Optimum Basin Management Program

Staff Status Report 2014-1: January to June 2014

CHINO BASIN WATERMASTER

Optimum Basin Management Program

Highlighted Activities

- In December 2013, Watermaster and Inland Empire Utilities Agency (IEUA) submitted an updated Maximum Benefit Monitoring Program Work Plan and Proposed Schedule for Achieving Hydraulic Control to the Regional Board. The new Maximum Benefit Monitoring Program Work Plan was adopted by the Regional Water Quality Control Board (RWQCB) in April 2014.
- In January 2014, the RWQCB confirmed that the model results indicated that Hydraulic Control would be achieved under the projected range of the Chino Creek Well Field pumping. At the RWQCB's request, IEUA and Watermaster submitted a plan and schedule to increase desalter production capacity from 32,000 to 40,000 acre-feet per year to the RWQCB on May 30, 2014. The plan included the installation of three new wells—one well location being provisional. In June 2014, the RWQCB accepted the plan, and requested that the final well locations be submitted to the RWQCB by September 30, 2014.
- As a requirement of Mitigation Measure 4.4-3 from the Peace II Subsequent Environmental Impact Report, Watermaster, IEUA and Orange County Water District (OCWD) continued to develop a Prado Basin Habitat Sustainability Program. Included within this program will be the Prado Basin Habitat Sustainability Adaptive Management Plan, the installation of up to 17 monitoring wells at nine separate sites, and vegetative monitoring. During this reporting period, property acquisition and permitting continued.
- Watermaster and IEUA continued work on the Turner Basins/Guasti Park Recharge Expansion Project in MZ-2. The expansion project is projected to recharge an additional 300 acre-feet of storm runoff annually. Also, infiltration testing for the Wineville Proof-of-Concept project was completed in November 2013. The Final Report on the project was published in April 2014, and it stated that the basin showed potential for recharge. Additionally, Watermaster and IEUA continued to develop a series of projects outside of the 2013 Amendment to the 2010 Recharge Master Plan Update (2013 RMPUA) effort that will increase stormwater and supplemental water recharge reliability, and have jointly agreed to fund these projects. Watermaster and IEUA are in the process of finalizing agreements for the joint projects. Watermaster and IEUA continued to hold monthly Joint Recharge Improvement Projects Committee meetings for the purpose of providing regular project status updates to the Parties.
- During the reporting period, approximately 2,931 acre-feet of stormwater, 6,216 acre-feet of recycled water, and 795 acre-feet of imported water were recharged.
- Watermaster and IEUA began to implement the 2013 RMPUA. During the reporting period, Watermaster and IEUA began the process of developing agreements to construct the storm and supplemental water recharge projects listed in Table 8-2c of the 2013 RMPUA report, prioritizing the construction of these projects relative to the availability of grant funding, and planning subsequent implementation. Implementation of the Lower Day project began, on an accelerated timeline ahead of the other 2013 RMPUA projects because it received a $750,000 Proposition 84 grant. Implementation of the San Sevaine project continued, also on an accelerated timeline due to its $750,000 grant. The Recharge Master Plan Update Steering Committee now meets quarterly on the progress of implementing the 2013 RMPUA Projects. Section 5 of the RMPUA report was approved by the Court on April 25, 2014.

Important Court Hearings and Orders

- April 25, 2014- Notice of Rulings and Notice of Hearing; Order Approving Section 5 of Watermaster's 2013 Amendment to 2010 Recharge Master Plan Update

Program Element 1: Develop and Implement a Comprehensive Monitoring Program

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 IEUA, such as new regulatory requirements, and to increase efficiency. The groundwater-level monitoring program supports many Watermaster functions, such as the periodic reassessment of Safe Yield, the monitoring and management of land subsidence, the assessment of Hydraulic Control, the analysis of desalter pumping impacts at private wells, and the triennial re-computation of ambient water quality that is mandated by the Water Quality Control Plan for the Santa Ana Basin. The data are also used to update and re-calibrate Watermaster's computer-simulation groundwater-flow model, to understand directions of groundwater flow, to compute storage changes, to interpret 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 1,000 wells. At about 800 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 located south of the 60 freeway.

Groundwater Quality Monitoring

Watermaster initiated a comprehensive groundwater-quality monitoring program as part of the implementation of the OBMP. The groundwater-quality monitoring program consists of the following four components:

1. An Annual Key-Well Water-Quality Monitoring Program consisting of 111 wells, which are mostly privately-owned agricultural wells in the southern portion of Chino Basin that are otherwise not included in an established sampling program. Twenty of these wells are sampled every year, and the remaining wells are sampled once every three years. The wells sampled annually are for the continuous monitoring of areas of concern associated with the southern edge of the Archibald South (formerly OIA) volatile organic compound (VOC) plume, the southern region of the Chino Airport Plume, and the Kaiser Steel Plume, and includes two multi-port MZ-3 monitoring wells.

2. Annual sampling at nine HCMP multi-port monitoring wells strategically placed between the Chino Desalter well fields and the Santa Ana River. Results of the annual sampling are used to analyze the effect of desalter pumping over time on Hydraulic Control, by comparing water quality of the native groundwater and the Santa Ana River.

3. Quarterly sampling at four near-river wells to characterize the interaction between the Santa Ana River and nearby groundwater. These shallow monitoring wells along the Santa Ana River consist of two former USGS National Water Quality Assessment Program (NAWQA) wells (Archibald 1 and Archibald 2), and two wells owned by the Santa Ana River Water Company (Well 9 and Well 11) .

4. A cooperative basin-wide data-collection effort known as the Chino Basin Data Collection (CBDC) program, which relies on municipal producers and other government agencies to supply groundwater-quality data on a cooperative basis. These sources include the Appropriators, DTSC, RWQCB, US Geological Survey (USGS), the Counties, and other cooperators.

Santa Ana River

All groundwater-quality data are checked by Watermaster staff and uploaded to a centralized database management system that can be accessed online through HydroDaVE℠. Groundwater-quality data are used by Watermaster for: the biennial State of the Basin report; the triennial ambient water quality update mandated by the Basin Plan; and the demonstration of Hydraulic Control—a maximum benefit commitment in the Basin Plan. Data are also used for monitoring nonpoint source groundwater contamination and plumes associated with point source discharges and to assess 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 groundwater remediation strategies.

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

Groundwater Production Monitoring

All active wells (except for minimum user wells) are now metered. Watermaster reads the agricultural production data from the meters on a quarterly basis and enters these data into Watermaster's relational database. Minimum user well production is estimated annually by Watermaster, and entered into the database.

Surface Water Monitoring

Water Quality and Quantity in Recharge Basins. Watermaster and IEUA measure the quantity of storm and supplemental water that enters into recharge basins. Pressure transducers or staff gauges are used to measure water levels during recharge operations. In addition to these quantity measurements, 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 the RP-1 and RP-4 treatment plant effluents are obtained from IEUA. Combining the measured flow data with the respective water qualities enables the calculation of the blended water quality in each recharge basin, the New Yield to the Chino Basin, and the adequate dilution of recycled water.

Surface Water Monitoring in the Santa Ana River. Watermaster measures selected water quality parameters quarterly at two sites along the Santa Ana River (Santa Ana River at River Road and Santa Ana River at Etiwanda). Along with data collected at four near-river wells, these data are used to characterize the interaction between the Santa Ana River and nearby groundwater. These data are also combined with discharge data from permanent USGS stream gauges, discharge data from publicly owned treatment works (POTWs), and groundwater modeling to assess the state of Hydraulic Control.

Hydraulic Control

In January 2004, the RWQCB amended the Water Quality Control Plan (Basin Plan) for the Santa Ana River Basin 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-nitrogen for the Chino-North and Cucamonga groundwater management zones. The application of the "maximum benefit" objectives relies on Watermaster and IEUA's implementation of a specific program of projects and requirements, which are an integral part of the OBMP. On April 15, 2005, the RWQCB adopted resolution R8-2005-0064, thus approving the Surface Water Monitoring Program and Groundwater Monitoring Program in support of maximum benefit commitments in the Chino-North and Cucamonga Basins.

One of the main maximum-benefit commitments is to achieve and maintain “hydraulic control” of the Chino Basin so that downstream beneficial uses of the Santa Ana River are protected. Hydraulic Control is defined by the Basin Plan as the elimination of groundwater discharge from the Chino-North Management Zone to the Santa Ana River or its reduction to a *de minimus* level. In October 2011, the RWQCB indicated that groundwater discharge in an amount less than 1,000 acre-feet per year would be considered *de minimus* by the RWQCB.

In 2012, the Basin Plan was amended to remove all references to the specific monitoring locations and sampling frequencies required for groundwater and surface water monitoring, thus allowing the program to be modified over time, with approval of the Executive Officer of the RWQCB. The Basin Plan amendment was approved by the RWQCB 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 included 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 Amendment required that Watermaster and IEUA submit for approval by the Executive Officer 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 RWQCB approved, a new surface water monitoring program that reduced the 2004 monitoring program from bi-weekly water quality measurements at 17 sites and direct discharge measurements at six sites, to quarterly water quality sampling at two sites. The new work plan including these changes was adopted by the RWQCB in March 2012.

In December 2013, Watermaster and IEUA submitted an updated Maximum Benefit Monitoring Program Work Plan and Proposed Schedule for Achieving Hydraulic Control to the RWQCB. The updated Work Plan states that Watermaster and IEUA will recalibrate the Chino Basin groundwater model every five years and use the model to estimate groundwater discharge from Chino-North to the Santa Ana River (i.e. annual underflow past the Chino Creek Well Field [CCWF]) and determine whether Hydraulic Control has been achieved. The new Maximum Benefit Monitoring Program Work Plan was adopted by the RWQCB in April 2014.

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

In January 2014, in a letter to IEUA and Watermaster, the RWQCB confirmed that the model results indicated that Hydraulic Control would be achieved under the projected range of Chino Creek Well Field pumping. The RWQCB also requested that IEUA and Watermaster submit a plan and schedule to increase desalter production capacity from 32,000 to 40,000 acre-feet per year by May 31, 2014. IEUA and Watermaster submitted the plan and schedule to the RWQCB on May 30, 2014 to install three new wells—one well location being provisional. In June 2014, the RWQCB accepted the plan, and requested that the final well locations be submitted to the RWQCB by September 30, 2014.

During this reporting period, Watermaster measured 455 manual water levels at 79 private wells throughout the Chino Basin, conducted downloads at 100 wells containing pressure transducers, and collected eight groundwater-quality samples and four surface-water quality samples.

Prado Basin Habitat Sustainability Program

A requirement of Mitigation Measure 4.4-3 from the Peace II Subsequent EIR is for Watermaster, IEUA and Orange County Water District (OCWD) to develop an Adaptive Management Plan for the Prado Basin Habitat Sustainability Program (PBHSP). The objective of this plan is to ensure that the riparian habitat in Prado Basin is not adversely impacted by drawdown associated with the implementation of the Peace II activities. Seventeen monitoring wells at nine sites will be constructed as part of the monitoring program for the PBHSP. During this reporting period, the PBHSP Committee continued property acquisition and permitting.

Chino Basin Groundwater Recharge Program

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

Recharge Activities. Ongoing recycled water recharge occurred in the Brooks, 7th Street, 8th Street, Turner, Victoria, San Sevaine, Ely, Hickory, RP-3, and Banana Basins this reporting period. Also during this reporting period, stormwater was recharged at 17 recharge basins across all management zones of the Chino Basin and six recharge basins received imported water.

Monitoring Activities. Watermaster and IEUA collect weekly water quality samples from recharge basins that are actively recharging recycled water and from lysimeters installed within those recharge basins. During this reporting period, approximately 466 recharge basin and lysimeter samples were collected and 26 recycled water samples were collected for alternative monitoring plans that include the application of a correction factor for soil-aquifer treatment determined from each recharge basin's start-up period. Monitoring wells located down-gradient of the recharge basins were sampled quarterly at a minimum; however, some monitoring wells were sampled more frequently during the reporting period for a total of 106 samples.

CB-20 Turnout

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

- 4Q-2013 Quarterly Report, submitted to the RWQCB – February 2014
- 1Q-2014 Quarterly Report, submitted to the RWQCB – May 2014
- 2013 Annual Report, submitted to the RWQCB – May 2014

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

Land Surface Monitoring

In response to the occurrence of land subsidence in the City of Chino, the Watermaster prepared and submitted the MZ-1 Subsidence Management (MZ-1 Plan) to the Court for approval and, in November 2007, the Court ordered its implementation (see Program Element 4: Develop and Implement a Comprehensive Groundwater Management Plan for Management Zone 1). The MZ-1 Plan calls for several monitoring and mitigation measures to minimize or abate the future occurrence of land subsidence and ground fissuring in the western Chino Basin. These measures and activities include:

- 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.
- Expanding the monitoring of the aquifer system and land subsidence into other areas of MZ-1 and Chino Basin where the data indicate concern for future subsidence and ground fissuring.
- Monitoring of horizontal strain across the historical zone of ground fissuring.
- Evaluating the potential contribution of groundwater production in northern MZ-1 on conditions in southern MZ-1.
- Conducting additional testing and monitoring to refine the MZ-1 Guidance Criteria.
- Developing alternative pumping plans for the MZ-1 producers that are 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 ASR (aquifer storage recovery) 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.

During the reporting period, Watermaster undertook the following activities called for in the MZ-1 Plan:

- The continuation of detailed water-level monitoring at wells within the Managed Area and across much of the western portion of Chino Basin. 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 MZ-1 Plan.
- The continuation of monitoring and maintenance at the extensometer facilities including: Ayala Park, Chino Creek, and Daniels sites.
- The collection of InSAR data from radar satellites during the reporting period, which will be analyzed for ground motion in early 2015.
- Assisted the City of Chino Hills in required quarterly reporting for its DWR grant to support the ASR pilot test.

Program Element 2: Develop and Implement a Comprehensive Recharge Program

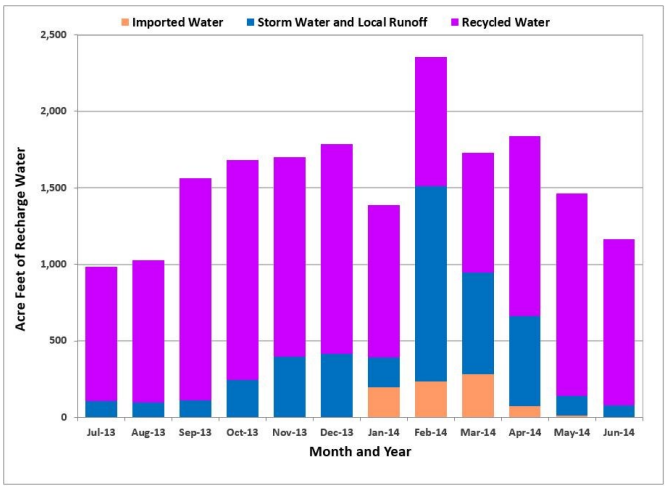
The average stormwater recharge of the Chino Basin Facilities Improvement Program (CBFIP) facilities is approximately 13,000 acre-feet per year, the supplemental "wet"[1] water recharge capacity is approximately 60,600 acre-feet per year, and the in lieu supplemental water recharge capacity ranges from 25,000 to 40,000 acre-feet per year. There is also a demonstrated well injection capacity of 5,600 acre-feet per year. Current total supplemental water recharge capacity ranges from 91,200 to 106,200 acre-feet per year, which is greater than projected supplemental water recharge capacity required of Watermaster.

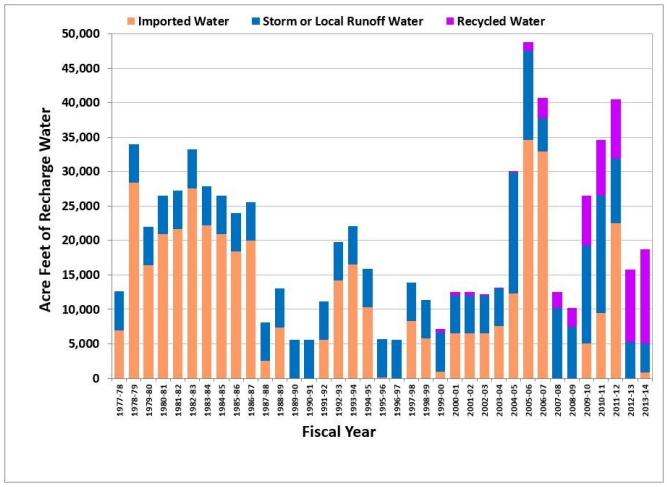
[1]The modifier "wet" means actual physical water is being recharged in spreading basins as opposed to the dedication of water from storage or in-lieu recharge.

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

Stormwater recharge during this reporting period was approximately 2,931 acre-feet. Recycled water recharge during this reporting period was approximately 6,216 acre-feet. Approximately 795 acre-feet of imported water was recharged during this reporting period. The IEUA and Watermaster recharge permit was amended in fiscal year 2009/10 to allow for underflow dilution and extend the dilution period from a running 60 months to a running 120 months. The significance of this permit amendment was to reduce the amount of imported and storm waters required for dilution. IEUA projects that dilution requirements will likely be met through 2019/20, even if no imported water were available for dilution.

The total amount of supplemental water recharged in MZ-1 since the Peace II Agreement through June 30, 2014 was approximately 44,446 acre-feet, which is slightly less than the 45,500 acre-feet required by June 30, 2014 (annual requirement of 6,500 acre-feet): the shortfall of 1,054 acre-feet will be carried-over and recharged in MZ-1 in a future year. The amount of supplemental water recharged into MZ-1 during the reporting period was approximately 819 acre-feet.





The Groundwater Recharge Coordinating Committee (GRCC) met once during this reporting period, in March 2014. Recharge basin operations and maintenance are discussed during these meetings.

Watermaster and IEUA continued work on the Turner Basins/Guasti Park Recharge Expansion Project in MZ-2. Following completion, anticipated in 2014, the expansion project is projected to recharge an additional 300 acre-feet of storm runoff annually. Infiltration testing for the Wineville Proof-of-Concept project was completed in November 2013. The Final Report on the project was published in April 2014, and it stated that the basin showed potential for recharge.

During the reporting period, Watermaster and IEUA continued to develop a series of projects outside of the 2013 Amendment to the 2010 Recharge Master Plan Update (2013 RMPUA) effort that will increase stormwater and supplemental water recharge reliability and have jointly agreed to fund these projects. Watermaster's share of the cost of these projects was included in the budget adopted by Watermaster for fiscal year 2013/14. Watermaster and IEUA are in the process of finalizing agreements for the joint projects. Watermaster and IEUA continued to hold monthly Joint Recharge Improvement Projects Committee meetings for the purpose of providing regular project status updates to the Parties.

Pursuant to the October 2013 Court Order authorizing Watermaster and IEUA to implement the 2013 RMPUA, Watermaster and IEUA have begun implementation. During the reporting period, Watermaster and IEUA began the process of developing agreements to construct the storm and supplemental water recharge projects listed in Table 8-2c of the 2013 RMPUA report, prioritizing the construction of these projects relative to the availability of grant funding, and planning subsequent implementation. Implementation of the Lower Day project began, on an accelerated timeline ahead of the other 2013 RMPUA projects because it received a $750,000 Proposition 84 grant. Implementation of the San Sevaine project continued, also on an accelerated timeline due to its $750,000 grant. The Recharge Master Plan Update Steering Committee (Steering Committee) now meets quarterly on the progress of implementing the 2013 RMPUA Projects. Section 5 of the RMPUA report was approved by the Court on April 25, 2014.

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

Construction of the Chino I Desalter Expansion and the Chino II Desalter facilities was completed in February 2006. As currently configured, the Chino I Desalter provides 2.6 million gallons per day (MGD) of treated (air stripping for VOC removal) water from Well Nos. 1-4, 4.9 MGD of treated (ion exchange for nitrate removal) water from Well Nos. 5-15, and 6.7 MGD of treated (reverse osmosis for nitrate and TDS removal) water from Well Nos. 5-15 for a total of 14.2 MGD (15,900 acre-feet per year). The Chino II Desalter provides 4.0 MGD of ion exchange treated water and 6.0 MGD of reverse osmosis treated water from eight additional wells for a total of 10.0 MGD (11,200 acre-feet per year).

Planning continued between the Chino Desalter Authority (CDA) and Western Municipal Water District (WMWD) to expand the Chino II Desalter by 10.5 MGD (11,800 acre-feet per year). To date, more than $70 million in grant funds have been secured toward this expansion project. Raw water will be drawn from existing CDA II wells, and possible additional new wells, if needed. In addition, a new Chino Creek Desalter Well Field, required for the Hydraulic Control commitment associated with Maximum Benefit, will provide additional raw water to the Chino I Desalter, enabling some existing wells to direct production to the expanded Chino II Desalter facility. Watermaster and the CDA demonstrated continued progress on the project schedule RWQCB approved by the RWQCB in June 2010. The final completion date of the expansion project is anticipated to be August 2016. However, efforts to support Hydraulic Control can begin upon completion of the Chino Creek Well Field and associated raw water pipeline. Construction of the raw water pipeline of Wells I-16, I-17 and I-18 is complete. The CDA received its modification of the Chino I wellfield operating permit from the California Department of Public Heath for Wells 1-16 and 1-1 7. Well 1-18 is not currently planned to be placed into operation due to high VOC concentrations. A nine-month pilot test for a treatment system for removal of TCE, TCP and nitrate is planned. Equipping designs of Wells 1-20 and 1-21 are complete, and the well equipping construction is planned for late 2014. Three additional wells are planned outside of the Chino Creek Well Field, which are necessary to meet the requirement for the CDA to produce 40,000 acre-feet of groundwater per year. A draft well siting study was submitted in January 2014. Property acquisition for these three sites is in progress.

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

MZ-1 Management Plan

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

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

From 2001-2005, Watermaster developed, coordinated, and conducted an Interim Monitoring Program (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.

During this reporting period, Watermaster continued implementation of the MZ-1 Plan. Drawdown at the PA-7 piezometer stayed above the Guidance Level during the reporting period, and very little, if any, permanent compaction was recorded at the Ayala Park Extensometer. The ongoing monitoring program called for by the MZ-1 Plan continues to be implemented.

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

The Land Subsidence Committee (LSC) met in March and June 2014. Watermaster staff and consultants provided an update on the ongoing monitoring and testing program in the Areas of Subsidence Concern, and on the ASR pilot test at Chino Hills Well 16. Watermaster consultants reviewed the draft scope and budget for the Land Subsidence Monitoring Program for fiscal year 2014/15 and the draft 2013 Annual Report of the Land Subsidence Committee. Watermaster staff recommended that the MZ-1 Subsidence Management Plan be updated.

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

Program Element 7: Develop and Implement a Salt Management Program

Archibald South Plume

In July 2005, the RWQCB prepared draft Cleanup and Abatement Orders (CAOs) for six parties who were tenants on the Ontario International Airport (OIA) with regard to the Archibald South (trichloroethene [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 parties (Aerojet, Boeing, General Electric [GE], 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 ABGL.

Groundwater Quality Sampling

In 2012, the RWQCB issued a draft CAO to the City of Ontario, the City of Upland, and IEUA concerning the former Ontario-Upland Sewage Treatment Plant (Regional Recycling Plant No. 1), located in the City of Ontario. The draft CAO states that these parties are "responsible parties subject to this Order because, as the former and current owners and operators of the WWTP and disposal areas, they are responsible for discharge of wastes that resulted in the presence of trichloroethylene (TCE) in groundwater down-gradient of the WWTP and disposal areas." In part, the draft CAO requires the parties to "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 RWQCB. In addition, the 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."

Upon the direction of the RWQCB, sampling at residential taps in the affected area has been conducted approximately every two years (2007-2008, 2009, 2011, 2013-2014). Several parties recently conducted additional sampling at private water supply wells in the area of the plume, and submitted the results of this sampling to the RWQCB in October 2013 and May 2014. With the completion of this work, all wells in the area of the plume have been sampled at least once. 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 system 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 plume.

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

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

The RWQCB has indicated that many of the potential responsible parties issued Draft CAOs will work together to prepare a remedial action feasibility study. Discussions among those parties are ongoing to resolve details about how to proceed with that work. Many of the parties are also pursuing various grant funding opportunities to develop a remediation strategy that is long-term, regional, and mutually beneficial to the Chino Basin. This includes the existing applications submitted to the United States Bureau of Reclamation.

Chino Airport

The County of San Bernardino, Department of Airports is working under RWQCB CAO No. R8-2008-0064, which requires the County to define the lateral and vertical extent of the plume and prepare a remedial action plan. Beginning in 2007, Tetra Tech, the consultant to the County, conducted several off-site plume characterization studies to delineate the areal and vertical extent of the plume. Since 2003, the County has conducted quarterly monitoring events at their monitoring wells. Conclusions from this monitoring program can be found in reports posted on the RWQCB's GeoTracker website. In March 2014, Tetra Tech submitted the *Semiannual Groundwater Monitoring Report, Summer and Fall 2013, Chino Airport Groundwater Assessment, San Bernardino County, California*.

Watermaster has also collected samples from dedicated monitoring wells and private wells in and around the Chino Airport plume area. Watermaster has also used its calibrated groundwater model to estimate cleanup times and contaminant concentrations in the Chino Creek Well Field. This work will be updated, given new information about the extent of contamination, subsurface hydrogeology, well performance, and the need for habitat sustainability in the Prado Basin.

In October 2013, the RWQCB approved a work plan for Tetra Tech to conduct field work for additional characterization of contamination in soil and groundwater associated with the Chino Airport. In April 2014, the County and Tetra Tech submitted a Mid-Year Project Status Report describing the progress in implementing the work plan, which has included the completion of cone penetrometer tests and the sampling of vertical aquifer profiling borings. The remainder of the work described in the work plan, which includes the installation of long-term groundwater monitoring wells, the investigation of 20 areas of concern for soil contamination, and an update to the conceptual site model, is expected to be completed by December 2014. The County has not yet performed any groundwater remediation activities.

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, the California Institution for Men, Crown Coach, GE Test Cell and Flatiron, Kaiser Steel, Milliken Landfill, Upland Landfill, and the Stringfellow National Priorities List sites.

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 important to the Chino Basin. Watermaster has committed 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 Valley Municipal Water District (TVMWD) Dry-Year Yield (DYY) program continued during the reporting period. By April 30, 2011, all DYY program construction projects and a full "put" and "take" cycle had been completed, leaving the storage account with a zero balance. Watermaster, IEUA, TVMWD, and MWDSC continue to negotiate potential amendments to the current contract.

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

Safe Yield Redetermination

According to the Judgment, the Chino Basin Safe Yield is to be re-determined periodically. Pursuant to the OBMP Implementation Plan and Watermaster's Rules and Regulations, in year 2010/11 and every ten years thereafter, Watermaster is to compute the Safe Yield for the prior ten-year period and reset the Safe Yield for the next ten-year period.

The Basin's Safe Yield was initially set by the Judgment at 140,000 acre feet per year. The number was arrived at after examination of the prior ten years of record, specifically 1965 through 1974. The Judgment provided that the Safe Yield would not be reexamined for at least ten years from 1978; the Safe Yield has not been reevaluated since the time of the Judgment. The OBMP Implementation Plan, which was ordered by the Court in the year 2000, includes the provision to recalculate and reset the Safe yield in 2010/11 using data collected in the period 2001-2010, and every ten years after.

In 2011, Watermaster authorized expenses to update the computer model of the Basin to recalculate the Safe Yield. The model calibration was completed in 2012, and evaluation of the Safe Yield began in 2013. The effort continues. During this reporting period, a fourth workshop was held in January 2014. There were also two technical group meetings, in January and March 2014, in which Watermaster's modelers were made available to meet with the Parties' experts in order to better understand the model. Following the workshops, the Appropriative Pool sent a letter to Watermaster in April 2014 which stated that the model is sound, and in the letter, the Pool also provided some recommendations for moving forward. Also, Watermaster filed a status report with the Court in April 2014, updating the Court on the process.