Optimum Basin Management Program

Staff Status Report 2017-1: January to June 2017

CHINO BASIN WATERMASTER

Optimum Basin Management Program

Highlighted Activities

- On June 30, 2017, Watermaster published the *2016 State of the Basin Report*, which contains detailed exhibits, characterizing current conditions in the Chino Basin related to hydrology, groundwater production and recharge, groundwater levels, groundwater quality, and ground-level monitoring as of the end of fiscal year (FY) 2015-2016. This report is prepared every two years pursuant to the Optimum Basin Management Program (OBMP) Phase 1 Report, the Peace Agreement and the associated OBMP Implementation Plan, and the November 15, 2011 Court Order.

- During this reporting period, Watermaster manually measured 400 water levels at about 70 private wells throughout the Chino Basin, conducted two quarterly download events at about 120 wells containing pressure transducers, collected 45 groundwater-quality samples from private and dedicated monitoring wells, and collected four surface-water quality samples.

- Pursuant to a monitoring and mitigation requirement of the Peace II Subsequent Environmental Impact Report, Watermaster, the Inland Empire Utilities Agency (IEUA), and the Orange County Water District (OCWD) continued to implement the Prado Basin Habitat Sustainability Program (PBHSP). During this reporting period, the Prado Basin Habitat Sustainability Committee (PBHSC) prepared its first annual report: *Annual Report of the Prado Basin Habitat Sustainability Committee for Water Year 2015/16*.

- Pursuant to the *Chino Basin Subsidence Management Plan*, Watermaster continued to implement the Ground-Level Monitoring Program and began drafting the *2016 Annual Report of the Ground-Level Monitoring Committee*, which analyzes and interprets data from the monitoring program and recommends future monitoring and testing activities. A main conclusion from the monitoring program is that land subsidence is being successfully managed within the MZ-1 Managed Area within the City of Chino, where land subsidence and ground fissuring occurred in the 1990s.

- Watermaster and the IEUA are continuing to implement the 2013 Amendment to the 2010 Recharge Master Plan Update (2013 RMPU) pursuant to the October 2013 Court Order authorizing its implementation. During this reporting period, Watermaster and the IEUA continued developing agreements to construct the storm and supplemental water recharge projects listed in Table 8-2c of the 2013 RMPU report, to prioritize the construction of these projects relative to the availability of grant funding, and to plan subsequent implementation. The San Sevaine Basin project went to bid for construction, and a consultant was selected for the design of five other 2013 RMPU projects.

- During this reporting period, Watermaster and the IEUA recharged a total of 22,726 acre-feet of water in the basin: 6,996 acre-feet of stormwater, 6,839 acre-feet of recycled water, and 8,891 acre-feet of imported water.

- To recalculate the Safe Yield, Watermaster began updating the groundwater model in 2011 and using it to evaluate Safe Yield in 2013. The Watermaster parties concluded a facilitated process and developed an agreement to implement the recalculated Safe Yield. This proposed agreement was filed with the Court on October 23, 2015 with a motion recommending that the Court reset the Safe Yield of the Chino Basin at 135,000 acre-feet per year. The Court conducted a hearing on September 23, 2016, heard oral arguments from various parties and Watermaster legal counsel, requested further briefing from the interested parties, and scheduled a hearing in the next reporting period. On April 28, 2017, the Court issued a final order resetting the Safe Yield at 135,000 acre-feet per year.

- Watermaster and the IEUA proposed a temporary change in the Safe Storage Capacity of the Chino Basin from 500,000 to 600,000 acre-feet, based on new information regarding storage management and basin conditions versus what was known in 2000 when the OBMP storage management plan was developed and evaluated in the programmatic environmental impact reports (PEIR). This change in Safe Storage Capacity was submitted as an addendum to the 2000 PEIR and approved by the IEUA Board of Directors on March 15, 2017. Watermaster staff, at the direction of its Board of Directors, began the development of a scope of work to develop the architecture for an updated storage management plan.

Important Court Hearings and Orders

- February 22, 2017—Notice of Revised Order on Chino Basin Watermaster's Motion Regarding 2015 Safe Yield Reset Agreement, Amendment of Restated Judgment, Paragraph 6
- April 28, 2017—Chino Basin Watermaster Court Hearing
- April 28, 2017—Notice of Rulings After Hearing on Watermaster's Motion Regarding 2015 Safe Yield Reset Agreement, Amendment of Restated Judgment, Paragraph 6

Program Element 1: Develop and Implement a Comprehensive Monitoring Program

Fundamental to the implementation of each of the OBMP Program Elements are the monitoring and data collection efforts performed in accordance with Program Element 1, which includes monitoring basin hydrology, production, recharge, groundwater levels, groundwater quality, and ground-level movement. Monitoring is performed by basin pumpers, Watermaster staff and other cooperating entities as follows.

Groundwater Level Monitoring

Watermaster initiated a basin-wide groundwater-level monitoring program as part of the implementation of the OBMP. The monitoring program has been refined over time to satisfy the evolving needs of Watermaster and the IEUA, such as new regulatory requirements and improved data coverage. The groundwater-level monitoring program supports many Watermaster functions, such as the periodic reassessment of Safe Yield, the monitoring and management of ground-level movement, the analysis of desalter pumping impacts at private wells, the analysis of the implementation of the Peace II Agreement on groundwater levels and riparian vegetation in Prado Basin, the triennial re-computation of ambient water quality mandated by the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan), and the assessment of hydraulic control—a maximum-benefit commitment in the Basin Plan. The data are also used to update and recalibrate Watermaster's computer-simulation groundwater-flow model, to understand groundwater flow directions, to compute storage changes, to support interpretations of water quality data, and to identify areas of the basin where recharge and discharge are not in balance.

The current groundwater-level monitoring program is comprised of about 1,100 wells. At about 900 of these wells, water levels are measured by well owners, which include municipal water agencies, the California Department of Toxic Substances Control (DTSC), the Counties, and various private consulting firms. Watermaster collects these water level data at least semi-annually. At the remaining 200 wells, water levels are measured by Watermaster staff using manual methods once per month or by using pressure transducers that record data once every 15 minutes. These wells are mainly Agricultural Pool wells or dedicated monitoring wells located south of the 60 freeway.

All groundwater-level data are checked by Watermaster staff and uploaded to a centralized database management system that can be accessed online through HydroDaVE℠. During this reporting period, Watermaster measured 400 manual water levels at about 70 wells throughout the Chino Basin and conducted two quarterly downloads of 120 pressure transducers installed in private, municipal, and monitoring wells. Additionally, Watermaster compiled all available groundwater-level data from well owners in the basin for the October 2016 to March 2017 period.

Groundwater Quality Monitoring

Watermaster initiated a comprehensive groundwater-quality monitoring program as part of the implementation of the OBMP. The monitoring program has been refined over time to satisfy the evolving needs of Watermaster and the IEUA, such as new regulatory requirements and improved data coverage. The groundwater-quality data are used by Watermaster for: the biennial State of the Basin report; the triennial ambient water quality update; the demonstration of hydraulic control, monitoring nonpoint-source groundwater contamination and plumes associated with point-source discharges, and assessing the overall health of the groundwater basin. Groundwater-quality data are also used in conjunction with numerical models to assist Watermaster and other parties in evaluating proposed salinity management and groundwater remediation strategies. The details of the groundwater monitoring programs as of FY 2016/17 are described below.

Chino Basin Data Collection (CBDC). Watermaster routinely and proactively collects groundwater-quality data from well owners, such as municipal producers and government agencies. Groundwater-quality data are also obtained from special studies and monitoring that takes place under orders of the Santa Ana Regional Water Quality Control Board (Regional Board)—such as for landfills and other groundwater quality investigations, the Department of Toxic Substances Control (DTSC), the US Geological Survey (USGS), and others. These data are collected from well owners and monitoring entities at least twice per year. Data is collected for about 840 wells as part of the CBDC program. During this reporting period, Watermaster compiled data collected for the CBDC program for the July to December 2016 period.

Watermaster Field Groundwater Quality Monitoring Programs. Watermaster continues to sample privately owned wells and its own monitoring wells on a routine basis as follows:

1. *Private Wells*. About 100 private wells, located predominantly in the southern portion of the basin, are sampled at various frequencies based on their proximity to known point-source contamination plumes. 76 wells are sampled on a triennial basis, and 20 wells near contaminant plumes are sampled on an annual basis.

Program Element 1: Develop and Implement a Comprehensive Monitoring Program (Continued)

2. *Watermaster Monitoring Wells.* Watermaster collects groundwater quality samples from a total of about 22 multi-nested monitoring wells located throughout the southern Chino Basin. These include nine nested HCMP monitoring wells constructed to support the demonstration of Hydraulic Control, nine sites constructed to support the PBHSP, and four sites that fill spatial data gaps near contamination plumes in MZ-3. Each nested well site contains up to three wells in the borehole. Currently, the HCMP and MZ-3 wells are sampled annually, and the PBHSP wells are sampled quarterly.
3. *Other wells.* Watermaster collects quarterly samples from four near-river wells to characterize the interaction of the Santa Ana River and groundwater. These shallow monitoring wells along the Santa Ana River consist of two former USGS National Water Quality Assessment Program wells (Archibald 1 and Archibald 2) and two Santa Ana River Water Company wells (well 9 and well 11).

During this reporting period, Watermaster collected 45 groundwater-quality samples from private and dedicated monitoring wells. All groundwater-quality data are checked by Watermaster staff and uploaded to a centralized database management system that can be accessed online through HydroDaVE^{sm}.

Groundwater Production Monitoring

As of the end of this reporting period, there were a total of 519 producing wells, 304 of it was agricultural. All active agricultural production wells, with a few exceptions, are now metered. Wells that are not metered include minimal producer wells, and wells where installing a meter is not feasible. Watermaster reads the meters on a quarterly basis and enters the production data into Watermaster's relational database, which can be accessed online through HydroDaVE^{sm}.

Surface Water Monitoring in the Santa Ana River

Watermaster collects grab water quality samples at two sites along the Santa Ana River (Santa Ana River at River Road and Santa Ana River at Etiwanda) on a quarterly basis. Along with data collected at four wells near the Santa Ana River, these data are used to characterize the interaction between the Santa Ana River and nearby groundwater. During this reporting period, Watermaster collected four surface-water quality samples.

Prado Basin Habitat Sustainability Program (PBHSP)

Mitigation Measure 4.4-3 from the Peace II SEIR requires that Watermaster and the IEUA, in collaboration with OCWD, form a committee, the PBHSC, and develop and implement an Adaptive Management Plan for the PBHSP. The PBHSC is open to all interested participants, including the Watermaster Parties, IEUA member agencies, OCWD, and other interested stakeholders. The objective of the PBHSP is to ensure that riparian habitat in the Prado Basin is not adversely impacted by the implementation of Peace II activities. Currently, the PBHSP consists of a monitoring program and annual reporting on the results of the monitoring program. The monitoring program includes an assessment of the riparian habitat and all factors that could potentially impact the riparian habitat, including those factors affected by Peace II activities, such as changes in groundwater levels. Sixteen monitoring wells at nine sites were constructed in 2015 to support the PBHSP.

Prado Wetlands

During the reporting period, Watermaster performed the following tasks:

- Conducted the groundwater monitoring program, which included the quarterly collection of groundwater-level and groundwater-quality data from the PHBSP monitoring wells.
- Prepared a memorandum titled: *Recommended Scope and Budget of the Prado Basin Habitat Sustainability Program for FY 2017-18*. This memorandum was used by Watermaster and the IEUA to develop and approve their respective FY 2017-18 budgets.
- Prepared the first annual report: *Annual Report of the Prado Basin Habitat Sustainability Committee for Water Year 2015/16*. The main conclusion of the annual report was that there has been no observed degradation of riparian habitat contemporaneous with the implementation of the Peace II Agreement.

Program Element 1: Develop and Implement a Comprehensive Monitoring Program (Continued)

- Conducted three meetings of the PBHSC:
  - On March 21, 2017 to present the preliminary results of the PBHSP and the Recommended Scope and Budget of the PBHSP for FY 2017-18.
  - On April 25, 2017 to present the draft 2016 Annual Report of the PBHSC through Section 3.1.
  - On June 6, 2017 to present the draft-final 2016 Annual Report of the PBHSC.

Chino Basin Groundwater Recharge Monitoring Program

Watermaster, the IEUA, the Chino Basin Water Conservation District, and the San Bernardino County Flood Control District jointly sponsor the Chino Basin Groundwater Recharge Program. This is a comprehensive water supply program to enhance water supply reliability and improve groundwater quality in local drinking water wells by increasing the recharge of storm, imported, and recycled waters. The recharge program is regulated under Regional Board Order No. R8-2007-0039 and Monitoring and Reporting Program No. R8-2007-0039.

Montclair 1 Basin after a rain storm.

Watermaster and the IEUA measure the quantity of storm and supplemental water that enters into recharge basins using pressure transducers or staff gauges and collect weekly water quality samples from recharge basins that are actively recharging recycled water and from lysimeters installed within those recharge basins. Imported water quality data for State Water Project water are obtained from the Metropolitan Water District of Southern California (MWDSC) and recycled water quality data for RP-1 and RP-4 treatment plant effluents are obtained from the IEUA. Combining measured flow data with respective water quality data enables the calculation of the blended water quality of the recharge sources in each recharge basin and the assessment of adequate dilution of recycled water, as required by the recycled water recharge permits held with the Department of Drinking Water (DDW). The recharge measurements are also used to estimate the New Yield to the Chino Basin as a result of the recharge activities.

Monitoring Activities. During this reporting period, the IEUA performed its ongoing monitoring program to measure and record recharge volumes and to collect stormwater quality samples pursuant to its permit requirements. Also, during this reporting period, approximately 58 recharge basin and lysimeter samples were collected for water quality analysis, and 28 recycled water samples were collected for alternative water quality monitoring plans, including the application of a correction factor for soil-aquifer treatment, determined from each recharge basin's startup period. Monitoring wells located downgradient of the recharge basins were sampled, at a minimum, on a quarterly basis; that said, some monitoring wells were sampled more frequently during the reporting period for a total of 123 samples.

Reporting. Watermaster and the IEUA completed the following compliance reports concerning the recharge program during the reporting period:

- 4Q-2016 Quarterly Report, submitted to the RWQCB – February 2017
- 1Q-2017 Quarterly Report, submitted to the RWQCB – May 2017
- 2016 Annual Report, submitted to the RWQCB – May 2017

Ground-Level Monitoring

To address the historical occurrence of land subsidence and ground fissuring in the Chino Basin, Watermaster prepared and submitted a subsidence management plan (known as the MZ-1 Plan) to the Court for approval, and in November 2007, the Court ordered its implementation (see Program Element 4 in this report for more on the MZ-1 Plan implementation). The MZ-1 Plan required several monitoring and mitigation measures to minimize or abate the future occurrence of land subsidence and ground fissuring. These measures and activities included:

- Continuing the scope and frequency of monitoring within the so-called Managed Area (southwest MZ-1) that was conducted during the period when the MZ-1 Plan was being developed.

Program Element 1: Develop and Implement a Comprehensive Monitoring Program (Continued)

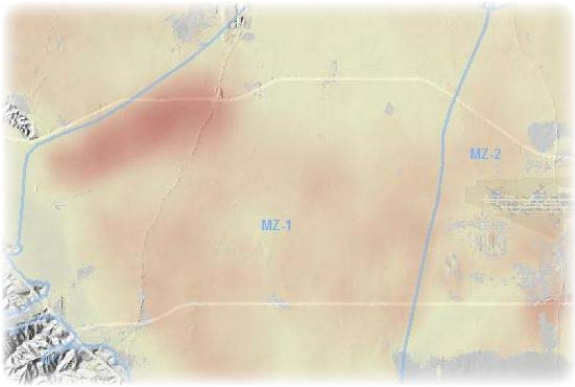
- Expanding the monitoring of the aquifer system and ground-level movement into other areas of MZ-1 and the Chino Basin where data indicate concern for future subsidence and ground fissuring (Areas of Subsidence Concern).
- Monitoring of horizontal strain across the historical zone of ground fissuring.
- Evaluating the potential contribution of groundwater production in northern MZ-1 on ground-level conditions in southern MZ-1.
- Conducting additional testing and monitoring to refine the MZ-1 Guidance Criteria for subsidence management (e.g. the Long-Term Pumping Test).
- Developing alternative pumping plans for the MZ-1 producers impacted by the MZ-1 Plan.
- Constructing and testing a lower-cost cable extensometer facility at Ayala Park.
- Evaluating and comparing ground-level surveying and Interferometric Synthetic Aperture Radar (InSAR), and recommending future monitoring protocols for both techniques.
- Conducting an aquifer storage recovery (ASR) feasibility study at a City of Chino Hills production well within the MZ-1 Managed Area (Well 16).
- Providing for recovery of groundwater levels in the MZ-1 Managed Area.

Since the initial MZ-1 Plan was adopted in 2007, Watermaster has conducted the annual Ground-Level Monitoring Program (GLMP). The main results of the GLMP are: very little permanent land subsidence has occurred in the MZ-1 Managed Area, indicating that subsidence is being successfully managed in this area, and land subsidence has been occurring in the Northwest MZ-1 Area. One concern is that subsidence in Northwest MZ-1 has occurred differentially across the San Jose Fault, following the same pattern of differential subsidence that occurred in the MZ-1 Managed Area during the time of ground fissuring.

Based on these results, Watermaster determined that the subsidence management plan needed to be updated to include a *Subsidence Management Plan for the Northwest MZ-1 Area* with the long-term objective of minimizing or abating the occurrence of the differential land subsidence. Thus, Watermaster expanded the GLMP into the Northwest MZ-1 Area and prepared an updated *Chino Basin Subsidence Management Plan* (SMP), which included the *Work Plan to Develop a Subsidence-Management Plan for the Northwest MZ-1 Area* (Work Plan) as an appendix.

During this reporting period, Watermaster undertook the following SMP activities:

- Continued high-resolution water-level monitoring at wells within the Managed Area and within the Areas of Subsidence Concern. All monitoring equipment is inspected at least quarterly and is repaired and/or replaced as necessary. The data collected were checked and analyzed to assess the functionality of the monitoring equipment and for compliance with the SMP.
- Performed monthly routine maintenance, data collection, and verification at the Ayala Park and Chino Creek extensometer facilities. This included repair and the reinstallation of the Ayala Park data logger, which was malfunctioning.
- Collected InSAR data scenes across the western Chino Basin from the German Aerospace Center's TerraSAR-X satellite.
- Conducted vertical ground-level surveys at benchmarks in the Southeast and Northwest Areas. Electronic distance measurements (EDMs) were also conducted across the San Jose Fault Zone. Installed a new line of benchmark monuments across the Northwest MZ-1 Area.
- Continued implementation of the Work Plan:
    - Collected, processed, and checked groundwater level data and production data from wells in the Northwest MZ-1 Study Area monthly.
    - Coordinated with the Monte Vista Water District, City of Pomona, and SCADA Integrations (consulting firm) to prepare a proposal to equip and integrate up to 21 wells with SCADA-based monitoring of groundwater levels and production. Developed a SCADA Installation, Monitoring, and Reimbursement Letter Agreement between the Monte Vista Water District and Watermaster.



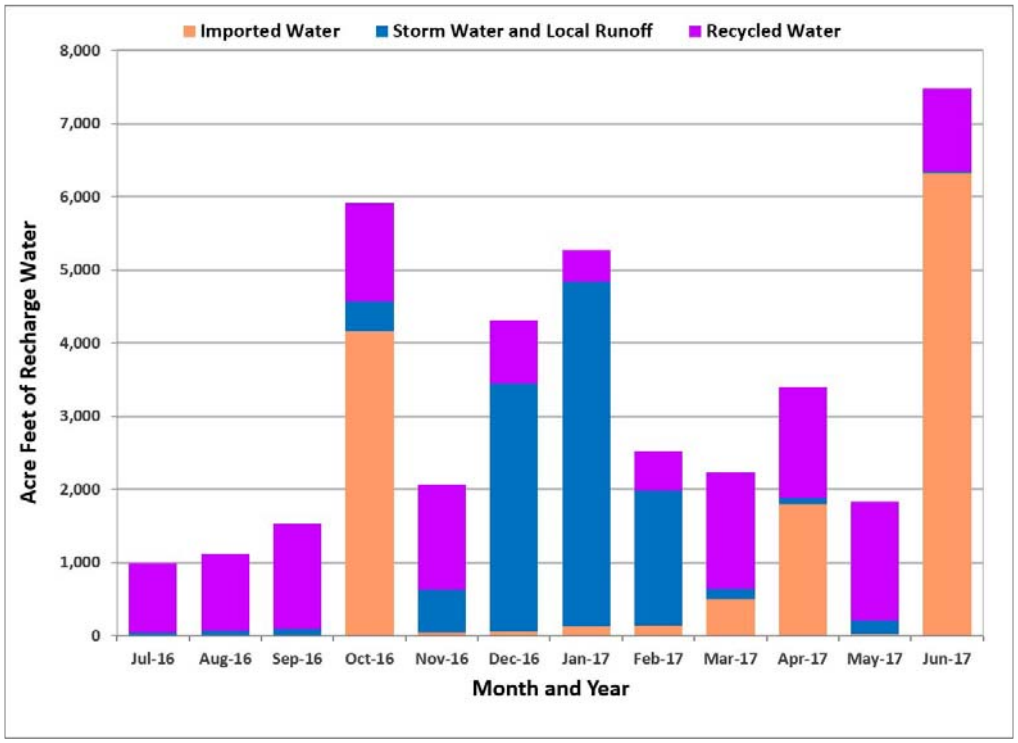
Utilization of InSAR data in maps for analysis.

Program Element 1: Develop and Implement a Comprehensive Monitoring Program (Continued)

- The Long-Term Pumping Test, described in the SMP, was developed by the GLMC to test and refine the Guidance Level for the Managed Area. The test requires the City of Chino Hills to pump wells CH-15B and CH-17 such that they cause water levels at PA-7 to decline below the Guidance Level. The recovery phase of the test includes groundwater injection cycles at City of Chino Hills well CH-16. The following work was performed during this reporting period:
  - The City of Chino Hills worked on the wellhead-treatment filters for arsenic at CH-15B.
  - The City of Chino Hills connected CH-16 to a potable source water pipeline.
  - Pumping at wells in the MZ-1 Managed Area did not result in water levels to decline below the Guidance Level at PA-7.

Program Element 2: Develop and Implement a Comprehensive Recharge Program

The objectives of the comprehensive recharge program include enhancing the yield of the Chino Basin through the development and implementation of a Recharge Master Plan to improve, expand, and construct recharge facilities that enable the recharge of storm, recycled, and imported waters; to ensure a balance of recharge and discharge in the Chino Basin management zones; and to ensure that sufficient storm and imported waters are recharged to comply with the recycled water dilution requirements in Watermaster and the IEUA's recycled water recharge permits.



Pursuant to PE2 of the OBMP, Watermaster and the IEUA partnered with the San Bernardino County Flood Control District and the Chino Basin Water Conservation District to construct and/or improve eighteen recharge sites. This project is known as the Chino Basin Facilities Improvement Project (CBFIP). The average annual stormwater recharge of the CBFIP facilities is approximately 10,000 acre-feet per year, the supplemental "wet"[1] water recharge capacity is approximately 74,700 acre-feet per year, and the in-lieu supplemental water recharge capacity ranges from 25,000 to 40,000 acre-feet per year. In addition to the CBFIP facilities, the Monte Vista Water District has five ASR wells with a demonstrated well injection capacity of 5,600 acre-feet per year. The current total supplemental water recharge capacity ranges from 105,300 to 120,300 acre-feet per year, which is greater than the projected supplemental water recharge capacity required by Watermaster.

In 2008, Watermaster began preparing the *2010 Recharge Master Plan Update* (2010 RMPU) pursuant to the December 21, 2007 Court Order (the Peace II Agreement) to complete a Recharge Master Plan Update by July 1, 2010. In October 2010, the Court accepted the 2010 RMPU as satisfying the condition and ordered that certain recommendations of the 2010 RMPU be implemented. In November 2011, Watermaster reported its progress to the Court pursuant to the October 2010 Court Order, and in December 2011, the Court issued an order directing Watermaster to continue with its implementation of the 2010 RMPU per its October 2010 order but with a revised schedule. On December 15, 2011, the Watermaster Board moved to:

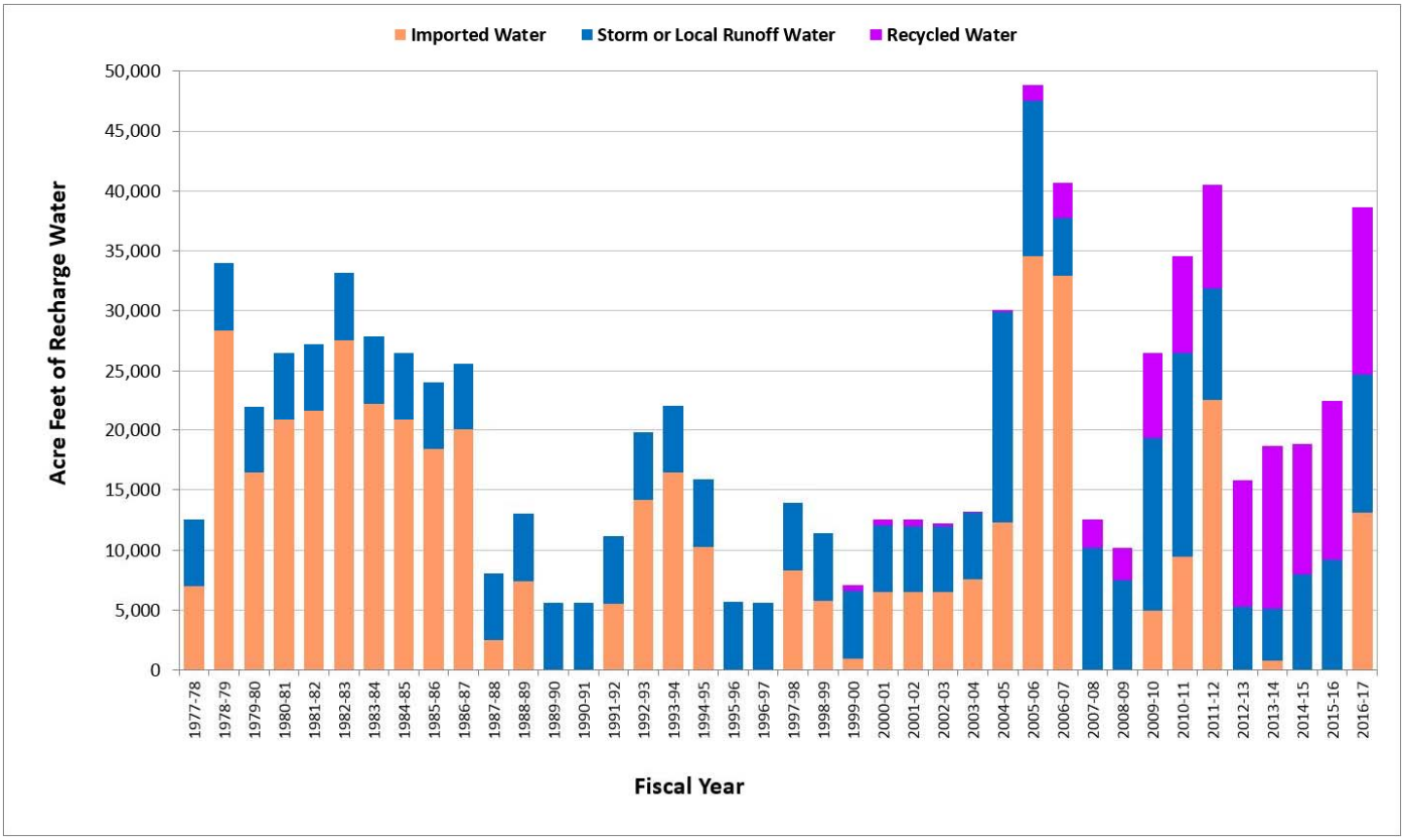
> "approve that within the next year there will be the completion of [a] Recharge Master Plan Update, there will be the development of an Implementation Plan to address balance issues within the Chino Basin subzones, and the development of a Funding Plan, as presented."

[1]The modifier "wet" means actual physical water is being recharged in spreading basins as opposed to the dedication of water from storage or in-lieu recharge.

Program Element 2: Develop and Implement a Comprehensive Recharge Program (Continued)

This motion led to the development of an update to the 2010 RMPU, and in 2012, Watermaster staff sent out a "call for projects" to the Watermaster parties, seeking their recommendations for recharge improvement projects that should be considered in the update. The *2013 Amendment to the 2010 Recharge Master Plan Update* (2013 RMPU) outlines the recommended projects to be implemented by Watermaster and the IEUA and lays out the implementation and financing plans. The 2013 RMPU report was approved by the Watermaster Board in September 2013 and filed with the Court in October 2013. In December 2013, the Court approved the 2013 RMPU except for Section 5, which dealt with the accounting for new recharge from Municipal Separate Stormwater Sewer Systems; Section 5 was later approved by the Court in April 2014.

During this reporting period, Watermaster staff developed a budget and schedule to complete the forthcoming 2018 Recharge Master Plan Update (2018 RMPU), which is due to the Court by October 2018.



2013 RMPU Implementation. Watermaster and the IEUA are continuing to carry out the October 2013 Court Order, which authorizes them to implement the 2013 RMPU. During the reporting period, Watermaster and the IEUA continued developing agreements to construct the storm and supplemental water recharge projects listed in Table 8-2c of the 2013 RMPU report, prioritizing the construction of projects relative to the availability of grant funding. During the reporting period, the San Sevaine Basin project was put out to bid for construction. A design consultant was selected for the design of five of the chosen 2013 RMPU projects: CSI Basin, Wineville/Jurupa/RP3 Basins, Montclair Basins, Lower Day Basin, and Victoria Basin. Watermaster stakeholders chose to defer the remaining 2013 RMPU projects for consideration in a future RMPU.

Additionally, Watermaster and the IEUA continued to develop a series of projects outside of the 2013 RMPU effort that will increase and/or facilitate stormwater and supplemental water recharge and have jointly agreed to fund these projects, including monitoring upgrades and habitat conservation. Watermaster's share of the cost of these projects was included in the budget adopted by Watermaster for fiscal 2016/17.

Program Element 2: Develop and Implement a Comprehensive Recharge Program (Continued)

The Recharge Improvements Project Committee met monthly on the progress of implementing the 2013 RMPU Projects and other recharge-related projects.

Recharge for Dilution of Recycled Water. In fiscal year 2009/10, Watermaster and the IEUA's recharge permit was amended to allow for existing underflow dilution and extended the period for calculating dilution from a running 60-month to a running 120-month period. Additionally, the IEUA has worked with the DDW to obtain approval to increase the allowable recycled water contribution (RWC) at wells to 50 percent. These permit amendments allow for increased recycled water recharge without having to increase the amount of imported and storm waters required for dilution. The IEUA projects its dilution requirements as part of its annual reporting to the DDW. Based on the latest Annual Report (May 2017), the IEUA projects that dilution requirements will be met through 2027 even if no imported water is available for dilution.

Recycled water line at the Ely Basins.

Recharge Activities. During this reporting period, ongoing recycled water recharge occurred in the Brooks, 7th Street, 8th Street, Turner, Ely, Declez, RP-3, Victoria, and Banana Basins; stormwater was recharged at 18 recharge basins across all management zones of the Chino Basin; and imported water was recharged in 13 recharge basins, primarily in MZ-1. Watermaster and the IEUA recharged a total of 22,726 acre-feet of water: 6,996 acre-feet of stormwater, 6,839 acre-feet of recycled water, and 8,891 acre-feet of imported water.

Balance of Recharge and Discharge in MZ-1. The total amount of supplemental water recharged in MZ-1 since the Peace II Agreement through June 30, 2017 was approximately 61,547 acre-feet, which is about 3,500 acre-feet less than the 65,000 acre-feet that required by that date (annual requirement of 6,500 acre-feet); the shortfall will be recharged in MZ-1in subsequent years as supplemental water becomes available. The amount of supplemental water recharged into MZ-1 during the reporting period was approximately 7,844 acre-feet.

Program Element 3: Develop and Implement Water Supply Plan for the Impaired Areas of the Basin; and
Program Element 5: Develop and Implement Regional Supplemental Water Program

As stated in the OBMP, "the goal of Program Elements 3 and 5 is to develop a regional, long range, cost-effective, equitable, water supply plan for producers in the Chino Basin that incorporates sound basin management." One element of the water supply plan is the development of a way to replace the decline in groundwater production to prevent significant amounts of degraded groundwater from discharging to the Santa Ana River and violating the Basin Plan. Replacing the decline in agricultural groundwater production will mitigate the reduction of the Safe Yield of the basin and allow for more flexibility in the basin's supplemental water supplies if the produced groundwater is treated. This is achieved through the operation of the Chino Basin Desalter facilities, which comprise a series of wells and treatment facilities in the southern Chino Basin that are designed to replace the decline in production of the agricultural groundwater producers and to treat and serve this groundwater to various Appropriative Pool members.

The Chino I Desalter Expansion and the Chino II Desalter facilities were completed in February 2006. As currently configured, the Chino I Desalter produces about 13,500 acre-feet of groundwater per year (12.1 million gallons per day [MGD]) at 15 wells (I-1 through I-15). This water is treated through air stripping (volatile organic compound [VOC] removal), ion exchange (nitrate removal), and/or reverse osmosis (for nitrate and TDS removal). The Chino II Desalter produces about 15,800 acre-feet of groundwater per year (14.1 MGD) at eight wells (II-1 through II-4 and II-6 through II-9). This water is treated through ion exchange and/or reverse osmosis. Development and planning continues between the CDA and Watermaster to expand the production and treatment capacity of the Chino Desalters by about 10,500 acre-feet per year (9.5 MGD). More than $77 million in grant funds have been secured toward this expansion.

The most recently completed expansion project included the construction of five wells for the new Chino Creek Well Field (CCWF): wells I-16, I-17, I-18, I-20, and I-21. These wells were constructed to meet the hydraulic control commitment associated with the maximum benefit (see the Program Element 7 update in this status report) and provide additional raw water to the Chino I Desalter. Production began at wells I-16 and I-17 in mid-2014 and at wells I-20 and I-21 in early 2016. Well 1-18 is not planned for operation by the CDA due to high concentrations of VOCs.

Program Element 3: Develop and Implement Water Supply Plan for the Impaired Areas of the Basin; and
Program Element 5: Develop and Implement Regional Supplemental Water Program (Continued)

Three final wells (II-10, II-11, and II-12) are planned for construction to provide additional raw water to the Chino II Desalter and are required to meet the maximum-benefit commitment to produce a total of 40,000 acre-feet per year from the combined desalter well fields. These wells are also being constructed as part of the remediation action plan to clean-up the South Archibald Plume (See the Program Element 6 update in this status report). The construction of wells II-10 and II-11 was completed in late-2015, and equipping the wells is planned for completion in July 2017once the CDA completes the construction of the raw-water pipeline to plumb the new wells into the Chino-II Desalter. During this reporting period, the CDA continued with the land acquisition process for Well II-12. As soon as that land is acquired, a monitoring well will be constructed to support the design of the production well. The CDA has retained consultants for the construction and design of Well II-12, which is anticipated to be completed and operational by July 2019.

Program Element 4: Develop and Implement a Comprehensive Groundwater Management Plan for Management Zone 1

Because of the historical occurrence of pumping-induced land subsidence and ground fissuring in southwestern Chino Basin (southern MZ-1), the OBMP required the development and implementation of an Interim Management Plan (IMP) for MZ-1 that would:

- Minimize subsidence and fissuring in the short-term.
- Collect the information necessary to understand the extent, rate, and mechanisms of subsidence and fissuring.
- Formulate a management plan to reduce to tolerable levels or abate future subsidence and fissuring.

From 2001-2005, Watermaster developed, coordinated, and conducted an IMP under the guidance of the MZ-1 Technical Committee. The investigation provided enough information for Watermaster to develop Guidance Criteria for the MZ-1 producers in the investigation area that, if followed, would minimize the potential for subsidence and fissuring during the completion of the MZ-1 Plan. The Guidance Criteria included a listing of Managed Wells and their owners subject to the criteria, a map of the so-called Managed Area, and an initial threshold water level (Guidance Level) of 245 feet below the top of the PA-7 well casing. The MZ-1 Summary Report and the Guidance Criteria were adopted by the Watermaster Board in May 2006. The Guidance Criteria formed the basis for the MZ-1 Plan, which was approved by Watermaster in October 2007. The Court approved the MZ-1 Plan in November 2007 and ordered its implementation. Watermaster has implemented the MZ-1 Plan since that time, including the ongoing Ground-Level Monitoring Program (GLMP) called for by the MZ-1 Plan (refer to the update in this report under Program Element 1).

Extensometer at Ayala Park.

The MZ-1 Plan states that if data from existing monitoring efforts in the so-called Areas of Subsidence Concern indicate the potential for adverse impacts due to subsidence, Watermaster will revise the MZ-1 Plan pursuant to the process outlined in Section 3 of the MZ-1 Plan. In early 2015, Watermaster prepared an update to the MZ-1 Plan, which included a name change to the *2015 Chino Basin Subsidence Management Plan* (SMP) and a *Work Plan to Develop the Subsidence Management Plan for the Northwest MZ-1 Area* (Work Plan) as an appendix. The SMP and the Work Plan were adopted through the Watermaster Pool process during July 2015.

The data, analysis, and reports generated through the implementation of the MZ-1 Plan, SMP, and Work Plan are reviewed and discussed by the Ground-Level Monitoring Committee (GLMC), which meets on a periodic basis throughout the year. The GLMC is open to all interested participants, including the Watermaster Parties and their consultants. During this reporting period, Watermaster undertook the following data analysis and reporting tasks:

- Reviewed water levels at the PA-7 piezometer and determined that levels remained above the Guidance Level during the reporting period; very little, if any, permanent compaction was recorded at the Ayala Park Extensometer.
- Analyzed historical EDM data collected in the Managed Area and Northwest MZ-1 Area. The results of the analysis will be used to identify potential sites for the re-installation of a horizontal extensometer in the Managed Area and make recommendations for future EDM methods.

Program Element 4: Develop and Implement a Comprehensive Groundwater Management Plan for Management Zone 1 (Continued)

- Analyzed data from the GLMP during 2016, and prepared draft text, tables and figures for the *2016 Annual Report of the Ground-Level Monitoring Committee*.
- For the *Work Plan to Develop a Subsidence Management Plan for the Northwest MZ-1 Area*:
  - Prepared draft response to comments on the memorandum: *Initial Hydrogeologic Conceptual Model and the Monitoring and Testing Program for the Northwest MZ-1 Area*. The response to comments is currently under internal review.
  - Prepared the draft technical memorandum: *Development and Characterization of the Baseline Management Alternative and Initial Subsidence-Management Alternative for the Northwest MZ-1 Area*. The technical memorandum is currently under internal review.
  - Finalized the technical memorandum: *Siting Study for the Pomona Extensometer*.
  - Prepared the final technical specifications: *Detailed Technical Specifications for the Drilling and Construction of Two Dual-Nested Piezometers for the Pomona Extensometer Facility*. The technical specifications will be incorporated in the Pomona Extensometer Piezometers construction bid package at the completion of CEQA.
- The GLMC met on March 23 and April 11, 2017. The meeting agendas included the following items:
  - Preliminary results of the GLMP for 2016.
  - Recommended scope and budget of the GLMC for FY 2017-18.
  - Cost estimates for the proposed modifications to the SCADA systems at MVWD and the City of Pomona.
  - Draft Technical Specifications for the Pomona Extensometer piezometers.
  - Review the GLMC's next steps: finalize the recommended scope and budget for FY 2017-18 and upcoming GLMC deliverables and meetings.

Program Element 6: Develop and Implement Cooperative Programs with the Regional Water Quality Control Board, Santa Ana Region and Other Agencies to Improve Basin Management

Program Elements 6 and 7 are necessary to address the water quality management problems that occur in the Chino Basin. During the development of the OBMP, it was identified that Watermaster did not have sufficient information to determine whether point and non-point sources of groundwater contamination are being adequately addressed, including the various contaminant plumes in the Chino Basin. With the Regional Board and other agencies, Watermaster has worked to address the following major point source contaminant plumes in the Chino Basin:

South Archibald Plume

In July 2005, the Regional Board prepared draft Cleanup and Abatement Orders (CAOs) for six parties who were tenants on the Ontario Airport with regard to the South Archibald TCE Plume. The draft CAOs required the parties to "submit a work plan and time schedule to further define the lateral and vertical extent of the TCE and related VOCs that are discharging, have been discharged, or threaten to be discharged from the site" and to "submit a detailed remedial action plan, including an implementation schedule, to cleanup or abate the effects of the TCE and related VOCs." Four of the six parties (Aerojet-General Corporation, The Boeing Company, General Electric, and Lockheed Martin) voluntarily formed a group known as ABGL to work jointly on a remedial investigation. Northrop Grumman declined to participate in the group. The US Air Force, in cooperation with the US Army Corps of Engineers, funded the installation of one of the four clusters of monitoring wells installed by the ABGL Parties.

In 2008, Regional Board staff conducted research pertaining to the likely source of the TCE contamination and identified discharges of wastewater that may have contained TCE to the RP-1 treatment plant and associated disposal areas to be a potential source. The Regional Board identified several industries, including some previously identified tenants of the Ontario Airport property, that likely used TCE solvents before and during the early-1970s, and discharged wastes to the Cities of Ontario and Upland's sewage systems and subsequently to the RP-1 treatment plant and disposal areas. In 2012, an additional Draft CAO was issued by the Regional Board jointly to the City of Ontario, City of Upland, and IEUA as the previous and current operators of the RP-1 treatment plant and

Program Element 6: Develop and Implement Cooperative Programs with the Regional Water Quality Control Board, Santa Ana Region and Other Agencies to Improve Basin Management (Continued)

disposal area (collectively, the RP-1 parties). In part, the draft CAOs require that RP-1 parties "supply uninterrupted replacement water service […] to all residences south of Riverside Drive that are served by private domestic wells at which TCE has been detected at concentrations at or exceeding 5 µg/L […]" and to report this information to the Regional Board. In addition, the RP-1 parties are to "prepare and submit [a] […] feasibility study" and "prepare, submit and implement the Remedial Action Plan" to mitigate the "effects of the TCE groundwater plume."

Under the Regional Board's oversight, sampling at private residential wells and taps has been conducted approximately every two years (2007-2008, 2009, 2011, 2013-2014) by multiple parties in the region where groundwater is potentially contaminated with TCE. By 2014, all private wells and/or taps in the area of the plume had been sampled at least once since 2007. Alternative water systems (tanks) have been installed at residences in the area where well water contains TCE at or above 80% of the MCL for TCE. Residents who declined tank systems are being provided bottled water. Watermaster also routinely samples for water quality at private wells in the area and uses data obtained from this monitoring to delineate the spatial extent of the plume.

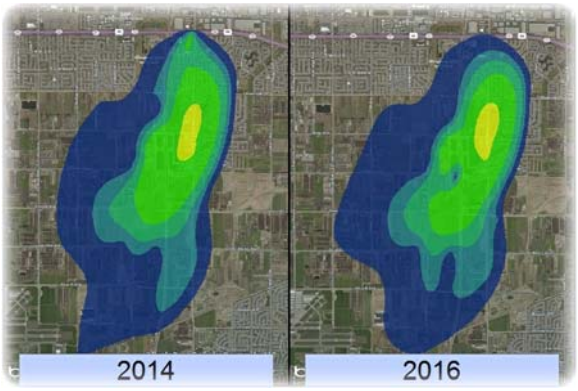
In July 2015, the RP-1 parties completed the Draft Feasibility Study Report for the South Archibald Plume (Feasibility Study). The Feasibility Study established cleanup objectives for both domestic water supply and plume remediation and evaluates alternatives to accomplish these objectives. In August 2015, a Draft Remedial Action Plan (RAP) was concurrently prepared by the RP-1 parties to present the preferred plume remediation and domestic water supply alternatives. A public review period followed along with two community meetings to educate the public about the plume, the Feasibility Study, and the RAP, and to solicit comments on these reports. In November 2015, a revised Draft Feasibility Study, RAP, and Responses to Comments were completed to address input from the public, the ABGL, and others. In September 2016, the Regional Board issued the Final CAO R8-2016-0016 collectively to the RP-1 parties and the ABGL parties. The Final CAO was adopted by all parties in November 2016, thus approving the preferred plume remediation and domestic water supply alternatives identified in the RAP. The parties also reached a settlement agreement that aligns with the Final CAO and authorizes funding to initiate implementation of the plume remediation alternative.

The plume remediation alternative involves the use of existing and proposed CDA production wells and facilities. The RP-1 parties reached a Joint Facility Development Agreement with the CDA for implementation of a project designed to remediate the South Archibald Plume. The proposed project includes the operation of three new CDA desalter wells (II-10, II-11, and II-12) and a dedicated pipeline to convey produced groundwater from the three new wells and existing CDA well I-11 to the Desalter II treatment facility. As noted previously in this status report, the CDA has completed construction of two of the three wells, which will be operational by July 2017. The third well will be completed and operational by July 2019.

The domestic water supply alternative for those private residences affected by TCE groundwater contamination is a hybrid between the installation of tank systems for some residences, where water is delivered from the City of Ontario potable supply via truck deliveries, and the installation of a temporary pipeline to connect some residences to the City of Ontario potable water system. The City of Ontario has assumed responsibility for implementing the domestic water supply alternative.

During the reporting period, the City of Ontario submitted a private water supply well sampling work plan and a domestic water supply work plan to the Regional Board, including performance objectives for both the plume remediation and domestic water supply alternatives. Pursuant to the February 2017 work plans, an Annual Groundwater Monitoring Report was completed on May 15, 2017 by the Cities of Ontario and Upland and submitted to the Regional Board. The groundwater sampling effort took place during February and March 2017 and included 41 private and municipal well locations. Based on the results of the 2017 sampling event, no additional residences were recommended for participation in the alternative water supply program.

Also during the reporting period, Watermaster prepared an updated delineation of the spatial extent of the South Archibald TCE plume. The updated plume delineation was published on June 30, 2017 as part of the *2016 State of the Basin Report*.



South Archibald TCE plume from 2014 to 2016.

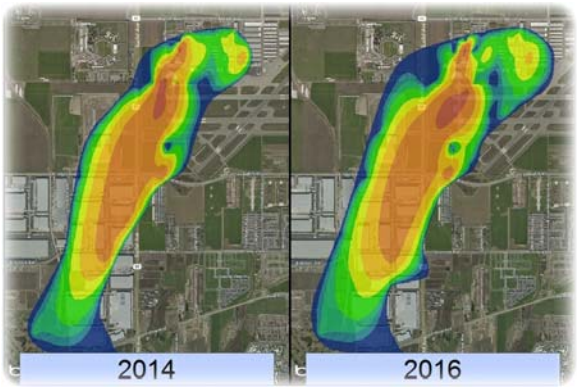
Program Element 6: Develop and Implement Cooperative Programs with the Regional Water Quality Control Board, Santa Ana Region and Other Agencies to Improve Basin Management (Continued)

Chino Airport Plume

In 1990, the Regional Board issued CAO No. 90-134 to the County of San Bernardino, Department of Airports (County) to address groundwater contamination originating from the Chino Airport. During 1991 to 1992, ten underground storage tanks and 310 containers of hazardous waste were removed, and 81 soil borings were drilled and sampled on the airport property. From 2003 to 2005, nine onsite monitoring wells were installed and used to collect groundwater quality samples. In 2007, the County conducted its first offsite monitoring effort, and in 2008, the Regional Board issued CAO No. R8-2008-0064, requiring the County to define the lateral and vertical extent of the plume and prepare a remedial action plan. From 2009 to 2012, Tetra Tech, the consultant to the County, conducted several off-site plume characterization studies to delineate the areal and vertical extent of the plume and constructed 33 offsite monitoring wells. From 2013 to early-2015, Tetra Tech conducted an extensive investigation of several areas identified for additional characterization of soil and groundwater contamination; and at the conclusion of the work, they constructed an additional 33 groundwater monitoring wells on and adjacent to the Airport property. In August 2016, the County completed a Draft Feasibility Study to identify remedial action objectives and evaluate remediation alternatives for mitigation.

The County conducts quarterly and/or annual monitoring events at all 75 of their monitoring wells constructed to date. The conclusions from this monitoring program can be found in reports posted on the Regional Board's GeoTracker website. In April 2017, Tetra Tech submitted the *Semiannual Groundwater Monitoring Report, Summer and Fall 2017, Chino Airport Groundwater Assessment, San Bernardino County, California*, which included the County's most recent characterizations of the TCE plume. Watermaster also routinely samples for water quality at private and monitoring wells in the area and uses this and other data obtained from its data collection programs to independently delineate the spatial extent of the plume.

During this reporting period, the Regional Board issued CAO R8-2017-0011, which requires the County to prepare a Final Feasibility Study that incorporates comments from the Regional Board and to prepare, submit, and implement a Remedial Action Plan. The County submitted a Final Feasibility Study for the Chino Airport on June 6, 2017, and it was approved by the Regional Board on June 7, 2017. The recommended remediation alternative is a groundwater pump-and-treat system to provide hydraulic containment and treatment of both the West Plume and the East Plume originating from the Chino Airport. The system consists of ten extraction wells that combined will produce approximately 900 gallons per minute of groundwater for onsite treatment using carbon adsorption. Included among the 10 wells is CDA well I-18, which is no longer planned for use by the CDA. Once treated, the preferred option is to discharge the treated groundwater to the CDA's Chino-I Desalter influent pipeline via a newly constructed pipeline. If this discharge option is not available at the time the system is constructed, the alternative options are to discharge the treated groundwater to either the local surface-water channels or wastewater treatment plants or to inject the treated groundwater back into the basin with six injection wells at the northeast corner of the Chino Airport. The final RAP, based on the approved final Feasibility Study, is due to the Regional Board by August 7, 2017.



Chino Airport TCE Plume from 2014 to 2016.

Also during the reporting period, Watermaster prepared an updated delineation of the spatial extent of the Chino Airport TCE plume. The updated plume delineation was published on June 30, 2017 as part of the *2016 State of the Basin Report*.

Other Water Quality Issues

Watermaster continues to track monitoring programs and mitigation measures associated with other point sources in the Chino Basin, including: Alumax Aluminum Recycling, Alger Manufacturing Facility, the Former Crown Coach Facility, General Electric Test Cell and Flatiron, Former Kaiser Steel Mill, Milliken Landfill, Upland Landfill, and the Stringfellow National Priorities List sites. During the reporting period, Watermaster prepared updated delineations of the extent of the VOC plumes for GE Test Cell, GE Flatiron, Milliken Landfill, and the so-called Pomona VOC plume. The updated plume delineations were published on June 30, 2017 as part of the 2016 State of the Basin Report.

Program Element 7: Develop and Implement a Salt Management Program

Maximum Benefit Salinity Management Plan

In January 2004, the Regional Board amended the Basin Plan to incorporate an updated total dissolved solids (TDS) and nitrogen (N) management plan. The Basin Plan amendment includes both "antidegradation" and "maximum benefit" objectives for TDS and nitrate-N for the Chino-North and Cucamonga groundwater management zones (GMZs). The maximum benefit objectives allow for the reuse and recharge of recycled water and the recharge of imported water without mitigation; these activities are an integral part of the OBMP. The application of the maximum-benefit objectives is contingent on Watermaster and the IEUA's implementation of specific projects and requirements termed the maximum-benefit commitments. There are a total of nine commitments, and Watermaster and the IEUA report the status of compliance with each commitment to the Regional Board annually. During this reporting period, Watermaster prepared and submitted the 2016 *Chino Basin Maximum Benefit Annual Report*. Specific details of the commitments and related activities are described below.

Monitoring Programs. Two of the maximum-benefit commitments are to implement surface and groundwater monitoring programs. On April 15, 2005, the Regional Board adopted resolution R8-2005-0064, approving Watermaster and the IEUA's surface and groundwater monitoring programs. These monitoring programs were conducted pursuant to the 2005 work plan until 2012, when the Basin Plan was amended to remove all references to the specific monitoring locations and sampling frequencies required for groundwater and surface water monitoring. The Basin Plan amendment allows for the monitoring programs to be modified over time on a go-forward basis, subject to the approval of the Executive Officer of the Regional Board. The Basin Plan amendment was approved by the Regional Board on February 12, 2012 and by the State Office of Administrative Law on December 6, 2012. This amendment was adopted based on demonstrations made by Watermaster and the IEUA, showing that the surface water monitoring program, as explicitly described in the Basin Plan, was not meaningfully adding to the body of evidence required to demonstrate hydraulic control. In the place of specific monitoring requirements, the Basin Plan required that Watermaster and the IEUA submit a new surface water monitoring program work plan by February 25, 2012 and a new groundwater monitoring program work plan by December 31, 2013. In February 2012, Watermaster and the IEUA submitted, and the Regional Board approved, a new surface water monitoring program that reduced the 2005 monitoring program from bi-weekly surface water quality measurements at 17 sites and direct discharge measurements at six sites to quarterly surface water quality sampling at two sites.

In December 2013, Watermaster and the IEUA submitted an updated Maximum Benefit Monitoring Program Work Plan and Proposed Schedule for Achieving Hydraulic Control to the Regional Board. The updated Work Plan states that Watermaster and the IEUA will recalibrate the Chino Basin groundwater model every five years and use the model to estimate groundwater discharge from the Chino-North GMZ to the Santa Ana River (i.e. annual underflow past the CCWF) and determine whether hydraulic control has been achieved. The new Maximum Benefit Monitoring Program Work Plan was adopted by the Regional Board in April 2014. Maximum benefit monitoring is incorporated as part of the groundwater level, groundwater quality, and surface water monitoring programs described in Program Element 1. During this reporting period, Watermaster continued implementing the monitoring programs (see Program Element 1 of this report for details).

Hydraulic Control and Chino Desalters. One of the main maximum-benefit commitments is to achieve and maintain "hydraulic control" of the Chino Basin so downstream beneficial uses of the Santa Ana River are protected. The mechanism for achieving hydraulic control is the construction of the Chino Basin Desalters in the southern Chino Basin, thereby replacing the diminishing agricultural production that previously prevented the outflow of high TDS and nitrate groundwater. Hydraulic control is defined by the Basin Plan as the elimination of groundwater discharge from the Chino-North GMZ to the Santa Ana River or its reduction to a de minimus level. In October 2011, the Regional Board indicated that groundwater discharge from the Chino-North GMZ to the Prado Basin surface water management zone (Prado Basin) in an amount less than 1,000 acre-feet per year is considered de minimus. Watermaster and the IEUA have demonstrated, in Annual Reports to the Regional Board, that complete hydraulic control has been achieved at and east of Chino-I Desalter Well 5. The construction and operation of the CCWF (see Program Element 5), which began in 2010, is intended to achieve hydraulic control in the area west of Chino-I Desalter Well 5. In February 2016, the CCWF commenced full-scale operation with production at wells I-16, I-17, I-20, and I-21. The CCWF wells produced a total of about 1,665 acre-feet in 2016, which is more than the model-estimated production needed to achieve hydraulic control to the de minimus standard west of Chino-I Desalter Well 5. With this accomplishment, Watermaster has achieved full hydraulic control of the Chino Basin.

Although full hydraulic control has been achieved, future agricultural groundwater production in the southern part of the basin is expected to continue to decline, necessitating future expansion of the desalters to sustain hydraulic control. In a letter dated January 23, 2014, the Regional Board required that by May 31, 2014, Watermaster and the IEUA submit a plan detailing how hydraulic control will be sustained in the future as agricultural production in the southern region of Chino-North continues to decrease—specifically, how the Chino Basin Desalters will achieve the required total groundwater production level of 40,000 acre-feet per year. On June 30, 2015 Watermaster and the IEUA submitted a final plan and schedule for the construction and operation of the three new

Program Element 7: Develop and Implement a Salt Management Program (Continued)

desalter wells. These wells are under construction. During this reporting period, Watermaster coordinated with the CDA to track the progress of construction of the desalter expansion facilities. A full status report on the desalter expansion facilities is described in this status report under Program Element 3.

Recycled Water Recharge and Quality. The maximum benefit commitments require Watermaster and the IEUA to construct and operate expanded facilities for the recharge of storm and recycled waters and to report on the quality of the individual and combined sources of water used for recharge. This data is compiled and analyzed each year for reporting to the Regional Board. During this reporting period, Watermaster and the IEUA continued their monitoring programs to collect the data required for analysis and reporting to the Regional Board.

Ambient Water Quality. Commitment number 9 requires that Watermaster and the IEUA recompute ambient TDS and nitrate concentrations for the Chino Basin and Cucamonga GMZs every three years. The recomputation of ambient water quality is performed for the entire Santa Ana River Watershed, and the technical work is contracted, managed, and directed by the Santa Ana Watershed Project Authority's Basin Monitoring Program Task Force. Watermaster and the IEUA have participated in each triennial, watershed-wide ambient water quality determination as members of the Task Force. The most recent recomputation, covering the 20-year period from 1993 to 2012, was completed in August 2014. In July 2016, the Task Force initiated the effort to compute the ambient water quality for the 20-year period from 1996 to 2015. The final report is due to be published in August 2017.

Program Element 8: Develop and Implement a Groundwater Storage Management Program; and Program Element 9: Develop and Implement a Storage and Recovery Program

Groundwater storage is critical to the Chino Basin. The OBMP outlines Watermaster's commitments to investigate the technical and management implications of Local Storage Agreements, improve related policies and procedures, and then revisit all pending Local Storage Agreement applications.

The existing Watermaster/IEUA/MWDSC/Three Valleys Municipal Water District Dry-Year Yield (DYY) program continues to be implemented. By April 30, 2011, all DYY program construction projects and a full "put" and "take" cycle had been completed, leaving the DYY storage account with a zero balance. Since that time the balance has increased, as during the reporting period, about 6,320 acre-feet was recharged in June and placed into storage for the DYY Program.

Dry Year Yield inflow at Montclair 1 Basin.

Safe Yield Recalculation

The Basin's Safe Yield was initially set by the Judgment at 140,000 acre-feet per year. The Safe Yield was based in on the hydrology for the period of 1965 through 1974. Pursuant to the Judgment, the Chino Basin Safe Yield is to be recalculated periodically but not for at least ten years following 1978. Pursuant to the OBMP Implementation Plan and Watermaster's Rules and Regulations, in year 2010/11 and every ten years thereafter, Watermaster is to recalculate the Safe Yield. The 2011 Safe Yield recalculation was to be based in part on the information obtained in the prior ten-year period.

In 2011, Watermaster authorized its staff to compile the necessary data and update the model of the basin and to recalculate the Safe Yield. The model calibration was completed in 2012, and the evaluation of Safe Yield began in 2013. During fiscal 2014/15, the Watermaster parties, pursuant to the Watermaster Board's direction, met intensively in a facilitated process, which resulted in a majority consensus regarding the implementation of the recalculated Safe Yield, and drafted the 2015 Safe Yield Reset Agreement. At its September 24, 2015 meeting, the Board adopted Resolution 2015-06, endorsing the 2015 Safe Yield Reset Agreement, and directed Watermaster legal counsel to file the Agreement with the Court. Resolution 2015-06 was adopted by a majority vote with two of the nine Board members opposing the action. The agreement was filed with the Court on October 23, 2015 with a motion recommending that the Court reset the Safe Yield of the Chino Basin to 135,000 acre-feet per year. The hearing on this motion was originally scheduled for December 18, 2015. The Court continued the hearing and conducted it on September 23, 2016; the Court heard oral arguments from various parties and Watermaster legal counsel, requested further briefing from the interested parties, and scheduled a hearing in the next reporting period. On April 28, 2017, the Court issued a final order, resetting the Safe Yield to 135,000 acre-feet per year.

Program Element 8: Develop and Implement a Groundwater Storage Management Program; and Program Element 9: Develop and Implement a Storage and Recovery Program (Continued)

Groundwater Storage Management

Addendum to PEIR. The OBMP storage management plan was temporarily revised during the reporting period. The original OBMP storage management program consists of managing groundwater production, replenishment, recharge, and storage such that the total storage within the basin would range from a low of 5,300,000 acre-feet to a high of 5,800,000 acre-feet. The following storage-related definitions are included in the OBMP Implementation Plan:

- Operational Storage Requirement – The Operational Storage Requirement is the storage or volume in the Chino Basin that is necessary to maintain the Safe Yield. [Author's note: This is an average value with the storage oscillating around this value due to dry and wet periods in precipitation. The Operational Storage Requirement was estimated in the development of the OBMP to be about 5.3 million acre-feet. This storage value was set at the estimated storage in the basin in 1997.]
- Safe Storage – Safe Storage is an estimate of the maximum storage in the basin that will not cause significant water-quality and high-groundwater related problems. [Author's note: Safe storage was estimated in the development of the OBMP to be about 5.8 million acre-feet.]
- Safe Storage Capacity – Safe Storage Capacity is the difference between the Safe Storage and the Operational Storage Requirement. The allocation and use of storage space in excess of the Safe Storage Capacity will preemptively require mitigation; mitigation must be defined and resources committed to mitigation prior to allocation and use.

Water occupying the Safe Storage Capacity includes Local Storage Account Water, Carryover Water, and water that was anticipated to be stored in future groundwater storage programs. This storage management program was evaluated in the OBMP programmatic environmental impact report (PEIR) in 2000.

Subsequent to the OBMP PEIR, Watermaster and the Parties developed revisions to the OBMP based on: new monitoring and borehole data collected since 1998, an improved hydrogeologic conceptualization of the basin, new numerical models that have improved the understanding of basin hydrology since 2000, and the need to expand the Chino Basin Desalters (desalters) to the 40,000 acre-feet per year of groundwater production required in the OBMP Implementation Plan. These investigations included a recalculation of the total water in storage in the basin, based on the improved hydrogeologic understanding. The total storage in the Chino Basin for 2000 was estimated to be about 5,935,000 acre-feet.

The Peace II Agreement was negotiated by the Parties to implement, among other things, the expansion of the desalters, the dedication of 400,000 acre-feet of groundwater in storage to desalter replenishment, and changes in the Judgment to implement the Peace II Agreement. However, there was no change to the storage management plan in the OBMP Implementation Plan even though the revised storage estimated for 2000 was greater than the Safe Storage and the implementation of the Peace II Agreement would result in 400,000 acre-feet of new controlled overdraft. The IEUA completed and subsequently adopted a supplemental environmental impact report (SEIR) for the Peace II Agreement in 2010.

There is a significant difference in what is known today regarding storage management and basin conditions versus what was known in 2000 when the OBMP storage management plan was developed and evaluated in the PEIR. Watermaster and the IEUA proposed a temporary change in the Safe Storage Capacity, increasing it from 500,000 acre-feet to 600,000 acre-feet for the period July 1, 2017 through June 30, 2021. This temporary increase in Safe Storage Capacity was found to not cause Material Physical Injury and/or loss of Hydraulic Control, and it will provide Watermaster and the IEUA time to develop a new storage management plan and agreements to implement it. The IEUA adopted an addendum to the 2000 PEIR, increasing the Safe Storage Capacity from 500,000 acre-feet to 600,000 acre-feet for the period July 1, 2017 through June 30, 2021. The addendum was approved by the IEUA Board of Directors on March 15, 2017.

Storage Management Plan Architecture. Watermaster staff, at the direction of its Board of Directors, began the development of a scope of work to develop the architecture for an updated storage management plan. The intent of this effort is to provide the technical information to enable the development of a storage management plan based on a scientific and sustainable foundation.