ANNUAL REPORT

WATERMASTER SERVICE IN THE UPPER LOS ANGELES RIVER AREA (ULARA) LOS ANGELES COUNTY, CALIFORNIA

Re: City of Los Angeles vs. City of San Fernando, et al.
Superior Court Case No. 650079 - County Of Los Angeles

2015-16 WATER YEAR
OCTOBER 1, 2015 - SEPTEMBER 30, 2016

December 2017

ULARA

UPPER LOS ANGELES RIVER AREA WATERMASTER

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December 2017

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

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FOREWORD

As Watermaster for the Court-adjudicated Upper Los Angeles River Area (ULARA), I am pleased to present the Annual Watermaster Report for Water Year (WY) 2015-16 (i.e., from October 1, 2015 through September 30, 2016). Please note that this Annual Watermaster Report is being submitted to the Court later than its anticipated May 2017 filing date. Due to the delayed receipt of data necessary for analysis and reporting, and timely finalization of the report, this current Annual Report is being provided to the Court in July 2018. However, to avoid confusion with the submittal to the Court of the forthcoming Annual Watermaster Report for WY 2016-17, this current report has been purposely dated December 2017.

This report has been prepared by Watermaster staff and me in general accordance with the provisions of the Final ULARA 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, 2016. This report also provides general information regarding the four ULARA groundwater basins, such as their respective locations and basin boundaries and their basic local geologic conditions, along with basin-specific data on local water supply, groundwater extractions, changes in groundwater levels over time, estimates of the change in groundwater in storage, imported water use, recharge operations, and water quality for the current 2015-16 WY.

Key current challenges in ULARA continue to be: the accumulation of stored water credits in the San Fernando Basin; new and/or ongoing problems with contamination of groundwater in the San Fernando, Verdugo and Sylmar basins; the need to remediate that groundwater contamination; and the need to increase recharge into the local groundwater basins. 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.

Groundwater contamination from volatile organic compounds (VOCs), hexavalent chromium (CrVI), and certain other newly-emerging contaminants continues to be a serious problem for water-supply in ULARA, but particularly in the eastern portion of 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 CrVI by certain wells, and the current limitations of existing treatment facilities to treat those excessive concentrations, have also become recent problems in San Fernando 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 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.

To provide ongoing groundwater management within the four ULARA groundwater basins, the Watermaster and the Administrative Committee (i.e., representatives from the Parties to the Judgment: the cities of Burbank, Glendale, Los Angeles, and San Fernando, and the Crescenta Valley Water District) continued to meet on a quarterly basis during the current WY. The Watermaster also continued to provide updates of key ULARA issues at occasional status conferences with The Honorable Susan Bryant-Deason, Judge of the Los Angeles County Superior Court.

The Watermaster has received positive feedback from many parties related to the revised “streamlined” report format used to create the prior Annual Report (for WY 2014-15). As noted in that prior Annual Report, it is noteworthy that some table numbers did change in the report when compared to those annual reports issued for WY2014-15 and prior, but the formats of the tables were left primarily intact.

In accordance with the provisions of the California Sustainable Groundwater Management Act, the Watermaster has continued to upload the required information from the Annual ULARA Watermaster reports to the SGMA Adjudicated Basins

Reporting website. To help clarify those submissions for the reader, summary Table 1-3 in this report has been reformatted to include the information that is reported on the SGMA website, and shows how those values are collected using the data presented in the Annual Report. The Watermaster also continues to attend DWR workshops related to SGMA Adjudicated Basin reporting, and has worked directly with DWR personnel on various issues.

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. Among those at LADWP whose efforts continue to be particularly notable are: Ms. Sarah Mouakkad, Mr. Scott Hungerford, Mr. Chris Repp, Ms. Fatema Akhter, Mr. Hadi Jonny, and Mr. Gregory Reed. I also want to thank the Assistant Watermaster, Mr. Anthony Hicke, for his ongoing efforts in preparing this report and attending the quarterly meetings with the ULARA Administrative Committee.

Finally, I would like to thank Mr. Gregory Reed for his work over the past several years with Watermaster Support Services at LADWP. Mr. Reed has transitioned to a new assignment within the LADWP organization.

Respectfully submitted

Richard C. Slade

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KEY ABBREVIATIONS

AF	Acre-feet
AFY	Acre-feet per Year
BOU	Burbank Operable Unit
BTEX	Benzene, toluene, ethylbenzene, and total xylene
CVWD	Crescenta Valley Water District
Cal-EPA	California Environmental Protection Agency
CrT	Total chromium
CrVI	Hexavalent chromium
DCA	Dichloroethane
DCE	Dichloroethylene
DDW	California Division of Drinking Water, within the SWRCB
DTSC	California Department of Toxic Substances Control
DWP	Department of Water and Power (see also LADWP)
ERB	Eagle Rock Basin
EPA	Environmental Protection Agency (see also USEPA)
EVWRP	East Valley Water Recycling Project
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
LAFD	Los Angeles Fire Department
LID	Low Impact Development (formerly known as SUSMP)
MCL	Maximum Contaminant Level
mg/L	Milligrams per Liter, same as parts per million
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
PRP	Potentially responsible party
PSDS	Private Sewage Disposal Systems
RAP	Remedial Action Plan
RI	Remedial Investigation
RWQCB	Regional Water Quality Control Board
SB	Sylmar Basin
SGMA	Sustainable Groundwater Management Act
SFB	San Fernando Basin
SWRCB	State Water Resources Control Board
SWAT	Solid Waste Assessment Test
TCA	1,1,1-Trichloroethane
TCE	Trichloroethylene

TCP	1,2,3-Trichloropropane
TDS	Total Dissolved Solids
TSG	Tujunga Spreading Grounds
µg/L	Micrograms per Liter, same as parts per billion
ULARA	Upper Los Angeles River Area
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound
VB	Verdugo Basin
VPWTP	Glendale-Verdugo Park Water Treatment Plant
WRP	Water Reclamation Plant
WY	Water Year (October 1 through September 30 of the following year)

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)

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

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 along the Los Angeles River, just north of its junction with 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 areas that form the four groundwater basins, whereas the remaining 205,700 acres are comprised by the tributary hills and mountains in the watershed that surrounds those groundwater basins. 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 eastern portion of the San Fernando Basin via the ongoing use of existing spreading basins whenever excess rainfall and runoff are available.

Within 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 that are assigned to the Saugus Formation. This formation is considered 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.

More detailed descriptions of each of the four ULARA groundwater basis are available at the ULARA Watermaster website, ULARAwatermaster.com.

1.2 HISTORY OF ADJUDICATION

A detailed history of the ULARA adjudication is provided on the ULARA Watermaster website ULARAwatermaster.com; digital versions of various legal documents that were a part of the adjudication process are available for download on that website. A basic summary of key milestones for the ULARA Judgment is provided below.

On September 30, 1955, the City of Los Angeles filed an action in Los Angeles Superior Court against the cities of San Fernando, Glendale, and Burbank, the Crescenta Valley Water District, and several other defendants to (1) quiet its title and obtain a declaration of its prior rights to the water underlying the ULARA; and (2) enjoin the defendants from

extracting such water other than in subordination to its prior rights. (*The City of Los Angeles v. City of San Fernando*, Los Angeles Superior Court Case No. 650079.)

The Superior Court appointed the State Water Rights Board as a referee in the action, and directed it to investigate, find, and report upon certain physical facts of the ULARA. The State Water Rights Board adopted its Report of Referee, and the resulting two-volume document is dated July 27, 1962.

The cities of Burbank, Glendale, Los Angeles, and San Fernando, the Crescenta Valley Water District, and several private parties with smaller water claims proceeded to a bench trial on March 1, 1966. Numerous other defendants were eliminated from the case before trial by dismissal, disclaimer, default, or stipulated judgment. On March 15, 1968, following more than 181 trial days, the judge entered a judgment.

The City of Los Angeles appealed that judgment and, on May 12, 1975, the California Supreme Court, by unanimous opinion (14 Cal. 3d 199), reversed and remanded the case. The Supreme Court affirmed the City of Los Angeles' Pueblo Water Rights to the surface waters of the Los Angeles River and all groundwater in the SFB derived from precipitation within ULARA (infiltration of direct rainfall plus surface water runoff). It held that the City of Los Angeles' Pueblo Water Rights did not extend to and/or include the groundwater in the Sylmar, Verdugo or Eagle Rock basins; however, it found all surface water runoff and groundwater underflows from these adjoining groundwater basins were part of the City of Los Angeles' Pueblo Water Rights.

As to imported water, the Supreme Court held that the City of Los Angeles had rights to all groundwater in the SFB that was derived from water the City imported from outside ULARA that was eventually spread or delivered within the SFB. The Supreme Court granted the cities of Glendale and Burbank similar rights based on water they imported from outside ULARA and delivered within SFB. Because the City of San Fernando was not a member of MWD until the end of 1971, and because it had never imported any water from outside ULARA prior to 1971, it was given no return flow rights based on a March 22, 1984-dated stipulation between the cities of Los Angeles and San Fernando.

After trial on some remaining issues on remand, and pursuant to stipulations among the parties, the Superior Court entered the Final Judgment on January 26, 1979 and also

issued Findings of Fact and Conclusions of Law that same day. This Judgment remains the governing document for ULARA.

The water rights set forth in the Judgment are generally consistent with the Supreme Court's opinion, with the exception of a provision regarding the calculation of Import Return Credit. 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 has had a significant but adverse impact on groundwater in storage in the San Fernando Basin, as discussed later in this report.

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:

1.3.1 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 ULARA Judgment of 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 private entity must then pay that Party for the resulting costs of the pumped water. Table 1-1, "Physical Solution Parties," lists the various private pumping entities and their maximum physical solution pumping volumes per year.

Table 1-1 PHYSICAL SOLUTION PARTIES

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

1. Valhalla began receiving recycled water from the City of Burbank in January 2016 and has since suspended its groundwater pumping
2. Angelica Healthcare no longer pumps its physical solution rights
3. Formerly Hathaway-Sycamore Children's Home
4. 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.

1.3.2 Sylmar Groundwater Basin

Native and Import Return Water

In August 1983, the original ULARA Watermaster (Mr. Melvin 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 to the Court, agreeing with the Watermaster that overdraft existed in the Sylmar Basin at that time. The March 22, 1984 Stipulation of the Court (effective October 1, 1984) 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). That re-assessment work was once again performed using the same basic methodology as had been used previously by the former Watermaster (Mr. Blevins); this work was 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 Court approved the new Stipulation after its hearing on December 13, 2006.

In 2012, the current Watermaster re-assessed the safe yield of the Sylmar Basin using the same basic methodology used by two prior ULARA Watermasters, Mr. Blevins and Mr. Mackowski. That 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 acre feet per year (AFY) for the cities of Los Angeles and San Fernando (this value is to be divided equally between these two cities); and these pumping amounts may continue for the five subsequent 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. The 2012-dated re-assessment of the safe yield of Sylmar Basin by the current Watermaster was filed with the Court in June 2013.

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.

1.3.3 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.

1.3.4 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 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.

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. All 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. Table 1-2 shows the duly appointed members of the Committee.

Table 1-2: ULARA ADMINISTRATIVE COMMITTEE

AS OF APRIL 15, 2016	REPRESENTATIVE	ALTERNATE
CITY OF BURBANK	Bill Mace	Matt Elsner
CRESCENTA VALLEY WATER DISTRICT	David Gould *Committee Chair*	Thomas Love
CITY OF GLENDALE	Michael De Ghetto *Committee Vice Chair*	Raja Takidin
CITY OF LOS ANGELES	David Pettijohn	Gregory Reed
CITY OF SAN FERNANDO	Tony Salazar	Chris Marcarello

The Watermaster may convene the Administrative Committee at any time in order to seek its advice although, typically, meetings are held on a quarterly basis each year. The Watermaster met with the Administrative Committee on October 21, 2015, and also on January 20, April 20, and July 25, 2016 of the 2015-16 Water Year. Each year the Administrative Committee is also responsible for reviewing and approving a Draft of the Annual Report prepared by the Watermaster

At the date the Final ULARA Judgment was signed by the Court judge on January 26, 1979, a separate stipulation was filed in Superior Court, 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.

1.5 SIGNIFICANT EVENTS THROUGH SEPTEMBER 2016

Below is a brief description of significant events that have occurred within ULARA through September 2016, which represents the current WY.

1.5.1 San Fernando Groundwater Basin Remediation (SFGWBR) Efforts

From 2009 through 2015, LADWP undertook an extensive characterization of its wellfields in this basin, and also conducted master planning for treatment options for the known groundwater contamination in the region. The 6-year, $11.5 million study characterized the groundwater contamination in the SFB. Twenty-six new groundwater monitoring wells were constructed and sampled in support of the groundwater characterization at a cost of approximately $22 million. These new wells, along with a network of more than 70 existing wells, were used to further characterize groundwater quality, and these wells continue to be sampled to gather additional groundwater data in the northern portion of the SFB. It is this portion of the SFB that contains the following most productive wellfields:

- Tujunga
- North Hollywood West
- Rinaldi-Toluca
- North Hollywood East (offline due to high concentrations of COCs)

LADWP plans to complete one or more response actions for each wellfield in substantial compliance with the National Contingency Plan (NCP). The NCP provides the organizational structure and procedures for responding to releases and/or threatened releases of hazardous substances, pollutants, and contaminants.

LADWP has begun evaluating potential response actions to restore the beneficial use of groundwater in the vicinity of its various wellfields. These efforts include the study and other analysis and activities as required by the NCP to evaluate appropriate response actions. While additional work is required to evaluate the appropriate interim and final response actions for each area, one potential set of alternatives would consist of a series of local and centralized treatment facilities that produce water for potable use.

The information LADWP will evaluate includes an analysis of pumping rates and treatment capacity that would be appropriate to capture contaminant mass and help to restore the beneficial use of the aquifers in each respective wellfield. LADWP also plans to evaluate ways to minimize the volume of water that would require treatment by giving priority to its wells that display higher levels of contamination, thereby minimizing the potential for contamination to spread to wells that currently are able to pump non-contaminated groundwater. The LADWP analysis will also evaluate other approaches,

such as: in situ treatment (treating contamination in the ground); constructing new extraction wells; and the purchase of replacement water alternatives.

LADWP will initially focus on response actions within: the most productive wellfields (i.e., the North Hollywood West, Rinaldi-Toluca, and Tujunga wellfields), where the impacts of the contamination on the beneficial use of the aquifers are most severe; and in wells (i.e., the Pollock wellfield) located near the terminus and surface water of ULARA (i.e., where groundwater and surface water leave ULARA). North Hollywood East would not be part of this approach because the wellfield would be addressed through targeted treatment to be implemented by potentially responsible parties under the oversight of the USEPA.

1.5.2 Mission Wells Improvement Project

The purpose of the Mission Wells Improvement Project is to rehabilitate and replace deteriorating groundwater facilities in the Sylmar Basin. Specifically, this project would include the construction of three new production wells, a few new groundwater monitoring wells, new piping, pump station upgrades, electrical upgrades, and new control devices. Once completed, the project will provide up to 3,077 AFY of potable groundwater supply for the first 15 years, and 2,477 AFY thereafter.

The initial monitoring well was constructed in January 2015, and two additional monitoring wells were completed in June 2016. Three production wells (PW) known as PW-08, PW-09, and PW-10, have been drilled, constructed, developed, and subjected to pumping tests; initial Title 22 water quality samples have also been taken for laboratory testing. PW-08 was found to have only a limited pumping capacity. Testing of the groundwater from PW-09 revealed high TCE concentrations and will require a future project for wellhead treatment. Therefore, at this time, permanent pumps are not being acquired for these two new wells. Pumping test data for PW-10 have been used to size and procure a new permanent pump for this well, and it is expected to be delivered and installed in the first-half of 2017.

The onsite Chlorination Generation System has been permitted and is in operation. All remaining above ground piping work and electrical upgrades are anticipated to be completed by early-2017. The entire improvement project is expected to be completed by mid-2017.

1.5.3 Van Norman Complex Investigation

Two exploratory wells were drilled on the LADWP Van Norman Complex property to investigate the existence and extent of potable groundwater to depths of ±1500 ft bgs within the Saugus Formation. As of late-2015, the boreholes have been reamed and the two wells have been constructed both reportedly appear capable of producing groundwater that may not need treatment for potable supply. Further, additional testing is scheduled for summer 2017 to determine the sustainability of the local Saugus Formation as a source of local water supply.

1.5.4 New Water Recycling Programs in the San Fernando Valley

In January 2016, Valhalla Cemetery began receiving recycled water from the City of Burbank and has since suspended groundwater pumping by its onsite wells. Typical annual deliveries of recycled water to Valhalla by Burbank are expected to be on the order of 300 AF/yr.

For the period from October 1, 2015 to September 30, 2016, LADWP began serving the following facilities with recycled water (the date service began, and the estimated annual amount of water provided, are shown for each facility):

- Delano Park - October 2015 – 10AF/yr
- Bette Davis Park - June 2016 – 35 AF/yr
- Griffith Park Maintenance Yard & Picnic Area - September 2015 – 6 AF/yr
- Chevy Chase Park - September 2015 – 10 AF/yr
- Woodley Park East - November 2015 – 10 AF/yr
- LACMTA Orange Line at Kester - May 2016 – 3AF/yr
- Branford Park - June 2016 – 20 AF/yr

1.5.5 City of Los Angeles Groundwater Replenishment Project

The City of Los Angeles Groundwater Replenishment Project (GWR), a project proposed by the City to deliver recycled water for aquifer recharge to the spreading basins in the SFB, is in the Planning and Environmental Analysis phase of the project. A Draft Environmental Impact Report (DEIR) for the GWR project, which was released for public review in May 2016, had a 60-day review period ending in July 2016. As part of the review period, City staff conducted 20 meetings and presentations to neighborhood councils, community groups, and elected officials in order to provide a summary of the proposed project. Following the preparation of the DEIR and the end of the subsequent

review period, a Final Environmental Impact Report was prepared and presented to the Board of Water and Power Commissioners for consideration in December 2016.

1.5.6 LADWP Stormwater Capture Program

1.5.6.1 Completed Centralized Stormwater Capture Projects

Centralized projects implemented to date have, according to LADWP, reportedly increased the amount of stormwater captured by an average of 10,600 AFY. Below are examples of recently-implemented centralized projects:

- Big Tujunga Dam Seismic Retrofit Project
- Sheldon-Arleta Gas Management
- Hansen Spreading Grounds Upgrade

1.5.6.2 Completed Distributed Stormwater Capture Projects

LADWP's distributed projects that have already been implemented and have increased the amount of captured stormwater by an average of 347 AFY. Below are examples of recently implemented distributed projects:

- Sun Valley Economic Development Administration Public Improvement Project
- Garvanza Park Stormwater Capture Use and Infiltration Project
- Sun Valley Park Stormwater Infiltration Project
- Los Angeles Beautification Team Stormwater Capture Project
- Elmer Avenue Neighborhood Green Street/Elmer Paseo Green Alley Stormwater Infiltration Projects
- North Hollywood Alley Retrofit BMP Demonstration Project
- Glenoaks-Sunland Stormwater Infiltration Project
- Woodman Avenue Median Stormwater Infiltration Project

A summary of existing distributed stormwater capture projects and estimates prepared by each Party of the annual volume of stormwater captured at each of the sites listed are included in Appendix F.

1.5.6.3 Future Centralized Stormwater Capture Projects

Within the next five years, the following centralized projects are expected to be implemented that will reportedly provide, according to LADWP, an estimated 20,432 AF of increased groundwater recharge annually. Below is a list of these future projects:

- Big Tujunga Dam Sediment Removal Project
- Pacoima Dam Sediment Removal Project
- Tujunga Spreading Grounds Upgrade
- Lopez Spreading Grounds Upgrade

- Branford Spreading Basin Upgrade
- Pacoima Spreading Grounds Upgrade
- Valley Generating Station Stormwater Capture Project
- Whitnall Highway Power Line Easement Stormwater Capture Project
- Bull Creek Stormwater Capture Project
- Canterbury Power Line Easement Stormwater Capture Project
- Strathern Park Infiltration System Project
- East Valley Baseball Park Infiltration System
- Old Pacoima Wash Stormwater Capture Project
- San Fernando Road Stormwater Capture Project
- Van Norman Stormwater Capture Project

1.5.6.4 Future Distributed Stormwater Capture Projects

Within the next five years, the following distributed projects are expected to be implemented that will reportedly provide, according to LADWP, an estimated 662 AF of increased groundwater recharge annually. Below is a list of these future projects:

- Laurel Canyon Blvd Green Street Stormwater Infiltration Project (under construction)
- Arundo Donax Removal Project (under construction)
- Burbank Boulevard Stormwater Capture Project
- LAUSD Conserving for Our Kids Program
- Glenoaks-Filmore Stormwater Capture Project
- Great Street: Lankershim Blvd (Chandler to Victory)
- Great Street: Van Nuys Blvd (Laurel Canyon to San Fernando)
- Agnes Ave: Vanowen to Kittridge Stormwater Capture Project
- Branford St: Laurel Canyon to Pacoima Wash Stormwater Capture Project

1.5.7 Rockhaven Well Nitrate Treatment Agreement

A new well, known as the Rockhaven Well, was constructed in the Verdugo Basin by GWP in mid-2011 at the Rockhaven Sanitarium in the City of Glendale, but due to elevated concentrations of nitrate in the groundwater pumped from the well, this well could not be used immediately following its construction. In 2014, GWP and CVWD applied for and were awarded a grant through the Greater Los Angeles IRWM Group, as a joint project to make use of the groundwater from the Rockhaven Well. Groundwater extracted from this well will be conveyed to CVWD's Nitrate Removal Treatment facility at Glenwood for nitrate removal and disinfection and, thereafter, that groundwater will be used to serve the La Crescenta-Montrose area. The volume of groundwater extracted will be counted against the adjudicated water right of Glendale in the Verdugo Basin; those extractions will be reported to the ULARA Watermaster on a monthly basis. GWP

entered into agreement with CVWD for this arrangement in March 2015. The Rockhaven Well and its ancillary facilities have been completed and active pumping by this well commenced in March 2016, .

1.5.8 Crescenta Valley County Park Stormwater Recharge Study

CVWD received a $158,450 Local Groundwater Assistance Grant in March 2014 from the California Department of Water Resources to study the feasibility of using portions of Crescenta Valley County Park (CVC Park) to recharge the Verdugo Basin with stormwater runoff. The study included installation of flow monitoring stations in the Verdugo Wash, installation of two monitoring wells, percolation soil testing and updating the Verdugo Basin groundwater model. During WY2015-16, the feasibility study was considered to be 90% complete. About 300 AF/yr of stormwater could reportedly be recharged into the Basin according to the preliminary report. CVWD is in the process of preparing a grant application for installation of infiltration galleries in CVC Park and piping to direct storm water from the Verdugo Wash into those infiltration galleries. CVWD has met with Los Angeles County - Public Works Department, the City of Glendale, and the City of Los Angeles regarding project implementation. The grant application is due in November 2017 and grants may be awarded in July 2018. Design and construction probably will be completed by September 2019 and stormwater could conceivably be used to recharge the Verdugo Basin by WY2019-20.

1.6 SUMMARY OF WATER OPERATIONS IN ULARA

Highlights of the various elements of water operations within ULARA for the Water Years 2014-15 and 2015-16 are summarized in Table 1-3. Also shown on Table 1-3 are the values that are input into the Sustainable Groundwater Management Act (SGMA website), and information showing how those values are calculated. Details of WY 2015-16 operations and hydrologic conditions are provided in Section 2. The Groundwater Extractions Report provided in Appendix A summarizes the groundwater extractions for the 2015-16 WY by all ULARA pumpers. Locations of the four ULARA groundwater basins are shown on Plate 1, whereas the water service areas of the parties and individual producers within ULARA are shown on Plate 2. Other pertinent hydrologic facilities used to measure precipitation, runoff, and water levels, are provided on Plates 1 through 8.

1.6.1 Construction/Destruction of Water Wells

No water wells were constructed or destroyed in any of the four groundwater basins in ULARA in Water Year 2015-16

Table 1-3 SUMMARY OF OPERATIONS IN ULARA

Item	Water Year 2014-15	Water Year 2015-16	Calculation	SGMA Section Reporting
Active Pumpers (parties and nonparties)	36	36		
Inactive Pumpers (parties)[1]	7	7		
Annual Weighted Average Rainfall, in inches				
Valley Floor	10.79	8.53		
Mountain Area	13.87	10.99		
Total ULARA	12.68	10.05		
Spreading Operations, in acre-feet				
Native Water Spread	2,825	3,242	A	Section C Water available for recharge or in-lieu use by source type (if available): Local Surface Deliveries
MWD Water Spread	150	306	B	
Groundwater Spread	1	0	C	
Total	**2,976**	**3,548**	D = A+B+C	
Extractions, in acre-feet	97,932	98,911	E	Section B Total Groundwater Extraction
Gross Imports, in acre-feet				
Los Angeles Aqueduct (LAA) Water	26,954	88,007	F	
MWD Water [2]	371,204	287,372	G	
Total	**398,158**	**375,379**	H = F+G	
Exports, in acre-feet				
Los Angeles Aqueduct Water	13,016	40,725	I	
MWD Water	173,975	131,796	J	
Groundwater	63,881	65,366	K	
Total	**250,872**	**237,887**	L = I+J+k	
Net LAA Deliveried, in acre-feet	13,938	47,282	M = F-I	Section C Water available for recharge or in-lieu use by source type (if available): Local Imported
Net MWD Delivered, in acre-feet	197,229	155,576	N = G-J	Section C Water available for recharge or in-lieu use by source type (if available): Other
Net Groundwater Delivered in ULARA in acre-feet	34,051	33,545	O = E-K	Section D Water Use Met by Source Type: Groundwater
Net Imports Delivered in ULARA in acre-feet	211,167	202,858	P = M+N	Section D Water Use Met by Source Type: Surface Water
Net Surface Water Used in ULARA in acre-feet	213,992	206,100	Q = A+M+N	Section C Surface Water Supply
Recycled Water Used in acre-feet	14,244	16,767	R	Section D Water Use Met by Source Type: Recycled
Total Water Delivered in ULARA in acre-feet	259,462	253,170	S = O+P+R	Section D Total Water Use in ULARA
Treated Wastewater, in acre-feet [3]	78,944	77,864		
Change in Groundwater Storage				
San Fernando Basin	(39,722)	(39,722)	T	
Sylmar Basin	4,153	3,442	U	
Verdugo Basin	3,903	4,224	V	
Eagle rock Basin	(110)	(125)	W	
Total	**(31,776)**	**(32,181)**	X = T+U+V+W	Section E Annual Change in Groundwater Storage

1. The seven inactive pumpers are Van de Kamp, Disney, Angelica, Santiago Estates, Greeff, Sears, and Waste Management.
2. MWD Gross Imports includes water spread for groundwater replenishment by the City of Burbank.
3. Most treated wastewater is discharged to the Los Angeles River, whereas a portion is delivered to the Hyperion Plant or to other locations which utilize recycled water.

1.7 ALLOWABLE PUMPING FOR THE FORTHCOMING WATER YEAR

Table 1-4 provides a summary of the allowable groundwater extraction rights for the municipal-supply Parties in each of the three major groundwater basins in ULARA for the forthcoming water year, along with the current Stored Water Credit where applicable. The method to determine these values is described in more detail in Section 2.

Table 1-4 ALLOWABLE GROUNDWATER EXTRATION RIGHTS FOR FORTHCOMING WY

(all units in acre-feet)	Native Safe Yield Credit [1]	Import Return Credit [2]	Total Native + Import	Available Stored Water Credit [3, 4] (as of Oct. 1, 2015)	Allowable Pumping 2015-16 Water Year[5]
San Fernando Basin					
City of Burbank	---	3,485	3,485	1,291	4,775
City of Glendale	---	4,117	4,117	3,019	7,136
City of Los Angeles	43,660	30,115	73,775	47,419	121,195
Total	43,660	37,717	81,377	51,729	133,106
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 2-17 for calculation of SFB Totals and Stored Water Credits in reserve; see Table 2-18 and Table 2-19 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

2.1 PRECIPITATION

Precipitation varies considerably throughout ULARA depending on such local factors as site location and topography/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.

Table 2-1 provides rainfall data from several raingages on the valley floor areas and in the hill and mountain areas for the current WY; Plate 3 illustrates the locations of these raingages (stations). Appendix B shows the actual monthly rainfall totals on the valley floor and in the hill and mountain areas in ULARA for the current WY 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 2-1.

To help identify possible trends in annual rainfall for each water year at this raingage, the Watermaster further created the accumulated rainfall departure graph shown on Figure 2-2. This graph illustrates the accumulated departure of annual rainfall for each water year from the long-term average annual rainfall at the Burbank Valley Pump Plant Gage (Gage No. 041194) 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 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 were 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 2-2 is as follows:

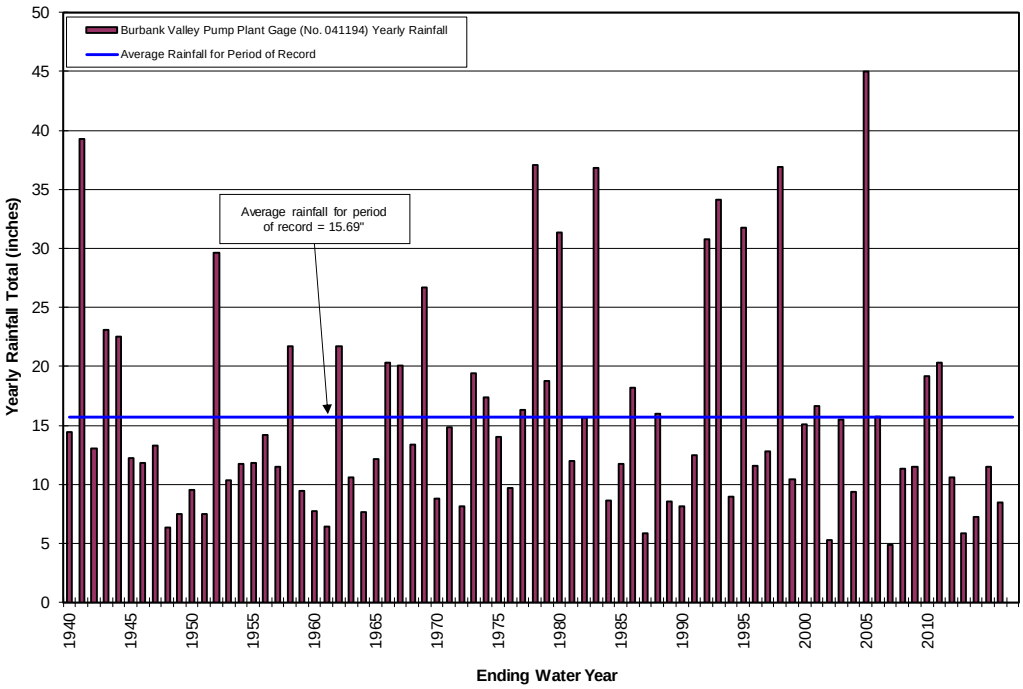
- Whenever the accumulated departure curve descends over time to the right, the total rainfall in each water year during that period was generally at or below the long-term average annual rainfall. Hence, such a period displayed generally deficient rainfall; in essence, a dry period or drought had been occurring. Examples of such dry periods on Figure 2-2 are: 1943-44 through 1975-76 and 1982-83 through 1990-91.
- 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 2-2 are 1975-76 through 1982-83, and 1990-91 through 1997-98.

Table 2-1 WY 2015-16 PRECIPITATION

Water Year 2015-16 (inches)				
Gage No.	**LACDPW Rain Gage Stations**	**2015-16 Precipitation**	**100-Year Mean (1881-1981)**	**Percent of 100-Year Mean**
	Valley Floor Stations			
13C	North Hollywood-Lakeside	8.19	16.63	49%
1107D	La Tuna Debris Station	9.21	14.98	61%
465C	Sepulveda Dam	8.54	15.30	56%
21B	Woodland Hills	7.15	14.60	49%
735H	Chatsworth Reservoir	7.24	15.19	48%
25C	Northridge-LADWP	6.55	15.16	43%
251C	La Crescenta	13.49	23.31	58%
AL464	Pacoima Wash Spreading Grounds	7.91	17.32	46%
	Weighted Average[1]	**8.53**	**16.48**	**52%**
	Hill & Mountain Stations			
10A	Bel Air Hotel	8.56	18.50	46%
17	Sepulveda Canyon at Mulholland	10.24	16.84	61%
33A	Pacoima Dam	9.01	19.64	46%
47D	Clear Creek - City School	19.34	33.01	59%
53D	Colby's Ranch	12.37	29.04	43%
54C	Loomis Ranch-Alder Creek	8.82	18.62	47%
210C	Brand Parks	9.41	19.97	47%
1222	Northridge-Garland	8.16	17.52	47%
1074	Tujunga-Mill Creek	13.08	21.79	60%
	Weighted Average[1]	**10.99**	**21.76**	**51%**
	Weighted Average Valley/Mountain Areas[1]	**10.05**	**19.64**	**51%**

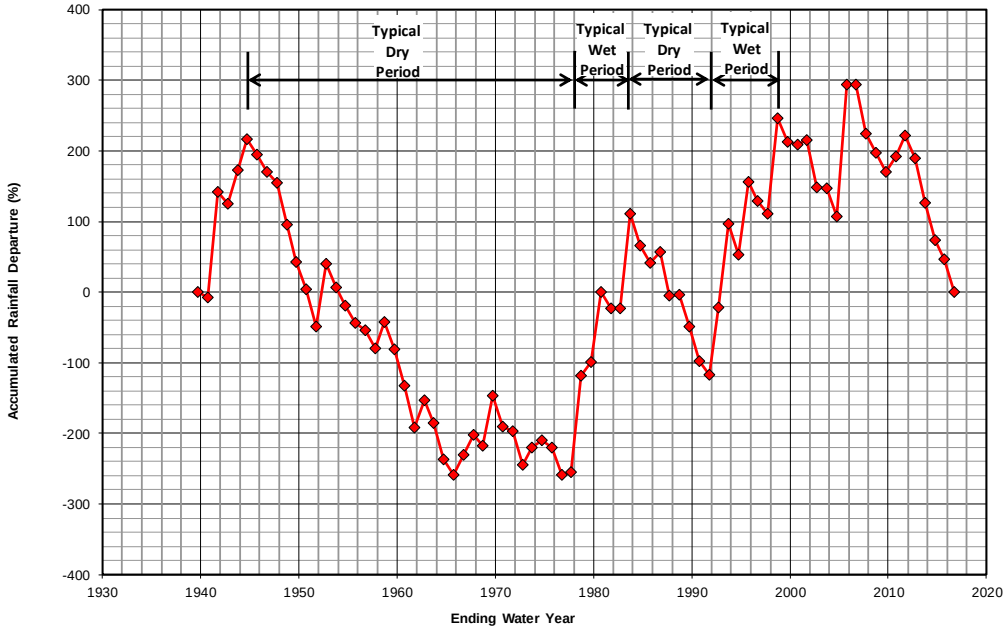
1. Weighted Averages calculated using methodology provided in the Report of Referee-July 1962. Hill & Mountain Station Weighted Average estimated due to incomplete data sets that exist in the 100-year period for which the average is calculated.

Figure 2-1 YEARLY RAINFALL TOTALS, BURBANK VALLEY PUMP PLANT RAINGAGE



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 2-2 ACCUMULATED RAINFALL DEPARTURE CURVE BURBANK VALLEY PUMP PLANT RAINGAGE



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; runoff of excess domestic irrigation; 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 3) are as follows:

- 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.
- 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.
- 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 from the Tillman WRP.
- 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.
- Station F-252-R, which monitors flow from Verdugo Canyon, includes flows from Dunsmore and Pickens canyons.
- Station F-57C-R, which lies in the main channel of the Los Angeles River just north of its confluence with the Arroyo Seco, records all surface outflows from ULARA.

Table 2-2 summarizes the monthly runoff for these six stations for Water Years 2014-15 and 2015-16. The daily mean discharge volumes for the current WY for these six stations are summarized in Appendix B.

Table 2-2 MONTHLY RUNOFF AT SELECTED GAGING STATIONS

Station	Water Year	(acre-feet) OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
F-118C-R	2014-15	20	0	1	0	2	0	6	0	0	0	0	0	**29**
Pacoima Dam	2015-16	0	1420	0	11	0	0	0	35	156	0	0	1	**1,623**
F-168B-R	2014-15	97	106	117	108	108	99	103	157	103	152	116	134	**1,400**
Big Tujunga Dam	2015-16	117	147	134	165	133	171	131	115	126	125	119	107	**1,590**
F-300-R	2014-15	2,900	5,310	16,560	6,750	3,870	6,740	3,020	4,170	3,520	5,670	3,580	6,490	**68,580**
L.A. River Tujunga Ave.	2015-16	3580	2550	3720	13750	3840	8170	3880	3750	2840	2890	3000	2820	**54,790**
E-285-R	2014-15	455	934	1,480	704	820	682	444	671	483	480	479	1,130	**8,762**
Burbank Storm Drain	2015-16	979	488	831	2470	512	1370	433	471	499	388	272	326	**9,039**
F-252-R	2014-15	140	146	917	166	145	168	125	210	121	267	112	1,550	**4,067**
Verdugo Wash	2015-16	273	94	192	1220	146	718	179	199	160	124	119	136	**3,560**
F-57C-R	2014-15	5,120	8,370	22,310	10,750	7,580	10,580	5,300	9,190	5,870	11,160	5,130	18,500	**119,860**
L.A. River Arroyo Seco	2015-16	5570	5260	8210	22070	8150	17160	6990	5380	4850	4890	4870	4720	**98,120**

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 WRPs;
3. Industrial discharges and runoff of excess domestic irrigation; 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 (see Table 2-3 and also Appendix C for a detailed breakdown of the components of Los Angeles River flow).

A significant factor affecting surface water runoff in the Los Angeles River has been the releases of treated wastewater over time by the three 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 runoff of excess irrigation 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 WY 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 provides these calculated rising water values for the current water year.

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 this river, both upstream and downstream of the lined section of the river near its confluence with the Verdugo Wash. 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 may be up to 3,000 AF of recharge per year from delivered water within the Los Angeles Narrows-Pollock Wellfield area that contribute 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: local 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, created 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 original gaging stations along the Los Angeles River and its tributaries have been lost, abandoned, or even damaged. Actual data from some of 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, damaged, or inaccurate gaging stations need to be identified, and then these stations should be either rehabilitated or replaced entirely.

The first site visit to these types of gages occurred in March 2014, when the Watermaster visited gage site F-57C-R, along 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 runoff flows in the bottom of the lined river channel at Gage F-57C-R. Some of these problems were 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 near this gage. 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 impacted gage operation. Project construction ended in March 2016 and the K-Rails were removed in roughly May 2016. The monitoring is currently functioning as intended, observing and recording the flows every 5 minutes.

In an effort to help ensure accurate measurements of low runoff 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 this gage. Through this collaborative effort, both short- and long-term solutions have been developed to allow the ongoing collection of low flow measurements at 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 conduct 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 runoff measurements are recorded.

As a result of the work described above, the Watermaster is satisfied that the low flow stream measurements currently 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 by LACFCD to continue providing accurate runoff measurements. The Watermaster updated the Court on this specific matter in a Special Hearing before the Judge on April 25, 2014.

Table 2-3 ESTIMATED SEPARATION OF SURFACE FLOW, F-57C-R & F-252-R

	F-57C-R (acre-feet)				F-252-R (acre-feet)		
Water Year	Rising Groundwater[1]	Waste Discharge	Storm Runoff	Total Outflow	Rising Groundwater[2,3]	Storm Runoff [3]	Total Outflow
2015-16	2,570	55,310	23,970	81,858	1,279	1,215	2,494
2014-15	3,300	63,757	38,777	105,834	3,974	747	4,721
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	3,215	57,179	113,106	174,958	2,512	8,518	11,165

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 March 2014 due to measurement inaccuracies and/or disruptions. Installation of new equipment and measurement practices by LACFCD at Gage F-57C-R increased reliability of the measurements to the satisfaction of the Watermaster.
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 four ULARA 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 flows and releases to existing downstream spreading basins operated by the LACDPW and the City of Los Angeles in the northeastern portion of the SFB.

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 in the SFB for the current Water Year, whereas Table 2-5 summarizes the estimates of recharge since the 1968-69 Water Year. Plate 1A shows the locations of these spreading grounds.

A summary of existing distributed stormwater capture projects within ULARA are included in Appendix F. Included on the table are estimates prepared by each Party of the annual volume of stormwater captured by each project listed therein.

Table 2-4 SPREADING OPERATIONS IN THE SAN FERNANDO BASIN

Agency	Spreading Facility	2015 OCT	2015 NOV	2015 DEC	2016 JAN	2016 FEB	2016 MAR	2016 APR	2016 MAY	2016 JUN	2016 JUL	2016 AUG	2016 SEP	TOTAL
		(acre-feet)												
LACDPW														
	Branford	12	13	44	233	50	86	25	27	14	15	15	13	547
	Hansen	0	0	0	350	237	408	95	47	0	0	0	0	1,137
	Lopez [1]	0	23	0	0.36	0.08	0	0	0	19	0	0	0	42
	Pacoima [1]	0	226	16	504	70	257	160	0	65	0	0	0	1,298
	Tujunga	0	0	0	484	9.3	30	0	0	0	0	0	0	523
	Total	**12**	**262**	**60**	**1,571**	**366**	**781**	**280**	**74**	**98**	**15**	**15**	**13**	**3,548**
City of Los Angeles														
	Tujunga [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
	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**
Basin Total		**12**	**262**	**60**	**1,571**	**366**	**781**	**280**	**74**	**98**	**15**	**15**	**13**	**3,548**
City of Burbank [1]		0	150	0	0	0	0	156	0	0	0	0	0	**306**

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. Burbank began spreading MWD water in the 2009-10 Water Year following completion of the Burbank MWD connection.
2. This water is derived from backwashing of the Tujunga GAC vessels and discharged into Tujunga spreading basin.
3. The Headworks Spreading Basins no longer exists and have been removed from this table.

Table 2-5 ANNUAL SPREADING OPERATIONS IN THE SAN FERNANDO BASIN

Water Year	Los Angeles County Department of Public Works (Native + Imported[1]) (acre-feet)						City of Los Angeles (Imported) (acre-feet)			GRAND TOTAL (acre-feet)	City of Burbank (Imported)[1]	Rainfall (inches)
	Branford	Hansen	Lopez	Pacoima	Tujunga	TOTAL	Headworks	Tujunga	TOTAL		Pacoima (acre-feet)	Weighted Average Valley/Mtns.
2015-16	547	1,137	42	1,298	523	3,548	0	0	0	3,548	306	10.05
2014-15	529	922	1	1,254	268	2,974	0	1	1	2,975	150	12.68
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.	552	13,647	587	6,851	5,034	26,671	1,653	3,754	5,407	32,078	4,824	

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 combined 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 annual groundwater extractions by all Parties for the six years prior to 1968. The State Supreme Court's opinion, as implemented on remand in the Final Judgment of January 26, 1979, further restricted total groundwater pumping from each groundwater basin, and by each Party within each basin.

A summary of groundwater extractions from each ULARA basin is summarized on Table 2-11, Table 2-12, Table 2-13, and Table 2-14 for the San Fernando Basin, Sylmar Basin, Verdugo Basin, and Eagle Rock Basin, respectively. Extraction rights for the San Fernando Basin and the Sylmar Basin are shown on Table 2-15 and Table 2-16, respectively. The Groundwater Extractions Report provided in Appendix A summarizes the groundwater extractions by each Party during the current water year and Plates 1A through 1D show the general locations of the various wellfields owned by the five principal Parties in ULARA.

Table 2-6 summarizes private party pumping in the SFB for the current water year.

Table 2-6 PRIVATE PARTY PUMPING – SAN FERNANDO BASIN

2015-16 Water Year (acre-feet)

Nonconsumptive Use or Minimal Consumption	
Sears, Roebuck and Company (Air Conditioning; well disconnected 2000)	0.00
Sportsmens' Lodge	4.28
Toluca Lake Property Owners	7.27
Vulcan (CalMat) [1] (Gravel washing)	505.96
Walt Disney Productions (3 wells inactive/ Not abandoned)	0.00
Total	**517.51**

Groundwater Dewatering	
Charged to Los Angeles' water rights	
Avalon Encino	0.00
BFI Sunshine Canyon Landfill	50.83
Glenborough Realty (First Financial)	8.14
Mercedes Benz Encino (formerly known as Auto Stiegler)	0.28
Metropolitan Transportation Agency	20.70
Metropolitan Water District	104.40
Trillium Corporation	23.33
Warner Properties Plaza 6 and 3	7.73
Total	**215.41**

Groundwater Cleanup	
Charged to Burbank's water rights	
B.F.Goodrich (Menasco/Coltec)	0.00
Home Depot U.S.A. Inc.	0.00
Subtotal	*0.00*
Charged to Los Angeles' water rights	
3M-Pharmaceutical	23.74
Boeing Santa Susana Field Lab	4.30
Honeywell International, Inc.	224.74
Micro Matics USA, Inc.	0.00
Tesoro	0.00
Subtotal	*252.78*
Total	**252.78**

Physical Solution	
Charged to Burbank's water rights	
Valhalla Memorial Park	56.81
Subtotal	*56.81*
Charged to Glendale's water rights	
Forest Lawn Cemetery Assn.	434.73
Subtotal	*434.73*
Charged to Los Angeles' water rights	
Hallelujah Prayer Ctr (Hathaway/deMille)	2.07
Middle Ranch (deMille)	4.01
Toluca Lake Property Owners	30.00
Water Licenses	0.84
Wildlife Waystation	0.82
Subtotal	*37.74*
Total	**529.28**

Total Extractions 1,514.98

1. Water pumped by Vulcan (Calmat) excludes an estimated 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 availability of 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 2-7 summarizes the imports and exports from ULARA during the 2014-15 and 2015-16 WYs. 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 ULARA.

Table 2-7 ULARA WATER IMPORTS AND EXPORTS

Source and Agency	Water Year (acre-feet) 2014-15	2015-16
Gross Imported Water		
Los Angeles Aqueduct		
City of Los Angeles	26,954	88,007
MWD Water		
City of Burbank [1]	5,769	5,398
Crescenta Valley Water District	1,714	1,718
City of Glendale	15,539	14,641
City of Los Angeles	340,667	258,048
La Canada Irrigation District [2]	945	915
Las Virgenes Municipal Water District [2]	6,470	6,652
City of San Fernando	100	0
MWD Total	**371,204**	**287,372**
Grand Total	**398,158**	**375,379**
Exported Water (Pass-Through)		
Los Angeles Aqueduct		
City of Los Angeles	13,016	40,725
MWD Water		
City of Los Angeles	173,975	131,796
Total	**186,991**	**172,521**
Net Imported Water	**211,167**	**202,858**

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.

2.7 RECYCLED WATER

Recycled water 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. Although the latter facility is located west of the southwestern boundary of ULARA, a part of the water treated at this facility is used in ULARA. Table 2-8 summarizes the operations at these four WRPs in Water Year 2015-16 whereas Plate 3 shows the locations of these facilities.

Table 2-8 RECYCLED WATER OPERATIONS

2015-16 Water Year (acre-feet) Plant/Agency	Plant Influent [1]	Effluent to L.A. River	Flow to Hyperion	Recycled Water Use	Recycled Water Use [2] (%)	Recycled Water Delivered to SFB
City of Burbank	7,779	4,985	(109) [3]	2,903	37%	2,903
Los Angeles-Glendale	18,861 [3]	10,407	3,198	4,954	26%	
Los Angeles				3,313		1,423
Glendale				1,641		1,320
Donald C. Tillman	51,224	32,175 [3]	14,266	6,659	13%	3,909
Las Virgenes MWD		12		2,251		2,251
Total	**77,864**	**47,567**	**17,355**	**16,767**		**11,806**

1. Does not include plant overflow/ by pass.
2. Recycled water use is calculated as a percentage (%) of plant influent.
3. Plant influent is not equal to the effluent due to metering error and/or in-plant use.

2.8 GROUNDWATER ELEVATIONS AND HYDROGRAPHS

The simulated groundwater elevation contour maps for the Spring (April) and the Fall (September) of 2016 for the San Fernando Basin were created by the ULARA Watermaster Support Staff at LADWP using the SFB Groundwater Flow Model. 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 contours for San Fernando Basin were estimated by incorporating the actual monthly recharge (e.g., the amount of spread water, precipitation, etc.) and groundwater extraction values as model inputs to simulate the actual operations in the San Fernando Basin during the WY period October 2015 to September 2016. Simulated contours of the equal elevation of groundwater as modeled by LADWP, for April 2016 (Spring 2016) and September 2016 (Fall 2016), were then plotted utilizing groundwater contouring software.

The simulated Groundwater Elevation Contour Maps for Spring and Fall 2016 are shown on Plates 4 and 5, respectively, to depict the regional direction of groundwater flow within the San Fernando Basin during 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) 367-4736. Additional water level data may also be available from Los Angeles County via http://dpw.lacounty.gov/general/wells/.

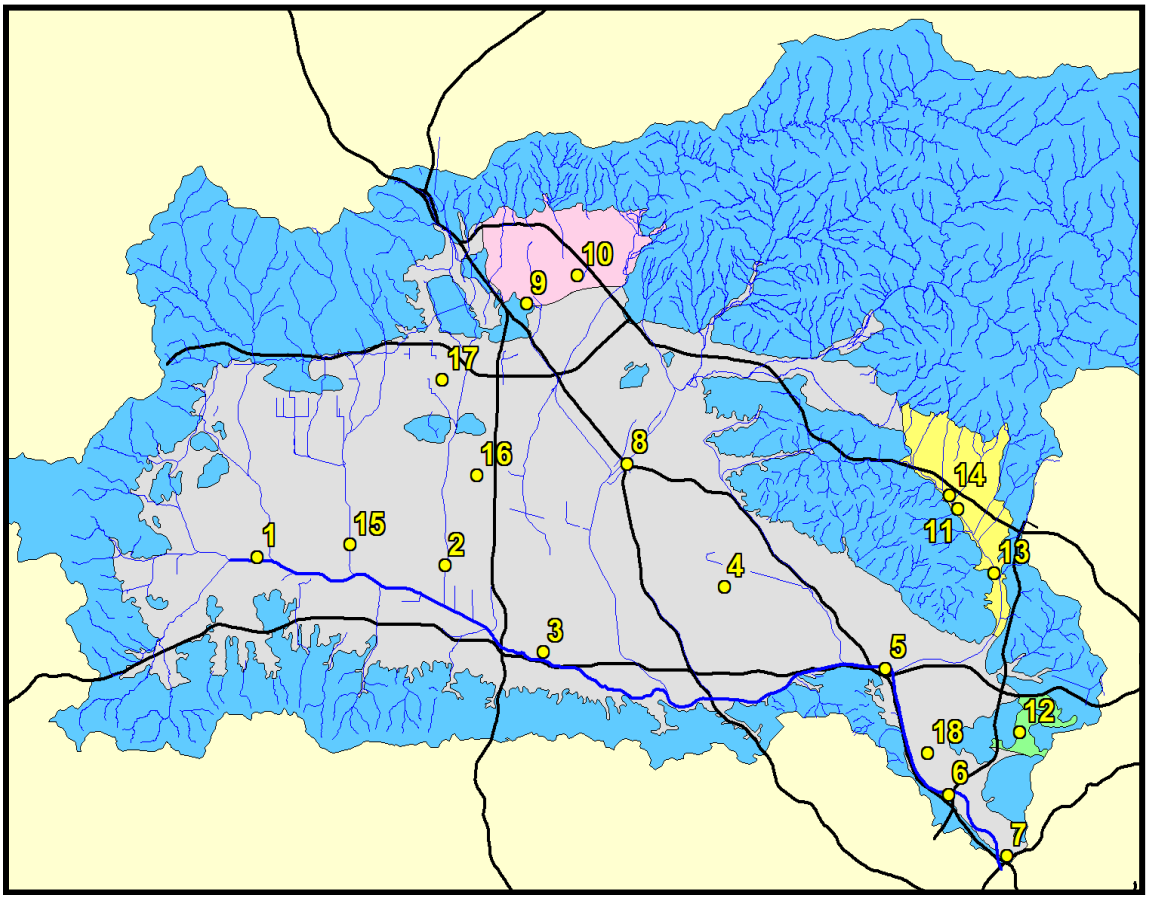
Plate 6 has been prepared to illustrate the simulated change in groundwater elevations from Fall 2015 to Fall 2016 for the San Fernando Basin. The simulation shows groundwater elevations in the region near the Hansen, Pacoima, and Tujunga spreading grounds declined on the order of 10 feet to 15 feet in that one-year period. This decline is attributed to both the relatively low volume (3,547 AF) of native runoff water that was artificially spread at these spreading grounds (due to the ongoing drought) and the relatively large volume of pumping at the Tujunga wellfield (34,703 AF) in that year. This compares to the long-term average annual spreading of native runoff of approximately

22,000 AF. In addition, due to operational restrictions imposed by MWD on imported water uses, Burbank was only able to purchase 306 AF of imported supply for spreading at Pacoima Spreading Grounds in the current WY.

Simulated groundwater elevations near the LADWP-owned Rinaldi-Toluca and North Hollywood wellfields decreased by 10 feet; this is also attributed to the relatively large volume of groundwater production and the decreased volume of native recharge (due to the ongoing drought) in the current WY.

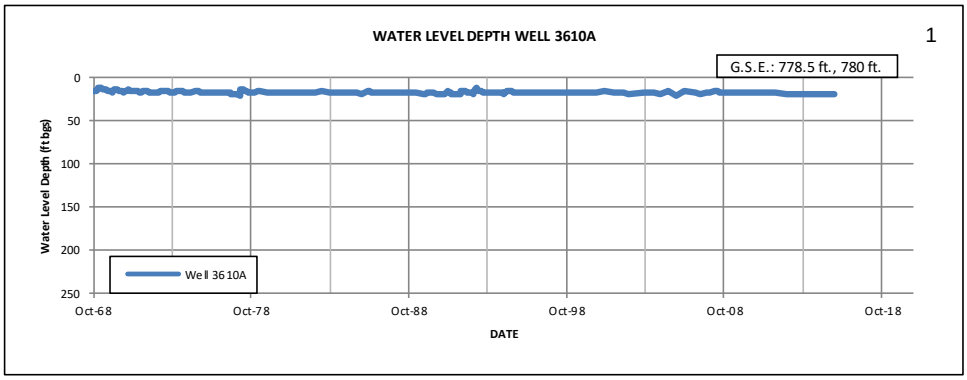
Water level data from 18 water level observation wells within the valley fill areas of ULARA continue to be monitored on a regular basis by LADWP and/or the LACDPW. The water level records for these observation wells have been used to create hydrographs (graphs of water levels versus time) for this Annual Watermaster Report. Figure 2-3 illustrates the locations of the 18 observation wells for which hydrographs have been prepared, whereas the hydrographs for these 18 wells are shown on Figure 2-4A through Figure 2-5D. These graphs illustrate the fluctuations in water levels in those 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 also listed on each respective hydrograph.

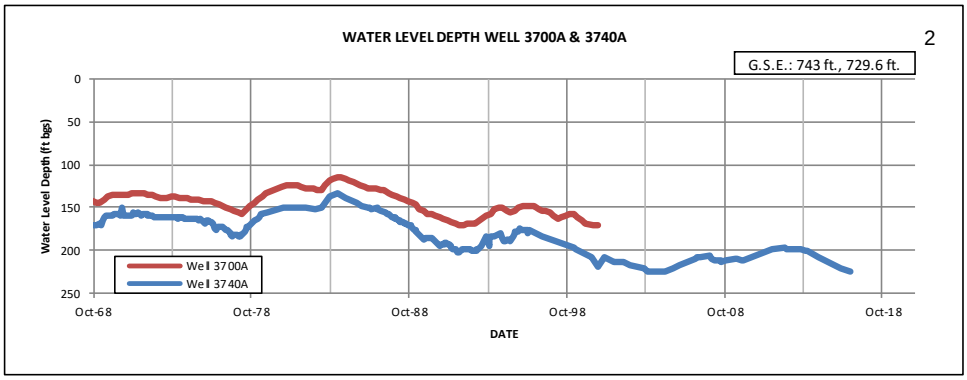
Figure 2-3 LOCATIONS OF WELLS WITH HYDROGRAPHS

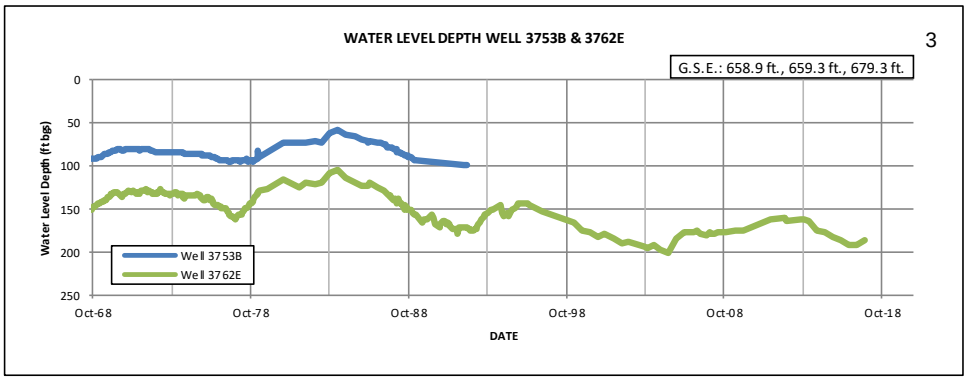


NOTE: See Hydrographs for each well shown above in the accompanying figures.

Figure 2-4A SAN FERNANDO BASIN HYDROGRAPHS







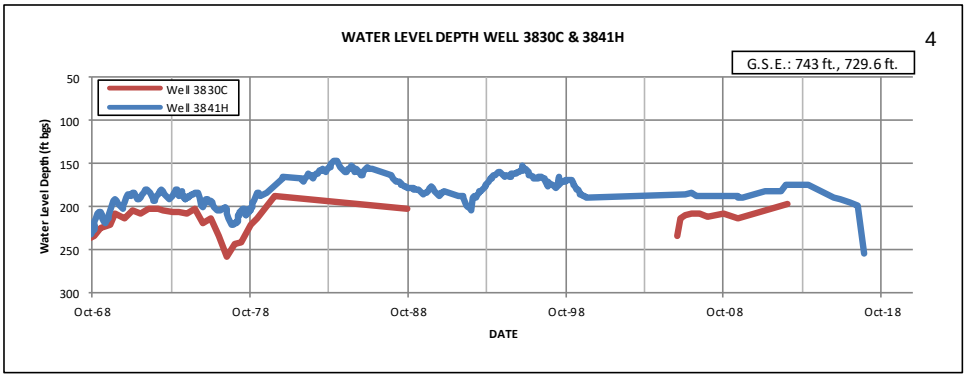
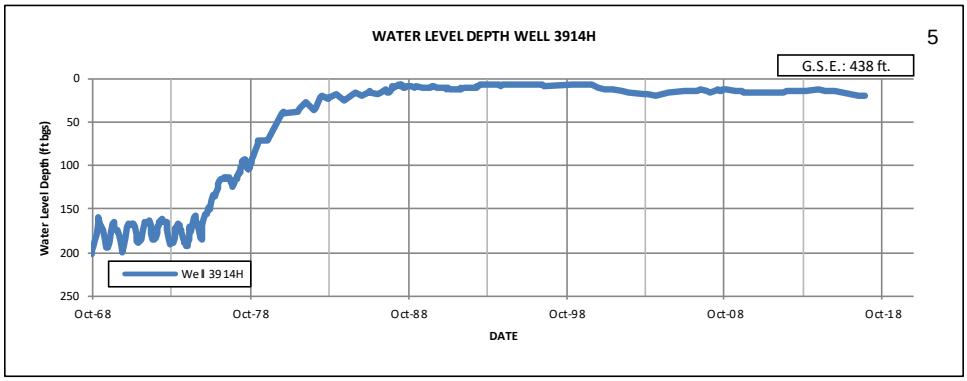
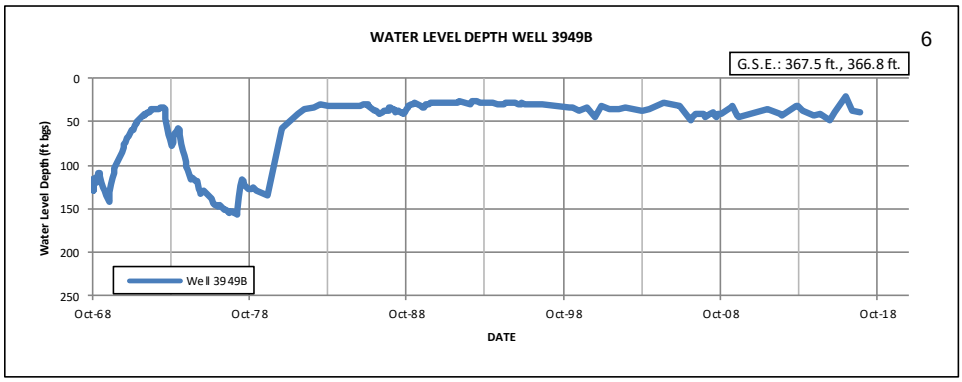
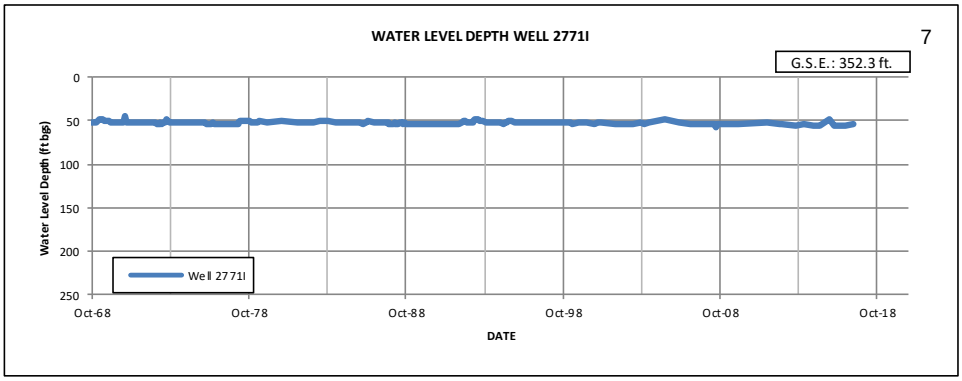


Figure 2-4A SAN FERNANDO BASIN HYDROGRAPHS, CONT'D







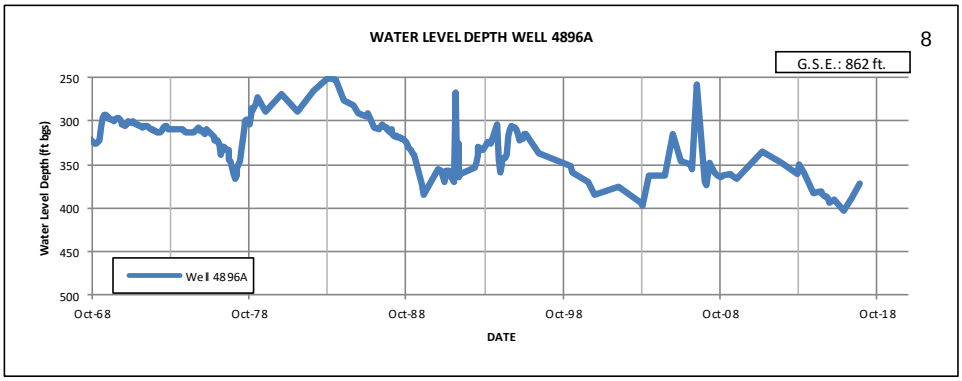
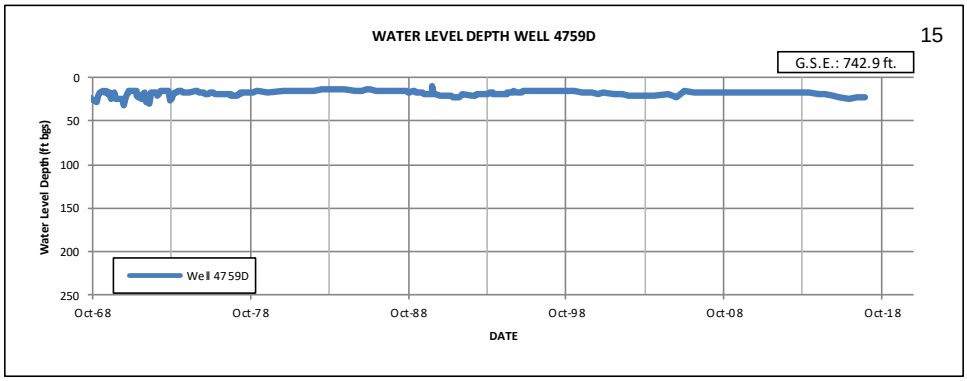
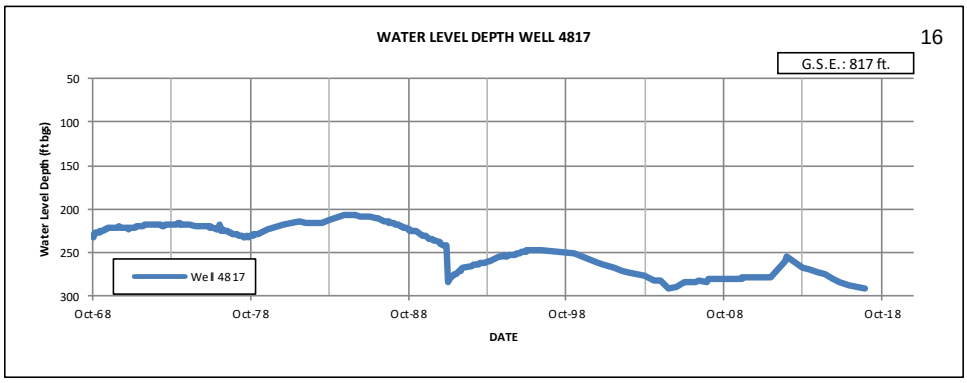
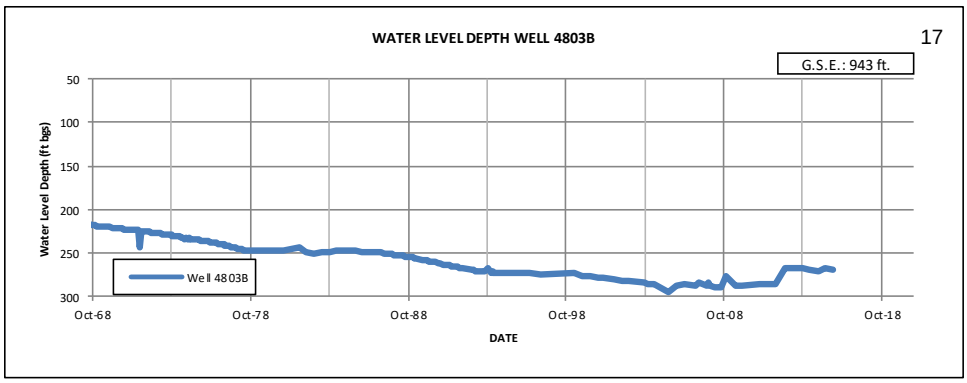


Figure 2-4A SAN FERNANDO BASIN HYDROGRAPHS, CONT'D







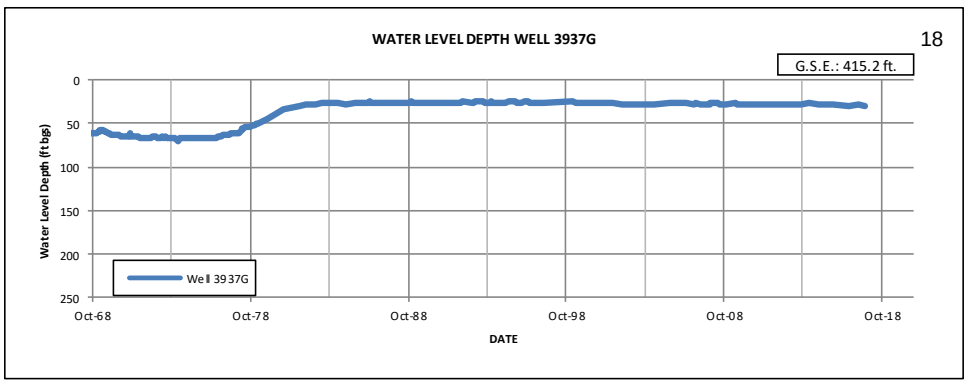
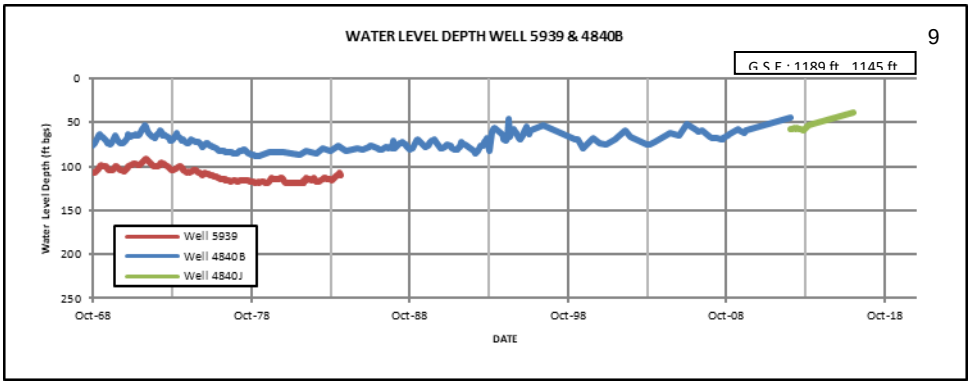


Figure 2-5B SYLMAR BASIN HYDROGRAPHS



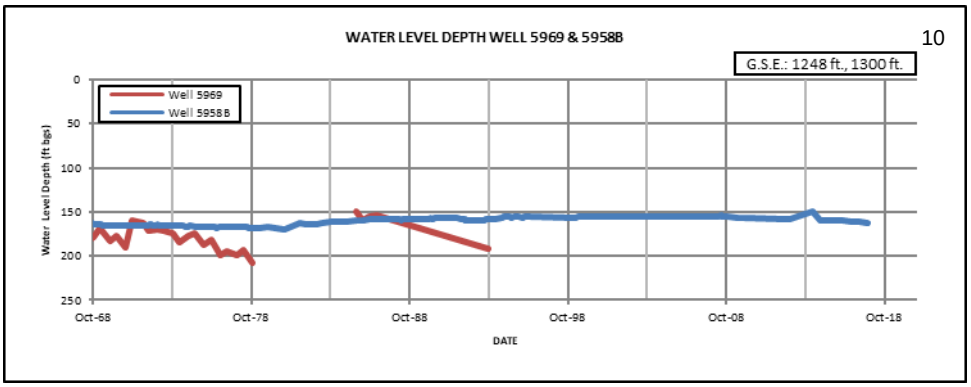
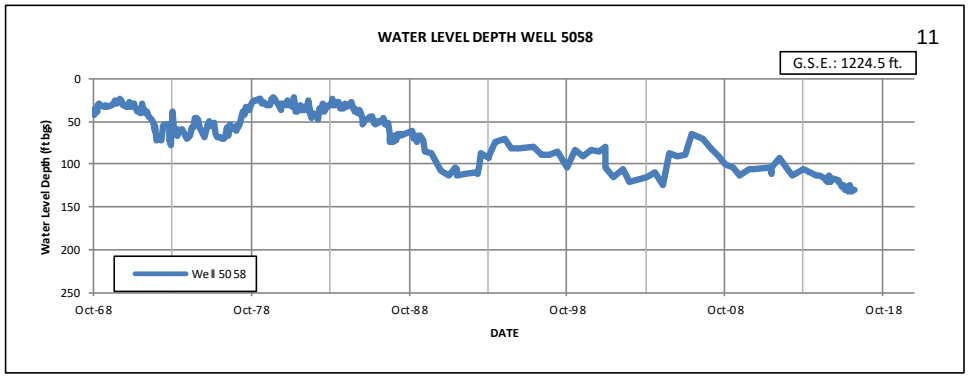
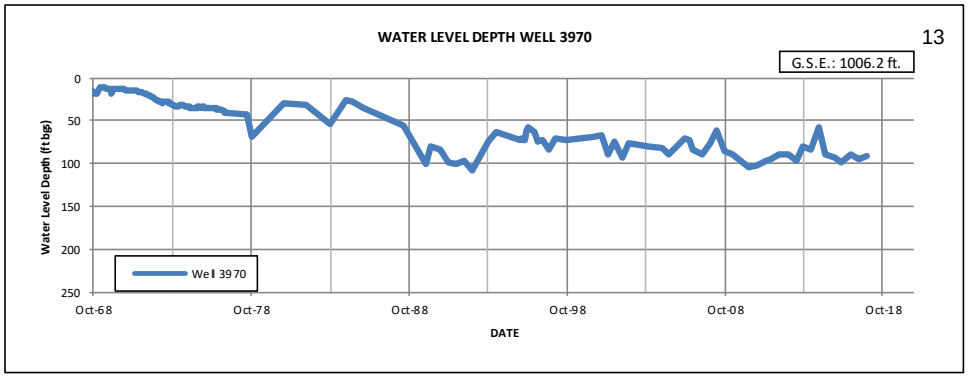


Figure 2-5C VERDUGO BASIN HYDROGRAPHS





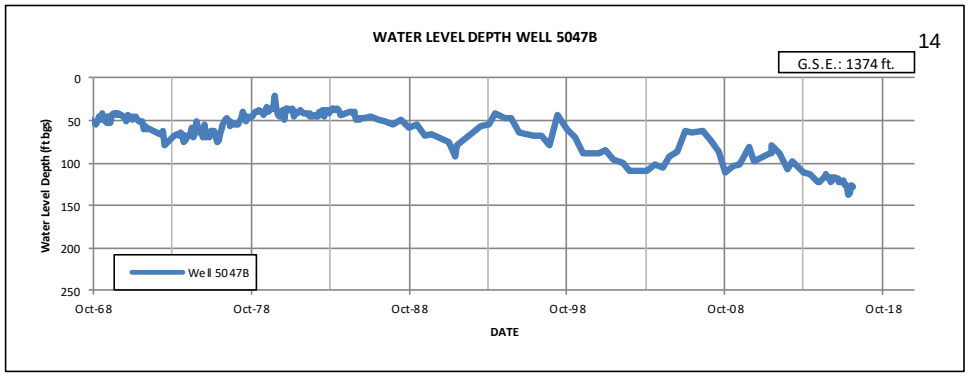
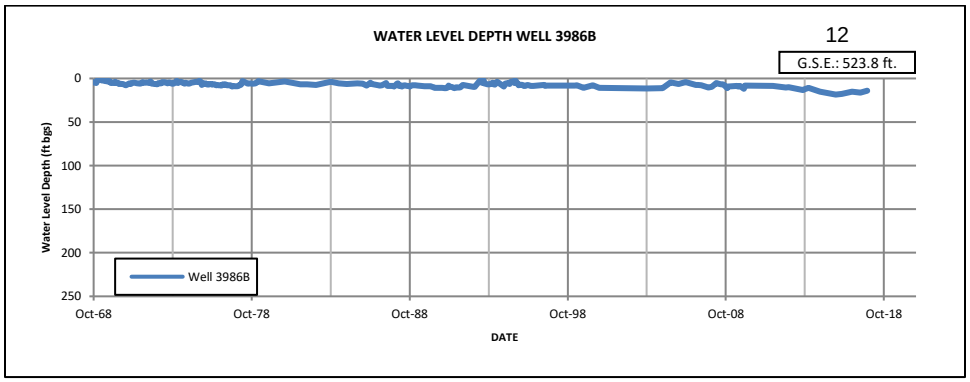


Figure 2-5D EAGLE ROCK BASIN HYDROGRAPH



2.9 GROUNDWATER IN STORAGE

2.9.1 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 7). 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 7 by the two horizontal-dashed red lines). As shown on Plate 7, and with only a few brief exceptions, the SFB has rarely been operated within this regulatory storage range after 1968.

Plate 7 graphically illustrates the estimated change in groundwater storage within the San Fernando Basin by the blue line, and in tabular form on Table 2-9. Each year, groundwater levels are measured in numerous wells throughout the SFB and these groundwater levels are used 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 7 depicts the fluctuations over time in the calculated change in groundwater storage, beginning in approximately 1980; the very slight but overall declining trend from 1980 to the present 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 long-term decline in groundwater in storage depicted on Plate 7 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; reductions in irrigation return-flow recharge due to reductions in irrigation water use as a result of water conservation efforts in the region; and reductions in the volumes of artificial recharge due to restrictions at the spreading grounds located on the northeastern side of SFB.

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.

Programs already completed and/or currently in progress between those two agencies and the respective annual volume of increased recharge at each facility in the SFB are shown on Table 2-10.

Table 2-9 shows a summary of the change in storage in the SFB over time, including the change in storage for the current water year as well as the cumulative total change in storage since 1968. The volume of groundwater in storage in San Fernando Basin is estimated to have decreased during the current Water Year. This decrease in storage was attributed to below-average rainfall, decreased stormwater spreading, and increased groundwater production during the current Water Year. Based on those changes in storage calculations, the remaining storage space available in the SFB is illustrated on Plate 7. This available 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 all ULARA Watermasters that the use of this storage space should be available for use by the Parties.

2.9.2 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 3,442 AF during the current Water Year.

2.9.3 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 4,244 AF during the current Water Year.

2.9.4 Eagle Rock Basin

The volume of groundwater in storage in ERB is estimated to have decreased by 125 AF during the current Water Year.

2.10 WATER SUPPLY AND DISPOSAL - BASIN SUMMARIES

Table 2-11, Table 2-12, Table 2-13, and Table 2-14, summarize water supply and disposal activities in the San Fernando, Sylmar, Verdugo, and Eagle Rock basins, respectively. Outflows from these basins are based on computations originally made by the State Water Rights Board in the 1962 Report of Referee.

Table 2-9 CHANGE IN GROUNDWATER IN STORAGE IN SFB

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)
2015-16	8.53	3,548	(43,179)	51,729	92,126
2014-15	10.79	2,973	(39,722)	94,908	91,896
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
48 Year Average	**17.14**	**30,692**	**1,078**	**-----**	**85,665**

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

Table 2-10 PROJECTS TO ENHANCE RECHARGE CAPACITY IN THE SFB

Project	LADWP's Project Partner	Construction Start Date	Construction End Date	Expected Increase in Recharge (AFY)
1. Sheldon-Arleta Project	Los Angeles Bureau of Sanitation (LA Sanitation)	2007	Completed Nov 2009	4,000
2. Big Tujunga Dam Seismic Retrofit Project	Los Angeles County Flood Control District (LACFCD)	2007	Completed Feb 2012	4,500
3. Hansen Spreading Grounds Enhancement Project	LACFCD	2008	Completed Jan 2013	2,100
4. Woodman Ave. Stormwater Capture Project	LA Sanitation	2012	Completed Feb 2014	55
5. Laurel Canyon Blvd. Green Street Project	LA Sanitation	2016	2016	40
6. Burbank Blvd. BMP Project	Los Angeles Bureau of Engineering (LABOE)	2017	2019	53
7. Sun Valley EDA Public Improvement Project	LABOE	2015	Completed March 2016	93
8. Valley Generating Station Stormwater Capture Project	LACFCD	2018	2019	37
9. Lopez Spreading Grounds Enhancement Project	LACFCD	2019	2021	480
10. Tujunga Spreading Grounds Enhancement Project	LACFCD	2016	2018	8,000
11. Pacoima Spreading Grounds Enhancement Project	LACFCD	2017	2019	5,300
12. Whitnall Power Line Easement Project	LABOE	2018	2019	95
13. Branford Spreading Basin Enhancement Project	LACFCD	2017	2019	600
14. Rory M. Shaw Wetlands Park Project	LACFCD	2017	2022	590
15. San Fernando Valley Distributed Projects	LA Sanitation	2017	2020	494
16. Big Tujunga Dam Sediment Removal Project	LACFCD	2018	2028	500
17. Pacoima Dam Sediment Removal Project	LACFCD	2019	2023	700

1. The future construction start and end dates and the expected increase in recharge listed in the chart are estimated and subject to change

Table 2-11 SUMMARY OF WATER SUPPLY & DISPOSAL - SAN FERNANDO BASIN

2015-16 Water Year	(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	9,443	7,270	73,898	---		90,611
Basin Account	---	---	---	---		0
Physical Solution	---	---	---	---	529 [1]	529
Cleanup/Dewaterers	---	---	---	---	468	468
Non-consumptive Use	---	---	---	---	518	518
Total	**9,443**	**7,270**	**73,898**	**0**	**1,515**	**92,126**
Imports						
LA Aqueduct Water	---	---	88,007	---	---	88,007
MWD Water	5,092 [2]	14,641	232,173	0	6,652 [3]	258,558
Groundwater from						
Sylmar Basin	---	---	683	2,737	---	3,420
Verdugo Basin	---	0	---	---	---	0
Total	**5,092**	**14,641**	**320,863**	**2,737**	**6,652**	**349,985**
Delivered Recycled Water [4]	2,903	1,320	5,332 [5]	0	2,251 [3]	11,806
Exports						
LA Aqueduct Water						
out of ULARA	---	---	37,273	---	---	37,273
to Verdugo Basin	---	---	134	---	---	134
to Sylmar Basin	---	---	1,730	---	---	1,730
to Eagle Rock Basin	---	---	3,824	---	---	3,824
MWD Water						
out of ULARA	---	---	98,802	---	---	98,802
to Verdugo Basin	---	2,201	355	---	---	2,556
to Sylmar Basin	---	---	4,563	---	---	4,563
to Eagle Rock Basin	---	---	9,615	---	---	9,615
Groundwater	15 [6]	445 [6]	64,693	---	---	65,153
Total	**15**	**2,646**	**220,989**	**0**	**0**	**223,650**
Delivered Water						
Hill & Mountain Areas	---	---	34,319	---	---	34,319
Total - All Areas	17,423	20,585	179,104	2,737	10,418	230,267
Water Outflow						
Storm Runoff (F-57C-R)	---	---	---	---	23,970	23,970
Rising Groundwater (F-57C-R)	---	---	---	---	2,570	2,570
Subsurface	---	---	---	---	347	347
Recycled Water to the LA River	4,985	3,484	39,098	---	12 [3]	47,579
Wastewater to Hyperion	(109) [8]	1,071 [7]	16,393 [7]	---	---	17,355

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 LAG WRPs. Volume assigned to each City from LAG WRP is derived from the proportion of the total recycled water delivered to each City .
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 2-8.

Table 2-12 SUMMARY OF WATER SUPPLY & DISPOSAL - SYLMAR BASIN

2015-16 Water Year	(acre-feet)			
Water Source and Use	City of Los Angeles	City of San Fernando	All Others	Total
Total Extractions	683	3,008	[1]	3,691
Imports				
LA Aqueduct Water from SFB	1,730	--	--	1,730
MWD Water		0	--	0
MWD Water from SFB	4,563		--	4,563
Total	**6,293**	**0**	**0**	**6,293**
Exports - Groundwater				
to San Fernando Basin	683	2,737	0	3,420
Total Delivered Water	6,293	271	0	6,564
Water Outflow				
Storm Runoff	5,000 [2]	--	--	5,000
Subsurface	560 [3]	--	--	560
Total	**5,560**	**0**	**0**	**5,560**

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 2-13 SUMMARY WATER SUPPLY & DISPOSAL - VERDUGO BASIN

2015-16 Water Year	(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	1,704	1,167	---	---	10 [1]	2,881
Imports						
LA Aqueduct Water from SF	---	---	---	134		134
MWD Water	1,718	1,167	915			3,800
MWD Water from SFB		2,201		355		2,556
Rockhaven (CVWD 16)	259					
Total	1,977	3,368	915	489		6,490
Exports						
San Fernando Basin	0	0	0	0		0
CVWD	---	259				
Total	0	259	0	0		0
Delivered Recycled Water [2]		293				293
Total Delivered Water	3,681	4,828	915	489	10	9,664
Water Outflow						
Storm Runoff (Sta. F-252) [3]					747	747
Rising Groundwater (Sta. F-252)					3,974	3,974
Subsurface to:						
Monk Hill Basin	---	---	---	---	300 [4]	300
San Fernando Basin	---	---	---	---	80 [4]	80
Total	**0**	**0**	**0**	**0**	**5,101**	**5,101**

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 2-14 SUMMARY OF WATER SUPPLY & DISPOSAL - EAGLE ROCK BASIN

2015-16 Water Year	(acre-feet)		
Water Source and Use	City of Los Angeles	DS Waters	Total
Total Extractions	0	213 [1]	213
Imports			
LA Aqueduct Water from SFB	3,824	--	3,824
MWD Water (LA35) [3] from SFB	9,615		9,615
MWD Water (LA17) [3]	25,875		25,875
Groundwater from SFB	0	--	0
Total	**39,314**	**0**	**39,314**
Exports			
LA Aqueduct Water out of ULARA	3,452		3,452
MWD Water (LA35) [3] out of ULARA	8,939		8,939
MWD Water (LA17) [3] out of ULARA	24,055		24,055
Groundwater	0	213	213
Total	**36,446**	**213**	**36,659**
Total Delivered Water	2,868	0	2,868
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 (1962).
3. 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

2.11.1 San Fernando Basin

Table 2-15 shows the calculation of extraction rights for the forthcoming Water Year in SFB, and Table 2-17 shows the Stored Water Credits, for the cities of Burbank, Glendale, and Los Angeles. All rights are based on the Final Judgment dated January 26, 1979 and the "Interim Agreement for the Preservation of the San Fernando Basin Water Supply, 2008" (document available at ULARAwatermaster.com).

In September 2007, Burbank, Glendale and Los Angeles 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. Importantly, the Agreement (a copy of which is available at ULARAwatermaster.com) contained several provisions designed to help address the imbalance between the decline in stored groundwater and the large accumulation of Stored Water Credits. Among the key provisions of the Stipulated Agreement are the following:

- 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 7 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.
- 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.
- 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.

2.11.2 Sylmar Basin

Table 2-16 shows the calculation of Sylmar Basin extraction rights for the forthcoming water year. Table 2-18 and Table 2-19 detail the Stored Water Credits 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. That 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 on December 13, 2006, and this increased the safe yield of the Sylmar Basin to 6,810 AFY (effective October 1, 2006), subject to certain conditions that provided 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 this document is available via ULARAwatermaster.com. 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 re-assessment. Specifically, groundwater credits in Sylmar Basin are now being calculated by the current Watermaster 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 2-19 shows the new method of groundwater credit calculation for Sylmar 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 ULARAwatermaster.com), 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 2-18. 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 2-19), 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.

2.11.3 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 for any party.

2.11.4 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.

Table 2-15 CALCULATION OF EXTRACTION RIGHTS – SAN FERNANDO BASIN

	(acre-feet)		
	City of Burbank	**City of Glendale**	**City of Los Angeles**
Total Delivered Water, WY2015-16	17,423	20,585	179,104
Water Delivered to Hill and Mountain Areas, WY2015-16	---	---	34,319
Water Delivered to Valley Fill, WY2015-16	17,423	20,585	144,785
Percent Recharge Credit	20.0%	20.0%	20.8%
Return Water Extraction Right	3,485	4,117	30,115
Native Safe Yield Credit	---	---	43,660
Annual Extraction Right for the 2016-17 Water Year[1]	**3,485**	**4,117**	**73,775**

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

Table 2-16 CALCULATION OF EXTRACTION RIGHTS - SYLMAR BASIN

	(acre-feet)		
	City of Los Angeles	**City of San Fernando**	**All Others**
Annual Extraction Right for the 2015-16 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 its well in 1999.

Table 2-17 CALCULATION OF STORED WATER CREDITS – SAN FERNANDO BASIN

Item Number and Description	(acre-feet) City of Burbank	City of Glendale	City of Los Angeles
1. Stored Water Credit (as of Oct. 1, 2015)	12,802	37,235	536,298
1a. Credits and Debits	7,200 [1]	0	(7,200) [1]
1b. Prior Year Adjustments	0	(52) [2]	52 [2]
2. Extraction Right for the 2015-16 Water Year	3,583	4,192	74,071
3. WY2015-16 Extractions			
Party Extractions	9,443	7,270	73,898
Physical Solution Extractions	57	435	38
Clean-up/Dewaterers	0	0	468
Total	9,500	7,705	74,404
4. Spread Water 2015-16 Water Year	306	0	0
5. Stored Water Credits [3] per City (as of Oct. 1, 2016)	14,392	33,670	528,817
6. 1% Basin Loss Factor [4]	(143.92)	(336.70)	(5288.17)
7. **Stored Water Credits** (less Basin Loss) **for each City** (as of Oct. 1, 2016)	**14,248**	**33,334**	**523,529**
8. **Total Stored Water Credits** (less Basin Loss)		**571,111**	
9. **Total Available Stored Water Credits 3** (from Plate 13)		**51,729**	
10. Percentage of Total Credits per City	2.495%	5.837%	91.669%
11. **Available Stored Water Credits for each City** (as of Oct. 1, 2016) (Item 9 x Item 10)	**1,291**	**3,019**	**47,419**
12. **Total Reserved Stored Water Credits 3** (Item 8 - Item 9)		**519,382**	
13. **Reserved Stored Water Credits for each City** (as of Oct. 1, 2016) (Item 7 - Item 11)	**12,957**	**30,315**	**476,110**

1. In October 2015, untreated MWD water was purchased by Burbank for LA in exchange for groundwater credits.
2. An exchange of 52.3 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 2014-15.
3. Item 5 = 1 +1a + 1b + 2 – 3 + 4.
4. 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 (document available at ULARAwatermaster.com)

Table 2-18: 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, 2014)	9,014	404
2. Extraction Right for the 2014-15 Water Year [1]	3,570	3,570
3. Total 2014-15 Extractions	683	3,008
Santiago Estates[2]	0.0	0.0
4. Total Extractions Less Extraction Right (= Item 3 - Item 2)	(2,887)	(562)
5. Remaining "Frozen" Water Credits[3] (as of Oct. 1, 2015)	**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 2012-dated Sylmar Safe Yield Evaluation available at ULARAwatermaster.com).

Table 2-19: CALC. OF STORED WATER CREDITS - 5-YEAR METHOD - SYLMAR BASIN

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	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.
	2014-15	3570	0	0	3570	Total extraction was less than annual extraction right.
	2015-16	3570	683	0	2887	Total extraction was less than annual extraction right.
	STORED WATER CREDITS (as of Oct. 1, 2016) =				**13733**	
City of San Fernando	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.
	2014-15	3570	2736	0	562	Total extraction was less than annual extraction right.
	2015-16	3570	3008	0	562	Total extraction was less than annual extraction right.
	STORED WATER CREDITS (as of Oct. 1, 2016) =				**2001**	

1. Note: Stored water credits in Table 2-19 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.

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3 WATER QUALITY, TREATMENT, AND REMEDIAL INVESTIGATION ACTIVITIES

3.1 WATER QUALITY BY SOURCE

Various water sources are used within ULARA as described below. A representative summary of the TDS concentrations and the general mineral analyses of imported water, surface water and groundwater are provided on Appendix D.

3.1.1 Imported Water

Sources of imported water and their basic water character in ULARA are as follows

1. *LOS ANGELES AQUEDUCT* water has a sodium bicarbonate character and is the highest quality water available to ULARA.
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.
3. *NORTHERN CALIFORNIA* Water (delivered via the State Water Project) is sodium bicarbonate-sulfate in character. It generally contains lower concentrations of total dissolved solids (TDS) and is softer than either local groundwater or imported Colorado River water.
4. *COLORADO RIVER/NORTHERN CALIFORNIA* waters were first blended at the Weymouth Plant in mid-1975. Blending ratios vary over time depending on the availability of supply and area demands.

3.1.2 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.

3.1.3 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 in 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 certain VOCs like trichloroethylene (TCE) and perchloroethylene (PCE), along with 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.

Wherever the local groundwater is pumped, it 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.

3.2 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.

Development of the SNMP for the ULARA groundwater basins is ongoing. The ULARA Watermaster continues to work closely with RWQCB-LA staff and the UALRA stakeholders as part of the SNMP development. During the 2015-16 Water Year, the ULARA SNMP Technical Committee continued to meet on a monthly basis. As of December 2016, four technical memoranda (TM's) have been prepared, and TM-5 summarizing the modeling efforts for the project is expected to be published in early 2017.

Each of the TM's developed for the ULARA SNMP can be accessed through the ULARA Watermaster website via ULARAwatermaster.com/SNMP. In addition, information

presented and distributed at various ULARA SNMP meetings are also available for download form the website. Important dates and updates regarding the ongoing development of the SNMP for ULARA will be distributed periodically via the website throughout the SNMP development process.

3.3 PRIVATE SEWAGE DISPOSAL SYSTEMS (PSDS)

To reduce the potential for groundwater contamination from septic tanks in the City of Los Angeles, the City enacted Ordinance No. 160388, Los Angeles Municipal Code Section 64.26 [LAMC Section 64.26] on September 17, 1985. 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:

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

In 2016, Industrial Waste Management Division (IWMD) did not receive any referral 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.

The City of Los Angeles is continuously looking for areas to add sewer and encourage owners of PSDS to properly abandon their septic systems and connect to sewer. Additionally, the City is seeking grant funding opportunities to implement septic-to-sewer projects to encourage residents to properly abandon their onsite wastewater treatment systems (OWTS) and connect to the public sewer. Plate 8 shows the locations of

proposed sewer improvement projects in the City of Los Angeles. Additional Information regarding the City of Los Angeles's efforts to reduce PSDS and OWTS sites can be found at their website, as follows:

https://www.lacitysan.org/san/faces/home/portal/s-lsh-wwd/s-lsh-wwd-cw/s-lsh-wwd-cw-ssps?_adf.ctrl-state=1cyuj3unrg_4&_afrLoop=13296318219627425#.

3.4 LANDFILLS

There are active and closed landfills throughout the ULARA, as shown on Plate 9, that may have impacted, or have the potential to impact, the quality of surface water and groundwater in ULARA. In 1987, the California Water Code was amended to include Section 13273, requiring the SWRCB to develop a ranked list of all known landfills throughout the state on the basis of each landfill's threat to water quality. Section 13273 also required the operator of each solid waste disposal site on the ranked list to submit to the appropriate RWQCB the results of a groundwater assessment, referred to as a solid waste water quality assessment test (SWAT), to determine if the solid waste disposal site was leaking. The SWAT reports were required on a yearly basis, submitted by rank, beginning with Rank 1 in 1987.

SWAT reports for major SWAT rank (Rank 1 to Rank 4) landfills in the ULARA have all been completed and previously submitted to the RWQCB-LA. The reports that have been reviewed by the RWQCB-LA are listed in Table 3-1. Further updates to the SWAT reports are triggered by proposals for post-closure land use. The current regulatory status of each site (as determined by the RWQCB-LA) and updated groundwater monitoring data for each landfill site may be found within the SWRCB GeoTracker data system, accessible via http://geotracker.waterboards.ca.gov/.

3.5 SUMMARY OF RECENT ACTIVITIES AT HEWITT PIT LANDFILL

The RWQCB-LA issued a California Water Code (CWC) section 13267 Investigative Order (Investigative Order) to Vulcan Materials Company (Vulcan), the owner of the Hewitt Pit landfill, in January 2014. The Investigative Order required information about historical and current operations and activities at the landfill, and also a proposal for a landfill groundwater monitoring program. In May 2014 Vulcan submitted a report in response to the January 2014 Investigative Order that indicated that the landfill is affecting groundwater quality; the dominant contaminant of potential concern (COPC)

was documented to be 1,4-dioxane. Vulcan began quarterly groundwater monitoring in the fourth quarter of 2014, and began implementation of a site assessment work plan in February 2015. The RWQCB-LA issued a Draft Cleanup and Abatement Order (CAO) to Vulcan in May of 2015. Vulcan submitted quarterly groundwater monitoring reports throughout 2015, and site assessment summary reports in May and July 2015; the reports document an evolving understanding of environmental conditions at the landfill that indicate that the landfill is leaking waste constituents (including 1,4-dioxane) to the environment, including groundwater below the site, and included information on the occurrence of landfill leachate not previously encountered in the middle of the eastern portion of the landfill. Vulcan submitted a work plan for additional site assessment, as required by the September 2015 Final CAO, in October 2015. The October 2015 work plan was approved by the RWQCB-LA in November 2015. An interim remedial action plan prepared by Golder Associates was submitted in April 2016 to RWQCB-LA.

Table 3-1 LANDFILLS WITH SWAT INVESTIGATION

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

1. Additional information including the historic landfill use, ongoing monitoring, leak information, etc, can be found at the SWRCB GeoTracker data system, accessible via http://geotracker.waterboards.ca.gov/

3.6 WATER TREATMENT

3.6.1 USEPA Operable Units - SFB

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.

3.6.1.1 North Hollywood Operable Unit (NHOU) –

In 1980, concentrations of certain VOCs, including TCE and PCE, were encountered at concentrations above their respective Federal Maximum Contaminant Levels (MCLs) and State Action Levels in many municipal production wells in the San Fernando Basin. Approximately 50 percent of LADWP's production wells were shut down in the 1980's due to such contamination.

Based on studies conducted by the State of California and LADWP, USEPA selected the first interim cleanup remedy to consist of groundwater pump and treat systems using aeration and granular activated carbon (GAC) air filtering units. The North Hollywood Operable Unit (NHOU) began operating in December 1989 and pumps contaminated groundwater into an aeration tower, where the contaminants are removed from the water by an air stripper. These contaminants are then captured by a vapor phase GAC system to limit air emissions of the compounds. The treated water is discharged into the LADWP pumping station for chlorination, and further blended with other sources of clean water before distribution in the public water supply.

More recently, the EPA has detected emerging contaminants including hexavalent chromium and 1,4-dioxane in some of the NHOU wells. An increase in chromium contamination has caused two of the eight extraction wells to be removed as a source of potable water supply. Since these wells serve an important plume containment function for the high levels of contamination the shut downs demonstrated the need for a change in the remedy.

In September 2009, the EPA recommended enhanced treatment methods, which included: well-head treatment for hexavalent chromium and 1,4 dioxane; expanding the combined treatment system; installation of additional monitoring wells; and construction of additional groundwater extraction wells. In 2014, the USEPA allowed for consideration of the treated effluent to be reinjected back into the aquifer.

On July 21, 2015, consultants Amec Foster Wheeler submitted a groundwater Modeling Memorandum to USEPA on behalf of Lockheed Martin Corporation and Honeywell International Inc. for the design of the Second Interim Remedy (2IR) for groundwater remediation at the NHOU. The NHOUR 2IR is intended to upgrade and expand the existing NHOU groundwater supply production well fields, and address emerging contaminants.

For more information about the NHOU, the USEPA website may be accessed via https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902251

3.6.1.2 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. This BOU 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.

The City of Burbank is also concerned about CrVI in the 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.

More information about the BOU can be found via the USEPA Website, https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902251

3.6.1.3 Glendale Operable Unit

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.

Information from the USEPA can be found via their website at https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902252

3.6.1.4 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 constructed to help evaluate the location and extent of the chromium contamination in soils and groundwater beneath the area.

Information for the GCOU are available from the USEPA via https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902252

3.6.1.5 Superfund Area 4 - Pollock Wells Treatment Plant (PWTP)

Area 4 in the San Fernando Valley is an area of contaminated groundwater covering approximately 5,860 acres near the Pollock Wellfield in the City of Los Angeles. In this area, groundwater is contaminated with various chlorinated VOCs, specifically trichloroethylene (TCE) and perchloroethylene (PCE). Chromium has also been detected in Area 4.

USEPA completed an interim investigation of the Pollock Wellfield in April 1994 and concluded that selecting and implementing a Superfund remedy for the Pollock Area was not immediately necessary because LADWP planned to conduct a wellhead treatment project in the Pollock Wellfield. In March 1999, LADWP reactivated wells to extract and treat the groundwater using liquid-phase granular activated carbon. The treated water is delivered to LADWP's distribution system for a drinking water end use. Investigations are still continuing to determine the full nature and extent of contamination at this area. LADWP recently constructed three groundwater monitoring wells to refine the characterization of groundwater within the vicinity of the Pollock Wells Treatment Plant.

USEPA and the California Regional Water Quality Control Board entered into a Cooperative Agreement to perform an investigation of potential sources of contamination in the San Fernando Basin. Currently, USEPA is conducting a search for Potentially Responsible Parties within the Pollock Site 4 Area, as well as a data gap analysis to identify where additional sampling and site characterization is needed. Following these activities, EPA will conduct a Remedial Investigation and Feasibility Study to identify the extent of contamination and evaluate clean up alternatives.

The use of an interim alternate drinking water supply and the operation of the Pollock wellhead treatment project have reduced the potential of exposure to contaminated

drinking water at the San Fernando Valley (Area 4) site and will continue to protect residents near this site while further cleanup activities are being planned.

More information about Superfund Area 4 and the Pollock Wells Treatment Plant is available via the USEPA website:
https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902253

3.6.2 Other Treatment Facilities

3.6.2.1 Verdugo Park Water Treatment Plant (VPWTP)

Glendale's VPWTP serves as a filtration and disinfection facility.

3.6.2.2 Glenwood Nitrate Water Treatment Plant

CVWD's Glenwood Nitrate Water Treatment Plant uses an ion-exchange process for nitrate removal. CVWD uses the plant to increase groundwater usage within their service area. The plant was operational during the subject water year.

3.6.2.3 CVWD Well 2 Nitrate Removal Plant

CVWD received a $1.8 million, Proposition 84, 2015 Integrated Regional Water Management Grant from the California Department of Water Resources for the construction of a new Nitrate Removal Treatment System and to re-active Well 2 in July 2015. The grant was a 40/60 split with DWR funding $705,775 and CVWD funding $1,119,225. The proposed Nitrate Removal Treatment System will use the "ARoNite" fixed-film biological process system which uses a biofilm to reduce nitrate levels below the MCL. Equipment for the project will include a new 150-gpm pump and motor for Well 2, onsite piping, an operations building, electrical and telemetry systems, sewer line for pump-to-waste purposes, and other onsite improvements. The project design is expected to be completed by April 2017, with construction to begin in October 2017 and be completed in March 2018.

3.6.2.4 City of San Fernando Nitrate Treatment

The City of San Fernando is in the process of completing the construction of a water treatment plant to address nitrate contamination that affects some of their wells. The plant is expected to be online and operation in 2018.

3.6.2.5 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 CrVI in the groundwater. Since then, the plant has been used only when necessary to obtain water quality data from the wells and when needed

for limited, non-potable power plant use. In Water Year 2015-16, Wells 7 and 15 and the GAC Treatment Plant were operated in April and May 2016 and again in September 2016 because of reduced recycled water supply, caused when a major sewer force main was shut down. The total amount of water produced and delivered to the Magnolia Power Project cooling towers for industrial cooling was 64.67 AF. 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..

3.6.2.6 Temporary Tujunga Wellfield Treatment Study Project

Twelve production wells were completed by 1992 in the Tujunga Wellfield to produce groundwater from the SFB. Certain VOCs, like TCE and PCE, were detected in each of the wells. Over time, VOC concentrations increased sharply above their respective Federal and State MCLs requiring the shutdown of several of the production wells; at times, the entire wellfield has had to be shut down. In 2010, LADWP and MWD completed a wellhead treatment project with the installation of liquid-phase GAC adsorption vessels on two of the most severely impacted wells. The treatment plant is capable of treating a flow rate of 8,000 gpm. Other constituents of concern include 1,4 dioxane, carbon tetrachloride, and 1,1 dichloroethene (DCE).

Liquid-phase granular activated carbon adsorption vessels designed to remove VOCs from groundwater were installed at two wells, Nos. 6 and 7. Use of the vessels has restored more than 20,000 AFY of pumping capacity that was previously unavailable due to water quality constraints.

In the event either Wells No. 6 or 7 are taken out of service due to either mechanical or maintenance needs, water flow should be maintained through the vessels in order to minimize the possibility of bacteriological growth and leaching of metals in the GAC. In response to that need, a backup piping system has been installed to maintain the flow of raw well water from Well No. 8. It is necessary for water from Well No. 8 to supply either Well No. 6 or 7 in the event of a shut down since neither well can provide the minimum flow requirements to operate more than one GAC treatment system.

LADWP is current in the process of obtaining necessary permits from the Division of Drinking Water to operate this connection.

3.7 GROUNDWATER QUALITY INVESTIGATIONS

There are numerous ongoing groundwater quality investigations in ULARA, particularly in the SFB. The reader can obtain current information and more details for the sites mentioned below, which are regulated by the RWCQCB-LA, via that agency's GeoTracker website: http://geotracker.waterboards.ca.gov/.

The DTSC website, http://www.envirostor.dtsc.ca.gov/public/, also contains information regarding groundwater quality investigations and/or cleanup sites within ULARA.

Below are brief descriptions of particular groundwater quality investigations for contaminated and/or potentially contaminated sites within ULARA. Note that the discussion below does not provide and an exhaustive list of these sites within ULARA. Any omission of a site from the list below does not imply that the omitted site is not important or not of concern to the Watermaster or to the Parties to the Adjudication.

3.7.1 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 Potentially Responsible Party by the USEPA as the source responsible for discharging contaminants from its site into the groundwater affecting the original Glendale South OU. The results of subsurface investigations to date by others 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 (711 W. Broadway and 718 W. Wilson) 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.

3.7.2 PRC-DeSoto, 5430 San Fernando Rd, 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 Potentially Responsible Party by the USEPA as a source for releasing chlorinated organic solvents within the groundwater in the original Glendale South OU; this facility is considered a PRP for the Glendale OU. Historically, the principal industrial activities at the facility 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 the soils and groundwater beneath the facility. Groundwater monitoring continues on a quarterly basis as part of the CAO.

Cleanup operations regarding chromium and VOCs in the soils have reportedly been completed. Work toward closure of the site in regard to soils contamination will begin with the RWQCB-LA. Work regarding chromium contamination within the local groundwater will be transferred to the USEPA. PRC DeSoto has been identified by the EPA as a PRP for the Chromium OU (CrOU).

3.7.3 Excello Plating, 4057 Goodwin Ave., Los Angeles

The RWQCB-LA issued a CAO to Excello Plating in June, 2003 which 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 basic purpose of this CAO was to ensure that Excello Plating completes the onsite and offsite assessment to help define 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.

3.7.4 B.F. Goodrich (fmr. Menasco/Coltec Ind., 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 reportedly owned by United Technologies. This facility was identified as a Potentially Responsible Party by the USEPA as a source of discharging contaminants to the groundwater, and affecting the original Glendale North OU (GNOU). Additionally, the USEPA has issued a General

Notice Letter and a 104E Letter to the site owner(s), and the facility is considered by the EPA to be a PRP for the Glendale Cr OU (GCOU). The former industrial activities at this facility 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 soils and in the groundwater underlying the site.

The site was purchased by IKEA, Inc in late-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 were conducted between 1998 and 2004 in an effort to reduce VOC concentrations in the soils beneath the site. The decommissioning of the SVE system was approved by RWQCB-LA in February 2014. Additionally, both a groundwater extraction system and in-situ bioremediation treatment have been used to further remediate the shallow perched-groundwater zone. The groundwater extraction system was decommissioned in January 2015.

3.7.5 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 a continuous clay layer that is reported to underlie the property. The contamination in the groundwater beneath the clay layer 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 constructed a subsurface 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.

3.7.6 Honeywell (fmr. 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 along with their short-term remediation plan. Recently, Honeywell submitted its long-term remediation plan for 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 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 construction 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.

3.7.7 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 PCE, lubricating and cutting oils, and metal plating solutions. Over the years, these chemicals, oils and solutions have contaminated the local soils and groundwater.

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 RWQCB-LA 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 as high as 8,300 µg/L were initially detected in August, 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 was 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.

3.7.8 General Electric, 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 used to remove 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.

3.7.9 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 downgradient of this reported 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.

3.8 EPA SHALLOW ZONE CONTAMINATION MAPS

The USEPA occasionally provides the Watermaster with contamination "plume" maps for the Shallow aquifer zone in the eastern portion of the SFB. Appendix E shows 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 in the Appendix E maps are reportedly based on data through September 30, 2014.

Plates

Plate 1 – Upper Los Angeles River Area: Vicinity and Location Map

Plate 1A – San Fernando Groundwater Basin Map

Plate 1B – Sylmar Groundwater Basin Map

Plate 1C – Verdugo Groundwater Basin Map

Plate 1D – Eagle Rock Groundwater Basin Map

Plate 2 – Water Service Areas of Public Agencies

Plate 3 – Components of Los Angeles River

Plate 4 – Simulated Groundwater Elevation Contour Map, Spring (April)

Plate 5 – Simulated Groundwater Elevation Contour Map, Fall (September)

Plate 6 – Simulated Change in Groundwater Elevations

Plate 7 – San Fernando Basin: Cumulative Change in Groundwater Storage

Plate 8 – Los Angeles Bureau of Sanitation Sewer Construction Program for Commercial Parcels

Plate 9 – Landfill Locations

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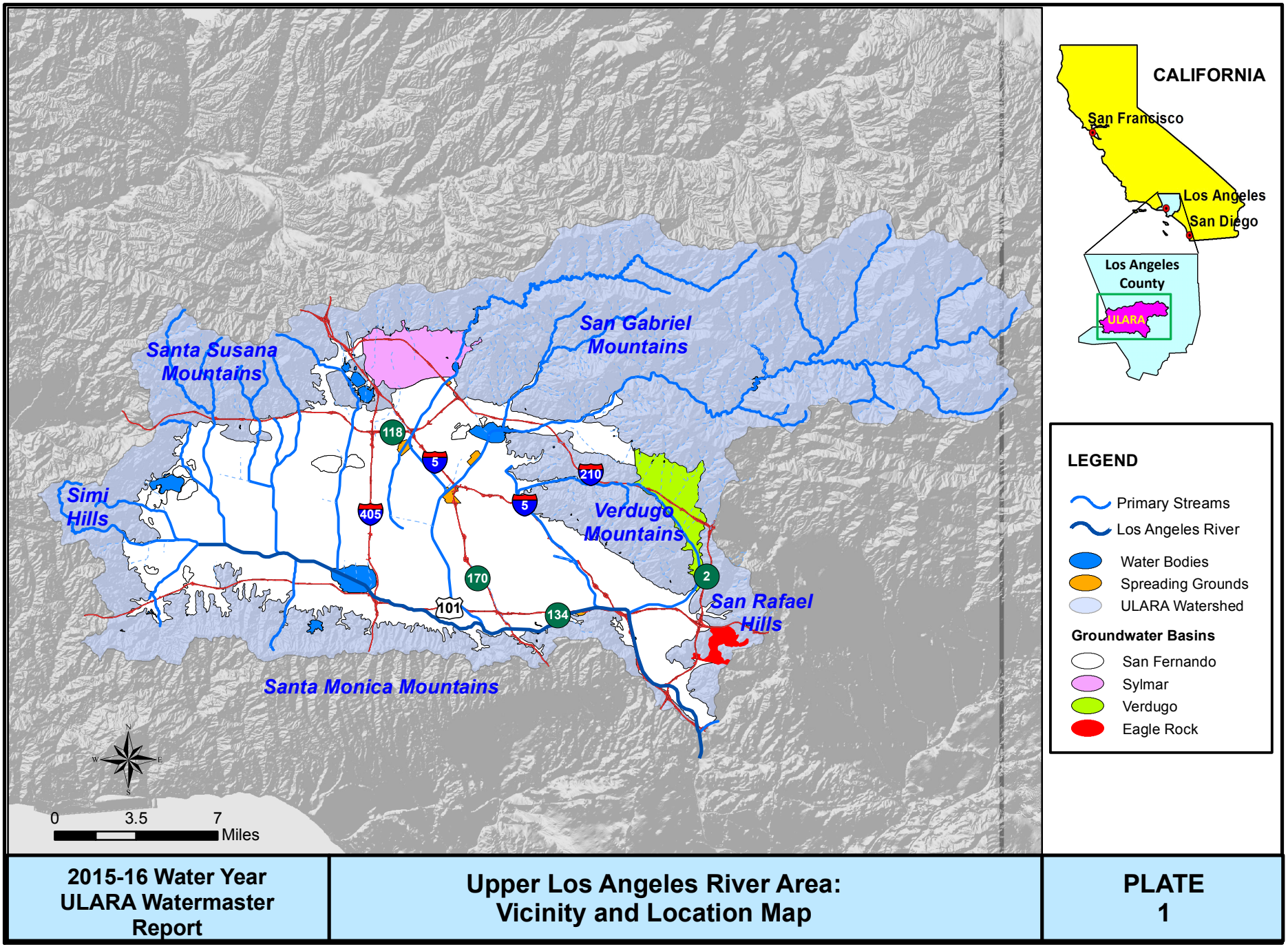

2015-16 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Vicinity and Location Map	PLATE 1

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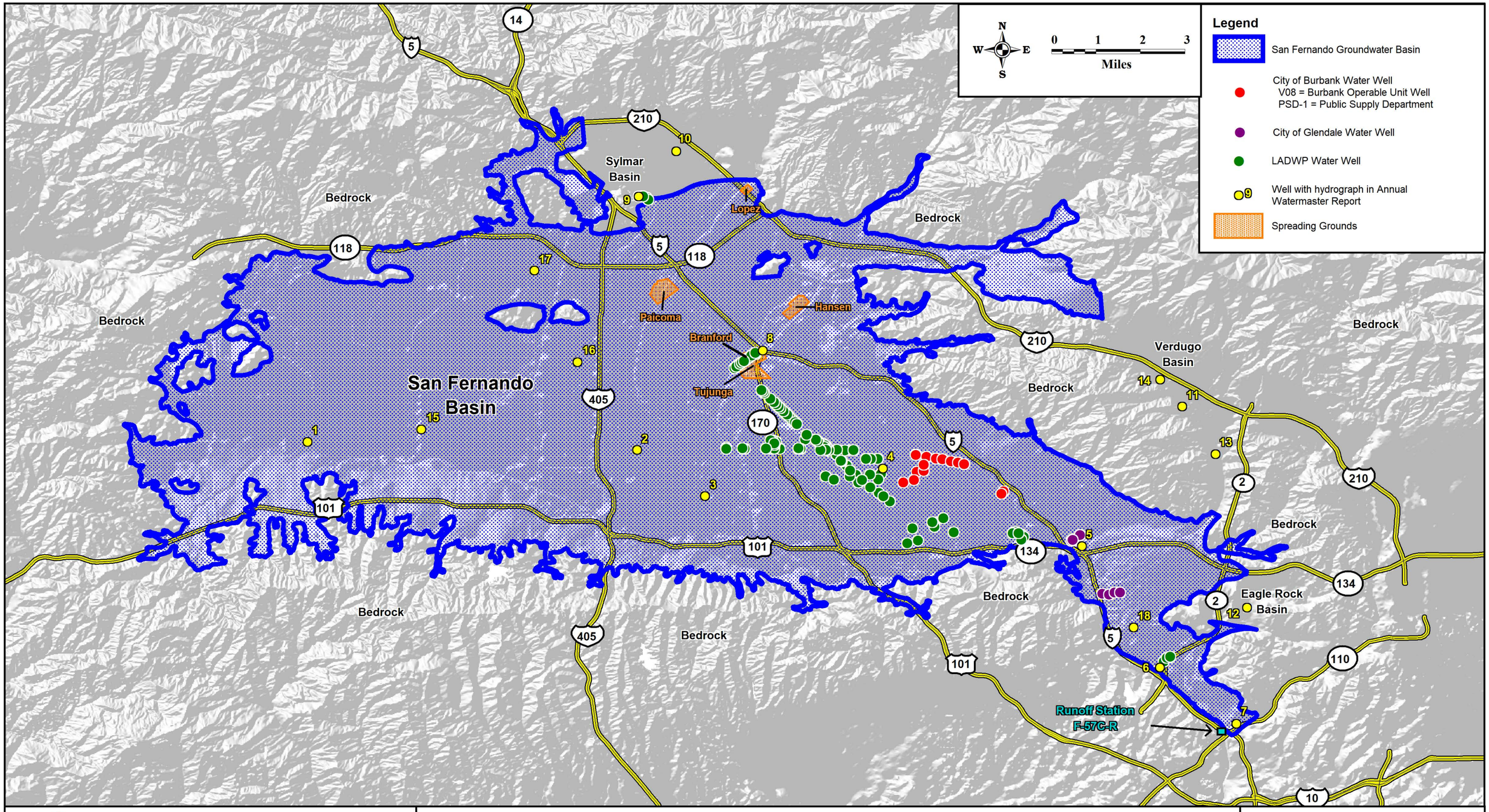

ULARA 2015-2016 Water Year ULARA Wastermaster Report	Upper Los Angeles River Area: San Fernando Groundwater Basin Map	PLATE 1A

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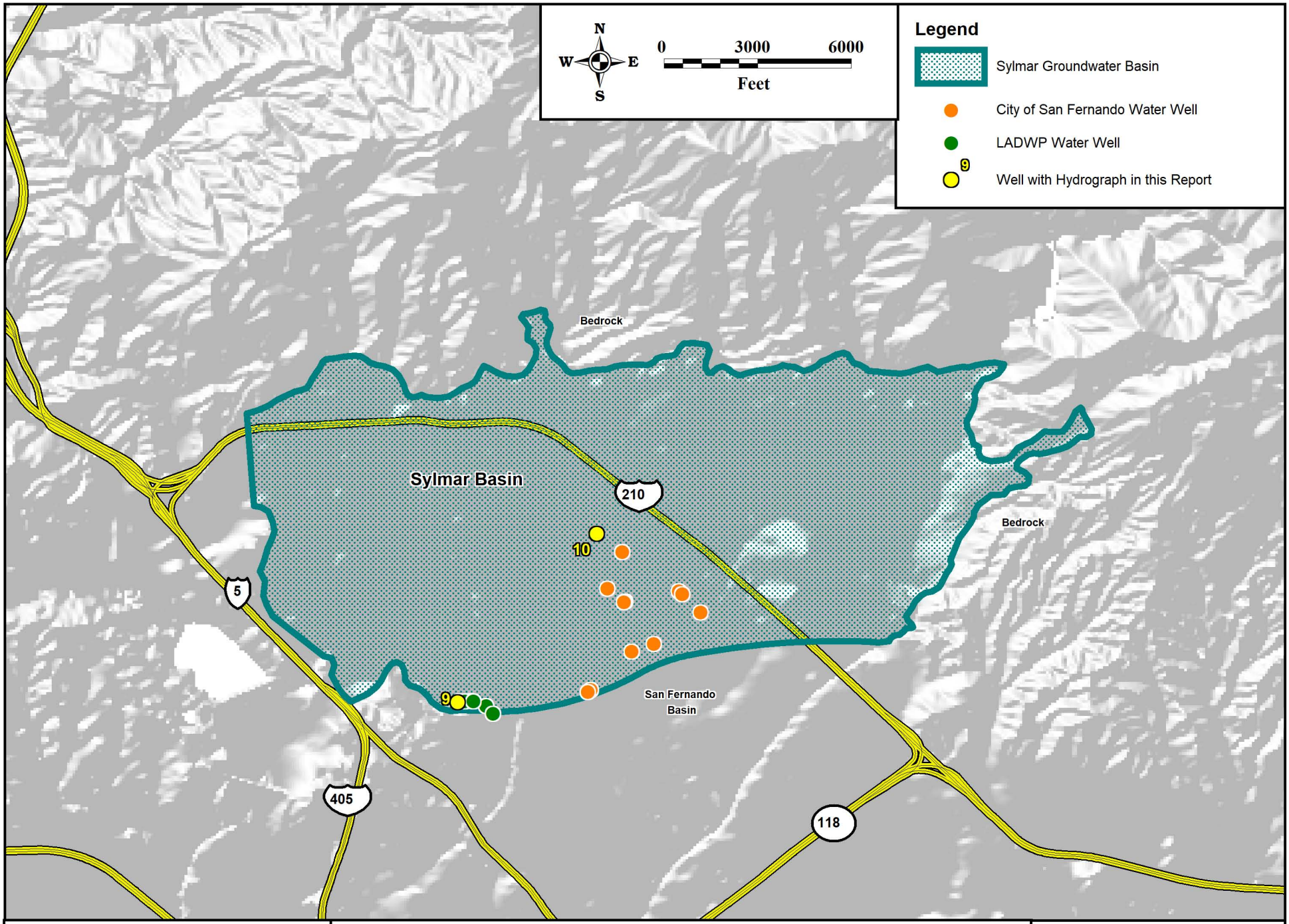

ULARA 2015-2016 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Sylmar Groundwater Basin Map	PLATE 1B

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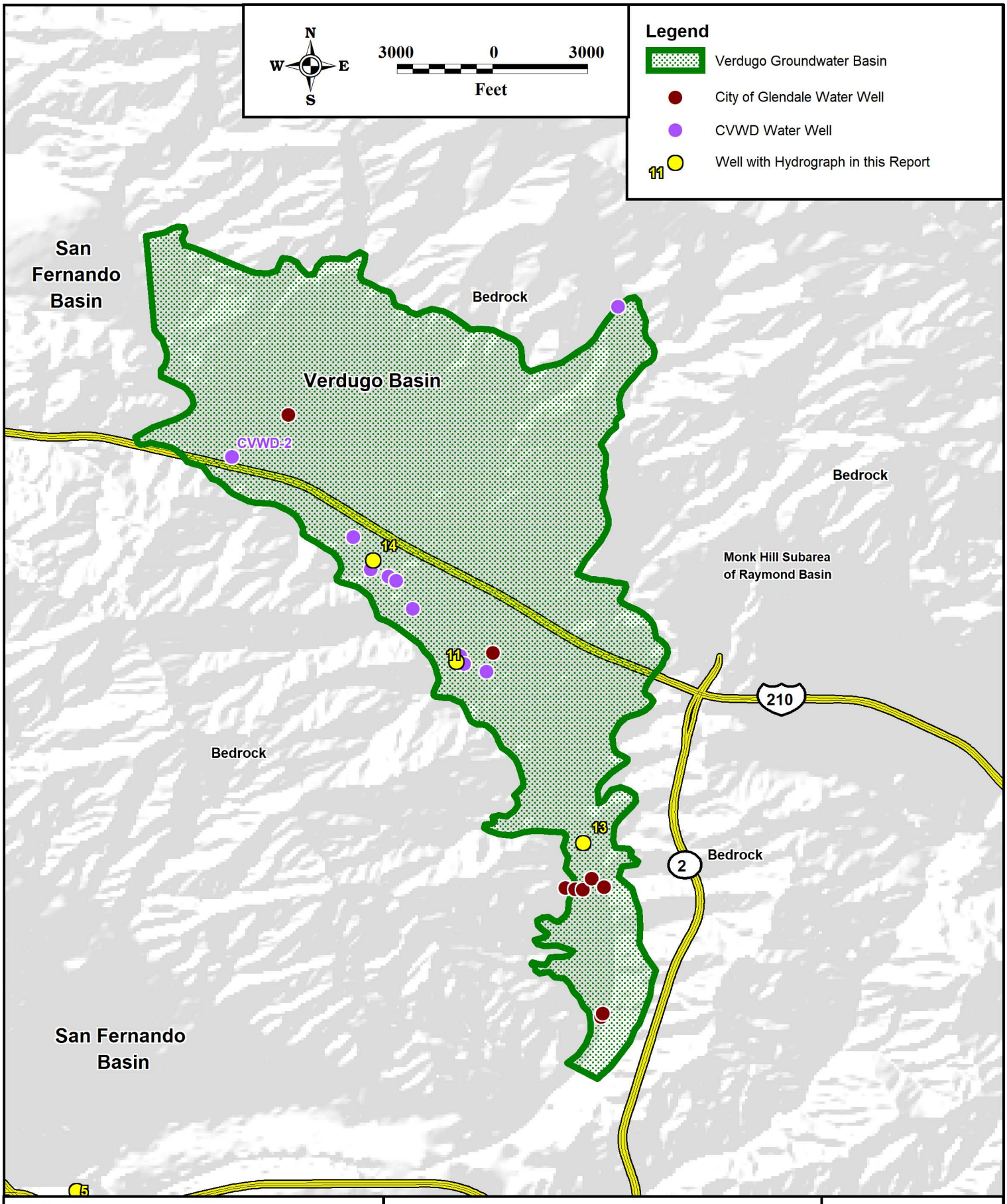

ULARA 2015-2016 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Verdugo Groundwater Basin Map	PLATE 1C

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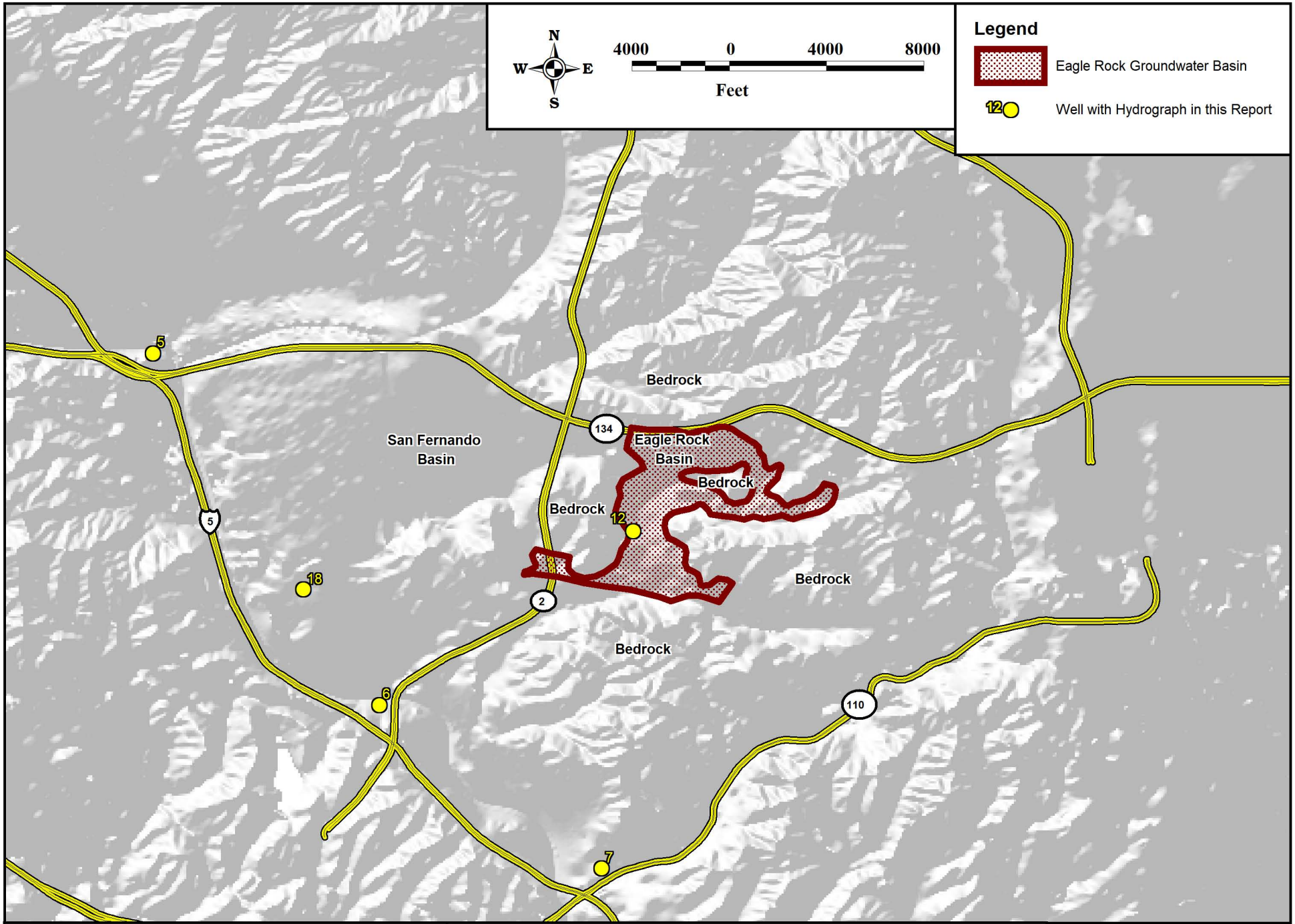

ULARA	2015-2016 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Eagle Rock Groundwater Basin Map
		PLATE 1D

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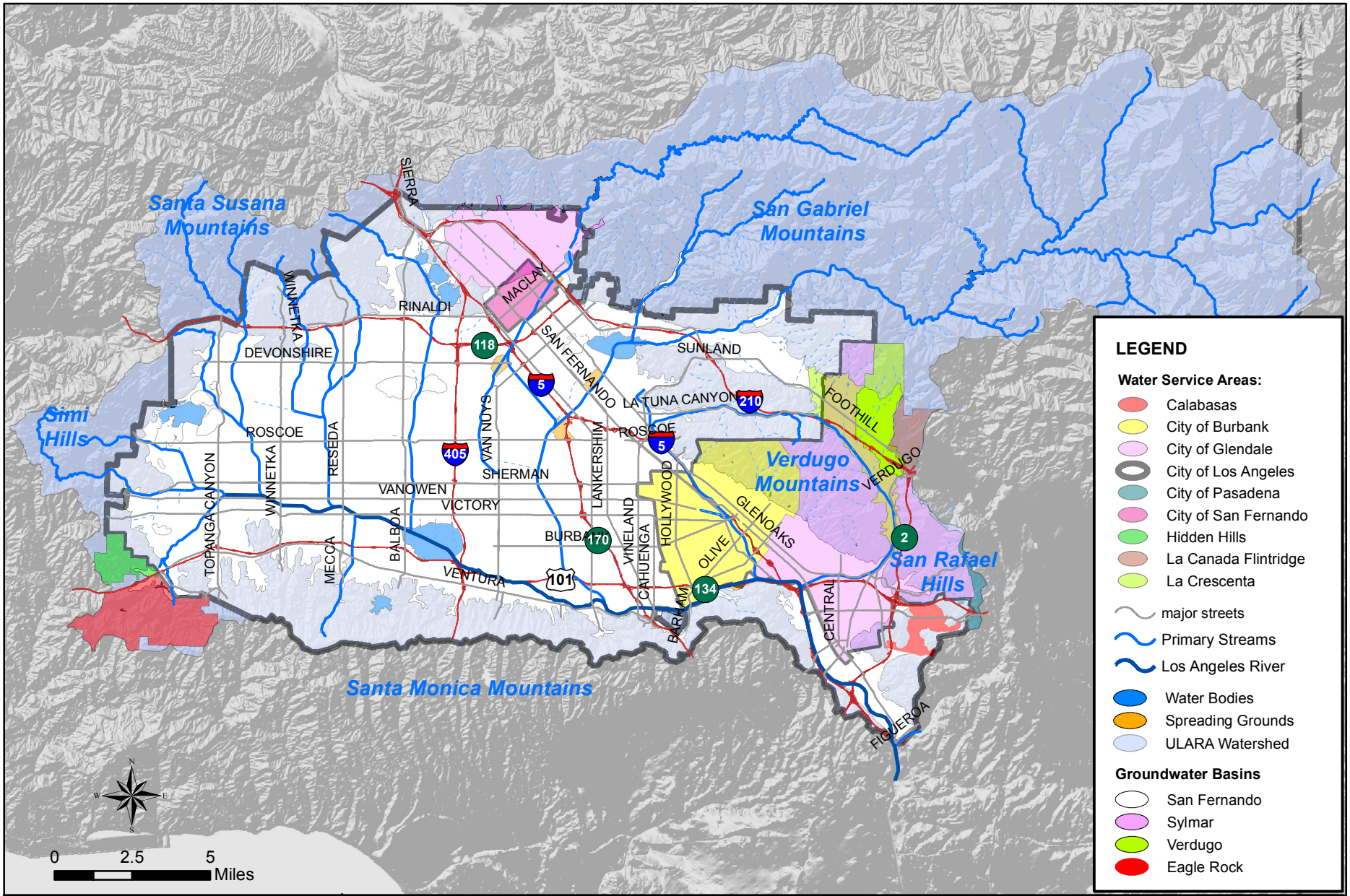

2015-16 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Water Service Areas of Public Agencies	PLATE 2

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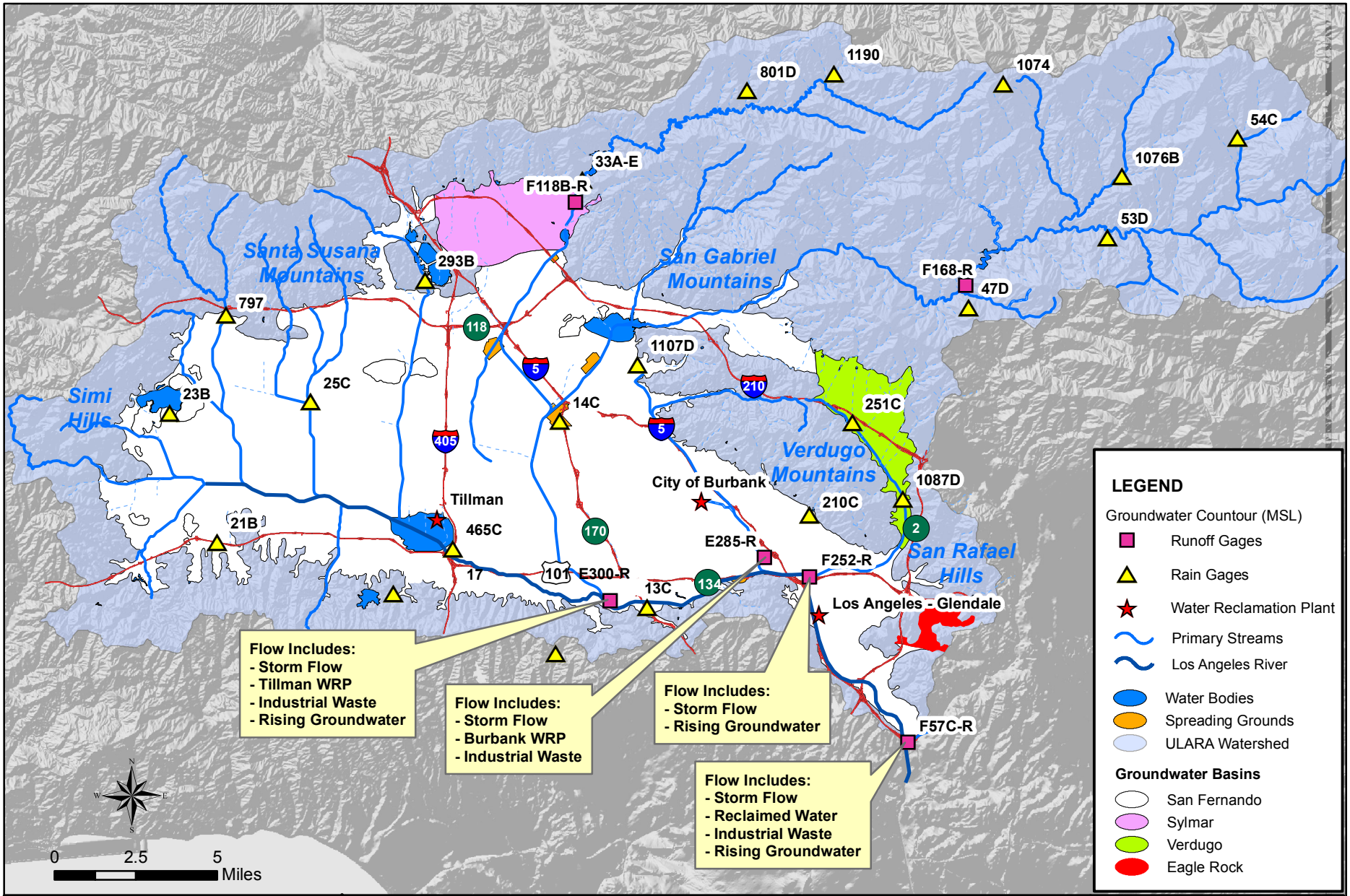

2015-16 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Components of Los Angeles River	PLATE 3

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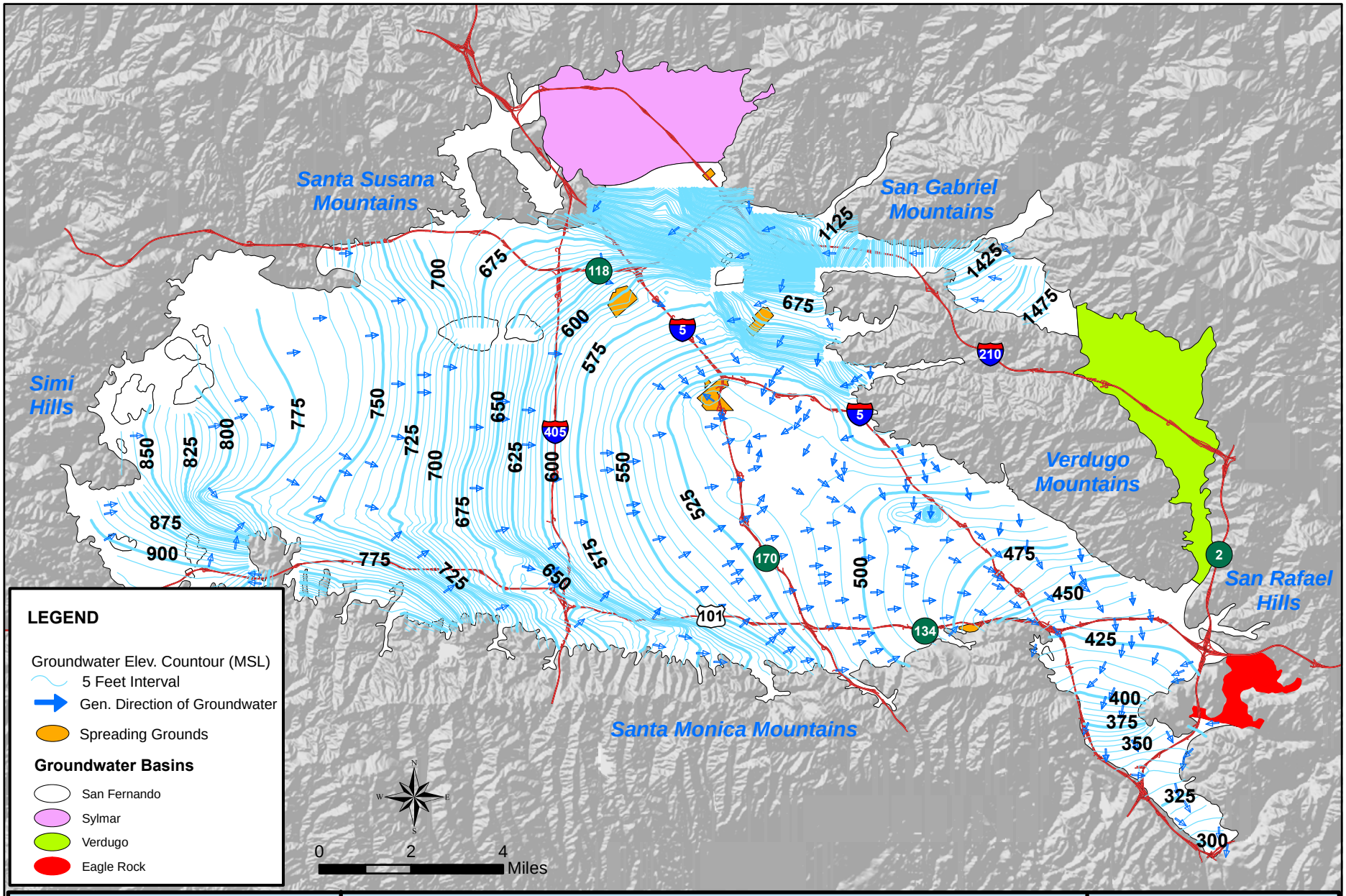

2015-16 Water Year ULARA Watermaster Report	Simulated Groundwater Elevation Contour Map Spring (April) 2016	PLATE 4

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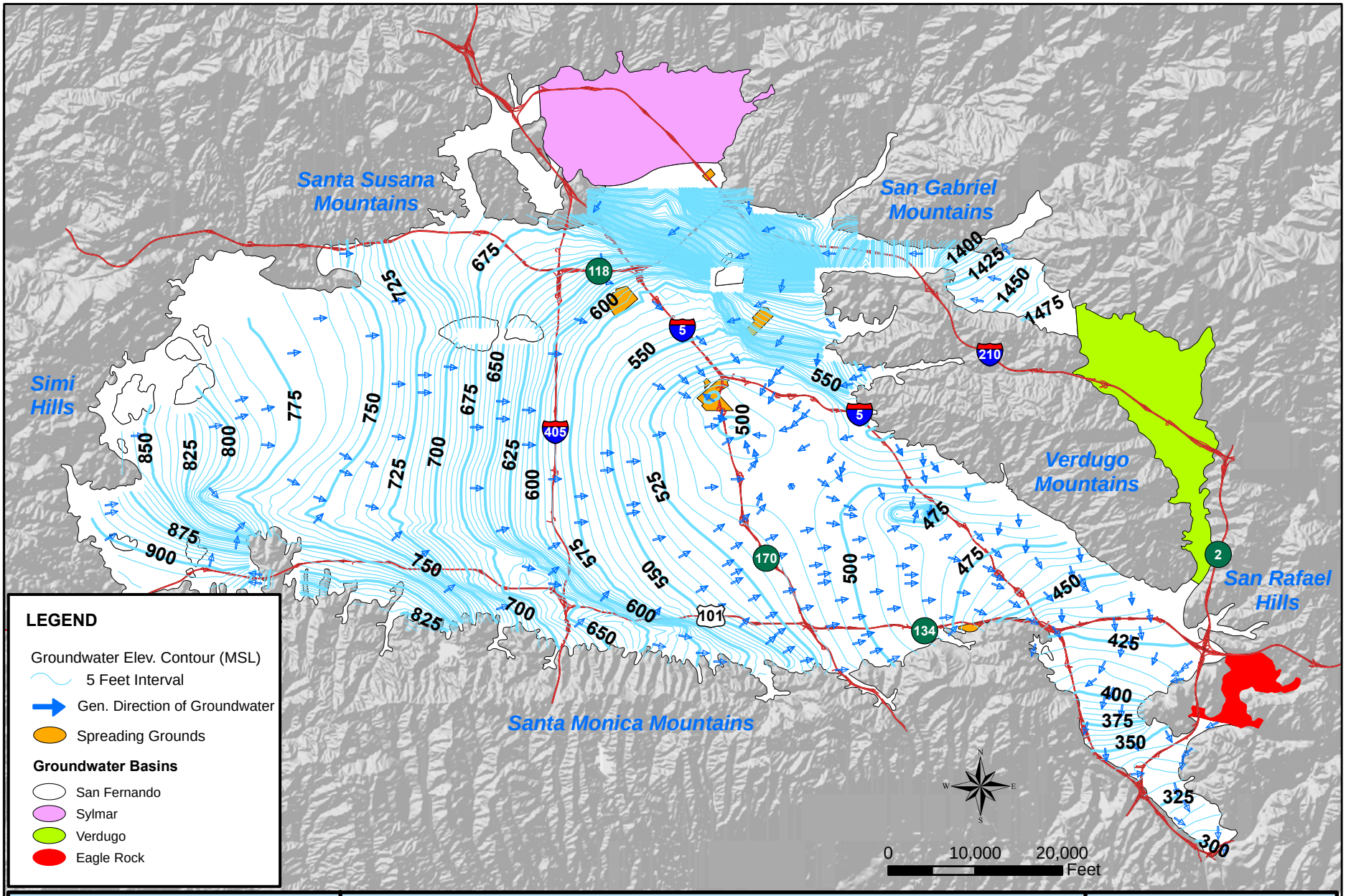

2015-16 Water Year ULARA Watermaster Report	Simulated Groundwater Elevation Contour Map Fall (September) 2016	PLATE 5

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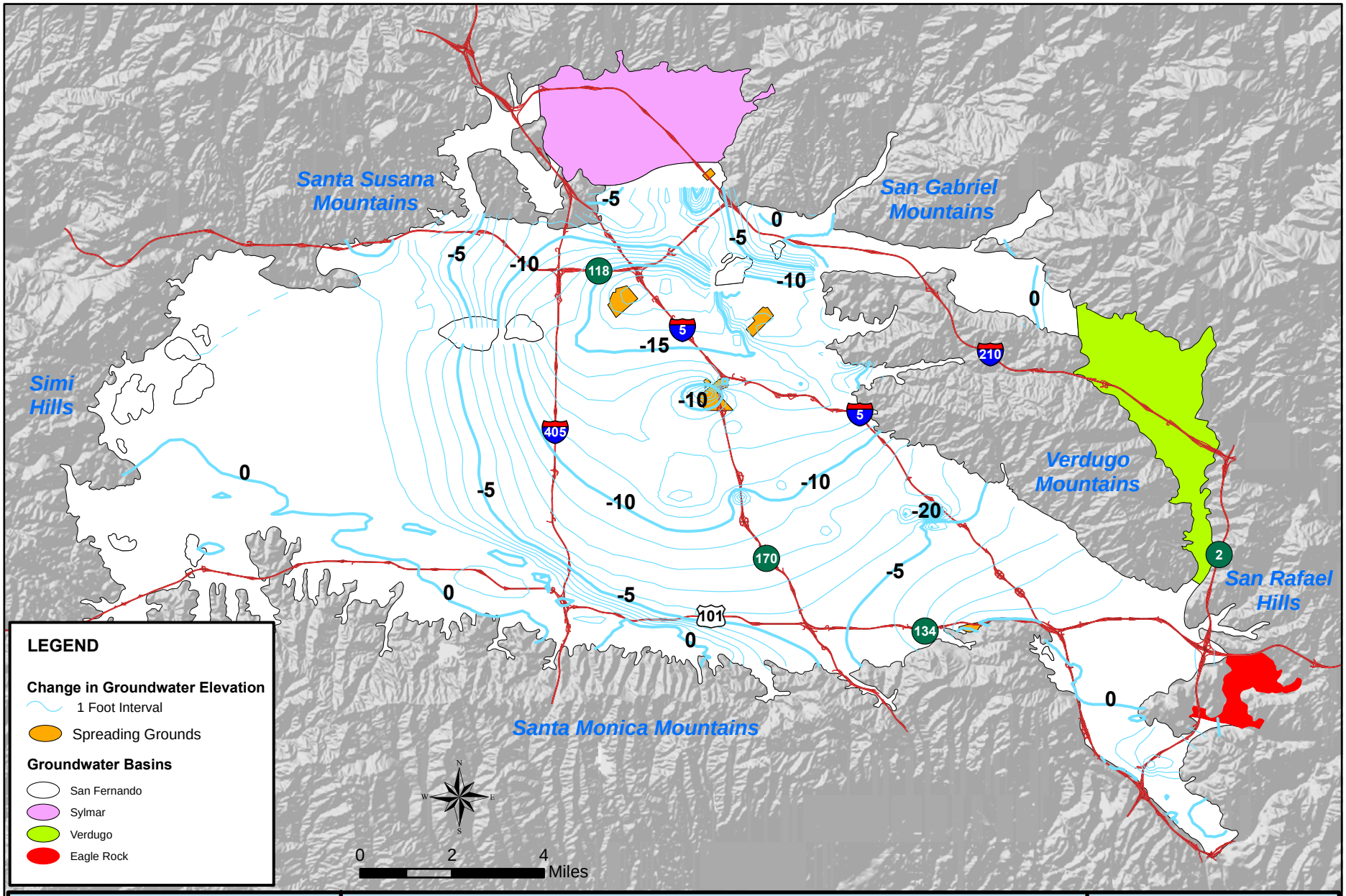

2015-16 Water Year ULARA Watermaster Report	Simulated Change in Groundwater Elevations Fall 2015 - Fall 2016	PLATE 6

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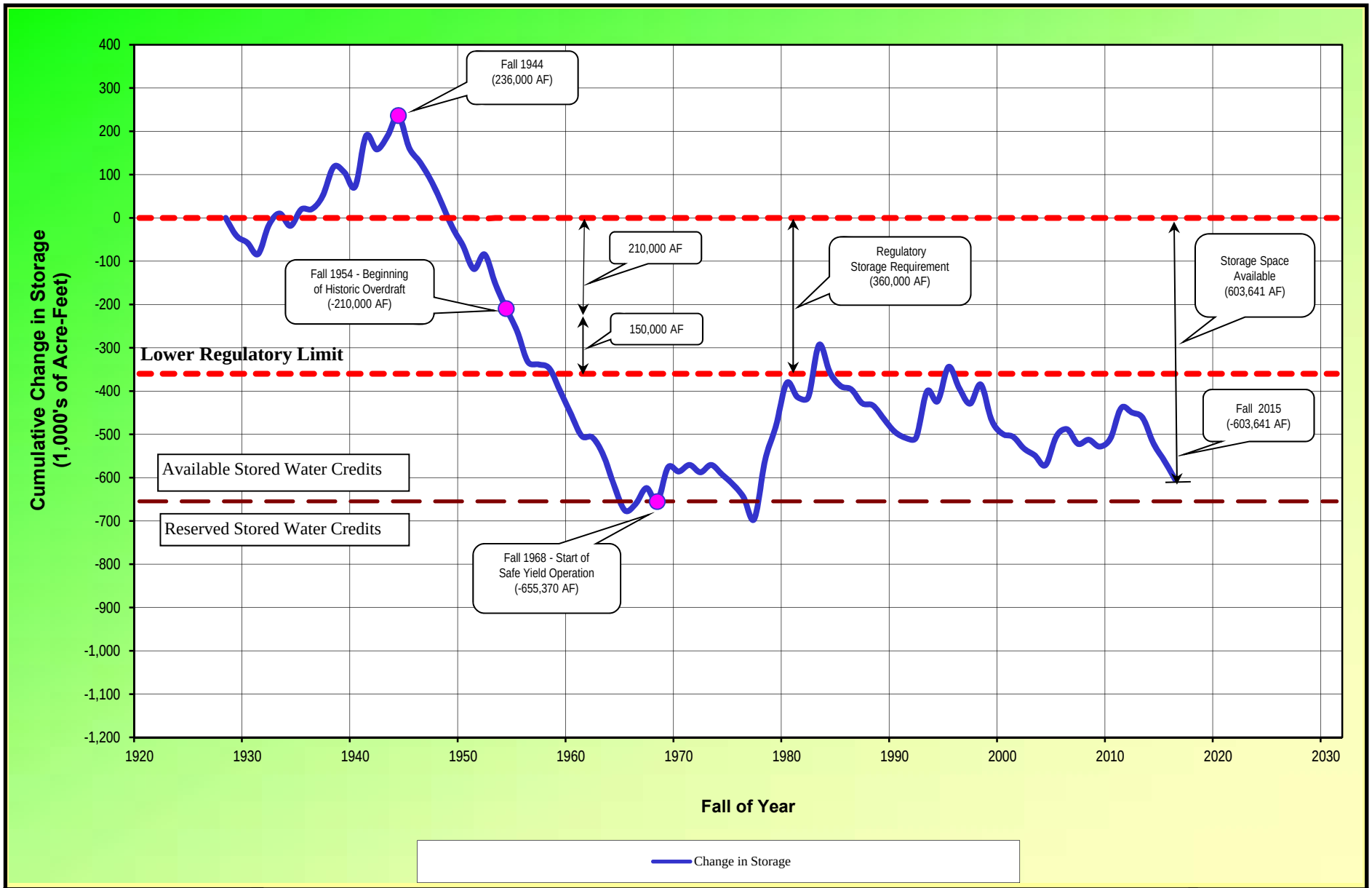

2015-16 Water Year ULARA Watermaster Report	San Fernando Basin: Cumulative Change in Groundwater Storage	PLATE 7

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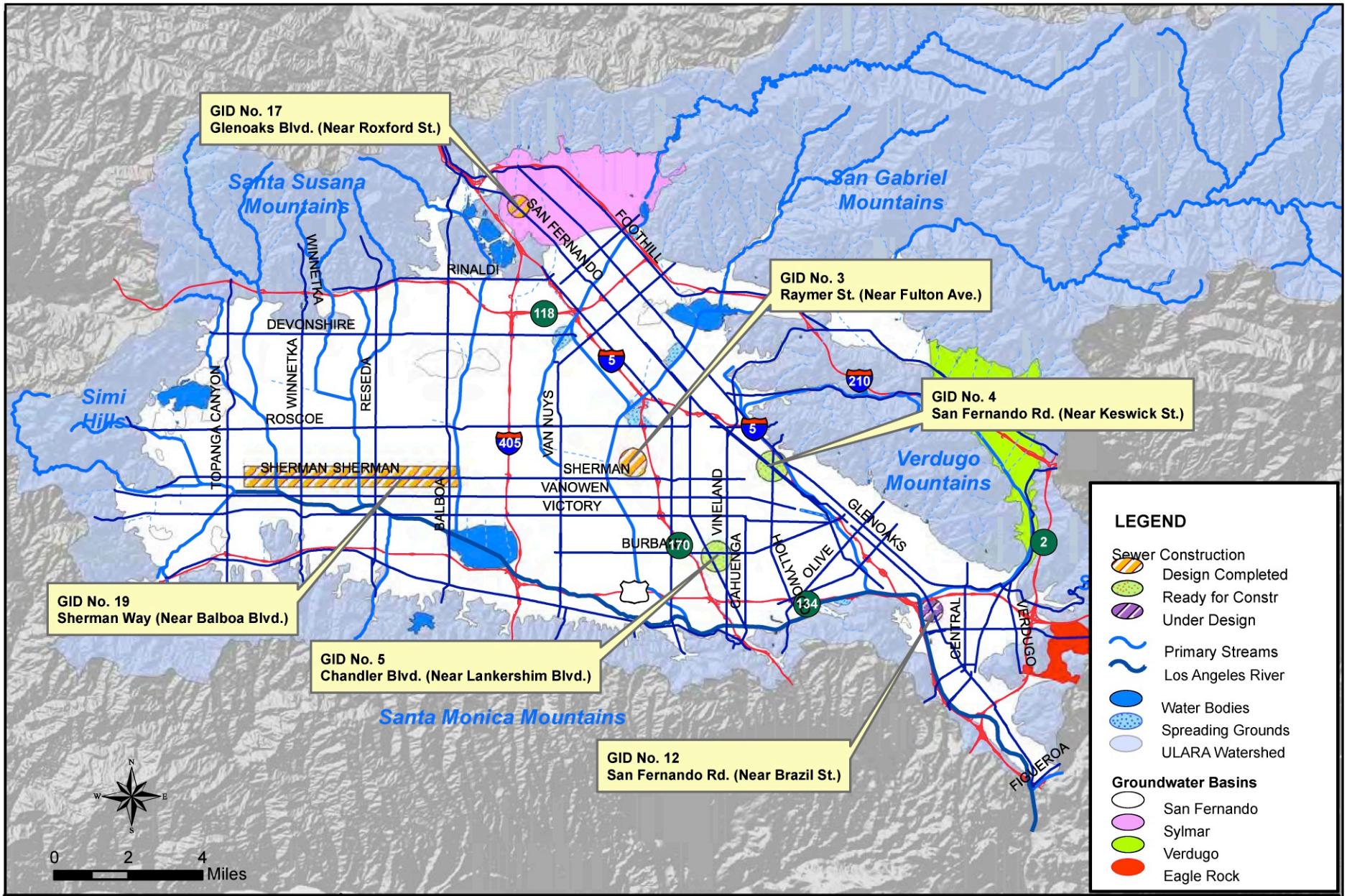

2015-16 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Los Angeles Bureau of Sanitation Sewer Construction Program for Commercial Parcels	PLATE 8

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Appendix A

Groundwater Extractions

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2015-16 WATER YEAR

(acre-feet)

LACDPW Well No.	Owner Well No.	2015 Oct.	Nov.	Dec.	2016 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin														
A. W. Warner Properties														
Plaza Three		0.34	0.35	0.35	0.34	0.38	0.36	0.35	0.31	0.33	0.24	0.24	0.22	3.81
Plaza Six		0.50	0.19	0.35	0.33	0.39	0.37	0.33	0.34	0.31	0.28	0.29	0.24	3.92
	Total:	0.84	0.54	0.70	0.67	0.77	0.73	0.68	0.65	0.64	0.52	0.53	0.46	7.73
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														
---	---	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.38
BFI Sunshine Canyon Landfill														
---	---	3.98	3.80	3.88	3.47	5.06	4.84	4.88	5.58	3.79	4.23	3.88	3.46	50.83
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	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.30
	Total:	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.30
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	0.03	0.00	0.00	0.00	0.00	21.98	22.01
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	16.59	26.07	0.00	0.00	0.00	0.00	42.66
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	16.62	26.07	0.00	0.00	0.00	21.98	64.67
Burbank Operable Unit														
3871L	VO-1	108.50	42.70	36.18	13.22	32.36	17.90	26.30	87.82	1.75	0.00	0.00	82.03	448.76
3861G	VO-2	109.62	180.56	159.16	121.81	148.77	174.71	126.52	114.19	164.02	181.63	185.93	168.97	1,835.89
3861K	VO-3	113.43	30.46	27.88	28.30	37.51	12.31	30.72	84.07	76.14	98.94	119.05	115.36	774.17
3861L	VO-4	149.72	29.10	89.47	81.61	55.68	78.80	93.47	126.05	120.61	129.32	118.23	39.82	1,111.88
3850X	VO-5	0.00	111.75	120.86	106.85	113.90	42.52	97.61	124.42	115.52	104.89	39.96	84.01	1,062.29
3850Z	VO-6	200.58	181.18	76.74	56.65	54.26	86.61	51.77	63.33	158.64	125.78	188.07	154.93	1,398.54
3850AB	VO-7	0.00	0.00	0.00	0.00	0.00	102.11	61.96	127.21	62.21	133.70	138.70	96.33	722.22
3851C	V0-8	200.43	175.94	189.08	169.51	138.35	124.35	95.22	151.36	185.10	195.51	202.08	196.94	2,023.87
	Total:	882.28	751.69	699.37	577.95	580.83	639.31	583.57	878.45	883.99	969.77	992.02	938.39	9,377.62

2015-16 WATER YEAR

(acre-feet)

LACDPW Well No.	Owner Well No.	2015 Oct.	Nov.	Dec.	2016 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin (cont'd)														
Douglas Emmett Management, LLC (Trillium)														
Well #1	---	0.00	1.16	0.87	0.97	0.75	0.79	0.89	1.08	0.43	0.36	0.83	0.79	8.92
Well #2	---	1.41	1.74	1.23	0.54	0.99	1.36	1.34	1.61	1.02	0.56	1.28	1.33	14.41
	Total:	1.41	2.90	2.10	1.51	1.74	2.15	2.23	2.69	1.45	0.92	2.11	2.12	23.33
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.	0.67	0.00	0.00	0.00	0.00	0.00	0.00	4.05	0.89	0.83	0.85	0.85	8.14
Forest Lawn Memorial Park														
3947B	3	1.72	0.00	0.07	0.00	0.00	0.00	2.92	10.25	15.87	12.34	17.62	21.15	81.94
3947C	4	2.01	0.00	0.08	0.00	0.00	0.00	0.00	10.62	17.64	13.93	20.64	25.06	89.98
3947M	8	4.15	0.00	0.00	0.00	0.00	0.00	9.01	39.85	47.33	36.59	58.16	67.72	262.81
	Total:	7.88	0.00	0.15	0.00	0.00	0.00	11.93	60.72	80.84	62.86	96.42	113.93	434.73
Glendale, City of														
3924N	STPT 1	14.68	1.78	0.39	0.07	0.44	0.38	0.18	0.30	0.00	0.00	0.00	1.54	19.76
3924R	STPT 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GVENT	GVENT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total:	14.68	1.78	0.39	0.07	0.44	0.38	0.18	0.30	0.00	0.00	0.00	1.54	19.76
Glendale North/South														
	GN-1	107.82	83.40	101.51	109.91	76.39	72.92	56.67	56.31	109.59	109.65	80.54	99.10	1,063.81
	GN-2	106.35	78.27	97.47	104.85	63.54	73.21	55.71	52.25	106.81	104.97	80.29	97.31	1,021.03
	GN-3	0.00	0.00	0.00	0.00	1.42	0.00	12.67	58.67	66.24	51.68	22.52	30.42	243.62
	GN-4	195.71	193.46	148.72	197.81	186.36	183.08	167.19	198.46	194.94	196.16	191.55	187.44	2,240.88
	GS-1	54.00	42.65	37.62	51.84	22.74	34.33	26.98	43.27	54.79	53.67	49.81	50.81	522.51
	GS-2	91.62	66.54	86.33	93.26	51.64	32.70	50.35	54.78	88.65	92.66	67.91	86.19	862.63
	GS-3	75.77	61.66	68.82	78.52	42.89	31.23	48.76	56.70	75.85	78.04	57.69	70.78	746.71
	GS-4	61.69	55.98	63.66	10.63	0.28	33.78	47.53	55.20	54.47	54.90	58.61	51.95	548.68
	Total:	692.96	581.96	604.13	646.82	445.26	461.25	465.86	575.64	751.34	741.73	608.92	674.00	7,249.87
Greeff Fabrics (Inactive)														
----	-----	0.00	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														
----	-----	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.24
Hallelujah Prayer Center of USA (Hathaway - successor to deMille)														
----	1	0.04	0.04	0.04	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.17
	2	0.18	0.18	0.18	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	1.89
	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:	0.22	0.22	0.22	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	2.07
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

2015-16 WATER YEAR

(acre-feet)

LACDPW Well No.	Owner Well No.	2015 Oct.	Nov.	Dec.	2016 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
							San Fernando Basin (cont'd)							
Honeywell International, Inc.														
----	NHE-2	15.89	15.38	16.65	16.88	15.37	18.00	12.21	17.68	15.06	14.92	16.14	14.70	188.88
----	NHE-3	0.27	2.47	0.65	0.14	3.00	3.22	4.00	4.32	6.52	3.34	3.32	4.61	35.86
	Total:	16.16	17.85	17.30	17.02	18.37	21.22	16.21	22.00	21.58	18.26	19.46	19.31	224.74
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	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.12
Lopez-Zamarripa (010007T)														
---	---	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
Menasco/Coltec Site														
---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mercedes Benz of Encino (Auto Stiegler)														
---	---	0.02	0.02	0.04	0.02	0.02	0.02	0.01	0.01	0.01	0.03	0.04	0.04	0.28
Metropolitan Transportation Authority														
---	1065	0.02	0.02	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02	0.02	0.10	0.24
---	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	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	1.75	4.50
---	1140	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.11
---	1150	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.11
---	1070	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	3.42	15.74
---	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:	1.41	1.41	1.39	1.39	1.39	1.39	1.41	1.41	1.41	1.41	1.41	5.27	20.70
Metropolitan Water District														
	Jensen	6.20	24.40	6.10	6.10	17.80	6.30	5.80	5.50	10.90	5.30	5.10	4.90	104.40
Micro Matics														
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	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
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	0.05	0.03	0.03	0.02	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.08	0.58
new	8	0.22	0.27	0.12	0.10	0.20	0.20	0.25	0.25	0.39	0.36	0.37	0.42	3.15
	Spring 1&2	0.01	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.02	0.27
	Total	0.28	0.33	0.17	0.14	0.26	0.26	0.32	0.33	0.48	0.45	0.47	0.52	4.01
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

2015-16 WATER YEAR

(acre-feet)

LACDPW Well No.	Owner Well No.	2015 Oct.	Nov.	Dec.	2016 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin (cont'd)														
(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	0.39	0.39	0.39	0.38	0.38	0.38	0.38	0.38	0.38	0.28	0.28	0.28	4.28
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														
---	---	1.73	2.00	1.69	1.80	1.96	2.13	1.73	2.12	2.10	2.01	2.44	2.03	23.74
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	4.39	4.39	0.09	0.26	0.23	0.27	3.92	3.35	4.63	5.93	4.07	5.74	37.27
Valhalla Memorial Park and Mortuary														
3840K	4	24.94	18.60	12.45	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	56.81
Vulcan Materials														
4916	1	24.03	15.09	21.04	19.01	1.77	0.00	0.00	9.97	29.48	20.73	28.08	21.74	190.94
4916A	2	15.81	11.52	14.31	13.79	21.22	22.68	23.33	18.00	20.81	15.01	19.65	15.13	211.26
4916x	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
Sheldon Pond		24.78	45.61	21.93	11.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	103.76
	Total:	64.62	72.22	57.28	44.24	22.99	22.68	23.33	27.97	50.29	35.74	47.73	36.87	505.96
Waste Management Disposal Services of Calif. (Inactive)														
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 (Inactive)														
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 (Inactive)														
---	---	0.00	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

2015-16 WATER YEAR

(acre-feet)

LACDPW Well No.	Owner Well No.	2015 Oct.	Nov.	Dec.	2016 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin (cont'd)														
Wildlife Waystation														
Rehab Canyon		0.10	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.70
Foreman Hill Spring		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.12
	Total:	0.11	0.11	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.82
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810W	A-4	6.75	2.69	0.25	0.02	0.02	2.73	8.08	8.40	5.46	1.06	0.00	0.00	35.46
3820H	A-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
3821J	A-6	32.35	31.40	32.28	33.93	7.42	31.40	31.31	32.53	21.24	3.40	0.00	0.00	257.26
3830P	A-7	27.25	26.35	27.18	28.56	24.27	25.90	26.35	27.39	17.88	3.44	0.00	0.00	234.57
3831K	A-8	35.77	34.80	35.67	37.49	31.86	33.84	34.60	36.00	23.46	3.74	0.00	0.00	307.23
	A Total:	102.12	95.24	95.38	100.00	63.57	93.87	100.34	104.32	68.04	11.64	0.00	0.00	834.52
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3811F	E-10	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30
	E Total:	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30
Headworks (H)	Inactive Well Field													
3893Q	H-27A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3893R	H-28A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3893S	H-29A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3893T	H-30A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	H Total:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2015-16 WATER YEAR

(acre-feet)

LACDPW Well No.	Owner Well No.	2015 Oct.	Nov.	Dec.	2016 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
					San Fernando Basin (cont'd)									
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	0.18	0.18	0.00	0.18	0.00	0.18	0.18	76.79	90.54	118.96	130.26	417.45
3770	NH-7	0.00	0.00	0.00	0.00	0.00	0.28	0.14	94.38	63.84	67.36	88.36	96.90	411.26
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	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37.47	37.77
3790D	NH-23	0.46	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.46	0.00	0.00	1.38
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	140.04	137.19	141.76	150.90	128.03	41.71	23.05	141.76	86.87	91.64	120.98	131.84	1,335.77
3790E	NH-26	293.37	284.69	293.76	312.72	264.94	86.87	47.77	293.37	180.83	274.82	111.34	0.00	2,444.48
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	184.46	178.51	184.71	196.10	166.60	54.29	27.85	174.45	106.77	112.63	147.98	161.80	1,696.15
3780C	NH-33	226.54	110.22	0.00	0.30	0.30	0.00	0.30	0.00	132.19	146.85	192.95	211.27	1,020.92
3790G	NH-34	0.23	0.23	0.23	0.23	0.00	44.93	95.98	175.92	11.82	0.23	0.00	0.23	330.03
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	0.23	0.23	0.23	0.23	0.00	0.23	0.23	0.23	0.00	0.23	0.00	58.40	60.24
3790J	NH-37	0.25	94.21	194.44	207.25	175.85	188.93	106.24	195.22	87.40	72.22	83.22	91.18	1,496.41
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	0.44	0.44	0.44	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.19
3790L	NH-44	0.46	0.46	0.46	0.46	0.00	0.94	0.46	0.46	0.00	0.46	0.46	165.29	169.91
3790M	NH-45	0.55	0.55	277.13	436.36	370.25	396.69	223.69	409.92	28.12	132.23	192.84	384.02	2,852.35
	NH Total:	847.33	806.91	1,093.34	1,305.42	1,106.15	814.87	526.35	1,485.89	774.63	989.67	1,057.09	1,468.66	12,276.31

2015-16 WATER YEAR

(acre-feet)

LACDPW Well No.	Owner Well No.	2015 Oct.	Nov.	Dec.	2016 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin (cont'd)														
Pollock (P)														
3959E	P-4	146.49	51.65	0.00	0.00	161.09	182.99	176.34	176.34	173.07	183.63	180.64	47.42	1,479.66
3958H	P-6	186.20	64.21	0.00	0.00	0.12	0.10	0.16	0.07	0.13	0.30	0.13	0.00	251.42
3958J	P-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	P Total:	332.69	115.86	0.00	0.00	161.21	183.09	176.50	176.41	173.20	183.93	180.77	47.42	1,731.08
Rinaldi-Toluca (RT)														
4909E	RT-1	0.55	0.00	0.55	0.55	0.55	0.00	0.00	0.55	0.55	0.00	1.10	0.55	4.95
4898A	RT-2	0.67	0.67	0.67	0.67	0.67	0.00	0.00	0.67	0.67	0.00	1.33	0.67	6.69
4898B	RT-3	0.51	1.54	0.51	1.54	1.03	0.00	0.00	1.03	0.00	0.51	0.51	361.09	368.27
4898C	RT-4	455.28	442.98	372.22	0.60	0.60	248.55	237.47	457.12	356.22	483.56	414.05	457.74	3,926.39
4898D	RT-5	391.25	380.69	319.44	2.11	1.06	213.31	203.81	117.75	0.00	0.00	0.00	0.00	1,629.42
4898E	RT-6	275.94	267.77	170.32	0.37	178.12	268.14	267.38	276.31	216.80	292.31	250.28	276.68	2,740.42
4898F	RT-7	330.44	320.66	269.44	0.44	212.88	321.10	182.60	330.90	257.85	350.05	299.72	331.34	3,207.42
4898G	RT-8	403.70	391.74	249.17	0.53	286.18	392.81	391.18	788.91	301.40	427.64	366.16	404.78	4,404.20
4898H	RT-9	465.01	451.24	287.03	0.62	329.64	451.86	256.96	402.34	362.86	492.58	421.76	465.63	4,387.53
4909G	RT-10	0.67	0.67	0.67	0.67	0.67	0.67	0.00	0.67	0.00	0.00	1.33	0.00	6.02
4909K	RT-11	0.60	0.60	0.60	0.00	0.60	0.60	0.00	0.00	0.60	0.60	0.60	0.00	4.80
4909H	RT-12	0.67	0.67	0.67	0.67	0.00	0.67	0.00	0.67	0.67	0.00	0.67	0.67	6.03
4909J	RT-13	0.60	0.60	0.00	0.60	0.60	0.60	0.00	0.00	0.60	0.60	0.60	0.60	5.40
4909L	RT-14	0.57	0.57	0.57	0.57	0.00	0.57	0.00	0.57	0.00	0.57	0.57	0.57	5.13
4909M	RT-15	0.55	0.55	0.55	0.55	0.00	0.55	0.00	0.55	0.00	0.55	1.10	0.55	5.50
	RT Total:	2,327.01	2,260.95	1,672.41	10.49	1,012.60	1,899.43	1,539.40	2,378.04	1,498.22	2,048.97	1,759.78	2,300.87	20,708.17
Tujunga (T)														
4887C	T-1	514.42	465.89	516.51	413.89	21.44	485.31	498.46	509.57	501.93	226.70	481.84	501.93	5,137.89
4887D	T-2	545.09	493.66	547.29	438.57	323.23	534.07	528.19	539.94	531.86	523.78	510.56	531.86	6,048.10
4887E	T-3	448.14	502.20	505.95	436.13	218.43	0.73	0.00	0.73	0.73	186.16	0.00	0.00	2,299.20
4887F	T-4	486.80	469.24	523.35	419.38	203.01	0.00	0.69	0.69	0.00	353.33	488.91	507.87	3,453.27
4887G	T-5	128.26	0.00	1.33	0.67	0.00	0.67	0.67	0.67	0.67	0.67	0.67	30.05	164.33
4887H	T-6	463.31	440.84	465.82	377.13	337.19	453.95	448.94	458.95	452.71	460.19	433.98	452.07	5,245.08
4887J	T-7	449.68	427.87	452.11	365.45	389.69	440.59	435.15	445.45	439.39	446.65	421.21	438.77	5,152.01
4887K	T-8	0.67	0.67	1.35	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.00	8.05
4886B	T-9	0.76	0.76	0.76	0.76	0.76	0.00	0.76	0.76	0.00	1.52	0.76	0.00	7.60
4886C	T-10	0.00	0.73	1.47	0.00	0.73	0.73	0.00	0.73	0.73	87.76	507.25	538.50	1,138.63
4886D	T-11	0.69	0.69	0.00	0.69	0.69	0.00	0.69	0.69	0.69	0.00	0.69	0.69	6.21
4886E	T-12	551.88	489.99	555.60	444.79	473.78	535.54	535.54	541.41	539.26	329.50	508.01	537.76	6,043.06
	T Total:	3,589.70	3,292.54	3,571.54	2,898.13	1,969.62	2,452.26	2,449.76	2,500.26	2,468.64	2,616.93	3,354.55	3,539.50	34,703.43

2015-16 WATER YEAR

(acre-feet)

LACDPW Well No.	Owner Well No.	2015 Oct.	Nov.	Dec.	2016 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin (cont'd)														
Van Norman (VN)														
VN-1		0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	10.73
VN-2		0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	11.88
VN-3		0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	3.20
VN-4		0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	5.06
VN-5		0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	3.03
VN-6		0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	4.17
VN-7		0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	1.20
VN-8		0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1.67
VN-9		1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	20.09
VN-10		2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	26.46
VN-11		0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	4.58
	T Total:	7.67	7.67	7.67	7.67	7.67	7.67	7.67	7.67	7.67	7.67	7.67	7.67	92.06
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	245.62	239.99	245.94	261.48	222.47	237.01	126.93	245.27	95.52	0.00	0.00	0.00	1,920.23
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
	V-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
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	121.65	0.00	0.55	50.90	222.47	236.69	127.27	244.95	95.52	0.00	0.00	0.00	1,100.00
	V Total:	367.27	239.99	246.49	312.38	444.94	473.70	254.20	490.22	191.04	0.00	0.00	0.00	3,020.23
Whitnall (W)														
3820E	W-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821B	W-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821C	W-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821D	W-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821E	W-5	0.00	0.00	0.00	0.00	0.00	64.12	127.27	245.27	95.52	0.00	0.00	0.00	532.18
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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:	0.00	0.00	0.00	0.00	0.00	64.12	127.27	245.27	95.52	0.00	0.00	0.00	532.18
Los Angeles, City of Total:		7,566.12	6,811.49	6,679.46	4,626.42	4,758.09	5,981.34	5,173.82	7,380.41	5,269.29	5,851.14	6,352.19	7,356.45	73,898.28
San Fernando Basin Total:		9,295.44	8,293.75	8,086.77	5,929.21	5,852.86	7,141.70	6,309.15	8,993.58	7,077.76	7,698.34	8,134.87	9,183.80	92,125.17

2015-16 WATER YEAR

(acre-feet)

LACDPW Well No.	Owner Well No.	2015 Oct.	Nov.	Dec.	2016 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
							Sylmar Basin							
Los Angeles, City of														
Plant	Mission													0.00
4840J	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
4840K	6	0.00	0.00	0.18	17.05	154.35	123.35	87.86	176.84	122.96	0.00	0.00	0.00	682.59
4840S	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
		0.00	0.00	0.18	17.05	154.35	123.35	87.86	176.84	122.96	0.00	0.00	0.00	682.59
Santiago Estates (Inactive; well capped in 1999)														
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
San Fernando, City of														
5969D	2A	209.90	197.37	190.32	163.47	169.39	167.14	181.40	203.01	221.79	245.53	250.37	228.01	2,427.70
5959	3	0.03	0.00	0.00	0.03	0.04	0.03	0.04	0.02	0.00	0.03	0.04	0.00	0.26
5969	4	29.05	24.33	14.22	20.14	22.43	28.66	28.83	30.51	32.80	36.57	36.79	33.36	337.69
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:	238.98	221.70	204.54	183.64	191.86	195.83	210.27	233.54	254.59	282.13	287.20	261.37	2,765.65
Sylmar Basin Total:		238.98	221.70	204.72	200.69	346.21	319.18	298.13	410.38	377.55	282.13	287.20	261.37	3,448.24

							Verdugo Basin							
Crescenta Valley County Water District														
5058B	1	5.39	4.88	3.54	3.74	9.11	5.75	6.56	4.15	6.91	5.87	2.74	3.91	62.55
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	50.56	49.95	48.34	51.98	46.66	47.63	45.38	46.16	44.34	44.35	41.47	54.16	570.98
5058	6	0.97	1.80	2.48	1.58	3.66	1.62	0.02	1.12	0.38	0.87	0.02	0.97	15.49
5047B	7	8.24	20.80	15.23	8.19	25.77	17.50	22.11	11.48	23.81	25.20	22.46	22.02	222.81
5069J	8	17.96	17.47	16.85	18.14	16.61	17.38	16.05	16.61	16.17	17.79	16.41	15.18	202.62
5047D	9	10.23	8.39	6.35	3.44	10.76	7.81	9.54	4.93	10.72	12.93	11.61	9.43	106.14
5058D	10	13.14	6.03	9.76	14.49	11.87	7.18	10.96	9.01	3.47	4.78	4.00	2.80	97.49
5058E	11	10.05	10.05	10.02	10.42	9.40	8.86	8.78	8.84	7.90	7.95	7.15	7.24	106.66
5058J	12	10.54	10.63	10.07	9.29	6.85	8.68	14.15	9.02	10.33	8.30	9.60	2.11	109.57
5069F	14	14.42	14.56	12.25	13.76	13.20	14.94	11.98	12.81	13.63	14.85	13.39	13.30	163.09
	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)	4.19	3.80	3.68	3.92	3.52	3.88	3.97	4.24	3.99	3.90	3.68	3.87	46.64
	Total:	145.69	148.36	138.57	138.95	157.41	141.23	149.50	128.37	141.65	146.79	132.53	134.99	1,704.04
Knowltons														
	PICKENS	0.80	0.80	0.82	0.82	0.82	0.82	0.77	1.14	0.80	0.82	0.82	0.82	10.05

2015-16 WATER YEAR

(acre-feet)

LACDPW Well No.	Owner Well No.	2015 Oct.	Nov.	Dec.	2016 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
							Verdugo Basin (cont'd)							
Glendale, City of														
3971	GL-3	15.63	14.98	14.35	14.19	13.04	13.55	13.20	13.78	13.21	13.51	13.51	8.48	161.43
3961	GL-4	38.58	36.80	36.92	36.29	33.05	35.02	32.80	34.47	33.15	33.89	33.29	34.59	418.85
3970	GL-6	27.13	26.36	27.38	26.75	24.80	25.82	24.28	25.46	24.48	14.78	0.00	0.00	247.24
---	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
5036	FHW	10.36	11.80	10.19	10.76	0.00	0.00	0.00	0.00	1.52	11.95	15.18	13.95	85.71
	Rockhaver	0.00	0.00	0.00	0.00	0.00	29.72	49.90	47.24	42.23	13.49	38.70	37.56	258.84
	Total:	91.70	89.94	88.84	87.99	70.89	104.11	120.18	120.95	114.59	87.62	100.68	94.58	1,172.07
Verdugo Basin Total:		238.19	239.10	228.23	227.76	229.12	246.16	270.45	250.46	257.04	235.23	234.03	230.39	2,886.16

							Eagle Rock Basin							
Sparkletts														
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	4.70	7.01	3.36	5.06	5.03	3.38	5.47	4.81	4.63	6.37	8.94	4.16	62.92
3987F	3	3.29	2.36	2.93	3.00	3.79	2.11	2.65	3.57	3.06	4.26	3.77	2.51	37.30
3987G	4	10.22	6.95	10.56	6.45	10.94	7.23	7.29	11.11	9.39	11.15	11.75	9.61	112.65
	Total:	18.21	16.32	16.85	14.51	19.76	12.72	15.41	19.49	17.08	21.78	24.46	16.28	212.87
Eagle Rock Basin Total:		18.21	16.32	16.85	14.51	19.76	12.72	15.41	19.49	17.08	21.78	24.46	16.28	212.87

ULARA Total:		9,790.82	8,770.87	8,536.57	6,372.17	6,447.95	7,719.76	6,893.14	9,673.91	7,729.43	8,237.48	8,680.56	9,691.84	98,672.44

Appendix B

Key Gaging Stations of Surface Runoff and Precipitation Data

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COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

GAIL FARBER, Director

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE
REFER TO FILE: WR-3

December 7, 2016

Mr. Richard C. Slade
Upper Los Angeles River Area Watermaster
12750 Ventura Boulevard, Suite 202
Studio City, CA 91604

Dear Mr. Slade:

REQUESTED HYDROLOGIC DATA FOR WATER YEAR 2015-16

The following data is enclosed as requested in your recent letter:

- Summary of water spread for the 2015-16 Water Year at Branford, Pacoima, Lopez, Hansen, and Tujunga Spreading Grounds.

- Seasonal precipitation for the 2015-16 Water Year at Stations: 10A, 13C, 1107D, 465C, 17, 21B, 735H, 25C, 33A, 47D, 53D, 54C, 210C, 251C, 1222, AL464, and 1074. Several stations have either incomplete data or have been discontinued. Data from nearby stations have been substituted.

    - The records for Stations 11D, 23B, 797, and 293B are incomplete and have been substituted with the data from Stations 10A, 735H, 1222, and AL464, respectively. These stations are owned and operated by the City of Los Angeles Department of Water and Power and they have not submitted the complete data despite our requests.

- Gaging station summaries for Stations: F57C-R, F118C-R, F300-R, F168B-R, E285-R, and F252-R.

- Available static water level data within the range of Well Nos. 3504A through 5077C for fall 2016. Incomplete or unavailable data is denoted.

If you have any questions regarding the data, please contact Mr. Arthur Gotingco of our Water Resources Division, Records and System Support Unit, at (626) 458-6379 or agoting@dpw.lacounty.gov.

Very truly yours,

GAIL FARBER
Director of Public Works

For CHRISTOPHER STONE
Assistant Deputy Director
Water Resources Division

AG:vt
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Enc.

Summary Report

Site: 4SGTOTALWC Branford Spreading Basin Total Water Conserved.
USGS #:
Beginning Date: 10/01/2015
Ending Date: 09/30/2016

Daily Mean Discharge in Cubic feet/second Water Year Oct 2015 to Sep 2016

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.06	.16	.17	.34	.45	.35	.28	.20	.19	.27	.24	.24
2	.05	.26	.15	.30	.38	.35	.28	.18	.19	.27	.26	.23
3	.05	.21	.17	.30	.35	.35	.27	.18	.18	.25	.22	.25
4	1.67	.17	.20	.30	.35	.35	.27	.20	.17	.25	.21	.25
5	.43	.15	.19	40.6	.35	.35	.26	.20	.18	.25	.24	.24
6	.12	.15	.18	23.6	.35	23.4	.26	5.37	.28	.23	.21	.24
7	.09	.12	.17	13.7	.34	2.83	.88	2.97	.24	.22	.21	.22
8	.07	.14	.17	1.87	.32	.25	1.21	.25	.23	.21	.20	.20
9	.05	.27	.23	1.51	.33	.20	5.12	.23	.22	.22	.20	.22
10	.05	.25	1.02	1.46	.31	.18	.29	.23	.23	.21	.20	.23
11	.06	.22	.27	1.44	.31	9.10	.23	.21	.24	.22	.20	.25
12	.08	.32	.17	1.15	1.73	.20	.24	.19	.24	.22	.20	.22
13	.08	.21	7.02	.92	.36	.14	.21	.19	.35	.21	.36	.24
14	.07	.20	.45	.87	.35	.29	.18	.18	.28	.24	.20	.25
15	.07	.31	.40	.71	.35	.13	.16	.17	.25	.26	.20	.22
16	.09	.24	.52	.57	.35	.12	.15	.17	.22	.24	.20	.20
17	.47	.20	.39	.52	10.2	.11	.15	.17	.20	.25	.23	.20
18	.26	.20	.38	.46	4.22	.14	.16	.14	.19	.23	.23	.19
19	.16	.20	1.84	1.11	.43	.15	.16	.16	.17	.22	.25	.20
20	.13	.20	.41	.48	.40	.15	.16	.16	.16	.25	.26	.20
21	.10	.21	.38	.43	.39	.16	.15	.14	.19	.24	.28	.20
22	.11	.20	4.39	.42	.35	.16	.16	.13	.22	.27	.28	.19
23	.10	.20	.40	.40	.35	.10	.17	.17	.26	.25	.25	.17
24	.11	.23	.37	.40	.35	.19	.15	.18	.26	.25	.27	.25
25	.10	.24	.35	.40	.34	.17	.24	.18	.25	.24	.25	.22
26	.33	.25	.35	.40	.35	.16	.23	.19	.23	.24	.25	.20
27	.20	.25	.35	.40	.35	.17	.20	.17	.24	.23	.25	.20
28	.20	.22	.35	.40	.36	.17	.21	.16	.41	.22	.28	.20
29	.19	.20	.32	.40	.37	1.20	.20	.17	.29	.23	.27	.20
30	.15	.19	.31	.40	------	1.45	.20	.16	.28	.25	.22	.20
31	.14	------	.31	21.1	------	.33	------	.23	------	.28	.22	------
Total	5.84	6.37	22.38	117.36	25.44	43.40	12.83	13.63	7.04	7.42	7.34	6.52
Mean	.19	.21	.72	3.79	.88	1.40	.43	.44	.23	.24	.24	.22
Max	1.67	.32	7.02	40.6	10.2	23.4	5.12	5.37	.41	.28	.36	.25
Min	.05	.12	.15	.30	.31	.10	.15	.13	.16	.21	.20	.17
Acre-Ft	12	13	44	233	50	86	25	27	14	15	15	13

Wtr Year 2016	Total	275.57	Mean	.75	Max	40.6	Min	.05	Inst Max	40.6	Acre-Ft	547
Cal Year 2015	Total	163.93	Mean	.45	Max	16.8	Min	0	Inst Max	16.8	Acre-Ft	325

GA JC

Los Angeles County Dept of Public Works

USDAY V106 Output 10/13/2016

Summary Report

Site: 17SGTOTALWC Pacoima Spreading Grounds Total Water Conserved
USGS #:
Beginning Date: 10/01/2015
Ending Date: 09/30/2016

Daily Mean Discharge in Cubic feet/second Water Year Oct 2015 to Sep 2016

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	25.0	0	0	0	0	0	0	0	0	0	0
3	0	37.6	0	0	0	0	0	0	0	0	0	0
4	0	11.3	0	0	0	0	0	0	0	0	0	0
5	0	0	0	122	0	0	0	0	0	0	0	0
6	0	0	0	101	0	64.9	0	0	12.6	0	0	0
7	0	0	0	.47	0	14.2	0	0	20.4	0	0	0
8	0	0	0	0	0	0	0	0	.02	0	0	0
9	0	0	0	0	0	0	3.99	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	47.8	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	8.21	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	15.1	0	0	28.9	0	0	0	0	0	0	0
18	0	24.9	0	0	6.24	0	0	0	0	0	0	0
19	0	0	0	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	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	25.1	0	0	0	0	0
27	0	0	0	0	0	0	38.7	0	0	0	0	0
28	0	0	0	0	0	0	12.7	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	------	2.70	0	0	0	0	0	0
31	0	------	0	30.6	------	0	------	0	------	0	0	------
Total	0	113.9	8.21	254.07	35.14	129.60	80.49	0	33.02	0	0	0
Mean	0	3.80	.26	8.20	1.21	4.18	2.68	0	1.10	0	0	0
Max	0	37.6	8.21	122	28.9	64.9	38.7	0	20.4	0	0	0
Min	0	0	0	0	0	0	0	0	0	0	0	0
Acre-Ft	0	226	16	504	70	257	160	0	65	0	0	0

Wtr Year 2016	Total	654.43	Mean	1.79	Max	122	Min	0	Inst Max	122	Acre-Ft	1300
Cal Year 2015	Total	270.48	Mean	.74	Max	39.2	Min	0	Inst Max	49.1	Acre-Ft	536

GA

Los Angeles County Dept of Public Works

USDAY V106 Output 10/06/2016

Summary Report

Site: 12SGTOTALWC Hansen Spreading Grounds Total Water Conserved
USGS #:
Beginning Date: 10/01/2015
Ending Date: 09/30/2016

Daily Mean Discharge in Cubic feet/second Water Year Oct 2015 to Sep 2016

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0	0	0	32.9	3.02	2.47	1.26	0	0	0	0
2	0	0	0	0	16.5	3.38	2.45	1.00	0	0	0	0
3	0	0	0	0	10.0	2.99	2.28	.76	0	0	0	0
4	0	0	0	0	6.76	2.92	2.10	.65	0	0	0	0
5	0	0	0	0	4.80	3.48	1.79	.64	0	0	0	0
6	0	0	0	0	3.14	20.1	1.54	.93	0	0	0	0
7	0	0	0	38.9	2.09	21.8	1.35	2.44	0	0	0	0
8	0	0	0	29.6	1.16	10.8	1.34	2.01	0	0	0	0
9	0	0	0	15.9	.46	8.67	1.72	1.73	0	0	0	0
10	0	0	0	11.2	.12	8.01	1.91	1.76	0	0	0	0
11	0	0	0	8.66	0	11.3	1.92	1.29	0	0	0	0
12	0	0	0	7.10	0	19.2	2.38	1.00	0	0	0	0
13	0	0	0	6.15	.13	13.2	2.25	.97	0	0	0	0
14	0	0	0	5.49	4.64	10.2	2.17	1.04	0	0	0	0
15	0	0	0	5.03	5.02	7.75	1.95	.85	0	0	0	0
16	0	0	0	4.65	2.60	6.67	1.64	.77	0	0	0	0
17	0	0	0	4.40	.02	7.11	1.50	.42	0	0	0	0
18	0	0	0	4.26	.98	7.24	1.40	.41	0	0	0	0
19	0	0	0	4.04	.01	5.34	1.25	.42	0	0	0	0
20	0	0	0	3.68	.68	5.29	1.15	.83	0	0	0	0
21	0	0	0	3.43	3.80	4.90	1.05	.89	0	0	0	0
22	0	0	0	3.39	4.17	2.72	1.04	1.12	0	0	0	0
23	0	0	0	3.40	2.64	2.41	1.06	.30	0	0	0	0
24	0	0	0	3.41	4.77	2.32	.96	0	0	0	0	0
25	0	0	0	3.39	6.63	2.21	1.01	0	0	0	0	0
26	0	0	0	2.26	3.99	2.02	1.03	0	0	0	0	0
27	0	0	0	1.20	0	1.92	1.32	0	0	0	0	0
28	0	0	0	.34	.24	1.97	1.30	0	0	0	0	0
29	0	0	0	0	1.15	2.10	1.18	0	0	0	0	0
30	0	0	0	0	------	2.32	1.25	0	0	0	0	0
31	0	------	0	6.52	------	2.48	------	0	------	0	0	------
Total	0	0	0	176.40	119.40	205.84	47.76	23.49	0	0	0	0
Mean	0	0	0	5.69	4.12	6.64	1.59	.76	0	0	0	0
Max	0	0	0	38.9	32.9	21.8	2.47	2.44	0	0	0	0
Min	0	0	0	0	0	1.92	.96	0	0	0	0	0
Acre-Ft	0	0	0	350	237	408	95	47	0	0	0	0

Wtr Year 2016	Total	572.89	Mean	1.57	Max	38.9	Min	0	Inst Max	38.9	Acre-Ft	1140
Cal Year 2015	Total	257.03	Mean	.70	Max	9.76	Min	0	Inst Max	9.76	Acre-Ft	510

Los Angeles County Dept of Public Works USDAY V106 Output 10/13/2016

Summary Report

Site: 16SGTOTALWC Lopez Spreading Grounds Total Water Conserved
USGS #:
Beginning Date: 10/01/2015
Ending Date: 09/30/2016

Daily Mean Discharge in Cubic feet/second Water Year Oct 2015 to Sep 2016

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	.04	0	0	0	0	0	0	0	0
6	0	0	0	.07	0	0	0	0	3.89	0	0	0
7	0	0	0	.04	0	0	0	0	5.32	0	0	0
8	0	0	0	0	0	0	0	0	.05	0	0	0
9	0	0	0	0	0	0	0	0	.05	0	0	0
10	0	0	0	0	0	0	0	0	.03	0	0	0
11	0	0	0	0	0	0	0	0	.02	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	.04	0	0	0
16	0	0	0	0	0	0	0	0	.02	0	0	0
17	0	4.96	0	0	.01	0	0	0	.02	0	0	0
18	0	6.65	0	0	.03	0	0	0	.01	0	0	0
19	0	.02	0	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	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	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	0
30	0	0	0	0	------	0	0	0	0	0	0	0
31	0	------	0	.03	------	0	------	0	------	0	0	------
Total	0	11.63	0	0.18	0.04	0	0	0	9.45	0	0	0
Mean	0	.39	0	.006	.001	0	0	0	.32	0	0	0
Max	0	6.65	0	.07	.03	0	0	0	5.32	0	0	0
Min	0	0	0	0	0	0	0	0	0	0	0	0
Acre-Ft	0	23	0	.36	.08	0	0	0	19	0	0	0

Wtr Year 2016	Total	21.30	Mean	.058	Max	6.65	Min	0	Inst Max	6.65	Acre-Ft	42
Cal Year 2015	Total	11.93	Mean	.033	Max	6.65	Min	0	Inst Max	6.65	Acre-Ft	24

GA DC

Summary Report

Site: 33SGTOTALWC Tujunga Spreading Grounds Total Water Conserved
USGS #:
Beginning Date: 10/01/2015
Ending Date: 09/30/2016

Daily Mean Discharge in Cubic feet/second Water Year Oct 2015 to Sep 2016

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	56.9	0	0	0	0	0	0	0	0
6	0	0	0	95.8	0	0	0	0	0	0	0	0
7	0	0	0	67.0	0	5.23	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	10.1	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	4.70	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	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	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	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	7.70	0	0	0	0	0	0	0	0
29	0	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	16.8	------	0	------	0	------	0	0	------
Total	0	0	0	244.20	4.70	15.33	0	0	0	0	0	0
Mean	0	0	0	7.88	.16	.49	0	0	0	0	0	0
Max	0	0	0	95.8	4.70	10.1	0	0	0	0	0	0
Min	0	0	0	0	0	0	0	0	0	0	0	0
Acre-Ft	0	0	0	484	9.3	30	0	0	0	0	0	0

Wtr Year 2016	Total	264.23	Mean	.72	Max	95.8	Min	0	Inst Max	95.8	Acre-Ft	524
Cal Year 2015	Total	37.13	Mean	.10	Max	13.0	Min	0	Inst Max	13.0	Acre-Ft	74

Los Angeles County Dept of Public Works HYDAY V129 Output 11/21/2016

Site 10A Bel Air Hotel Year 2015/16
Variable 11.04 Rainfall in Inches, Data Logger (Not in DST) Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2													2
3		0.04											3
4													4
5				1.69		0.16							5
6				1.14		1.50							6
7				0.31		0.28		0.08					7
8							0.08						8
9							0.16						9
10													10
11						0.55							11
12													12
13			0.20										13
14													14
15													15
16													16
17					0.55								17
18				0.04	0.20								18
19			0.51										19
20													20
21			0.12										21
22			0.08										22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31				0.87									31
Mean	0.00	0.00	0.03	0.13	0.03	0.08	0.01	0.00	0.00	0.00	0.00	0.00	
Maximum	0.00	0.04	0.51	1.69	0.55	1.50	0.16	0.08	0.00	0.00	0.00	0.00	
Minimum	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	0.04	0.91	4.06	0.75	2.48	0.24	0.08	0.00	0.00	0.00	0.00	

Summaries

Annual Mean	0.02
Annual Total	8.54

	Maximum	Minimum
Daily	1.69	0.00

Notes

All recorded data is continuous and reliable

Los Angeles County Dept of Public Works HYDAY V129 Output 11/21/2016

Site 13C North Hollywood - Lakeside Year 2015/16
Variable 11.01 Rainfall in Inches, Daily manual reading Table Type Rain
Figures are for a 24-hour period

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1					0.86$								1
2													2
3		0.03$											3
4	0.07$												4
5													5
6	0.04$			1.80$		1.38$							6
7				1.10$				0.11$					7
8						0.60$	0.05$						8
9							0.10$						9
10				0.10$			0.04$						10
11			0.02$										11
12						0.49$							12
13													13
14			0.08$										14
15		0.01$											15
16													16
17													17
18					0.67$								18
19													19
20			0.25$	0.03$									20
21													21
22			0.09$										22
23			0.25$										23
24													24
25													25
26													26
27													27
28													28
29													29
30						0.02$			$			$	30
31										$	$		31
Mean	0.00$	0.00$	0.02$	0.10$	0.05$	0.08$	0.01$	0.00$	0.00$	0.00$	0.00$	0.00$	
Maximum	0.07$	0.03$	0.25$	1.80$	0.86$	1.38$	0.10$	0.11$	0.00$	0.00$	0.00$	0.00$	
Minimum	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	0.11$	0.04$	0.69$	3.03$	1.53$	2.49$	0.19$	0.11$	0.00$	0.00$	0.00$	0.00$	

Summaries

Annual Mean	0.02$
Annual Total	8.19$

	Maximum	Minimum
Daily	1.80$	0.00$

Notes

All recorded data is continuous and reliable except where the following tags are used...
$ ... Daily Read

Preliminary Records Subject to Revision

Los Angeles County Dept of Public Works HYDAY V129 Output 11/21/2016

Site 1107D La Tuna Debris Basin Year 2015/16
Variable 11.03 Rainfall in Inches, ALERT Transmitted Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2		0.04											2
3													3
4	0.35												4
5	0.43			1.38		0.12							5
6				0.98		1.06		0.35					6
7				0.43		0.39	0.08						7
8							0.28						8
9							0.12						9
10			0.04										10
11						0.47							11
12													12
13			0.35									0.08	13
14						0.04							14
15		0.08											15
16													16
17					0.39								17
18	0.04				0.28								18
19			0.24	0.04									19
20													20
21													21
22			0.20										22
23			0.04										23
24													24
25													25
26													26
27													27
28													28
29						0.20							29
30													30
31				0.71									31
Mean	0.03	0.00	0.03	0.11	0.02	0.07	0.02	0.01	0.00	0.00	0.00	0.00	
Maximum	0.43	0.08	0.35	1.38	0.39	1.06	0.28	0.35	0.00	0.00	0.00	0.08	
Minimum	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	0.83	0.12	0.87	3.54	0.67	2.28	0.47	0.35	0.00	0.00	0.00	0.08	

Summaries

Annual Mean	0.03
Annual Total	9.21

	Maximum	Minimum
Daily	1.38	0.00

---------- Notes ----------
All recorded data is continuous and reliable

Preliminary Records
Subject to Revision

Los Angeles County Dept of Public Works HYDAY V129 Output 11/22/2016

Site 465C Sepulveda Dam Year 2015/16
Variable 11.01 Rainfall in Inches, Daily manual reading Table Type Rain
Figures are for a 24-hour period

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2													2
3		0.01$											3
4	0.01$												4
5				1.94$									5
6				1.15$		1.02$		0.01$					6
7				0.45$		0.53$	0.03$	0.16$					7
8							0.05$						8
9							0.06$						9
10				0.04$									10
11						0.65$							11
12													12
13													13
14			0.04$			0.01$							14
15													15
16													16
17					0.08$								17
18					0.49$								18
19			0.12$	0.04$									19
20			0.08$										20
21				0.01$									21
22			0.28$										22
23			0.02$										23
24													24
25													25
26													26
27													27
28													28
29													29
30									$			$	30
31				1.26$						$	$		31
Mean	0.00$	0.00$	0.02$	0.16$	0.02$	0.07$	0.00$	0.01$	0.00$	0.00$	0.00$	0.00$	
Maximum	0.01$	0.01$	0.28$	1.94$	0.49$	1.02$	0.06$	0.16$	0.00$	0.00$	0.00$	0.00$	
Minimum	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	0.01$	0.01$	0.54$	4.89$	0.57$	2.21$	0.14$	0.17$	0.00$	0.00$	0.00$	0.00$	

Summaries

Annual Mean	0.02$
Annual Total	8.54$

	Maximum	Minimum
Daily	1.94$	0.00$

Notes

All recorded data is continuous and reliable except where the following tags are used...
$ ... Daily Read

Preliminary Records Subject to Revision

Los Angeles County Dept of Public Works HYDAY V129 Output 11/22/2016

Site 17 Sepulveda Canyon At Mulholland - Fire Station # 109 Year 2015/16
Variable 11.04 Rainfall in Inches, Data Logger (Not in DST) Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2													2
3		0.12											3
4													4
5				2.01		0.08							5
6				1.42		1.50							6
7				0.28		0.55	0.04						7
8							0.04						8
9				0.04			0.12						9
10													10
11			0.08			0.83							11
12													12
13			0.08										13
14						0.04							14
15													15
16													16
17					0.55								17
18				0.04	0.24								18
19			0.31	0.08									19
20				0.04									20
21			0.16										21
22			0.16										22
23			0.04										23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31				1.42									31
Mean	0.00	0.00	0.03	0.17	0.03	0.10	0.01	0.00	0.00	0.00	0.00	0.00	
Maximum	0.00	0.12	0.31	2.01	0.55	1.50	0.12	0.00	0.00	0.00	0.00	0.00	
Minimum	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	0.12	0.83	5.31	0.79	2.99	0.20	0.00	0.00	0.00	0.00	0.00	

Summaries

Annual Mean	0.03
Annual Total	10.24

	Maximum	Minimum
Daily	2.01	0.00

Notes

All recorded data is continuous and reliable

Los Angeles County Dept of Public Works HYDAY V129 Output 11/22/2016

Site 21B Woodland Hills Year 2015/16
Variable 11.01 Rainfall in Inches, Daily manual reading Table Type Rain
Figures are for a 24-hour period

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2		0.01$											2
3		0.09$											3
4	0.02$			0.01$									4
5				1.55$									5
6				0.92$		0.76$		0.03$					6
7				0.32$		0.51$	0.06$	0.04$					7
8							0.07$						8
9				0.01$			0.30$						9
10													10
11						0.39$							11
12													12
13			0.04$										13
14						0.04$							14
15													15
16													16
17					0.14$								17
18	0.01$			0.01$	0.40$								18
19			0.19$	0.07$									19
20			0.01$	0.01$									20
21													21
22			0.30$										22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30									$			$	30
31				0.84$						$	$		31
Mean	0.00$	0.00$	0.02$	0.12$	0.02$	0.05$	0.01$	0.00$	0.00$	0.00$	0.00$	0.00$	
Maximum	0.02$	0.09$	0.30$	1.55$	0.40$	0.76$	0.30$	0.04$	0.00$	0.00$	0.00$	0.00$	
Minimum	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	0.03$	0.10$	0.54$	3.74$	0.54$	1.70$	0.43$	0.07$	0.00$	0.00$	0.00$	0.00$	

Summaries

Annual Mean	0.02$
Annual Total	7.15$

	Maximum	Minimum
Daily	1.55$	0.00$

---------- Notes ----------
All recorded data is continuous and reliable except where the following tags are used...
$ ... Daily Read

Preliminary Records Subject to Revision

Los Angeles County Dept of Public Works HYDAY V129 Output 11/22/2016

Site 735H Bell Canyon Debris Basin Year 2015/16
Variable 11.04 Rainfall in Inches, Data Logger (Not in DST) Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2													2
3		0.04											3
4													4
5	0.24			1.22		0.04							5
6				1.18		0.71		0.12					6
7				0.39		0.51	0.04						7
8							0.16						8
9							0.28						9
10													10
11						0.35							11
12													12
13			0.08										13
14													14
15													15
16													16
17					0.39								17
18					0.16								18
19			0.12	0.12									19
20													20
21			0.24										21
22			0.12										22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31				0.75									31
Mean	0.01	0.00	0.02	0.12	0.02	0.05	0.02	0.00	0.00	0.00	0.00	0.00	
Maximum	0.24	0.04	0.24	1.22	0.39	0.71	0.28	0.12	0.00	0.00	0.00	0.00	
Minimum	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	0.24	0.04	0.55	3.66	0.55	1.61	0.47	0.12	0.00	0.00	0.00	0.00	

Summaries

Annual Mean	0.02
Annual Total	7.24

	Maximum	Minimum
Daily	1.22	0.00

Notes

All recorded data is continuous and reliable

Los Angeles County Dept of Public Works HYDAY V129 Output 11/22/2016

Site 25C Northridge - LADWP Year 2015/16
Variable 11.04 Rainfall in Inches, Data Logger (Not in DST) Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2													2
3													3
4													4
5	0.01			1.13		0.01		0.01					5
6				1.11		0.76		0.23					6
7				0.41		0.33	0.05						7
8							0.05						8
9							0.11						9
10			0.01	0.01									10
11			0.07			0.38	0.24						11
12													12
13			0.11										13
14													14
15													15
16													16
17					0.51								17
18					0.09								18
19			0.14	0.09									19
20			0.01										20
21			0.07										21
22			0.24										22
23			0.02										23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31				0.35									31
Mean	0.00	0.00	0.02	0.10	0.02	0.05	0.01	0.01	0.00	0.00	0.00	0.00	
Maximum	0.01	0.00	0.24	1.13	0.51	0.76	0.24	0.23	0.00	0.00	0.00	0.00	
Minimum	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	0.01	0.00	0.67	3.10	0.60	1.48	0.45	0.24	0.00	0.00	0.00	0.00	

Summaries

Annual Mean	0.02
Annual Total	6.55

	Maximum	Minimum
Daily	1.13	0.00

---------- Notes ----------
All recorded data is continuous and reliable

Los Angeles County Dept of Public Works HYDAY V129 Output 11/22/2016

Site 33A Pacoima Dam Year 2015/16
Variable 11.01 Rainfall in Inches, Daily manual reading Table Type Rain
Figures are for a 24-hour period

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1					0.45$								1
2													2
3		0.04$											3
4	0.28$												4
5	0.07$			0.09$				T					5
6				1.42$		0.93$							6
7				1.50$		0.34$		0.65$					7
8						0.29$	0.10$						8
9							0.34$						9
10				0.05$			0.15$						10
11			0.15$										11
12						0.64$			0.02$				12
13									T				13
14			0.27$			0.07$						0.01$	14
15													15
16													16
17													17
18					0.70$								18
19	0.02$												19
20			0.13$	0.08$									20
21													21
22			0.08$										22
23			0.03$										23
24													24
25		0.02$											25
26													26
27		0.08$											27
28													28
29													29
30							0.01$						30
31										$	$		31
Mean	0.01$	0.00$	0.02$	0.10$	0.04$	0.07$	0.02$	0.02$	0.00$	0.00$	0.00$	0.00$	
Maximum	0.28$	0.08$	0.27$	1.50$	0.70$	0.93$	0.34$	0.65$	0.02$	0.00$	0.00$	0.01$	
Minimum	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	0.37$	0.14$	0.66$	3.14$	1.15$	2.27$	0.60$	0.65$	0.02$	0.00$	0.00$	0.01$	

Summaries

Annual Mean	0.02$
Annual Total	9.01$

	Maximum	Minimum
Daily	1.50$	0.00$

Notes

All recorded data is continuous and reliable except where the following tags are used...

$ ... Daily Read
T ... Trace

Preliminary Records Subject to Revision

Los Angeles County Dept of Public Works HYDAY V129 Output 11/22/2016

Site 47D Clear Creek-City School Year 2015/16
Variable 11.04 Rainfall in Inches, Data Logger (Not in DST) Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2		0.16											2
3													3
4	1.34												4
5	0.04			2.87		0.28		0.08					5
6				2.52		1.77		0.08					6
7				0.67		0.55	0.08						7
8							0.20						8
9							0.31						9
10			0.04										10
11						0.98			0.04				11
12													12
13			0.83			0.08							13
14													14
15													15
16													16
17					0.63								17
18					0.71								18
19			0.31	0.12									19
20													20
21			0.08										21
22			0.12										22
23													23
24													24
25		0.08					0.08						25
26		0.12											26
27													27
28									0.04				28
29						0.28							29
30						0.04							30
31				3.82									31
Mean	0.04	0.01	0.04	0.32	0.05	0.13	0.02	0.01	0.00	0.00	0.00	0.00	
Maximum	1.34	0.16	0.83	3.82	0.71	1.77	0.31	0.08	0.04	0.00	0.00	0.00	
Minimum	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	1.38	0.35	1.38	10.00	1.34	3.98	0.67	0.16	0.08	0.00	0.00	0.00	

Summaries

Annual Mean 0.05
Annual Total 19.33

	Maximum	Minimum
Daily	3.82	0.00

Notes
All recorded data is continuous and reliable

Los Angeles County Dept of Public Works HYDAY V129 Output 11/22/2016

Site 53D Colby's Ranch Year 2015/16
Variable 11.04 Rainfall in Inches, Data Logger (Not in DST) Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2		0.20											2
3													3
4	0.71												4
5	0.04			2.05									5
6				2.01		0.98							6
7				0.51		0.43	0.08						7
8							0.04						8
9							0.04						9
10													10
11			0.08			0.83	0.04						11
12													12
13			0.31			0.04							13
14	0.04												14
15		0.08											15
16													16
17					0.59								17
18					0.20								18
19			0.31	0.12									19
20													20
21													21
22			0.08										22
23													23
24													24
25		0.08					0.04						25
26		0.04											26
27		0.04											27
28													28
29						0.20							29
30						0.04							30
31				2.13									31
Mean	0.03	0.01	0.03	0.22	0.03	0.08	0.01	0.00	0.00	0.00	0.00	0.00	
Maximum	0.71	0.20	0.31	2.13	0.59	0.98	0.08	0.00	0.00	0.00	0.00	0.00	
Minimum	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	0.43	0.79	6.81	0.79	2.52	0.24	0.00	0.00	0.00	0.00	0.00	

Summaries

Annual Mean	0.03
Annual Total	12.36

	Maximum	Minimum
Daily	2.13	0.00

Notes
All recorded data is continuous and reliable

Los Angeles County Dept of Public Works HYDAY V129 Output 11/22/2016

Site 54C Loomis Ranch-Alder Creek Year 2015/16
Variable 11.04 Rainfall in Inches, Data Logger (Not in DST) Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2		0.20											2
3		0.04											3
4	0.51												4
5	0.31			1.06									5
6				0.87		0.43		0.12					6
7				0.71		0.28	0.08						7
8													8
9							0.12						9
10				0.04									10
11			0.04			0.63							11
12													12
13			0.35			0.08							13
14													14
15		0.04											15
16	0.16												16
17					0.67								17
18					0.08								18
19			0.28	0.16									19
20													20
21			0.04										21
22			0.16										22
23													23
24													24
25		0.04					0.04						25
26													26
27													27
28													28
29						0.08							29
30						0.08							30
31				1.14									31
Mean	0.03	0.01	0.03	0.13	0.03	0.05	0.01	0.00	0.00	0.00	0.00	0.00	
Maximum	0.51	0.20	0.35	1.14	0.67	0.63	0.12	0.12	0.00	0.00	0.00	0.00	
Minimum	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	0.98	0.31	0.87	3.98	0.75	1.57	0.24	0.12	0.00	0.00	0.00	0.00	

Summaries

Annual Mean	0.02
Annual Total	8.82

	Maximum	Minimum
Daily	1.14	0.00

Notes
All recorded data is continuous and reliable

Los Angeles County Dept of Public Works HYDAY V129 Output 11/22/2016

Site 210C Brand Park Year 2015/16
Variable 11.03 Rainfall in Inches, ALERT Transmitted Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2													2
3													3
4	0.28												4
5	0.28			2.40		0.04							5
6				0.91		1.34		0.12					6
7				0.20		0.31	0.04						7
8							0.31						8
9							0.08						9
10													10
11						0.55							11
12													12
13			0.28									0.04	13
14						0.04							14
15													15
16													16
17					0.39								17
18					0.12								18
19	0.04		0.28										19
20													20
21													21
22			0.24										22
23			0.04										23
24													24
25													25
26													26
27													27
28													28
29						0.16							29
30													30
31				0.94									31
Mean	0.02	0.00	0.03	0.14	0.02	0.08	0.01	0.00	0.00	0.00	0.00	0.00	
Maximum	0.28	0.00	0.28	2.40	0.39	1.34	0.31	0.12	0.00	0.00	0.00	0.04	
Minimum	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	0.59	0.00	0.83	4.45	0.51	2.44	0.43	0.12	0.00	0.00	0.00	0.04	

Summaries

Annual Mean	0.03
Annual Total	9.41

	Maximum	Minimum
Daily	2.40	0.00

Notes
All recorded data is continuous and reliable

Preliminary Records
Subject to Revision

Los Angeles County Dept of Public Works HYDAY V129 Output 11/22/2016

Site 251C La Crescenta Year 2015/16
Variable 11.01 Rainfall in Inches, Daily manual reading Table Type Rain
Figures are for a 24-hour period

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2													2
3		0.10$											3
4	0.30$												4
5				2.16$		A		0.01$					5
6	T			0.79$		2.78A		0.15$					6
7				0.75$		0.03$	0.10$	A					7
8				T			0.13$	0.16A					8
9				A			A						9
10				0.03A			0.47A						10
11			0.06$			0.82$			0.10$				11
12						A	T						12
13			0.61$			0.08A						0.13$	13
14													14
15		0.04$							T				15
16													16
17					0.15$								17
18	0.02$				0.79$								18
19			0.37$	0.03$									19
20				0.02$									20
21													21
22			0.49$									0.02$	22
23													23
24													24
25		T											25
26													26
27													27
28						T							28
29						0.05$							29
30						0.07$	0.05$						30
31				1.63$						$	$		31
Mean	0.01$	0.00$	0.05$	0.17A	0.03$	0.12A	0.02A	0.01A	0.00$	0.00$	0.00$	0.00$	
Maximum	0.30$	0.10$	0.61$	2.16A	0.79$	2.78A	0.47A	0.16A	0.10$	0.00$	0.00$	0.13$	
Minimum	0.00$	0.00$	0.00$	0.00A	0.00$	0.00A	0.00A	0.00A	0.00$	0.00$	0.00$	0.00$	
Total	0.32$	0.14$	1.53$	5.41A	0.94$	3.83A	0.75A	0.32A	0.10$	0.00$	0.00$	0.15$	

Summaries

Annual Mean	0.04A
Annual Total	13.49A

	Maximum	Minimum
Daily	2.78A	0.00A

Notes

All recorded data is continuous and reliable except where the following tags are used...

$ ... Daily Read
A ... Accumulated Data
T ... Trace

Preliminary Records Subject to Revision

Los Angeles County Dept of Public Works HYDAY V129 Output 11/22/2016

Site 1222 Northridge - Garland Year 2015/16
Variable 11.01 Rainfall in Inches, Daily manual reading Table Type Rain
Figures are for a 24-hour period

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2													2
3		0.02$											3
4	0.02$												4
5				1.45$									5
6				1.42$		1.04$		0.14$					6
7				0.46$		0.33$	A	0.03$					7
8							0.30A						8
9				0.03$									9
10													10
11						0.49$							11
12			0.05$										12
13						0.03$							13
14			0.20$										14
15													15
16													16
17					0.13$								17
18					0.60$								18
19			0.43$	0.08$									19
20				0.03$									20
21													21
22			0.50$										22
23													23
24													24
25													25
26													26
27													27
28						T							28
29													29
30									$			$	30
31				0.38$						$	$		31
Mean	0.00$	0.00$	0.04$	0.12$	0.03$	0.06$	0.01A	0.01$	0.00$	0.00$	0.00$	0.00$	
Maximum	0.02$	0.02$	0.50$	1.45$	0.60$	1.04$	0.30A	0.14$	0.00$	0.00$	0.00$	0.00$	
Minimum	0.00$	0.00$	0.00$	0.00$	0.00$	0.00$	0.00A	0.00$	0.00$	0.00$	0.00$	0.00$	
Total	0.02$	0.02$	1.18$	3.85$	0.73$	1.89$	0.30A	0.17$	0.00$	0.00$	0.00$	0.00$	

Summaries

Annual Mean	0.02A
Annual Total	8.16A

	Maximum	Minimum
Daily	1.45A	0.00A

---------- Notes ----------
All recorded data is continuous and reliable except where the following tags are used...
$ ... Daily Read
A ... Accumulated Data
T ... Trace

Preliminary Records
Subject to Revision

Los Angeles County Dept of Public Works HYDAY V129 Output 11/22/2016

Site AL464 Pacoima Wash Spreading Grounds Head Works Year 2015/16
Variable 11.04 Rainfall in Inches, Data Logger (Not in DST) Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1					0.01								1
2		0.02											2
3													3
4	0.04												4
5	0.07			1.30									5
6				1.11		1.02		0.59					6
7				0.30		0.34	0.07	0.08					7
8							0.08						8
9							0.16						9
10			0.07										10
11						0.75							11
12													12
13			0.24										13
14						0.02							14
15		0.03											15
16													16
17					0.42								17
18					0.13								18
19			0.09	0.06									19
20				0.01									20
21			0.02										21
22			0.25										22
23													23
24													24
25							0.05						25
26													26
27													27
28													28
29													29
30						0.09							30
31				0.49									31
Mean	0.00	0.00	0.02	0.11	0.02	0.07	0.01	0.02	0.00	0.00	0.00	0.00	
Maximum	0.07	0.03	0.25	1.30	0.42	1.02	0.16	0.59	0.00	0.00	0.00	0.00	
Minimum	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	0.11	0.05	0.67	3.27	0.56	2.22	0.36	0.67	0.00	0.00	0.00	0.00	

Summaries

Annual Mean	0.02
Annual Total	7.91

	Maximum	Minimum
Daily	1.30	0.00

Notes

All recorded data is continuous and reliable

Los Angeles County Dept of Public Works HYDAY V129 Output 11/22/2016

Site 1074 Little Gleason Year 2015/16
Variable 11.03 Rainfall in Inches, ALERT Transmitted Table Type Rain
Figures are for period ending 24:00

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1													1
2		0.39											2
3													3
4	0.55			0.04									4
5	0.28			2.13		0.08		0.16					5
6				0.16		1.30		0.08					6
7				0.20		0.16	0.08						7
8				0.31		0.04	0.20						8
9				0.51			0.31						9
10			0.12	0.08									10
11			0.12			0.51	0.08						11
12						0.04							12
13			0.47			0.08						0.04	13
14													14
15		0.08											15
16													16
17					0.71								17
18					0.67								18
19			0.12	0.24									19
20			0.16										20
21													21
22			0.16										22
23													23
24													24
25		0.12											25
26			0.04										26
27													27
28													28
29													29
30						0.16							30
31				2.13									31
Mean	0.03	0.02	0.04	0.19	0.05	0.08	0.02	0.01	0.00	0.00	0.00	0.00	
Maximum	0.55	0.39	0.47	2.13	0.71	1.30	0.31	0.16	0.00	0.00	0.00	0.04	
Minimum	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	0.83	0.59	1.18	5.79	1.38	2.36	0.67	0.24	0.00	0.00	0.00	0.04	

Summaries

Annual Mean	0.04
Annual Total	13.07

	Maximum	Minimum
Daily	2.13	0.00

---------- Notes ----------
All recorded data is continuous and reliable

Preliminary Records
Subject to Revision

Los Angeles County Dept of Public Works USDAY V106 Output 10/20/2016

Summary Report

Site: F57C Los Angeles River Above Arroyo Seco
USGS #:
Beginning Date: 10/01/2015
Ending Date: 09/30/2016

Daily Mean Discharge in Cubic feet/second Water Year Oct 2015 to Sep 2016

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	91.4	74.1	112	91.5	165	84.4	75.6	82.3	75.0	81.8	78.8	84.9
2	90.7	75.0	114	90.9	92.0	90.5	84.1	62.6	78.1	83.8	76.7	80.3
3	91.2	74.8	113	93.2	88.7	106	81.0	79.0	82.5	74.5	79.3	79.6
4	141	74.5	125	99.7	87.2	118	85.5	70.9	83.5	71.0	79.2	84.2
5	129	73.4	121	3250	85.7	136	130	72.3	79.2	74.5	79.5	76.3
6	103	73.9	127	2610	81.3	2840	86.4	165	82.3	77.7	79.3	79.8
7	97.3	75.4	129	1210	79.7	1310	112	319	96.3	73.9	82.0	82.6
8	95.8	76.7	112	91.4	72.3	101	246	60.5	87.2	73.8	78.8	83.7
9	94.9	79.1	107	74.9	66.1	88.6	478	66.4	91.8	75.2	79.0	85.1
10	92.5	80.1	103	75.0	75.0	94.0	144	83.2	88.8	76.1	78.2	80.3
11	91.3	81.7	147	76.1	74.2	1530	287	89.9	101	74.2	79.3	78.8
12	90.4	82.8	134	82.4	72.2	190	168	76.2	94.0	78.4	78.0	77.9
13	90.1	84.3	289	79.9	74.8	103	77.5	61.1	80.4	80.8	82.5	80.4
14	89.4	86.1	270	77.0	74.5	105	90.0	71.1	74.0	75.8	76.8	80.1
15	88.6	86.8	75.4	79.4	81.4	107	84.6	74.4	68.8	77.9	76.4	82.9
16	88.2	87.8	67.6	74.4	87.8	106	84.0	73.9	73.4	81.7	75.7	78.3
17	88.7	89.2	61.2	74.9	777	113	82.2	77.9	75.4	87.4	77.9	78.9
18	88.9	91.8	61.9	66.5	947	112	89.7	77.9	89.9	81.1	79.1	84.9
19	89.5	93.3	304	90.4	94.1	107	75.1	77.5	84.0	77.1	77.9	79.6
20	89.1	95.2	172	112	78.0	111	94.0	75.8	80.1	74.4	79.0	78.8
21	88.0	96.7	85.6	78.2	79.2	104	78.0	75.2	81.5	77.0	83.4	76.9
22	87.5	97.5	539	79.1	77.9	105	95.6	75.2	82.7	82.0	74.8	81.5
23	85.9	99.3	111	82.9	80.5	96.2	97.5	81.5	75.4	82.3	79.3	74.1
24	84.3	101	82.8	81.3	109	99.3	103	77.8	66.5	85.2	80.6	77.7
25	82.4	103	76.0	85.7	120	103	68.7	80.4	79.1	87.6	80.1	76.3
26	80.8	103	81.4	90.0	111	104	66.0	77.3	73.4	88.4	77.4	77.4
27	78.9	103	77.5	90.5	106	104	77.8	84.2	68.9	83.8	82.1	70.6
28	77.6	104	80.1	88.7	90.5	94.7	92.3	84.4	73.2	83.4	84.1	75.1
29	75.4	104	84.8	94.1	78.4	121	90.2	85.5	76.1	81.3	81.7	75.5
30	74.4	105	82.5	96.3	------	87.8	102	86.1	104	81.9	81.2	75.1
31	74.2	------	94.2	1760	------	80.0	------	86.9	------	82.3	79.1	------
Total	2810.4	2652.5	4140.0	11126.4	4106.5	8651.5	3525.8	2711.4	2446.5	2466.3	2457.2	2377.6
Mean	90.7	88.4	134	359	142	279	118	87.5	81.6	79.6	79.3	79.3
Max	141	105	539	3250	947	2840	478	319	104	88.4	84.1	85.1
Min	74.2	73.4	61.2	66.5	66.1	80.0	66.0	60.5	66.5	71.0	74.8	70.6
Acre-Ft	5570	5260	8210	22070	8150	17160	6990	5380	4850	4890	4870	4720

Wtr Year 2016	Total	49472.1	Mean	135	Max	3250	Min	60.5	Inst Max	22100	Acre-Ft	98130
Cal Year 2015	Total	51979.9	Mean	142	Max	5760	Min	59.2	Inst Max	30700	Acre-Ft	103100

15A

Los Angeles County Dept of Public Works

USDAY V106 Output 10/20/2016

Summary Report

Site: F118C Pacoima Creek below Pacoima Dam
USGS #:
Beginning Date: 10/01/2015
Ending Date: 09/30/2016

Daily Mean Discharge in Cubic feet/second Water Year Oct 2015 to Sep 2016

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	2.02	0	0	0	0	0	0	0	0	0	0
6	0	0	0	5.65	0	0	0	0	44.1	0	0	0
7	0	0	0	0	0	0	0	0	32.2	0	0	0
8	0	0	0	0	0	0	0	0	2.23	0	0	0
9	0	1.21	0	0	0	0	0	0	0	0	0	0
10	0	8.79	0	0	0	0	0	0	0	0	0	0
11	0	15.8	0	0	0	0	0	0	0	0	0	0
12	0	21.3	0	0	0	0	0	0	0	0	0	0
13	0	27.8	0	0	0	0	0	0	0	0	0	0
14	0	36.1	0	0	0	0	0	0	0	0	0	0
15	0	47.0	0	0	0	0	0	0	0	0	0	0
16	0	61.1	0	0	0	0	0	0	0	0	0	0
17	0	82.6	0	0	0	0	0	0	0	0	0	0
18	0	98.4	0	0	0	0	0	0	0	0	0	0
19	0	60.0	0	0	0	0	0	0	0	0	0	0
20	0	50.6	0	0	0	0	0	0	0	0	0	0
21	0	42.8	0	0	0	0	0	0	0	0	0	0
22	0	35.9	0	0	0	0	0	0	0	0	0	.41
23	0	30.3	0	0	0	0	0	0	0	0	0	0
24	0	25.6	0	0	0	0	0	0	0	0	0	0
25	0	21.5	0	0	0	0	0	0	0	0	0	0
26	0	18.0	0	0	0	0	0	17.4	0	0	0	0
27	0	14.1	0	0	0	0	0	0	0	0	0	0
28	0	9.54	0	0	0	0	0	0	0	0	0	0
29	0	4.06	0	0	0	0	0	0	0	0	0	0
30	0	.12	0	0	------	0	0	0	0	0	0	0
31	0	------	0	0	------	0	------	0	------	0	0	------
Total	0	714.64	0	5.65	0	0	0	17.4	78.53	0	0	0.41
Mean	0	23.8	0	.18	0	0	0	.56	2.62	0	0	.014
Max	0	98.4	0	5.65	0	0	0	17.4	44.1	0	0	.41
Min	0	0	0	0	0	0	0	0	0	0	0	0
Acre-Ft	0	1420	0	11	0	0	0	35	156	0	0	.81

Wtr Year 2016	Total	816.63	Mean	2.23	Max	98.4	Min	0	Inst Max	1040	Acre-Ft	1620
Cal Year 2015	Total	719.61	Mean	1.97	Max	98.4	Min	0	Inst Max	1040	Acre-Ft	1430

GA

Summary Report

Site: F300 Los Angeles River at Tujunga Avenue
USGS #:
Beginning Date: 10/01/2015
Ending Date: 09/30/2016

Daily Mean Discharge in Cubic feet/second Water Year Oct 2015 to Sep 2016

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65.5	40.3	43.4	42.4	62.1	48.9	49.7	54.9	46.4	48.0	46.4	48.6
2	65.9	45.5	41.5	42.6	47.0	46.1	45.9	54.3	47.7	48.6	47.9	48.0
3	69.7	53.1	42.0	42.3	47.4	50.1	45.5	52.8	48.2	46.0	49.5	47.6
4	86.6	49.2	44.5	42.3	47.2	48.6	47.0	50.6	48.2	46.1	58.9	46.1
5	80.7	39.5	44.9	2020	47.4	51.0	75.0	51.8	47.8	48.2	52.3	47.2
6	74.2	38.9	46.9	2040	45.1	1370	45.4	323	47.7	49.2	52.0	48.7
7	64.7	37.1	45.2	674	41.8	650	57.7	192	47.4	48.8	52.2	48.7
8	64.0	36.4	47.5	58.7	37.8	62.2	113	49.4	47.0	46.6	48.8	49.0
9	62.5	41.0	49.4	49.1	43.0	52.8	261	57.1	46.8	47.1	48.7	47.8
10	60.6	42.5	51.1	47.8	45.3	51.8	60.8	47.2	46.5	47.1	48.2	48.2
11	58.4	40.4	70.8	52.5	47.2	682	135	47.5	46.3	46.4	61.9	47.8
12	59.5	38.6	52.2	57.0	44.0	72.6	51.8	41.5	46.3	46.6	45.4	47.7
13	59.6	40.1	109	53.2	43.2	52.7	45.1	43.1	46.5	46.3	46.2	48.7
14	60.4	43.5	97.9	47.9	42.1	55.7	46.4	45.1	46.3	47.4	44.8	48.8
15	59.5	43.4	27.9	49.9	42.4	50.3	45.0	46.4	46.2	45.9	44.6	48.3
16	59.8	45.9	22.9	49.8	45.2	49.1	44.7	46.2	46.1	47.0	45.1	45.3
17	69.8	40.3	15.6	45.2	444	49.0	49.2	47.0	45.9	47.0	45.2	46.4
18	68.8	41.6	21.6	37.0	276	49.3	63.9	47.5	45.8	45.8	47.4	48.1
19	64.9	41.2	188	77.1	45.8	46.9	50.8	46.9	46.1	45.6	47.9	48.2
20	61.9	43.6	67.6	58.5	43.7	46.8	52.3	46.2	46.4	49.6	48.7	48.0
21	51.4	43.4	37.6	47.1	42.0	46.5	53.2	46.1	47.4	46.2	48.5	47.6
22	49.7	42.9	350	46.4	39.4	45.2	55.1	45.8	49.0	50.2	47.2	47.0
23	48.1	47.5	54.1	44.8	46.4	42.8	56.5	47.6	52.8	46.3	48.6	46.2
24	45.2	49.5	36.8	45.2	43.7	46.7	57.5	49.4	52.2	46.7	49.1	46.5
25	43.8	47.3	35.5	44.8	44.4	47.0	59.4	48.3	53.4	46.0	49.0	48.0
26	43.2	46.9	37.9	49.4	46.9	48.1	60.4	40.2	48.4	47.6	46.3	51.4
27	41.3	43.6	37.2	45.9	44.8	48.4	60.2	46.2	47.5	44.6	47.3	44.2
28	43.9	40.3	35.1	43.0	46.7	48.6	57.8	46.2	48.8	46.4	48.7	44.0
29	40.9	40.5	39.5	48.8	46.2	53.4	56.2	43.4	49.8	45.1	48.3	43.5
30	40.0	43.4	39.9	45.0	------	56.8	55.5	44.0	46.8	48.0	48.5	45.4
31	40.8	------	42.4	886	------	49.2	------	44.9	------	46.6	47.3	------
Total	1805.3	1287.4	1875.9	6933.7	1938.2	4118.6	1957.0	1892.6	1431.7	1457.0	1510.9	1421.0
Mean	58.2	42.9	60.5	224	66.8	133	65.2	61.1	47.7	47.0	48.7	47.4
Max	86.6	53.1	350	2040	444	1370	261	323	53.4	50.2	61.9	51.4
Min	40.0	36.4	15.6	37.0	37.8	42.8	44.7	40.2	45.8	44.6	44.6	43.5
Acre-Ft	3580	2550	3720	13750	3840	8170	3880	3750	2840	2890	3000	2820

Wtr Year 2016	Total	27629.3	Mean	75.5	Max	2040	Min	15.6	Inst Max	13000 Acre-Ft 54800
Cal Year 2015	Total	27048.5	Mean	74.1	Max	1400	Min	15.6	Inst Max	7200 Acre-Ft 53650

GA

Summary Report

Site: F168B Big Tujunga Creek below Big Tujunga Dam
USGS #:
Beginning Date: 10/01/2015
Ending Date: 09/30/2016

Daily Mean Discharge in Cubic feet/second Water Year Oct 2015 to Sep 2016

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.93	2.18	2.16	2.16	2.56	2.74	2.45	2.73	1.96	1.97	1.50	1.88
2	1.79	3.72	2.15	2.09	2.26	4.11	2.22	2.24	2.00	2.04	1.91	1.90
3	1.84	4.08	2.12	1.94	2.05	4.84	2.05	2.17	2.10	2.02	1.80	1.86
4	2.40	2.91	2.21	1.83	1.98	5.35	1.97	2.16	2.19	2.00	1.66	1.85
5	2.03	2.91	2.22	5.70	1.96	5.96	1.84	2.15	2.24	1.96	1.59	1.92
6	1.89	2.97	2.11	6.29	1.80	4.29	1.47	2.07	2.37	1.96	1.63	1.84
7	1.75	2.96	2.15	4.15	1.97	1.92	1.70	1.93	2.32	1.96	1.58	1.87
8	1.83	3.07	2.18	4.16	2.17	1.61	2.05	1.65	2.30	1.94	1.37	1.88
9	1.97	3.05	2.33	2.87	2.21	1.69	2.40	1.76	2.37	1.88	1.64	1.82
10	2.04	3.16	2.39	2.32	2.21	1.80	2.42	1.52	2.35	1.97	1.98	1.80
11	1.97	3.20	2.51	2.25	2.24	3.11	2.84	1.38	2.31	2.04	1.95	1.85
12	1.87	2.39	2.53	2.30	2.28	2.98	3.78	1.50	2.10	2.13	2.07	1.99
13	1.86	1.75	2.66	2.14	2.13	2.87	1.28	1.54	2.07	1.97	2.00	2.17
14	2.02	1.76	2.29	2.02	2.19	2.67	2.00	1.82	2.04	2.13	1.95	2.01
15	2.10	1.81	2.06	1.92	2.41	2.61	1.79	2.15	2.14	2.24	1.94	1.92
16	2.04	1.85	2.09	1.99	2.18	2.57	1.73	2.23	2.14	2.24	2.18	1.89
17	2.04	1.78	1.97	2.09	2.36	2.53	1.77	2.17	2.02	2.22	2.12	1.81
18	1.97	1.86	1.77	2.40	2.58	2.46	1.76	2.69	1.93	2.15	1.92	1.74
19	1.88	2.78	2.04	2.53	2.32	2.40	1.86	1.80	1.89	2.09	1.99	1.69
20	1.86	1.99	2.03	2.56	2.35	2.41	2.00	1.90	1.81	2.08	2.15	1.81
21	1.77	2.10	1.95	2.65	2.36	2.24	2.10	1.89	1.74	2.21	2.15	1.68
22	1.76	2.05	2.00	2.43	2.36	2.41	2.24	1.81	1.79	2.29	2.27	1.63
23	1.83	2.17	2.10	2.16	2.52	2.23	2.35	1.85	1.83	2.34	2.32	1.61
24	1.90	2.30	2.16	2.11	2.59	2.16	2.39	1.84	2.40	2.50	2.19	1.54
25	1.87	2.39	2.20	2.08	2.60	2.22	2.49	1.63	2.28	2.21	2.18	1.46
26	1.88	2.27	2.17	2.05	2.58	2.28	2.52	1.52	1.96	2.13	2.18	1.52
27	1.92	2.21	2.31	1.98	2.52	2.36	2.48	1.43	2.16	2.22	2.16	1.59
28	1.85	2.17	2.29	1.87	2.53	2.37	2.63	1.32	2.31	1.38	2.04	1.68
29	1.78	2.12	2.24	1.84	2.64	2.49	2.80	1.59	2.30	1.92	1.98	1.73
30	1.71	2.08	2.20	1.82	------	2.35	2.81	1.68	1.97	1.51	1.92	1.91
31	1.66	------	2.16	6.37	------	2.37	------	1.78	------	1.43	1.87	------
Total	59.01	74.04	67.75	83.07	66.91	86.40	66.19	57.90	63.39	63.13	60.19	53.85
Mean	1.90	2.47	2.19	2.68	2.31	2.79	2.21	1.87	2.11	2.04	1.94	1.80
Max	2.40	4.08	2.66	6.37	2.64	5.96	3.78	2.73	2.40	2.50	2.32	2.17
Min	1.66	1.75	1.77	1.82	1.80	1.61	1.28	1.32	1.74	1.38	1.37	1.46
Acre-Ft	117	147	134	165	133	171	131	115	126	125	119	107

Wtr Year 2016	Total	801.83	Mean	2.19	Max	6.37	Min	1.28	Inst Max	41.5	Acre-Ft	1590
Cal Year 2015	Total	745.54	Mean	2.04	Max	7.77	Min	1.04	Inst Max	96.7	Acre-Ft	1480

Summary Report

Site: E285 Burbank-Western Storm Drain
USGS #:
Beginning Date: 10/01/2015
Ending Date: 09/30/2016

Daily Mean Discharge in Cubic feet/second Water Year Oct 2015 to Sep 2016

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.98	7.90	11.2	8.25	38.2	6.73	12.4	7.90	8.05	7.11	4.17	6.32
2	6.92	7.90	11.4	9.20	13.1	5.11	7.75	7.90	7.93	7.11	3.38	6.32
3	6.98	7.96	13.1	10.6	7.89	3.71	6.70	7.90	7.95	7.11	2.64	6.28
4	10.1	8.02	13.9	12.2	6.60	1.83	7.11	7.90	8.01	7.11	2.93	5.54
5	45.0	7.50	14.8	341	5.96	.23	7.11	7.90	8.16	7.67	2.58	5.53
6	91.1	7.31	14.7	230	6.02	188	7.11	7.63	9.29	7.83	2.74	5.05
7	58.1	7.34	12.6	134	6.42	104	7.11	7.90	9.55	7.75	3.04	4.74
8	39.4	7.38	10.5	87.2	7.44	35.6	7.11	7.90	10.6	7.67	3.34	4.74
9	27.4	7.43	8.68	60.1	8.76	19.4	7.11	7.20	10.5	7.59	3.63	4.74
10	19.4	7.48	7.86	42.1	8.03	10.6	7.11	7.11	9.96	7.51	3.93	4.25
11	15.0	7.52	6.50	30.1	7.90	78.0	7.44	7.11	9.60	7.43	3.64	3.95
12	12.0	7.57	4.95	21.3	7.90	36.7	7.29	7.11	9.67	7.35	3.73	5.38
13	9.75	7.62	5.84	15.3	7.90	24.5	6.39	7.11	9.73	7.27	3.52	6.57
14	8.64	7.66	14.8	10.6	7.90	17.1	6.85	7.26	9.79	7.19	3.54	6.32
15	7.86	7.71	13.7	8.21	7.90	12.3	7.11	7.90	9.22	7.11	3.84	5.73
16	7.81	7.76	12.7	7.32	7.90	8.59	7.11	7.90	8.74	7.03	4.13	5.53
17	8.12	7.16	8.86	6.59	7.90	6.48	7.11	8.33	8.80	6.95	4.43	5.53
18	8.47	7.11	6.06	6.35	7.90	5.03	7.11	8.77	8.52	6.40	4.23	5.53
19	8.83	7.92	26.8	6.17	7.90	4.01	7.11	8.56	7.98	6.00	4.27	5.53
20	8.58	7.75	67.7	6.42	7.90	3.56	7.11	7.90	7.85	5.92	4.59	5.53
21	7.88	8.39	37.7	6.32	7.90	3.26	7.11	7.43	7.63	5.42	4.92	5.53
22	7.69	8.53	23.1	6.21	7.90	2.95	7.11	7.11	7.16	4.97	5.25	5.53
23	7.95	8.87	14.7	6.52	7.90	2.99	7.11	7.11	7.11	4.42	5.58	5.53
24	7.70	9.39	10.4	7.04	7.90	3.44	7.11	7.11	7.11	4.02	5.55	5.53
25	7.63	9.76	8.10	7.11	7.90	3.32	7.11	7.10	7.11	4.73	5.44	5.53
26	7.85	9.95	6.81	7.41	7.90	3.94	7.11	7.02	7.11	5.35	5.77	5.53
27	7.90	9.39	6.03	8.01	7.90	4.38	7.11	7.19	7.11	5.15	6.10	5.53
28	8.09	9.54	6.01	8.80	7.90	4.67	7.11	7.61	7.11	4.96	6.43	5.53
29	8.40	9.86	5.83	9.36	7.58	24.1	7.11	7.85	7.11	4.76	6.76	5.53
30	7.99	10.3	6.55	6.04	------	44.0	7.11	8.34	7.11	4.56	6.63	5.53
31	7.90	------	7.15	121	------	19.7	------	8.19	------	4.36	6.32	------
Total	493.42	245.98	419.03	1246.83	258.20	688.23	218.35	237.25	251.57	195.81	137.05	164.41
Mean	15.9	8.20	13.5	40.2	8.90	22.2	7.28	7.65	8.39	6.32	4.42	5.48
Max	91.1	10.3	67.7	341	38.2	188	12.4	8.77	10.6	7.83	6.76	6.57
Min	6.92	7.11	4.95	6.04	5.96	.23	6.39	7.02	7.11	4.02	2.58	3.95
Acre-Ft	979	488	831	2470	512	1370	433	471	499	388	272	326

Wtr Year 2016	Total	4556.13	Mean	12.4	Max	341	Min	.23	Inst Max	4310	Acre-Ft	9040
Cal Year 2015	Total	4128.93	Mean	11.4	Max	180	Min	1.16	Inst Max	2110	Acre-Ft	8190

GA

Los Angeles County Dept of Public Works USDAY V106 Output 10/18/2016

Summary Report

Site: F252 Verdugo Wash At Estelle Avenue
USGS #:
Beginning Date: 10/01/2015
Ending Date: 09/30/2016

Daily Mean Discharge in Cubic feet/second Water Year Oct 2015 to Sep 2016

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.25	1.10	.65	3.48	4.43	1.51	1.84	2.91	2.72	2.46	1.98	1.98
2	.60	3.43	.91	2.21	2.12	1.59	2.07	2.83	2.80	2.71	2.01	2.02
3	1.08	2.78	1.29	1.18	1.98	2.12	1.87	2.44	2.60	2.42	2.09	2.07
4	10.9	2.21	1.72	.43	1.98	1.98	1.56	2.36	3.06	2.36	2.17	2.18
5	68.7	2.29	2.20	299	1.98	2.96	1.69	2.63	2.75	2.77	2.00	2.42
6	16.1	1.98	2.52	176	1.98	165	1.50	21.5	2.95	2.44	2.11	2.26
7	6.66	1.98	2.44	29.1	1.74	41.4	4.87	5.01	3.03		2.11	2.56
8	4.01	1.98	2.34	2.02	1.96	4.00	14.1	2.38	2.86	2.61	1.98	2.15
9	2.89	2.34	2.80	2.06	1.97	3.38	22.7	2.42	2.96	2.23	2.17	2.49
10	1.88	2.57	2.74	2.11	1.98	3.14	2.01	2.79	2.98	2.12	2.27	2.08
11	1.57	2.24	2.86	2.15	2.00	74.9	3.53	2.61	4.04	2.01	1.78	2.30
12	1.41	1.98	1.88	2.19	2.00	4.90	1.38	2.44	3.21	2.22	1.95	2.07
13	1.24	1.98	9.92	2.24	1.98	2.88	1.36	2.44	2.59	2.09	1.83	3.65
14	.87	1.98	14.3	2.28	1.98	4.14	1.51	2.51	2.57	1.98	2.10	2.09
15	.73	2.15	2.42	2.33	1.98	2.90	1.22	2.37	2.34	1.92	2.18	1.98
16	.34	1.86	1.10	2.37	2.12	2.52	1.11	2.66	2.32	2.22	1.76	1.98
17	.20	.82	.56	2.42	3.80	2.26	1.03	2.86	2.42	2.07	1.74	2.26
18	.37	.86	.66	2.46	16.1	2.36	.95	2.81	2.76	1.84	1.72	2.16
19	2.68	.86	2.78	2.51	2.43	2.55	1.06	2.38	2.64	1.76	1.71	1.98
20	2.65	.63	7.42	2.77	1.98	2.39	1.07	2.23	2.56	1.73	1.72	2.14
21	.71	.86	2.98	2.76	1.98	2.51	1.21	2.25	2.96	1.64	1.83	2.31
22	.82	1.01	7.51	2.09	1.97	2.41	1.43	2.20	2.96	1.69	1.74	2.26
23	1.01	1.01	7.38	1.98	1.72	2.31	1.51	2.15	2.30	1.79	1.80	2.57
24	1.01	1.01	3.59	1.98	1.74	2.71	1.60	2.51	2.23	1.73	1.76	2.83
25	1.01	1.01	2.48	1.98	1.46	2.69	2.11	2.71	2.45	1.74	1.95	2.44
26	1.01	1.01	1.70	1.98	1.80	2.75	2.70	2.54	2.27	1.78	1.83	2.08
27	1.35	1.01	1.70	1.98	1.57	2.65	2.50	2.53	2.32	2.47	1.86	2.19
28	1.46	1.01	1.48	1.98	1.58	2.30	2.73	2.76	2.51	1.89	1.80	2.36
29	1.67	.79	1.35	1.96	1.50	8.87	3.02	2.67	2.33	1.95	1.94	2.23
30	1.46	.63	1.65	1.98	------	2.29	3.15	2.67	2.42	2.03	2.11	2.24
31	1.14	------	1.64	54.1	------	1.71	------	2.74	------	2.05	2.07	------
Total	137.78	47.37	96.97	616.08	73.81	362.08	90.39	100.31	80.91	62.72	60.07	68.33
Mean	4.44	1.58	3.13	19.9	2.55	11.7	3.01	3.24	2.70	2.09	1.94	2.28
Max	68.7	3.43	14.3	299	16.1	165	22.7	21.5	4.04	2.77	2.27	3.65
Min	.20	.63	.56	.43	1.46	1.51	.95	2.15	2.23	1.64	1.71	1.98
Acre-Ft	273	94	192	1220	146	718	179	199	160	124	119	136

Wtr Year 2016	Total	1796.82	Mean	4.92	Max	299	Min	.20	Inst Max	2140	Acre-Ft	3560
Cal Year 2015	Total	1729.78	Mean	4.74	Max	352	Min	0	Inst Max	1920	Acre-Ft	3430

GA

Los Angeles County Department of Public Works

Water Resources Division
Records and System Support
900 South Fremont Avenue, 2nd Floor
Alhambra, CA 91803-1331
(626) 458-6167, FAX (626) 979-5436
www.ladpw.org

GROUNDWATER LEVEL DATA UPPER LOS ANGELES RIVER AREA WATERMASTER, FALL 2016

COUNTY WELL NUMBER	MEASURED DATE	REFERENCE POINT ELEVATION (ft)	REFERENCE POINT TO WATER SURFACE (ft)	WATER SURFACE ELEVATION (ft)
3540A	11/14/2016	871.1	31.5	839.6
3561L	11/14/2016	842.2	30.7	811.5
3580C	11/14/2016	803.9	18.8	785.1
3922	11/14/2016	613.1	165.4	447.7
4705	11/15/2016	909.7	99.5	810.2
4806	11/15/2016	844.0	214.8	629.2
4841B	11/28/2016	1046.8	17.6	1029.2
4842A	11/15/2016	1001.5	335.5	666.0
4850L		1141.1	Can't Locate	-
4865		910.5	Can't Locate	-
4905H	11/28/2016	904.8	DRY @ 361.7	-
4936B	11/28/2016	854.7	270.6	584.1
4969B	11/28/2016	680.5	199.3	481.2

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Appendix C

Components of Los Angeles River Flow

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UPPER LOS ANGELES RIVER AREA: COMPONENTS OF LOS ANGELES RIVER FLOW			
2015-16 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:	81,858	(adjusted)	E285-R :Storm, Burbank WRP, Industrial Waste
			F252-R: Storm, Rising Water
I. RECLAIMED WATER DISCHARGED TO L.A. RIVER IN ULARA			
Tillman:	32,175	: Record	
L.A.-Glendale:	10,407	: Record	
Burbank WRP:	4,985	: Record	
Total:	**47,567**		
II. INDUSTRIAL WATER and STORM FLOWS DISCHARGED TO L.A. RIVER IN ULARA			
Upstream of F300-R			
Industrial Water	8	: From F300-R separation of flow	
F168	1,590	(adjusted)	
F118	1,620	(adjusted)	
Storm Flows @300	16,890	Storm flows less F168 and F118	
	20,108		
Between F300-R and E-285			
Burbank OU	15	Burbank Operable Unit	
MTA	21		
Storm Drains and Unaccounted water	2,787	: 6.7 cfs assumes 4,852	
Headworks:	0	: pilot project record	
Western Drain:	42	: From E285-R separation of flow	
Storm Flows @285	3,869		
	6,734		
Between E-285 and F57C-R			
Storm Flows, DryWeather Flow, perennial stream flow, VPWTP @ 252	1,040	: From F252-R separation of flow	
Glendale Operable Unit	445		
Eagle Rock Blow Off	0		
Pollock Treatment	0		
Sycamore Canyon	1,100	Estimated from historic flows	
Storm Drains and Unaccounted water	2,293	: 5.5 cfs assumes 3,982	
	4,878		
Total Part II	**31,720**		
III. RISING WATER IN L.A. RIVER IN ULARA			
Total:	2,571	: See Section 2.3 of the Watermaster's Report	

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Appendix D

Water Quality Data

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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	2015/16 FY	1021	8.1	78	26	97	4.8	-	162	247	93	1.4	0.3	0.1	636	300
State Water Project at Joseph Jensen Filtration Plant (efffluent)	2015/16 FY	711	8.3	35	11	94	2.8	-	114	106	91	3.7	0.7	0.3	415	131
Colorado River/ State Water Project Blend Point at the Plant (effluent)	2015/16 FY	1045	8.1	76	26	104	4.9	-	148	252	102	0.9	0.8	0.1	648	295
LA Aqueduct No 1. Influent	2015/16 WY	490	8.2	32	9.8	55	7.2	12	177	35	34	-	0.9	740	285	119
LA Aqueduct Filtration Plant Influent	2015/16 WY	557	8.0	-	-	-	-	11.4	121	73	69	2.7	0.3	320	353	134
Surface Water																
Tillman Rec. Plant Discharge to LA River	2015/16 FY	-	7.2	-	-	-	-	-	-	126	164	6.2	0.7	0.4	644	166
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	2015/16 FY	-	7.4	-	-	-	-	-	-	203	165	4.6	0.6	0.3	799	302
Groundwater																
(San Fernando Basin - Western Portion)																
4757C (Reseda No. 6) Well Destroyed in 2014	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	-	0.5	0.2	781	314
3851C V0-8/Burbank No. 10	2015/16 FY	730	7.8	89	24	31	4.7	<2.0	290	76	31	23	0.5	0.2	463	323
Glendale OU GN-1	2015/16 WY	940	7.4	110	29	45	4.8	<2	280	150	-	35	0.3	0.2	590	390
(San Fernando Basin - L.A. Narrows)																
3959E (Pollock No. 6)	11/19/2013	971	7.2	92	32	50	3	ND	234	95	42	-	0.3	0.2	444	261
(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)	2014/15 FY	560	7.8	60	12	33	4.4	ND	210	52	24	28	0.2	-	340	200
(Verdugo Basin)																
3971 (Glorietta No. 3)	2015/16 WY	970	7.2	93	34	44	2.9	ND	250	130	0	35	0.2	-	630	370
5069F (CVWD No. 14)	2016	820	7.7	88	32	32	3.1	ND	200	110	75	39	0.3	ND	540	350

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Appendix E

EPA Shallow Zone Contamination Maps

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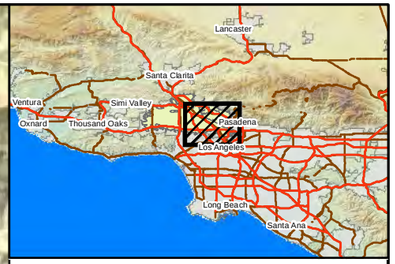

Legend

CrT Concentration

- >1,000 µg/L
- 100-1,000 µg/L
- 50-100 µg/L
- 10-50 µg/L
- Wells with CrT Data
- Data Prior to 2010
- LADWP Production Wells
- OU Extraction Wells
- Treatment Plant
- Area Boundaries
- Freeways
- Roads
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

N

0 0.5 1 2 Miles

Total Chromium (CrT) Contamination in Groundwater (Most Recent Concentration Jan 2010 - Sept 2014)

Contaminants of Concern in Eastern San Fernando Valley

OTIE

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 indicted 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- µg/L = micrograms per liter

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Cr6 Concentration

- >1,000 µg/L
- 100-1,000 µg/L
- 50-100 µg/L
- 10-50 µg/L
- Wells with Cr6 Data
- Cr6 Data Prior to 2010
- LADWP Production Wells
- OU Extraction Wells
- Treatment Plant
- Area Boundaries
- Freeways
- Roads
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

N

0 0.5 1 2 Miles

Verdugo Mountains

Santa Monica Mountains

Burbank Airport

Burbank Treatment Plant

North Hollywood Treatment Plant

Glendale Treatment Plant

Pollock Treatment Plant

Area 1

Area 2

Area 4

Pacoima Wash

Verdugo Wash

Tujunga Wash

Los Angeles River

VAN NUYS BLVD

BRANFORD ST

GLENOAKS BLVD

LAUREL CANYON BLVD

ELLISON AV

FULTON AV

SHERMAN WY

VANOWEN ST

VICTORY BLVD

OXNARD ST

LANKERSHIM BLVD

BURBANK BLVD

MAGNOLIA BLVD

ALAMEDA AV

WESTERN AV

VICTORY BLVD

GLENOAKS BLVD

CALIFORNIA AV

COLORADO ST

GLENDALE BLVD

VENTURA BLVD

VENTURA BLVD

VENTURA BLVD

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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- µg/L = micrograms per liter

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Hexavalent Chromium (Cr6) Contamination in Groundwater (Most Recent Concentration Jan 2010 - Sept 2014)

Contaminants of Concern in Eastern San Fernando Valley

OTIE

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TCP Concentration

- >50 µg/L
- 5-50 µg/L
- 0.5-5 µg/L
- 0.05-0.5 µg/L
- 0.005-0.05 µg/L
- Wells with TCP Data
- TCP Data Prior to 2010
- LADWP Production Wells
- OU Extraction Wells
- Treatment Plant
- Area Boundaries
- Freeways
- Roads
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

N

0 0.5 1 2 Miles

1,2,3-trichloropropane (TCP) Contamination in Groundwater (Most Recent Concentration Jan 2010 - Sept 2014)

Contaminants of Concern in Eastern San Fernando Valley

OTIE

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 indicted 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- µg/L = micrograms per liter

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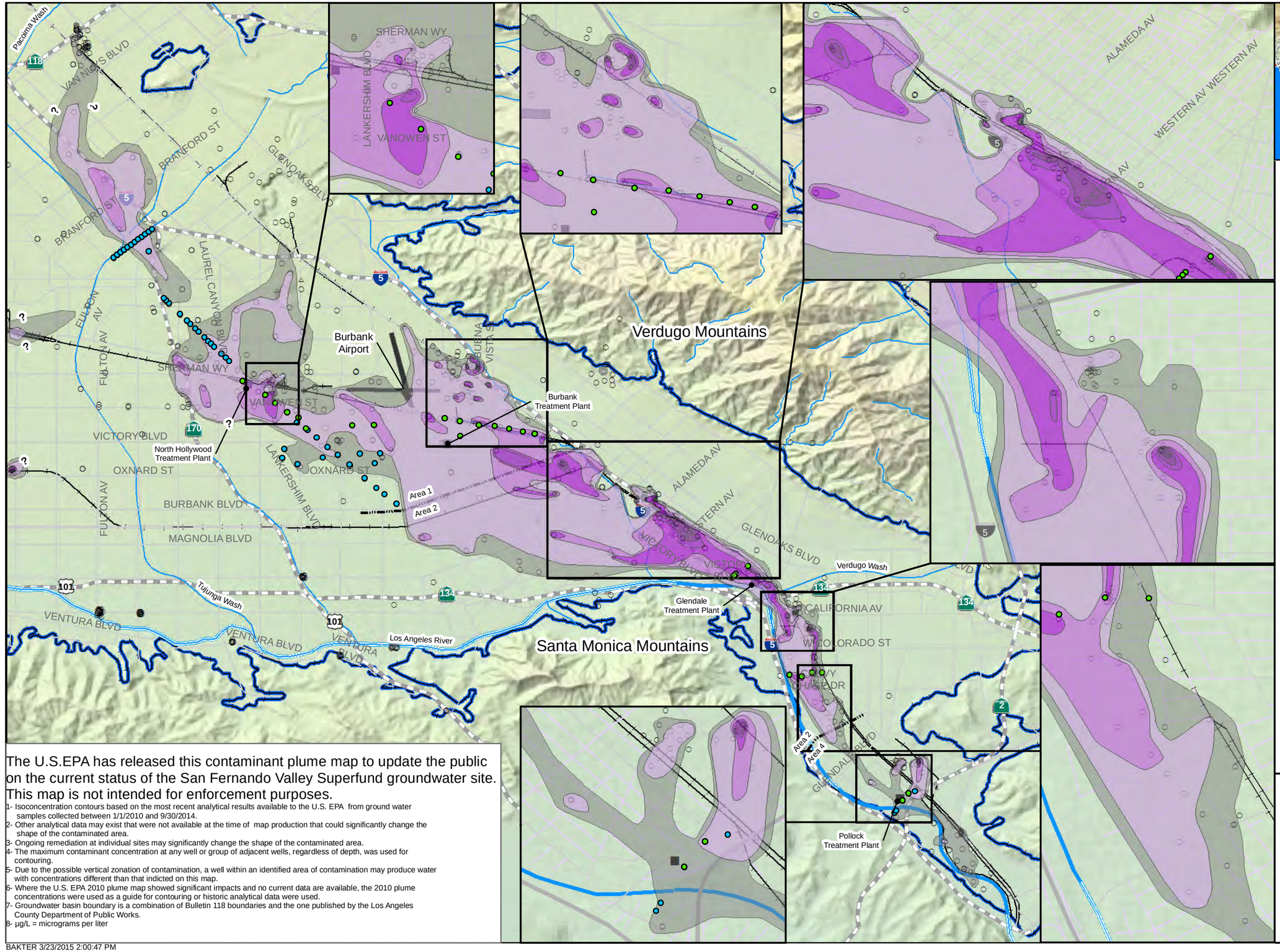

Legend

TCE Concentration

- >10,000 µg/L
- 1,000-10,000 µg/L
- 500-1,000 µg/L
- 100-500 µg/L
- 50-100 µg/L
- 5-50 µg/L
- 0.5-5 µg/L
- Wells with TCE Data
- TCE Data Prior to 2010
- LADWP Production Wells
- OU Extraction Wells
- Treatment Plant
- Area Boundaries
- Freeways
- Roads
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

N

0 0.5 1 2 Miles

Trichloroethene (TCE) Contamination in Groundwater (Most Recent Concentration Jan 2010 - Sept 2014)

Contaminants of Concern in Eastern San Fernando Valley

OTIE

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 indicted 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- µg/L = micrograms per liter

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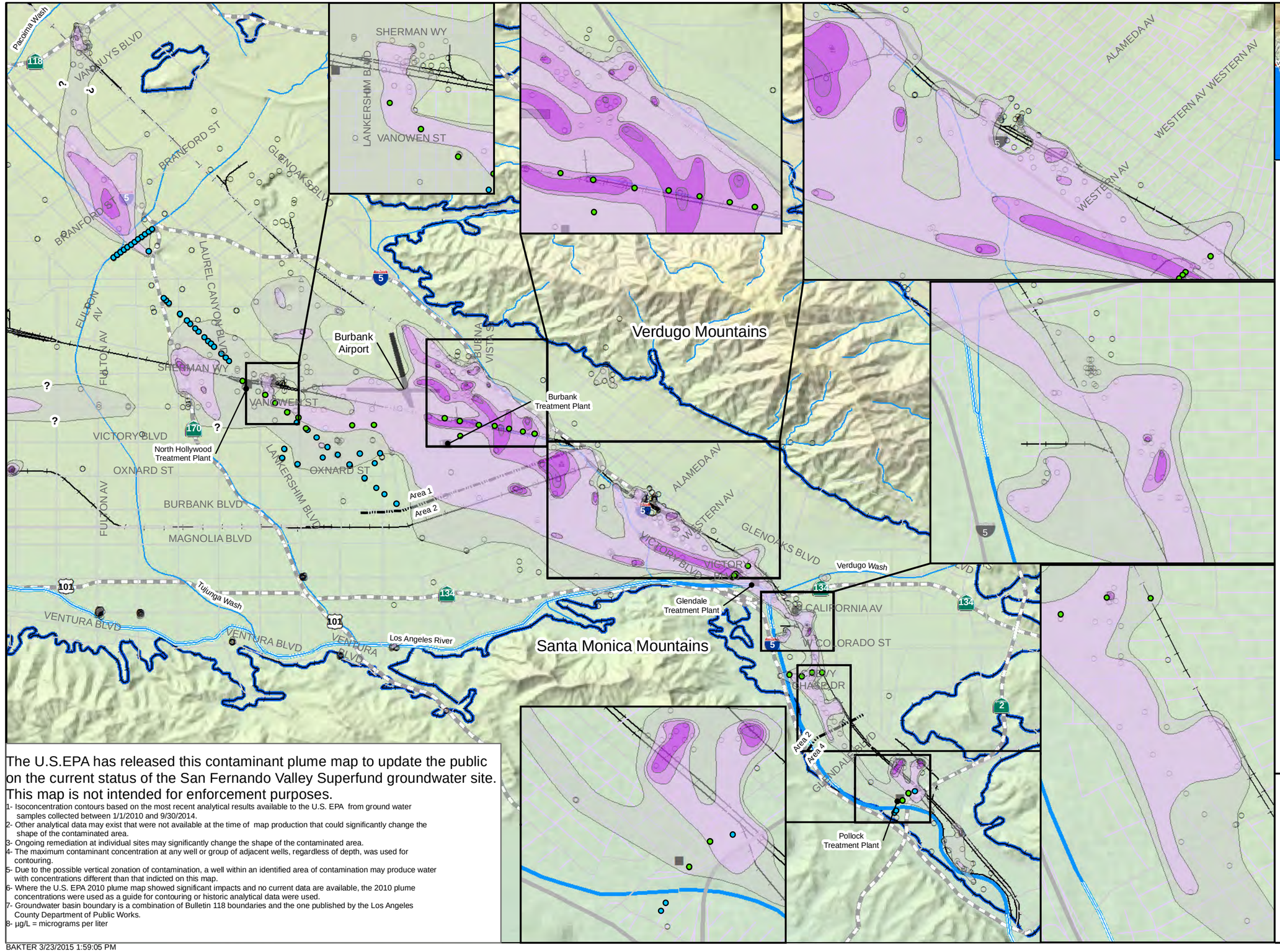

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PCE Concentration

- > 1,000 µg/L
- 500-1,000 µg/L
- 100-500 µg/L
- 50-100 µg/L
- 5-50 µg/L
- 0.5-5 µg/L
- Wells with PCE Data
- PCE Data Prior to 2010
- LADWP Production Wells
- OU Extraction Wells
- Treatment Plant
- Area Boundaries
- Freeways
- Roads
- Railroads
- Streams
- Groundwater Basin Boundary

Los Angeles River

- Unlined
- Lined

N

0 0.5 1 2 Miles

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 indicted 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- µg/L = micrograms per liter

Tetrachloroethene (PCE) Contamination in Groundwater (Most Recent Concentration Jan 2010 - Sept 2014)

Contaminants of Concern in Eastern San Fernando Valley

OTIE

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Appendix F

Summary of Distributed Stormwater Capture Projects

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APPENDIX F - Summary of Distributed Stormwater Capture Projects

(acre-feet)

Agency	Distributed Spreading Facility	WY2015-16 OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
City of Los Angeles [1]														
	Woodman Avenue Median	0.08	0.00	1.58	3.49	0.92	2.41	0.48	0.67	0.00	0.00	0.00	0.00	9.63
	Glenoaks-Sunland	0.05	0.00	0.47	0.62	0.25	0.45	0.23	0.07	0.00	0.00	0.00	0.00	2.14
	Garvanza Park	0.06	0.00	1.36	5.13	1.06	2.49	0.39	0.54	0.00	0.00	0.00	0.00	11.03
	Elmer Avenue/Elmer Paseo	0.06	0.00	1.00	1.42	0.40	0.74	0.23	0.21	0.00	0.00	0.00	0.00	4.06
	North Hollywood Alley Retrofit	0.02	0.00	0.36	0.87	0.23	0.50	0.06	0.14	0.00	0.00	0.00	0.00	2.18
	Sun Valley Park	0.29	0.00	0.27	5.02	1.07	0.78	0.24	0.08	0.00	0.00	0.00	0.00	7.75
	HBT Stormwater Capture Projects	0.01	0.00	0.07	0.27	0.06	0.19	0.02	0.04	0.00	0.00	0.00	0.00	0.66
	City of Los Angeles Total	**0.57**	**0.00**	**5.11**	**16.82**	**3.99**	**7.56**	**1.65**	**1.75**	**0.00**	**0.00**	**0.00**	**0.00**	**37.45**
City of Glendale														
	Harvard Green Street Demonstration Project	0.01	0.00	0.06	0.19	0.04	0.08	0.02	0.02	0.00	0.00	0.00	0.00	**0.41**

1. Distributed facilities spreading figures only account for single-day storm events exceeding 0.1" of rainfall. Values are based on flow telemetry software available at each facility. Figures are reported by LADWP and are modeled estimates based on amount of precipitation and the specific project hydrology.