addressed as set forth below.

[ ] by personally delivering the document(s) listed above to the person(s) at the address(es) set forth below.

PLEASE SEE THE ATTACHED LIST.

I am readily familiar with the firm's practice of collection and processing correspondence for mailing. Under that practice it would be deposited with the U.S. Postal Service on that same day with postage thereon fully prepaid in the ordinary course of business.

I declare under penalty of perjury under the laws of the State of California that the above is true and correct.

Executed on September 25, 2007, at Los Angeles, California.

Lillian M. Catena

Lillian M. Catena

THE CITY OF LOS ANGELES v. CITY OF SAN FERNANDO, ET AL.
LASC CASE NO. C 650 079

SERVICE LIST

SCOTT S. SLATER, ESQ. STEPHANIE OSLER HASTINGS, ESQ. **HATCH & PARENT** 21 E. Carillo Street Santa Barbara, California 93101 Telephone: (805) 963-7000 Facsimile: (805) 965-4333	Attorneys for Defendants CITY OF BURBANK and CITY OF GLENDALE
CITY OF GLENDALE SCOTT H. HOWARD, City Attorney CHRISTINE A. GODINEZ, Assist. City Attorney 613 East Broadway, Suite 220 Glendale, California 91206-4394 Telephone: (818) 548-2080 Facsimile: (818) 547-3402	Attorneys for Defendants CITY OF BURBANK and CITY OF GLENDALE
CITY OF BURBANK DENNIS BARLOW, City Attorney CAROLYN BARNES, Senior Assist. City Attorney 275 East Olive Avenue Burbank, California 91510-6459 Telephone: (818) 238-5700 Facsimile: (818) 238-5724	Attorneys for Defendants CITY OF BURBANK and CITY OF GLENDALE
Julie Conboy Riley Deputy City Attorney Office of the City Attorney Department of Water and Power P. O. Box 5111- Room 340 (Mailing) 111 N. Hope Street, Room 340 Los Angeles, CA 90051-0100	Attorneys for Plaintiff, THE CITY OF LOS ANGELES, acting by and through the DEPARTMENT OF WATER AND POWER
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Peter Kavbounas (Member)
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Operations Manager
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David Gould (Alternate)
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La Crescenta, California 91214
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Dennis Erdman (Member)
General Manager
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La Crescenta, California 91214
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Attorneys for
Upper Los Angeles River Area Watermaster

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

THE CITY OF LOS ANGELES, Plaintiff, v. CITY OF SAN FERNANDO, et al., Defendants.	Case No. C650 079 **WATERMASTER STATEMENT RE: INTERIM AGREEMENT FOR THE PRESERVATION OF THE SAN FERNANDO BASIN WATER SUPPLY** Before the Hon. Susan Bryant-Deason

The court-appointed Watermaster hereby submits the following statement regarding the Stipulation and [Proposed] Order re: Interim Agreement for the Preservation of the San Fernando Basin Water Supply, submitted by the Cities of Los Angeles, Glendale and Burbank ("Agreement").

The Watermaster supports this Court's approval of the Agreement. The Watermaster appreciates the efforts on the part of the Cities of Los Angeles, Glendale and Burbank to reach a negotiated solution to the complex issues affecting the declining stored groundwater levels in the San Fernando Basin. The Watermaster believes the Agreement

represents significant progress in addressing the issues set forth in the Watermaster White Paper lodged with this Court on March 23, 2007. The Agreement contains many elements that will help restore the long-term sustainability of the Basin, and the Agreement expressly provides for the preservation of all Watermaster authority under the Judgment.[1]

While the Watermaster supports approval of the Agreement, and while the Watermaster is hopeful that the Agreement will facilitate improved storage levels in the Basin, the Watermaster is obligated to raise several issues that may materialize in the future.

First, the Watermaster believes that a Basin Safe Yield Study is a critical component of understanding the true and correct hydrologic conditions in the Basin. It has been over 40 years since a Basin Safe Yield Study has been performed. Section 6 of the Agreement provides that the Parties will develop a proposal for a Basin Safe Yield Study. This paragraph further provides that if the Parties do not come to an agreement on a single proposal, then the Parties will submit their separate proposals to this Court. The Agreement therefore has the potential to delay the Basin Safe Yield Study. The Watermaster agrees that a six month period is ample time for the Parties to agree upon the proposal for the Basin Safe Yield Study. Indeed, the Parties should endeavor to commence the study prior to the time allocated by the Agreement. In any case, the Safe Yield Study should begin no later than the completion of the six month study period.

Second, the Watermaster believes that actual losses must be calculated, not merely estimated. Section 5.1 of the Agreement provides that for the 10-year term of the Agreement, the Parties authorize Watermaster to deduct one-percent annually from each Party's respective Stored Water Credit, or until such time as the Basin loss calculation is re-evaluated. The Watermaster believes the one-percent estimate is reasonable on an interim basis. However, Section 8.2.9 of the Judgment requires that Watermaster shall calculate and

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[1] Paragraph 9 of the Agreement provides: "Watermaster and the Administrative Committee are not Parties to this Agreement. This Agreement is made among the Parties and nothing herein shall be construed as a limitation on the powers and responsibilities of the Administrative Committee or the Watermaster arising under the Judgment."

account for stored water losses.[2] It is therefore imperative that Watermaster calculate the true and correct Basin losses from rising groundwater and underflow. Upon obtaining the necessary data to accurately perform that calculation, Watermaster believes it is necessary and appropriate to deduct actual losses, not estimated losses, from the Parties' Stored Water Credits. Therefore, the Watermaster will recommend that the calculation for determining Basin losses be re-evaluated as part of the Basin Safe Yield Study, and implemented upon completion of the Study.

Third, Section 4.2.6.1 of the Judgment states that the San Fernando Basin "...remained in overdraft continuously until 1968, when an injunction became effective. Thereafter, the basin was placed on safe yield operation." The Parties anticipate that the actions required of them under the Agreement will forestall the Basin's decline and prevent groundwater levels from slipping below the 1968 benchmark. However, if progress does not materialize as anticipated and groundwater levels fall below the 1968 level, the Watermaster may be obligated to declare overdraft and consider further options consistent with the Judgment to protect the Basin.

The Watermaster is hopeful that the Parties will reach consensus on the implementation of a Basin Safe Yield Study, the calculation of losses, and conjunctive use projects to replenish the Basin. In that regard, the Watermaster hopes that the reservations expressed herein will not need to be addressed by this Court. Nonetheless, in light of the Agreement's dependence on additional action by the Parties over the next 10 years, and in particular the next six months, the Watermaster is obligated to inform this Court of the aforementioned issues.

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[2] Section 8.2.9, in relevant part, provides: "Watermaster shall record and verify additions, extractions and losses and maintain an annual and cumulative account of all (a) stored water and (b) import return water in San Fernando Basin."

The Watermaster expresses its appreciation to the Parties and this Court for their attention in developing solutions to enhance the long-term sustainability of the San Fernando Basin.

DATED: September 25, 2007

NOSSAMAN, GUTHNER, KNOX & ELLIOTT, LLP
Frederic A. Fudacz
Alfred E. Smith

By: _____
Alfred E. Smith
Attorneys for Upper Los Angeles River Area Watermaster

PROOF OF SERVICE

The undersigned declares:

I am employed in the County of Los Angeles, State of California. I am over the age of 18 and am not a party to the within action; my business address is c/o Nossaman, Guthner, Knox & Elliott, LLP, 445 S. Figueroa Street, 31st Floor Los Angeles, California 90071-1602.

On September 25, 2007, I served the foregoing **WATERMASTER STATEMENT RE: INTERIM AGREEMENT FOR THE PRESERVATION OF THE SAN FERNANDO BASIN WATER SUPPLY** on parties to the within action by placing ( ) the original (x) a true copy thereof enclosed in a sealed envelope, addressed as shown on the attached service list.

(X) (By U.S. Mail) On the same date, at my said place of business, said correspondence was sealed and placed for collection and mailing following the usual business practice of my said employer. I am readily familiar with my said employer's business practice for collection and processing of correspondence for mailing with the United States Postal Service, and, pursuant to that practice, the correspondence would be deposited with the United States Postal Service, with postage thereon fully prepaid, on the same date at Los Angeles, California.

( ) (By Facsimile) I served a true and correct copy by facsimile pursuant to C.C.P. 1013(e), to the number(s) listed on the attached sheet. Said transmission was reported complete and without error. A transmission report was properly issued by the transmitting facsimile machine, which report states the time and date of sending and the telephone number of the sending facsimile machine. A copy of that transmission report is attached hereto.

( ) (By Overnight Service) I served a true and correct copy by overnight delivery service for delivery on the next business day. Each copy was enclosed in an envelope or package designated by the express service carrier; deposited in a facility regularly maintained by the express service carrier or delivered to a courier or driver authorized to receive documents on its behalf; with delivery fees paid or provided for; addressed as shown on the accompanying service list.

Executed on September 25, 2007.

(X) (STATE) I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

( ) (FEDERAL) I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Charlyn Jones

ATTORNEYS OF RECORD

Name	Party
Ms. Julie Riley Deputy City Attorney Office of the City Attorney Department of Water and Power 111 N. Hope Street, Suite 340 P.O. Box 5111 Los Angeles, CA 90051-5700 Telephone: 213-367-4579	Los Angeles
Mr. Dennis Barlow City Attorney 275 East Olive Avenue Burbank, CA 91502 Telephone: 818-238-5700	Burbank
Mr. Scott Howard City Attorney 613 East Broadway Glendale, CA 91205 Telephone: 818-548-2080	Glendale
Steven R. Orr, Esq. Richards, Watson & Gershon 355 South Grand Avenue, 40th Floor Los Angeles, CA 90071 Telephone: 213-626-8484	San Fernando
Mr. H. Jess Senecal, Special Counsel Lagerlof, Senecal, Swift and Bradley 301 North Lake Avenue - 10th Floor Pasadena, CA 91101 Telephone: 626-793-9400	Crescenta Valley, Vulcan-CalMat
Greg Chafee, Esq. 5660 New Northside Drive, Suite 500 Atlanta, GA 30328 Telephone: 770-933-1447	DS Waters

ATTORNEYS OF RECORD (CONT'D)

Name	Party
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Mr. Patrick Holleran General Manager 12833 Ventura Boulevard Studio City, CA 91604 Telephone: 818-984-0202	Sportsmen's Lodge
Mr. Fritz Tegatz Middle Ranch 11700 No. Little Tujunga Canyon Road Lake View Terrance, CA 91342	Middle Ranch Parties

ADMINISTRATIVE COMMITTEE and ALTERNATES

Name	Party
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ADMINISTRATIVE COMMITTEE and ALTERNATES (CONT'D)

Mr. Ronald Ruiz (Member) Director of Public Works City of San Fernando 117 Macneil Street San Fernando, CA 91340 Telephone: 818-898-1237	San Fernando
Mr. Daniel Wall (Alternate) City of San Fernando 117 Macneil Street San Fernando, CA 91340 Telephone: 818-898-1299	San Fernando
Mr. Dennis Erdman (Member) General Manager Crescenta Valley Water District 2700 Foothill Boulevard La Crescenta, CA 91214 Telephone: 818-248-3925	Crescenta Valley Water District
Mr. David Gould (Alternate) District Engineer Crescenta Valley Water District 2700 Foothill Boulevard La Crescenta, CA 91214 Telephone: 818-248-3925	Crescenta Valley Water District

APPENDIX H
WELLS DRILLED, REACTIVATED, ABANDONED, OR DESTROYED

ACTIVITIES INVOLVING THE CONSTRUCTION, REHABILITATION, AND/OR DESTRUCTION OF WATER WELLS

2013-14 WATER YEAR

Five wells were destroyed by LADWP in Water Year 2013-14, as follows:

- Erwin 8, in the North Hollywood Area of ULARA, was destroyed in October 2013
- Langmiur 1, was destroyed in January of 2014; this well was located in the Sunland/Tujunga area of Los Angeles
- Reseda Well Nos 5, 6, and 9 were destroyed in September 2014.

No other water wells were constructed or destroyed in any of the four groundwater basins in ULARA in Water Year 2013-14

APPENDIX I
ACTION ITEMS 2014-15 WATER YEAR

ACTION ITEMS

WATERMASTER ACTIVITIES FOR 2014-15 WATER YEAR

1. Continue work efforts on developing a Salt and Nutrient Management Plan (SNMP) for the four groundwater basins within ULARA.

2. Continue to support ways to maximize the spreading of native water and increase the infiltration of urban runoff in the SFB.

3. Revise the structure of this report to help verify compliance with the reporting requirements of the Sustainable Groundwater Management Act.

4. Continue the work needed for the four ULARA groundwater basins to be in conformance with the DWR regulations regarding the California Groundwater Elevation Monitoring (CASGEM) program.

5. Continue to work with the Parties and regulatory agencies, such as the USEPA and RWQCB – Los Angeles, to enforce chromium cleanup in the SFB.

6. Continue to work with the City of Los Angeles Department of Water and Power--Watershed Protection Division and their Low Impact Development Ordinance for the proposed development and/or the re-development of properties within the City portion of the San Fernando Valley.

7. Collect, organize, convert to electronic format, and correlate the driller's logs, geologic logs and electric logs for new water wells and groundwater monitoring wells in the ULARA groundwater basins.

8. Collect, organize, convert to electronic format, and correlate electric logs of wildcat and/or producing oil wells in the San Fernando and Sylmar groundwater basins.

9. Collect, scan, and convert to electronic format all prior Annual Watermaster Reports and 5-year Pumping and Spreading Plans, the ULARA Judgment and the 2-volume set of the Report of Referee; post all to the ULARA website.

10. Continue to review reports on selected contamination sites and continue liaison with regulators and/or their consultants in an effort to help accelerate the time schedules and effectiveness of cleanup activities at these sites.

11. Continue liaison with community and civic groups focused on "revitalization" of the Los Angeles River.

12. Continue to attend meetings of technical groups, such as the Association of Groundwater Agencies (AGWA) and the Groundwater Resources Association (GRA), to exchange ideas and information regarding water quality and groundwater basin management.

APPENDIX J
WATER EQUIVALENTS

WATER EQUIVALENTS

Volume

1 gallon* …….	= 3.7854 liters (L)	= 231** cubic inches (in^3)
…….	= 0.003785 cubic meters (m^3)	= 0.132475 cubic feet (ft^3)
100 cubic feet (HCF)**** …….....	= 748 gallons (gal)	= 2.83317 cubic meters (m^3)
…….....	= 2,832 liters (L)	= 3.70386 cubic yards (yd^3)
…….....	= 6,230.8 pounds of water (lb)	= 2,826.24 kilograms (kg)
1 acre-foot (AF)*** ……..	= 43,560** cubic feet (ft^3)	= 1233.5 cubic meters (m^3)
……..	= 325,851 gallons (gal)	= 1,233,476.3754 liters (L)
……..	= the average amount of water used by two families for one year.	

Flow

1 cubic foot per second (cfs) …	= 448.83 gallons per minute (gpm)	= 0.028317 cubic meters/sec (m^3/s)
…	= 646,317 gallons per day (gal/day)	= 1.70 cubic meters/min
…	= 1.98 AF/day	= 2446.6 cubic meters/day
1,000 gallons per Minute(gpm) …	= 2.23 cubic feet per second (cfs)	= 0.063 cubic meters/sec (m^3/s)
...	= 4.42 AF/day	= 5452.6 cubic meters/day
...	= 11,613.01 AF/year	= 1.99 million cubic meters/yr
1 million gallons per day (mgd) …	= 3.07 AF/day	= 3785 cubic meters/day
...	1,120.14 AF/year	= 1.38 million cubic meters/yr

Concentration

…	= 1.0 milligrams per liter (mg/L)	= 1.0 part per million (ppm)
…	= 1.0 micrograms per liter (μg/L)	= 1.0 part per billion (ppb)

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* U.S. gallons
** Exact Value
*** An acre-foot of water covers one acre of land one foot deep
**** This is a billing unit of DWP

APPENDIX K
LIST OF ABBREVATIONS

LIST OF ABBREVIATIONS

AF	Acre-feet
AF/Y	Acre-feet per Year
BOU	Burbank Operable Unit
BTEX	Benzene, tolulene,ethylbenzene,and total xylene
CVWD	Crescenta Valley Water District
Cal-EPA	California Environmental Protection Agency
DCA	Dichloroethane
DCE	Dichloroethylene
CDPH	California Department of Public Health
DTSC	California Department of Toxic Substances Control
DWP	Department of Water and Power (see also LADWP)
EPA	Environmental Protection Agency (see also USEPA)
EVWRP	East Valley Water Recycling Project
LAFD	Los Angeles Fire Department
GAC	Granular Activated Carbon
GOU	Glendale Operable Unit
GNOU	Glendale North Operable Unit
GSOU	Glendale South Operable Unit
gpm	Gallons Per Minute
LACDPW	Los Angeles County Department of Public Works
LADWP	Los Angeles Department of Water and Power
MCL	Maximum Contaminant Level
mg/L	Milligrams per Liter, same as PPM
MTA	Metropolitan Transportation Authority
MWD	Metropolitan Water District of Southern California
NHOU	North Hollywood Operable Unit
OEHHA	Office of Environmental Health Hazard Assessment
OU	Operable Unit
PCE	Tetrachloroethylene
PHG	Public Health Goal
PPB	Parts Per Billion, same as micrograms per liter
PPM	Parts Per Million, same as milligrams per liter
PSDS	Private Sewage Disposal Systems
RAW	Removal Action Workplan
RI	Remedial Investigation
RWQCB	Regional Water Quality Control Board
SFB	San Fernando Basin
SUSMP	Standard Urban Stormwater Mitigation Plan
SWRCB	State Water Resouces Control Board
SWAT	Solid Waste Assessment Test
TCA	1,1,1- Trichloroethane
TCE	Trichloroethylene
TDS	Total Dissolved Solids
TSG	Tujunga Spreading Grounds
µg/L	Micrograms per Liter, same as PPB
ULARA	Upper Los Angeles River Area
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound

LIST OF ABBREVIATIONS

VPWTP	Glendale-Verdugo Park Water Treatment Plant
USGS	United States Geological Survey