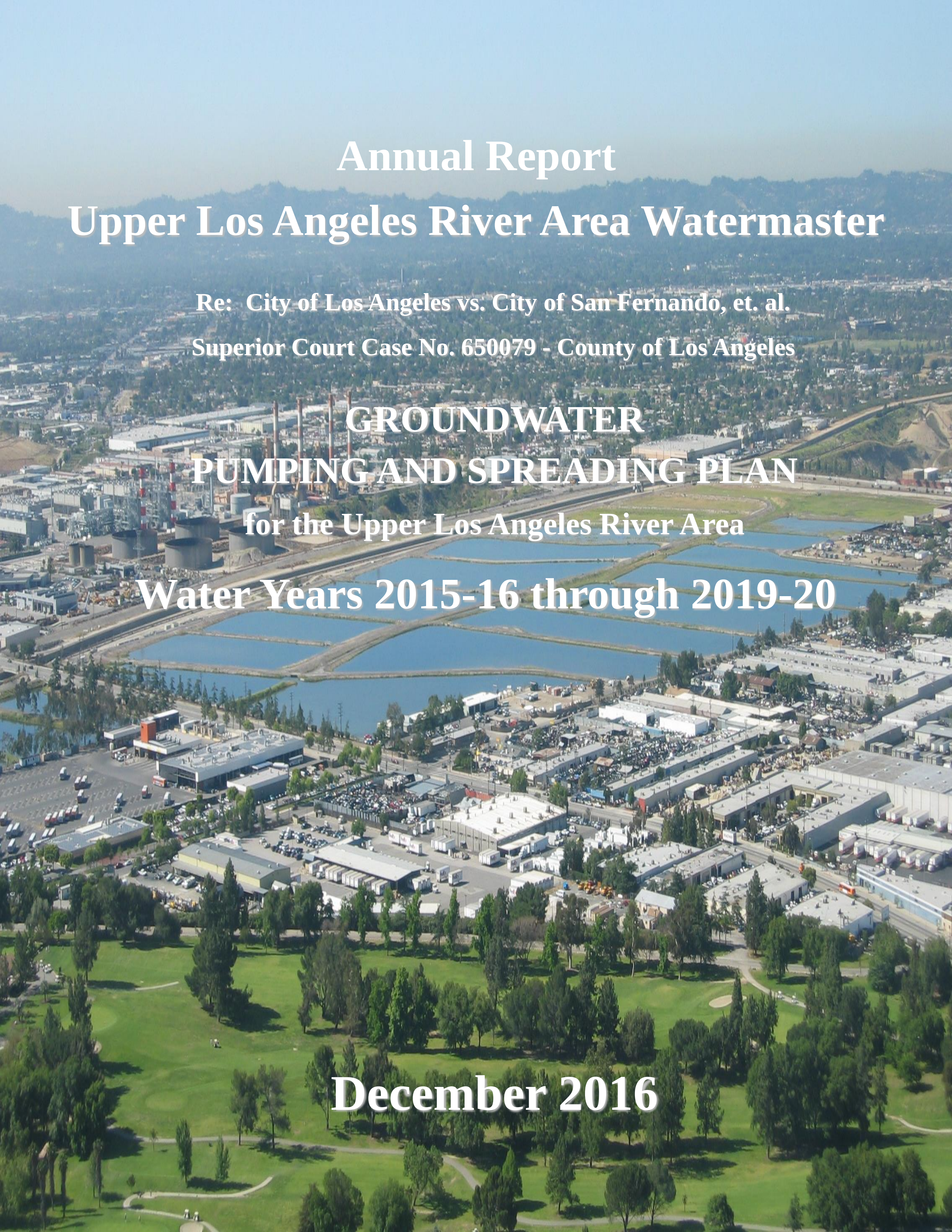

Annual Report

Upper Los Angeles River Area Watermaster

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

Superior Court Case No. 650079 - County of Los Angeles

GROUNDWATER
PUMPING AND SPREADING PLAN

for the Upper Los Angeles River Area

Water Years 2015-16 through 2019-20

December 2016

ANNUAL REPORT

UPPER LOS ANGELES RIVER AREA WATERMASTER

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

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

Water Years 2015-16 through 2019-20
October 2015 – September 2020

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Copies of this report may be downloaded from the
ULARA Watermaster Website (http://ularawatermaster.com).

December 2016

TABLE OF CONTENTS

IX. TABLES

X. FIGURE

XI. PLATES

I. EXECUTIVE SUMMARY

As the Watermaster for the Court-adjudicated Upper Los Angeles River Area (ULARA), I am pleased to submit this Annual Report for the Groundwater Pumping and Spreading Plan for Water Years 2015-16 through 2019-20. Note that this Groundwater Pumping and Spreading Plan is being submitted to the Court later than its anticipated July 2016 filing date. Due to various technical and personnel issues at the Watermaster's office, in conjunction with the delayed receipt of data necessary for analysis and reporting, the report is being provided to the Court in February 2018. However, to avoid confusion with the submittal to the Court of the subsequent Annual Pumping and Spreading Plan for Water Years 2016-17 through 2020-21, this current report has been purposely dated December 2016.

Preparation of this Annual Report is in compliance with Section 5.4 of the Policies and Procedures document (as developed by the original ULARA Watermaster), which established the Watermaster's responsibility for management of the four groundwater basins in ULARA (the San Fernando, Verdugo, Sylmar and Eagle Rock basins). Also provided in this Groundwater Pumping and Spreading Plan, as appendices, are the individual pumping and spreading plans submitted by each of the five major pumping Parties in ULARA (the cities of Burbank, Glendale, Los Angeles and San Fernando, and the Crescenta Valley Water District) for their proposed operations during Water Years 2015-16 through 2019-20. Further, this report discusses the possible changes in recharge, spreading, pumping rates and pumping patterns, especially in relation to the available plans for cleanup of the contaminated groundwater in the eastern portion of the San Fernando Groundwater Basin (SFB).

In this current Water Year which ended September 30, 2016, drought conditions in the State have again continued, and, similar to the previous water year, local stormwater supplies historically used for spreading in the ULARA spreading basins have been adversely impacted. In addition, drought conditions have again resulted in a historically-low allocation of State Water Project (SWP) supplies by the California Department of Water Resources (DWR). The cities of Los Angeles and San Fernando continued to experience pumping difficulties in the Sylmar Basin due to the existence of certain groundwater contaminants; both of these Parties also expect to pump less than their annual entitlements from the SFB. Overall pumping in the SFB is expected to be less than its long-term average during the upcoming water year. However, the cities of Burbank and Glendale are on track to produce more than their adjudicated water rights from SFB. Although, the City of Los Angeles continues to experience considerable challenges with groundwater contamination in the SFB, the City has implemented changes to their system (such as wellhead treatment facilities) that has allowed them to extract more groundwater from the SFB than they have in recent years, in order to offset reduction in SWP deliveries. In addition, work by the City of Los Angeles to construct new and/or replacement water wells in the Sylmar Basin has been ongoing to further increase the supply of local groundwater. For the Verdugo Basin, the Crescenta Valley Water District, due primarily to declining water levels, and Glendale, due to its limited local pumping capacity, expect to produce less than their adjudicated water rights from this basin during Water Year 2015-2016. There are no municipal-supply wells in the Eagle Rock Basin, the smallest of the four separate groundwater basins in ULARA.

Currently, there are five major groundwater cleanup facilities in operation in ULARA; each facility has its own extraction wells and treatment plant. These include: the North Hollywood Operable Unit (NHOU) and the Pollock Wells Treatment Plant, both of which are located in the City of Los Angeles; the Burbank OU (BOU) in Burbank; the Glendale OU (GOU), which includes the Glendale North Extraction Wells and the in Glendale and the Glendale South Extraction Wells in Los Angeles; and the CVWD Glenwood Nitrate Removal Plant in La Crescenta. Glendale operates its grant-funded Weak Base Anion Exchange (WBA) Chromium (VI) Removal facility to remove hexavalent chromium from a portion of the groundwater produced by its OU wells; the WBA facility is located in the GOU. Glendale previously operated a successful demonstration RCF facility within the GOU to remove hexavalent chromium from the groundwater. The City of Los Angeles continues to operate wellhead treatment facilities on a few of its twelve wells at its Tujunga Wellfield in the SFB.

The groundwater model for the SFB, which is updated each year by the Watermaster support group at the Los Angeles Department of Water and Power (LADWP), continues to be used to simulate the combined effects of the projected pumping and spreading operations on groundwater elevations in this basin for the five-year period ending September 30, 2020. As simulated by the model, water levels are projected to increase in some areas of the SFB as a result of the projected future spreading of stormwater and imported MWD water. Some "pumping troughs" or areas of declining water levels are identified as a result of ongoing pumping operations in those areas. Los Angeles has had to reduce its pumping in some of its wellfields in the SFB in response to ongoing water quality concerns regarding the existence of certain contaminants at concentrations that exceed their respective regulatory limits in the groundwater. As a result, LADWP is taking steps to site, design and eventually construct water treatment facilities to treat the contaminated groundwater in an effort to regain the operational capacity of its wellfields over the next several years. In addition, wellhead treatment in the Tujunga wellfield has allowed for increased groundwater extraction from the SFB. Also noteworthy are the simulated groundwater elevation contours in the areas near the BOU wells which appear to show some possible effects of plume containment by those wells. In summary, the estimated cumulative amounts of extraction have been projected to exceed the cumulative amounts of recharge by approximately 70,200 AF over the next five years, as simulated by the LADWP model using projections of future pumping and spreading operations provided by the ULARA Parties for the modeling effort.

In closing, I thank each Party for taking the time and making the effort to provide its individual Spreading and Pumping Plan for the next five Water Years, and express my appreciation to each of those Parties for providing information and data that were essential to the preparation of this Annual Pumping and Spreading Plan document for Water Years 2015-16 through 2019-20. Also much appreciated has been the continued assistance of the Watermaster support group at LADWP (including Mr. Hadi Jonny, Ms. Fatema Akhter, Mr. Greg Reed Ms. Heather Yegiazaryan, and Mr. Chris Repp) in helping with data analyses, modeling and preparation of the figures for this report.

RICHARD C. SLADE
ULARA Watermaster

II. INTRODUCTION

As a result of the groundwater contamination that was detected in certain municipal-supply water wells in the eastern portion of the San Fernando Basin in the late-1970s, the original ULARA Watermaster and Administrative Committee, together with the Los Angeles Regional Water Quality Control Board (LARWQCB), revised (in late-1993) the ULARA Watermaster's Policies and Procedures document to help prevent further degradation of groundwater quality and to help limit the spread of contamination in all four ULARA groundwater basins. The Policies and Procedures document was revised again by that Watermaster in February 1998 to organize the material into a more comprehensive document.

Section 5.4 of the Policies and Procedures requires each of the five municipal-supply purveyors (Parties) in ULARA to prepare its own annual Groundwater Pumping and Spreading Plan for each successive five-year period. These five Parties include the cities of Burbank, Glendale, Los Angeles and San Fernando, and the Crescenta Valley Water District (CVWD). Thus, each of these municipal-supply pumpers is required to annually submit (on or before May 1 of each Water Year) its own Groundwater Pumping and Spreading Plan to the ULARA Watermaster. Each plan is to include the projected groundwater pumping and spreading volumes, recent water quality data for each active water well, and possible modifications planned for key facilities owned/operated by that Party (e.g., constructing or destroying wells, building or modifying treatment plants, etc) for the next five-year period.

The ULARA Watermaster is required to: evaluate the five individual plans in regard to the potential impacts of the combined pumping and spreading activities by all Parties regarding the implementation of the San Fernando Judgment of January 26, 1979; and provide, if needed, recommendations for improving groundwater management and/or for helping to protect groundwater quality in the ULARA groundwater basins. The Watermaster's evaluation and recommendations are to be included in each Annual Groundwater Pumping and Spreading Plan, and the Administrative Committee is to review and approve the plan so that it may be provided to the Court in July of each Water Year.

This Annual Report represents the Groundwater Pumping and Spreading Plan for the five Water Year period of 2015-16 through 2019-20 for ULARA, and it has been prepared pursuant to Section 5.4 of the Policies and Procedures document. This Groundwater Pumping and Spreading Plan provides basic information to the Administrative Committee for use in possibly improving basin management, providing protection of the water rights of each Party, and protecting water quality within ULARA.

III. PLANS FOR THE 2015-16 THROUGH 2019-20 WATER YEARS

A. Projected Groundwater Pumping for 2015-16 Water Year

The estimated pumping capacities of the various municipal-supply water wells owned by each of the five Parties within the San Fernando, Sylmar and Verdugo basins are listed on Table 3-1. Because there are no municipal-supply wells in the Eagle Rock Basin, this small basin is not listed on Table 3-1 and is not discussed further herein. Also shown on Table 3-1 are the number of active wells owned by each Party in each basin, the total number of municipal-supply wells owned by all Parties in each basin, and the estimated pumping capacity of each well (as reported by each Party). Clearly, the SFB has the most Parties (3) and the total largest number of currently active municipal-supply water wells (76); the Sylmar Basin has the fewest number of active wells (4). The number of active wells in each basin is subject to change each year due to various problems, such as water level declines, mechanical problems, and impacts from groundwater contamination.

Table 3-1A has been prepared to show the actual and projected volumes of groundwater pumped by the five Parties for Water Year 2015-16 in the San Fernando, Sylmar and Verdugo groundwater basins. Actual values listed on Table 3-1A represent the specific volumes of groundwater pumped by each Party for the period October 2015 through April 2016, as reported to the Watermaster by the respective Party. Projected values shown on Table 3-1A are the groundwater extractions estimated (or projected) by each Party for the remainder of Water Year 2015-16 (i.e., from May 2016 through September 2016) for each of the three ULARA groundwater basins. As seen on Table 3-1A, the five Parties expect to pump a total of approximately 100,147 acre feet (AF) of groundwater during Water Year 2015-16 from the three ULARA groundwater basins. These total groundwater extractions for Water Year 2015-16 by the five Parties are expected to include 93,624 AF from San Fernando Basin, 3,643 AF from Sylmar Basin and 2,880 AF from Verdugo Basin.

The total volume of groundwater expected to be pumped by all Parties during the current Water Year (100,147 AF) is 9,097 AF less than the long-term historical average extractions from the three basins for the long-term period of WY 1979-80 to 2014-15. The estimated volume of pumping for the next Water Year (2016-17) is shown on Table 3-1B to be 114,142 AF, which is more than the historical long-term (1979-2015) average of 109,244 AF.

As shown on Table 3-1A, the City of Burbank plans to pump 9,560 AF of groundwater from the SFB in the 2015-2016 Water Year; this volume exceeds its annual pumping entitlement from this basin (including extractions by Valhalla Mortuary). Including approximately 57 AF of pumping by Valhalla Mortuary in water year 2015-16, extractions by Burbank will be 1,203 AF less than its five-year average of 10,763 AF, and 3,290 AF higher than its long-term average of 6,270 AF for the period of WY 1979-80 to 2014-15. Burbank's annual entitlement for the 2015-16 Water Year is 3,583 AF, based on its 20 percent import return credit (as reported in the 2014-15 Annual Watermaster Report). Existing and planned extractions by Burbank are required by its US Environmental Protection Agency (EPA)-mandated groundwater clean-up operations by its BOU facilities; the BOU has a total pumping capacity of 9,000 gallons per minute (gpm), which represents about 14,000 acre-feet per year (AF/Y). Burbank can account for its pumping in excess of its annual import return credit by electing to purchase as much as 4,200 AF of Physical Solution water from Los Angeles. Burbank may also purchase and import water from the MWD and store it in the SFB, or deliver that imported water to Los Angeles in exchange for water credits from the city of Los Angeles. Since the completion of the Foothill Feeder connection, Burbank can spread MWD water in the Pacoima spreading grounds, and accumulate credit for the spread water. As of April 2016, Burbank has spread 306 AF of MWD water in the Pacoima spreading grounds during Water Year 2015-2016. In October 2015, Burbank and Los Angeles exchanged 7,200 AF of purchased imported water delivered to Los Angeles for groundwater credits to Burbank. Burbank can also use a portion of its *available* groundwater storage credits, which were 2,072 AF as of October 1, 2015 (Burbank also has an additional 10,730 AF of stored water credits *on reserve*).

CVWD plans to pump 1,710 AF in Water Year 2015-16 from Verdugo Basin; this volume is less than its current full right of 3,294 AF/Y from this basin. This planned pumping by CVWD from Verdugo Basin is 1,105 AF less than its long-term average pumping of 2,815 AF for the period 1979-2015 and 932 AF less than its five-year average of 2,642 AF (2010-2015).

The City of Glendale resumed significant pumping from the SFB when its Glendale Operable Unit (GOU) began operating in September 2000. In the 2015-16 Water Year, Glendale plans to pump 7,693 AF from the SFB; this volume is 196 AF less than its five-year average of 7,889 AF (2010-2015). Glendale's annual water right is 4,192 AF from SFB, based on its 20 percent import return credit for water delivered to its service area within this basin during the 2014-15 Water Year. Glendale has the right to purchase up to 5,500 AF/Y of Physical Solution water from Los Angeles to cover the excess pumping. Glendale can also use a portion of its *available* stored water credits, which totaled 6,027 AF as of October 1, 2015 (Glendale also has an additional 31,208 AF of stored water credits *on reserve*).

In the Verdugo Basin, Glendale plans to pump 1,170 AF in Water Year 2015-16; this volume is 1,020 AF less than its long-term (1979-80 to 2014-15) historical average extractions of 2,190 AF from this basin, and represents a decrease of 433 AF relative to its average pumping during the recent five-year period of 2010-2015 (see Table 3-1B). Glendale has been taking steps to increase its pumping capacity from the Verdugo Basin. Glendale completed the rehabilitation of its Glorietta Well 6 in 2016, and Glorietta Wells 3 & 4 in 2013. In WY 2010-11, Glendale rehabilitated an old, unused well on Foothill Boulevard and connected it to the City's water supply system in mid-2011. Additionally, a new well at the Rockhaven Sanitarium was constructed in mid-2011, but, due to elevated concentrations of nitrate in this portion of Verdugo Basin, this well could not be used immediately. In 2014, the City of Glendale 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 the well will now be conveyed to CVWD's Nitrate Removal Treatment Facility at Glenwood for nitrate removal and disinfection, and will then 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, and work on the Rockhaven Well and its ancillary facilities was completed and the well became operational in March 2016.

In the current Water Year, the City of Los Angeles expects to pump 76,371 AF from the SFB, a volume that is 11,626 AF less than its long-term (1979-80 to 2014-15) annual average of 87,997 AF from this basin, but 28,757 AF more than its average pumping over the past five years (2010-11 to 2015-16). Los Angeles expects to pump 843 AF of groundwater from the Sylmar Basin; this volume is 1,713 AF less than its 1979-80 to 2014-15 average of 2,556 AF from this basin. As of October 1, 2015, Los Angeles' *available* stored water credits were 86,809 AF in the SFB (Los Angeles also has an additional 449,490 AF of stored water credits *on reserve* in the SFB). In the Sylmar Basin, Los Angeles currently has 9,014 AF of "frozen" water credits, or 13,287 AF of credits using the 5-year calculation method.

For WY 2015-16, the City of San Fernando plans to pump 2,800 AF from the Sylmar Basin. This volume is 331 AF less than its average pumping for the past five years and 305 AF less than its long-term average (for 1979 to 2015). San Fernando currently has 404 AF of "frozen" water credits, or 2,304 AF of credits using the 5-year calculation method.

Estimated pumping capacities of the ULARA wellfields are provided in Table 3-1A. Actual and projected amounts of pumping and spreading by the major parties during WY 2015-2016 are shown in Tables 3-1A, 3-1B, and 5-1A.

B. Constraints on Pumping as of 2015-16

CONSTRAINTS ON PUMPING IN THE SAN FERNANDO BASIN

City of Burbank – The USEPA Consent Decree project implemented the Burbank Operable Unit (BOU) treatment facility which became fully operational on January 3, 1996.

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 hexavalent chromium (CrVI) in the groundwater produced by BOU

More information about the BOU can be found via the USEPA website, https://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/BySite/San%20Fernando%20Valley%20(Area%201%20North%20Hollywood%20And%20Burbank)?OpenDocument.

As part of the requirement to close the first consent decree, USEPA required Burbank to demonstrate that the BOU would operate at its design capacity. In the summer of 2010, Burbank successfully completed a 60-day performance test at the BOU operating at 9,000 gpm. To ensure the effectiveness of the remedy EPA monitored water level drawdown and the extent of the cone of depression by conducting a multi-well pumping test for 30 days during the demonstration time frame. EPA used water levels and pumping ratio data monitored during this pumping test to update hydraulic conductivity, transmissivity, and storativity values for the BOU in the Basin-wide groundwater model.

Groundwater extracted by the City of Burbank also contains chromium, which cannot be removed by the BOU or by Burbank's other groundwater treatment facility (the Lake Street GAC Treatment Plant). Currently, the BOU operations are limited by fluctuations in city-wide water demands and blending requirements to manage chromium concentrations. Burbank has been blending the pumped groundwater with imported water to keep the concentration of total chromium at or below 7 micrograms per liter (µg/L). The GAC treatment plant will remain on an active status, but will not be operated except for water quality testing of its wells, and for emergencies.

The City of Burbank currently contracts with the consulting firm of TerranearPMC, for the day-to-day operation of the BOU.

City of Glendale – Construction of the Glendale Operable Unit (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.

The City managed a major research effort on identifying viable treatment technologies for the removal of Cr(VI) from its pumped groundwater. In 2010, Glendale constructed the Weak Base Anion (WBA) Chromium Removal facility to remove Cr(VI) from groundwater pumped from GOU Well GS-3 using WBA exchange technology. The City of Glendale also constructed a 100-gpm demonstration-scale facility next to the Glendale Water Treatment Plant; this facility uses reduction, coagulation and filtration (RCF) technology with microfiltration as an enhancement. These facilities have been effective in removing Cr(VI) in the groundwater to concentrations below 5 μg/L. The Hexavalent Chromium Removal Research Project Report was published on February 28, 2013, followed by a Supplemental Project Report in December 2015..

City of Los Angeles - All wellfields operated by Los Angeles within the SFB have been impacted to varying degrees by groundwater contamination, primarily from volatile organic compounds (VOCs), such as trichloroethylene (TCE) and perchloroethylene (PCE). Further, increasing concentrations of Cr(VI), as well as other emerging chemicals, have been detected in certain water supply wells. This contamination has greatly impacted the ability of Los Angeles to pump groundwater from the SFB. Contaminant concentrations have exceeded the respective Primary MCLs for the VOCs in a large percentage of the active wells operated by Los Angeles. Whereas Los Angeles' five-year pumping plans reflect continued reductions in its groundwater pumping, this City is responding to the challenges of groundwater contamination by pursuing plans to build new facilities for contaminant removal; when completed, these facilities will help restore Los Angeles' ability to pump and serve potable groundwater to its customers.

CONSTRAINTS ON PUMPING IN THE SYLMAR BASIN

City of San Fernando - All of the groundwater pumped by the City of San Fernando is extracted from the Sylmar Basin. To date, VOC contamination has not been detected in any of its municipal-supply wells in this basin. However, two of its wells have pumped groundwater with nitrate concentrations that have exceeded the Primary MCL for nitrate (as NO_3) of 45 milligrams per liter (mg/L). One of these wells (Well 7A) was placed on inactive status whereas the other well (Well 3) has been on stand-by status while awaiting implementation of a nitrate mitigation plan. Old septic systems and past agricultural practices in the region are the likely causes of these elevated nitrate concentrations in the local groundwater. The City of San Fernando selected a consultant to design a nitrate removal system and a new transmission line. Current projections include the installation of a new Envirogen ion exchange nitrate removal unit. That treatment system is expected to come on-line in 2017.

City of Los Angeles - Los Angeles has been unable to pump its full adjudicated water right from the Sylmar Basin due to elevated concentrations of TCE in at least two wells in its Mission Wellfield and also to the physical deterioration of the infrastructure at this facility. To help address these limitations, the City of Los Angeles has implemented the Mission Wells Improvement Project is to rehabilitate and replace its deteriorating groundwater facilities in Sylmar Basin, including installation of three replacement production wells, a few monitoring wells, new piping, pump station upgrades, electrical upgrades, and controls. An application has been submitted to California Division of Drinking Water to permit the operation of Well No. 10, one of the three new production wells in Sylmar Basin. The other three wells, Nos. 7, 8 and 9, will not be operated due to very low production capacity (Well No. 8) or concentrations of TCE which exceed the State Primary Maximum Contamination Level for this constituent. The recently constructed on-site Chlorination Generation System has been permitted and is in operation and Well No. 10 is expected to be operational by 2017.

CONSTRAINTS ON PUMPING IN THE VERDUGO BASIN

Crescenta Valley Water District - All of the groundwater rights of CVWD occur in the Verdugo Basin. Groundwater contamination from VOCs has been negligible to date; however, nitrate contamination is widespread and methyl tertiary butyl ether (MTBE), a component of gasoline, has also been detected in a few CVWD-owned wells. Elevated nitrate concentrations are mitigated in the water supply by treating a portion of the pumped groundwater using anion exchange at the existing Glenwood Nitrate Removal

Plant, and by blending untreated groundwater with treated groundwater and/or with imported MWD supplies in order to meet drinking water standards.

From the initial detection of MTBE in 2005, groundwater pumped by the 12 wells in CVWD's service area has encountered concentrations of this contaminant ranging up to approximately 50 µg/L. In August 2006, concentrations of MTBE increased to values above its Primary MCL of 13 µg/L in Well 7, whereupon this well was immediately taken out of service. In November 2006, the prior ULARA Watermaster responded by establishing the Verdugo Basin MTBE Task Force; task force members included the CDPH, the LARWQCB, the Watermaster, Glendale Water and Power, CVWD, and various oil companies and independent gas station owners in Verdugo Basin. The Task Force had historically been meeting at the CVWD office on a bi-monthly basis to coordinate site-remediation activities among the various responsible parties.

In Water Year 2009-10, CVWD received a grant from CDPH (now known as DDW) under the Drinking Water Treatment and Research Fund for funding the installation of a granulated activated carbon (GAC) water treatment system for removal of MTBE at its Well 5. In February 2011, CVWD performed a pumping test at Well 5 to determine if the MTBE levels would increase during operational pumping activity. The results of the pumping test were that the MTBE concentrations in the groundwater remained steady at 0.20 µg/L. CVWD was given permission by CDPH to place Well 5 back into service in March 2011 and, in addition, CDPH suspended CVWD's grant for funding the installation of the GAC at Well 5. Since the MTBE levels in Well 5 were below their respective secondary or primary MCLs, grant funding was put on hold until such time that the MTBE might increase once again. In WY 2011-12, the grant funding was eliminated by the State. If MTBE levels do rise again, CVWD will have to find a new funding source for the treatment. In Water Year 2014-15, the Task Force did not meet. The Task Force will reconvene at any time MTBE concentrations are higher than 1.0 µg/L in any CVWD well.

Declining water levels in the Verdugo Basin have also affected CVWDs ability to extract groundwater. In Water Year 2012-13, CVWD received a Local Groundwater Assistance (LGA) grant from DWR to perform a feasibility study for stormwater recharge within the Verdugo Basin. The study is a cooperative effort with the City of Glendale, the County of Los Angeles, and other local stakeholders to determine if stormwater can be captured, stored and then recharged at Crescenta Valley County Park. The feasibility study started in August 2013 and work is still ongoing.

City of Glendale - The City of Glendale has made only limited use of its current maximum adjudicated right of 3,856 AF/Y from the Verdugo Basin, due to water quality problems, groundwater level declines, and limited extraction capacity in this basin.

In order to increase the use of its water rights, the City completed construction of the Verdugo Park Water Treatment Plant ("VPWTP") in 1996. This facility treats water from the two low-capacity wells, and from a subsurface horizontal collection system within Verdugo Canyon.

In WY 2010-11, the City completed the rehabilitation of its Foothill Well and constructed its new Rockhaven Well in the Montrose area in a further attempt to increase its extraction capacity from the Verdugo Basin. The Foothill Well was connected to the City's water supply system in mid-2011. The Rockhaven Well was completed and in operation in March 2016, in accordance with the treatment agreement between the City and CVWD. In 2013, the City completed the rehabilitation of Glorietta Wells 3 & 4.

TABLE 3-1: ESTIMATED CAPACITY OF EXISTING WELLFIELDS

Party/Well Field	Number of Active Wells	Number of Standby Wells	Estimated Capacity (All Wells)	
			(cfs)	(gpm)
SAN FERNANDO BASIN				
City of Los Angeles				
Aeration (NHOU)	7	---	2.5	1,122
Erwin	2	---	6.1	2,738
North Hollywood	14	3	55.5	24,910
Pollock	2	---	5.9	2,648
Rinaldi-Toluca	15	---	113.0	50,718
Tujunga	12	---	98.2	44,075
Verdugo	2	---	7.4	3,321
Whitnall	4	---	14.8	6,643
City of Burbank	8	2	24.5	11,000
City of Glendale	10	---	17.0	7,650
TOTAL	76	5	345.0	154,825
SYLMAR BASIN				
City of Los Angeles	2	---	5.0	2,244
City of San Fernando	3	1	8.5	3,800
TOTAL	5	1	13.5	6,044
VERDUGO BASIN				
CVWD	12	---	5.3	2,400
City of Glendale	6	---	5.0	2,240
TOTAL	18	---	10.3	4,640

Note:

A. There are no municipal-supply water wells in the Eagle Rock Basin.

TABLE 3-1A: HISTORIC AND PROJECTED GROUNDWATER EXTRACTIONS 2015-16

(Acre-feet)

Party/Well Field	2015			2016									Total
	Oct.	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
						SAN FERNANDO BASIN							
City of Los Angeles													
Aeration (NHOU)	102	95	95	100	64	94	100	104	68	12	0	0	834
Erwin	0	0	0	0	0	0	0	0	0	0	0	0	-
North Hollywood	847	807	2,369	1,305	1,106	815	526	1,486	775	990	1,057	1,833	13,916
Pollock	333	116	0	0	161	183	176	176	173	184	181	143	1,826
Rinaldi-Toluca	2,327	2,261	1,672	10	1,013	1,899	1,539	2,378	1,498	2,049	1,760	3,214	21,620
Tujunga	3,590	3,293	3,572	2,898	1,970	2,452	2,450	2,500	2,469	2,617	3,355	3,458	34,624
Verdugo	367	240	246	312	445	474	254	490	191	0	0	0	3,019
Whitnall	0	0	0	0	0	64	127	245	96	0	0	0	532
SUB TOTAL City of Los Angeles:	7,566	6,812	7,954	4,625	4,759	5,981	5,172	7,379	5,270	5,852	6,353	8,648	76,371
City of Burbank[A]	920	770	712	579	581	639	600	952	952	952	952	952	9,560
City of Glendale[B]	716	584	605	647	446	462	478	751	751	751	751	751	7,693
TOTAL San Fernando Basin:	**9,201**	**8,166**	**9,270**	**5,851**	**5,786**	**7,082**	**6,250**	**9,082**	**6,973**	**7,555**	**8,056**	**10,351**	**93,624**
						SYLMAR BASIN							
City of Los Angeles	0	0	0	17	154	123	88	177	123	0	0	161	843
City of San Fernando	239	222	205	184	192	196	210	271	271	271	271	271	2,800
TOTAL Sylmar Basin:	**239**	**222**	**205**	**201**	**346**	**319**	**298**	**448**	**394**	**271**	**271**	**432**	**3,643**
						VERDUGO BASIN							
Crescenta Valley Water Dist.	146	148	139	139	157	141	150	138	138	138	138	138	1,710
City of Glendale	92	90	89	88	71	74	120	109	109	109	109	109	1,170
TOTAL Verdugo Basin:	**237**	**238**	**227**	**227**	**228**	**216**	**270**	**247**	**247**	**247**	**247**	**247**	**2,880**
ULARA TOTAL:	**9,677**	**8,626**	**9,702**	**6,278**	**6,360**	**7,616**	**6,818**	**9,777**	**7,614**	**8,073**	**8,574**	**11,030**	**100,147**

Notes:

A. Includes BOU and Valhalla.

B. Includes GOU, Forest Lawn, and Grayson Power Plant

C. Shaded Cells denote projected values

D. There are no municipal-supply water wells in the Eagle Rock Basin.

TABLE 3-1B: HISTORIC AVERAGE AND PROJECTED GROUNDWATER EXTRACTIONS

(Acre-feet)

Party/Wellfield	Historic Average Pumping (AF)		Projected Groundwater Pumping (AF)				
SAN FERNANDO BASIN							
City of Los Angeles	1979-2015[A]	2010-2015[B]	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Aeration (NHOU)	1,186	849	834	1,242	1,242	1,242	8,500
Erwin	4,007	476	0	0	0	0	0
North Hollywood	23,960	11,878	13,916	18,128	18,128	18,128	28,140
Pollock	1,826	2,185	1,826	1,738	1,738	1,738	2,178
Rinaldi-Toluca	24,874	12,620	21,620	26,239	26,239	26,239	22,165
Tujunga	20,836	28,883	34,624	40,315	40,315	40,315	29,017
Verdugo	4,957	1,162	3,019	0	0	0	0
Whitnall	6,351	1,187	532	0	0	0	0
SUBTOTAL City of Los Angeles	87,997	59,240	76,371	87,662	87,662	87,662	90,000
City of Burbank[C]	6,270	10,763	9,560	10,477	10,477	10,477	10,477
City of Glendale[D]	4,311	7,889	7,693	7,720	7,720	7,720	7,720
TOTAL San Fernando Basin:	**98,578**	**77,892**	**93,624**	**105,859**	**105,859**	**105,859**	**108,197**
SYLMAR BASIN							
City of Los Angeles	2,556	880	843	2,172	4,170	4,170	4,170
City of San Fernando	3,105	3,131	2,800	3,250	3,250	3,250	3,250
TOTAL Sylmar Basin:	**5,661**	**4,011**	**3,643**	**5,422**	**7,420**	**7,420**	**7,420**
VERDUGO BASIN							
Crescenta Valley Water District	2,815	2,642	1,710	1,403	1,685	1,825	2,095
City of Glendale	2,190	1,603	1,170	1,458	1,816	1,816	1,816
TOTAL Verdugo Basin:	**5,005**	**4,245**	**2,880**	**2,861**	**3,501**	**3,641**	**3,911**
TOTAL ULARA:	109,244	86,148	100,147	114,142	116,780	116,920	119,528

Notes:

A. In prior reports, the longterm-average included only muncipal well field pumping. Herein, the averages include physical solution pumping for burbank, Glendale and CVWD (but not Los Angeles). Historic pumping averages include wells that are no longer in service.

B. 5-year average. Please note that in the historic report dated July 2011, this 5-year average did not include physical solution pumping.

C. Includes BOU, City pumping, and Valhalla. Valhalla pumping not included in projections after 2013-14. Vallhalla is expected to be using recycled water in lieu of puming beginning sometime during the 2013-14 WY.

D. Includes Forest Lawn, GOU, and Grayson Power Plant pumping.

E. There are no municipal-supply water wells in the Eagle Rock Basin.

IV. GROUNDWATER PUMPING AND TREATMENT FACILITIES

A. Wellfields

As shown on Table 3-1, there are ten municipal-supply wellfields located in the SFB, two in the Sylmar Basin, and two in the Verdugo Basin; there are no municipal-supply wells in the Eagle Rock Basin. Table 3-1, as mentioned previously, also lists the current number of active wells in each basin and the estimated pumping capacity of each wellfield (as reported by each Party). The general locations of wellfields within the SFB are shown on Plate 3.

Table 4-1 has been prepared to summarize the volumes (in AF) of groundwater that have reportedly been pumped and treated in the San Fernando, Sylmar and Verdugo basins by each of the various treatment facilities owned and/or operated by the five Parties in ULARA. The volumes of treated groundwater are listed for the Water Years 1985-86 through 2014-15. As seen on Table 4-1, an approximate total of 547,780 AF of groundwater has been treated during that time period by the eight listed treatment facilities. Table 4-2 lists the volumes (in AF) of groundwater that are projected to be treated at the eight listed (active) treatment facilities for the Water Years 2015-16 through 2019-20. Note that Table 4-2 includes the Rockhaven Nitrate removal plant. As shown on Table 4-2, the Parties report that an approximate total of 299,573 AF are projected to be treated at their existing treatment facilities between Water Years 2015-16 through 2019-20.

TABLE 4-1 HISTORIC AND CURRENT GROUNDWATER TREATMENT

(Acre-feet)

Water Year	Burbank GAC	Lockheed Aqua Detox	Burbank OU	Glendale North/South OU	CVWD Glenwood Nitrate Removal Plant	Los Angeles North Hollywood OU	Los Angeles Pollock Wells Treatment Plant	Los Angeles Tujunga Wells Treatment Plant	Annual Total
1985-86		1							1
1986-87		1							1
1987-88		1							1
1988-89		924							924
1989-90		1,108				1,148			2,256
1990-91		747				1,438			2,185
1991-92		917			847	786			2,550
1992-93	1,205	692			337	1,279			3,513
1993-94	2,395	425	378		1,550	726			5,474
1994-95	2,590		462		1,626	1,626			6,304
1995-96	2,295		5,772		1,419	1,182			10,668
1996-97	1,620		9,280		1,562	1,448			13,910
1997-98	1,384		2,580		1,391	2,166			7,521
1998-99	1,555		9,184		1,281	1,515	1,513		15,048
1999-00	1,096		11,451	979	1,137	1,213	1,851		17,727
2000-01	995		9,133	6,345	989	1,092	1,256		19,810
2001-02	0		10,540	6,567	515	998	1,643		20,263
2002-03	0		9,170	7,508	216	1,838	1,720		20,452
2003-04	0		9,660	6,941	164	1,150	1,137		19,052
2004-05	0		6,399	7,541	782	1,042	1,752		17,517
2005-06	0		10,108	6,777	997	1,766	2,442		22,090
2006-07	0		9,780	7,562	644	1,307	2,231		21,524
2007-08	0		6,817	7,347	660	1,038	2,573		18,435
2008-09	148		9,818	7,148	459	662	1,698		19,932
2009-10	5		10,043	7,300	410	935	2,377	36,623	57,693
2010-11	4		10,394	7,473	592	1,150	3,127	12,200	34,940
2011-12	4		9,993	7,830	447	1,248	2,957	20,648	43,128
2012-13	0		11,387	6,518	488	343	1,629	5,718	26,084
2013-14	1		10,148	7,231	150	968	2,580	38,304	59,382
2014-15	2		10,006	7,025	186	1,132	3,037	10,442	31,830
Total AF	**15,299**	**4,815**	**182,504**	**108,093**	**18,849**	**31,197**	**35,524**	**123,935**	**520,215**

NOTE: Corrections were made herein to totals for the Los Angeles North Hollywood OU for the 2010-11, 2011-12, and 2012-13 water years.

TABLE 4-2 PROJECTED GROUNDWATER TREATMENT

(Acre-feet)

	Burbank GAC	Burbank OU	Glendale North/South OUs [1]	CVWD Glenwood Nitrate Removal Plant	Los Angeles North Hollywood OU	Los Angeles Pollock Wells Treatment Plant	Los Angeles Tujunga Wells Treatment Plant [2]	Annual Total
2015-16	40	9,463	7,273	530	835	1,827	34,622	54,590
2016-17	0	10,477	7,300	550	1,242	1,738	40,315	61,622
2017-18	0	10,477	7,300	500	1,242	1,738	40,315	61,572
2018-19	0	10,477	7,300	500	1,242	1,738	40,315	61,572
2019-20	0	10,477	7,300	500	8,500	2,178	29,017	57,972
TOTAL	**40**	**51,371**	**36,473**	**2,580**	**13,061**	**9,219**	**184,584**	**297,328**

1. Groundwater treatment includes chromium via theWBA Chromium Removal facility and the RCF demonstration project.
2. Treatment plant utilizing GAC wellhead treatment only on Wells #6 and #7 of the twelve extraction wells at Tujunga Wellfield

B. Active Groundwater Pumping and Treatment Facilities

Glendale OU (GOU) – City of Glendale

Construction of the GOU allowed for treated water to be available for delivery in Glendale 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://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/vwsoalphabetic/San+Fernando+Valley+(Area+2+Glendale)?OpenDocument.

Burbank OU (BOU) – City of Burbank

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://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/BySite/San%20Fernando%20Valley%20(Area%201%20North%20Hollywood%20And%20Burbank)?OpenDocument/

GAC Treatment Plant - City of Burbank

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 and remained out of service through the 2007-08 Water Year. The plant saw limited use for non-potable purposes in Water Year 2008-09, and since then it has been used only when necessary to obtain water quality data from the wells. 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.

North Hollywood OU (NHOU) - City of Los Angeles

The North Hollywood Operable Unit (NHOU) began operating in December 1989 in response to elevated concentrations of chlorinated volatile organic compounds (VOCs) including trichloroethylene (TCE) and perchloroethylene (PCE). The NHOU operates by pumping water into an aeration tower where the TCE and PCE are removed from the water by an air stripper. Treated water is chlorinated and 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 wells. An increase in chromium contamination has caused two of the eight extraction wells to be removed as a source of potable water supply.

In September 2009, the EPA recommended enhanced treatment methods, which included hexavalent chromium and 1,4 dioxane, expanding the combined treatment system, and installation of additional monitoring wells and groundwater extraction wells. In 2015, Lockheed Martin Corporation and Honeywell International Inc. prepared and submitted a groundwater Modeling Memorandum to USEPA for the design of the Second Interim Remedy for groundwater remediation at the NHOU. The Second Interim Remedy is intended to upgrade and expand the existing NHOU groundwater supply production well fields, and address treatment of emerging contaminants.

For more information about the NHOU, please visit the following USEPA website: https://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/ViewByEPAID/CAD980894893.

Pollock Wells Treatment Plant - City of Los Angeles

San Fernando Valley (Area 4) is an area of contaminated groundwater covering approximately 5,860 acres near the Pollock Well Field in the City of Los Angeles. This area is part of the San Fernando Basin where groundwater is contaminated with various chlorinated VOCs, specifically trichloroethylene (TCE) and perchloroethylene (PCE).

USEPA completed an interim investigation of the Pollock Well Field 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 Well Field. 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. Emerging contaminants in the

Pollock Well Field include 1,4-dioxane. LADWP plans to upgrade the existing plant to include treatment for 1,4-dioxane.

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.

For more information about Superfund Area 4 and the Pollock Wells Treatment Plant, please visit the following USEPA website: https://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/vwsoalphabetic/San+Fernando+Valley+(Area+4+Pollock)?OpenDocument.

Temporary Tujunga Wells Treatment Study Project (TTW)– City of Los Angeles

Tujunga Wellfield was established in the SFB in 1992 and has utilized 12 production wells to produce groundwater for municipal-supply use. Certain VOCs, like TCE and PCE, were detected in each of the wells. Over time, VOC concentrations increased sharply above their respective Federal and/or State MCLs requiring the shutdown of multiple wells and, at times, the entire wellfield. 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).

Glenwood Nitrate Removal Plant – Crescenta Valley Water District

Groundwater pumped from wells operated by CVWD in the Verdugo Basin often contains elevated to excessive concentrations of nitrate. A portion of the pumped groundwater is treated by ion exchange and then blended with untreated water from MWD and/or imported water to reduce nitrate concentrations to values that are below the Primary MCL for nitrate (as NO_3) of 45 mg/L. In the past few years, the ion-exchange plant has been in operation for the majority of each year to help maximize the use of local groundwater. For the 2014-15 Water Year, the plant was in operation each month to maximize the use of groundwater production and this trend will continue in Water Year 2015/16 unless there are maintenance issues requiring the plant to temporarily discontinue operation. The plant also began to receive water from the Rockhaven well in March 2016.

C. Other Projects

1. Future Groundwater Pumping and/or Treatment Facilities

Groundwater System Improvement Study – City of Los Angeles

In early-2015, LADWP completed groundwater characterization in the San Fernando Basin (SFB) and installed twenty-five new monitoring wells.

In mid-2015, LADWP began the necessary planning for the groundwater basin remediation facilities, which may consist of centralized and localized treatment, to effectively cleanup and remove contaminants from the SFB and restore its beneficial use. Contaminants of concern and proposed treatment will be determined through site-specific remedial investigations and feasibility studies. The four highest-priority basin remediation facilities are anticipated to be operational by 2021. The need for additional remediation facilities will continue to be investigated.

North Hollywood West Advanced Oxidation Processes (AOP) Pilot Project

The UV/AOP Pilot Testing has two phases. Phase 1 will utilize the oxidation from peroxide, chloride, and other background chemicals at flow rates ranging from 10 to 50 gpm. Phase 2 testing increases the flow rate up to 100 gpm and increases the UV dose with the goal of better understanding reactor efficiency.

Other Groundwater Remediation Projects

Many privately-owned, industrial-type properties in the ULARA groundwater basins have been found to have contaminated the soils and/or the groundwater beneath their facilities. Many of these facilities are under Cleanup and Abatement Orders from the RWQCB-Los Angeles; some sites are under the regulatory authority of the State Department of Toxic Substance Control (DTSC). Each known contaminated site typically has soil vapor borings and/or groundwater monitoring wells, and some have extraction wells, treatment facilities, and/or injection wells to help mitigate the spread of contamination. The USEPA has been including Cr(VI) in the quarterly sampling from its monitoring wells in SFB as a step in the eventual containment and cleanup of this contaminant. The RWQCB-Los Angeles has also been evaluating properties and/or facilities in the eastern portion of the SFB for their possible onsite use, storage and/or release of Cr(VI) to the environment over time.

The reader can obtain current information and more details for various contamination and/or cleanup sites within ULARA, 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.

Mission Wellfield Improvement Project

The purpose of the Mission Wells Improvement Project is to rehabilitate and replace deteriorating groundwater facilities in Sylmar Basin, including construction of three replacement production wells, a few groundwater monitoring wells, new piping, pump station upgrades, electrical upgrades, and controls. An application has been submitted to California Division of Drinking Water to permit the operation of Well No. 10, one of the three new production wells in this basin. The other two wells, Nos. 9 and 10, will not be operated due to very low production capacity and TCE concentrations exceeding its State Maximum Contamination Level. The recently constructed on-site Chlorination Generation System has been permitted and is in operation, whereas Well No. 10 is expected to be operational by 2017.

Van Norman Complex Investigation

Two exploratory wells were drilled to approximately 1,500 feet below ground surface on the LADWP Van Norman Complex property to investigate the existence and extent of groundwater within the Saugus Formation. Initial pumping tests from the two exploratory wells produced groundwater with concentrations of total dissolved solids that were in excess of 1,000 milligrams per liter (mg/L). Additional pumping tests will be performed starting in mid-2017 to further evaluate potential aquifer yields and response to various pumping conditions.

2. Dewatering Operations

Temporary Construction Dewatering

Temporary construction excavations, such as for deep subterranean parking structures or pipelines, sometimes require dewatering in areas that have a high (shallow) water table. Groundwater that is discharged from such temporary dewatering operations may, depending on volume, be required to be accounted for by the Watermaster, and the annual groundwater withdrawals by these dewatering activities would be deducted from the local water right holder.

Permanent Dewatering Operations

A few facilities along the southern and western portions of the SFB have deep foundations and subterranean parking structures that have been excavated and constructed into areas of shallow (high) groundwater; these facilities require permanent dewatering. The amount of groundwater pumped at each such facility is required to be reported to the Watermaster. These activities are subject to approval by the affected municipal-supply Party, and the dewaterer is required to pay for the replacement cost of the extracted groundwater. The pumped groundwater is subtracted from the affected Party's water right by the Watermaster.

3. Unauthorized Pumping in the County

There are numerous individuals, primarily within the unincorporated hill and mountain area of ULARA, who are or may be pumping groundwater without reporting the annual volume of production to the Watermaster. This groundwater was adjudicated and, in the opinion of prior Watermasters, is owned by the City of Los Angeles; the volume produced by each pumper is probably small. Working in cooperation with the Los Angeles County Department of Public Health and Los Angeles County Planning, the former Watermaster and LADWP initiated a process to help begin to identify and monitor the water usage of these private pumpers through a water license agreement.

V. GROUNDWATER RECHARGE FACILITIES AND PROGRAMS

A. Agency-Owned Spreading Facilities

There are five active spreading facilities located in the SFB (see Plate 1). The Los Angeles County Department of Public Works (LACDPW) operates the Branford, Hansen, Lopez, and Pacoima spreading grounds, whereas the LACDPW (in cooperation with the City of Los Angeles) operates the Tujunga Spreading Grounds. These spreading facilities are used for spreading native and imported water, when available. Projects are underway to deepen and improve the capacity of these spreading basins and the LACDPW and the LADWP are also working to identify ways to maximize spreading, including possible changes to the operations at each spreading basin. The City of Burbank completed construction of MWD's new Foothill Feeder connection in 2010, which is capable of delivering 50 cubic feet per second (cfs) to the Pacoima spreading grounds, in order to enable Burbank to spread imported water when it is available. These facilities also allow Burbank to direct water to the Lopez spreading grounds. Burbank spread 150 AF of water in the Pacoima spreading grounds in the 2014-15 Water Year and, through April 2016 in this current 2015-16 Water Year, Burbank has spread nearly 306 AF in these spreading grounds.

B. Proposed Spreading Facilities

Rory M. Shaw Wetlands Park

The Rory M. Shaw Wetlands Park, Strathern Wetlands Park Project, consists of stormwater capture and treatment facilities within this 46-acre site, which had formerly been used as a gravel borrow pit. The project includes the construction of detention ponds and wetlands to store and treat stormwater runoff that will then be pumped to Sun Valley Park for infiltration. The project has the potential to recharge an average of approximately 590 AF of runoff per year. The project is currently being designed, and construction is estimated to start in 2017 and be completed by 2020.

C. Actual and Projected Spreading Operations

Table 5-1A shows the recent and projected volumes of native and imported water spread in the San Fernando Basin for the current 2015-16 Water Year. An estimated 3,549 AF of native runoff and imported water are projected to be spread in Water Year 2015-16. This represents a decrease when compared to both the long-term (1968-2015) average of 29,889 AF and the past five-year (2010-2015) average of 31,065 AF. This decrease is due to the historic drought that continues in the region.

TABLE 5-1A RECENT AND PROJECTED SPREADING OPERATIONS, WY2015-16

(Acre-feet)

Month	Basin Operator					Total
	LACDPW				LACDPW and LADWP	
	Branford	Hansen	Lopez	Pacoima[A,B]	Tujunga[A]	
Actual						
Oct-15	12	0	0	0	0	12
Nov-15	13	0	23	226	0	262
Dec-15	44	0	0	16	0	60
Jan-16	233	350	0	504	484	1,571
Feb-16	50	237	0	70	9	366
Mar-16	86	408	0	257	30	781
Apr-16	25	95	0	160	0	280
May-16	27	47	0	0	0	74
Jun-16	14	0	19	65	0	98
Jul-16	15	0	0	0	0	15
Aug-16	15	0	0	0	0	15
Sep-16	15	0	0	0	0	15
TOTAL	549	1,137	42	1,298	523	3,549
2010-2015 Average	555	8,255	911	13,705	7,639	31,065
1968-2015 Average	550	13,121	576	7,378	8,264	29,889

Headworks Spreading Grounds out of service since 1981-82. The average spreading from 1968-69 to 1981-82 was 5,283 AF.

A) Includes native and imported water.

B) Includes water spread via the new Foothill Feeder connection

Precipitation on the valley fill area in the SFB is projected to be about 10.79 inches for 2015-16 compared to the long-term average of 17.31 inches per year; the previous five-year average was 12.01 inches per year.

TABLE 5-1B HISTORICAL PRECIPITATION ON THE VALLEY FILL

(Inches per year)

1968-15	2010-15	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16**
17.31	12.01	24.44	10.81	7.71	6.30	10.79	10.79

** Projected

The estimated capacities (in AF/yr) of the five spreading grounds in the northeastern portion of the SFB are shown on Table 5-2. Also listed for each spreading grounds are: the site operator; the type of facility; the approximate total wetted area; and the storage capacity. As shown, the total maximum capacity of these five spreading grounds is currently on the order of 108,000 AF/yr.

TABLE 5-2 ESTIMATED CAPACITIES OF EXISTING SPREADING GROUNDS

Name of Spreading Grounds	Basin Type	Total Wetted Area (ac)	Capacity (AF/Y)
Operated by LACDPW			
Branford	Deep basin	7	2,100
Hansen	Med. Depth basin	107	35,100
Lopez	Shallow basin	12	3,900
Pacoima	Med. Depth basin	107	24,100
Operated by LACDPW and LADWP			
Tujunga	Shallow basin	83	42,800
	TOTAL:	316	108,000

D. Stormwater Recharge Capacity Enhancements

Background Information

During the 1997-98 Water Year, weighted-average precipitation in the valley-fill and hill-and-mountain areas in ULARA was approximately 225% of normal. This amount of rainfall provided a well above-average volume of stormwater runoff that became available for capture in upstream reservoirs and diversion into existing spreading grounds. In April 1998, a former Watermaster received notice from the LACDPW that spreading at both the Hansen and Tujunga spreading grounds would be temporarily suspended. The reasons for curtailing spreading were that: the water table had risen to a level that threatened to inundate the base of the Bradley-East Landfill near the Hansen Spreading Grounds; and methane gas generated from the refuse was migrating from the Sheldon-Arleta Landfill and into the surrounding neighborhood due to the recharge operations at the nearby Tujunga spreading grounds. At that time, reservoirs in Los Angeles County were full, and thus thousands of acre-feet of surface water runoff had to otherwise be discharged and lost to the ocean. The spreading activities were suspended for at least one month at that time.

In response to this undesirable condition, in May 1998, that former Watermaster formed the Tujunga and Hansen Spreading Grounds Task Force which later became the San Fernando Basin Recharge Task Force. The task force included representatives from the LACDPW, LADWP, Los Angeles Bureau of Sanitation, and the Watermaster. After a series of meetings, the task force developed preliminary mitigation measures to help improve the utilization of both spreading grounds, particularly during years of above-normal runoff and recharge.

The task force met as the Stormwater Recharge Committee for a period of time, and has since become a collaborative effort between LACDPW and LADWP to focus on projects to enhance the recharge capacity of spreading basins in the eastern portion of the SFB. As a result, watershed management groups have been formed within both the LACDPW and LADWP to address the entire cycle of pumping and recharge as an interrelated discipline, and these groups are working in partnership to study and develop solutions to enhance the groundwater supply in the SFB.

LADWP and LACFCD, in cooperation with the City of Los Angeles Bureau of Engineering, Bureau of Sanitation and Bureau of Street Services, continue to partner on, jointly fund, and collaborate on several projects that will enhance the capacity for recharge of native water into the SFB via existing spreading grounds in the eastern portion of this basin.

Below, a list of plans for modifying existing spreading facilities and construction of new facilities to provide expanded opportunities for enhancing the recharge capacity of the SFB and the Verdugo Basin.

<u>Projects</u>

- <u>Hansen Spreading Grounds</u>

Hansen spreading grounds is a 156-acre parcel, located adjacent to the channel of Tujunga Wash and downstream of Hansen Dam. The total wetted area of the spreading grounds is 107 AF with a maximum intake of 600 cfs. These spreading grounds are owned and operated by LACFCD. Improvements to deepen and combine the basins as well as to retrofit and automate the intake structure were completed in January 2013. No additional modifications to the spreading basin are currently proposed. LADWP and LACFCD shared the $8.4 million cost for construction of this project, and it is expected that the project will increase average stormwater recharge by 2,100 AFY.

- <u>Sheldon-Arleta Project – Cesar Chavez Recreational Complex Project (Phase I)</u>

Located adjacent to the Tujunga spreading grounds is the Sheldon-Arleta Landfill, which has caused an environmental concern due to the methane gas that is produced (as a byproduct of landfill operations) and released into the subsurface.

During the spreading of surface water at the adjoining Tujunga spreading grounds, recharge water moving downward through the underlying earth materials displaces the air from voids within the unsaturated soil matrix. The resulting lateral migration of the air mass has the potential to displace methane gas out of the adjacent landfill. In recent years, the methane has occasionally migrated offsite, and elevated concentrations of this gas have been reported at a nearby school. To avoid such occurrences, temporary limitations have been placed on the amount of stormwater that can be spread at the Tujunga spreading grounds.

To mitigate the displacement of methane gas, LADWP, the Los Angeles Bureau of Sanitation, and the Los Angeles Bureau of Engineering completed the replacement of the existing methane gas collection system at the Sheldon-Arleta Landfill with a new gas collection system. This new system enhances the containment of the methane gas within the landfill, restores the historic spreading flow capacity of 250 cfs at the Tujunga spreading grounds, and restores operations at some of the basins closest to the landfill. Construction was completed in 2009 and the three agencies will eventually conduct an evaluation hopefully during the next (substantial) storm season to determine the maximum recharge capacity of the improved facility. It is expected that the project could increase average annual stormwater capture by 3,000 AF, to a total of 5,000 AF, at this spreading grounds.

- <u>Tujunga Spreading Grounds</u>

Tujunga spreading grounds is a 188-acre parcel located along the Tujunga Wash Channel at its confluence with the Pacoima Wash Channel. This spreading facility, which is owned by LADWP and operated by LACFCD, has a total wetted area of 83 acres, a maximum intake capacity of 250 cfs, and a storage capacity of 100 AF.

The Tujunga spreading grounds upgrade project is currently in the construction phase and is expected to be completed by 2018. The scope includes consolidating and deepening existing spreading basins, installing two high-flow rubber dam intakes, and modifying the existing intake to remove sediments. This project is expected to increase regional annual average stormwater recharge by 8,000 AFY

- <u>Pacoima Spreading Grounds</u>

The 169-acre Pacoima spreading grounds surrounds old Pacoima Wash Channel downstream of Pacoima Dam and Reservoir. This spreading facility, which is owned and operated by LACFCD, has a total wetted area of 107 AF, a maximum intake capacity of 600 cfs, and a storage capacity of 530 AF.

LADWP and LACFCD are currently working cooperatively to improve stormwater capture at this facility by upgrading and automating the intake structure and revitalizing the recharge basins. This upgrade project is currently in design, with construction expected to begin in 2017 and be completed by 2019. The LA County Flood Control District is finalizing the Mitigated Negative Declaration documents in the environmental review process. The scope includes consolidating existing spreading basins, excavating sediment to improve infiltration rates, and installing a new automated intake structure. This project is expected to increase regional annual average stormwater recharge by 5,300 AFY.

- Lopez Spreading Grounds

Lopez spreading grounds, owned and operated by the LACFCD, are located downstream of Pacoima Dam. The facility has a total wetted area of 12 AF, a maximum intake of 25 cfs, and storage capacity of 24 AF.

LADWP and LACFCD are currently working cooperatively to improve stormwater capture by upgrading and automating the intake facility and revitalizing the recharge basins. This upgrade project is currently in design, with construction expected to begin in 2017 and be completed by 2019. The scope includes expanding and deepening existing spreading basins, excavating sediment to improve infiltration rates, and improving the intake structure. This project is expected to increase regional annual average stormwater recharge by 480 AFY.

- Branford Spreading Grounds

Branford spreading grounds, owned and operated by LACFCD, are located immediately adjacent to Tujunga spreading grounds, along the Pacoima diversion channel. Most of the water tributary to the Branford Spreading Grounds is urban runoff from Branford Street Channel. The total wetted area of the facility is 7 acres, and it has with a maximum intake of 1,540 cfs and a storage capacity of 137 AF. Average annual recharge for the facility is approximately 550 AF based on LACFCD historical record.

The Branford Spreading Basin Upgrade Project is currently in design, with construction expected to begin in 2018 and be completed by 2019. The scope includes installing a pump to divert water from the Branford Basin into the Tujunga spreading grounds. This project is expected to increase regional annual average stormwater recharge by 597 AFY.

- Big Tujunga Dam Seismic Retrofit

Big Tujunga Dam was constructed by LACDPW in the 1930s primarily as a flood control facility. In the 1970s, a seismic analysis indicated the dam was susceptible to damage from a large earthquake. Since then, the dam has been operated at a reduced capacity for safety reasons.

LACDPW completed a major seismic retrofit of this dam in January 2012 and this effort has also restored its storage capacity for flood control and water conservation. Specifically, the structural improvements to Big Tujunga Dam increased its storage capacity from 1,500 AF to 6,000 AF. This project, which was partially funded by the City of Los Angeles, greatly enhances

LACDPW's ability to retain and manage stormwater for flood protection, water conservation, and environmental restoration.

- <u>CVWD Stormwater Recharge Feasibility Study</u>

CVWD's Verdugo Basin Groundwater Recharge, Storage, and Conjunctive Use Feasibility Study was completed in 2005 and recommended methods for stormwater recharge and storage within this basin. In WY 2012-13, CVWD received a Local Groundwater Assistance (LGA) grant from the Department of Water Resources (DWR) to perform a feasibility study for stormwater recharge within the Verdugo Basin.

The study is a cooperative effort with the City of Glendale, the County of Los Angeles, and other local stakeholders to determine if stormwater can be stored at Crescenta Valley County Park. The feasibility study started in August 2013 and has been ongoing through WY 2014-15. The study is expected be completed in late-2016.

VI. GROUNDWATER INVESTIGATION PROGRAMS

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 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 ULARA adjudication.

Pacoima Area Groundwater Investigation

A significant VOC contaminant plume exists in the groundwater near the intersection of San Fernando Road and the Simi Valley Freeway (118 Freeway) in the Pacoima area of the SFB. This area lies approximately 2.5 miles north of and upgradient from the LADWP Tujunga wellfield; groundwater pumped at this wellfield has experienced increasing concentrations of VOCs over time.

To help characterize the extent and potential migration of contamination in the Pacoima area, LADWP constructed two groundwater monitoring wells in 1997, including: PA-01, approximately 0.5 miles downgradient; and PA-02, approximately 1.25 miles downgradient from the suspected source areas.

The reportedly suspected sources include the Chase chemical (formerly Holchem) and the Black & Decker (formerly Price-Pfister) sites, which are under the jurisdiction of DTSC and LARWQCB, respectively.

Chromium Investigations

The LARWQCB, funded in part with a grant from the USEPA, reviewed a large number of sites for potential hexavalent chromium contamination in the SFB and published its original findings in December 2002. Based on this LARWQCB review, 255 suspected hexavalent chromium sites were identified and inspected. As a result of those inspections, the RWQCB-LA recommended closure (i.e., no further action) for 150 of those sites and the further assessment of the remaining 105 sites. In addition, the RWQCB-LA issued Cleanup and Abatement Orders to several sites, including, among others, B.F. Goodrich (formerly Menasco Aerospace Division), PRC-Desoto (formerly Courtauld), Drilube, Honeywell (formerly Allied Signal), Lockheed (2), ITT, and Excello Plating; it may eventually issue additional orders to several other sites. The Cleanup and Abatement Orders require a responsible party to assess, clean up, and remediate the effects of contamination encountered in the soil and groundwater. Increasing concentrations of hexavalent chromium in the groundwater have caused the shutdown or reduced pumping of several municipal-supply water wells associated with groundwater treatment plants, because those plants were not designed to remove this contaminant (or any other newly-emerging contaminants). Shutdowns of those municipal-supply wells may possibly allow the continued vertical and lateral migration of the VOCs and chromium to other production wells, and also continue to complicate the extraction, management, and delivery of potable water by the Parties within the SFB.

In addition, the Glendale Chromium Operable Unit (GCOU) was established in 2007 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://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/vwsoalphabetic/San+Fernando+Valley+(Area+2+Glendale)?OpenDocument

Tujunga Discovery Project

In 2008, the LADWP, in conjunction with USEPA and DTSC, formed a task force to conduct an inter-agency investigation into groundwater contamination at the Tujunga wellfield. The investigation began with LADWP's comprehensive sampling of eight existing groundwater monitoring wells in the vicinity of this wellfield. Two additional monitoring wells were sampled in December 2009. The lack of VOCs detected in groundwater samples collected from monitoring well TJ-MW-01 suggests that the Sheldon-Arleta landfill, adjacent to the Tujunga wellfield, may not be the source of this contamination.

USEPA's contractor performed soil vapor sampling and limited soil sampling along several miles of transects upgradient of LADWP's Tujunga wellfield. The site-specific soil vapor results indicate low levels of PCE at most of the investigated sites. In early-2010, sediment sampling was conducted in the adjacent Branford spreading grounds to determine whether sediments in this basin might be a source of VOC contamination. Numerous borings were drilled and a large number of soil samples were analyzed for various analytes, including VOCs; however, TCE was not detected in any of these soils samples. Further, sample results showed the presence of acetone and 2-butanone in certain samples, but these may be related to laboratory contamination.

The next stage of the investigation will involve the construction of several new groundwater monitoring wells in the capture zone of the Tujunga wellfield. The locations of these new monitoring wells were prioritized based on data gaps in the existing wellfield. LADWP completed the construction of four new monitoring wells near the Tujunga wellfield between April 2012 and June 2013, and two other monitoring wells were to be constructed in late-2013. USEPA also constructed a monitoring well (TJ-MW-09) in 2013. Construction of these monitoring wells was completed in 2014.

VII. ULARA WATERMASTER MODELING ACTIVITIES

A. Introduction

LADWP continues to support the ULARA Watermaster by performing groundwater modeling of the San Fernando Basin. The purpose of this groundwater modeling is to evaluate the combined effects of the proposed groundwater pumping and estimated groundwater recharge in the SFB projected over a five-year period. The projected pumping volumes used in the model were obtained from the "Water Year 2015-16 through 2019-20 Pumping and Spreading Plans" submitted by each Party pursuant to the provisions established in the revised February 1998 Policies and Procedures report. A copy of the Pumping and Spreading Plan of each Party is included in the appendix of this report.

The groundwater flow model used is a comprehensive three-dimensional computer model that was developed originally for the USEPA during the Remedial Investigation Study of the San Fernando Valley (December 1992). The model is a tool and it has been used herein to estimate the future response to pumping and spreading in the SFB for the five-year period ending September 30, 2020.

The model code, "Modular Three-Dimensional Finite-Difference Groundwater Flow Model," commonly called MODFLOW, was originally developed by the U.S. Geological Survey (McDonald-Harbaugh); this model is currently used to develop the San Fernando Basin Groundwater Flow Model. This model consists of 64 rows, 86 columns, and up to four layers to reflect the varying geologic and hydrogeologic characteristics of the SFB in three dimensions. In the deepest portion of the San Fernando Basin, the model is subdivided into four layers, each layer characterizing a specific depth zone beneath ground surface. The model has a variable horizontal grid that ranges from 1,000 by 1,000 feet in size in the southeastern portion of the SFB, to 3,000 by 3,000 feet in size in the northwestern portion of this basin (Figure 7-1) or where less data are available; LADWP regularly updates this model.

B. Model Inputs

The input data for this model are illustrated in Table 7-1. Table 7-1A provides the various elements of recharge into the San Fernando Basin; recharge occurs from precipitation, delivered water, hill and mountain runoff, spreading, and subsurface inflow. Table 7-1B provides the volumes of groundwater extracted from SFB by each major producer, including the City of Los

Angeles, the City of Burbank, the City of Glendale, and other individual pumpers. Both tables show projected values for the five-year period, from Fall 2015 to Fall 2020, as well as any actual values that have been reported for the first half of the 2015-16 Water Year.

In Table 7-1A, the projected values for percolation and spreading activities were estimated using the long-term average rainfall and recharge amounts, and the resulting estimates were then used as inputs to the model. The projections for 2015-20 include the actual amounts reported for the first half of this current Water Year. The spreading estimates reflect temporary shutdowns during construction of the Tujunga spreading grounds (TSG). Construction to enhance the spreading capacity at the TSG is planned to occur from 2016 through 2018. The anticipated spreading of imported water at the Pacoima spreading grounds (PSG) by the City of Burbank is also included in these projections. Subsurface inflows to the SFB occur from the Sylmar Basin (through the Sylmar Notch and Pacoima Notch) were estimated by the current ULARA Watermaster, Mr. Richard Slade, to be approximately 250 acre-feet per year. The amounts of subsurface inflows from the Verdugo Basin were determined in the 1962 Report of Referee. These values were used as constants in the model throughout the five-year study period.

The volumes for all groundwater extractions shown on Table 7-1B and used as model inputs were obtained from the "Groundwater Pumping and Spreading Plans" submitted by the five municipal–supply producers; a copy of each of these plans is included in the appendices of this report. The total extraction by each wellfield was initially allocated among the individual wells comprising each wellfield, and then a percentage of the pumping allocated to each well was assigned to each model layer based on the percentage of casing perforations considered to be contained within each layer.

The initial head values (groundwater elevations) were derived from the actual data from Water Year 2014-15, and these values set the initial conditions for model analysis for the next five-year period. These initial conditions reflect the decrease in simulated groundwater elevations observed in most areas of the SFB resulting from increased pumping by the wellfields operated by the City of Los Angeles.

At the close of every Water Year, the Watermaster staff at LADWP updates the model input files with the actual basin recharge and extraction data; this activity is performed each year by LADWP and incorporates actual data from as early as 1981.

Table 7-1
MODEL INPUT
San Fernando Basin Recharge & Extractions
2015-2020

Table 7-1A

Projected San Fernando Basin Recharge 2015-20

WATER YEAR	RAINFALL (IN/Y)		SAN FERNANDO BASIN RECHARGE (AF/Y)																	
			PERCOLATION			H&M (A)	SPREADING GROUNDS									SUBSURFACE INFLOW				TOTAL RECHARGE
										PACOIMA										
	VALLEY	HILL & MTN	VALLEY FILL	RETURN WATER	SUB TOTAL	HILL & MTN	BRANFORD	HANSEN (B) (NATIVE)	LOPEZ	PACOIMA (NATIVE)	PACOIMA (C) (MWD)	PACOIMA (TOTAL)	TUJUNGA (D)	SUB - TOTAL	PACOIMA NOTCH (E)	SYLMAR NOTCH (E)	VERDUGO BASIN	SUB - TOTAL	
2015-16	10.79	13.86	7,496	45,342	52,838	2,367	549	1,137	42	1,298	306	1,604	523	3,855	117	133	70	320	59,380
2016-17	17.31	21.37	12,025	50,208	62,233	3,650	540	13,900	540	6,564	7,550	14,114	0	29,094	117	133	70	320	95,297
2017-18	17.31	21.37	12,025	50,208	62,233	3,650	540	13,900	540	6,564	7,150	13,714	0	28,694	117	133	70	320	94,897
2018-19	17.31	21.37	12,025	50,208	62,233	3,650	540	13,900	540	6,564	7,150	13,714	5,100	33,794	117	133	70	320	99,997
2019-20	17.31	21.37	12,025	50,208	62,233	3,650	540	13,900	540	6,564	7,150	13,714	5,100	33,794	117	133	70	320	99,997

Table 7-1B

Projected San Fernando Basin Extraction 2015-20

WATER YEAR	SAN FERNANDO BASIN EXTRACTIONS (AF/Y)																			
	LADWP										BURBANK			GLENDALE			OTHERS		
	AE	ER	HW	NH (WEST)	NH (EAST)	PL	RT	TJ	VD	WH	TOTAL LADWP (F)	BURBANK PSD	LOCKHEED	NON-BURBANK (VMP)	CITY OF GLENDALE	OU-NORTH	OU-SOUTH	TOTAL NON-LADWP	TOTAL NON-GLENDALE (F. LAWN)	TOTAL EXTRACTION
2015-16	-990	0	0	-13,917	0	-1,827	-21,621	-34,622	-3,020	-532	-76,529	-40	-9,463	-57	-20	-4,727	-2,546	-518	-400	-94,300
2016-17	-1,242	0	0	-18,128	0	-1,738	-26,239	-40,315	0	0	-87,662	0	-10,477	0	-20	-4,745	-2,555	-518	-400	-106,377
2017-18	-1,242	0	0	-18,128	0	-1,738	-26,239	-40,315	0	0	-87,662	0	-10,477	0	-20	-4,745	-2,555	-518	-400	-106,377
2018-19	-1,242	0	0	-18,128	0	-1,738	-26,239	-40,315	0	0	-87,662	0	-10,477	0	-20	-4,745	-2,555	-518	-400	-106,377
2019-20	-8,500	0	0	-28,140	0	-2,178	-22,165	-29,017	0	0	-90,000	0	-10,477	0	-20	-4,745	-2,555	-518	-400	-108,715

NOTES:

(A) Hill & Mountain runoff

(B) Hansen Spreading Grounds activated in the water year of 2009-10 after completing the modification work

(C) Burbank projected to spread between 7,150 to 7,550 AF of imported water (MWD) at Pacoima Spreading Grounds on a yearly basis.

(D) Tujunga Spreading Grounds will be out of service during the water years of 2016-18 for modifications to increase storage capacity

(E) The values were estimated on the updated Safe Yield for the Sylmar Basin by Mr. Richard Slade, the Watermaster of Upper Los Angeles River Area.

(F) The values shown for Los Angeles on this extraction plan are estimates only. The estimated groundwtaer pumping amounts for the above-mentioned wellfields may be increased as treatment faculities are installed or as the blending with external source of water will continue to be allowable.

C. Simulated Groundwater Elevations and Flow Directions

After running the model for five separate but successive stress periods (Water Years 2015-2020), each lasting 365 days, MODFLOW generated various numerical data, including the heads (groundwater elevations), the drawdown (change in groundwater elevations), and the cell-by-cell flow (vector or flow direction data). These numerical data were used to create the following figures and plates:

- The simulated groundwater (water table) contour results for Model Layer 1 for Fall 2020 are shown on Plate 1; the simulated contours for Model Layer 2 are shown on Plate 2 for the same period.

- The changes in the simulated groundwater elevation contours were generated from the drawdown data from the Fall 2015 to Fall 2020 stress period and the results are shown on Plate 3 for Layer 1 and on Plate 4 for Layer 2.

- The simulated horizontal groundwater flow directions for Fall 2020 are shown on Plate 5 for Model Layer 1 and on Plate 6 for Layer 2 for the same period.

- Plates 7 through 10 depict the most recently generated contaminant plumes for TCE, PCE, NO_3, and total dissolved chromium (as adapted from 2014-dated work published by the USEPA), superimposed onto the Layer 1 simulated horizontal groundwater flow direction for the year 2020.

D. Evaluation of Model Results

Plate 1: Simulated Groundwater Contour Model Layer 1 – Fall 2020

- The most noticeable feature of the simulated groundwater contours shown on Plate 1 is the cone of depression (pumping cone) that has developed around the BOU. The extractions by this facility occur primarily from Layer 1, although Layer 2 does provide some recharge to Layer 1. Burbank has projected pumping of about 10,477AF/Y from its BOU for the period from Fall 2015 to Fall 2020. The radius of pumping influence is shown to extend as far as 5,500 feet in the downgradient (southeasterly) direction from the BOU wells. The upgradient radius of influence is usually larger than the down-gradient radius of influence.

Plate 1 illustrates the more subtle pumping influence of the GOU wells, and the Pollock Treatment Plant Wells.

Plate 2: Simulated Groundwater Contour Model Layer 2 – Fall 2020

- The most significant features of the simulated groundwater contours shown on Plate 2 are the simulated cones of depression near the Tujunga wellfield, Rinaldi-Toluca wellfield, North Hollywood wellfield and the BOU. Approximately 75 percent of the groundwater pumped from the Tujunga, Rinaldi-Toluca and North Hollywood wellfields is from model Layers 2, 3 and 4.

Plate 3: Change in Groundwater Elevation Model Layer 1 – Fall 2015 to Fall 2020

In general, the model simulation showed a decrease in groundwater elevations in most areas of the basin, particularly in areas near the wellfields. This decrease in simulated water levels would result mostly from the difference between the increase in groundwater extractions in the groundwater basins and the relatively low volumes of groundwater recharge that were simulated during the five years of model simulation.

The estimated total groundwater extraction during the five years of simulation exceeds total recharge volume by about 72,539 AF, cumulatively. The items below provide a more detailed review of Plate 3:

- The area in the vicinity of the Tujunga spreading grounds (TSG) shows a decrease in simulated water elevations of about 20 feet, as a result of increased pumping activities at the Tujunga well field and reduced spreading at the nearby TSG.

- The area in the vicinity of Hansen spreading grounds (HSG) shows an increase in simulated groundwater elevations of about 20 feet.

- The increase in simulated groundwater levels from 2015 to 2020 in the vicinity of the Pacoima spreading grounds (PSG) is due to the proposed spreading of imported water by Burbank (7,150 AF/Y) in addition to the normal recharge of native surface water by the Los Angeles County Department of Public Works (LACDPW).

- The simulated groundwater elevations within the cone of depressions created by the Rinaldi-Toluca and North Hollywood West wellfields were shown by the model to decrease by about 30 and 50 ft, respectively. This simulated reduction in water levels in areas near these wellfields would result from the proposed pumping anticipated by the City of Los Angeles.

- Groundwater elevations near the Erwin, Whitnall and Verdugo wellfields were simulated to decrease by 15 to 40.

- The simulated groundwater elevation near the Burbank OU showed an expected decrease by about 30 feet and the groundwater elevation near the Glendale North OU was projected to decrease by 5 feet from 2015 to 2020.

Plate 4: Change in Groundwater Elevation Model Layer 2 – Fall 2015 to Fall 2020

- Similar to Model Layer 1, Plate 4 illustrates much of the same decreases in simulated groundwater elevations in Model Layer 2 which would also result from the increased pumping during the five years of the model scenario.

- The model simulated a decrease in the groundwater elevations by 30 to 45 feet in the area near the Rinaldi-Toluca and North Hollywood-West wellfields. Simulated groundwater elevations in the area near the Erwin, Whitnall and Verdugo wellfields were projected by the model to decrease by 15 to 40 feet.

Plate 5: Simulated Groundwater Flow Direction Model Layer 1 – Fall 2020

- Plate 5 consists of groundwater flow direction arrows superimposed on the simulated groundwater elevation contours to illustrate the general (or regional) direction of groundwater flow within Layer 1 of the model.

- Groundwater pumped at the Rinaldi-Toluca, Tujunga, North Hollywood, GOU, and BOU wellfields and water spread at the Hansen, Pacoima and Tujunga spreading grounds caused the most pronounced effect on the direction of groundwater flow in the SFB. In particular, the BOU may create such a significant cone of pumping depression that groundwater appears to flow inward toward the wellfield from all directions (radial flow).

- A groundwater divide apparently develops south of the Burbank OU wells. This appears to be primarily due to the ‘pumping trough” formed by the pumping at the BOU.

Plate 6: Simulated Groundwater Flow Direction Model Layer 2 – Fall 2020

- Plate 6 consists of groundwater flow direction arrows superimposed on the simulated groundwater elevation contours to illustrate the general or regional direction of groundwater flow within Layer 2 of the model.

Plates 7 – 10: Simulated Groundwater Flow Direction and TCE, PCE, NO_3, and Chromium (Cr) Contamination in Model Layer 1 – Fall 2020

- Plates 7 through 10 depict the most recent TCE, PCE, NO_3, and Cr contaminant plumes available from the work of USEPA (as of 2014), and these plumes are superimposed onto the horizontal direction of groundwater movement in Layer 1 for Fall 2020. The BOU appears to contain most of the 1,000 to 5,000 μg/L TCE and PCE plumes and a large portion of the 0-5, 5-50, 100-500, and 500-1,000 μg/L TCE and PCE plumes. The uncaptured portions of these plumes are likely to continue migrating in a southwesterly direction toward the Los Angeles River Narrows area and toward the Glendale OU.

- Pumping by the Burbank OU (10,477 AF/Y) tends to flatten the horizontal gradient in a southeasterly direction and slows the natural movement of groundwater southeasterly of the plume in the area of the Burbank OU.

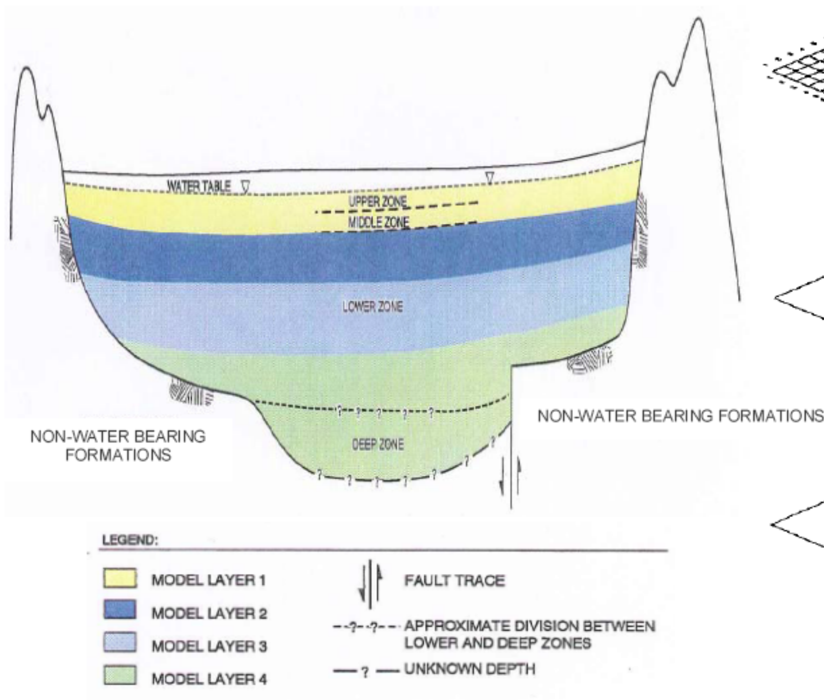
- Wells in the Glendale NOU and SOU capture a portion of the plume(s) that is (are) not captured by the Burbank OU wells. Glendale OU wells also capture the plume up gradient and within the radius of influence of these wells.

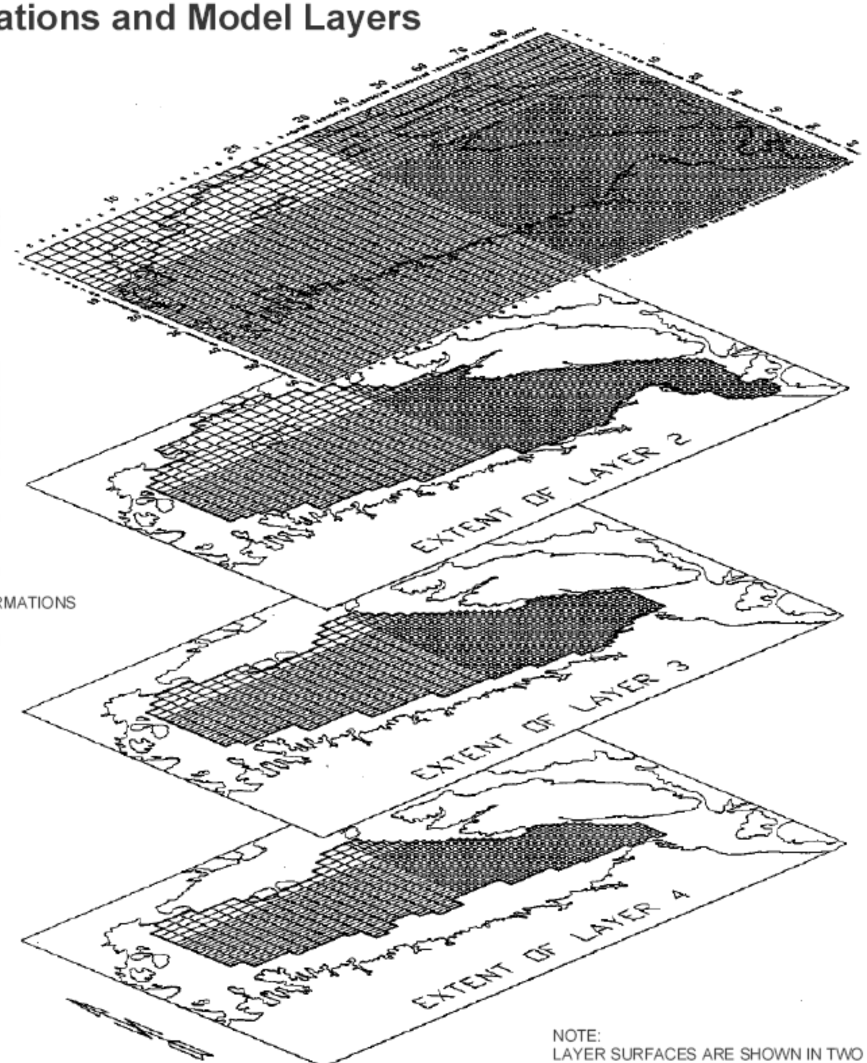
- Pumping by the Pollock wells (2,178 AF/Y) appears to have little effect on Layer 1 because approximately 75 percent of the pumping by this facility extracts groundwater from the zones within Layer 2.

- Plate 9 (NO_3 Contamination) indicates that Layer 1 extractions by the NHOU, BOU and GOU wells may be impacted by NO_3.

- Plate 10 (Total Dissolved Chromium) indicates that Layer 1 extractions by wells in the NHOU, BOU, and the north and south GOUs, and Pollock Wells may be impacted by the chromium plume(s).

Figure 7.1: Cell Configurations and Model Layers





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

VIII. WATERMASTER EVALUATION AND RECOMMENDATIONS

The Parties to the Judgment continue to explore ways to increase groundwater recharge in the ULARA groundwater basins. In an effort to increase stormwater recharge in SFB, the City and County of Los Angeles initiated and continue to fund an ambitious and very important program to increase the recharge capacity in several of the local spreading grounds; the City of Los Angeles also continues to investigate additional alternatives to increase water conservation. This Watermaster commends the City and County of Los Angeles for these vital efforts. The City of Burbank has continued spreading imported water in the basins when possible to increase basin recharge, and CVWD is continuing to work independently and with the City of Glendale to perhaps try to implement stormwater capture programs to increase recharge in the Verdugo Basin. Further, Burbank, Glendale and Los Angeles continue to expand their recycled water programs to offset groundwater and imported water use.

VOC contamination continues in conjunction with newly-discovered contaminants (such as 1,4 dioxane) in some areas continue to be the most serious challenge to water quality and to the ability of the Parties to pump their water rights (without treatment) from the SFB. The various contaminant plumes are large and continue to migrate, despite years of groundwater remediation and treatment. For example, the VOC plumes in North Hollywood have not been completely controlled by the extraction wells in the NHOU, due in large part to declining groundwater levels which have resulted in the reduced pumping capacity of those extraction wells. It is encouraging to see USEPA's proposed Second Interim Remedy for the NHOU which entails facility improvements to increase its peak pumping capacity to as much as 4,000 gpm (3,050 gpm on average). Although the planned implementation of these improvements is several years away, this Remedy should eventually help remove additional contaminant mass and control contaminant migration in the nearby plume(s). The BOU has undergone several capital improvements and that facility now operates with much greater reliability to pump and treat VOC-contaminated groundwater near its 9,000 gpm design capacity on a consistent basis.

The Watermaster continues to monitor and be concerned with detections of hexavalent chromium in several production wells in the eastern portion of the SFB. Currently, none of the existing water treatment plants are capable of removing this contaminant. As Watermaster, I continue to support an aggressive approach by regulatory agencies including USEPA, LARWQCB, and DTSC in identifying the various sources of this contaminant and in requiring effective, efficient and timely cleanup by the responsible parties. The Watermaster appreciates Glendale's lead in the development of chromium treatment technology in the area and in the construction of its Chromium (VI) Removal Demonstration Facilities.

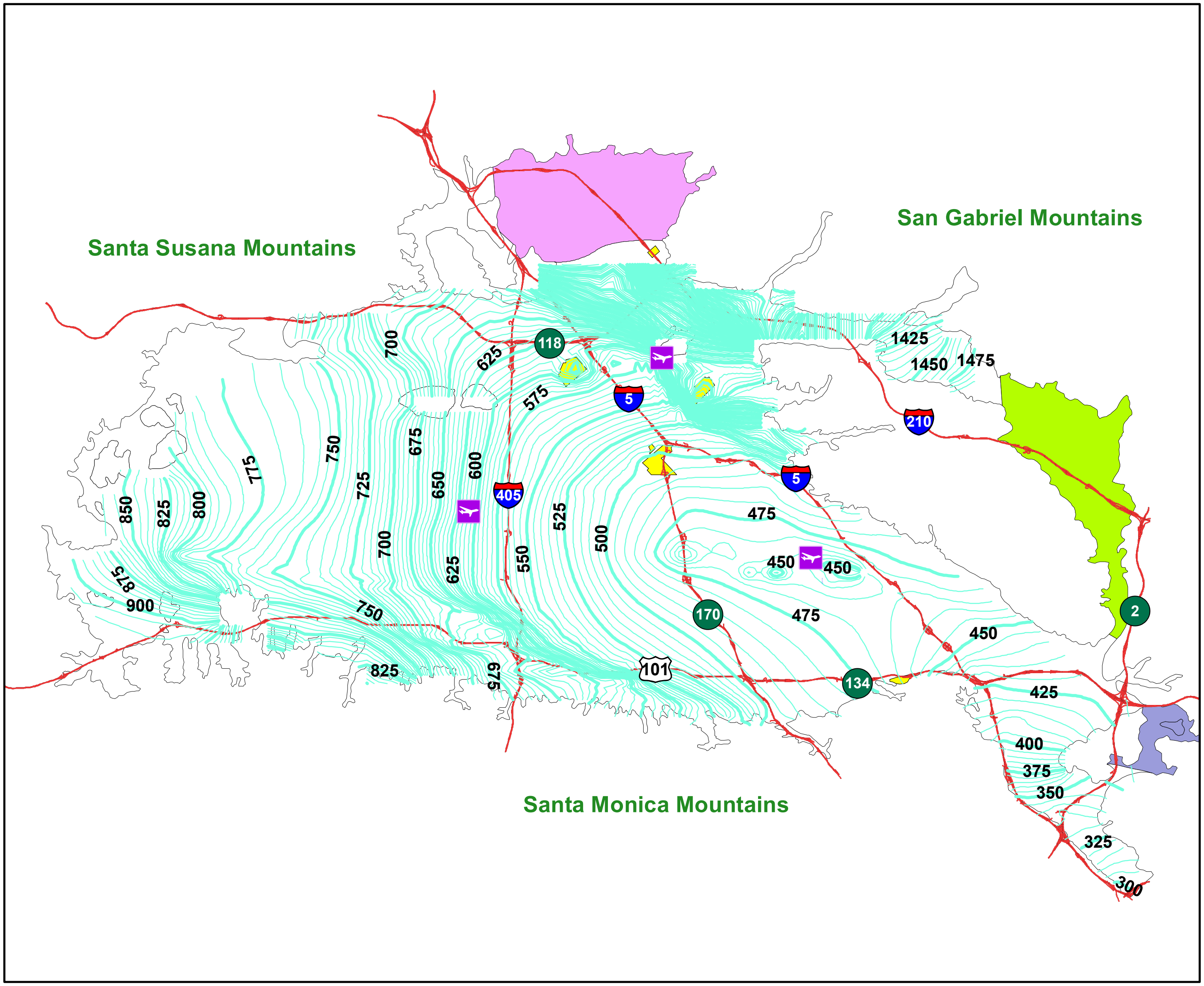
Due to the geologic conditions in Verdugo Basin and the presence of local bedrock constrictions, groundwater tends to rise to ground surface near the Verdugo Wash Narrows and eventually leaves this basin as surface outflow. Glendale is currently unable to pump its full right from the Verdugo Basin, but by rehabilitating one of its previously-abandoned wells and constructing a new municipal-supply well, Glendale has taken steps to increase its use of groundwater from this basin and help reduce the continued groundwater outflow from this basin. The Watermaster commends the ongoing efforts of Glendale to increase its pumping capacity and also the efforts of CVWD to its ongoing evaluation of potential stormwater recharge projects in Verdugo Basin.

The Parties should continue to expect to face significant challenges to both the availability and quality of the groundwater in the ULARA groundwater basins during the next five water years. It is the opinion of this Watermaster that, over the forthcoming years, it will be essential for the continuing safe yield operation of the ULARA groundwater basins to continue to: provide more recharge at existing spreading basins; define and implement new locations and/or other methods (such as the use of injection wells) for recharging these groundwater basins; and actively pursue the possible spreading of recycled water in existing spreading basins in the northeastern side of the SFB in order to augment groundwater recharge that occurs naturally during the rainy season each year in those existing spreading basins.

PLATES

PLATE 1

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2015-2020 Water Years



LEGEND

Groundwater Contour

Spreading Grounds

Airport

Groundwater Basins

San Fernando

Sylmar

Verdugo

Eagle Rock

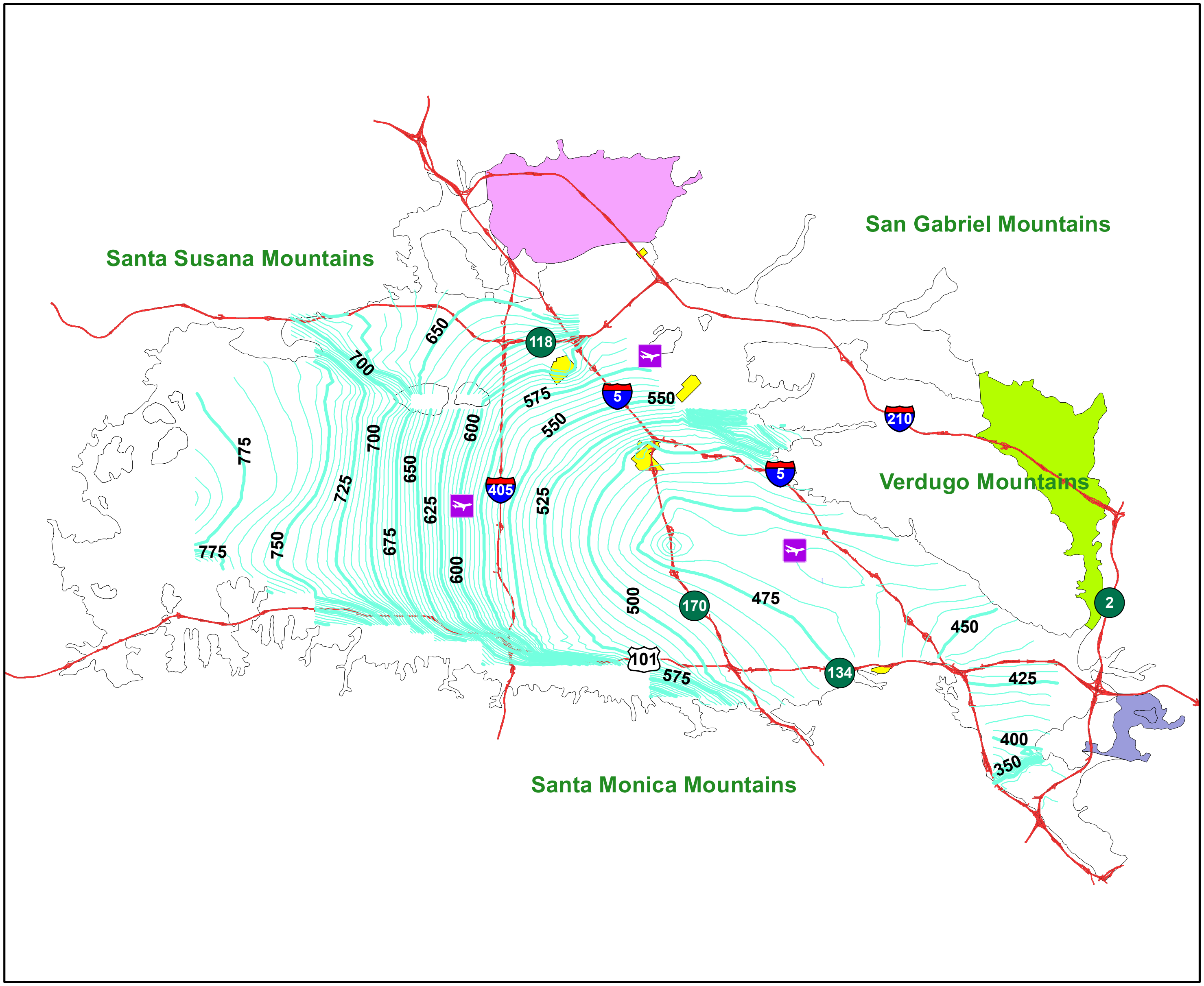
N

2 0 2 Miles

Simulated Groundwater Contour - Model Layer 1
Fall 2020

PLATE 2

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2015-2020 Water Years



LEGEND

Groundwater Contour
Spreading Grounds
Airport

Groundwater Basins

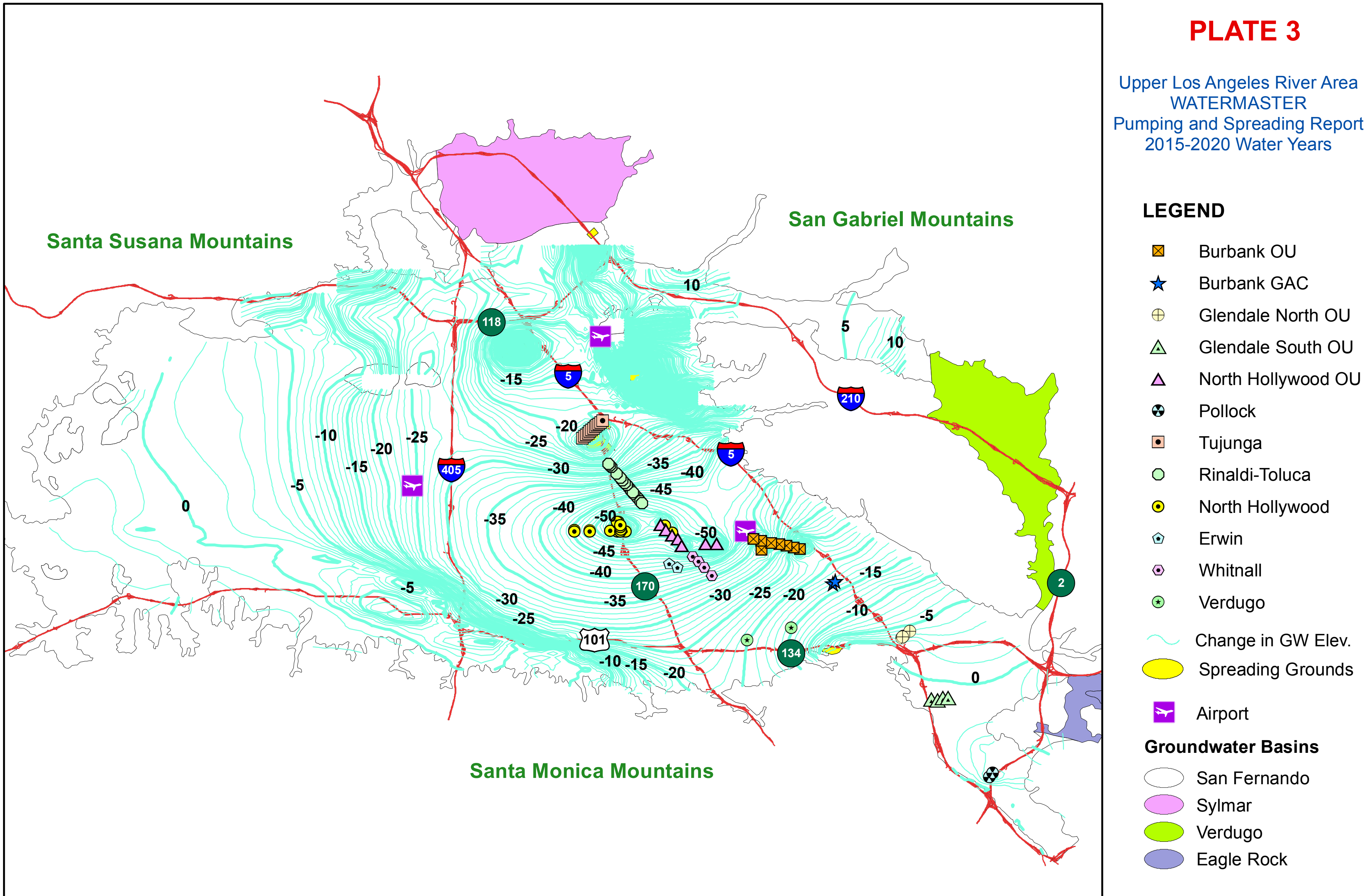
San Fernando
Sylmar
Verdugo
Eagle Rock

N
2 0 2 Miles

Simulated Groundwater Contour - Model Layer 2
Fall 2020

PLATE 3

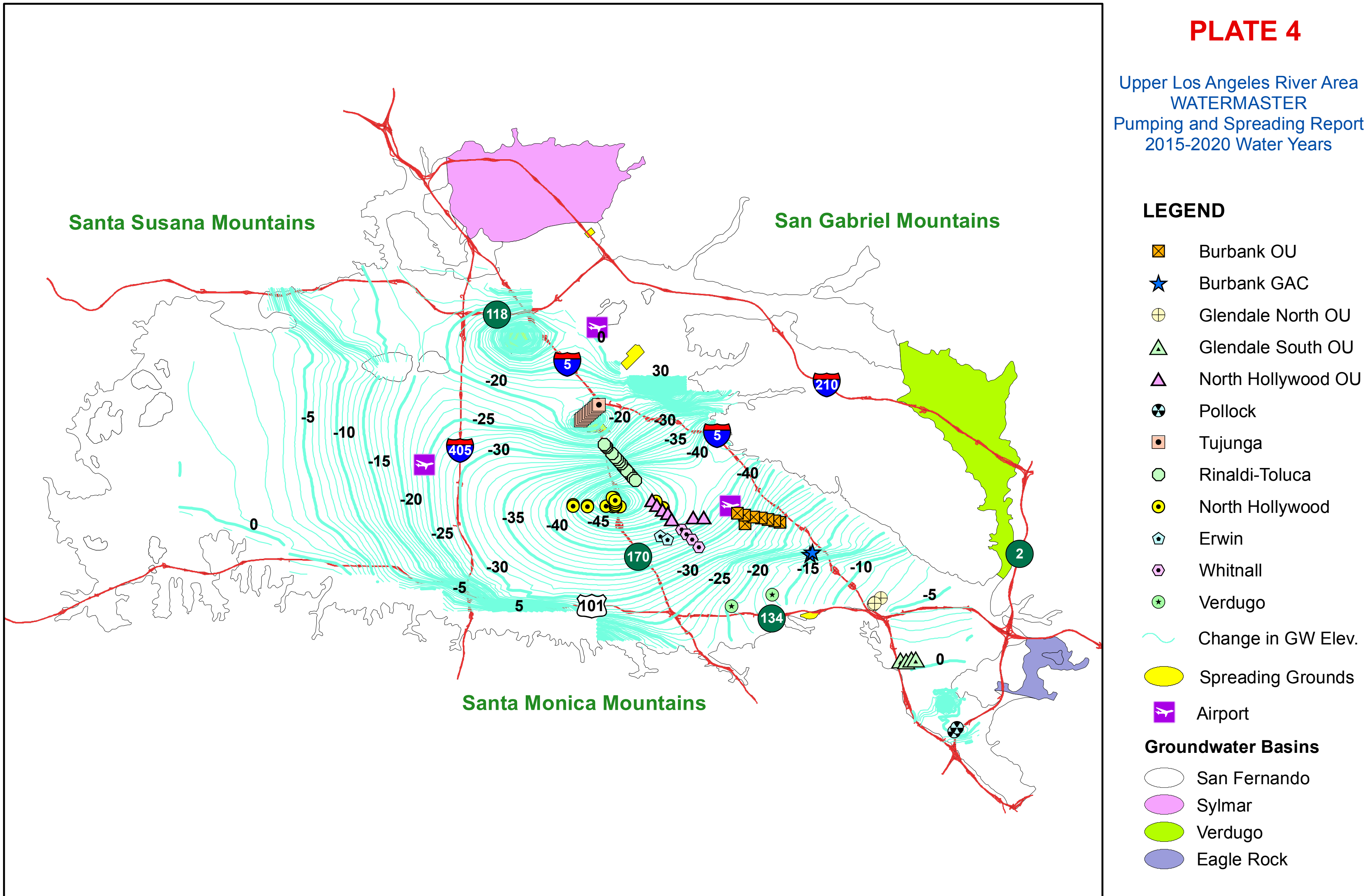
Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2015-2020 Water Years



Simulated Change in Groundwater - Model Layer 1
Fall 2015 - Fall 2020

PLATE 4

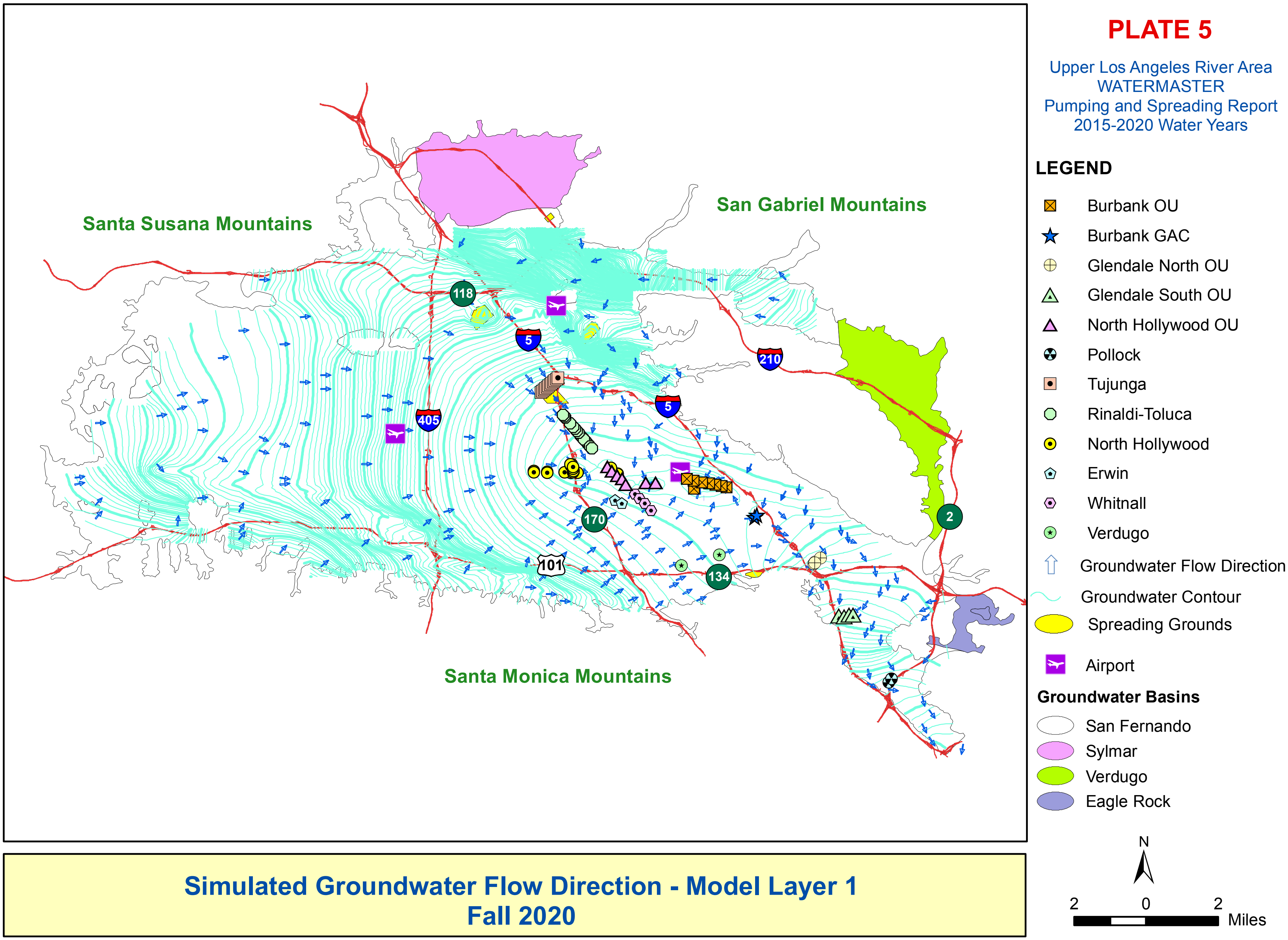
Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2015-2020 Water Years



Simulated Change in Groundwater - Model Layer 2
Fall 2015 - Fall 2020

PLATE 5

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2015-2020 Water Years



Simulated Groundwater Flow Direction - Model Layer 1
Fall 2020

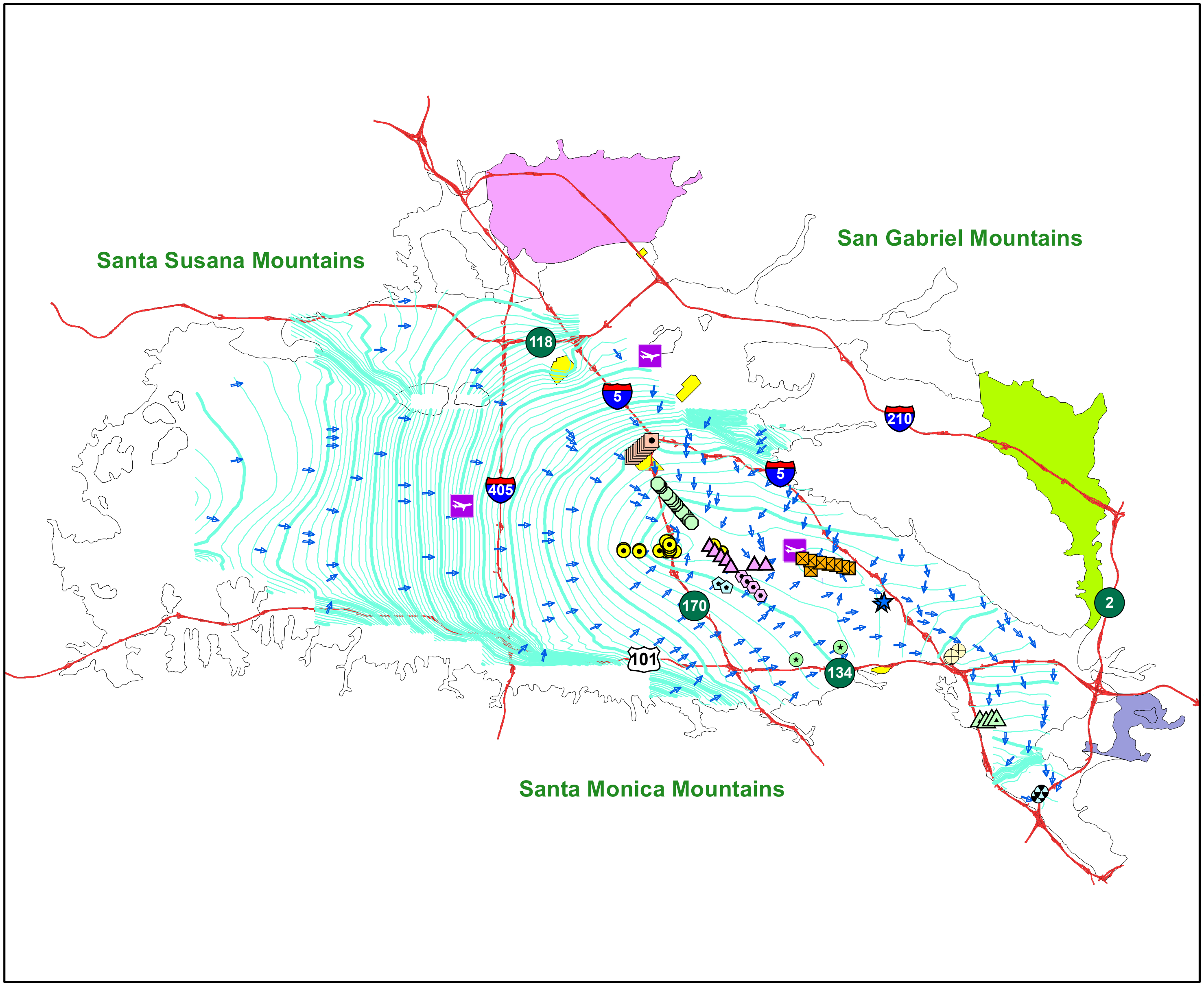


PLATE 6

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2015-2020 Water Years

LEGEND

- Burbank OU
- Burbank GAC
- Glendale North OU
- Glendale South OU
- North Hollywood OU
- Pollock
- Tujunga
- Rinaldi-Toluca
- North Hollywood
- Erwin
- Whitnall
- Verdugo
- Groundwater Flow Direction
- Groundwater Contour
- Spreading Grounds
- Airport

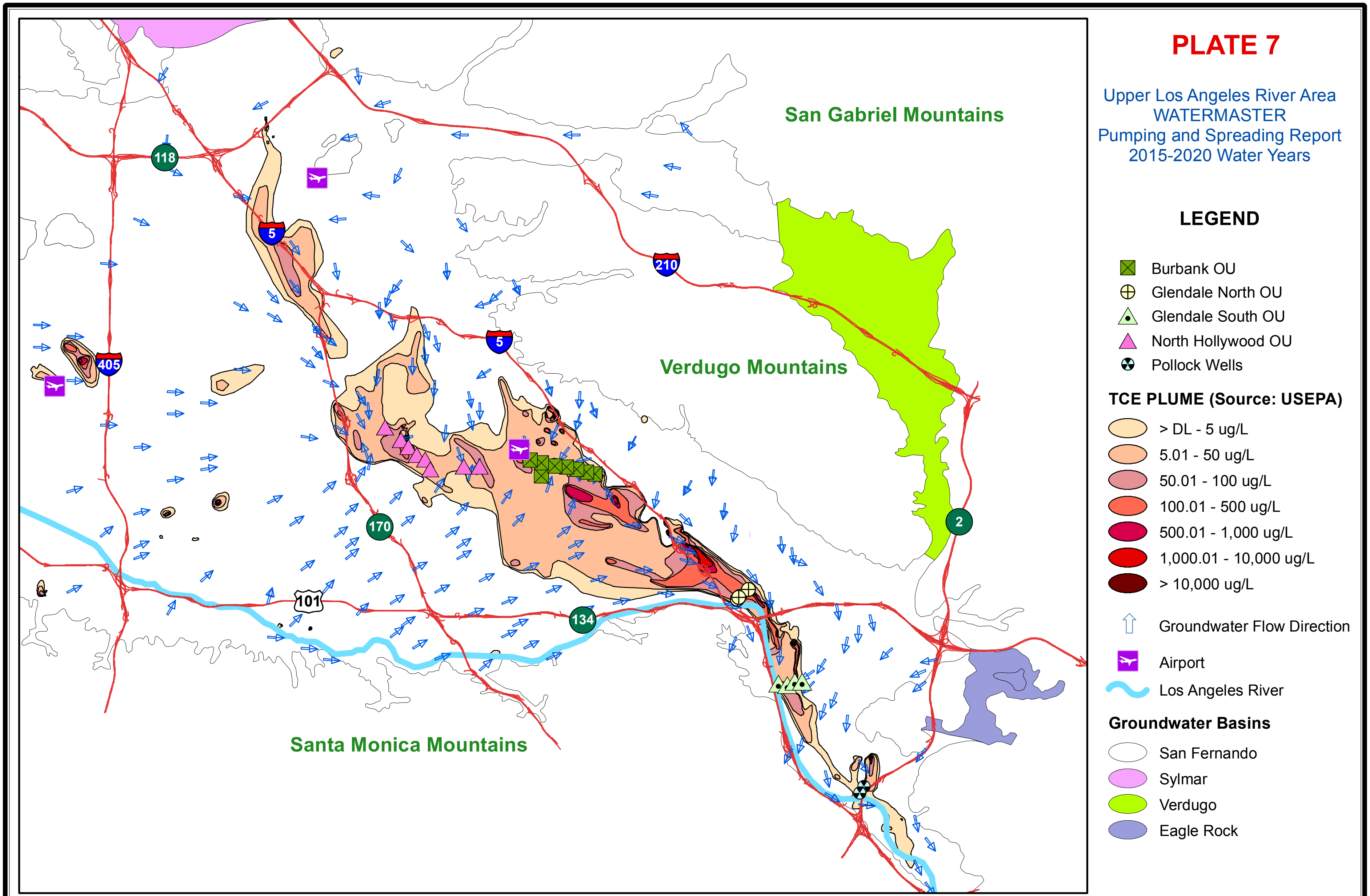
Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

N

2 0 2 Miles

Simulated Groundwater Flow Direction - Model Layer 2
Fall 2020



2014 TCE Contamination and 2020 Simulated Groundwater Flow Direction
Model Layer 1

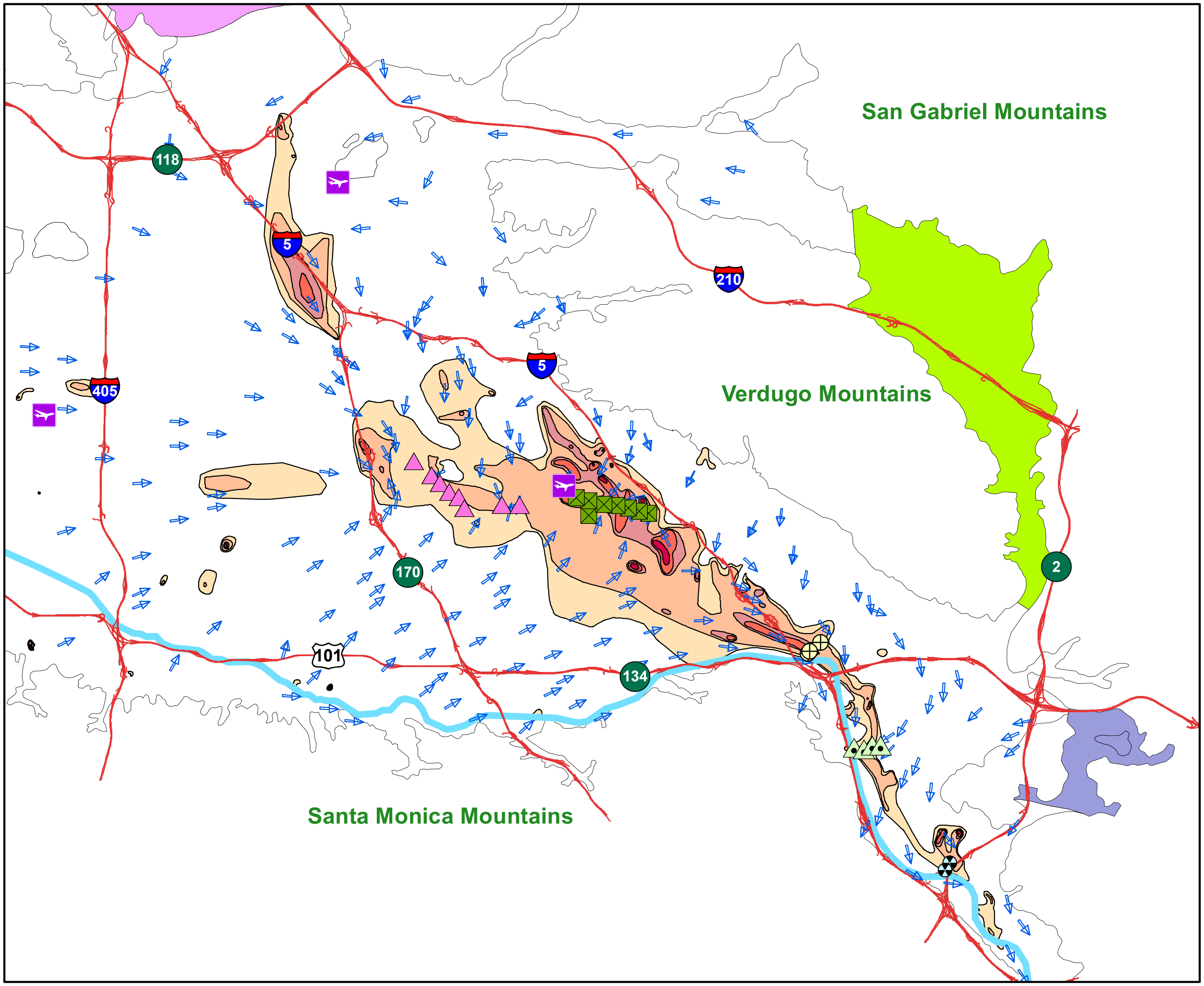


PLATE 8

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2015-2020 Water Years

LEGEND

- Burbank OU
- Glendale North OU
- Glendale South OU
- North Hollywood OU
- Pollock Wells

PCE PLUME (Source: USEPA)

- > DL - 5 ug/L
- 5.01 - 50 ug/L
- 50.01 - 100 ug/L
- 100.01 - 500 ug/L
- 500.01 - 1,000 ug/L
- > 1,000 ug/L

Groundwater Flow Direction

Airport

Los Angeles River

Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

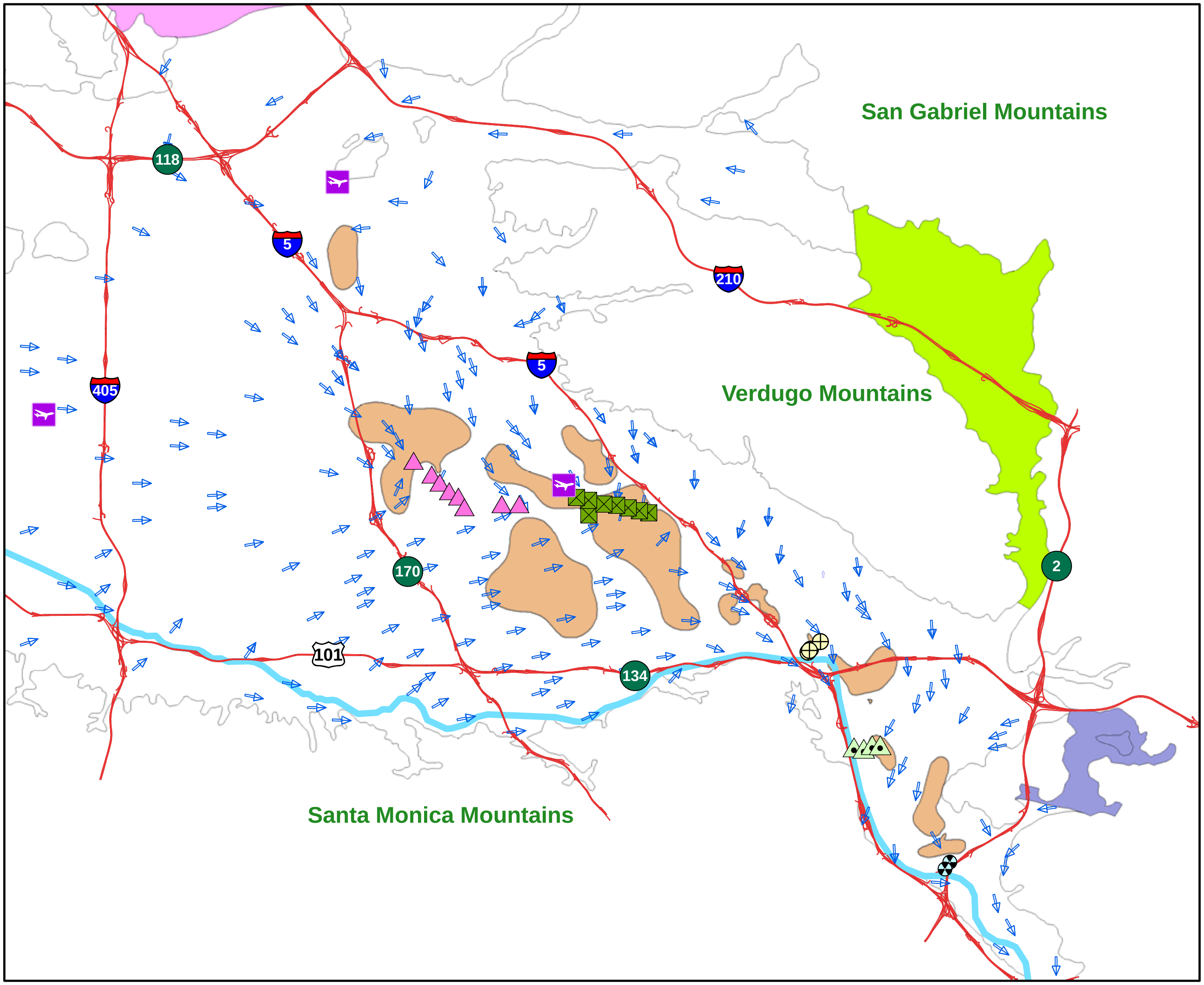
N

1 0 1 2 Miles

2014 PCE Contamination and 2020 Simulated Groundwater Flow Direction
Model Layer 1

PLATE 9

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2015-2020 Water Years



LEGEND

- Burbank OU
- Glendale North OU
- Glendale South OU
- North Hollywood OU
- Pollock Wells

NO3 PLUME (Source: USEPA)

- NO3_2010_shallow
- Groundwater Flow Direction
- Airport
- Los Angeles River

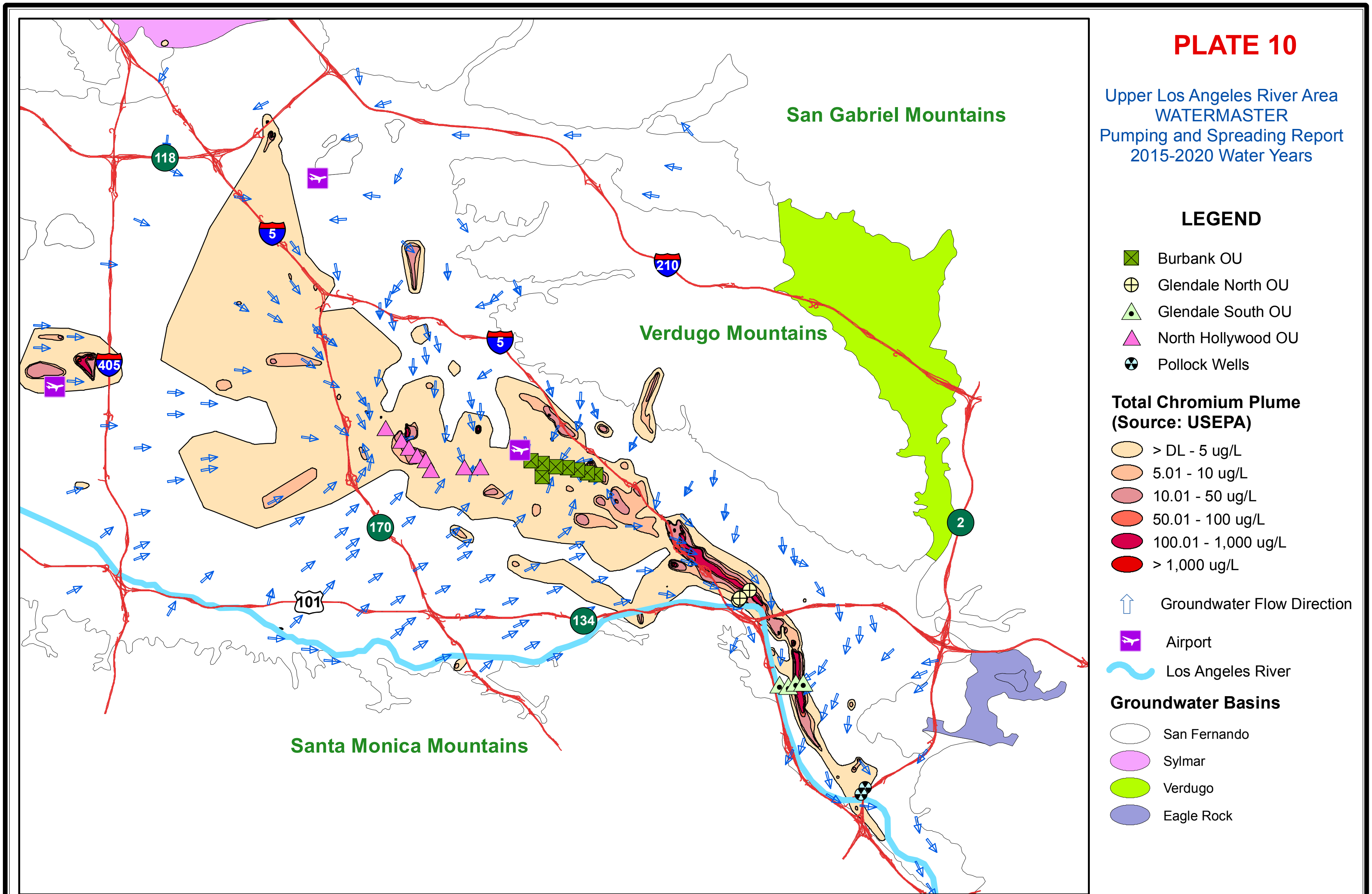
Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

N

1 0 1 2 Miles

2010 Nitrate (as NO3) Contamination and 2020 Simulated Groundwater Flow Direction
Model Layer 1



2014 Total Dissolved Chromium Contamination and 2020 Simulated Groundwater Flow Direction
Model Layer 1

APPENDIX A

CITY OF LOS ANGELES

PUMPING AND SPREADING PLAN

2015-16 through 2019-20 Water Years

CITY OF LOS ANGELES
GROUNDWATER PUMPING AND SPREADING PLAN
IN THE UPPER LOS ANGELES RIVER AREA
FOR WATER YEARS 2015-2020

OCTOBER 2016

Prepared by:
Water Rights & Groundwater Management Group
WATER RESOURCES DIVISION
Los Angeles Department of Water and Power

TABLE OF CONTENTS

Introduction

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

In Section 5.4 of the ULARA Policies and Procedures as amended in February 1998, it is stated that:

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

This 2016 report presents the five-year Groundwater Pumping and Spreading Plan for the Water Years 2015–2020 for the City of Los Angeles.

Section 1: Facilities Description

Groundwater conditions in ULARA are influenced by facilities owned or operated by the Los Angeles Department of Water and Power (LADWP).

a. *Spreading Grounds*

There are five spreading ground facilities that can be used for groundwater recharge of native water in ULARA. The Los Angeles County Flood Control District (LACFCD) owns and operates the Branford, Hansen, Lopez, and Pacoima spreading grounds. LADWP owns Tujunga spreading grounds which are cooperatively operated and maintained by LACFCD and LADWP. Estimated capacities for the spreading grounds are shown in Table 1-1 and their locations are shown in Figure 1-1.

TABLE 1-1
ESTIMATED CAPACITIES EXPERIENCED AT SPREADING GROUNDS

Spreading Ground	Type	Total wetted area (acre)	Max Recharge Capacity Experienced (acre-feet)
Operated by LACFCD			
Branford	Deep basin	7	2,100
Hansen	Med. Depth basin	107	35,100
Lopez	Shallow basin	12	3,900
Pacoima	Med. Depth basin	107	24,100
(Jointly Maintained by LADWP & LACFCD)			
Tujunga	Shallow basin	83	42,800
		TOTAL:	108,000

b. Extraction Wells

LADWP has nine wellfields in the San Fernando Basin, and one in the Sylmar Basin. The rated capacities of the nine wellfields are shown in Table 1-2. The rated capacities are approximate, as operating capacities vary depending on the water levels. Actual groundwater pumping will vary due to maintenance schedules and water quality for each well.

TABLE 1-2
RATED CAPACITIES OF LADWP WELLFIELDS IN ULARA

Wellfield	Number of Wells			Rated Capacity	
San Fernando Basin	Active	Standby	Total	cfs	gpm
Aeration	7	---	7	2.5	1,122
Crystal Springs [A]	---	---	---	---	---
Erwin	2	---	2	6.1	2,738
Headworks [B]	---	---	---	---	---
North Hollywood	14	---	14	55.5	24,910
Pollock	2	---	2	5.9	2,648
Rinaldi-Toluca	15	---	15	113.0	50,718
Tujunga	12	---	12	98.2	44,075
Verdugo	2	---	2	7.4	3,321
Whitnall	4	---	4	14.8	6,643
Sylmar Basin					
Mission	2	---	2	5	2,244
TOTAL	60	---	60	308.4	138,419

[A] Wellfield has been abandoned pursuant to sale of property to DreamWorks, Inc.
[B] Wellfield is no longer in service

c. *Groundwater Remediation Facilities*

LADWP operates three groundwater remediation facilities. Treated effluent produced by these facilities is conveyed to the water distribution system and delivered to LADWP customers for potable supply as a beneficial end use.

North Hollywood Groundwater Treatment Facility

The North Hollywood Operable Unit (NHOU) was placed into service December 1989 and is being operated and maintained by LADWP under the direction of the United States Environmental Protection Agency (USEPA) in accordance with the Cooperative Agreement between these two agencies. USEPA provides 90 percent of the funding for the operations and maintenance of the North Hollywood Groundwater Treatment Facility.

The NHOU was designed to achieve a groundwater treatment capacity of up to 2,000 gallons per minute (gpm) utilizing eight shallow extraction wells and an aeration tower to remove volatile organic compounds (VOC) from the extracted groundwater. Vapor-phase granular activated carbon (GAC) vessels are then utilized to remove VOCs from the aeration tower air emissions.

Pollock Wells Treatment Plant

The Pollock Wells Treatment Plant was placed into service March 1999 to remove VOCs from the groundwater at a rate of up to 3,000 gpm. This facility was designed to remove trichloroethylene (TCE) and perchloroethylene (PCE) from groundwater produced by two extraction wells. Liquid-phase GAC vessels restored the use of Pollock Wells, which also reduces the potential of rising groundwater discharge from the San Fernando Basin into the Los Angeles River.

Temporary Tujunga Wells Treatment Study Project

The Temporary Tujunga Wells Treatment Study Project was placed into service May 2010 to remove VOCs from the groundwater with a remediation capacity of approximately 8,000 gpm. Liquid-phase GAC vessels designed to remove VOCs from groundwater were installed at two wells at the Tujunga Wellfield, and have restored more than 20,000 acre feet per year (AFY) of pumping capacity that was unavailable due to water quality constraints.

Section 2: Annual Pumping and Spreading Projections

a. Pumping Projections for Water Years 2015-2020

The City of Los Angeles has the following six sources of water supply:

1) Los Angeles Aqueduct supply imported from the Owens Valley/Mono Basin areas,
2) Local groundwater supply from the Central, San Fernando, and Sylmar Basins,
3) Metropolitan Water District of Southern California (MWD) supply imported from the Sacramento Bay Delta via the State Water Project (SWP) and the Colorado River Aqueduct,
4) Recycled water,
5) Stormwater, and
6) Conservation.

LADWP's use of groundwater from the San Fernando Basin fluctuates from year to year depending on the availability of the imported water sources, which can vary as a result of hydrologic conditions and operational constraints. Use of the San Fernando Basin groundwater supply is largely constrained by the impacts of groundwater contamination, including most significantly VOCs, hexavalent chromium (Cr-VI), and other emerging chemicals. VOCs that have escaped the containment area of the NHOU have affected nearby groundwater supply wells. To a lesser degree, VOCs have impaired LADWPs use of groundwater in Sylmar Basin and Central Basin.

The San Fernando, Sylmar, and Central Basins provide the City's local groundwater supply. The City of Los Angeles has the following average annual water rights, in acre feet (AF), which comprise approximately 18% of the City's supply:

San Fernando Basin:	87,000 AF
Sylmar Basin:	3,570 AF
Central Basin:	17,236 AF

Table 2-1 shows the amount of groundwater extractions that are expected, during the 2015-2016 Water Year, from the San Fernando and Sylmar Basins. Projected 2016 to 2020 groundwater extractions are provided in Table 2-2. These projections are based upon water demand forecasts and availability of Los Angeles Aqueduct flows, and are subject to yearly adjustments.

TABLE 2-1
ACTUAL AND PROJECTED PUMPING
BY THE CITY OF LOS ANGELES FOR WY 2015-2016
(acre-feet)

San Fernando Basin		Actual Extraction											Projected Extraction [A]
	Total	**Oct-15**	**Nov-15**	**Dec-15**	**Jan-16**	**Feb-16**	**Mar-16**	**Apr-16**	**May-16**	**Jun-16**	**Jul-16**	**Aug-16**	**Sep-16**
Aeration	**835**	102	95	95	100	64	94	100	104	68	12	0	0
Erwin	**0**	0	0	0	0	0	0	0	0	0	0	0	0
Headworks	**0**	0	0	0	0	0	0	0	0	0	0	0	0
North Hollywood	**13,917**	847	807	2,369	1,305	1,106	815	526	1,486	775	990	1,057	1,833
Pollock	**1,827**	333	116	0	0	161	183	176	176	173	184	181	143
Rinaldi-Toluca	**21,621**	2,327	2,261	1,672	10	1,013	1,899	1,539	2,378	1,498	2,049	1,760	3,214
Tujunga	**34,622**	3,590	3,293	3,572	2,898	1,970	2,452	2,450	2,500	2,469	2,617	3,355	3,458
Verdugo	**3,020**	367	240	246	312	445	474	254	490	191	0	0	0
Whitnall	**532**	0	0	0	0	0	64	127	245	96	0	0	0
San Fernando Basin Total	**76,374**	**7,566**	**6,811**	**7,955**	**4,626**	**4,758**	**5,981**	**5,174**	**7,380**	**5,269**	**5,851**	**6,352**	**8,648**
Sylmar Basin													
Mission	**843**	0	0	0	17	154	123	88	177	123	0	0	161
ULARA Total	**77,217**	**7,566**	**6,811**	**7,956**	**4,643**	**4,912**	**6,105**	**5,262**	**7,557**	**5,392**	**5,851**	**6,352**	**8,809**

[A] Increased production in the San Fernando Basin due to low allocation from the State Water Project may increase the risk of experiencing high concentrations of contaminates at wellheads, which may curtail pumping.

TABLE 2-2
PROJECTED PUMPING IN THE SAN FERNANDO AND SYLMAR BASINS
BY THE CITY OF LOS ANGELES FOR 2015-2020
(acre-feet)

Wellfield	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Aeration	835	1,242	1,242	1,242	8,500
Erwin	0	0	0	0	0
Headworks	0	0	0	0	0
North Hollywood	13,917	18,128	18,128	18,128	28,140
Pollock	1,827	1,738	1,738	1,738	2,178
Rinaldi-Toluca	21,621	26,239	26,239	26,239	22,165
Tujunga	34,622	40,315	40,315	40,315	29,017
Verdugo	3,020	0	0	0	0
Whitnal	532	0	0	0	0
Total (San Fernando)	**76,374**	**87,662**	**87,662**	**87,662**	**90,000**
Note*: *Groundwater production for San Fernando Basin may increase with additional remediation of contaminated wells or blending with external water sources as allowed by state regulatory agencies.					
Mission (Sylmar)	843	2,172	4,170	4,170	4,170

b. Spreading Projections for the 2015-2016 Water Year

Native groundwater recharge from captured storm runoff occurs primarily as a result of runoff diversion from adjacent storm channels into engineered spreading grounds. Spreading grounds are primarily operated by Los Angeles County Flood Control District (LACFCD). Table 2-3 represents the anticipated spreading volumes for Water Year 2015-2016.

TABLE 2-3
ACTUAL AND PROJECTED SPREADING
IN ULARA SPREADING GROUNDS FOR WY 2015-2016
(acre-feet)

Operated by:							
Month	**LACDPW**				**LADWP**	**LACDPW and LADWP**	**Monthly Total**
	Branford	**Hansen**	**Lopez**	**Pacoima**	**Headworks [A]**	**Tujunga**	
Actual							
15-Oct	12	0	0	0	0	0	12
15-Nov	13	0	23	226	0	0	262
15-Dec	44	0	0	16	0	0	60
16-Jan	233	350	0	504	0	484	1,571
16-Feb	50	237	0	70	0	9	366
16-Mar	86	408	0	257	0	30	781
16-Apr	25	95	0	160	0	0	280
16-May	27	47	0	0	0	0	74
16-Jun	14	0	19	65	0	0	98
16-Jul	15	0	0	0	0	0	15
16-Aug	15	0	0	0	0	0	15
Projected							
16-Sep	15	0	0	0	0	0	15
Total	**549**	**1,137**	**42**	**1,298**	**0**	**523**	**3,549**

[A] 1992-93 Water Year was the last year of spreading.

Section 3: Water Quality Monitoring Program Description

All of LADWP's 60 active wells in ULARA are monitored in conformance with the requirements set forth in Title 22, California Code of Regulations (CCR). For all active wells, monitoring is required whether the well is in production or not. State regulations require the following types of monitoring regimens:

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

Each well, whether on active or standby status, is monitored every three years for all types of inorganic and organic compounds. Phase II and V initial monitoring involves analysis for newly regulated organic compounds at all wells. Each well must be sampled for four consecutive quarters within a three-year period. Quarterly monitoring of organic compounds is performed for each well where such compounds have been detected. A complete list of the parameters that must be tested for is contained in Title 22 of the CCR.

Appendix A provides the concentrations of various compounds detected in LADWP's groundwater wells in the San Fernando and Sylmar Basins during the period of April 2015 through March 2016. This report includes concentrations detected for nitrate, TCE, PCE, perchlorate, Cr-VI, total chromium, iron, chloride, manganese, 1,2-dichloroethene-cis, carbon tetrachloride, total coliform, 1,1-DCA, 1,1-DCE, 1,2,3-TCP, 1,4-dioxane, bromide, MTBE, Freon-11, N-Nitrosodimethylamine (NDMA), TDS, and uranium.

Section 4: Groundwater Treatment Facilities Operations Summary

a. North Hollywood Operable Unit (NHOU)

Table 4-1 provides the volume of groundwater extracted by each North Hollywood extraction well and treated through the aeration tower for VOC removal. This table also provides the concentrations of TCE and PCE detected in the raw groundwater from each wellhead before treatment. Water quality measurements from the treated effluent show that VOCs were effectively removed by the treatment process. Current operations include the use of four of the seven extraction wells.

Emerging contaminants have also impacted operational reliability of the NHOU. North Hollywood Extraction Well Nos. 2 and 3 (NHE-2, NHE-3) have been shut down since February 2007 and March 2013, respectively, due to elevated concentrations of Cr-VI, which the NHOU was not designed to remove. In order to contain the plumes, the responsible party, Honeywell International, Inc., began operating NHE-2 in 2008, and NHE-3 in 2015 and has been discharging the untreated effluent into the sanitary sewer.

TABLE 4-1
GROUNDWATER TREATMENT FROM THE NORTH HOLLYWOOD OPERABLE UNIT (AERATION) WELLS
(acre-feet)

	Groundwater Treatment from Aeration Wells								PCE/TCE (μg/L)	
Mon-Yr	**No. 2 [A]**	**No. 3 [A]**	**No. 4**	**No. 5**	**No. 6**	**No. 7**	**No. 8**	**Total**	**Influent**	**Effluent**
Apr-15	--	--	6	0	23	25	27	**81**	ns/ns	ns/ns
May-15	--	--	9	0	27	11	31	**78**	8.14/51.8	ND/ND
Jun-15	--	--	8	0	30	32	34	**104**	7.12/33.9	ND/ND
Jul-15	--	--	5	0	29	31	32	**98**	7.54/35.8	ND/ND
Aug-15	--	--	10	0	35	37	39	**122**	7.04/34.4	ND/ND
Sep-15	--	--	10	0	30	26	34	**99**	7.41/34.8	ND/ND
Oct-15	--	--	7	0	32	27	36	**102**	8.09/38.1	ND/ND
Nov-15	--	--	3	0	31	26	35	**95**	8.38/51.3	ND/ND
Dec-15	--	--	0	0	32	27	36	**95**	10.1/46.8	ND/ND
Jan-16	--	--	0	0	34	29	37	**100**	8.45/38.4	ND/ND
Feb-16	--	--	0	0	7	24	32	**64**	8.95/64.9	ND/ND
Mar-16	--	--	3	0	31	26	34	**94**	8.11/38.8	ND/ND
Total								**1,132**		

Note:
[A] Effluent from Well Nos. 2 and 3 is currently being diverted to the sanitary sewer, and therefore does not enter the NHOU.
ND: Not Detected
ns: Not Sampled

b. Pollock Wells Treatment Plant (PWTP)

Table 4-2 provides the volume of groundwater extracted by each well and treated through the liquid-phase GAC vessels for VOC removal. This table also provides the concentrations of TCE and PCE detected in the raw groundwater from the influent line before treatment. Water quality measurements from the treated effluent show that VOCs were effectively removed by the treatment process.

TABLE 4-2
GROUNDWATER TREATMENT FROM POLLOCK WELLS
(acre-feet)

	Treatment from Pollock Wells			PCE/TCE (µg/L)	
Mon-Yr	**No. 4**	**No. 6**	**Total**	**Influent**	**Effluent**
Apr-15	147	236	**383**	8.01/7.37	ns/ns
May-15	152	236	**388**	6.58/6.12	ns/ns
Jun-15	101	231	**332**	6.62/6.78	ns/ns
Jul-15	0	285	**285**	9.83/9.83	ND/ND
Aug-15	181	234	**415**	5.87/6.44	ND/ND
Sep-15	207	235	**442**	5.66/5.91	ND/ND
Oct-15	146	186	**333**	6.04/6.16	ND/ND
Nov-15	52	64	**116**	ns/ns	ND/ND
Dec-15 [A]	0	0	**0**	ns/ns	ns/ns
Jan-16 [A]	0	0	**0**	ns/ns	ns/ns
Feb-16	161	0	**161**	ND/ND	ND/ND
Mar-16	183	0	**183**	1.34/2.00	ND/ND
Total			**3,037**		

Note:
ND: Not Detected
ns: Not Sampled
[A] Removed from service for GAC filter replacement

c. Temporary Tujunga Wells Treatment Study Project (TTW)

Table 4-3 provides the volume of groundwater extracted by each well and treated through the liquid-phase GAC vessels for VOC removal. This table also provides the concentrations of TCE and PCE detected in the raw groundwater from each wellhead before treatment. Water quality measurements from the treated effluent show that VOCs were effectively removed by the treatment process.

Well No. 8 has been connected to the treatment system to run as a backup when Well Nos. 6 or 7 are shutdown either for mechanical or maintenance needs. LADWP has requested a permit amendment from the Division of Drinking Water to operate this connection.

TABLE 4-3
GROUNDWATER TREATMENT FROM TUJUNGA WELLS
(acre-feet)

Mon-Yr	Tujunga Well No. 6			Tujunga Well No. 7			Treatment
	Treatment (AF)	PCE/TCE (µg/L)		Treatment (AF)	PCE/TCE (µg/L)		Totals
		Influent	Effluent		Influent	Effluent	
15-Apr	443	35.1/23.4	ND/ND	436	23.0/23.6	ND/ND	**880**
15-May	465	34.3/23.3	ND/ND	451	17.3/19.6	ND/ND	**916**
15-Jun	447	35.0/23.6	ND/ND	428	16.8/19.0	ND/ND	**875**
15-Jul	438	34.5/23.6	ND/ND	425	13.7/17.7	ND/ND	**863**
15-Aug	502	37.4/25.1	ND/ND	483	15.1/18.3	ND/ND	**986**
15-Sep	436	33.3/21.9	ND/ND	424	14.4/16.4	ND/ND	**860**
15-Oct	463	35.8/23.2	ND/ND	450	17.4/18.3	ND/ND	**913**
15-Nov	441	33.7/20.7	ND/ND	428	19.5/19.0	ND/ND	**869**
15-Dec	466	34/21.3	ND/ND	452	25.0/21.0	ND/ND	**918**
16-Jan	377	30.4/18.9	ND/ND	365	24.2/21.0	ND/ND	**743**
16-Feb	337	24.9/16.5	ND/ND	390	22.0/20.0	ND/ND	**727**
16-Mar	454	20.2/14.3	ND/ND	441	26.3/21.6	ND/ND	**895**
Total							**10,442**

Note:
ND: Not Detected
ns: Not Sampled

Section 5: Proposed Facility Modifications

LADWP and LACFCD, in cooperation with the City of Los Angeles Bureau of Engineering, Bureau of Sanitation and Bureau of Street Services, continue to partner on, jointly fund, and collaborate on several projects that will enhance the capacity for recharge of native water into the groundwater basin via existing spreading grounds in the eastern portion of the San Fernando Basin. This section describes plans for modifying existing spreading facilities and construction of new facilities to provide expanded opportunities for enhancing the recharge capacity of the San Fernando Groundwater Basin.

a. Spreading Grounds

<u>Tujunga Spreading Grounds Upgrade</u>
The project is currently in the construction phase and is expected to be completed by 2018. The scope includes consolidating and deepening existing spreading basins, installing two high-flow rubber dam intakes, and modifying the existing intake to remove sediments. This project is expected to increase regional annual average stormwater recharge by 8,000 AFY.

<u>Lopez Spreading Grounds Upgrade</u>
This upgrade project is currently in design, with construction expected to begin in 2017 and be completed by 2019. The scope includes expanding and deepening existing spreading basins, excavating sediment to improve infiltration rates, and improving the intake structure. This project is expected to increase regional annual average stormwater recharge by 480 AFY.

<u>Branford Spreading Basin Upgrade</u>
This upgrade project is currently in design, with construction expected to begin in 2018 and be completed by 2019. The scope includes installing a pump to divert water from the Branford Basin into the Tujunga Spreading Grounds. This project is expected to increase regional annual average stormwater recharge by 597 AFY.

<u>Pacoima Spreading Grounds Upgrade</u>
This upgrade project is currently in design, with construction expected to begin in 2017 and be completed by 2019. The LA County Flood Control District is finalizing the Mitigated Negative Declaration documents in the environmental review process. The scope includes consolidating existing spreading basins, excavating sediment to improve infiltration rates, and installing a new automated intake structure. This project is expected to increase regional annual average stormwater recharge by 5,300 AFY.

b. Groundwater Production Facilities

Mission Wellfield Improvement Project

The purpose of the Mission Wells Improvement Project is to rehabilitate and replace deteriorating groundwater facilities in Sylmar Basin, including installation of three replacement production wells, monitoring wells, new piping, pump station upgrades, electrical upgrades, and controls. An application has been submitted to California Division of Drinking Water to permit the operation of Well No. 10, one of the three new production wells. The other two wells, Nos. 9 and 10 will not be operated due to very low production capacity and TCE concentrations exceeding the State Maximum Contamination Level, respectively. The recently constructed on-site Chlorination Generation System has been permitted and is in operation and Well No. 10 is expected to be operational by 2017.

Van Norman Complex Investigation

Two exploratory wells were drilled to approximately 1,500 feet below ground surface on the LADWP Van Norman Complex property to investigate the existence and extent of groundwater within the Saugus Formation. Initial pump tests from the two exploratory wells produced groundwater with concentrations of Total Dissolved Solids in excess of 1,000 milligrams per liter. Additional pump tests will be performed starting in mid-2017 to further evaluate potential aquifer yield and response to various pumping conditions.

c. Groundwater Remediation Facilities

North Hollywood Operable Unit (NHOU)

The NHOU, which has been in operation since December 1989, was designed to remove TCE and PCE contaminants from groundwater via aeration. The treated effluent is disinfected and conveyed into the municipal water distribution system. More recently, EPA has detected emerging contaminants, including Cr-VI and 1,4-dioxane, in excess of the state MCL and notification level (NL) for 1,4-dioxane at two of the NHOU extraction wells. The existing NHOU treatment system is incapable of removing these contaminants, and a sharp increase in the chromium concentrations has caused two of the eight extraction wells to be shut down, removed from the system, and the untreated effluent from these two wells have been redirected for discharge into the municipal sewer. These wells serve an important plume containment function for the high levels of contamination, and these shut downs demonstrated the need for a change in the remedy.

In response to the above shut downs and continued migration of VOC-contaminated groundwater, USEPA conducted a Focused Feasibility Study (FFS) to evaluate alternatives for changing the groundwater remedy. USEPA summarized the results in its July 2009 Proposed Plan, and selected the preferred remedy in its September 2009 Second Interim Record of Decision. The selected remedy is to install well-head treatment for hexavalent chromium and 1,4 dioxane, expand the combined treatment system, install additional monitoring wells, install and operate three additional groundwater extraction wells, and to continue to provide the treated water to LADWP for a drinking water end use. USEPA amended the 2009 Second Interim Record of Decision in 2014 to allow for consideration of the treated effluent to be reinjected back into the aquifer (reinjection end use).

San Fernando Groundwater Basin Remediation (SFGWBR) Efforts

In early 2015, LADWP completed groundwater characterization in the San Fernando Basin (SFB) and installed twenty-five new monitoring wells.

In mid-2015, LADWP began the necessary planning for the groundwater basin remediation facilities, which may consist of centralized and localized treatment, to effectively cleanup and remove contaminants from the SFB and restore its beneficial use. Contaminants of concern and proposed treatment will be determined through site-specific remedial investigations and feasibility studies. The four highest-priority basin remediation facilities are anticipated to be operational by 2021. The need for additional remediation facilities will continue to be investigated.

North Hollywood West Advanced Oxidation Processes (AOP) Pilot Project

The UV/AOP Pilot Testing has two phases. Phase 1 will utilize the oxidation from peroxide, chloride, and other background chemicals at flow rates ranging from 10 to 50 GPM. Phase 2 testing increases the flow rate up to 100 GPM and increases the UV dose with the goal of better understanding reactor efficiency.

d. *Recycled Water Projects*

Groundwater Replenishment (GWR) Project

The GWR Project will provide up to 30,000 AFY of recycled water to replenish the SFB to increase the City's local water supplies and reduce the need for purchased imported water. The water utilized for GWR will consist of tertiary-treated recycled water from DCT that will go through additional treatment that meets or exceeds the State's Title 22 groundwater recharge regulations before being used for replenishment.

The GWR project is in the planning and environmental analysis phase. The Draft Environmental Impact Report is being prepared for public release in late spring 2016. Outreach is being conducted for the Mayor's Office, Council Districts, Neighborhood Councils, and community groups throughout the City of Los Angeles. The project's Phase 2 Pilot Study began in February 2016 and is testing various combinations of purification technologies to optimize the production of recycled water and cost.

APPENDIX A:
Water Quality Sampling Results,
April 2015 through March 2016

Location Code	Analyte	Regulatory Theshold	Result	Date
AT002	1, 1-DCE	MCL: 6 ug/L	4.54	8/30/2016
AT003	1, 1-DCE	MCL: 6 ug/L	4.87	8/30/2016
AT004	1, 1-DCE	MCL: 6 ug/L	0.6520	5/27/2016
AT005	1, 1-DCE	MCL: 6 ug/L	0	3/25/2013
AT006	1, 1-DCE	MCL: 6 ug/L	0	5/31/2016
AT007	1, 1-DCE	MCL: 6 ug/L	0.98	5/31/2016
AT008	1, 1-DCE	MCL: 6 ug/L	3.37	5/31/2016
AT002	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/30/2016
AT003	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0.603	8/30/2016
AT004	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	5/27/2016
AT005	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0.934	3/25/2013
AT006	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	5/31/2016
AT007	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0.642	5/31/2016
AT008	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0.653	5/31/2016
AT002	1,2,3-TCP	NL: 0.005 ug/L	0	8/30/2016
AT003	1,2,3-TCP	NL: 0.005 ug/L	0	8/30/2016
AT004	1,2,3-TCP	NL: 0.005 ug/L	0	5/27/2016
AT005	1,2,3-TCP	NL: 0.005 ug/L	0.00579	3/25/2013
AT006	1,2,3-TCP	NL: 0.005 ug/L	0	5/31/2016
AT007	1,2,3-TCP	NL: 0.005 ug/L	0	5/31/2016
AT008	1,2,3-TCP	NL: 0.005 ug/L	0	5/31/2016
AT002	1,2-DCE-cis	MCL: 6 ug/L	2.05	8/30/2016
AT003	1,2-DCE-cis	MCL: 6 ug/L	1.57	8/30/2016
AT004	1,2-DCE-cis	MCL: 6 ug/L	1.52	5/27/2016
AT005	1,2-DCE-cis	MCL: 6 ug/L	4.75	3/25/2013
AT006	1,2-DCE-cis	MCL: 6 ug/L	2.13	5/31/2016
AT007	1,2-DCE-cis	MCL: 6 ug/L	0.903	5/31/2016
AT008	1,2-DCE-cis	MCL: 6 ug/L	0.5670	5/31/2016
AT002	1,4-Dioxane	NL: 1 ug/L	3.82	8/30/2016
AT003	1,4-Dioxane	NL: 1 ug/L	1.39	8/30/2016
AT004	1,4-Dioxane	NL: 1 ug/L	1.46	5/27/2016
AT005	1,4-Dioxane	NL: 1 ug/L	2.28	3/25/2013
AT006	1,4-Dioxane	NL: 1 ug/L	0.959	5/31/2016
AT007	1,4-Dioxane	NL: 1 ug/L	1.16	5/31/2016
AT008	1,4-Dioxane	NL: 1 ug/L	1.63	5/31/2016
AT002	Bromide	Not regulated - mg/L	0.221	9/24/2013
AT003	Bromide	Not regulated - mg/L	0.219	2/18/2014
AT004	Bromide	Not regulated - mg/L	0.115	5/13/2014
AT005	Bromide	Not regulated - mg/L	0.292	9/8/2004
AT006	Bromide	Not regulated - mg/L	0.077	2/18/2014
AT007	Bromide	Not regulated - mg/L	0.169	2/18/2014
AT008	Bromide	Not regulated - mg/L	0.205	2/18/2014
AT002	CCl4	MCL: 0.5 ug/L	0.43	8/30/2016
AT003	CCl4	MCL: 0.5 ug/L	0	8/30/2016
AT004	CCl4	MCL: 0.5 ug/L	0	5/27/2016
AT005	CCl4	MCL: 0.5 ug/L	0	3/25/2013
AT006	CCl4	MCL: 0.5 ug/L	0	5/31/2016
AT007	CCl4	MCL: 0.5 ug/L	0	5/31/2016
AT008	CCl4	MCL: 0.5 ug/L	2.19	5/31/2016
AT002	Chloride	MCL = 250 mg/L	36.6	9/24/2013
AT003	Chloride	MCL = 250 mg/L	54.3	2/18/2014
AT004	Chloride	MCL = 250 mg/L	23.2	5/13/2014
AT005	Chloride	MCL = 250 mg/L	48.8	9/8/2004
AT006	Chloride	MCL = 250 mg/L	14.4	2/18/2014
AT007	Chloride	MCL = 250 mg/L	28.4	2/18/2014
AT008	Chloride	MCL = 250 mg/L	34.1	2/18/2014
AT002	Cr 6	MCL = 10 ug/L	70	8/30/2016
AT003	Cr 6	MCL = 10 ug/L	45.6	8/30/2016
AT004	Cr 6	MCL = 10 ug/L	6.77	5/27/2016
AT005	Cr 6	MCL = 10 ug/L	0.7	3/25/2013
AT006	Cr 6	MCL = 10 ug/L	3.59	5/31/2016
AT007	Cr 6	MCL = 10 ug/L	2.72	5/31/2016
AT008	Cr 6	MCL = 10 ug/L	1.090	5/31/2016
AT002	Cr, Total	MCL = 50 ug/L	64	8/30/2016
AT003	Cr, Total	MCL = 50 ug/L	42.2	8/30/2016

Location Code	Analyte	Regulatory Theshold	Result	Date
AT004	Cr, Total	MCL = 50 ug/L	6.70	5/27/2016
AT005	Cr, Total	MCL = 50 ug/L	3.8	3/25/2013
AT006	Cr, Total	MCL = 50 ug/L	3.60	5/31/2016
AT007	Cr, Total	MCL = 50 ug/L	2.60	5/31/2016
AT008	Cr, Total	MCL = 50 ug/L	1.000	5/31/2016
AT002	Freon-11	MCL: 150 ug/L	0	8/30/2016
AT003	Freon-11	MCL: 150 ug/L	0	8/30/2016
AT004	Freon-11	MCL: 150 ug/L	0	5/27/2016
AT005	Freon-11	MCL: 150 ug/L	0	3/25/2013
AT006	Freon-11	MCL: 150 ug/L	0	5/31/2016
AT007	Freon-11	MCL: 150 ug/L	0	5/31/2016
AT008	Freon-11	MCL: 150 ug/L	0	5/31/2016
AT002	Iron	SMCL: 300 ug/L	0	9/24/2013
AT003	Iron	SMCL: 300 ug/L	70.0	2/18/2014
AT004	Iron	SMCL: 300 ug/L	44.7	5/13/2014
AT005	Iron	SMCL: 300 ug/L	0	9/8/2004
AT006	Iron	SMCL: 300 ug/L	0	2/18/2014
AT007	Iron	SMCL: 300 ug/L	0	2/18/2014
AT008	Iron	SMCL: 300 ug/L	0	2/18/2014
AT002	Manganese	SMCL: 50 ug/L	0	9/24/2013
AT003	Manganese	SMCL: 50 ug/L	2.900	2/18/2014
AT004	Manganese	SMCL: 50 ug/L	0	5/13/2014
AT005	Manganese	SMCL: 50 ug/L	0	9/8/2004
AT006	Manganese	SMCL: 50 ug/L	0	2/18/2014
AT007	Manganese	SMCL: 50 ug/L	0	2/18/2014
AT008	Manganese	SMCL: 50 ug/L	0	2/18/2014
AT002	MTBE	MCL: 13 ug/L	0	8/30/2016
AT003	MTBE	MCL: 13 ug/L	0	8/30/2016
AT004	MTBE	MCL: 13 ug/L	0	5/27/2016
AT005	MTBE	MCL: 13 ug/L	0	3/25/2013
AT006	MTBE	MCL: 13 ug/L	0	5/31/2016
AT007	MTBE	MCL: 13 ug/L	0	5/31/2016
AT008	MTBE	MCL: 13 ug/L	0	5/31/2016
AT002	NDMA	NL: 10 ng/L	0	5/26/2016
AT003	NDMA	NL: 10 ng/L	0	5/26/2016
AT004	NDMA	NL: 10 ng/L	0	5/27/2016
AT005	NDMA	NL: 10 ng/L	0	3/25/2013
AT006	NDMA	NL: 10 ng/L	0	5/31/2016
AT007	NDMA	NL: 10 ng/L	0	5/31/2016
AT008	NDMA	NL: 10 ng/L	0	5/31/2016
AT002	Nitrate (N)	MCL: 10 mg/L	7.50	8/30/2016
AT003	Nitrate (N)	MCL: 10 mg/L	10.60	8/30/2016
AT004	Nitrate (N)	MCL: 10 mg/L	8.97	5/27/2016
AT005	Nitrate (N)	MCL: 10 mg/L	6.8	3/25/2013
AT006	Nitrate (N)	MCL: 10 mg/L	5.01	5/31/2016
AT007	Nitrate (N)	MCL: 10 mg/L	9.53	5/31/2016
AT008	Nitrate (N)	MCL: 10 mg/L	8.87	5/31/2016
AT002	PCE	MCL: 5 ug/L	8.7	8/30/2016
AT003	PCE	MCL: 5 ug/L	8.39	8/30/2016
AT004	PCE	MCL: 5 ug/L	8.4	5/27/2016
AT005	PCE	MCL: 5 ug/L	9.0	3/25/2013
AT006	PCE	MCL: 5 ug/L	9.16	5/31/2016
AT007	PCE	MCL: 5 ug/L	7.90	5/31/2016
AT008	PCE	MCL: 5 ug/L	8.5	5/31/2016
AT002	Perchlorate	MCL: 6 ug/L	2.0600	5/26/2016
AT003	Perchlorate	MCL: 6 ug/L	0	5/26/2016
AT004	Perchlorate	MCL: 6 ug/L	0	5/27/2016
AT005	Perchlorate	MCL: 6 ug/L	0	3/25/2013
AT006	Perchlorate	MCL: 6 ug/L	0	5/31/2016
AT007	Perchlorate	MCL: 6 ug/L	0	5/31/2016
AT008	Perchlorate	MCL: 6 ug/L	0	5/31/2016
AT002	TCE	MCL: 5 ug/L	112	8/30/2016
AT003	TCE	MCL: 5 ug/L	51.1	8/30/2016
AT004	TCE	MCL: 5 ug/L	32.2	5/27/2016
AT005	TCE	MCL: 5 ug/L	10.5	3/25/2013

Location Code	Analyte	Regulatory Theshold	Result	Date
AT006	TCE	MCL: 5 ug/L	21.3	5/31/2016
AT007	TCE	MCL: 5 ug/L	9.5	5/31/2016
AT008	TCE	MCL: 5 ug/L	86.8	5/31/2016
AT002	TDS	SMCL: 1000 mg/L	541	8/30/2016
AT003	TDS	SMCL: 1000 mg/L	427	8/30/2016
AT004	TDS	SMCL: 1000 mg/L	425	5/27/2016
AT005	TDS	SMCL: 1000 mg/L	517	9/8/2004
AT006	TDS	SMCL: 1000 mg/L	397	5/31/2016
AT007	TDS	SMCL: 1000 mg/L	576	5/31/2016
AT008	TDS	SMCL: 1000 mg/L	505	5/31/2016
AT002	Total Coliform	MCL = 1 NUM/100 ml	0	12/14/2015
AT003	Total Coliform	MCL = 1 NUM/100 ml	12.000	4/19/2016
AT004	Total Coliform	MCL = 1 NUM/100 ml	0	2/29/2016
AT005	Total Coliform	MCL = 1 NUM/100 ml	0	3/25/2013
AT006	Total Coliform	MCL = 1 NUM/100 ml	0	12/11/2015
AT007	Total Coliform	MCL = 1 NUM/100 ml	0	12/11/2015
AT008	Total Coliform	MCL = 1 NUM/100 ml	0	12/11/2015
AT002	Uranium	MCL: 20 pCi/L	12.9	11/30/2015
AT003	Uranium	MCL: 20 pCi/L	7.20	12/14/2015
AT004	Uranium	MCL: 20 pCi/L	10.7	6/27/2014
AT005	Uranium	MCL: 20 pCi/L	--	
AT006	Uranium	MCL: 20 pCi/L	7.50	2/18/2014
AT007	Uranium	MCL: 20 pCi/L	31.0	5/31/2016
AT008	Uranium	MCL: 20 pCi/L	25.3	2/18/2014

Location Code	Analyte	Regulatory Threshold	Result	Date
NH004	1, 1-DCE	MCL: 6 ug/L	0	8/26/2016
NH007	1, 1-DCE	MCL: 6 ug/L	0	8/26/2016
NH011	1, 1-DCE	MCL: 6 ug/L	0	5/4/2004
NH021	1, 1-DCE	MCL: 6 ug/L	0	4/28/2000
NH022	1, 1-DCE	MCL: 6 ug/L	0	10/27/2015
NH023	1, 1-DCE	MCL: 6 ug/L	0	7/25/2016
NH025	1, 1-DCE	MCL: 6 ug/L	0	8/22/2016
NH026	1, 1-DCE	MCL: 6 ug/L	0	7/13/2016
NH027	1, 1-DCE	MCL: 6 ug/L	0.581	3/31/2000
NH028	1, 1-DCE	MCL: 6 ug/L	0	5/4/2004
NH030	1, 1-DCE	MCL: 6 ug/L	0	6/18/2003
NH032	1, 1-DCE	MCL: 6 ug/L	0	8/26/2016
NH033	1, 1-DCE	MCL: 6 ug/L	0	8/26/2016
NH034	1, 1-DCE	MCL: 6 ug/L	7.82	8/23/2016
NH035	1, 1-DCE	MCL: 6 ug/L	0	11/15/2001
NH036	1, 1-DCE	MCL: 6 ug/L	3.22	8/23/2016
NH037	1, 1-DCE	MCL: 6 ug/L	1.30	8/9/2016
NH040	1, 1-DCE	MCL: 6 ug/L	0	5/4/2004
NH041	1, 1-DCE	MCL: 6 ug/L	--	
NH043A	1, 1-DCE	MCL: 6 ug/L	0.830	1/7/2016
NH044	1, 1-DCE	MCL: 6 ug/L	0	8/23/2016
NH045	1, 1-DCE	MCL: 6 ug/L	0	8/23/2016
NH004	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/26/2016
NH007	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/26/2016
NH011	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	5/4/2004
NH021	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	4/28/2000
NH022	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	10/27/2015
NH023	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	7/25/2016
NH025	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/22/2016
NH026	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	7/13/2016
NH027	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	1.39	3/31/2000
NH028	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	5/4/2004
NH030	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	6/18/2003
NH032	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/26/2016
NH033	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/26/2016
NH034	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/23/2016
NH035	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	11/15/2001
NH036	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/23/2016
NH037	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/9/2016
NH040	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	5/4/2004
NH041	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	--	
NH043A	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0.9130	1/7/2016
NH044	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/23/2016
NH045	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/23/2016
NH004	1,2,3-TCP	NL: 0.005 ug/L	0	8/26/2016
NH007	1,2,3-TCP	NL: 0.005 ug/L	0	3/31/2016
NH011	1,2,3-TCP	NL: 0.005 ug/L	--	
NH021	1,2,3-TCP	NL: 0.005 ug/L	--	
NH022	1,2,3-TCP	NL: 0.005 ug/L	0	10/27/2015
NH023	1,2,3-TCP	NL: 0.005 ug/L	0	7/25/2016
NH025	1,2,3-TCP	NL: 0.005 ug/L	0	4/29/2016
NH026	1,2,3-TCP	NL: 0.005 ug/L	0	5/24/2016
NH027	1,2,3-TCP	NL: 0.005 ug/L	--	
NH028	1,2,3-TCP	NL: 0.005 ug/L	--	
NH030	1,2,3-TCP	NL: 0.005 ug/L	--	
NH032	1,2,3-TCP	NL: 0.005 ug/L	0	8/26/2016
NH033	1,2,3-TCP	NL: 0.005 ug/L	0	8/26/2016
NH034	1,2,3-TCP	NL: 0.005 ug/L	0	1/22/2016
NH035	1,2,3-TCP	NL: 0.005 ug/L	--	
NH036	1,2,3-TCP	NL: 0.005 ug/L	0	5/24/2016
NH037	1,2,3-TCP	NL: 0.005 ug/L	0	3/15/2016
NH040	1,2,3-TCP	NL: 0.005 ug/L	--	
NH041	1,2,3-TCP	NL: 0.005 ug/L	--	
NH043A	1,2,3-TCP	NL: 0.005 ug/L	0	8/25/2015
NH044	1,2,3-TCP	NL: 0.005 ug/L	0	5/24/2016

Location Code	Analyte	Regulatory Threshold	Result	Date
NH045	1,2,3-TCP	NL: 0.005 ug/L	0	2/5/2016
NH004	1,2-DCE-cis	MCL: 6 ug/L	0	8/26/2016
NH007	1,2-DCE-cis	MCL: 6 ug/L	0	8/26/2016
NH011	1,2-DCE-cis	MCL: 6 ug/L	1.55	5/4/2004
NH021	1,2-DCE-cis	MCL: 6 ug/L	0	4/28/2000
NH022	1,2-DCE-cis	MCL: 6 ug/L	0	10/27/2015
NH023	1,2-DCE-cis	MCL: 6 ug/L	0	7/25/2016
NH025	1,2-DCE-cis	MCL: 6 ug/L	0	8/22/2016
NH026	1,2-DCE-cis	MCL: 6 ug/L	0	7/13/2016
NH027	1,2-DCE-cis	MCL: 6 ug/L	3.10	3/31/2000
NH028	1,2-DCE-cis	MCL: 6 ug/L	1.61	5/4/2004
NH030	1,2-DCE-cis	MCL: 6 ug/L	0	6/18/2003
NH032	1,2-DCE-cis	MCL: 6 ug/L	0	8/26/2016
NH033	1,2-DCE-cis	MCL: 6 ug/L	0	8/26/2016
NH034	1,2-DCE-cis	MCL: 6 ug/L	0	8/23/2016
NH035	1,2-DCE-cis	MCL: 6 ug/L	0	11/15/2001
NH036	1,2-DCE-cis	MCL: 6 ug/L	0	8/23/2016
NH037	1,2-DCE-cis	MCL: 6 ug/L	0.546	8/9/2016
NH040	1,2-DCE-cis	MCL: 6 ug/L	1.18	5/4/2004
NH041	1,2-DCE-cis	MCL: 6 ug/L	--	
NH043A	1,2-DCE-cis	MCL: 6 ug/L	1.3300	1/7/2016
NH044	1,2-DCE-cis	MCL: 6 ug/L	0	8/23/2016
NH045	1,2-DCE-cis	MCL: 6 ug/L	0	8/23/2016
NH004	1,4-Dioxane	NL: 1 ug/L	0	8/26/2016
NH007	1,4-Dioxane	NL: 1 ug/L	0	8/26/2016
NH011	1,4-Dioxane	NL: 1 ug/L	--	
NH021	1,4-Dioxane	NL: 1 ug/L	--	
NH022	1,4-Dioxane	NL: 1 ug/L	0	10/27/2015
NH023	1,4-Dioxane	NL: 1 ug/L	0	7/25/2016
NH025	1,4-Dioxane	NL: 1 ug/L	0	8/22/2016
NH026	1,4-Dioxane	NL: 1 ug/L	0	7/12/2016
NH027	1,4-Dioxane	NL: 1 ug/L	--	
NH028	1,4-Dioxane	NL: 1 ug/L	--	
NH030	1,4-Dioxane	NL: 1 ug/L	--	
NH032	1,4-Dioxane	NL: 1 ug/L	0	8/26/2016
NH033	1,4-Dioxane	NL: 1 ug/L	0	8/26/2016
NH034	1,4-Dioxane	NL: 1 ug/L	1.03	8/23/2016
NH035	1,4-Dioxane	NL: 1 ug/L	--	
NH036	1,4-Dioxane	NL: 1 ug/L	0	8/23/2016
NH037	1,4-Dioxane	NL: 1 ug/L	2.84	8/31/2016
NH040	1,4-Dioxane	NL: 1 ug/L	--	
NH041	1,4-Dioxane	NL: 1 ug/L	--	
NH043A	1,4-Dioxane	NL: 1 ug/L	12.3	1/7/2016
NH044	1,4-Dioxane	NL: 1 ug/L	0	8/23/2016
NH045	1,4-Dioxane	NL: 1 ug/L	0	8/23/2016
NH004	Bromide	Not regulated - mg/L	0.310	3/3/2016
NH007	Bromide	Not regulated - mg/L	0.248	3/31/2016
NH011	Bromide	Not regulated - mg/L	0.170	7/9/2003
NH021	Bromide	Not regulated - mg/L	0.129	3/9/2000
NH022	Bromide	Not regulated - mg/L	0.234	6/10/2014
NH023	Bromide	Not regulated - mg/L	0.197	6/10/2015
NH025	Bromide	Not regulated - mg/L	0.255	4/23/2014
NH026	Bromide	Not regulated - mg/L	0.254	11/16/2015
NH027	Bromide	Not regulated - mg/L	--	
NH028	Bromide	Not regulated - mg/L	0.140	7/9/2003
NH030	Bromide	Not regulated - mg/L	--	
NH032	Bromide	Not regulated - mg/L	0.332	8/6/2014
NH033	Bromide	Not regulated - mg/L	0.306	7/21/2016
NH034	Bromide	Not regulated - mg/L	0.195	2/4/2015
NH035	Bromide	Not regulated - mg/L	0.121	9/26/2001
NH036	Bromide	Not regulated - mg/L	0.226	9/24/2013
NH037	Bromide	Not regulated - mg/L	0.228	2/4/2015
NH040	Bromide	Not regulated - mg/L	0.168	9/27/2001
NH041	Bromide	Not regulated - mg/L	--	
NH043A	Bromide	Not regulated - mg/L	0.281	9/16/2015

Location Code	Analyte	Regulatory Threshold	Result	Date
NH044	Bromide	Not regulated - mg/L	0.284	4/8/2015
NH045	Bromide	Not regulated - mg/L	0.248	9/10/2013
NH004	CCl4	MCL: 0.5 ug/L	0	8/26/2016
NH007	CCl4	MCL: 0.5 ug/L	0	8/26/2016
NH011	CCl4	MCL: 0.5 ug/L	0	5/4/2004
NH021	CCl4	MCL: 0.5 ug/L	0	4/28/2000
NH022	CCl4	MCL: 0.5 ug/L	0	10/27/2015
NH023	CCl4	MCL: 0.5 ug/L	0	7/25/2016
NH025	CCl4	MCL: 0.5 ug/L	0	8/22/2016
NH026	CCl4	MCL: 0.5 ug/L	0	7/13/2016
NH027	CCl4	MCL: 0.5 ug/L	0	3/31/2000
NH028	CCl4	MCL: 0.5 ug/L	0	5/4/2004
NH030	CCl4	MCL: 0.5 ug/L	0	6/18/2003
NH032	CCl4	MCL: 0.5 ug/L	0	8/26/2016
NH033	CCl4	MCL: 0.5 ug/L	0	8/26/2016
NH034	CCl4	MCL: 0.5 ug/L	0	8/23/2016
NH035	CCl4	MCL: 0.5 ug/L	0	11/15/2001
NH036	CCl4	MCL: 0.5 ug/L	0	8/23/2016
NH037	CCl4	MCL: 0.5 ug/L	0	8/9/2016
NH040	CCl4	MCL: 0.5 ug/L	0	5/4/2004
NH041	CCl4	MCL: 0.5 ug/L	--	
NH043A	CCl4	MCL: 0.5 ug/L	0	1/7/2016
NH044	CCl4	MCL: 0.5 ug/L	0	8/23/2016
NH045	CCl4	MCL: 0.5 ug/L	0	8/23/2016
NH004	Chloride	MCL = 250 mg/L	53.6	3/3/2016
NH007	Chloride	MCL = 250 mg/L	46.3	3/31/2016
NH011	Chloride	MCL = 250 mg/L	22.8	7/9/2003
NH021	Chloride	MCL = 250 mg/L	21.0	3/9/2000
NH022	Chloride	MCL = 250 mg/L	44.9	6/10/2014
NH023	Chloride	MCL = 250 mg/L	36.8	6/10/2015
NH025	Chloride	MCL = 250 mg/L	46.4	4/23/2014
NH026	Chloride	MCL = 250 mg/L	51.0	11/16/2015
NH027	Chloride	MCL = 250 mg/L	--	
NH028	Chloride	MCL = 250 mg/L	21.5	7/9/2003
NH030	Chloride	MCL = 250 mg/L	--	
NH032	Chloride	MCL = 250 mg/L	55.7	7/1/2015
NH033	Chloride	MCL = 250 mg/L	64.1	7/21/2016
NH034	Chloride	MCL = 250 mg/L	36.9	2/4/2015
NH035	Chloride	MCL = 250 mg/L	20.3	9/26/2001
NH036	Chloride	MCL = 250 mg/L	39.7	9/24/2013
NH037	Chloride	MCL = 250 mg/L	42.8	2/4/2015
NH040	Chloride	MCL = 250 mg/L	19.1	9/27/2001
NH041	Chloride	MCL = 250 mg/L	--	
NH043A	Chloride	MCL = 250 mg/L	52.9	9/16/2015
NH044	Chloride	MCL = 250 mg/L	53.9	4/8/2015
NH045	Chloride	MCL = 250 mg/L	39.7	9/10/2013
NH004	Cr 6	MCL = 10 ug/L	0.2040	2/24/2016
NH007	Cr 6	MCL = 10 ug/L	0	3/31/2016
NH011	Cr 6	MCL = 10 ug/L	1.24	5/9/2002
NH021	Cr 6	MCL = 10 ug/L	0.600	9/26/2001
NH022	Cr 6	MCL = 10 ug/L	1.32	11/5/2014
NH023	Cr 6	MCL = 10 ug/L	1.67	6/10/2015
NH025	Cr 6	MCL = 10 ug/L	0.85	11/7/2014
NH026	Cr 6	MCL = 10 ug/L	1.75	11/16/2015
NH027	Cr 6	MCL = 10 ug/L	1.30	9/26/2001
NH028	Cr 6	MCL = 10 ug/L	1.72	5/9/2002
NH030	Cr 6	MCL = 10 ug/L	2.40	9/27/2001
NH032	Cr 6	MCL = 10 ug/L	0	11/7/2014
NH033	Cr 6	MCL = 10 ug/L	0.4230	7/21/2016
NH034	Cr 6	MCL = 10 ug/L	4.38	11/5/2014
NH035	Cr 6	MCL = 10 ug/L	0.800	9/26/2001
NH036	Cr 6	MCL = 10 ug/L	3.40	11/5/2014
NH037	Cr 6	MCL = 10 ug/L	2.77	11/5/2014
NH040	Cr 6	MCL = 10 ug/L	2.70	3/25/2002
NH041	Cr 6	MCL = 10 ug/L	5.30	6/20/2001

Location Code	Analyte	Regulatory Threshold	Result	Date
NH043A	Cr 6	MCL = 10 ug/L	0.99	9/16/2015
NH044	Cr 6	MCL = 10 ug/L	1.17	4/16/2015
NH045	Cr 6	MCL = 10 ug/L	2.47	11/5/2014
NH004	Cr, Total	MCL = 50 ug/L	0	2/24/2016
NH007	Cr, Total	MCL = 50 ug/L	1.200	3/31/2016
NH011	Cr, Total	MCL = 50 ug/L	0	7/9/2003
NH021	Cr, Total	MCL = 50 ug/L	0	9/26/2001
NH022	Cr, Total	MCL = 50 ug/L	0	6/10/2014
NH023	Cr, Total	MCL = 50 ug/L	1.80	6/10/2015
NH025	Cr, Total	MCL = 50 ug/L	1.300	4/23/2014
NH026	Cr, Total	MCL = 50 ug/L	1.700	11/16/2015
NH027	Cr, Total	MCL = 50 ug/L	1.500	9/26/2001
NH028	Cr, Total	MCL = 50 ug/L	0	7/9/2003
NH030	Cr, Total	MCL = 50 ug/L	5.70	9/27/2001
NH032	Cr, Total	MCL = 50 ug/L	0	8/6/2014
NH033	Cr, Total	MCL = 50 ug/L	0	7/21/2016
NH034	Cr, Total	MCL = 50 ug/L	4.10	1/21/2014
NH035	Cr, Total	MCL = 50 ug/L	0	9/26/2001
NH036	Cr, Total	MCL = 50 ug/L	4.10	9/24/2013
NH037	Cr, Total	MCL = 50 ug/L	4.10	12/11/2013
NH040	Cr, Total	MCL = 50 ug/L	0	3/25/2002
NH041	Cr, Total	MCL = 50 ug/L	4.90	6/20/2001
NH043A	Cr, Total	MCL = 50 ug/L	1.100	9/16/2015
NH044	Cr, Total	MCL = 50 ug/L	1.700	4/16/2015
NH045	Cr, Total	MCL = 50 ug/L	3.20	2/20/2015
NH004	Freon-11	MCL: 150 ug/L	0	8/26/2016
NH007	Freon-11	MCL: 150 ug/L	0	8/26/2016
NH011	Freon-11	MCL: 150 ug/L	0	5/4/2004
NH021	Freon-11	MCL: 150 ug/L	0	4/28/2000
NH022	Freon-11	MCL: 150 ug/L	0	10/27/2015
NH023	Freon-11	MCL: 150 ug/L	0	7/25/2016
NH025	Freon-11	MCL: 150 ug/L	0	8/22/2016
NH026	Freon-11	MCL: 150 ug/L	0	7/13/2016
NH027	Freon-11	MCL: 150 ug/L	0	3/31/2000
NH028	Freon-11	MCL: 150 ug/L	0	5/4/2004
NH030	Freon-11	MCL: 150 ug/L	0	6/18/2003
NH032	Freon-11	MCL: 150 ug/L	0	8/26/2016
NH033	Freon-11	MCL: 150 ug/L	0	8/26/2016
NH034	Freon-11	MCL: 150 ug/L	0	8/23/2016
NH035	Freon-11	MCL: 150 ug/L	0	11/15/2001
NH036	Freon-11	MCL: 150 ug/L	0	8/23/2016
NH037	Freon-11	MCL: 150 ug/L	0	8/9/2016
NH040	Freon-11	MCL: 150 ug/L	0	5/4/2004
NH041	Freon-11	MCL: 150 ug/L	--	
NH043A	Freon-11	MCL: 150 ug/L	0.6140	1/7/2016
NH044	Freon-11	MCL: 150 ug/L	0	8/23/2016
NH045	Freon-11	MCL: 150 ug/L	0	8/23/2016
NH004	Iron	SMCL: 300 ug/L	204.0	2/24/2016
NH007	Iron	SMCL: 300 ug/L	1050	3/31/2016
NH011	Iron	SMCL: 300 ug/L	23.3	7/9/2003
NH021	Iron	SMCL: 300 ug/L	170	3/9/2000
NH022	Iron	SMCL: 300 ug/L	39.0	6/10/2014
NH023	Iron	SMCL: 300 ug/L	54.3	5/24/2016
NH025	Iron	SMCL: 300 ug/L	31.8	4/23/2014
NH026	Iron	SMCL: 300 ug/L	0	11/16/2015
NH027	Iron	SMCL: 300 ug/L	--	
NH028	Iron	SMCL: 300 ug/L	55.0	7/9/2003
NH030	Iron	SMCL: 300 ug/L	--	
NH032	Iron	SMCL: 300 ug/L	31.4	8/6/2014
NH033	Iron	SMCL: 300 ug/L	0	7/21/2016
NH034	Iron	SMCL: 300 ug/L	34	2/4/2015
NH035	Iron	SMCL: 300 ug/L	40.2	9/26/2001
NH036	Iron	SMCL: 300 ug/L	0	9/24/2013
NH037	Iron	SMCL: 300 ug/L	25.6	2/4/2015
NH040	Iron	SMCL: 300 ug/L	279	4/2/2004

Location Code	Analyte	Regulatory Threshold	Result	Date
NH041	Iron	SMCL: 300 ug/L	--	
NH043A	Iron	SMCL: 300 ug/L	100.0	9/16/2015
NH044	Iron	SMCL: 300 ug/L	61	4/29/2016
NH045	Iron	SMCL: 300 ug/L	0	9/10/2013
NH004	Manganese	SMCL: 50 ug/L	4.50	2/24/2016
NH007	Manganese	SMCL: 50 ug/L	17	5/24/2016
NH011	Manganese	SMCL: 50 ug/L	0	7/9/2003
NH021	Manganese	SMCL: 50 ug/L	10.0	3/9/2000
NH022	Manganese	SMCL: 50 ug/L	0	6/10/2014
NH023	Manganese	SMCL: 50 ug/L	0	6/10/2015
NH025	Manganese	SMCL: 50 ug/L	0	4/23/2014
NH026	Manganese	SMCL: 50 ug/L	0	11/16/2015
NH027	Manganese	SMCL: 50 ug/L	--	
NH028	Manganese	SMCL: 50 ug/L	3.92	7/9/2003
NH030	Manganese	SMCL: 50 ug/L	--	
NH032	Manganese	SMCL: 50 ug/L	46.4	4/29/2016
NH033	Manganese	SMCL: 50 ug/L	0	7/21/2016
NH034	Manganese	SMCL: 50 ug/L	0	2/4/2015
NH035	Manganese	SMCL: 50 ug/L	0	9/26/2001
NH036	Manganese	SMCL: 50 ug/L	0	9/24/2013
NH037	Manganese	SMCL: 50 ug/L	0	2/4/2015
NH040	Manganese	SMCL: 50 ug/L	14.0	9/27/2001
NH041	Manganese	SMCL: 50 ug/L	--	
NH043A	Manganese	SMCL: 50 ug/L	2.90	9/16/2015
NH044	Manganese	SMCL: 50 ug/L	5.60	4/8/2015
NH045	Manganese	SMCL: 50 ug/L	0	9/10/2013
NH004	MTBE	MCL: 13 ug/L	0	8/26/2016
NH007	MTBE	MCL: 13 ug/L	0	8/26/2016
NH011	MTBE	MCL: 13 ug/L	0	5/4/2004
NH021	MTBE	MCL: 13 ug/L	--	
NH022	MTBE	MCL: 13 ug/L	0	10/27/2015
NH023	MTBE	MCL: 13 ug/L	0	7/25/2016
NH025	MTBE	MCL: 13 ug/L	0	8/22/2016
NH026	MTBE	MCL: 13 ug/L	0	7/13/2016
NH027	MTBE	MCL: 13 ug/L	--	
NH028	MTBE	MCL: 13 ug/L	0	5/4/2004
NH030	MTBE	MCL: 13 ug/L	0	6/18/2003
NH032	MTBE	MCL: 13 ug/L	0	8/26/2016
NH033	MTBE	MCL: 13 ug/L	0	8/26/2016
NH034	MTBE	MCL: 13 ug/L	0	8/23/2016
NH035	MTBE	MCL: 13 ug/L	0	11/15/2001
NH036	MTBE	MCL: 13 ug/L	0	8/23/2016
NH037	MTBE	MCL: 13 ug/L	0	8/9/2016
NH040	MTBE	MCL: 13 ug/L	0	5/4/2004
NH041	MTBE	MCL: 13 ug/L	--	
NH043A	MTBE	MCL: 13 ug/L	0	1/7/2016
NH044	MTBE	MCL: 13 ug/L	0	8/23/2016
NH045	MTBE	MCL: 13 ug/L	0	8/23/2016
NH004	Nitrate (N)	MCL: 10 mg/L	2.65	8/26/2016
NH007	Nitrate (N)	MCL: 10 mg/L	3.33	8/26/2016
NH011	Nitrate (N)	MCL: 10 mg/L	5.76	5/4/2004
NH021	Nitrate (N)	MCL: 10 mg/L	2.43	3/23/2001
NH022	Nitrate (N)	MCL: 10 mg/L	6.91	10/27/2015
NH023	Nitrate (N)	MCL: 10 mg/L	7.12	7/25/2016
NH025	Nitrate (N)	MCL: 10 mg/L	3.65	8/22/2016
NH026	Nitrate (N)	MCL: 10 mg/L	5.37	7/12/2016
NH027	Nitrate (N)	MCL: 10 mg/L	2.35	4/23/2002
NH028	Nitrate (N)	MCL: 10 mg/L	5.81	5/4/2004
NH030	Nitrate (N)	MCL: 10 mg/L	5.64	6/18/2003
NH032	Nitrate (N)	MCL: 10 mg/L	1.090	8/26/2016
NH033	Nitrate (N)	MCL: 10 mg/L	0.944	8/26/2016
NH034	Nitrate (N)	MCL: 10 mg/L	8.02	8/23/2016
NH035	Nitrate (N)	MCL: 10 mg/L	2.34	9/26/2001
NH036	Nitrate (N)	MCL: 10 mg/L	7.14	8/23/2016
NH037	Nitrate (N)	MCL: 10 mg/L	5.39	8/9/2016

Location Code	Analyte	Regulatory Threshold	Result	Date
NH040	Nitrate (N)	MCL: 10 mg/L	2.10	5/4/2004
NH041	Nitrate (N)	MCL: 10 mg/L	3.14	5/8/2001
NH043A	Nitrate (N)	MCL: 10 mg/L	6.95	1/7/2016
NH044	Nitrate (N)	MCL: 10 mg/L	3.67	8/23/2016
NH045	Nitrate (N)	MCL: 10 mg/L	3.34	8/23/2016
NH004	PCE	MCL: 5 ug/L	0	8/26/2016
NH007	PCE	MCL: 5 ug/L	0	8/26/2016
NH011	PCE	MCL: 5 ug/L	17.70	5/4/2004
NH021	PCE	MCL: 5 ug/L	8.23	4/28/2000
NH022	PCE	MCL: 5 ug/L	0	10/27/2015
NH023	PCE	MCL: 5 ug/L	1.06	7/25/2016
NH025	PCE	MCL: 5 ug/L	0	8/22/2016
NH026	PCE	MCL: 5 ug/L	0	7/13/2016
NH027	PCE	MCL: 5 ug/L	6.63	3/31/2000
NH028	PCE	MCL: 5 ug/L	18.00	5/4/2004
NH030	PCE	MCL: 5 ug/L	1.12	6/18/2003
NH032	PCE	MCL: 5 ug/L	0	8/26/2016
NH033	PCE	MCL: 5 ug/L	0	8/26/2016
NH034	PCE	MCL: 5 ug/L	1.340	8/23/2016
NH035	PCE	MCL: 5 ug/L	2.81	11/15/2001
NH036	PCE	MCL: 5 ug/L	0.574	8/23/2016
NH037	PCE	MCL: 5 ug/L	5.34	8/9/2016
NH040	PCE	MCL: 5 ug/L	1.85	5/4/2004
NH041	PCE	MCL: 5 ug/L	--	
NH043A	PCE	MCL: 5 ug/L	15.40	1/7/2016
NH044	PCE	MCL: 5 ug/L	0.864	8/23/2016
NH045	PCE	MCL: 5 ug/L	1.330	8/23/2016
NH004	Perchlorate	MCL: 6 ug/L	0	8/25/2015
NH007	Perchlorate	MCL: 6 ug/L	0	3/31/2016
NH011	Perchlorate	MCL: 6 ug/L	0	6/18/2003
NH021	Perchlorate	MCL: 6 ug/L	0	8/24/2001
NH022	Perchlorate	MCL: 6 ug/L	0	5/14/2015
NH023	Perchlorate	MCL: 6 ug/L	0	7/25/2016
NH025	Perchlorate	MCL: 6 ug/L	0	4/29/2016
NH026	Perchlorate	MCL: 6 ug/L	0	5/24/2016
NH027	Perchlorate	MCL: 6 ug/L	0	5/17/2002
NH028	Perchlorate	MCL: 6 ug/L	0	8/8/2003
NH030	Perchlorate	MCL: 6 ug/L	0	8/8/2003
NH032	Perchlorate	MCL: 6 ug/L	0	8/14/2015
NH033	Perchlorate	MCL: 6 ug/L	0	8/25/2015
NH034	Perchlorate	MCL: 6 ug/L	0	1/22/2016
NH035	Perchlorate	MCL: 6 ug/L	0	5/11/2001
NH036	Perchlorate	MCL: 6 ug/L	0	10/27/2015
NH037	Perchlorate	MCL: 6 ug/L	0	12/10/2015
NH040	Perchlorate	MCL: 6 ug/L	0	5/4/2004
NH041	Perchlorate	MCL: 6 ug/L	0	8/24/2001
NH043A	Perchlorate	MCL: 6 ug/L	0	8/25/2015
NH044	Perchlorate	MCL: 6 ug/L	0	7/21/2016
NH045	Perchlorate	MCL: 6 ug/L	0	5/24/2016
NH004	TCE	MCL: 5 ug/L	0	8/26/2016
NH007	TCE	MCL: 5 ug/L	0	8/26/2016
NH011	TCE	MCL: 5 ug/L	16.8	5/4/2004
NH021	TCE	MCL: 5 ug/L	1.64	4/28/2000
NH022	TCE	MCL: 5 ug/L	0	10/27/2015
NH023	TCE	MCL: 5 ug/L	5.1	7/25/2016
NH025	TCE	MCL: 5 ug/L	0	8/22/2016
NH026	TCE	MCL: 5 ug/L	0.65	7/13/2016
NH027	TCE	MCL: 5 ug/L	8.27	3/31/2000
NH028	TCE	MCL: 5 ug/L	17.0	5/4/2004
NH030	TCE	MCL: 5 ug/L	8.08	6/18/2003
NH032	TCE	MCL: 5 ug/L	0	8/26/2016
NH033	TCE	MCL: 5 ug/L	0	8/26/2016
NH034	TCE	MCL: 5 ug/L	12.40	8/23/2016
NH035	TCE	MCL: 5 ug/L	1.22	11/15/2001
NH036	TCE	MCL: 5 ug/L	3.54	8/23/2016

Location Code	Analyte	Regulatory Threshold	Result	Date
NH037	TCE	MCL: 5 ug/L	10.40	8/9/2016
NH040	TCE	MCL: 5 ug/L	1.63	5/4/2004
NH041	TCE	MCL: 5 ug/L	--	
NH043A	TCE	MCL: 5 ug/L	25.50	1/7/2016
NH044	TCE	MCL: 5 ug/L	3.75	8/23/2016
NH045	TCE	MCL: 5 ug/L	5.19	8/23/2016
NH004	TDS	SMCL: 1000 mg/L	1060	2/24/2016
NH007	TDS	SMCL: 1000 mg/L	934	3/31/2016
NH011	TDS	SMCL: 1000 mg/L	414	7/9/2003
NH021	TDS	SMCL: 1000 mg/L	377	3/9/2000
NH022	TDS	SMCL: 1000 mg/L	858	6/10/2014
NH023	TDS	SMCL: 1000 mg/L	684	6/10/2015
NH025	TDS	SMCL: 1000 mg/L	971	4/23/2014
NH026	TDS	SMCL: 1000 mg/L	825	11/16/2015
NH027	TDS	SMCL: 1000 mg/L	--	
NH028	TDS	SMCL: 1000 mg/L	412	7/9/2003
NH030	TDS	SMCL: 1000 mg/L	--	
NH032	TDS	SMCL: 1000 mg/L	826	7/1/2015
NH033	TDS	SMCL: 1000 mg/L	763	7/21/2016
NH034	TDS	SMCL: 1000 mg/L	695	1/21/2014
NH035	TDS	SMCL: 1000 mg/L	462	9/26/2001
NH036	TDS	SMCL: 1000 mg/L	974	9/24/2013
NH037	TDS	SMCL: 1000 mg/L	675	12/11/2013
NH040	TDS	SMCL: 1000 mg/L	362	9/27/2001
NH041	TDS	SMCL: 1000 mg/L	--	
NH043A	TDS	SMCL: 1000 mg/L	795	9/16/2015
NH044	TDS	SMCL: 1000 mg/L	785	4/8/2015
NH045	TDS	SMCL: 1000 mg/L	795	9/10/2013
NH004	Total Coliform	MCL = 1 NUM/100 ml	0	12/10/2015
NH007	Total Coliform	MCL = 1 NUM/100 ml	2.200	5/3/2016
NH011	Total Coliform	MCL = 1 NUM/100 ml	0	5/4/2004
NH021	Total Coliform	MCL = 1 NUM/100 ml	0	9/26/2001
NH022	Total Coliform	MCL = 1 NUM/100 ml	8.60	10/27/2015
NH023	Total Coliform	MCL = 1 NUM/100 ml	0	10/27/2015
NH025	Total Coliform	MCL = 1 NUM/100 ml	0	1/8/2016
NH026	Total Coliform	MCL = 1 NUM/100 ml	0	1/7/2016
NH027	Total Coliform	MCL = 1 NUM/100 ml	0	5/17/2002
NH028	Total Coliform	MCL = 1 NUM/100 ml	0	5/4/2004
NH030	Total Coliform	MCL = 1 NUM/100 ml	0	8/8/2003
NH032	Total Coliform	MCL = 1 NUM/100 ml	0	12/10/2015
NH033	Total Coliform	MCL = 1 NUM/100 ml	0	12/10/2015
NH034	Total Coliform	MCL = 1 NUM/100 ml	1.100	5/26/2016
NH035	Total Coliform	MCL = 1 NUM/100 ml	0	11/15/2001
NH036	Total Coliform	MCL = 1 NUM/100 ml	0	1/7/2016
NH037	Total Coliform	MCL = 1 NUM/100 ml	0	1/7/2016
NH040	Total Coliform	MCL = 1 NUM/100 ml	0	5/4/2004
NH041	Total Coliform	MCL = 1 NUM/100 ml	--	
NH043A	Total Coliform	MCL = 1 NUM/100 ml	0	1/7/2016
NH044	Total Coliform	MCL = 1 NUM/100 ml	0	12/18/2015
NH045	Total Coliform	MCL = 1 NUM/100 ml	0	1/7/2016
NH004	Uranium	MCL: 20 pCi/L	8.00	2/24/2016
NH007	Uranium	MCL: 20 pCi/L	8.00	3/31/2016
NH011	Uranium	MCL: 20 pCi/L	--	
NH021	Uranium	MCL: 20 pCi/L	--	
NH022	Uranium	MCL: 20 pCi/L	4.90	6/10/2014
NH023	Uranium	MCL: 20 pCi/L	4.50	6/10/2015
NH025	Uranium	MCL: 20 pCi/L	6.00	8/22/2016
NH026	Uranium	MCL: 20 pCi/L	6.90	5/26/2016
NH027	Uranium	MCL: 20 pCi/L	--	
NH028	Uranium	MCL: 20 pCi/L	--	
NH030	Uranium	MCL: 20 pCi/L	--	
NH032	Uranium	MCL: 20 pCi/L	6.30	8/6/2014
NH033	Uranium	MCL: 20 pCi/L	4.20	7/21/2016
NH034	Uranium	MCL: 20 pCi/L	5.60	1/21/2014
NH035	Uranium	MCL: 20 pCi/L	--	

Location Code	Analyte	Regulatory Threshold	Result	Date
NH036	Uranium	MCL: 20 pCi/L	5.50	9/24/2013
NH037	Uranium	MCL: 20 pCi/L	5.30	12/11/2013
NH040	Uranium	MCL: 20 pCi/L	--	
NH041	Uranium	MCL: 20 pCi/L	--	
NH043A	Uranium	MCL: 20 pCi/L	3.70	9/16/2015
NH044	Uranium	MCL: 20 pCi/L	3.10	4/8/2015
NH045	Uranium	MCL: 20 pCi/L	5.70	10/10/2013

Location Code	Analyte	Regulatory Threshold	Result	Date
RT001	1, 1-DCE	MCL: 6 ug/L	0	8/11/2016
RT002	1, 1-DCE	MCL: 6 ug/L	0	8/12/2016
RT003	1, 1-DCE	MCL: 6 ug/L	0	8/22/2016
RT004	1, 1-DCE	MCL: 6 ug/L	0	8/22/2016
RT005	1, 1-DCE	MCL: 6 ug/L	0	3/21/2016
RT006	1, 1-DCE	MCL: 6 ug/L	0	8/22/2016
RT007	1, 1-DCE	MCL: 6 ug/L	0	8/9/2016
RT008	1, 1-DCE	MCL: 6 ug/L	0	8/23/2016
RT009	1, 1-DCE	MCL: 6 ug/L	0	8/9/2016
RT010	1, 1-DCE	MCL: 6 ug/L	0	8/12/2016
RT011	1, 1-DCE	MCL: 6 ug/L	0	8/11/2016
RT012	1, 1-DCE	MCL: 6 ug/L	0	8/11/2016
RT013	1, 1-DCE	MCL: 6 ug/L	0	8/11/2016
RT014	1, 1-DCE	MCL: 6 ug/L	0	8/11/2016
RT015	1, 1-DCE	MCL: 6 ug/L	0	8/11/2016
RT001	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/11/2016
RT002	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/12/2016
RT003	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/22/2016
RT004	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/22/2016
RT005	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	3/21/2016
RT006	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/22/2016
RT007	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/9/2016
RT008	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/23/2016
RT009	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/9/2016
RT010	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/12/2016
RT011	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/11/2016
RT012	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/11/2016
RT013	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/11/2016
RT014	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/11/2016
RT015	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/11/2016
RT001	1,2,3-TCP	NL: 0.005 ug/L	0	3/18/2016
RT002	1,2,3-TCP	NL: 0.005 ug/L	0	5/17/2016
RT003	1,2,3-TCP	NL: 0.005 ug/L	0	5/17/2016
RT004	1,2,3-TCP	NL: 0.005 ug/L	0	5/17/2016
RT005	1,2,3-TCP	NL: 0.005 ug/L	0	8/27/2015
RT006	1,2,3-TCP	NL: 0.005 ug/L	0	6/28/2016
RT007	1,2,3-TCP	NL: 0.005 ug/L	0	5/17/2016
RT008	1,2,3-TCP	NL: 0.005 ug/L	0	4/15/2016
RT009	1,2,3-TCP	NL: 0.005 ug/L	0	5/17/2016
RT010	1,2,3-TCP	NL: 0.005 ug/L	0	5/17/2016
RT011	1,2,3-TCP	NL: 0.005 ug/L	0	5/12/2016
RT012	1,2,3-TCP	NL: 0.005 ug/L	0	5/12/2016
RT013	1,2,3-TCP	NL: 0.005 ug/L	0	5/12/2016
RT014	1,2,3-TCP	NL: 0.005 ug/L	0	5/12/2016
RT015	1,2,3-TCP	NL: 0.005 ug/L	0	5/12/2016
RT001	1,2-DCE-cis	MCL: 6 ug/L	0.677	8/11/2016
RT002	1,2-DCE-cis	MCL: 6 ug/L	0	8/12/2016
RT003	1,2-DCE-cis	MCL: 6 ug/L	0	8/22/2016
RT004	1,2-DCE-cis	MCL: 6 ug/L	0.5780	8/22/2016
RT005	1,2-DCE-cis	MCL: 6 ug/L	0.5440	3/21/2016
RT006	1,2-DCE-cis	MCL: 6 ug/L	0	8/22/2016
RT007	1,2-DCE-cis	MCL: 6 ug/L	0	8/9/2016
RT008	1,2-DCE-cis	MCL: 6 ug/L	0	8/23/2016
RT009	1,2-DCE-cis	MCL: 6 ug/L	0	8/9/2016
RT010	1,2-DCE-cis	MCL: 6 ug/L	0	8/12/2016
RT011	1,2-DCE-cis	MCL: 6 ug/L	0	8/11/2016
RT012	1,2-DCE-cis	MCL: 6 ug/L	0	8/11/2016
RT013	1,2-DCE-cis	MCL: 6 ug/L	0	8/11/2016
RT014	1,2-DCE-cis	MCL: 6 ug/L	0.655	8/11/2016
RT015	1,2-DCE-cis	MCL: 6 ug/L	1.230	8/11/2016
RT001	1,4-Dioxane	NL: 1 ug/L	0	7/22/2016
RT002	1,4-Dioxane	NL: 1 ug/L	0	7/22/2016
RT003	1,4-Dioxane	NL: 1 ug/L	0	7/25/2016
RT004	1,4-Dioxane	NL: 1 ug/L	1.350	7/25/2016
RT005	1,4-Dioxane	NL: 1 ug/L	0	1/29/2016

Location Code	Analyte	Regulatory Threshold	Result	Date
RT006	1,4-Dioxane	NL: 1 ug/L	0	8/22/2016
RT007	1,4-Dioxane	NL: 1 ug/L	0	8/9/2016
RT008	1,4-Dioxane	NL: 1 ug/L	0	8/23/2016
RT009	1,4-Dioxane	NL: 1 ug/L	0	8/9/2016
RT010	1,4-Dioxane	NL: 1 ug/L	0	8/12/2016
RT011	1,4-Dioxane	NL: 1 ug/L	0	6/14/2016
RT012	1,4-Dioxane	NL: 1 ug/L	0	6/14/2016
RT013	1,4-Dioxane	NL: 1 ug/L	0	6/14/2016
RT014	1,4-Dioxane	NL: 1 ug/L	0.558	6/14/2016
RT015	1,4-Dioxane	NL: 1 ug/L	1.260	6/14/2016
RT001	Bromide	Not regulated - mg/L	0.0976	10/20/2015
RT002	Bromide	Not regulated - mg/L	0.0797	3/15/2016
RT003	Bromide	Not regulated - mg/L	0.104	2/11/2015
RT004	Bromide	Not regulated - mg/L	0.119	6/10/2014
RT005	Bromide	Not regulated - mg/L	0.144	9/23/2015
RT006	Bromide	Not regulated - mg/L	0.137	6/10/2014
RT007	Bromide	Not regulated - mg/L	0.1350	9/23/2015
RT008	Bromide	Not regulated - mg/L	0.1600	8/23/2016
RT009	Bromide	Not regulated - mg/L	0.1310	9/23/2015
RT010	Bromide	Not regulated - mg/L	0.0950	9/23/2015
RT011	Bromide	Not regulated - mg/L	0.090	10/20/2015
RT012	Bromide	Not regulated - mg/L	0.0920	10/7/2014
RT013	Bromide	Not regulated - mg/L	0.1000	10/21/2014
RT014	Bromide	Not regulated - mg/L	0.0750	2/4/2015
RT015	Bromide	Not regulated - mg/L	0.0670	2/4/2015
RT001	CCl4	MCL: 0.5 ug/L	0	8/11/2016
RT002	CCl4	MCL: 0.5 ug/L	0	8/12/2016
RT003	CCl4	MCL: 0.5 ug/L	0	8/22/2016
RT004	CCl4	MCL: 0.5 ug/L	0	8/22/2016
RT005	CCl4	MCL: 0.5 ug/L	0	3/21/2016
RT006	CCl4	MCL: 0.5 ug/L	0	8/22/2016
RT007	CCl4	MCL: 0.5 ug/L	0	8/9/2016
RT008	CCl4	MCL: 0.5 ug/L	0	8/23/2016
RT009	CCl4	MCL: 0.5 ug/L	0	8/9/2016
RT010	CCl4	MCL: 0.5 ug/L	0	8/12/2016
RT011	CCl4	MCL: 0.5 ug/L	0	8/11/2016
RT012	CCl4	MCL: 0.5 ug/L	0	8/11/2016
RT013	CCl4	MCL: 0.5 ug/L	0	8/11/2016
RT014	CCl4	MCL: 0.5 ug/L	0	8/11/2016
RT015	CCl4	MCL: 0.5 ug/L	0	8/11/2016
RT001	Chloride	MCL = 250 mg/L	19.3	10/20/2015
RT002	Chloride	MCL = 250 mg/L	15.2	3/15/2016
RT003	Chloride	MCL = 250 mg/L	20.0	2/11/2015
RT004	Chloride	MCL = 250 mg/L	22.6	6/10/2014
RT005	Chloride	MCL = 250 mg/L	26.9	9/23/2015
RT006	Chloride	MCL = 250 mg/L	26.1	6/10/2014
RT007	Chloride	MCL = 250 mg/L	26.6	9/23/2015
RT008	Chloride	MCL = 250 mg/L	29.4	8/23/2016
RT009	Chloride	MCL = 250 mg/L	22.8	9/23/2015
RT010	Chloride	MCL = 250 mg/L	19.4	9/23/2015
RT011	Chloride	MCL = 250 mg/L	13.5	1/26/2016
RT012	Chloride	MCL = 250 mg/L	18.3	10/7/2014
RT013	Chloride	MCL = 250 mg/L	18.0	10/21/2014
RT014	Chloride	MCL = 250 mg/L	14.9	2/4/2015
RT015	Chloride	MCL = 250 mg/L	13.7	2/4/2015
RT001	Cr 6	MCL = 10 ug/L	0.629	10/20/2015
RT002	Cr 6	MCL = 10 ug/L	1.60	3/15/2016
RT003	Cr 6	MCL = 10 ug/L	2.42	2/11/2015
RT004	Cr 6	MCL = 10 ug/L	2.15	11/7/2014
RT005	Cr 6	MCL = 10 ug/L	2.26	9/23/2015
RT006	Cr 6	MCL = 10 ug/L	1.50	11/6/2014
RT007	Cr 6	MCL = 10 ug/L	1.69	9/23/2015
RT008	Cr 6	MCL = 10 ug/L	2.20	8/23/2016
RT009	Cr 6	MCL = 10 ug/L	1.36	9/23/2015
RT010	Cr 6	MCL = 10 ug/L	1.21	9/23/2015

Location Code	Analyte	Regulatory Threshold	Result	Date
RT011	Cr 6	MCL = 10 ug/L	1.05	10/20/2015
RT012	Cr 6	MCL = 10 ug/L	1.63	12/11/2014
RT013	Cr 6	MCL = 10 ug/L	1.70	12/11/2014
RT014	Cr 6	MCL = 10 ug/L	0.85	12/4/2014
RT015	Cr 6	MCL = 10 ug/L	1.59	12/4/2014
RT001	Cr, Total	MCL = 50 ug/L	0	10/20/2015
RT002	Cr, Total	MCL = 50 ug/L	1.600	3/15/2016
RT003	Cr, Total	MCL = 50 ug/L	2.60	2/11/2015
RT004	Cr, Total	MCL = 50 ug/L	1.60	6/10/2014
RT005	Cr, Total	MCL = 50 ug/L	2.20	9/23/2015
RT006	Cr, Total	MCL = 50 ug/L	1.60	6/10/2014
RT007	Cr, Total	MCL = 50 ug/L	1.60	9/23/2015
RT008	Cr, Total	MCL = 50 ug/L	2.10	8/23/2016
RT009	Cr, Total	MCL = 50 ug/L	1.300	9/23/2015
RT010	Cr, Total	MCL = 50 ug/L	1.100	9/23/2015
RT011	Cr, Total	MCL = 50 ug/L	1.100	10/20/2015
RT012	Cr, Total	MCL = 50 ug/L	1.20	10/7/2014
RT013	Cr, Total	MCL = 50 ug/L	1.10	10/21/2014
RT014	Cr, Total	MCL = 50 ug/L	0	10/21/2014
RT015	Cr, Total	MCL = 50 ug/L	0	10/21/2014
RT001	Freon-11	MCL: 150 ug/L	0	8/11/2016
RT002	Freon-11	MCL: 150 ug/L	0	8/12/2016
RT003	Freon-11	MCL: 150 ug/L	0	8/22/2016
RT004	Freon-11	MCL: 150 ug/L	0	8/22/2016
RT005	Freon-11	MCL: 150 ug/L	0	3/21/2016
RT006	Freon-11	MCL: 150 ug/L	0	8/22/2016
RT007	Freon-11	MCL: 150 ug/L	0	8/9/2016
RT008	Freon-11	MCL: 150 ug/L	1.590	8/23/2016
RT009	Freon-11	MCL: 150 ug/L	0.781	8/9/2016
RT010	Freon-11	MCL: 150 ug/L	0	8/12/2016
RT011	Freon-11	MCL: 150 ug/L	0	8/11/2016
RT012	Freon-11	MCL: 150 ug/L	0	8/11/2016
RT013	Freon-11	MCL: 150 ug/L	0	8/11/2016
RT014	Freon-11	MCL: 150 ug/L	0	8/11/2016
RT015	Freon-11	MCL: 150 ug/L	0	8/11/2016
RT001	Iron	SMCL: 300 ug/L	0	10/20/2015
RT002	Iron	SMCL: 300 ug/L	0	3/15/2016
RT003	Iron	SMCL: 300 ug/L	76.3	2/11/2015
RT004	Iron	SMCL: 300 ug/L	0	6/10/2014
RT005	Iron	SMCL: 300 ug/L	30.0	9/23/2015
RT006	Iron	SMCL: 300 ug/L	0	6/10/2014
RT007	Iron	SMCL: 300 ug/L	0	9/23/2015
RT008	Iron	SMCL: 300 ug/L	0	8/23/2016
RT009	Iron	SMCL: 300 ug/L	0	9/23/2015
RT010	Iron	SMCL: 300 ug/L	0	9/23/2015
RT011	Iron	SMCL: 300 ug/L	0	10/20/2015
RT012	Iron	SMCL: 300 ug/L	0	10/7/2014
RT013	Iron	SMCL: 300 ug/L	0	10/21/2014
RT014	Iron	SMCL: 300 ug/L	0	2/4/2015
RT015	Iron	SMCL: 300 ug/L	141	2/4/2015
RT001	MTBE	MCL: 13 ug/L	0	8/11/2016
RT002	MTBE	MCL: 13 ug/L	0	8/12/2016
RT003	MTBE	MCL: 13 ug/L	0	8/22/2016
RT004	MTBE	MCL: 13 ug/L	0	8/22/2016
RT005	MTBE	MCL: 13 ug/L	0	3/21/2016
RT006	MTBE	MCL: 13 ug/L	0	8/22/2016
RT007	MTBE	MCL: 13 ug/L	0	8/9/2016
RT008	MTBE	MCL: 13 ug/L	0	8/23/2016
RT009	MTBE	MCL: 13 ug/L	0	8/9/2016
RT010	MTBE	MCL: 13 ug/L	0	8/12/2016
RT011	MTBE	MCL: 13 ug/L	0	8/11/2016
RT012	MTBE	MCL: 13 ug/L	0	8/11/2016
RT013	MTBE	MCL: 13 ug/L	0	8/11/2016
RT014	MTBE	MCL: 13 ug/L	0	8/11/2016
RT015	MTBE	MCL: 13 ug/L	0	8/11/2016

Location Code	Analyte	Regulatory Threshold	Result	Date
RT001	Manganese	SMCL: 50 ug/L	0	10/20/2015
RT002	Manganese	SMCL: 50 ug/L	0	3/15/2016
RT003	Manganese	SMCL: 50 ug/L	0	2/11/2015
RT004	Manganese	SMCL: 50 ug/L	0	6/10/2014
RT005	Manganese	SMCL: 50 ug/L	0	9/23/2015
RT006	Manganese	SMCL: 50 ug/L	0	6/10/2014
RT007	Manganese	SMCL: 50 ug/L	0	9/23/2015
RT008	Manganese	SMCL: 50 ug/L	0	8/23/2016
RT009	Manganese	SMCL: 50 ug/L	0	9/23/2015
RT010	Manganese	SMCL: 50 ug/L	0	9/23/2015
RT011	Manganese	SMCL: 50 ug/L	0	10/20/2015
RT012	Manganese	SMCL: 50 ug/L	0	10/7/2014
RT013	Manganese	SMCL: 50 ug/L	0	10/21/2014
RT014	Manganese	SMCL: 50 ug/L	0	2/4/2015
RT015	Manganese	SMCL: 50 ug/L	6.1	2/4/2015
RT001	Nitrate (N)	MCL: 10 mg/L	4.63	8/11/2016
RT002	Nitrate (N)	MCL: 10 mg/L	4.67	8/12/2016
RT003	Nitrate (N)	MCL: 10 mg/L	4.28	8/22/2016
RT004	Nitrate (N)	MCL: 10 mg/L	5.40	8/22/2016
RT005	Nitrate (N)	MCL: 10 mg/L	5.70	3/21/2016
RT006	Nitrate (N)	MCL: 10 mg/L	5.58	8/22/2016
RT007	Nitrate (N)	MCL: 10 mg/L	4.94	8/9/2016
RT008	Nitrate (N)	MCL: 10 mg/L	4.66	8/23/2016
RT009	Nitrate (N)	MCL: 10 mg/L	4.28	8/9/2016
RT010	Nitrate (N)	MCL: 10 mg/L	4.56	8/12/2016
RT011	Nitrate (N)	MCL: 10 mg/L	3.39	8/11/2016
RT012	Nitrate (N)	MCL: 10 mg/L	2.19	8/11/2016
RT013	Nitrate (N)	MCL: 10 mg/L	2.56	8/11/2016
RT014	Nitrate (N)	MCL: 10 mg/L	4.36	8/11/2016
RT015	Nitrate (N)	MCL: 10 mg/L	6.49	8/11/2016
RT001	PCE	MCL: 5 ug/L	2.76	8/11/2016
RT002	PCE	MCL: 5 ug/L	1.870	8/12/2016
RT003	PCE	MCL: 5 ug/L	1.210	8/22/2016
RT004	PCE	MCL: 5 ug/L	2.380	8/22/2016
RT005	PCE	MCL: 5 ug/L	2.490	3/21/2016
RT006	PCE	MCL: 5 ug/L	0	8/22/2016
RT007	PCE	MCL: 5 ug/L	0	8/9/2016
RT008	PCE	MCL: 5 ug/L	0	8/23/2016
RT009	PCE	MCL: 5 ug/L	0	8/9/2016
RT010	PCE	MCL: 5 ug/L	2.440	8/12/2016
RT011	PCE	MCL: 5 ug/L	1.500	8/11/2016
RT012	PCE	MCL: 5 ug/L	0.528	8/11/2016
RT013	PCE	MCL: 5 ug/L	1.220	8/11/2016
RT014	PCE	MCL: 5 ug/L	2.560	8/11/2016
RT015	PCE	MCL: 5 ug/L	3.860	8/11/2016
RT001	Perchlorate	MCL: 6 ug/L	0	6/14/2016
RT002	Perchlorate	MCL: 6 ug/L	0	7/22/2016
RT003	Perchlorate	MCL: 6 ug/L	0	8/22/2016
RT004	Perchlorate	MCL: 6 ug/L	0	8/22/2016
RT005	Perchlorate	MCL: 6 ug/L	0	8/27/2015
RT006	Perchlorate	MCL: 6 ug/L	0	8/22/2016
RT007	Perchlorate	MCL: 6 ug/L	0	8/9/2016
RT008	Perchlorate	MCL: 6 ug/L	0	7/12/2016
RT009	Perchlorate	MCL: 6 ug/L	0	5/17/2016
RT010	Perchlorate	MCL: 6 ug/L	0	7/22/2016
RT011	Perchlorate	MCL: 6 ug/L	0	5/12/2016
RT012	Perchlorate	MCL: 6 ug/L	0	7/22/2016
RT013	Perchlorate	MCL: 6 ug/L	0	10/20/2015
RT014	Perchlorate	MCL: 6 ug/L	0	10/20/2015
RT015	Perchlorate	MCL: 6 ug/L	0	8/11/2016
RT001	TCE	MCL: 5 ug/L	25.2	8/11/2016
RT002	TCE	MCL: 5 ug/L	11.60	8/12/2016
RT003	TCE	MCL: 5 ug/L	7.66	8/22/2016
RT004	TCE	MCL: 5 ug/L	5.63	8/22/2016
RT005	TCE	MCL: 5 ug/L	1.900	3/21/2016

Location Code	Analyte	Regulatory Threshold	Result	Date
RT006	TCE	MCL: 5 ug/L	0.5500	8/22/2016
RT007	TCE	MCL: 5 ug/L	0	8/9/2016
RT008	TCE	MCL: 5 ug/L	0.522	8/23/2016
RT009	TCE	MCL: 5 ug/L	0.502	8/9/2016
RT010	TCE	MCL: 5 ug/L	14.3	8/12/2016
RT011	TCE	MCL: 5 ug/L	11.20	8/11/2016
RT012	TCE	MCL: 5 ug/L	3.09	8/11/2016
RT013	TCE	MCL: 5 ug/L	7.91	8/11/2016
RT014	TCE	MCL: 5 ug/L	35.7	8/11/2016
RT015	TCE	MCL: 5 ug/L	50.9	8/11/2016
RT001	TDS	SMCL: 1000 mg/L	393	10/20/2015
RT002	TDS	SMCL: 1000 mg/L	342	3/15/2016
RT003	TDS	SMCL: 1000 mg/L	437	2/11/2015
RT004	TDS	SMCL: 1000 mg/L	471	6/10/2014
RT005	TDS	SMCL: 1000 mg/L	537	9/23/2015
RT006	TDS	SMCL: 1000 mg/L	463	6/10/2014
RT007	TDS	SMCL: 1000 mg/L	476	9/23/2015
RT008	TDS	SMCL: 1000 mg/L	566	8/23/2016
RT009	TDS	SMCL: 1000 mg/L	409	9/23/2015
RT010	TDS	SMCL: 1000 mg/L	383	9/23/2015
RT011	TDS	SMCL: 1000 mg/L	364	10/20/2015
RT012	TDS	SMCL: 1000 mg/L	380	10/7/2014
RT013	TDS	SMCL: 1000 mg/L	379	10/21/2014
RT014	TDS	SMCL: 1000 mg/L	371	10/21/2014
RT015	TDS	SMCL: 1000 mg/L	378	10/21/2014
RT001	Total Coliform	MCL = 1 NUM/100 ml	0	12/28/2015
RT002	Total Coliform	MCL = 1 NUM/100 ml	0	12/28/2015
RT003	Total Coliform	MCL = 1 NUM/100 ml	0	12/29/2015
RT004	Total Coliform	MCL = 1 NUM/100 ml	0	12/29/2015
RT005	Total Coliform	MCL = 1 NUM/100 ml	1.100	2/26/2016
RT006	Total Coliform	MCL = 1 NUM/100 ml	0	12/29/2015
RT007	Total Coliform	MCL = 1 NUM/100 ml	0	12/29/2015
RT008	Total Coliform	MCL = 1 NUM/100 ml	0	12/29/2015
RT009	Total Coliform	MCL = 1 NUM/100 ml	0	12/29/2015
RT010	Total Coliform	MCL = 1 NUM/100 ml	0	1/29/2016
RT011	Total Coliform	MCL = 1 NUM/100 ml	0	12/28/2015
RT012	Total Coliform	MCL = 1 NUM/100 ml	0	12/28/2015
RT013	Total Coliform	MCL = 1 NUM/100 ml	0	12/28/2015
RT014	Total Coliform	MCL = 1 NUM/100 ml	0	12/28/2015
RT015	Total Coliform	MCL = 1 NUM/100 ml	0	12/28/2015
RT001	Uranium	MCL: 20 pCi/L	5.70	10/20/2015
RT002	Uranium	MCL: 20 pCi/L	3.70	3/15/2016
RT003	Uranium	MCL: 20 pCi/L	3.60	5/17/2016
RT004	Uranium	MCL: 20 pCi/L	6.10	5/19/2015
RT005	Uranium	MCL: 20 pCi/L	6.20	9/23/2015
RT006	Uranium	MCL: 20 pCi/L	6.10	6/28/2016
RT007	Uranium	MCL: 20 pCi/L	5.20	9/23/2015
RT008	Uranium	MCL: 20 pCi/L	6.00	8/23/2016
RT009	Uranium	MCL: 20 pCi/L	3.80	9/23/2015
RT010	Uranium	MCL: 20 pCi/L	5.50	5/17/2016
RT011	Uranium	MCL: 20 pCi/L	4.90	10/20/2015
RT012	Uranium	MCL: 20 pCi/L	4.00	3/21/2016
RT013	Uranium	MCL: 20 pCi/L	3.60	3/21/2016
RT014	Uranium	MCL: 20 pCi/L	5.50	10/21/2014
RT015	Uranium	MCL: 20 pCi/L	6.50	10/21/2014

Location Code	Analyte	Regulatory Threshold	Result	Date
TJ001	1, 1-DCE	MCL: 6 ug/L	0	8/2/2016
TJ002	1, 1-DCE	MCL: 6 ug/L	0	8/2/2016
TJ003	1, 1-DCE	MCL: 6 ug/L	0	8/2/2016
TJ004	1, 1-DCE	MCL: 6 ug/L	0	8/2/2016
TJ005	1, 1-DCE	MCL: 6 ug/L	0	8/3/2016
TJ006	1, 1-DCE	MCL: 6 ug/L	1.41	7/6/2016
TJ007	1, 1-DCE	MCL: 6 ug/L	7.16	8/3/2016
TJ008	1, 1-DCE	MCL: 6 ug/L	6.23	8/3/2016
TJ009	1, 1-DCE	MCL: 6 ug/L	4.02	8/9/2016
TJ010	1, 1-DCE	MCL: 6 ug/L	1.730	8/9/2016
TJ011	1, 1-DCE	MCL: 6 ug/L	0.784	8/9/2016
TJ012	1, 1-DCE	MCL: 6 ug/L	0	8/9/2016
TJ001	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/2/2016
TJ002	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/2/2016
TJ003	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/2/2016
TJ004	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/2/2016
TJ005	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/3/2016
TJ006	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	7/6/2016
TJ007	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0.5440	8/3/2016
TJ008	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/3/2016
TJ009	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/9/2016
TJ010	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/9/2016
TJ011	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/9/2016
TJ012	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/9/2016
TJ001	1,2,3-TCP	NL: 0.005 ug/L	0	7/8/2016
TJ002	1,2,3-TCP	NL: 0.005 ug/L	0	7/8/2016
TJ003	1,2,3-TCP	NL: 0.005 ug/L	0	7/8/2016
TJ004	1,2,3-TCP	NL: 0.005 ug/L	0	7/8/2016
TJ005	1,2,3-TCP	NL: 0.005 ug/L	0.01050	7/7/2016
TJ006	1,2,3-TCP	NL: 0.005 ug/L	0	7/6/2016
TJ007	1,2,3-TCP	NL: 0.005 ug/L	0	7/6/2016
TJ008	1,2,3-TCP	NL: 0.005 ug/L	0	7/14/2016
TJ009	1,2,3-TCP	NL: 0.005 ug/L	0	7/14/2016
TJ010	1,2,3-TCP	NL: 0.005 ug/L	0	7/14/2016
TJ011	1,2,3-TCP	NL: 0.005 ug/L	0	4/11/2016
TJ012	1,2,3-TCP	NL: 0.005 ug/L	0	7/20/2016
TJ001	1,2-DCE-cis	MCL: 6 ug/L	0	8/2/2016
TJ002	1,2-DCE-cis	MCL: 6 ug/L	0	8/2/2016
TJ003	1,2-DCE-cis	MCL: 6 ug/L	0	8/2/2016
TJ004	1,2-DCE-cis	MCL: 6 ug/L	0	8/2/2016
TJ005	1,2-DCE-cis	MCL: 6 ug/L	0	8/3/2016
TJ006	1,2-DCE-cis	MCL: 6 ug/L	0	7/6/2016
TJ007	1,2-DCE-cis	MCL: 6 ug/L	0.885	8/3/2016
TJ008	1,2-DCE-cis	MCL: 6 ug/L	0	8/3/2016
TJ009	1,2-DCE-cis	MCL: 6 ug/L	0	8/9/2016
TJ010	1,2-DCE-cis	MCL: 6 ug/L	0	8/9/2016
TJ011	1,2-DCE-cis	MCL: 6 ug/L	0	8/9/2016
TJ012	1,2-DCE-cis	MCL: 6 ug/L	0	8/9/2016
TJ001	1,4-Dioxane	NL: 1 ug/L	0	7/8/2016
TJ002	1,4-Dioxane	NL: 1 ug/L	0	7/8/2016
TJ003	1,4-Dioxane	NL: 1 ug/L	0	7/8/2016
TJ004	1,4-Dioxane	NL: 1 ug/L	0	7/8/2016
TJ005	1,4-Dioxane	NL: 1 ug/L	0	7/7/2016
TJ006	1,4-Dioxane	NL: 1 ug/L	0	7/6/2016
TJ007	1,4-Dioxane	NL: 1 ug/L	1.730	7/6/2016
TJ008	1,4-Dioxane	NL: 1 ug/L	1.590	7/14/2016
TJ009	1,4-Dioxane	NL: 1 ug/L	0.734	7/14/2016
TJ010	1,4-Dioxane	NL: 1 ug/L	0.827	7/14/2016
TJ011	1,4-Dioxane	NL: 1 ug/L	1.100	4/11/2016
TJ012	1,4-Dioxane	NL: 1 ug/L	0.7700	7/20/2016
TJ001	Bromide	Not regulated - mg/L	0.1490	6/10/2015
TJ002	Bromide	Not regulated - mg/L	0.0857	6/10/2014

Location Code	Analyte	Regulatory Threshold	Result	Date
TJ003	Bromide	Not regulated - mg/L	0.0870	11/12/2014
TJ004	Bromide	Not regulated - mg/L	0.0658	11/3/2015
TJ005	Bromide	Not regulated - mg/L	0.0740	1/21/2015
TJ006	Bromide	Not regulated - mg/L	0.125	2/5/2015
TJ007	Bromide	Not regulated - mg/L	0.155	11/16/2015
TJ008	Bromide	Not regulated - mg/L	0.188	7/7/2015
TJ009	Bromide	Not regulated - mg/L	0.186	6/10/2015
TJ010	Bromide	Not regulated - mg/L	0.178	9/16/2015
TJ011	Bromide	Not regulated - mg/L	0.172	6/30/2016
TJ012	Bromide	Not regulated - mg/L	0.119	8/25/2015
TJ001	CCl4	MCL: 0.5 ug/L	0	8/2/2016
TJ002	CCl4	MCL: 0.5 ug/L	0	8/2/2016
TJ003	CCl4	MCL: 0.5 ug/L	0	8/2/2016
TJ004	CCl4	MCL: 0.5 ug/L	0	8/2/2016
TJ005	CCl4	MCL: 0.5 ug/L	0	8/3/2016
TJ006	CCl4	MCL: 0.5 ug/L	0	7/6/2016
TJ007	CCl4	MCL: 0.5 ug/L	0	8/3/2016
TJ008	CCl4	MCL: 0.5 ug/L	0.354	8/3/2016
TJ009	CCl4	MCL: 0.5 ug/L	0	8/9/2016
TJ010	CCl4	MCL: 0.5 ug/L	0	8/9/2016
TJ011	CCl4	MCL: 0.5 ug/L	0	8/9/2016
TJ012	CCl4	MCL: 0.5 ug/L	0	8/9/2016
TJ001	Chloride	MCL = 250 mg/L	29.9	6/10/2015
TJ002	Chloride	MCL = 250 mg/L	19.7	6/10/2014
TJ003	Chloride	MCL = 250 mg/L	19.8	11/12/2014
TJ004	Chloride	MCL = 250 mg/L	24.7	5/13/2014
TJ005	Chloride	MCL = 250 mg/L	22.6	9/9/2015
TJ006	Chloride	MCL = 250 mg/L	26.2	1/6/2016
TJ007	Chloride	MCL = 250 mg/L	29.2	11/16/2015
TJ008	Chloride	MCL = 250 mg/L	31.7	7/7/2015
TJ009	Chloride	MCL = 250 mg/L	30.7	6/10/2015
TJ010	Chloride	MCL = 250 mg/L	28.8	9/16/2015
TJ011	Chloride	MCL = 250 mg/L	35.5	6/30/2016
TJ012	Chloride	MCL = 250 mg/L	21.7	8/25/2015
TJ001	Cr 6	MCL = 10 ug/L	3.67	6/10/2015
TJ002	Cr 6	MCL = 10 ug/L	2.47	11/13/2014
TJ003	Cr 6	MCL = 10 ug/L	1.95	11/12/2014
TJ004	Cr 6	MCL = 10 ug/L	1.87	11/13/2014
TJ005	Cr 6	MCL = 10 ug/L	1.30	1/21/2015
TJ006	Cr 6	MCL = 10 ug/L	1.39	1/21/2015
TJ007	Cr 6	MCL = 10 ug/L	1.41	12/29/2015
TJ008	Cr 6	MCL = 10 ug/L	0.79	7/7/2015
TJ009	Cr 6	MCL = 10 ug/L	0.740	6/10/2015
TJ010	Cr 6	MCL = 10 ug/L	0.87	9/16/2015
TJ011	Cr 6	MCL = 10 ug/L	1.01	6/30/2016
TJ012	Cr 6	MCL = 10 ug/L	0.690	8/25/2015
TJ001	Cr, Total	MCL = 50 ug/L	3.60	6/10/2015
TJ002	Cr, Total	MCL = 50 ug/L	3.10	5/1/2015
TJ003	Cr, Total	MCL = 50 ug/L	1.700	11/12/2014
TJ004	Cr, Total	MCL = 50 ug/L	2.000	5/13/2014
TJ005	Cr, Total	MCL = 50 ug/L	1.50	7/7/2016
TJ006	Cr, Total	MCL = 50 ug/L	1.10	7/6/2016
TJ007	Cr, Total	MCL = 50 ug/L	1.50	7/6/2016
TJ008	Cr, Total	MCL = 50 ug/L	1.300	7/14/2016
TJ009	Cr, Total	MCL = 50 ug/L	0	6/10/2015
TJ010	Cr, Total	MCL = 50 ug/L	0	9/16/2015
TJ011	Cr, Total	MCL = 50 ug/L	0	6/30/2016
TJ012	Cr, Total	MCL = 50 ug/L	0	8/25/2015
TJ001	Freon-11	MCL: 150 ug/L	0	8/2/2016
TJ002	Freon-11	MCL: 150 ug/L	0	8/2/2016
TJ003	Freon-11	MCL: 150 ug/L	0	8/2/2016
TJ004	Freon-11	MCL: 150 ug/L	0	8/2/2016

Location Code	Analyte	Regulatory Threshold	Result	Date
TJ005	Freon-11	MCL: 150 ug/L	0	8/3/2016
TJ006	Freon-11	MCL: 150 ug/L	0.912	7/6/2016
TJ007	Freon-11	MCL: 150 ug/L	10.80	8/3/2016
TJ008	Freon-11	MCL: 150 ug/L	2.12	8/3/2016
TJ009	Freon-11	MCL: 150 ug/L	1.76	8/9/2016
TJ010	Freon-11	MCL: 150 ug/L	34.2	8/9/2016
TJ011	Freon-11	MCL: 150 ug/L	3.4	8/9/2016
TJ012	Freon-11	MCL: 150 ug/L	27.4	8/9/2016
TJ001	Iron	SMCL: 300 ug/L	0	6/10/2015
TJ002	Iron	SMCL: 300 ug/L	0	6/10/2014
TJ003	Iron	SMCL: 300 ug/L	0	11/12/2014
TJ004	Iron	SMCL: 300 ug/L	0	5/13/2014
TJ005	Iron	SMCL: 300 ug/L	0	1/21/2015
TJ006	Iron	SMCL: 300 ug/L	26.10	2/5/2015
TJ007	Iron	SMCL: 300 ug/L	0	11/16/2015
TJ008	Iron	SMCL: 300 ug/L	0	7/7/2015
TJ009	Iron	SMCL: 300 ug/L	0	6/10/2015
TJ010	Iron	SMCL: 300 ug/L	20.7	9/16/2015
TJ011	Iron	SMCL: 300 ug/L	0	6/30/2016
TJ012	Iron	SMCL: 300 ug/L	0	8/25/2015
TJ001	MTBE	MCL: 13 ug/L	0	8/2/2016
TJ002	MTBE	MCL: 13 ug/L	0	8/2/2016
TJ003	MTBE	MCL: 13 ug/L	0	8/2/2016
TJ004	MTBE	MCL: 13 ug/L	0	8/2/2016
TJ005	MTBE	MCL: 13 ug/L	0	8/3/2016
TJ006	MTBE	MCL: 13 ug/L	0	7/6/2016
TJ007	MTBE	MCL: 13 ug/L	0	8/3/2016
TJ008	MTBE	MCL: 13 ug/L	0	8/3/2016
TJ009	MTBE	MCL: 13 ug/L	0	8/9/2016
TJ010	MTBE	MCL: 13 ug/L	0	8/9/2016
TJ011	MTBE	MCL: 13 ug/L	0	8/9/2016
TJ012	MTBE	MCL: 13 ug/L	0	8/9/2016
TJ001	Manganese	SMCL: 50 ug/L	0	6/10/2015
TJ002	Manganese	SMCL: 50 ug/L	0	6/10/2014
TJ003	Manganese	SMCL: 50 ug/L	0	11/12/2014
TJ004	Manganese	SMCL: 50 ug/L	0	5/13/2014
TJ005	Manganese	SMCL: 50 ug/L	0	1/21/2015
TJ006	Manganese	SMCL: 50 ug/L	0	2/5/2015
TJ007	Manganese	SMCL: 50 ug/L	0	11/16/2015
TJ008	Manganese	SMCL: 50 ug/L	0	7/7/2015
TJ009	Manganese	SMCL: 50 ug/L	0	6/10/2015
TJ010	Manganese	SMCL: 50 ug/L	0	9/16/2015
TJ011	Manganese	SMCL: 50 ug/L	0	6/30/2016
TJ012	Manganese	SMCL: 50 ug/L	0	8/25/2015
TJ001	NDMA	NL: 10 ng/L	0	7/8/2016
TJ002	NDMA	NL: 10 ng/L	0	7/8/2016
TJ003	NDMA	NL: 10 ng/L	0	7/8/2016
TJ004	NDMA	NL: 10 ng/L	0	7/8/2016
TJ005	NDMA	NL: 10 ng/L	0	7/7/2016
TJ006	NDMA	NL: 10 ng/L	0	7/6/2016
TJ007	NDMA	NL: 10 ng/L	0	7/6/2016
TJ008	NDMA	NL: 10 ng/L	0	7/14/2016
TJ009	NDMA	NL: 10 ng/L	0	7/14/2016
TJ010	NDMA	NL: 10 ng/L	0	7/14/2016
TJ011	NDMA	NL: 10 ng/L	0	4/11/2016
TJ012	NDMA	NL: 10 ng/L	0	7/20/2016
TJ001	Nitrate (N)	MCL: 10 mg/L	6.65	9/8/2016
TJ002	Nitrate (N)	MCL: 10 mg/L	5.25	9/8/2016
TJ003	Nitrate (N)	MCL: 10 mg/L	6.21	8/2/2016
TJ004	Nitrate (N)	MCL: 10 mg/L	4.48	8/2/2016
TJ005	Nitrate (N)	MCL: 10 mg/L	3.97	9/8/2016
TJ006	Nitrate (N)	MCL: 10 mg/L	4.90	9/7/2016

Location Code	Analyte	Regulatory Threshold	Result	Date
TJ007	Nitrate (N)	MCL: 10 mg/L	7.61	9/7/2016
TJ008	Nitrate (N)	MCL: 10 mg/L	8.19	9/8/2016
TJ009	Nitrate (N)	MCL: 10 mg/L	9.11	8/9/2016
TJ010	Nitrate (N)	MCL: 10 mg/L	7.45	8/9/2016
TJ011	Nitrate (N)	MCL: 10 mg/L	8.25	8/9/2016
TJ012	Nitrate (N)	MCL: 10 mg/L	3.71	8/9/2016
TJ001	PCE	MCL: 5 ug/L	0	8/2/2016
TJ002	PCE	MCL: 5 ug/L	0	8/2/2016
TJ003	PCE	MCL: 5 ug/L	0	8/2/2016
TJ004	PCE	MCL: 5 ug/L	0	8/2/2016
TJ005	PCE	MCL: 5 ug/L	0	8/3/2016
TJ006	PCE	MCL: 5 ug/L	10.1	7/6/2016
TJ007	PCE	MCL: 5 ug/L	29.3	8/3/2016
TJ008	PCE	MCL: 5 ug/L	14.80	8/3/2016
TJ009	PCE	MCL: 5 ug/L	8.21	8/9/2016
TJ010	PCE	MCL: 5 ug/L	4.40	8/9/2016
TJ011	PCE	MCL: 5 ug/L	2.29	8/9/2016
TJ012	PCE	MCL: 5 ug/L	0.946	8/9/2016
TJ001	Perchlorate	MCL: 6 ug/L	2.270	8/2/2016
TJ002	Perchlorate	MCL: 6 ug/L	0	8/2/2016
TJ003	Perchlorate	MCL: 6 ug/L	2.010	8/2/2016
TJ004	Perchlorate	MCL: 6 ug/L	0	8/2/2016
TJ005	Perchlorate	MCL: 6 ug/L	0	8/3/2016
TJ006	Perchlorate	MCL: 6 ug/L	0	8/3/2016
TJ007	Perchlorate	MCL: 6 ug/L	2.190	8/3/2016
TJ008	Perchlorate	MCL: 6 ug/L	0	8/3/2016
TJ009	Perchlorate	MCL: 6 ug/L	2.040	8/9/2016
TJ010	Perchlorate	MCL: 6 ug/L	2.89	8/9/2016
TJ011	Perchlorate	MCL: 6 ug/L	2.99	8/9/2016
TJ012	Perchlorate	MCL: 6 ug/L	0	8/9/2016
TJ001	TCE	MCL: 5 ug/L	0	8/2/2016
TJ002	TCE	MCL: 5 ug/L	0	8/2/2016
TJ003	TCE	MCL: 5 ug/L	0	8/2/2016
TJ004	TCE	MCL: 5 ug/L	0	8/2/2016
TJ005	TCE	MCL: 5 ug/L	0	8/3/2016
TJ006	TCE	MCL: 5 ug/L	7.8	7/6/2016
TJ007	TCE	MCL: 5 ug/L	22.4	8/3/2016
TJ008	TCE	MCL: 5 ug/L	21.0	8/3/2016
TJ009	TCE	MCL: 5 ug/L	14.80	8/9/2016
TJ010	TCE	MCL: 5 ug/L	9.49	8/9/2016
TJ011	TCE	MCL: 5 ug/L	12.20	8/9/2016
TJ012	TCE	MCL: 5 ug/L	4.20	8/9/2016
TJ001	TDS	SMCL: 1000 mg/L	630	6/10/2015
TJ002	TDS	SMCL: 1000 mg/L	386	6/10/2014
TJ003	TDS	SMCL: 1000 mg/L	373	11/12/2014
TJ004	TDS	SMCL: 1000 mg/L	392	5/13/2014
TJ005	TDS	SMCL: 1000 mg/L	339	1/21/2015
TJ006	TDS	SMCL: 1000 mg/L	410	1/6/2016
TJ007	TDS	SMCL: 1000 mg/L	489	11/16/2015
TJ008	TDS	SMCL: 1000 mg/L	549	7/7/2015
TJ009	TDS	SMCL: 1000 mg/L	584	6/10/2015
TJ010	TDS	SMCL: 1000 mg/L	554	9/16/2015
TJ011	TDS	SMCL: 1000 mg/L	595	6/30/2016
TJ012	TDS	SMCL: 1000 mg/L	483	8/25/2015
TJ001	Total Coliform	MCL = 1 NUM/100 ml	0	12/4/2015
TJ002	Total Coliform	MCL = 1 NUM/100 ml	0	12/4/2015
TJ003	Total Coliform	MCL = 1 NUM/100 ml	0	12/4/2015
TJ004	Total Coliform	MCL = 1 NUM/100 ml	0	12/4/2015
TJ005	Total Coliform	MCL = 1 NUM/100 ml	0	4/11/2016
TJ006	Total Coliform	MCL = 1 NUM/100 ml	0	1/6/2016
TJ007	Total Coliform	MCL = 1 NUM/100 ml	0	1/6/2016
TJ008	Total Coliform	MCL = 1 NUM/100 ml	0	12/9/2015

Location Code	Analyte	Regulatory Threshold	Result	Date
TJ009	Total Coliform	MCL = 1 NUM/100 ml	0	12/4/2015
TJ010	Total Coliform	MCL = 1 NUM/100 ml	0	12/4/2015
TJ011	Total Coliform	MCL = 1 NUM/100 ml	0	12/4/2015
TJ012	Total Coliform	MCL = 1 NUM/100 ml	0	12/4/2015
TJ001	Uranium	MCL: 20 pCi/L	5.40	6/10/2015
TJ002	Uranium	MCL: 20 pCi/L	4.00	7/8/2016
TJ003	Uranium	MCL: 20 pCi/L	2.70	7/8/2016
TJ004	Uranium	MCL: 20 pCi/L	2.90	6/9/2016
TJ005	Uranium	MCL: 20 pCi/L	3.00	5/6/2016
TJ006	Uranium	MCL: 20 pCi/L	3.90	1/21/2015
TJ007	Uranium	MCL: 20 pCi/L	5.50	11/16/2015
TJ008	Uranium	MCL: 20 pCi/L	5.80	7/7/2015
TJ009	Uranium	MCL: 20 pCi/L	6.20	6/10/2015
TJ010	Uranium	MCL: 20 pCi/L	6.60	9/16/2015
TJ011	Uranium	MCL: 20 pCi/L	7.60	6/30/2016
TJ012	Uranium	MCL: 20 pCi/L	8.40	8/25/2015

Location Code	Analyte	Regulatory Threshold	Result	Date
ER006	1, 1-DCE	MCL: 6 ug/L	0	3/20/2015
ER010	1, 1-DCE	MCL: 6 ug/L	0	3/27/2014
ER006	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	3/20/2015
ER010	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	3/27/2014
ER006	1,2,3-TCP	NL: 0.005 ug/L	0	6/27/2013
ER010	1,2,3-TCP	NL: 0.005 ug/L	0	6/27/2013
ER006	1,2-DCE-cis	MCL: 6 ug/L	0	3/20/2015
ER010	1,2-DCE-cis	MCL: 6 ug/L	0	3/27/2014
ER006	1,4-Dioxane	NL: 1 ug/L	0	5/30/2012
ER010	1,4-Dioxane	NL: 1 ug/L	0	5/30/2012
ER006	Bromide	Not regulated - mg/L	0.187	1/24/2012
ER010	Bromide	Not regulated - mg/L	0.171	2/18/2014
ER006	CCl4	MCL: 0.5 ug/L	0	3/20/2015
ER010	CCl4	MCL: 0.5 ug/L	0	3/27/2014
ER006	Chloride	MCL = 250 mg/L	36.8	1/24/2012
ER010	Chloride	MCL = 250 mg/L	34.7	2/18/2014
ER006	Cr 6	MCL = 10 ug/L	4.1	11/7/2000
ER010	Cr 6	MCL = 10 ug/L	2.1	2/27/2002
ER006	Cr, Total	MCL = 50 ug/L	3.3	1/24/2012
ER010	Cr, Total	MCL = 50 ug/L	3	2/18/2014
ER006	Freon-11	MCL: 150 ug/L	0	3/20/2015
ER010	Freon-11	MCL: 150 ug/L	0	3/27/2014
ER006	Iron	SMCL: 300 ug/L	25.4	1/24/2012
ER010	Iron	SMCL: 300 ug/L	40	2/18/2014
ER006	MTBE	MCL: 13 ug/L	0	3/20/2015
ER010	MTBE	MCL: 13 ug/L	0	3/27/2014
ER006	Manganese	SMCL: 50 ug/L	0	1/24/2012
ER010	Manganese	SMCL: 50 ug/L	0	2/18/2014
ER006	Nitrate (N)	MCL: 10 mg/L	14.1	3/20/2015
ER010	Nitrate (N)	MCL: 10 mg/L	2.32	3/27/2014
ER006	PCE	MCL: 5 ug/L	1.9	3/20/2015
ER010	PCE	MCL: 5 ug/L	0	3/27/2014
ER006	Perchlorate	MCL: 6 ug/L	0	3/27/2014
ER010	Perchlorate	MCL: 6 ug/L	0	7/16/2013
ER006	TCE	MCL: 5 ug/L	0	3/20/2015
ER010	TCE	MCL: 5 ug/L	0	3/27/2014
ER006	TDS	SMCL: 1000 mg/L	652	1/24/2012
ER010	TDS	SMCL: 1000 mg/L	481	2/18/2014
ER006	Total Coliform	MCL = 1 NUM/100 ml	0	3/20/2015
ER010	Total Coliform	MCL = 1 NUM/100 ml	0	3/27/2014
ER006	Uranium	MCL: 20 pCi/L	5.2	1/24/2012
ER010	Uranium	MCL: 20 pCi/L	2.8	2/18/2014

Location Code	Analyte	Regulatory Threshold	Result	Date
PL004	1, 1-DCE	MCL: 6 ug/L	1.03	8/23/2016
PL006	1, 1-DCE	MCL: 6 ug/L	0	8/23/2016
PL007	1, 1-DCE	MCL: 6 ug/L	99.8	12/12/2000
PL004	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/23/2016
PL006	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/23/2016
PL007	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	3.98	12/12/2000
PL004	1,2,3-TCP	NL: 0.005 ug/L	0	2/26/2016
PL006	1,2,3-TCP	NL: 0.005 ug/L	0	2/29/2016
PL007	1,2,3-TCP	NL: 0.005 ug/L		
PL004	1,2-DCE-cis	MCL: 6 ug/L	0	8/23/2016
PL006	1,2-DCE-cis	MCL: 6 ug/L	0	8/23/2016
PL007	1,2-DCE-cis	MCL: 6 ug/L	1.70	12/12/2000
PL004	1,4-Dioxane	NL: 1 ug/L	0.854	8/23/2016
PL006	1,4-Dioxane	NL: 1 ug/L	0	8/23/2016
PL007	1,4-Dioxane	NL: 1 ug/L		
PL004	Bromide	Not regulated - mg/L	0.295	5/21/2014
PL006	Bromide	Not regulated - mg/L	0.342	11/19/2013
PL007	Bromide	Not regulated - mg/L	0.381	12/12/2000
PL004	CCl4	MCL: 0.5 ug/L	0	8/23/2016
PL006	CCl4	MCL: 0.5 ug/L	0	8/23/2016
PL007	CCl4	MCL: 0.5 ug/L	1.46	12/12/2000
PL004	Chloride	MCL = 250 mg/L	72.8	5/30/2014
PL006	Chloride	MCL = 250 mg/L	88.7	7/1/2015
PL007	Chloride	MCL = 250 mg/L	89.2	12/12/2000
PL004	Cr 6	MCL = 10 ug/L	1.80	8/23/2016
PL006	Cr 6	MCL = 10 ug/L	1.77	8/23/2016
PL007	Cr 6	MCL = 10 ug/L	1.40	7/26/2001
PL004	Cr, Total	MCL = 50 ug/L	1.60	8/23/2016
PL006	Cr, Total	MCL = 50 ug/L	1.80	8/23/2016
PL007	Cr, Total	MCL = 50 ug/L	1.70	7/26/2001
PL004	Freon-11	MCL: 150 ug/L	0	8/23/2016
PL006	Freon-11	MCL: 150 ug/L	0	8/23/2016
PL007	Freon-11	MCL: 150 ug/L	0	12/12/2000
PL004	Iron	SMCL: 300 ug/L	0	5/21/2014
PL006	Iron	SMCL: 300 ug/L	0	11/19/2013
PL007	Iron	SMCL: 300 ug/L	74.8	12/12/2000
PL004	MTBE	MCL: 13 ug/L	0	8/23/2016
PL006	MTBE	MCL: 13 ug/L	0	8/23/2016
PL007	MTBE	MCL: 13 ug/L	0	12/12/2000
PL004	Manganese	SMCL: 50 ug/L	0	5/21/2014
PL006	Manganese	SMCL: 50 ug/L	0	8/15/2014
PL007	Manganese	SMCL: 50 ug/L	0	12/12/2000
PL004	NDMA	NL: 10 ng/L	0	5/30/2014
PL006	NDMA	NL: 10 ng/L	0	7/1/2015
PL007	NDMA	NL: 10 ng/L		
PL004	Nitrate (N)	MCL: 10 mg/L	6.69	8/23/2016
PL006	Nitrate (N)	MCL: 10 mg/L	9.28	8/23/2016
PL007	Nitrate (N)	MCL: 10 mg/L	6.32	5/24/2002
PL004	PCE	MCL: 5 ug/L	2.31	8/23/2016
PL006	PCE	MCL: 5 ug/L	5.0	8/23/2016
PL007	PCE	MCL: 5 ug/L	56.1	12/12/2000
PL004	Perchlorate	MCL: 6 ug/L	2.17	8/23/2016
PL006	Perchlorate	MCL: 6 ug/L	3.04	8/23/2016
PL007	Perchlorate	MCL: 6 ug/L	0	10/17/2001
PL004	TCE	MCL: 5 ug/L	2.85	8/23/2016
PL006	TCE	MCL: 5 ug/L	4.9	8/23/2016
PL007	TCE	MCL: 5 ug/L	66.0	12/12/2000
PL004	TDS	SMCL: 1000 mg/L	574	5/30/2014
PL006	TDS	SMCL: 1000 mg/L	733	7/1/2015
PL007	TDS	SMCL: 1000 mg/L	825	12/12/2000
PL004	Total Coliform	MCL = 1 NUM/100 ml	0	10/30/2015
PL006	Total Coliform	MCL = 1 NUM/100 ml	0	10/30/2015
PL007	Total Coliform	MCL = 1 NUM/100 ml	0	6/18/2002
PL004	Uranium	MCL: 20 pCi/L	4.20	3/28/2016
PL006	Uranium	MCL: 20 pCi/L	4.10	11/19/2013
PL007	Uranium	MCL: 20 pCi/L		

Location Code	Analyte	Regulatory Threshold	Result	Date
VE001	1, 1-DCE	MCL: 6 ug/L	0	8/7/2003
VE002	1, 1-DCE	MCL: 6 ug/L	0	2/26/2003
VE011	1, 1-DCE	MCL: 6 ug/L	0	5/27/2016
VE024	1, 1-DCE	MCL: 6 ug/L	0	5/27/2016
VE001	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/7/2003
VE002	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	2/26/2003
VE011	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	5/27/2016
VE024	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	5/27/2016
VE001	1,2,3-TCP	NL: 0.005 ug/L		
VE002	1,2,3-TCP	NL: 0.005 ug/L		
VE011	1,2,3-TCP	NL: 0.005 ug/L	0.01160	2/27/2014
VE024	1,2,3-TCP	NL: 0.005 ug/L	0	1/21/2014
VE001	1,2-DCE-cis	MCL: 6 ug/L	0	8/7/2003
VE002	1,2-DCE-cis	MCL: 6 ug/L	0	2/26/2003
VE011	1,2-DCE-cis	MCL: 6 ug/L	0	5/27/2016
VE024	1,2-DCE-cis	MCL: 6 ug/L	0	5/27/2016
VE001	1,4-Dioxane	NL: 1 ug/L		
VE002	1,4-Dioxane	NL: 1 ug/L		
VE011	1,4-Dioxane	NL: 1 ug/L	0	8/11/2015
VE024	1,4-Dioxane	NL: 1 ug/L	0	8/11/2015
VE001	Bromide	Not regulated - mg/L	0.145	3/21/2003
VE002	Bromide	Not regulated - mg/L		
VE011	Bromide	Not regulated - mg/L	0.325	8/20/2013
VE024	Bromide	Not regulated - mg/L	0.731	1/21/2014
VE001	CCl4	MCL: 0.5 ug/L	0.690	8/7/2003
VE002	CCl4	MCL: 0.5 ug/L	0	2/26/2003
VE011	CCl4	MCL: 0.5 ug/L	0	5/27/2016
VE024	CCl4	MCL: 0.5 ug/L	0	5/27/2016
VE001	Chloride	MCL = 250 mg/L	34.9	3/21/2003
VE002	Chloride	MCL = 250 mg/L		
VE011	Chloride	MCL = 250 mg/L	59.8	8/20/2013
VE024	Chloride	MCL = 250 mg/L	109.0	1/21/2014
VE001	Cr 6	MCL = 10 ug/L	3.10	11/8/2000
VE002	Cr 6	MCL = 10 ug/L	2.50	9/26/2001
VE011	Cr 6	MCL = 10 ug/L	2.15	5/16/2002
VE024	Cr 6	MCL = 10 ug/L	0	5/16/2002
VE001	Cr, Total	MCL = 50 ug/L	6.10	3/21/2003
VE002	Cr, Total	MCL = 50 ug/L	2.60	9/26/2001
VE011	Cr, Total	MCL = 50 ug/L	2.30	8/20/2013
VE024	Cr, Total	MCL = 50 ug/L	0	1/21/2014
VE001	Freon-11	MCL: 150 ug/L	0	8/7/2003
VE002	Freon-11	MCL: 150 ug/L	0	2/26/2003
VE011	Freon-11	MCL: 150 ug/L	0	5/27/2016
VE024	Freon-11	MCL: 150 ug/L	0	5/27/2016
VE001	Iron	SMCL: 300 ug/L	414	7/30/2003
VE002	Iron	SMCL: 300 ug/L	140	6/7/2001
VE011	Iron	SMCL: 300 ug/L	0	8/20/2013
VE024	Iron	SMCL: 300 ug/L	29.5	1/21/2014
VE001	MTBE	MCL: 13 ug/L	0	8/7/2003
VE002	MTBE	MCL: 13 ug/L	0	2/26/2003
VE011	MTBE	MCL: 13 ug/L	0	5/27/2016
VE024	MTBE	MCL: 13 ug/L	0	5/27/2016
VE001	Manganese	SMCL: 50 ug/L	13.30	7/30/2003
VE002	Manganese	SMCL: 50 ug/L	8.97	6/7/2001
VE011	Manganese	SMCL: 50 ug/L	0	8/20/2013
VE024	Manganese	SMCL: 50 ug/L	40	1/21/2014
VE001	Nitrate (N)	MCL: 10 mg/L	7.43	8/7/2003
VE002	Nitrate (N)	MCL: 10 mg/L	8.16	3/21/2003
VE011	Nitrate (N)	MCL: 10 mg/L	2.86	5/27/2016
VE024	Nitrate (N)	MCL: 10 mg/L	1.60	5/27/2016
VE001	PCE	MCL: 5 ug/L	0.756	8/7/2003
VE002	PCE	MCL: 5 ug/L	0.780	2/26/2003
VE011	PCE	MCL: 5 ug/L	0	5/27/2016
VE024	PCE	MCL: 5 ug/L	0	5/27/2016
VE001	Perchlorate	MCL: 6 ug/L	0	2/26/2003

Location Code	Analyte	Regulatory Threshold	Result	Date
VE002	Perchlorate	MCL: 6 ug/L	0	7/30/2003
VE011	Perchlorate	MCL: 6 ug/L	0	8/11/2015
VE024	Perchlorate	MCL: 6 ug/L	0	8/11/2015
VE001	TCE	MCL: 5 ug/L	6.46	8/7/2003
VE002	TCE	MCL: 5 ug/L	18.3	2/26/2003
VE011	TCE	MCL: 5 ug/L	3.53	5/27/2016
VE024	TCE	MCL: 5 ug/L	0	5/27/2016
VE001	TDS	SMCL: 1000 mg/L	506	3/21/2003
VE002	TDS	SMCL: 1000 mg/L		
VE011	TDS	SMCL: 1000 mg/L	723	8/20/2013
VE024	TDS	SMCL: 1000 mg/L	989	1/21/2014
VE001	Total Coliform	MCL = 1 NUM/100 ml	0	8/7/2003
VE002	Total Coliform	MCL = 1 NUM/100 ml	25.3	7/30/2003
VE011	Total Coliform	MCL = 1 NUM/100 ml	0	5/15/2016
VE024	Total Coliform	MCL = 1 NUM/100 ml	0	5/15/2016
VE001	Uranium	MCL: 20 pCi/L		
VE002	Uranium	MCL: 20 pCi/L		
VE011	Uranium	MCL: 20 pCi/L	5.50	8/11/2015
VE024	Uranium	MCL: 20 pCi/L	8.50	1/21/2014

Location Code	Analyte	Regulatory Threshold	Result	Date
VE001	1, 1-DCE	MCL: 6 ug/L	0	3/20/2015
VE002	1, 1-DCE	MCL: 6 ug/L	0	5/27/2016
VE011	1, 1-DCE	MCL: 6 ug/L	0	8/1/2012
VE024	1, 1-DCE	MCL: 6 ug/L	0	7/16/2015
VE001	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	3/20/2015
VE002	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	5/27/2016
VE011	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	8/1/2012
VE024	1,1-Dichloroethane (1,1-DCA)	MCL: 6 ug/L	0	7/16/2015
VE001	1,2,3-TCP	NL: 0.005 ug/L	0	11/27/2013
VE002	1,2,3-TCP	NL: 0.005 ug/L	0	3/27/2014
VE011	1,2,3-TCP	NL: 0.005 ug/L	0	3/13/2012
VE024	1,2,3-TCP	NL: 0.005 ug/L	0	9/26/2013
VE001	1,2-DCE-cis	MCL: 6 ug/L	1.18	3/20/2015
VE002	1,2-DCE-cis	MCL: 6 ug/L	0.559	5/27/2016
VE011	1,2-DCE-cis	MCL: 6 ug/L	0	8/1/2012
VE024	1,2-DCE-cis	MCL: 6 ug/L	0	7/16/2015
VE001	1,4-Dioxane	NL: 1 ug/L	0	2/28/2013
VE002	1,4-Dioxane	NL: 1 ug/L	0	3/25/2016
VE011	1,4-Dioxane	NL: 1 ug/L	0	5/30/2012
VE024	1,4-Dioxane	NL: 1 ug/L	0	8/21/2012
VE001	Bromide	Not regulated - mg/L	0.074	11/29/2012
VE002	Bromide	Not regulated - mg/L	0.101	4/12/2016
VE011	Bromide	Not regulated - mg/L	0.356	9/9/2009
VE024	Bromide	Not regulated - mg/L	0.325	8/21/2012
VE001	CCl4	MCL: 0.5 ug/L	0	3/20/2015
VE002	CCl4	MCL: 0.5 ug/L	0	5/27/2016
VE011	CCl4	MCL: 0.5 ug/L	0	8/1/2012
VE024	CCl4	MCL: 0.5 ug/L	0	7/16/2015
VE001	Chloride	MCL = 250 mg/L	14.9	11/29/2012
VE002	Chloride	MCL = 250 mg/L	21.2	4/12/2016
VE011	Chloride	MCL = 250 mg/L	62.2	9/9/2009
VE024	Chloride	MCL = 250 mg/L	61.8	8/21/2012
VE001	Cr 6	MCL = 10 ug/L	1.58	2/22/2008
VE002	Cr 6	MCL = 10 ug/L	2.9	4/12/2016
VE011	Cr 6	MCL = 10 ug/L	2.09	5/16/2002
VE024	Cr 6	MCL = 10 ug/L	1.57	5/16/2002
VE001	Cr, Total	MCL = 50 ug/L	2	11/29/2012
VE002	Cr, Total	MCL = 50 ug/L	2.6	4/12/2016
VE011	Cr, Total	MCL = 50 ug/L	1.8	10/20/2009
VE024	Cr, Total	MCL = 50 ug/L	1.8	8/22/2012
VE001	Freon-11	MCL: 150 ug/L	0	3/20/2015
VE002	Freon-11	MCL: 150 ug/L	0	5/27/2016
VE011	Freon-11	MCL: 150 ug/L	0	8/1/2012
VE024	Freon-11	MCL: 150 ug/L	0	7/16/2015
VE001	Iron	SMCL: 300 ug/L	25.5	11/29/2012
VE002	Iron	SMCL: 300 ug/L	0	4/12/2016
VE011	Iron	SMCL: 300 ug/L	0	9/9/2009
VE024	Iron	SMCL: 300 ug/L	389	8/22/2012
VE001	MTBE	MCL: 13 ug/L	0	3/20/2015
VE002	MTBE	MCL: 13 ug/L	0	5/27/2016
VE011	MTBE	MCL: 13 ug/L	0	8/1/2012
VE024	MTBE	MCL: 13 ug/L	0	7/16/2015
VE001	Manganese	SMCL: 50 ug/L	0	11/29/2012
VE002	Manganese	SMCL: 50 ug/L	0	4/12/2016
VE011	Manganese	SMCL: 50 ug/L	1.2	9/9/2009
VE024	Manganese	SMCL: 50 ug/L	3.3	8/22/2012
VE001	Nitrate (N)	MCL: 10 mg/L	2.79	3/20/2015
VE002	Nitrate (N)	MCL: 10 mg/L	3.71	5/27/2016
VE011	Nitrate (N)	MCL: 10 mg/L	1.4	8/1/2012
VE024	Nitrate (N)	MCL: 10 mg/L	0.638	7/16/2015
VE001	PCE	MCL: 5 ug/L	3.71	3/20/2015
VE002	PCE	MCL: 5 ug/L	3.29	5/27/2016
VE011	PCE	MCL: 5 ug/L	1.06	8/1/2012
VE024	PCE	MCL: 5 ug/L	0	7/16/2015
VE001	Perchlorate	MCL: 6 ug/L	0	11/27/2013

Location Code	Analyte	Regulatory Threshold	Result	Date
VE002	Perchlorate	MCL: 6 ug/L	0	3/25/2016
VE011	Perchlorate	MCL: 6 ug/L	0	8/1/2012
VE024	Perchlorate	MCL: 6 ug/L	0	10/31/2013
VE001	TCE	MCL: 5 ug/L	15.5	3/20/2015
VE002	TCE	MCL: 5 ug/L	10.9	5/27/2016
VE011	TCE	MCL: 5 ug/L	2.38	8/1/2012
VE024	TCE	MCL: 5 ug/L	0	7/16/2015
VE001	TDS	SMCL: 1000 mg/L	340	11/29/2012
VE002	TDS	SMCL: 1000 mg/L	397	4/12/2016
VE011	TDS	SMCL: 1000 mg/L	442	9/9/2009
VE024	TDS	SMCL: 1000 mg/L	527	8/21/2012
VE001	Total Coliform	MCL = 1 NUM/100 ml	0	3/20/2015
VE002	Total Coliform	MCL = 1 NUM/100 ml	0	5/15/2016
VE011	Total Coliform	MCL = 1 NUM/100 ml	0	8/1/2012
VE024	Total Coliform	MCL = 1 NUM/100 ml	0	7/17/2015
VE001	Uranium	MCL: 20 pCi/L	4.8	11/27/2013
VE002	Uranium	MCL: 20 pCi/L	8.1	4/12/2016
VE011	Uranium	MCL: 20 pCi/L	3.1	9/9/2009
VE024	Uranium	MCL: 20 pCi/L	2.2	8/22/2012

APPENDIX B

CITY OF BURBANK

PUMPING AND SPREADING PLAN

2015-16 through 2019-20 Water Years

GROUNDWATER PUMPING

AND

SPREADING PLAN

FIVE WATER YEARS

OCTOBER 1, 2015 TO SEPTEMBER 30, 2020

BURBANK

Water and Power

Since 1913

WATER DIVISION

164 W. MAGNOLIA BOULEVARD

SEPTEMBER 2016

Table of Contents

List of Tables

List of Figures

List of Appendices

SECTION 1: INTRODUCTION

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

In 1993, significant revisions were made to the Upper Los Angeles River Area (ULARA) Policies and Procedures with the addition of Section 2.9, Groundwater Quality Management. This addition was made by the Watermaster and the Administrative Committee to affirm its commitments to participate in the cleanup of the ground water and limit the spread of contamination in the San Fernando basin. The 1998 revision of the Policies and Procedures now includes Section 5.0, Watermaster Management of Groundwater Quality. This report is in response to Section 5.4, Groundwater Pumping and Spreading Plan for the Upper Los Angeles River Area.

The annual Groundwater Pumping and Spreading Plan is based on the water year, October 1 to September 30, and it includes projections for five years beginning with the current water year. This Plan for Burbank will be submitted to the Watermaster in September 2016. The Watermaster will evaluate the impact of pumping and spreading by all the parties, and the ULARA Pumping and Spreading Plan will be published by the Watermaster.

Burbank's Plan was prepared by the Water Engineering and Planning Section of City of Burbank Water and Power. Questions may be addressed to Bob Doxsee, Civil Engineering Associate, at (818) 238-3500 or by e-mail to bdoxsee@burbankca.gov.

SECTION 2: WATER DEMAND

The annual total water demand for the last ten years and the projected annual water demand for the next five years are shown in Table 2.

Urgent requests for voluntary conservation began in 2007. With increasing public awareness of water supply issues, and to comply with new State legislation, the plan was for 20 percent reduction in per-capita potable water usage by 2020. That target was actually reached in Fiscal Year 2009/10, with some help from the weather. In the more recent dry years, it is not surprising that water demands were higher. Then, with continuing drought, emergency regulation in 2015 called for an immediate 25 percent reduction compared to 2013 levels. Burbank did achieve reductions to meet its targets, and lower water demands have continued. For this plan, per-capita water use is predicted to remain lower than in 2013 because watering restrictions have been made permanent. Local supplies will be used as much as possible in order to reduce the demand on imported supplies from the Metropolitan Water District of Southern California (MWD). The projected water demand may vary significantly due to weather and/or economic conditions in the Burbank area; a variance of ±5% may be expected. A major expansion of the recycled system was completed in 2013, and demand on the potable water system will be offset by recycled water as additional site conversions are completed.

SECTION 3: WATER SUPPLY

The water supply for the City of Burbank is composed of purchased water from MWD, locally produced and treated groundwater, and recycled water from the Burbank Water Reclamation Plant. A discussion about each of the sources of supply is included below, and historic and projected use of each water source is shown in Table 3.

3.1 MWD

Burbank continues to directly rely on MWD for up to 70% of its water supply. Burbank purchases from MWD treated water for direct delivery to its distribution system and untreated water for basin replenishment. The City must purchase and spread water within the basin or purchase Physical Solution credits from the Los Angeles Department of Water and Power (LADWP) to operate its local groundwater wells. The economics determine which of these two options or what percentage of each Burbank will exercise in a given water year.

3.2 GAC Treatment Plant

Historically, the GAC Treatment Plant was normally operated during the summer season from May to October. The California Department of Public Health (CDPH) issued a draft Maximum Contaminant Level (MCL) for Chromium VI of 10 micrograms per liter in late 2013, and the MCL was adopted as final on July 1, 2014. Total chromium in the plant effluent is expected to exceed the new MCL and the GAC treatment process does not remove chromium, and facilities for blending are not available. Current plans are to keep the plant shut down, except for emergencies and water quality testing.

The GAC Treatment Plant treats the groundwater produced from Well No. 7 and Well No. 15 (Figure 3.1). The plant has a treatment capacity of 2,000 gallons per minute (gpm). In Water Year (WY) 2014/15, pumping for water quality testing resulted in 2 acre-foot (AF) being produced and delivered to the Magnolia Power Project cooling towers for industrial cooling.

3.3 EPA Consent Decree Project

The EPA Consent Decree Project (also known as Burbank Operable Unit or BOU) became operational January 3, 1996. The source of groundwater for treatment at the BOU is Wells VO-1 through VO-8 (Figure 3.1) and the treatment plant has a capacity of 9,000 gpm. The Second Consent Decree was entered on June 22, 1998.

3.4 Recycled Water

A master plan for expansion of the recycled water system was completed in 2007 and updated in 2010. The plan detailed an expansion of the distribution system which is expected to ultimately deliver an additional 1,000 acre-feet per year (AFY) of recycled water. 625 AFY of this total will directly offset potable water deliveries. The remaining 375 AFY will offset groundwater pumped from the well at Valhalla Memorial Park (Valhalla). The distribution main construction is complete, and site conversions are in progress.

3.5 Production Wells

Burbank has eight wells that are part of the BOU collector system, plus another four wells which are mechanically and electrically operable, and two others which have had equipment removed. The eight BOU wells are on “Active” status, while all the others are on "Inactive" status with the California Department of Public Health (DPH). (See Table 1.) Except for water quality testing at Wells 7 and 15, Burbank does not plan to operate the inactive wells in WY 2015/16 unless an emergency develops. Wells 7 and 15 may be operated for non-potable power plant use if there is an interruption or shortfall in the recycled water supply from the wastewater plant. This occurred in WY 2015/16 when a major sewer force main was under construction. Well No. 7 produces 1,050 gpm and Well No. 15 produces 850 gpm to supply the GAC treatment plant.

TABLE 1

BWP’S WELL STATUS

Active Wells	Inactive Wells	Inactive-Pulled
VO-1	No. 6A	No. 11A
VO-2	No. 7	No. 12
VO-3	No. 13A	
VO-4	No. 15	
VO-5		
VO-6		
VO-7		
VO-8		

SECTION 4: GROUNDWATER CREDITS

The Judgment includes a number of procedures related to groundwater pumping that Burbank and the other defendants must follow. In order to pump groundwater, rights to groundwater must be established, and in the San Fernando Basin those rights are accounted for as groundwater credits. Rights and procedures related to establishing, counting and maintaining groundwater credits are discussed in the following paragraphs. Historic and projected future groundwater credits are shown in Table 4.

4.1 Import Return Water

Under the Judgment, Burbank is entitled to extract 20 percent of the volume of water it delivered (potable and recycled) in the prior water year. This is known as import return water. The import return water credited for WY 2015/16 (based on water delivered in WY 2014/15) is 3,583 AF.

Estimated import return water credit for the next water year, based on 17,833 AF of delivered water, will be 3,567 AF.

4.2 Physical Solution

Burbank has a Physical Solution right to 4,200 AFY in addition to its import return water extraction rights. This is a right to purchase up to 4,200 AFY of groundwater credits from the City of Los Angeles. The price paid to the City of Los Angeles for this groundwater is set by formula in the Judgment.

Depending on the price of MWD untreated imported water and Physical Solution water from the City of Los Angeles, a decision will be made each year regarding which to purchase. MWD untreated water is currently less expensive than Physical Solution water. Therefore, Burbank will not purchase Physical Solution water from the City of Los Angeles in WY 2015/16. The current plan reflects the spreading of imported water instead of the purchase of Physical Solution credits.

In the Judgment, Valhalla and Lockheed Martin have the right under the Physical Solution to pump up to 300 AFY and 25 AFY, respectively. Burbank will charge the Physical Solution right holders for groundwater they extracted and claim the extractions against Burbank's rights.

4.3 Stored Water Credit

Burbank has a stored water credit of 12,803 AF as of October 1, 2015. Burbank’s objective is to maintain a reserve of 10,000 AF of stored water credits. (See Appendix B.) Therefore, some combination of Physical Solution and/or spreading of imported water is necessary to avoid depleting the stored water credits.

4.4 Spreading Operations and Transfers of Credits

Burbank has purchased water for basin replenishment since 1989. The water was typically spread at the Pacoima Spreading Grounds by L.A. County Public Works Department with the assistance of the Los Angeles Department of Water and Power (LADWP). Beginning in WY 1994/95, Burbank exchanged with LADWP purchased imported water taken through MWD service connection LA-35 at the LADWP Treatment Plant for groundwater credits.

In 2010 Burbank completed a new service connection to MWD at the end of the Foothill Feeder. (See Figure 4.1.) The connection is capable of delivering 50 cubic feet per second (cfs) of untreated imported water to the Pacoima Wash, where the water is conveyed down to the Pacoima Spreading Grounds. Additionally, this service connection allows Burbank to direct water to the Lopez Spreading Grounds via the Lopez Ditch. These facilities allow Burbank to spread the 6,000 to 8,000 AFY of untreated water at the Pacoima Spreading Grounds that is needed to avoid depleting its stored groundwater credits.

Burbank received the first water delivery through the new connection on April 26, 2010. By agreement with MWD, Burbank will spread a minimum of 150 AF twice a year to maintain water quality at the end of the Foothill Feeder. After the MWD allocation ended, MWD water was available for a limited time at the lower replenishment rate, so Burbank spread as much water as possible in WY 2010/11. A total of 11,187 AF of imported water was delivered and spread at the Pacoima spreading grounds. The replenishment rate was not available after September 2011, but Burbank still spread 1,371 AF in WY 2011/12, 6,700 AF in WY 2012/13, and 7,000 AF in WY 2013/14.

Because of the severe drought, instead of spreading imported water in WY 2014/15 and WY 2015/16, Burbank and Los Angeles again agreed to exchange purchased imported water delivered to LADWP for groundwater credits. In October 2015, 7,200 AF of credits were added to Burbank’s account by this exchange. In November 2015 and April 2016, a total of 306 AF were spread at Pacoima as the water in the Foothill Feeder was turned over to maintain water quality. For the remaining four water years covered by this plan, Burbank plans to purchase about 7,500 AF per year of Physical Solution credits, untreated imported water, or a combination of the two. (See Table 4.)

SECTION 5: CAPITAL IMPROVEMENTS

5.1 Wells

Burbank plans to continue the use of Wells No. 7 and No. 15 for the GAC Treatment Plant when it is operated. Wells V-01 through V-08 will continue to be operated to supply water to the BOU. No capital improvements are planned for any wells.

5.2 Groundwater Treatment Facilities

EPA Project: The EPA Consent Decree Project became fully operational on January 3, 1996. Burbank assumed responsibility for operation and maintenance of the BOU on March 12, 2001. Initially, the facility had difficulty in sustaining operation at the designed treatment rate of 9,000 gpm. Burbank, Lockheed-Martin, and the USEPA cooperated in efforts to determine the cause(s) of the reduced production. Over the past few years, several process enhancements and repairs were made to the liquid-phase GAC vessels and to the vapor-phase GAC vessels.

As part of the requirement to close the First Consent Decree, USEPA required Burbank to demonstrate that the BOU would operate at its design capacity. In the fall of 2010, Burbank successfully completed the performance test of the BOU by operating the facility at 9,000 gpm for 60-days.

The City of Burbank currently contracts with TerranearPMC for the day-to-day operation and maintenance of the BOU.

GAC Treatment Plant: The plant will remain on an active status, but will not be operated except for well water quality tests and for emergencies. No capital improvement projects are planned for the GAC Treatment Plant.

TABLE 2

ACTUAL AND PROJECTED WATER DEMAND

Water Year	Acre-Feet
2005/06	24,110
2006/07	25,745
2007/08	24,653
2008/09	22,532
2009/10	20,852
2010/11	19,735
2011/12	20,938
2012/13	20,937
2013/14	21,874
2014/15	18,234
2015/16*	17,915
2016/17*	20,315
2017/18*	20,547
2018/19*	20,674
2019/20*	20,933

* Projected

NOTES:

1) Water demand equals the total of MWD, extractions (GAC, Valley/BOU, Valhalla, and cleanup pumpers), and recycled.
2) The five-year average water demand was 20,344 AFY for WY 2010/11 through 2014/15.

TABLE 3

GROUNDWATER EXTRACTIONS, MWD TREATED WATER, AND RECYCLED WATER

Water Year	MWD	GAC	BOU	Recycled	Valhalla	Total
2005/06	11,879	0	10,108	1,692	431	24,110
2006/07	13,444	0	9,780	2,082	431	25,737
2007/08	15,299	0	6,817	2,192	337	24,645
2008/09	10,202	148	9,818	2,011	346	22,525
2009/10	8,401	5	10,043	2,080	317	20,846
2010/11	7,376	4	10,394	1,568	387	19,729
2011/12	8,602	4	9,993	2,000	338	20,937
2012/13	7,507	0	11,387	1,608	435	20,937
2013/14	8,901	1	10,148	2,407	417	21,874
2014/15	5,619	2	10,006	2,307	300	18,234
2015/16*	5,464	40	9,463	2,891	57	17,915
2016/17*	6,891	0	10,477	2,947	0	20,315
2017/18*	7,098	0	10,477	2,972	0	20,547
2018/19*	7,305	0	10,477	2,892	0	20,674
2019/20*	7,454	0	10,477	3,002	0	20,933

*Projected

Notes:

1. Use of BOU will be maximized, with MWD used for required blending and to meet total demand.
2. MWD amounts are treated water. (Untreated MWD purchases are in Table 4.)
3. GAC was used only for non-potable use in the Magnolia Power Plant.
4. BOU includes small amounts of non-municipal use which is not included in the import return calculation.
5. Groundwater extractions need to be balanced over time by groundwater credits (Table 4.)
6. Valhalla converted to recycled water in January 2016.
7. Groundwater extractions by small cleanup pumpers are not included in this table. They were about 6 to 8 AFY from 2004/05 through 2010/11, but have dropped to zero since then.

TABLE 4

GROUNDWATER CREDITS

Water Year	Physical Solution	Import Return	Spreading Operations	Other	Total
2005/06	0	4,817	0	0	4,817
2006/07	4,200	5,058	0	4,000 (2)	13,258
2007/08	4,200	4,855	0	0	9,055
2008/09	4,200	4,432	0	2,000 (3)	10,632
2009/10	0	4,103	34	0	4,137
2010/11	0	3,864	11,187	0	15,051
2011/12	0	4,117	1,371	0	5,488
2012/13	0	4,096	6,703	0	10,799
2013/14	0	4,288	7,000	0	11,288
2014/15	0	3,583	150	7,200 (4)	10,934
2015/16*	0	3,567	306	7,200 (5)	11,073
2016/17*	0	4,058	7,500	25 (6)	11,583
2017/18*	0	4,104	7,150	50 (6)	11,304
2018/19*	0	4,130	7,150	200 (6)	11,480
2019/20*	0	4,182	7,150	300 (6)	11,632

*Projected

Notes:

1. A 4,000 AF exchange of untreated MWD water for groundwater credits was arranged with LADWP for WY 2006/07.
2. A 2,000 AF exchange of untreated MWD water for groundwater credits was arranged with LADWP for WY 2008/09.
3. A 7,200 AF exchange of untreated MWD water for groundwater credits was arranged with LADWP in December 2014 for WY 2014/15.
4. A 7,200 AF exchange of untreated MWD water for groundwater credits was arranged with LADWP in October 2015 for WY 2015/16.
5. Beginning WY 2016/17, groundwater credits are expected from LADWP in exchange for recycled water delivered from Burbank to LADWP.

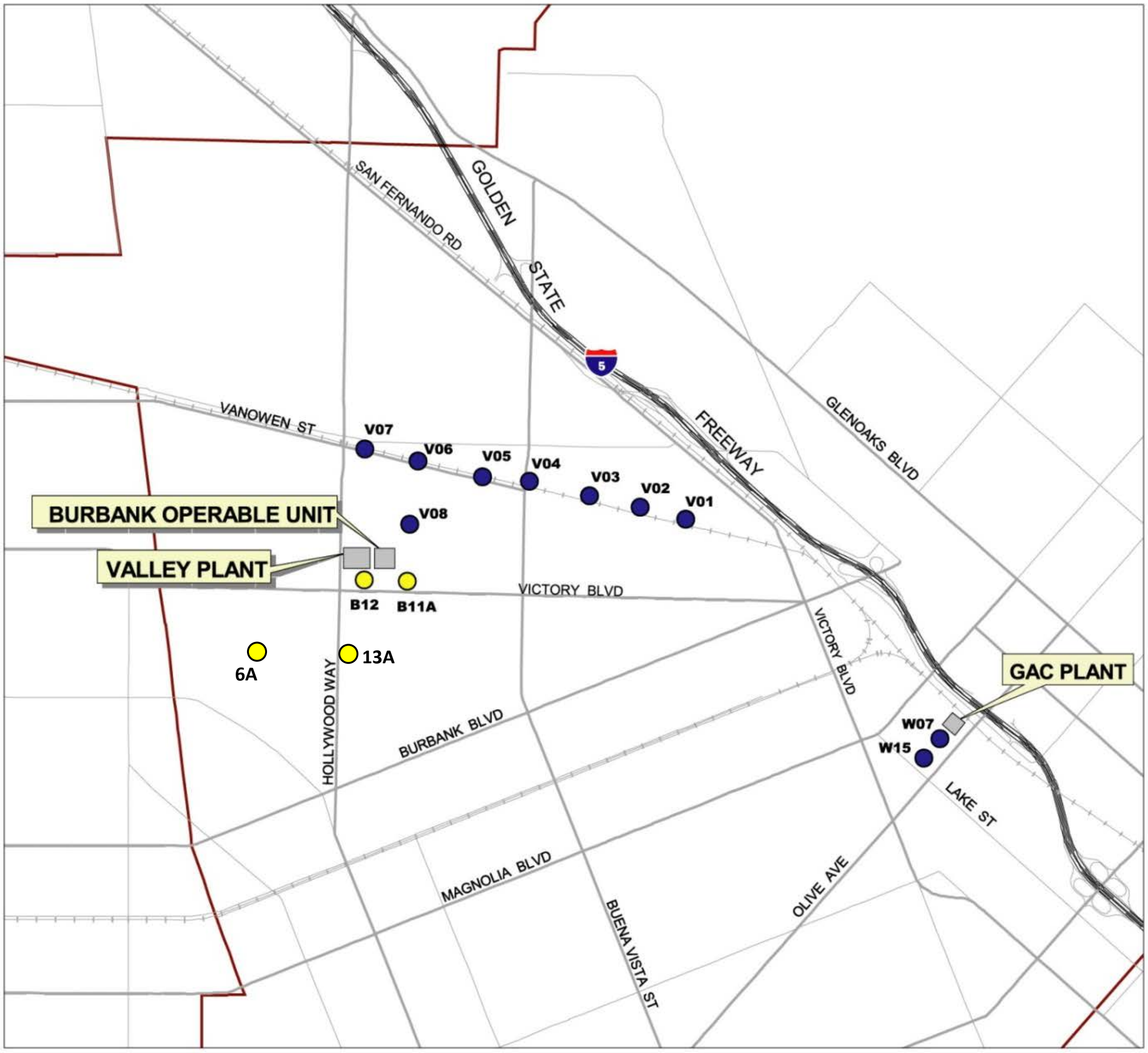


FIGURE 3.1

WELLS AND GROUNDWATER TREATMENT PLANTS

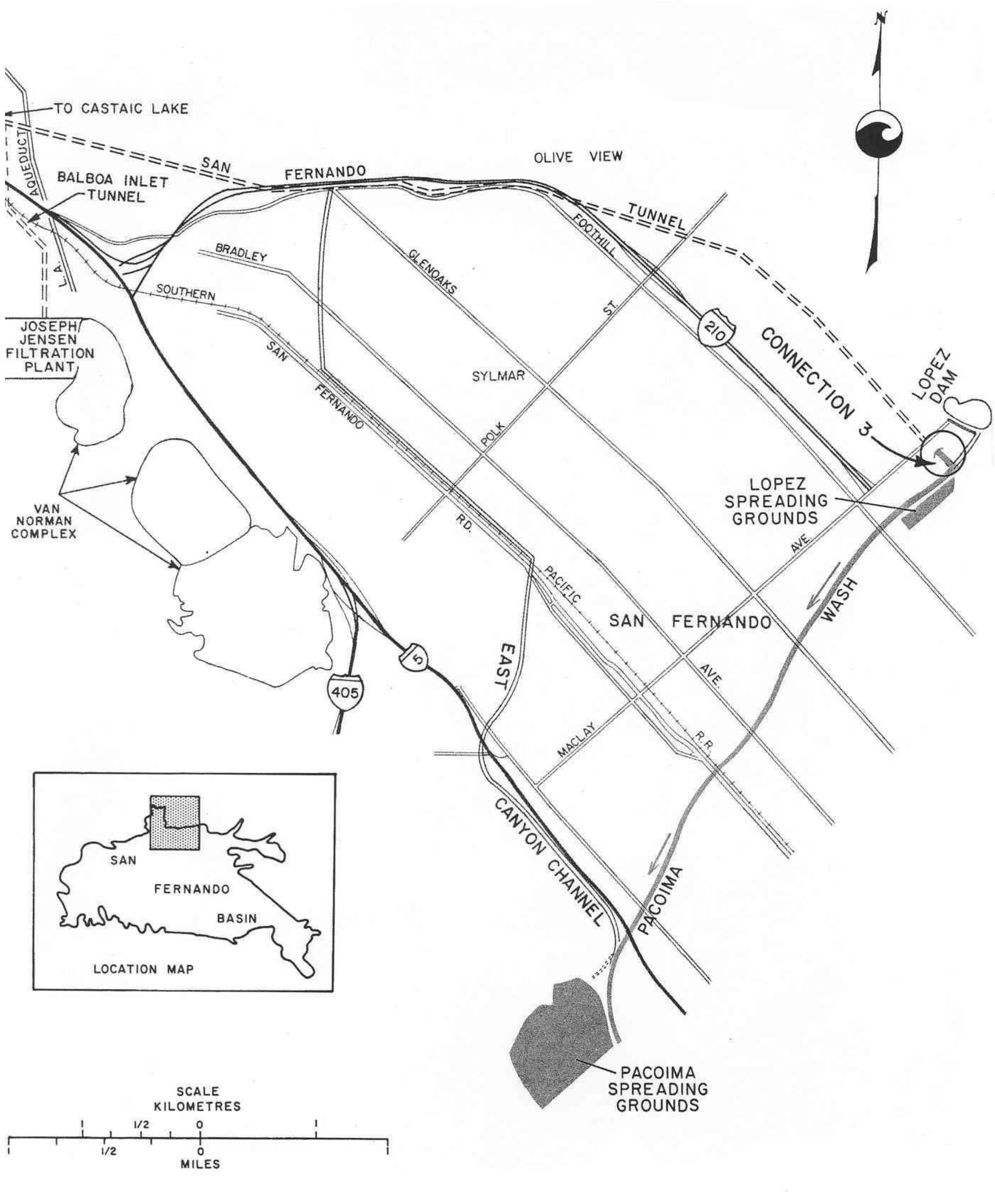


FIGURE 4.1

LOCATION OF MWD UNTREATED WATER CONNECTION

Appendix A

Water Treatment Facilities

LAKE STREET GAC TREATMENT PLANT

320 North Lake Street
Burbank CA 91502

OPERATOR:

City of Burbank
Burbank Water and Power, Water Division
Albert Lopez, Water Production/ Operations Superintendent

QUANTITY TREATED (10/1/14 through 9/30/15):

2 AF for non-potable power plant use

WATER QUALITY:

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

DISPOSITION:

Magnolia Power Project
Non-potable Water

EPA CONSENT DECREE PROJECT – BURBANK OPERABLE UNIT

2030 North Hollywood Way
Burbank CA 91505

OPERATOR:

City of Burbank
Burbank Water and Power, Water Division
Albert Lopez, Water Production/ Operations Superintendent

QUANTITY TREATED (10/1/14 through 9/30/15):

10,006 AF

WATER QUALITY:

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

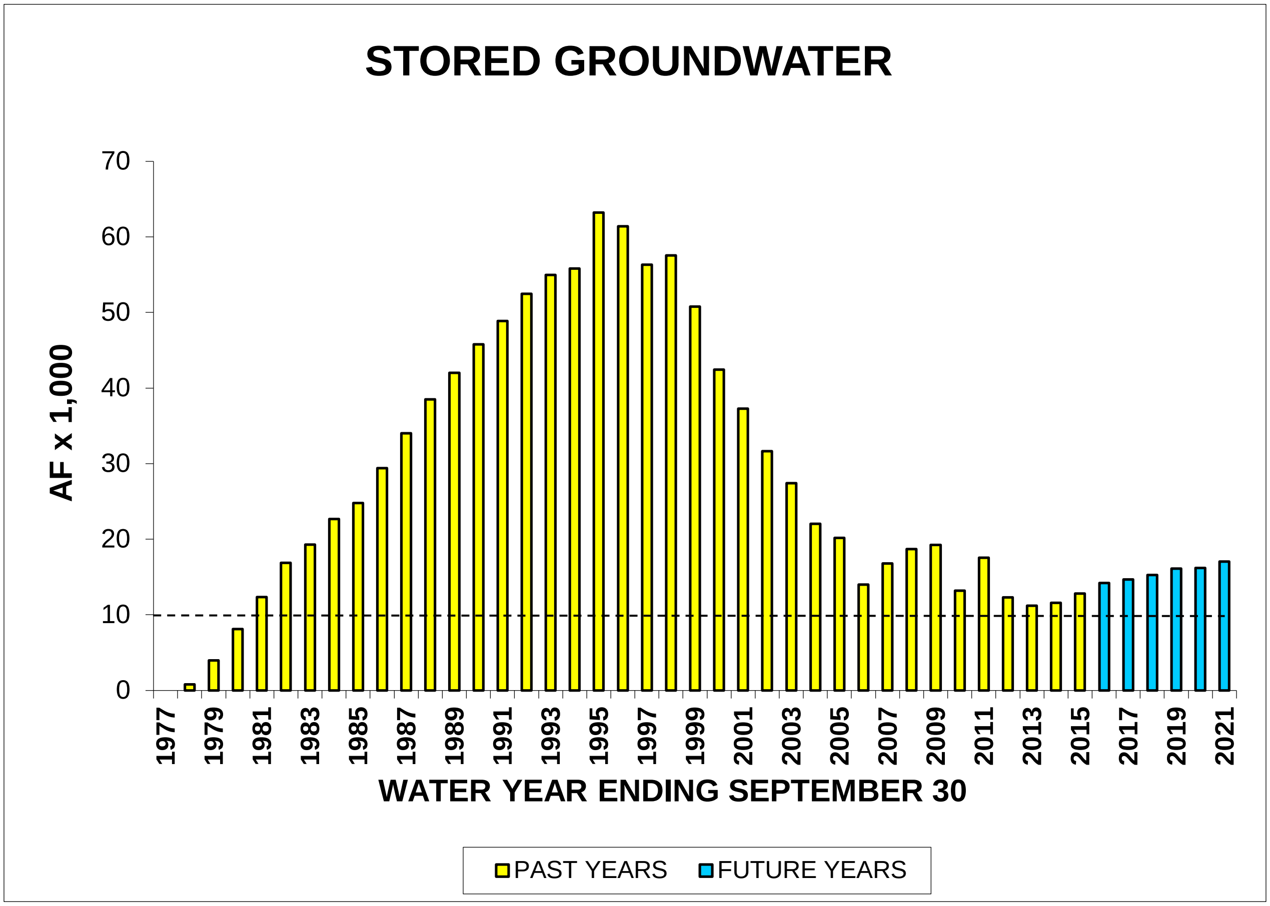
DISPOSITION:

1) Test Water- Waste
2) Operation Water (backwash, etc.) - Waste
3) Burbank Water System-(Potable water after blending)

Appendix B

Stored Groundwater

BURBANK WATER AND POWER
WATER DIVISION
WY 2014/15



NOTES:

- 10,000 AF RECOMMENDED AS BASIN BALANCE. THIS EQUATES TO ABOUT ONE YEAR OF DOMESTIC SYSTEM PRODUCTION IF REPLENISHMENT NOT AVAILABLE FROM MWD.
- STORED WATER IS REDUCED WHEN PRODUCTION EXCEEDS THE RETURN FLOW CREDIT (~4,200 AF) PLUS SPREAD WATER OR PHYSICAL SOLUTION CREDITS.
- SPREADING WATER OR GROUNDWATER CREDIT PURCHASES TO BE CONTINUED TO MAINTAIN BASIN BALANCE.

CITY OF BURBANK WATER AND POWER
WATER DIVISION
BURBANK'S STORED GROUNDWATER

WATER YEAR	DELIVERED WATER AF	RETURN FLOW CREDIT AF	SPREAD WATER AF	OTHER CREDITS AF	PUMPED GROUNDWATER AF	STORED WATER CREDIT AF
1976/77	22,743	4,549				
1977/78	22,513	4,503			3,767	(1) 782
1978/79	24,234	4,847			1,358	(2) 3,947
1979/80	24,184	4,837			677	8,117
1980/81	25,202	5,040			595	12,359
1981/82	22,120	4,424			523	16,876
1982/83	22,118	4,424			2,002	19,298
1983/84	24,927	4,985			1,063	22,659
1984/85	23,641	4,728			2,863	24,781
1985/86	23,180	4,636			123	29,386
1986/87	23,649	4,730			0	34,022
1987/88	23,712	4,742			253	38,498
1988/89	23,863	4,773			1,213	42,027
1989/90	23,053	4,611	378		1,401	45,777
1990/91	20,270	4,054	504		2,032	48,860
1991/92	20,930	4,186	503		938	52,479
1992/93	21,839	4,368	500		(3) 2,184	54,981
1993/94	24,566	4,913	0		(3) 3,539	55,810
1994/95	22,541	4,508	0	5,380	2,888	63,215
1995/96	23,124	4,625	0	2,000	8,308	61,415
1996/97	24,888	4,977	0	1,500	11,243	56,297
1997/98	22,447	4,489	0	0	3,731	57,543
1998/99	22,671	4,534	0	2,000	13,262	50,770
1999/2000	26,312	5,262	0	0	12,862	42,442
2000/01	25,619	5,124	0	0	10,440	37,264
2001/02	24,937	4,987	0	0	10,764	31,624
2002/03	23,108	4,622	0	300	9,483	27,428
2003/04	24,235	4,847	0	44	10,057	22,037
2004/05	21,749	4,350	0	0	6,694	20,190
2005/06	24,084	4,817	0	0	10,543	13,999
2006/07	25,288	5,058	0	8,200	10,220	16,796
2007/08	24,277	4,855	0	4,200	7,161	18,704
2008/09	22,160	4,432	0	6,200	10,319	19,246
2009/10	20,513	4,103	34	0	10,371	13,208
2010/11	19,322	3,864	11,187	0	10,791	17,530
2011/12	20,584	4,117	1,371	0	10,336	12,305
2012/13	20,480	4,096	6,703	0	11,822	11,190
2013/14	21,442	4,288	7,000	0	10,567	11,602
2014/15	17,917	3,583	150	7,200	10,308	12,803
2015/16	17,833	3,567	306	7,200	9,560	14,189
2016/17	20,290	4,058	7,500	25	10,477	14,656
2017/18	20,522	4,104	7,150	50	10,477	15,282
2018/19	20,649	4,130	7,150	200	10,477	16,097
2019/20	20,908	4,182	7,150	300	10,477	16,196
2020/21	20,942	4,188	7,150	300	10,477	17,028

NOTES:
(1) STORED WATER AS OF OCTOBER 1, 1978
(2) STORED WATER AS OF OCTOBER 1, 1979
(3) EXCLUDES 150 AF OF PUMPING FOR TESTING.
OTHER CREDITS INCLUDE PHYSICAL SOLUTION PURCHASES, IN-LIEU STORAGE,
AND OTHER TRANSFERS OF GROUNDWATER CREDITS
COLUMNS (1) THROUGH (6) - FROM ULARA WATERMASTER REPORTS
COLUMN (2) = 20% OF COL. (1)
PUMPED GROUNDWATER INCLUDES CITY, VALHALLA, LOCKHEED, DISNEY, MENASCO, HOME DEPOT
BEGINNING 2007-08, 1% IS DEDUCTED FROM THE STORED WATER AT THE END OF EACH YEAR.
SHADED AREAS OF TABLE ARE PROJECTED VALUES .

APPENDIX C

CITY OF GLENDALE

PUMPING AND SPREADING PLAN

2015-16 through 2019-20 Water Years

glendale california

Glendale Water & Power
Water Engineering

141 North Glendale Ave., Level 4
Glendale, CA 91206-4496
Tel: (818) 548-2062 Fax: (818) 240-4754

September 22, 2016

Mr. Richard Slade
ULARA Watermaster
12750 Ventura Blvd., Suite 202
Studio City, CA 91604

Subject: **Annual Pumping & Spreading Plan for Water Years 2015-2019 for City of Glendale**

Dear Mr. Slade:

Enclosed please find the annual Pumping and Spreading Plan for the City of Glendale for the Water Years 2015-2019. Glendale, as you know, does not have any spreading facilities.

If you have any question or need further information, please do not hesitate to contact my staff, Mr. Leo Chan at (818) 548-3905 or via email at lchan@glendaleca.gov.

Respectfully yours,

Raja Takidin
Senior Civil Engineer

RT/lc

Enclosed

cc: Anthony Hicke, Assistant Watermaster
Michael De Ghetto, Assistant General Manager – Water

CITY OF GLENDALE

GROUNDWATER PUMPING
AND
SPREADING PLAN

WATER YEARS 2015-2019

Prepared By

GLENDALE *WATER & POWER*

September 2016

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Introduction

This report discusses water supplies to the City of Glendale for Water Year 2015-16 and projections in local water resources available to meet future water demands and to reduce Glendale dependency on imported water. This information is used by the ULARA Watermaster and a wide group of individuals and organizations including Glendale's City Manager and Council Members, regulatory agencies and others interested in the future conditions of Glendale's water resources.

Executive Summary

Glendale receives its groundwater supply from San Fernando Groundwater Basin and Verdugo Groundwater Basin. Table 1 illustrates the actual (in bold letters) and projected pumping activities in the two basins between 2015-16 and 2019-20. Glendale currently does not have any spreading facility.

TABLE 1
ACTUAL & PROJECTED PUMPING ACTIVITIES IN WATER YEAR 2015-16 – 2019-20
(Acre Feet per Year)

Source	2015-16*	2016-17	2017-18	2018-19	2019-20
San Fernando (SF) Basin					
Glendale OU	***7,273***	*7,300*	*7,300*	*7,300*	*7,300*
Forest Lawn Memorial Park	***400***	*400*	*400*	*400*	*400*
Grayson Power Plant	***20***	*20*	*20*	*20*	*20*
SF Basin Total	**7,693**	7,720	7,720	7,720	7,720
Verdugo Basin	**1,170**	1,458	1,816	1,816	1,816

** The first eleven months of the year were based on actual production data.*

Existing Water Sources and Supplies

The City of Glendale ("City") currently has four sources of water available to meet demands: groundwater from the San Fernando Basin and Verdugo Basin, imported water from the Metropolitan Water District of Southern California ("Metropolitan") and recycled water from the Los Angeles/Glendale Water Reclamation Plant ("LAGWRP"). Each of these sources is described below. The entry points into the City water system for the various supplies are shown in Figure 1.

1. San Fernando Basin

The City's water right to San Fernando Basin supplies is defined by the judgment entitled "The City of Los Angeles vs. the City of San Fernando, et al." (1979) hereinafter referred to as the "Judgment"). The Judgment consists of a return flow credit, which is a type of water right based on the assumption that a percentage of water used in the City is returned to the groundwater basin. The City has a right to accumulate its return flow credits annually if its water rights are not used. In the water year of 2014-15, the City has a storage credit of 40,254 acre feet ("AF") within the basin. In addition, the Judgment contains rights for physical solution water. This is a right to produce water in excess of return flow credit and the accumulated credits, subject to a payment obligation to the City of Los Angeles based primarily on the cost of Metropolitan alternative supplies. This option to produce physical solution water in excess of the return flow credit and the accumulated credits is a significant factor in relation to the water production at the Glendale Water Treatment Plant ("GWTP"). The GWTP is part of a U.S. Environmental Protection Agency ("EPA") Superfund clean-up project in Glendale. The project consists of a 5,250* gallon per minute ("gpm") facility and nine (9)† wells that supply the plant. Further discussion regarding the GWTP can be found in the Section: *Past Water Use and Trend* on page 8 in this report. The various San Fernando Basin supplies are:

> Return Flow Credit – Glendale is entitled to a return flow credit of twenty (20.0) percent of all City-delivered water, including recycled water, in the San Fernando Basin and its tributary hill and mountain area. A location map is shown in Figure 2 *(Source: 2012-13 Water Year ULARA Watermaster Report)*. This credit ranges from about 4,500 acre feet per year (AFY) to 5,400 AFY depending on actual water use. This is the City's primary water right in the San Fernando Basin.
>
> Physical Solution Water – The City has an agreement to extract water over and above the return flow credit and accumulated credits, and it is chargeable against the rights of the City of Los Angeles upon payment of specified charges generally tied to Metropolitan's water rates. The City's physical solution right is 5,500 AFY.
>
> Pumping for Groundwater Cleanup – Section 2.5 of the Upper Los Angeles River Area's ("ULARA") Policies and Procedures, dated July, 1993, provides for the extraction of basin water for SUPERFUND activities, subject to payment of specified charges similar to physical solution water. This right became a significant factor with the completion of the GWTP in 2000.
>
> Carry-over extractions – In addition to current extractions of return flow water and stored water, Glendale may, in any one year, extract from the San Fernando Basin an amount not to exceed 10 percent of its last annual credit for import return water, subject to an obligation to replace such over-extraction by reduced extraction during the next water year. This provides important year-to-year flexibility in meeting water demands.

** State Water Resources Control Board – Division of Drinking Water (DDW) approved to increase the overall treatment plant capacity from the original 5,000 gpm to 5,250 gpm in October 2008.*

† The ninth extraction well (GS-5) is expected to be online in October 2016.

San Fernando Basin production has been limited in the past and was eventually eliminated for a time because of volatile organic compounds ("VOC") contamination of the groundwater. The entire San Fernando Valley is part of a U. S. Environmental Protection Agency ("EPA") Superfund cleanup program. Since the early 1990s, many water treatment plants had been constructed in the San Fernando Valley to remove VOC from the groundwater. EPA had focused on the construction of cleanup facilities in the City. The GWTP and eight extraction wells have been constructed to pump, treat and deliver water to the City via its Grandview Pumping Plant. Significant production from the basin and delivery to the City started in January 2002.

The cleanup facilities consist of eight shallow extraction wells and one deep well; the 5,250 gpm GWTP to remove the VOC; piping to convey the untreated groundwater from the wells to the water treatment plant; a system to convey treated water from the treatment plant to the City's potable distribution system; the Grandview facility to blend the treated groundwater with water from Metropolitan, and a disinfection facility. A general layout of these facilities is shown in Figure 3.

In 2000, major agreements were signed between City of Glendale and Glendale Respondents Group (GRG), which represents forty-plus industries identified by the EPA as potentially responsible for the groundwater contamination, and the EPA. GRG retained CDM Consulting Engineers, Inc. to design, construct and operate the water treatment facilities required by the agreements. The State Water Resources Control Board – Division of Drinking Water ("DDW") (formally known as the California Department of Public Health) issued a permit for the City to operate the facilities in July 2000. The City started taking small quantities of water from this facility on July 23, 2001. The delivery of the water was initially limited because of the City's concern with taking water with higher hexavalent chromium ("Cr(VI)") levels than in the current water supply, even though such water met all water quality standards. In January 2002, the Glendale City Council authorized the City to start delivering 5,000 gpm from the treatment facility into the City's potable water system with a target to minimize the concentration of Cr(VI) in the water. This source is expected to provide about 7,300 AFY to the City, which will meet about twenty-six percent (26%) of projected near-term water demands. There is additional groundwater production of 400 AFY by Forest Lawn Memorial Park for irrigation purposes, and about 20 AFY for use on the cooling tower and steam and gas combustion turbines at the Glendale Grayson Power Plant, for a total of approximately 7,720 AFY.

The City, as of October 1, 2014, has 40,254 AF in accumulated pumping credits in the San Fernando Basin. In order to achieve 7,720 AF of San Fernando Basin productions per year, Glendale must utilize its return flow credit of 5,500 AF per year and 2,220 AF of its accumulated pumping credits. Additional stored groundwater credit of 14,160 AF could be used to meet unexpected demands or in cases of emergency. Usage of the additional amounts of stored groundwater pumping credits was not considered in the supply-demand analysis of this Water Supply Evaluation, but rather would be in addition to the amounts of available water supplies detailed in that analysis. That these additional amounts of groundwater were not included in the supply-demand analysis further ensures that there are sufficient supplies to meet Plan demands.

2. Verdugo Basin

Historically, groundwater supplies from the Verdugo Basin contributed a small portion to the City's water supplies via five wells and an underground water infiltration system. The Judgment granted Glendale the right to extract 3,856 AFY from the Verdugo Basin. Crescenta Valley Water District (CVWD) also has water rights of 3,294 AFY and is the only other entity allowed to extract water from the Verdugo Basin.

Use of the Verdugo Basin supplies has been limited in the past due to water quality problems, groundwater levels, and limited extraction capacity. In order to increase the use of these supplies, the City completed construction of the Verdugo Park Water Treatment Plant ("VPWTP") in 1995. VPWTP treats water pumped from two low capacity wells, referred to as Verdugo Wells A & B, and from the water supplies in the Verdugo Pickup System, a subsurface horizontal infiltration system. The water is then pumped into the City's distribution system. The plant was originally designed to treat 1,150 gpm, however, at VPWTP startup in July of 1995 the flow was 550 gpm and over the years, the production of VPWTP has slowly declined. Due to the low production, the Verdugo Wells and the VPWTP were temporarily taken offline on September 17, 2013.

In 2011, the City completed the rehabilitation of the Foothill Well and the drilling of the Rockhaven Well in the Montrose area to increase its extraction capacity from the Verdugo Basin.

In 2014, the City and CVWD worked together as a joint project to construct and develop the Rockhaven Well. The new Rockhaven Well began operation in March 2016.

3. Metropolitan Water District of Southern California

The City relies on Metropolitan water supply to meet a majority of its current water supply requirements. For the past five water years ended September 30, 2015, water deliveries from Metropolitan averaged 15.9 million gallons per day (approximately 17,772 AFY), which constituted an average of 68% of the City's total potable water supply. The City expects to continue reliance on Metropolitan sales of water to meet a majority of its future water supply requirements.

The following information regarding Metropolitan has been obtained from Metropolitan and sources that the City believes to be reliable, but the City takes no responsibility for the accuracy or completeness hereof. Additional information about Metropolitan can be obtained on Metropolitan's website at *www.mwdh2o.com*.

3.1. History and Background

The Metropolitan Water District of Southern California is a public agency organized in 1928 by a vote of the electorates of eleven (11) southern California cities which included the City of Glendale, under authority of the Metropolitan Water District Act (California Statutes 1927, Chapter 429, as reenacted in 1969 as Chapter 209, as amended, herein referred to as the "Metropolitan Act"). The Metropolitan Act authorizes Metropolitan to levy property taxes within its service area; establish water rates; impose charges for water standby and service availability; incur general obligation bonded indebtedness and issue revenue bonds, notes and short-term revenue certificates; execute contracts; and exercise the power of eminent domain for the purpose of acquiring property. In addition, Metropolitan's Board of Directors ("Metropolitan's Board") is authorized to establish terms and conditions under which additional areas may be annexed to Metropolitan's service area.

Metropolitan's primary purpose is to provide a supplemental supply of water for domestic and municipal uses at wholesale rates to its member public agencies. The City is one of the 26 Metropolitan member public agencies. If additional water is available, such water may be sold for other beneficial uses. Metropolitan serves its member agencies as a water wholesaler and has no retail customers.

Metropolitan's charges for water sales and availability are fixed by Metropolitan's Board and are not subject to regulation by the California Public Utilities Commission or any other state or federal agency. Metropolitan imports water from two principal sources: northern California via the Edmund G. Brown California Aqueduct (the "California Aqueduct") of the State Water Project owned by the State of California and the Colorado River via the Colorado River Aqueduct owned by Metropolitan. Water deliveries through the Colorado River Aqueduct began in the early 1940's. This imported water supplemented the local water supplies of the original 13 southern California member cities. In 1972, to meet growing water demands in its service area, Metropolitan started receiving additional water supplies from the California Aqueduct. Metropolitan owns and operates the Colorado River Aqueduct and has a long-term contract for water from the State Water Project.

The locations of the California Aqueduct and Colorado River Aqueduct are shown in Figure 4. Metropolitan's service area also includes the southern California coastal plain. It extends about 200 miles along the Pacific Ocean from the City of Oxnard on the north to the international boundary with Mexico border on the south, and it reaches seventy (70) miles inland from the coast. The total area served is nearly 5,200 square miles. The service area includes portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. Metropolitan is currently composed of twenty-six (26) member agencies, including fourteen (14) cities, eleven (11) municipal water districts, and one (1) county water authority. Glendale is one of the fourteen member agency cities served by Metropolitan.

3.2. State Water Project

One of Metropolitan's two major sources of water is the State Water Project, which is owned by the State and operated by the State Department of Water Resources ("DWR"). The State Water Project (SWP) transports water from San Francisco Bay/Sacramento-San Joaquin River Delta ("Bay-Delta") south via the California Aqueduct to Metropolitan. The total length of the California Aqueduct is approximately 444 miles. The State Water Contract, under a 100 percent allocation, provides Metropolitan 1,911,500 AF of water per year.

Drought conditions in fiscal year 2014/15 resulted in a substantially reduced amount of 634,679 AF of available water through the SWP System, about 250,000 AF less than the previous year. The final SWP allocation for calendar year 2014 was just five percent, or 96,000 AF (the lowest in history) and slightly improved in calendar year 2015 at a 20 percent allocation, or 382,000 AF (second lowest in history). *(Source: MWDSC Annual Report 2015)*

3.3. Colorado River Aqueduct

Metropolitan has a legal entitlement to receive water from the Colorado River under a permanent service contract with the Secretary of the Interior. Water from the Colorado River or its tributaries is also available to other users in California, as well as users in the states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming, resulting in both competition and the need for cooperation among these holders of Colorado River entitlements. The Colorado River Aqueduct, which is owned and operated by Metropolitan, transports water from the Colorado River approximately 242 miles to its terminus at Lake Mathews in Riverside County.

Historically, Metropolitan had been able to take full advantage of the availability of surplus water and apportioned but unused water. However, other users increased their use of water from the Colorado River beginning in 1998. Although use of water is expected to fluctuate annually, this trend is projected to continue in the future. In addition, severe droughts in the Colorado River Basin have reduced water supplies.

In response to the low SWP deliveries in 2014/2015, Metropolitan maximized the use of Colorado River supplies, relied on storage reserves, and increased conservation and outreach efforts. During Fiscal Year 2014-15, no surplus was available to Metropolitan from the Colorado River and was limited to its 550,000 AF Basic Apportionment plus water management programs. Metropolitan conveyed 1.19 MAF in its Colorado River Aqueduct in calendar year 2014. *(Source: MWDSC Annual Report 2015)*

3.4. Metropolitan's Services to Glendale

Glendale receives Metropolitan water through three (3) service connections as shown on Figure 1. The service connection number and capacity are summarized in Table 2 below. In total, Metropolitan has a total delivery capacity of seventy-eight (78) cubic feet-per-second (cfs). During hot summer days, Glendale has the capability to utilize the full capacity of the facilities. Any significant increase in demands on Metropolitan could require another service connection.

TABLE 2
METROPOLITAN CONNECTIONS AND CAPACITY

Service Connection Number	Capacity (cfs)
G-1	48
G-2	10
G-3	20

Over the years, Metropolitan has provided high level of reliability in meeting Glendale's supplemental water supply needs. It is believed that the reliability of water supply to the City will continue in the future as a result of the many water resource programs under way and the proposed future programs now being considered based on Metropolitan's Integrated Water Resources Plan (IRP) and the Water Shortage and Drought Management Plan (WSDM). This source will always be a major factor in meeting the water needs of the City. The City closely follows the planning activities at Metropolitan to assure that it has adequate supplies to meet the needs of its member agencies.

4. Recycled Water

The City has been delivering recycled water from the LAGWRP since the late 1970's. This is a twenty (20) million gallon-per-day (MGD) facility owned by the Cities of Los Angeles and Glendale. Based on a 1970 contract between the Cities of Los Angeles and Glendale, Glendale is entitled to fifty percent (50%) of any effluent produced at the plant, which is more than sufficient to for all recycled water use within City of Glendale. Treated wastewater that is not used in either the Glendale or Los Angeles system is discharged to the Los Angeles River and eventually reaches the ocean.

In the 1990's Glendale Water & Power Department (GWP) began to require all new high-rise buildings (4-story or higher) to install dual-plumbing system within the Glendale Downtown area. Recycled water customers are solely responsible for funding and installing the connectors from the recycled water pipeline in the public streets to the customer's property, and for all on-site facilities to distribute recycled water to the ultimate use. The main recycled water distribution pipelines and existing recycled water facilities are shown in more detail in Figure 5.

As of October 2015, Glendale has a total of fifty-four (54) recycled water users. These include a landfill, two golf courses, two memorial parks, six schools, seven recreation parks, and other irrigation areas. Also, three (3) high-rise buildings, Glendale Police Headquarter, the Disney Complex on Flower Street, and the new buildings at Glendale Community College are dual-plumbed to use recycled water for sanitary flushing purposes when facilities are in place to provide the water (Figure 6). In water year 2014-2015, two new accounts were added to the recycled water system. The amount of potable water purchased from Metropolitan is expected to have a corresponding reduction.

5. Summary of Local Supplies

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

TABLE 3
LOCAL WATER PROJECTS AND USE (AFY)

Potential Source	Right	Current Use	Future Use
San Fernando Basin	4,500 - 5,400	7,693	7,720
Verdugo Basin	3,856	1,170	1,516
Recycled Water	10,000	1,612	1,662

Past Water Use and Trends

Historically, the City used groundwater to meet a varying portion of its water demand. In the 1940s and 1950s essentially all of the City's water needs were obtained from the San Fernando and the Verdugo Basins with limited supplies from Metropolitan. In the 1960's, production from the San Fernando Basin reached a peak of about 17,000 AFY. The Grandview well water collection system in the San Fernando Basin and the Grandview Pumping Plant originally pumped a peak capacity of about 24,000 gpm (34.6 MGD) from San Fernando Basin directly into Glendale's potable water system.

In the mid-1970s, Glendale limited production from the San Fernando Basin to about 12,000 AFY as part of a court decree arising from a Water Rights lawsuit by the City of Los Angeles. In 1975, the California Supreme Court issued the Judgment in City of Los Angeles vs. City of San Fernando which further limited Glendale's production right. The current right is about 5,500 AFY based on a Return Flow Credit right from water use in Glendale, with certain additional rights as described above. Other limitations to groundwater use occurred in the late 1970s, when production from the Verdugo pick-up system in the Verdugo Basin was discontinued because of water quality problems.

In late 1979, Assembly Bill 1803 required that all water agencies using groundwater must conduct tests for the presence of certain industrial solvents. The tests indicated that VOC such as trichlorethylene and perchloroethylene were present in the San Fernando Basin groundwater supplies in concentrations exceeding State Department of Health Services' maximum contaminant levels. Both chemicals were used extensively in the past as degreasers in manufacturing industries.

At that time, the presence and hazards to the water supplies were identified. As a result, Glendale had to further limit its use of San Fernando Basin supplies. From 1980 to 1992, Glendale reduced production; and from 1992 to 2000, Glendale totally suspended production from the basin because of the presence of VOC. During the twenty year period of reduced production, Glendale was allowed to accumulate the groundwater storage credits that could be used in the future. Glendale's storage account balance was 40,254 AF as of October 1, 2014.

The water quality problems in the San Fernando Basin and groundwater levels in the Verdugo Basin have impacted the ability of Glendale to produce water from these Basins. Glendale was able to better utilize its rights to the San Fernando Basin water supplies accumulated for many years started in 2000. The EPA has designated several locations in the San Fernando Basin as Superfund sites and required construction of cleanup treatment facilities by the industry group responsible for the contamination. The Glendale cleanup project – Glendale Operable Unit (GOU) is the last in a series of EPA-required cleanup facilities for VOC and is now complete.

The GOU is comprised of a treatment plant (the GWTP), nine (9) groundwater extraction wells, a pumping plant, a disinfection facility, and associated piping. The facility was designed to treat groundwater contaminated by TCE and PCE at a combined rate of 5,000 gpm using aeration and granulated activated carbon (GAC). The treated water is then blended with imported supplies to control nitrate concentrations. In December 2000, the City started operating the GOU. But due to the Cr(VI) issue, only a small quantity was initially pumped and delivered. Full operation started on January 6, 2002.

The wells were being pumped and blended in a manner to limit Cr(VI) concentrations to achieve the City's target of 5 µg/L. In 2003, the City began a major research effort on identifying viable treatment technologies for the removal of Cr(VI) from its pumped groundwater. In 2010, the City constructed the Weak Base Anion (WBA) Chromium Removal facility to remove Cr(VI) from groundwater produced by GOU Well GS-3. The City also constructed a 100-gpm demonstration-scale facility using reduction, coagulation and filtration (RCF) technology to remove Cr(VI). These facilities effectively removed Cr(VI) in the groundwater to concentration below 5 µg/L. The Cr(VI) Removal Research Project was completed in 2015.

In the Verdugo Basin, Glendale currently has six (6) active production wells and a pick-up system (infiltration galleries), along with the VPWTP. The four active wells referred to as Glorietta Wells 3, 4 & 6 and Foothill Well produce about 1,145 AFY in Water Year 2014-15 and account for about five percent (5%) of Glendale's total potable water supply. The declined water levels have significantly reduced supplies for this source, and accordingly, the City has reduced its projections of supply from this source as well. Due to the low production from the Verdugo Wells A & B, the two wells and the VPWTP were temporarily shut down since September 17, 2013 pending well performance evaluation and rehabilitation. The location of the VPWTP and existing wells are shown on Figure 1.

The City is committed to aggressively advocate the use of recycled water for irrigation & toilet flushing, which will help increased the conservation of potable water and reduced the dependency on imported supplies. In 2014, GWP and Glendale Public Works completed the design of recycled water pipeline extension project to the Public Works service yard and constructed with LADWP a pipeline that provides recycled water for the Bette Davis Park. The two new facilities were estimated to increase the recycled water use by 10 AF per year.

Glendale's Ability To Meet Demands

Over the past three years, there has been a sizeable increase in the development of multi-family mix-use buildings in the City. Reliability of water supplies is a key goal in the operation of Glendale's water distribution system to serve the current and forthcoming water demand. In Water Year 2014-15 Glendale imported approximately 67 percent of its potable water supply from Metropolitan. Consequently, the reliability of Metropolitan water supplies to meet Glendale water needs becomes exceptionally crucial. Glendale continues to maximize local groundwater production and work closely with Metropolitan on imported water delivery to meet the needs of our citizens.

Future Goals

The City's Water Department (GWP) has been actively trying to increase groundwater production in the Verdugo Basin. In 2014, GWP and CVWD worked together as a joint project to construct and develop the Rockhaven Well. Groundwater extracted from the well is conveyed to CVWD's Nitrate Removal Treatment Facility at Glenwood for nitrate removal and disinfection and is served to the La Crescenta-Montrose area. The extracted volume is accounted as part of the adjudicated water right of Glendale and will be reported to the ULARA Watermaster on a monthly basis. The Rockhaven Well began operation in March 2016.

Due to the declining water level of the Verdugo Basin resulted from the current drought and the conditions of the existing wells, the groundwater productions were gradually reducing from these wells. In June 2016, GWP began the rehabilitation of Glorietta Well 6. GWP also is planning on drilling a new Well in the next fiscal year to replace Glorietta Well 6 and schedule an evaluation of the Verdugo Basin groundwater supply and the potential rehabilitation of Verdugo Wells A & B in the fiscal year 2018-19.

As California entered the fifth consecutive dry-year in 2015, GWP continues its focus to the expansion and improvement of the recycled water system. In 2015, GWP completed the Bette Davis Park Recycled Water Pipeline Extension Project. The new facility is expected to be served 4 AFY of recycled water. GWP is currently working with City of Pasadena to supply a projected volume of 3,100 AFY of recycled water to Pasadena via the existing Glenoaks 1666 Tank. For the next several years, GWP is planning for at least four major capital improvement projects to extend the recycled water supply to (1) three Glendale Unified School District facilities (55 AFY), (2) Camino San Rafael & Chevy Oaks (120 AFY), (3) the Chevy Chase Golf Course (100 AFY), and (4) the Glendale T Project (50 AFY). The total estimated recycled water usage from these improvements is 329 AFY. The City continues to aggressively advocate the use of recycled water for irrigation & toilet flushing, which will help increased the conservation of potable water and reduced the dependency on imported supplies.

To maintain the reliability of the GWTP water supply, the City also worked with the DDW and the GRG to construct a full-scale WBA facility at the GWTP in dealing with the Cr(VI) at the GN-3 Well and the ninth GOU well in the City of Los Angeles. Both facilities are expected to be in full service in by November 2016. With the operation of the new WBA facility and blending with Metropolitan imported water, Glendale continues to meet the goal of 5 µg/L entering the distribution system

In water year 2014-2015, the City imported 67% of the total potable water used from the Metropolitan, which was 3% lower than projected as a result of the implementation of the Stage 3 water conservation measure. Given the current drought conditions and the well rehabilitation activities in both the San Fernando and Verdugo Basins, it is the goal of the City’s Water Department to maintain the City’s water purchase from Metropolitan to less than seventy percent (70%) of the total water use in water year 2016-17.

FIGURES

City of Glendale Water & Power
Your Trusted Community Utility

FIGURE 1

CITY OF GLENDALE WATER DEPARTMENT
SOURCES OF SUPPLY

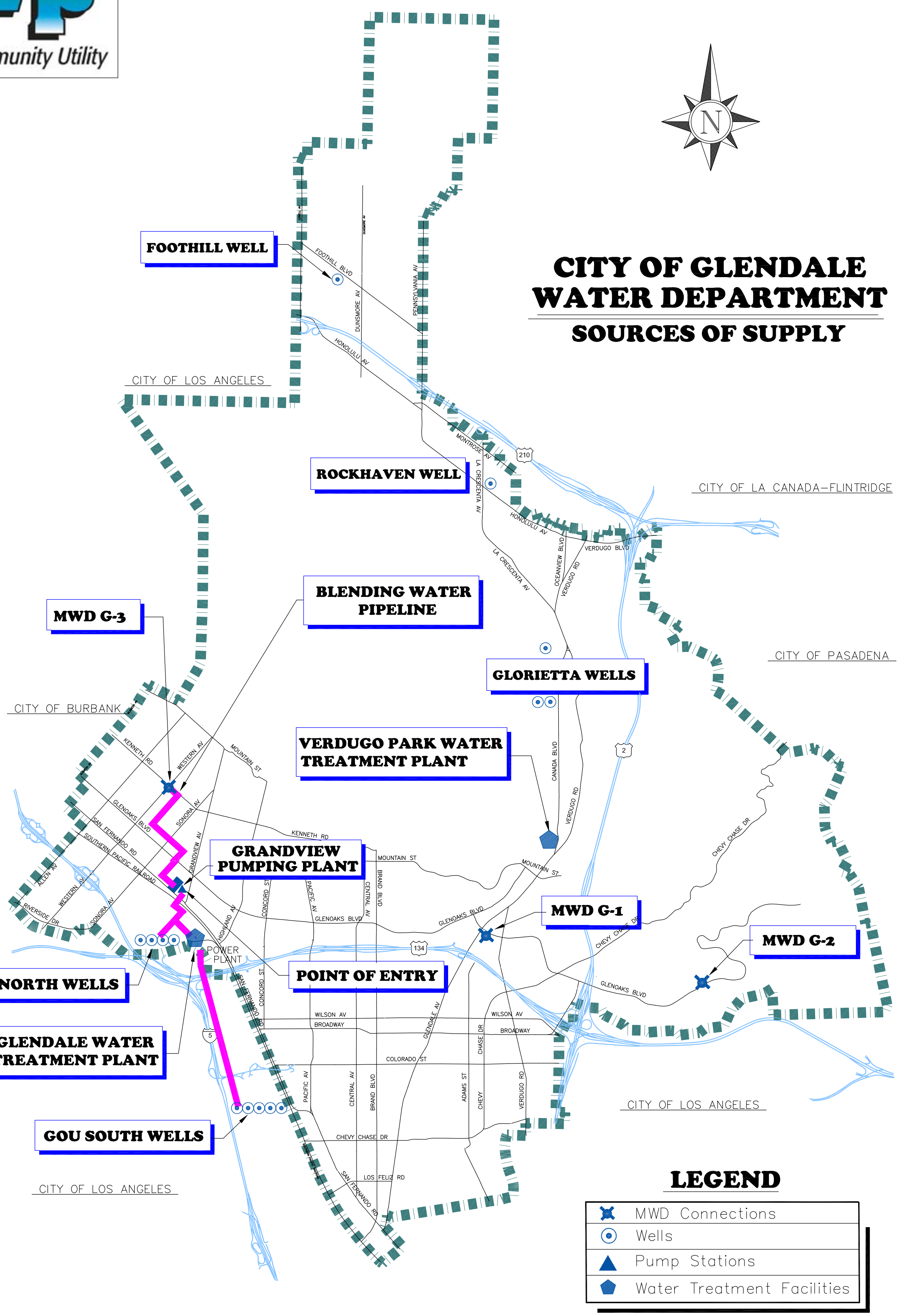
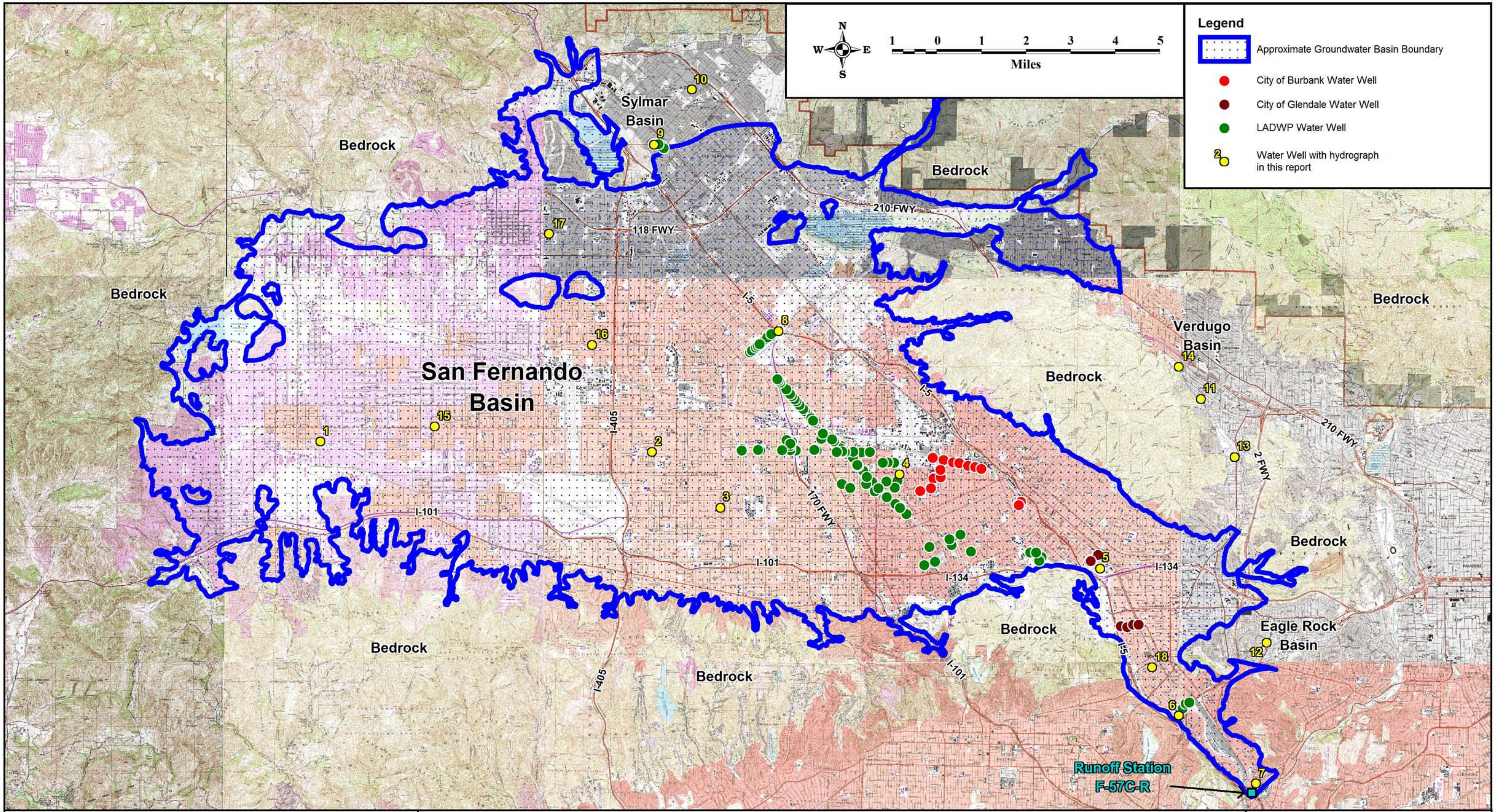


FIGURE 2



2012-2013 Water Year ULARA Wastermaster Report	Upper Los Angeles River Area: San Fernando Groundwater Basin	PLATE 1A

FIGURE 3

GLENDALE WATER TREATMENT PLANT SYSTEM LAYOUT

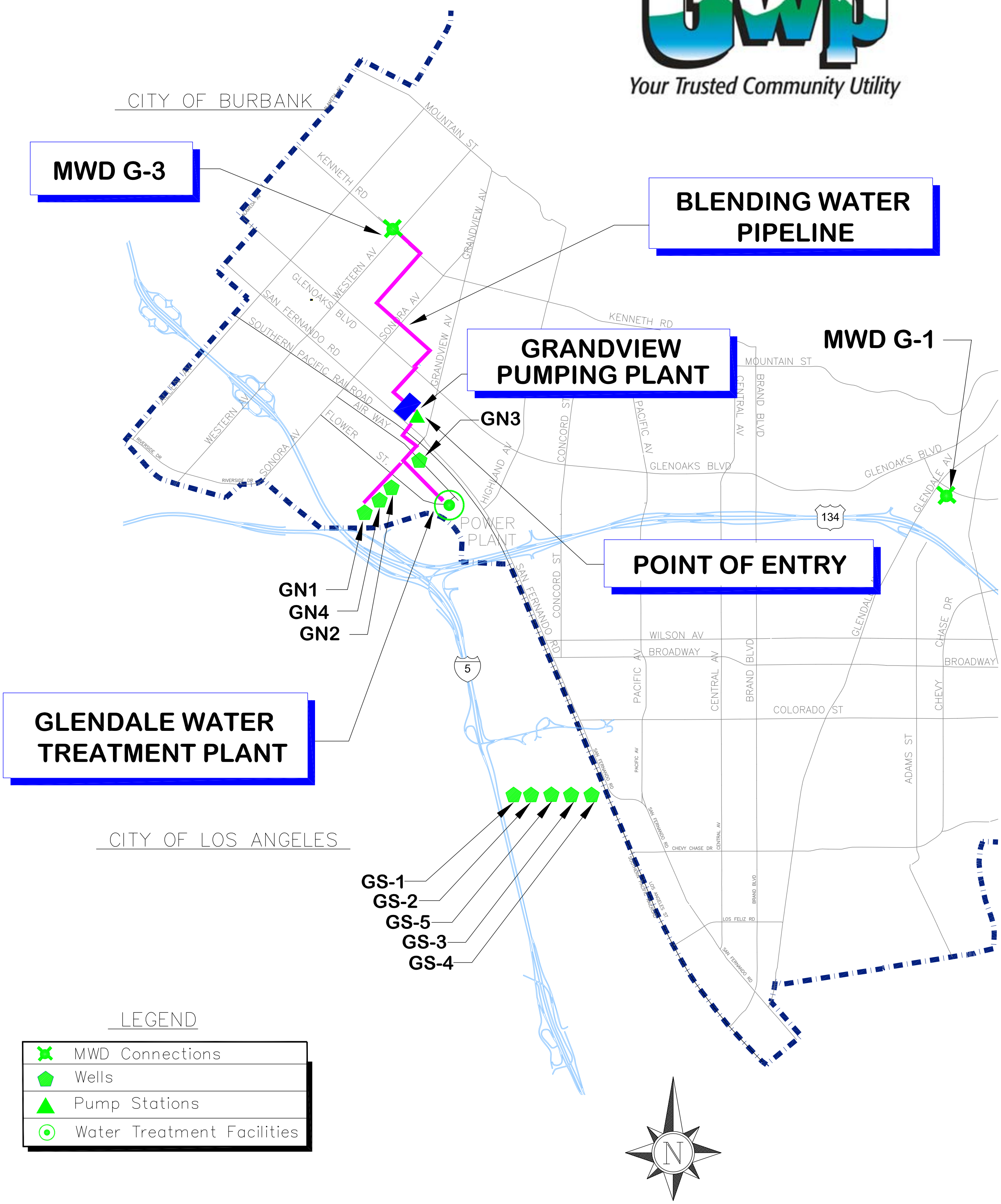
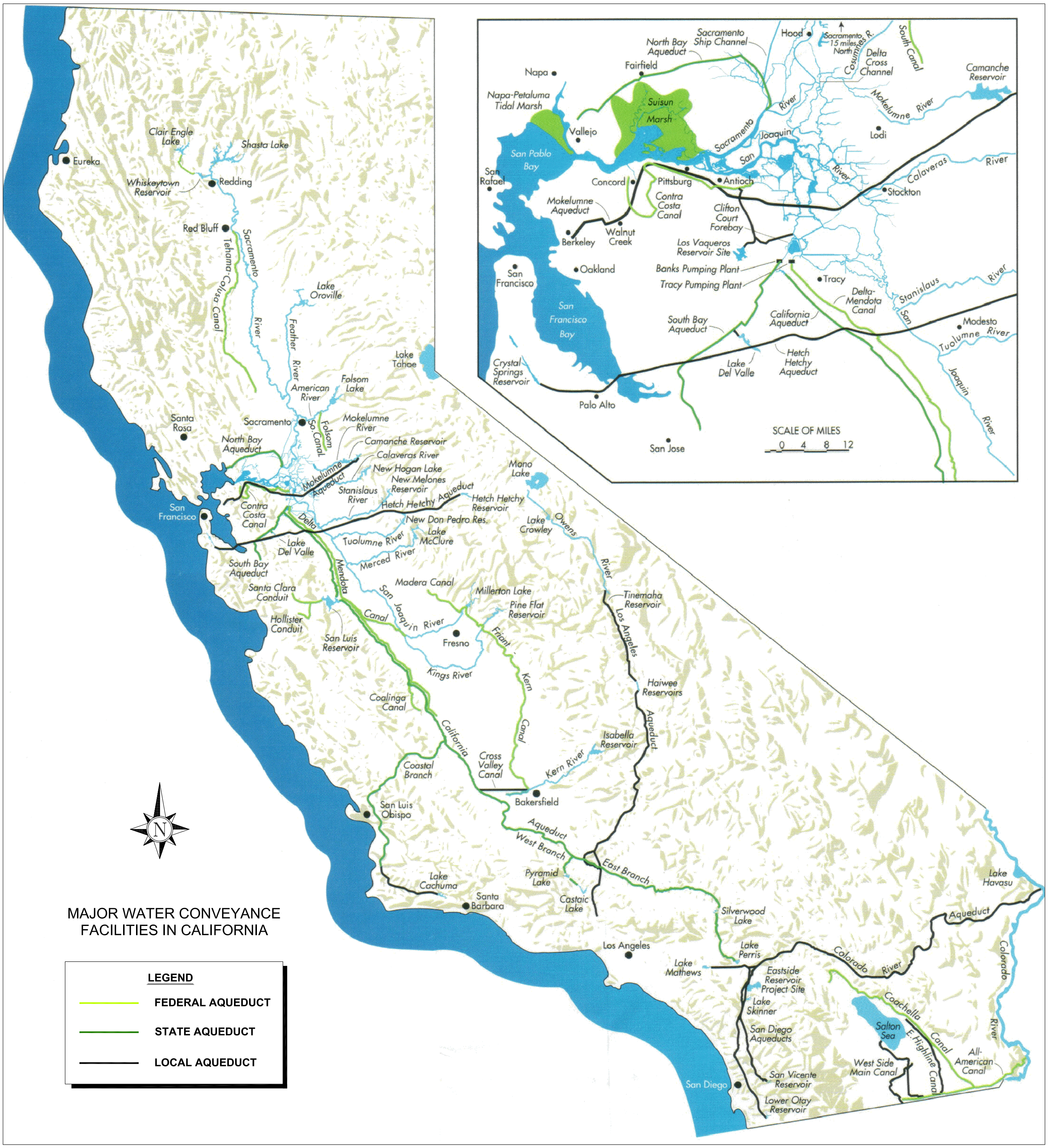
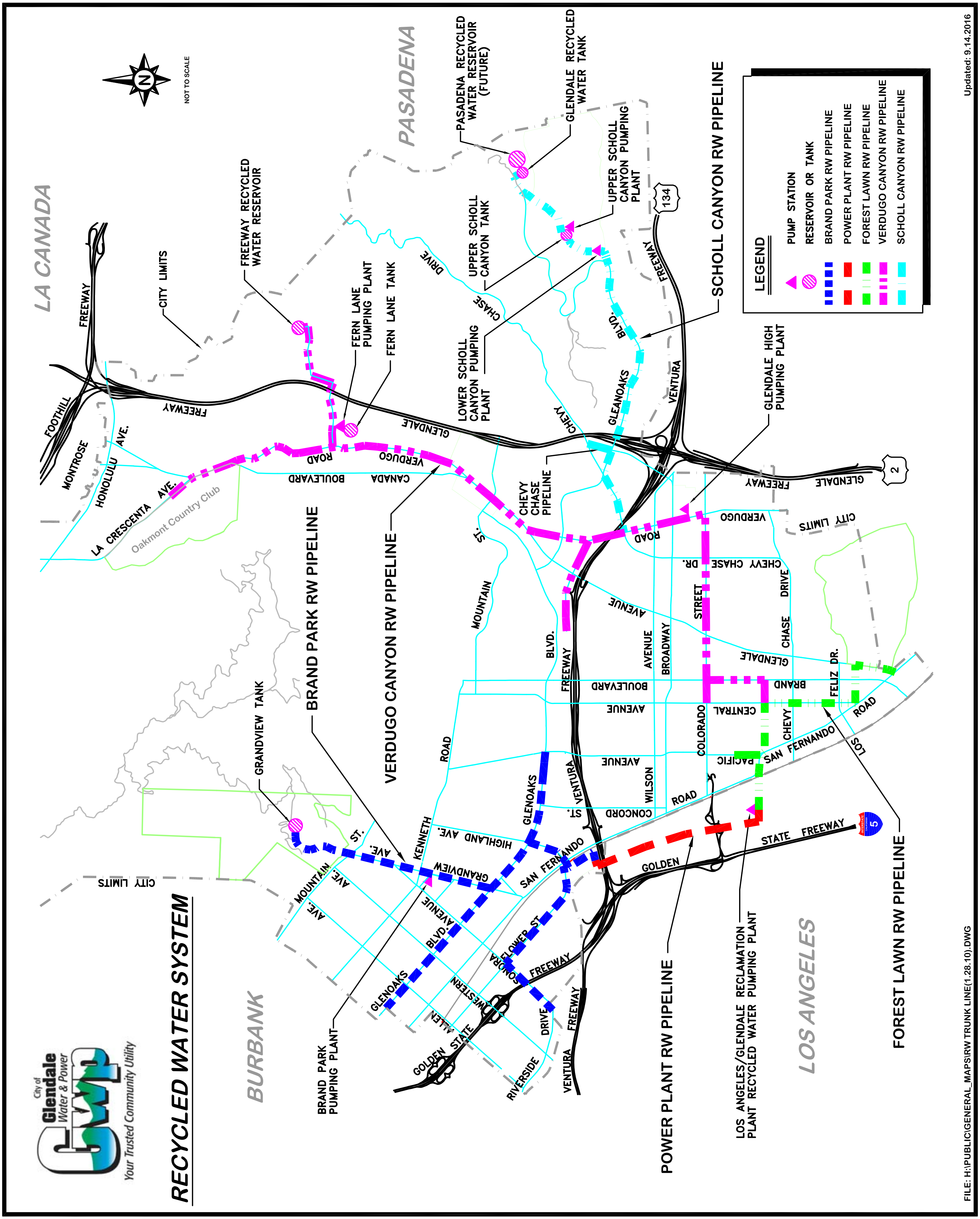


FIGURE 4



MAJOR WATER CONVEYANCE FACILITIES IN CALIFORNIA
LEGEND
FEDERAL AQUEDUCT
STATE AQUEDUCT
LOCAL AQUEDUCT
SCALE OF MILES
0 4 8 12
Eureka
Clair Engle Lake
Shasta Lake
Whiskeytown Reservoir
Redding
Red Bluff
Tehama-Colusa Canal
Sacramento River
Lake Oroville
Feather River
Lake Tahoe
Folsom Lake
American River
Santa Rosa
Sacramento
Folsom So. Canal
Mokelumne River
North Bay Aqueduct
Camanche Reservoir
Calaveras River
New Hogan Lake
New Melones Reservoir
Mokelumne Aqueduct
Stanislaus River
Hetch Hetchy Aqueduct
Hetch Hetchy Reservoir
Mono Lake
San Francisco
Contra Costa Canal
Delta
New Don Pedro Res.
Lake McClure
Tuolumne River
Lake Crowley
Owens River
Lake Del Valle
Merced River
South Bay Aqueduct
Mendota
Madera Canal
Millerton Lake
Pine Flat Reservoir
Santa Clara Conduit
Hollister Conduit
San Luis Reservoir
San Joaquin River
Canal
Fresno
Friant
Kings River
Tinemaha Reservoir
Los Angeles Aqueduct
Haiwee Reservoirs
Kern Canal
Coalinga Canal
California Aqueduct
Isabella Reservoir
Kern River
Cross Valley Canal
Coastal Branch
Bakersfield
San Luis Obispo
West Branch
East Branch
Pyramid Lake
Castaic Lake
Lake Cachuma
Santa Barbara
Silverwood Lake
Los Angeles
Lake Perris
Lake Mathews
Eastside Reservoir Project Site
Lake Skinner
San Diego Aqueducts
San Vicente Reservoir
Lower Otay Reservoir
San Diego
Lake Havasu
Colorado River Aqueduct
Colorado River
Coachella Canal
Salton Sea
E. Highline Canal
West Side Main Canal
All-American Canal
Napa
Napa-Petaluma Tidal Marsh
North Bay Aqueduct
Sacramento Ship Channel
Fairfield
Hood
Sacramento 15 miles North
Cosumnes R.
Delta Cross Channel
South Canal
Camanche Reservoir
Suisun Marsh
Vallejo
San Pablo Bay
Sacramento
Joaquin River
San River
Mokelumne River
Lodi
San Rafael
Concord
Pittsburg
Antioch
Calaveras River
Stockton
Mokelumne Aqueduct
Contra Costa Canal
Clifton Court Forebay
Berkeley
Walnut Creek
Los Vaqueros Reservoir Site
Oakland
Banks Pumping Plant
Tracy Pumping Plant
Tracy
San Francisco
San Francisco Bay
Delta-Mendota Canal
Stanislaus River
South Bay Aqueduct
California Aqueduct
Modesto
Tuolumne River
Hetch Hetchy Aqueduct
Lake Del Valle
Crystal Springs Reservoir
Palo Alto
San Jose
Joaquin River

FIGURE 5



RECYCLED WATER SYSTEM
City of Glendale Water & Power
GWP
Your Trusted Community Utility
NOT TO SCALE
LEGEND
PUMP STATION
RESERVOIR OR TANK
BRAND PARK RW PIPELINE
POWER PLANT RW PIPELINE
FOREST LAWN RW PIPELINE
VERDUGO CANYON RW PIPELINE
SCHOLL CANYON RW PIPELINE
LA CANADA
PASADENA
BURBANK
LOS ANGELES
CITY LIMITS
FREEWAY RECYCLED WATER RESERVOIR
FERN LANE PUMPING PLANT
FERN LANE TANK
PASADENA RECYCLED WATER RESERVOIR (FUTURE)
GLENDALE RECYCLED WATER TANK
UPPER SCHOLL CANYON TANK
UPPER SCHOLL CANYON PUMPING PLANT
LOWER SCHOLL CANYON PUMPING PLANT
SCHOLL CANYON RW PIPELINE
CHEVY CHASE PIPELINE
GLENDALE HIGH PUMPING PLANT
VERDUGO CANYON RW PIPELINE
BRAND PARK RW PIPELINE
GRANDVIEW TANK
BRAND PARK PUMPING PLANT
POWER PLANT RW PIPELINE
LOS ANGELES/GLENDALE RECLAMATION PLANT RECYCLED WATER PUMPING PLANT
FOREST LAWN RW PIPELINE
Oakmont Country Club
FOOTHILL FREEWAY
GLENDALE FREEWAY
VENTURA FREEWAY
GOLDEN STATE FREEWAY
134
2
5
Updated: 9.14.2016
FILE: H:\PUBLIC\GENERAL_MAPS\RW TRUNK LINE(1.28.10).DWG

FIGURE 6

CITY OF GLENDALE

Recycled Water Account Information

NO.	PROJECT NAME	ADDRESS	ACCOUNT NUMBER	NO. OF METER	DELIVERY DATE	TYPE OF USE
		FOREST LAWN PROJECT (A - 1)				
1	City of Glendale	1600 S Brand Boulevard	20241950-00	1	1995	Irrigation
2	Forest Lawn Memorial Park	1712 S Glendale Avenue	31192010-00	1	1992	Irrigation
2	Forest Lawn Memorial Park	3690 San Fernando Road	50009222-00	1	1992	Irrigation
3	Silver Crest Homes	316 W Windsor Road	50001202-00	1	2000	Irrigation
4	Cerritos Elementary School	120 E Cerritos Avenue	50006840-00	1	2006	Irrigation
4	Cerritos Elementary School	1715 S Glendale Avenue	50008277-00	1	2006	Irrigation
5	Cerritos School Park	3690 San Fernando Road	50008056-00	1	2007	Irrigation
6	Edison Elementary & Pacific Park	501 Riverdale Drive	50005134-00	1	Mar 2007	Irrigation
7	Steve Hodge	3900 SAN FERNANDO RD	50018671-00	1	-	Irrigation
		POWER PLANT PROJECT (A - 2)				
8	CalTrans	943 W Doran Street	22516764-00	1	1978	Irrigation
9	Grayson Power Plant	800 Air Way	50005630-00	1	1978	Cooling Towers
10	Glendale Water & Power - UOC	800 Air Way	50012227-00	1	2010	
11	Public Works	non metered	no account #	0		Irrigation
		BRAND PARK PROJECT (A - 3)				
12	Glenoaks Median (9 meters)	2008 W Glenoaks Boulevard	12356670-00	1	1996	Irrigation
12	Glenoaks Median (9 meters)	1818 W Glenoaks Boulevard (at Irving)	12382290-00	1	1996	Irrigation
12	Glenoaks Median (9 meters)	1108 W Glenoaks Boulevard	12513010-00	1	1996	Irrigation
12	Glenoaks Median (9 meters)	978 W Glenoaks Boulevard	12520700-00	1	1996	Irrigation
12	Glenoaks Median (9 meters)	720 W Glenoaks Boulevard	12576220-00	1	1996	Irrigation
12	Glenoaks Median (9 meters)	618 W Glenoaks Boulevard	12581960-00	1	1996	Irrigation
12	Glenoaks Median (9 meters)	532 W Glenoaks Boulevard	12583040-00	1	1996	Irrigation
12	Glenoaks Median (9 meters)	1628 W Glenoaks Boulevard	22453700-00	1	1996	Irrigation
12	Glenoaks Median (9 meters)	1400 W Glenoaks Boulevard	22482860-00	1	1996	Irrigation
13	Brand Park	1700 W Mountain Street	31091775-00	1	1997	Irrigation
14	Pelanconi Park	905 Cleveland Road	31092075-00	2	1996	Irrigation
15	Grandview Memorial Park	1341 Glenwood Road	32191200-02	3	2001	Irrigation
16	Disney Complex (Dual Plumbed-Future)	1101 Flower Street	50006720-00	1	2007	Irrigation
17	Walt Disney Co.	900 Grand Central Ave	50018286-00	1	Sep 2012	Irrigation
17	Walt Disney Co.	1200 Grand Central Ave	50018254-00	2	Aug 2012	Irrigation
18	San Fernando Landscape Project	5775 San Fernando Road	50009365-00	1	Jan 2009	Irrigation
19	Glendale Narrow Riverwalk	900 Flower St.	50010892-00	1	Feb 2013	Irrigation
20	Fairmont Street Extension Project	907 Flower Street	50012000-00	2	Mar 2010	Irrigation
21	Power Plant	630 Kellogg Ave	33091005-00	1	May 2007	Irrigation
		VERDUGO SCHOLL PROJECT (B)				
22	Colorado Blvd - Parkway Irrigation	815 E Colorado Street	31492805-00	1	1997	Irrigation
22	Colorado Blvd - Parkway Irrigation	1311 E Colorado Street	10512470-00	1	1997	Irrigation
22	Colorado Blvd - Parkway Irrigation	1401 E Colorado Street	10511248-00	1	1997	Irrigation
23	CalTrans	1970 E Glenoaks Blvd (E/S,W/S I2)	10661215-00	2	1995	Irrigation
23	Caltrans	406 N Verdugo Rd (at Chevy Chase Dr)	10915398-00	1	1995	Irrigation
23	Caltrans	709 Howard Street (at Monterey Road)	11621385-00	1	1995	Irrigation
23	Caltrans	2000 E Chevy Chase Drive (at Harvey)	20613615-00	1	1995	Irrigation
24	741 S. Brand Median	741 S Brand Boulevard (Median)	10228900-00	1	1995	Irrigation
25	Montecito Park	2978 N Verdugo Road (at Sparr)	21026940-01	1	1995	Irrigation
26	N. Verdugo Rd Median/La Cresenta Ave	3220 N Verdugo Road/Median/ La Crescenta Avenue *OPP	21130300-00	1	1996	Irrigation
27	Verdugo Rd/Canada (North Median)	3021 N Verdugo/Canada Median	21452650-00	1	1996	Irrigation
28	Verdugo Rd/Canada South Overpass	1388 N Verdugo/Canada (South) Overpass	21615900-01	1	1995	Irrigation
29	Parque Vaquero	1285 N Verdugo Road	21680110-00	1	1998	Irrigation

CITY OF GLENDALE

Recycled Water Account Information

NO.	PROJECT NAME	ADDRESS	ACCOUNT NUMBER	NO. OF METER	DELIVERY DATE	TYPE OF USE
30	701 N. Glendale Ave - Median @ Monterey Rd	701 N Glendale Avenue (Median)	21688594-00	1	1995	Irrigation
31	Civic Auditorium	1401 N Verdugo Road	31091125-00	1	1996	Irrigation
32	Sports Complex	2200 Fern Lane	31091370-00	1	1998	Irrigation
33	Adult Recreation Center	201 E Colorado Street	31092175-00	1	1995	Irrigation
34	Glenoaks Park	2531 E Glenoaks Boulevard	31092325-00	1	1995	Irrigation
35	Scholl Canyon Park	2849 E Glenoaks Boulevard	31092375-00	1	1996	Irrigation
36	Scholl Canyon Ballfield	3200 E Glenoaks Boulevard	31092600-00	1	1997	Irrigation
37	Glendale High School	1440 E Broadway	31691142-00	1	1995	Irrigation
38	Wilson Junior High School	1220 Monterey Road	31692740-00	1	1995	Irrigation
39	Glendale Adventist Hospital	1520 E Chevy Chase Drive	31791090-00	1	1997	Irrigation / Cooling Towers
40	Glenoaks Elementary School	2015 E Glenoaks Boulevard	31791182-00	1	1998	Irrigation
41	Glendale Community College	1500 N Verdugo Road	31891780-00	2	1996 & 2004	Irrigation / Toilet Flushing
42	Oakmont Country Club	3100 Country Club Drive	31893000-00	1	1996	Irrigation
43	Central Library	222 E Harvard Street	32093752-00	2	1995	Irrigation
44	Armory	220 E Colorado Street	32290830-00	1	1996	Irrigation
45	Scholl Canyon Golf Course	3800 E Glenoaks Boulevard	33093165-01	2	1998	Irrigation
46	Scholl Canyon Landfill (PW)	3798 E Glenoaks Boulevard	33093180-01	2	1996	Irrigation/ Soil Compaction/ Dust Control
47	Scholl Canyon Landfill (LACSD)	2847 E Glenoaks Boulevard	50008944-00	1	1997	Irrigation/ Soil Compaction/ Dust Control
48	Public Works (Scholl Canyon)	3798 E Glenoaks Boulevard	50008945-00	1	1996	Irrigation
48	Public Works (Scholl Canyon)	3798 E Glenoaks Boulevard	50019056-00	1	1996	Irrigation
49	Fern Lane (Freeway Tank + Median)	1926 Fern Lane	50005823-00	1	1997	Irrigation
50	Glendale Retirement Home	1551 E Chevy Chase Drive	50008949-00	1	Jul-09	Irrigation
51	Americana at Brand LLC	233 S Brand Boulevard	50009495-00	1	Apr-09	Irrigation
52	Monterey Community Garden	870 Monterey Road	50010690-00	1	Aug-09	Irrigation
53	City of Glendale - CCBG	827 Monterery Road	50012392-00	1	Jan-11	Irrigation
54	PUBLIC WORKS PARKING SECTION	101 E HARVARD ST	50020070-00	1	Feb-15	Irrigation

APPENDIX D

CITY OF SAN FERNANDO

PUMPING AND SPREADING PLAN

2015-16 through 2019-20 Water Years

CITY OF SAN FERNANDO

GROUNDWATER PUMPING AND SPREADING PLAN

OCTOBER 1, 2015 TO SEPTEMBER 30, 2020

2015-2016 Water Year

Prepared by:

Public Works Department

Water Division

117 Macneil Street

San Fernando, California 91340

September 2016

TABLE OF CONTENTS

I. INTRODUCTION

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

On August 26, 1983, the Watermaster reported to the court pursuant to Section 10.2 of the Judgment that the Sylmar Basin was in condition of overdraft. On October 1, 1984, San Fernando and Los Angeles were assigned equal rights to pump the safe yield of the Basin (6,210 acre-feet) thus, San Fernando and Los Angeles were each allowed to pump approximately 3,105 acre-feet per year. Thereafter, on October 1, 1996, the safe yield of the Basin was determined to be 6,510 acre-feet per year. A stipulation approved by the Court, on December 13, 2006, allows for a temporary increase in the safe yield of the Basin to 6,810 AF/Y beginning October 1, 2006. Therefore, San Fernando and Los Angeles are now allowed to each pump approximately 3,405 acre-feet per year.

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

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

II. WATER DEMAND

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

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

Projected water demands for the next five years is expected to slightly decrease or remain the same due to conservation efforts.
The projected water demand may vary significantly due to weather conditions, economic conditions and/or social conditions in the San Fernando area. A variance of ± 10 percent can be expected.

III. WATER SUPPLY

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

A. MWD: Treated water is purchased from the MWD to supplement ground water supplies. Historic and projected use of MWD water is shown in Table 2.1.

B. Production Wells: The City of San Fernando owns and operates three (3) wells that are on "active status" with the Department of Health Services as indicated below:

1. ***Well 2A***
   Location: 14060 Sayre Street, Sylmar
   Capacity: 2125 GPM

2. ***Well 4A***
   Location: 12900 Dronfield Avenue, Sylmar
   Capacity: 375 GPM

3. ***Well 3***
   Location: 13003 Borden Avenue, Sylmar
   Capacity: 1200 GPM

   This well shown is on "stand-by status" with the Department of Public Health Services and quarterly samples are collected by waste pumping.

4. ***Well 7A***
   Location: 13180 Dronfield Avenue, Sylmar
   Capacity: 900 GPM

   This well was placed on "inactive status" with the State Water Resources Control Board Division of Drinking Water and has been physically disconnected from the water system. Plans are to activate this well by 2017 and install a new Envirogen ion exchange nitrate removal unit to be located at 12900 Dronfield Avenue, Sylmar CA.

C. Quantity (Acre-Feet) of Water Pumped From Each Well (2014-2015)

1.	Well 2A	2,412.84
2.	Well 3	.45
3.	Well 4A	323.14
4.	Well 7A	0
	Total	2,736.43

D. Wells Groundwater Level Data

1.	Well 2A	1078.5 Taken 4/13 (Transducer out of service)
2.	Well 3	1102.2 Taken 12/15
3.	Well 4A	1071.1 Taken 12/15
4.	Well 7A	1096.3 Taken 12/15

E. Well Locations

Well 2A - 14060 Sayre Street, Sylmar

Well 3 - 13003 Borden Street, Sylmar

Well 4A - 12900 Dronfield Avenue, Sylmar

Well 7A 13180 Dronfield Avenue, Sylmar

IV JUDGMENT CONSIDERATIONS

A. Native and Imported Return Water

The safe yield of the Sylmar Basin was 6,810 acre-feet and the cities of San Fernando and Los Angeles have equal rights to pump from this basin. After subtracting the overlaying pumping rights of two private parties, San Fernando and Los Angeles were each allowed to pump approximately 3,405 acre-feet per year.

A stipulation approved by the Court May 01, 2013 allows for a temporary increase in the safe yield of the Basin to 7,140 AF/Y beginning October 1, 2012. Therefore, San Fernando and Los Angeles are now allowed to each pump approximately 3,570 acre-feet per year, for the next five years (2011-12 through 2016-17)

B. Stored Water Credit

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

As of 2011-12 through 2016-17 water years the City of San Fernando has a "frozen" water credit of 404 acre feet.

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

(Acre – Feet)

FY	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
DEMAND										
WELLS	3,082	3,202	3,279	3,352	2,736	2,800	3,250	3,250	3,250	3,250
MWD	18	106	82	9	100	0	0	0	0	0
TOTAL	3,100	3,308	3,361	3,361	2,836	2,800	3,250	3,250	3,250	3,250
ACTUAL						**PROJECTED**				

APPENDIX A

WATER QUALITY DATA

SEE ATTACHED WATER QUALITY REPORT, 2015

CITY OF SAN FERNANDO

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

APPENDIX B

POLICIES AND PROCEDURES

(By ULARA)

WATERMASTER SERVICE

UPPER LOS ANGELES RIVER AREA

POLICIES AND PROCEDURES

February 1998

APPENDIX E

CRESCENTA VALLEY WATER DISTRICT

PUMPING AND SPREADING PLAN

2015-16 through 2019-20 Water Years

CRESCENTA VALLEY WATER DISTRICT

GROUNDWATER PUMPING & SPREADING PLAN

FOR

WATER YEARS

OCTOBER 1, 2015 TO SEPTEMBER 30, 2020

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

Prepared for:
ULARA Watermaster's Office

May 2016

I. INTRODUCTION

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

This report as prepared by CVWD is in response to Section 5.4, Groundwater Pumping and Spreading Plan. This report refers to groundwater pumping only since there is no groundwater spreading performed by CVWD.

The Groundwater Pumping Plan is based on the water years October 1, 2015 to September 30, 2020.

II. WATER DEMAND

The annual total water demand for the last five (5) years and the projected annual water demand for the next five (5) years are shown in Table 2.1.

Water demands between WY 2010/11 and WY 2014/15 were affected by a number of factors including less than average annual rainfall, a five-year statewide drought, and water conservation efforts within the Crescenta Valley.

Demands in the CVWD's service area vary due to seasonal conditions, which is part of the residential character of the District and the large percentage of water consumption for outdoor landscaping.

CVWD anticipated a decrease in water demand of approximately 1% to 2% in WY 15/16 and a slight increase in demand from WY 16/17 – WY 19/20 as the State slowly comes out of the drought conditions.

In WY 2014/15, CVWD saw a decrease of -18.7% in water demand as compared to WY 2013/14, which was in the customer's direct response to the drought.

Statewide Drought and Water Conservation:

In January 2014, the Governor declared a statewide drought and new water conservation regulations were imposed in WY 14/15.

In WY 2014/15, CVWD increased their water conservation efforts in accordance with the State and Metropolitan Water District of Southern California (MWD) conservation mandates.

CVWD anticipates that water conservation will continue in WY 15/16 as the drought continues.

III. WATER SUPPLY

A. Existing Water Supply Overview:

The water supply for CVWD is composed of locally produced and treated groundwater, and imported water from MWD purchased on a wholesale basis from Foothill Municipal Water District (FMWD). In WY 2014/15, CVWD had an overall ratio of 54% local groundwater and 46% imported water from FMWD.

In WY 2014/15, CVWD saw a decrease in groundwater production of 9.6% as compared to WY 2013/14. CVWD's wells produced 2,029 ac-ft, which is 1,265 ac-ft under adjudicated right of 3,294 AFY.

In general, the well levels in the Verdugo Basin decreased over WY 2014/15, which is attributed to below average rainfall (14.28" total rainfall or 37% below average rainfall) for the fourth consecutive year. It was observed that static well levels had decreased on an average of 22 feet from the previous year.

CVWD performed well rehabilitation at Well 11 during WY 2014/15 and is planning in WY 2015/16 to perform well rehabilitation on Well 7 to obtain better well efficiency and to potentially increase groundwater production.

B. PRODUCTION WELLS

Currently CVWD has twelve (12) active wells in operation. Historic and projected production from these wells is shown in Table 3.1.

The well capacity for WY 2014/15 varied from a high of 2.5 MGD to a low of 1.85 MGD and the average was 2.29 MGD, which was 55% less than the well design capacity of 4.2 MGD.

This is largely due to declining water levels and Wells 10, 11 & 12 being out of service at various times throughout the year for rehabilitation and bacteriological issues.

B.1 Nitrate (NO_3) in Production Wells

CVWD's groundwater wells produce water which typically contains nitrate (as NO_3) levels above the 45 mg/L maximum contaminant level (MCL) as set by the EPA and California Department of Public Health (CDPH).

B.1.1 Glenwood

The Glenwood Nitrate Removal Treatment Plant is an ion-exchange process used to treat and remove nitrates from CVWD's well water. Untreated water and water treated at the Glenwood Plant are blended to produce water with a nitrate level less than the MCL.

In WY 2014/15, the ion-exchange plant was in operation for twelve (12) months and produced 533 ac-ft of treated water, which allows CVWD to maximize the use of local groundwater.

B.1.2 Mills

Water production at CVWD's Mills Plant is blended with FMWD water to decrease the nitrate levels below the MCL.

B.2 Methyl tertiary-butyl ether (MTBE) in Wells

In 2004, CVWD detected low levels of MTBE in Well 5 during routine sampling. In 2006, Well 7 was taken out of service because of MTBE above the 13 ug/L MCL. In 2008, Well 5 was taken out of service when the MTBE level reached 14 ppb, which is above the MCL of 13 ppb. MTBE levels have decreased below the MCL and Wells 5 & 7 have been back in service since 2010.

B.2.1 MTBE Levels

In WY 2014/15, the MTBE levels in CVWD's wells were between Non-Detect (ND) and 0.22 ug/L.

B.2.2 Verdugo Basin MTBE Task Force

In 2006, CVWD made a request to the Watermaster's office to create the Verdugo Basin MTBE Task Force. CVWD has been working with RWQCB, CDPH, stakeholders, and RP's on remediation and clean-up of the MTBE.

In WY 2014/15, the Task Force did not meet. The Task Force will reconvene at any time MTBE levels are higher than 1.0 ug/L.

B.2.3 Groundwater Recharge - Rainfall

CVWD has observed swings in the amount of rainfall in the Verdugo Basin over the past five (5) years as shown in the table below. In WY 2014/15, the rainfall was 14.28 inches, which was 37% below the annual average of 22.7 inches.

CVWD Annual Rainfall Total	
Water Year	**Total Rainfall (In)**
14-15	**14.28**
13-14	**9.11**
12-13	**12.25**
11-12	**14.17**
10-11	**32.31**

The forecast for WY 2015/16 is another dry year for rainfall and CVWD is planning for increased water conservation measures to be imposed within the next year.

C. WELL REPLACEMENT PROGRAM

The District's active wells range in age from 12 to 82 years and are mostly beyond their useful life. CVWD has included in its 10-year CIP program a project to install a new water production well within the next 5 – 10 years to replace its aging well system.

C.1 Rockhaven Well Project

CVWD worked with Glendale Water and Power (GWP) to activate the Rockhaven Well (CVWD Well 16) located at 2740 Hermosa Ave. The Rockhaven Well project is a joint project between CVWD and GWP to activate a groundwater well which was constructed by GWP and has not been put into service due to water quality (nitrate) issues. The project will use CVWD's existing Nitrate Treatment Removal Facility to treat the local groundwater to Federal and State water standards.

The project provides for the use of potable water from a local water source, reduces dependence on MWD, and provides additional benefit of reducing the amount of nitrates within the Verdugo Basin. The project is estimated to produce about 480 ac-ft per year of additional local water. The historic and projected GWP (Rockhaven) Water production is shown in Table 3.5.

CVWD and GWP received a 2014 Drought Grant as part of Proposition 84 for funding for the design and construction of the Rockhaven Well project. The grant funding was approved November 2015. The design of the Rockhaven Well project was completed and the project is currently under construction. The project is planned to be completed by March 2016.

C.2 Reactivation of Well 2 with a New Nitrate Treatment Removal Facility

CVWD submitted a 2015 Integrated Regional Water Management (IRWM) Grant application to the Department of Water Resources (DWR) in August 2015 to reactivate Well 2 and install a nitrate removal treatment facility at CVWD's Ordunio Reservoir site. Well 2 was drilled in 1927 and taken out of service in 1977 due to nitrate levels above the MCL and lack of a nitrate removal treatment facility. DWR will be publishing the recommendations to award grants in early 2016. If the grant is approved, design should begin in May 2016, construction in July 2017 and project completion in May 2018.

D. WELL REHABILITATION PROGRAM

CVWD continues performing well rehabilitation on its existing wells to maintain well capacity and extend the life of the wells. In WY 2014/15, CVWD performed well rehabilitation on Well 11 and is planning to continue rehabilitating Well 7 in WY 2015/16.

E. GLENWOOD NITRATE REMOVAL PLANT

The Glenwood ion-exchange nitrate removal plant was placed into operation in 1990. CVWD replaced the ion-exchange resin in WY 2010/11 during its annual maintenance shut-down.

During WY 2014/15, the plant was in operation during twelve (12) months of the year to maximize the use of groundwater production and this trend will continue in WY 2015/16 unless there are maintenance issues requiring the plant to discontinue operation. The historic and projected production from the Glenwood Plant is shown in Table 3.2.

F. PICKENS GRAVITY TUNNEL PRODUCTION

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

G. FMWD/MWD – IMPORTED WATER

In WY 2014/15, the amount of imported water purchased from MWD via FMWD increased from previous years because of an overall decrease in groundwater production. Proportionally, the ratio of groundwater to import water in WY 2014/15 was 54/46, which shows a decrease in ground water production from previous years.

In WY 2015/16, CVWD anticipates an increase in the amount of imported water received from FMWD as groundwater production and water demands decrease due to the drought conditions.

Historic and projected use of FMWD/MWD water shown in Table 3.4 reflects the additional water from the Rockhaven Well project.

H. CITY OF GLENDALE INTERCONNECTION

In 2004, CVWD completed the installation of a new water supply interconnection with the City of Glendale. This connection allowed CVWD to increase its water supply capacity by 5.0 cfs or 3.2 mgd. An agreement between the City of Glendale, FMWD, and CVWD was signed in 2004, where CVWD will pay FMWD for the water and the City of Glendale for the maintenance and operation of bringing the water to CVWD.

In WY 2014/15, CVWD used 0.77 MG (2.4 ac-ft) of water from the Glendale/CVWD interconnection (GCI) in February 2015. This was used for emergency water supply due to an imported water shutdown for repairs.

I. CITY OF LOS ANGELES INTERCONNECTION

In 2006, CVWD received a Proposition 50, Water Security Grant from CDPH to install an emergency water supply connection with the City of Los Angeles. The new connection will provide 2.2 cfs or 1.44 mgd. In addition, the new interconnection and associated facilities will allow CVWD to provide water during an emergency to FMWD and its sub-agencies in case of a local disaster or when MWD's Weymouth plant is out of service.

Project under construction and should be completed in WY 2015/16.

J. STORMWATER RECHARGE FEASILIBLITY STUDY

CVWD's Verdugo Basin Groundwater Recharge, Storage, and Conjunctive Use Feasibility Study was completed in 2005 and recommended methods of stormwater recharge and storage within the basin. In WY 2012/13, CVWD received a Local Groundwater Assistance (LGA) grant from the Department of Water Resources (DWR) to perform a feasibility study for stormwater recharge within the Verdugo Basin.

The study is a cooperative effort with the City of Glendale, the County of Los Angeles, and other local stakeholders to determine if stormwater can be stored at Crescenta Valley County Park. The feasibility study started in August 2013 and has been ongoing through WY 14/15. The study should be completed by June 2016.

IV. JUDGEMENT CONSIDERATIONS

The adjudicated rights of CVWD from the Verdugo Basin are 3,294 acre-feet per year:

- WY 1978/79 to WY 1991/92 - CVWD pumped 1,700 to 2,900 ac-ft/yr.
- WY 1993/94 to WY 2000/01 - CVWD pumped over its adjudicated right, up to 500 ac-ft/yr, which was allowed by the Watermaster's office.
- WY 2001/02 to WY 2003/04 - CVWD pumped below its adjudication by due to declining basin production.
- WY 2004/05 - CVWD increased its water production because of higher than normal rainfall and was able to pump over the adjudication by 16 ac-ft.
- WY 2005/06 - CVWD pumped over the adjudication by 59 ac-ft. CVWD and the City of Glendale agreed upon compensation for the amount of water pumped over the adjudication for WY 2004/05 & WY 2005/06.
- WY 2006/07 - CVWD planned to maintain well production within the adjudication, however due to operator error, CVWD pumped over the adjudication by 11 ac-ft. CVWD and Glendale agreed upon compensation for the amount of water pumped based on the WY 2005/06 agreement.
- WY 2007/08 - CVWD adjusted its pumping schedule to maintain well production within the adjudication, and was 15 ac-ft below, since Well 7 was out of service for high MTBE levels.

IV. JUDGEMENT CONSIDERATIONS (Cont.)

- WY 2008/09 – CVWD pumped below its adjudication by 330 ac-ft, due to Well 5 being out of service for high MTBE levels and Well 9 being out of service due to bacteriological problems.
- WY 2009/10 - CVWD pumped below its adjudication by 640 ac-ft, which was due to Well 5 being out of service for high MTBE levels, Well 9 being out of service due to bacteriological problems, and Well 11 being out of service due to pump failure.
- WY 2010/11 - CVWD pumped below its adjudication by 368 ac-ft, which was due to Well 5 being out of service for high MTBE levels for three (3) months and decrease in water demand.
- WY 2011/12 - CVWD pumped below its adjudication by 195 ac-ft, this increase in production over previous years was due mainly to an increase in well efficiency from rehabilitation.
- WY 2012/13 - CVWD pumped below its adjudication by 368 ac-ft due to Well 1 and 12 being out of service for rehabilitation, declining well levels, and declining water demands.
- WY 2013/14 - CVWD pumped below its adjudication by 1,038 ac-ft due to Well 5, Well 8, Well 9, Well 11 and 12 being out of service for rehabilitation, recurring bacteriological problems, and declining water levels.
- WY 2014/15 - CVWD pumped below its adjudication by 1,265 ac-ft due to Well 10, 11 and 12 being out of service for rehabilitation, recurring bacteriological problems, and declining water levels.

TABLE 2.1

HISTORIC AND PROJECTED
WATER DEMAND
(Acre-Feet)

2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
4,363	4,633	4,607	4603	3,744	3,690	3,930	4,320	4,560	4,750
ACTUAL					PROJECTED				

TABLE 3.1

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

2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
2,926	3,099	2,926	2,256	2,0290	1,710	1,403	1,685	1,825	2,095
ACTUAL					PROJECTED				

TABLE 3.2

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

2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
592	447	488	150	186	530	550	500	500	500
ACTUAL					PROJECTED				

NOTES:

(1) The Glenwood Treatment Plant has a capacity of 2.1 MGD of blended water.

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

TABLE 3.3

HISTORIC AND PROJECTED
PICKENS TUNNEL WATER PRODUCTION
(Acre-Feet)

2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
57	59	61	59	58	60	60	60	60	60
ACTUAL					PROJECTED				

TABLE 3.4

HISTORIC AND PROJECTED
FMWD/MWD TREATED WATER PRODUCTION
(Acre-Feet)

2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
1,437	1,534	1,682	2,348	1,715	1,720	2,139	2,165	2,200	2,055
ACTUAL					PROJECTED				

TABLE 3.5

HISTORIC AND PROJECTED
GWP (Rockhaven) WELL WATER PRODUCTION
(Acre-Feet)

2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
0	0	0	0	0	260	385	465	535	600
ACTUAL					PROJECTED				

NOTES:

(1) Rockhaven Well is anticipated to be in service in March 2016.

(2) GWP (Rockhaven) Well Production to be included in GWP’s adjudicated right.

APPENDIX F

ANNUAL MUNICIPAL EXTRACTIONS IN ULARA

1979-2015

ANNUAL MUNICIPAL EXTRACTIONS IN ULARA
1979-80 through 2014-15
(acre-feet)

Water	San Fernando Basin*				Sylmar Basin			Verdugo Basin			ULARA
Year	Burbank	Glendale	Los Angeles	TOTAL	Los Angeles	San Fernando	TOTAL	CVWD	Glendale	TOTAL	TOTAL
2014-15	10,008	7,054	72,633	89,696	0	2,736	2,736	2,029	1,145	3,174	95,606
2013-14	10,150	7,241	79,768	97,159	668	3,352	4,020	2,246	1,393	3,639	104,818
2012-13	11,387	7,176	52,751	71,314	1,673	3,284	4,957	2,917	1,670	4,587	80,858
2011-12	9,997	7,876	49,273	67,146	1,093	3,202	4,295	3,090	1,982	5,072	76,513
2010-11	10,398	7,476	43,951	61,825	964	3,082	4,046	2,927	1,826	4,753	70,624
2009-10	10,048	7,935	59,958	77,941	2,544	3,143	5,687	2,645	2,135	4,780	88,408
2008-09	9,966	7,151	52,896	70,013	868	3,473	4,341	2,957	2,087	5,043	79,397
2007-08	6,817	7,411	50,009	64,237	2,997	3,670	6,667	3,270	2,687	5,957	76,861
2006-07	9,780	7,622	76,251	93,653	3,919	2,894	6,813	3,294	2,568	5,862	106,328
2005-06	10,108	7,374	38,042	55,523	2,175	2,857	5,032	3,354	2,390	5,744	66,299
2004-05	6,399	7,792	49,085	63,276	1,110	3,143	4,253	3,310	2,358	5,668	73,197
2003-04	9,660	7,282	68,626	85,568	3,033	3,454	6,487	2,568	2,117	4,685	96,740
2002-03	9,170	8,507	73,676	91,353	3,549	3,357	6,906	2,836	1,613	4,449	102,708
2001-02	10,540	6,838	66,823	84,201	1,240	3,766	5,005	3,266	2,129	5,396	94,602
2000-01	12,547	6,886	65,409	84,843	2,606	3,696	6,301	3,422	2,227	5,649	96,793
1999-00	12,547	1,023	98,016	111,586	2,634	3,807	6,441	3,699	2,727	6,426	124,453
1998-99	10,729	31	123,207	133,966	4,536	3,528	8,064	3,797	2,627	6,424	148,455
1997-98	3,964	28	85,292	89,284	3,642	3,308	6,950	3,747	2,820	6,567	102,802
1996-97	11,171	20	89,935	101,126	2,482	3,259	5,741	3,672	2,674	6,346	113,213
1995-96	8,067	26	72,286	80,379	2,766	2,985	5,752	3,705	2,133	5,838	91,969
1994-95	3,052	53	55,478	58,583	2,311	3,421	5,732	3,708	1,633	5,341	69,656
1993-94	2,773	115	60,480	63,368	2,052	3,398	5,451	3,634	1,402	5,037	73,855
1992-93	1,354	91	34,973	36,419	1,369	2,145	3,514	2,557	990	3,547	43,480
1991-92	39	489	75,684	76,213	3,292	2,826	6,118	2,631	633	3,264	85,596
1990-91	1,278	2,755	67,032	71,065	3,281	2,266	5,546	2,615	1,230	3,845	80,456
1989-90	16	1,500	79,949	81,465	2,626	2,763	5,389	2,903	1,329	4,232	91,086
1988-89	29	1,315	126,630	127,974	3,259	2,199	5,459	2,285	2,064	4,349	137,781
1987-88	30	1,020	104,419	105,470	3,133	777	3,911	2,268	2,096	4,364	113,745
1986-87	29	5,758	85,845	91,632	3,113	3,026	6,139	2,255	2,619	4,874	102,645
1985-86	123	5,819	80,963	86,904	3,075	3,166	6,241	2,075	3,418	5,493	98,639
1984-85	2,863	3,086	95,641	101,591	3,130	3,102	6,232	1,997	3,837	5,834	113,657
1983-84	1,063	1,708	112,840	115,611	3,106	3,907	7,013	2,009	3,551	5,560	128,184
1982-83	2,187	1,028	65,178	68,394	3,048	3,133	6,181	1,759	3,427	5,187	79,761
1981-82	523	952	83,207	84,682	3,486	3,290	6,775	1,876	3,732	5,607	97,065
1980-81	595	1,129	91,067	92,791	4,117	3,380	7,497	2,140	2,122	4,262	104,550
1979-80	677	934	57,304	58,915	3,111	2,991	6,102	1,873	1,434	3,307	68,325
Average	5,836	3,903	73,461	83,199	2,556	3,105	5,661	2,815	2,190	5,005	93,865

*Includes municipal pumping only.