Optimum Basin Management Program

Staff Status Report 2021-2: July to December 2021

CHINO BASIN WATERMASTER

Optimum Basin Management Program

Highlighted Activities

- During this reporting period, Watermaster manually measured 300 water levels at about 40 private wells, three monitoring wells, and nine municipal supply wells throughout the Chino Basin, conducted two quarterly download events at about 130 wells containing pressure transducers, collected 81 groundwater quality samples from 78 wells, and collected four surface water quality samples.
- Pursuant to a monitoring and mitigation requirement of the Peace II Subsequent Environmental Impact Report (SEIR), 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, Watermaster conducted two quarterly downloads of pressure transducers that measure water levels at the 18 PBHSP monitoring wells and two surface water sites, and collected and reviewed climatic, vegetation, and imagery data for the Prado Wetland Area.
- Pursuant to the *Chino Basin Subsidence Management Plan*, Watermaster continued to implement the Ground-Level Monitoring Program and completed the *2020/21 Annual Report of the Ground-Level Monitoring Committee*, which analyzes and interprets data from the monitoring program and recommends future monitoring and testing activities. During this reporting period, Watermaster collected, processed, and checked groundwater level data and aquifer-system deformation data from the Pomona extensometer facility (PX) and published a technical memorandum on the construction and calibration of one-dimensional (1D) compaction models , which will be used to support additional modeling work in Northwest MZ-1.
- 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, construction of the Wineville/Jurupa/RP3 Basins began, and the construction for the Lower Day project continued. The required permits for the Montclair Basins are being obtained in preparation for the start of construction.
- During this reporting period, Watermaster and the IEUA recharged a total of 14,825 acre-feet of water: 6,132 acre-feet of stormwater, 8,420 acre-feet of recycled water, and 273 acre-feet of imported water.
- Watermaster began work to implement elements of the April 28, 2017 Court Order regarding the Safe Yield. This work includes supplementing the current Safe Yield Reset methodology to address comments received during the 2020 Safe Yield recalculation process and collecting data to evaluate changes in cultural conditions compared to the data used in the 2020 Safe Yield recalculation.

Important Court Hearings and Orders

- **JULY 21, 2021:**
  ORDER RE MOTION REGARDING IMPLEMENTATION OF THE LOCAL STORAGE LIMITATION SOLUTION
- **NOVEMBER 5, 2021:**
  HEARING ON OVERLYING (AGRICULTURAL) POOL'S MOTION FOR ATTORNEY'S FEES
- **DECEMBER 3, 2021:**
  ORDER RE OVERLYING (AGRICULTURAL) POOL'S MOTION FOR ATTORNEY'S FEES

Program Element 1: Develop and Implement a Comprehensive Monitoring Program

Fundamental to the implementation of the OBMP Program Elements are the monitoring and data collection efforts performed in accordance with Program Element 1, including monitoring basin hydrology, production, recharge, groundwater levels, groundwater quality, and ground-level movement. Various monitoring programs have and will continue to be refined over time to satisfy the evolving needs of Watermaster and the IEUA, such as new regulatory requirements and improved data coverage. Monitoring is performed by basin pumpers, Watermaster staff, and other cooperating entities as follows.

Groundwater Level Monitoring

Watermaster's basin-wide groundwater-level monitoring program supports the periodic reassessment of Safe Yield, the monitoring and management of ground-level movement, the impact analysis of desalter pumping on private wells, the impact analysis of the implementation of the Peace II Agreement on groundwater levels and riparian vegetation in the 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-simulated groundwater flow model in order to assess 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.

Watermaster Field Staff Measuring Groundwater Level at a CDA Well

The current groundwater level monitoring program is comprised of approximately 1,150 wells. At about 960 of these wells, groundwater 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 groundwater level data semi-annually from the well owners. At the remaining 190 wells, groundwater levels are measured monthly by Watermaster staff using manual methods or by pressure transducers that record data on a 15-minute interval. These wells are mainly Agricultural Pool wells or dedicated monitoring wells located south of the 60 freeway.

All groundwater level data are checked and uploaded to a centralized database management system that can be accessed online through HydroDaVE℠. During this reporting period, Watermaster measured approximately 300 groundwater levels at about 40 private wells, three monitoring wells, and nine municipal supply wells throughout the Chino Basin and conducted two quarterly downloads of 130 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 April 2021 to September 2021 period.

Groundwater Quality Monitoring

Watermaster initiated a comprehensive groundwater quality monitoring program in which the obtained data may be used for: the biennial State of the Basin report, the triennial re-computation of ambient water quality, the demonstration of Hydraulic Control, monitoring of nonpoint-source groundwater contaminations and plumes associated with point-source contaminations, 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 quality monitoring programs as of fiscal year 2021/22 are described below.

Chino Basin Data Collection (CBDC). Watermaster routinely and proactively collects groundwater quality data from well owners including municipal and governmental agencies. Groundwater quality data are also obtained from special studies and monitoring required by orders of the Santa Ana Regional Water Quality Control Board (Regional Board)—such as for landfills and other groundwater quality investigations, the DTSC, the US Geological Survey (USGS), and others. These data are collected semi-annually from well owners and monitoring entities. Data are collected for about 800 wells as part of the CBDC program. During this reporting period, Watermaster compiled data collected for the CBDC program for the January to June 2021 period.

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

Watermaster Field Groundwater Quality Monitoring Programs. Watermaster monitors groundwater quality at privately owned wells and dedicated monitoring wells on a routine basis as follows:

1. *Private Wells.* About 80 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. Seven wells near contaminant plumes are sampled annually, and the remaining 73 wells are sampled triennially.
2. *Watermaster Monitoring Wells.* Watermaster collects groundwater quality samples from a total of 49 multi-nested monitoring wells at 22 well sites located throughout the Chino Basin. These monitoring well sites include: nine HCMP sites constructed to support the demonstration of Hydraulic Control in the southern Chino Basin, nine sites constructed to support the PBHSP in the Prado Basin region, and three sites that fill spatial data gaps near contamination plumes in MZ-3. Each nested well site contains up to four wells in the borehole. Additionally, Watermaster samples one single-casing well in MZ-3. Currently, the HCMP and MZ-3 wells are sampled annually, and the PBHSP wells are sampled triennially.
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 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 (active Well 9 and inactive Well 11).

During this reporting period, Watermaster collected groundwater quality samples from 26 private wells, 48 monitoring wells that are sampled annually or triennially, and four near river wells that are sampled quarterly The samples were sent to Eurofins Eaton Analytical Laboratory for analysis. 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 459 producing wells, 255 of which were for agricultural uses. The number of agricultural wells has been decreasing in recent years due to urbanization and development. Many of the remaining active agricultural production wells are metered, and Watermaster reads the meters on a quarterly basis. Meter reads and production data are then entered into Watermaster's relational database, which can be accessed online through HydroDaVE^{sm}.

Development and Urbanization Continues Near The Chino Airport

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. Sample data from these surface water sites and from the near-river wells 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 from the two surface water sites.

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 the OCWD, form a committee, the Prado Basin Habitat Sustainability Committee (PBHSC), to 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, the 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 the annual reporting on its results. 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. Two existing wells are also monitored as part of the PBHSP. The PBHSC developed the Adaptive Management Plan of the PBHSP to describe an initial monitoring program and a process to modify the monitoring program and/or implement mitigation strategies, as necessary.

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

During this reporting period, Watermaster performed the following tasks:

- Conducted the groundwater monitoring program, which included the quarterly download of transducers that measure groundwater levels at 14 PBHSP monitoring wells, and the quarterly download of data loggers that measure electrical conductivity (EC), temperature, and level at four PHBSP monitoring wells in two locations.
- Conducted the surface-water monitoring program at two surface water sites, which included the quarterly download of data loggers that measure EC, temperature, and level.
- Collected climatic data near Prado Basin for water year 2021.
- Collected and reviewed the following riparian habitat monitoring data:
    - Normalized Difference Vegetation Index (NDVI) remote sensing data collected from Landsat satellites for water year 2021.
    - Performed a custom flight to collect a high-resolution air photo for 2021 of the Prado Basin region. This was cost shared with the OCWD.

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 IEUA and Watermaster's Regional Board Order No. R8-2007-0039 and Monitoring and Reporting Program No. R8-2007-0039.

Watermaster and the IEUA measure the quantity of storm, imported, and recycled water that enters recharge basins using pressure transducers or staff gauges. The IEUA also conducts water quality monitoring for all required parameters in Order No. R8-2007-0039 for recycled water, diluent water (storm water, dry-weather flow, and imported water), and groundwater. The IEUA staff samples for recycled water quality data: daily and weekly for the RP-1 and RP-4 effluent; quarterly and annually at two recycled water locations representative of recharge quality; and weekly or monthly from lysimeters at recharge basins. Most of the recycled water recharge basins have alternative compliance plans for total organic carbon (TOC) and Total Nitrogen (TN) using the recycled water samples and the application of a correction factor for soil aquifer treatment. The IEUA also collects samples at about 15 surface water locations for stormwater and dry-weather flows. Imported water quality data for State Water Project water are obtained from the Metropolitan Water District of Southern California (MWDSC). The flow and quality data is used to calculate: 120-month blended water quality for total dissolved solids (TDS) and nitrate of all recharge sources in each recharge basin to assess adequate dilution of recycled water as required by the recycled water recharge permits held with the Division of Drinking Water (DDW); and 5-year blended water quality for TDS and nitrate for all recharge sources in all recharge basins in the Chino Basin as required by the Maximum Benefit Salinity Management Plan (see the Program Element 7 update in this status report).

The IEUA also collects quarterly and annual groundwater quality samples at a network of about 35 dedicated monitoring wells and production wells that are downgradient of the recharge basins.

Monitoring Activities. During this reporting period, the IEUA water quality laboratory performed its ongoing monitoring program to measure and record recharge volumes and to collect water quality samples for recycled water, diluent water, and groundwater pursuant to Watermaster and IEUA permit requirements. This included collecting approximately 150 recycled water quality samples, 40 lysimeter samples, 7 diluent water quality samples, and 96 groundwater quality samples for analytical analyses. Daily composite water quality data was also collected at the RP-1 and RP-4 effluent.

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

- 2Q-2021 Quarterly Report, which was submitted to the Regional Board on August 15, 2021
- 3Q-2021 Quarterly Report, which was submitted to the Regional Board on November 15, 2021
- Draft Modified Start-Up Period Report for the San Sevaine Basins

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

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 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 that was conducted during the period when the MZ-1 Plan was being developed.
- 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.
- 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 (Well 16) within 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 from the GLMP show that very little permanent land subsidence has occurred in the MZ-1 Managed Area, indicating that subsidence is being successfully managed in this area, but land subsidence has been occurring in Northwest MZ-1. One concern is that land 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 observations, Watermaster determined that the subsidence management plan needed to be updated to include a Subsidence Management Plan for Northwest MZ-1, with the long-term objective of minimizing or abating the occurrence of the differential land subsidence. Thus, Watermaster expanded the GLMP into Northwest MZ-1 and prepared an updated Chino Basin Subsidence Management Plan, which included the Work Plan to Develop a Subsidence Management Plan for Northwest MZ-1 (Work Plan) as an appendix.

During this reporting period, Watermaster undertook the following Chino Basin Subsidence Management Plan activities:

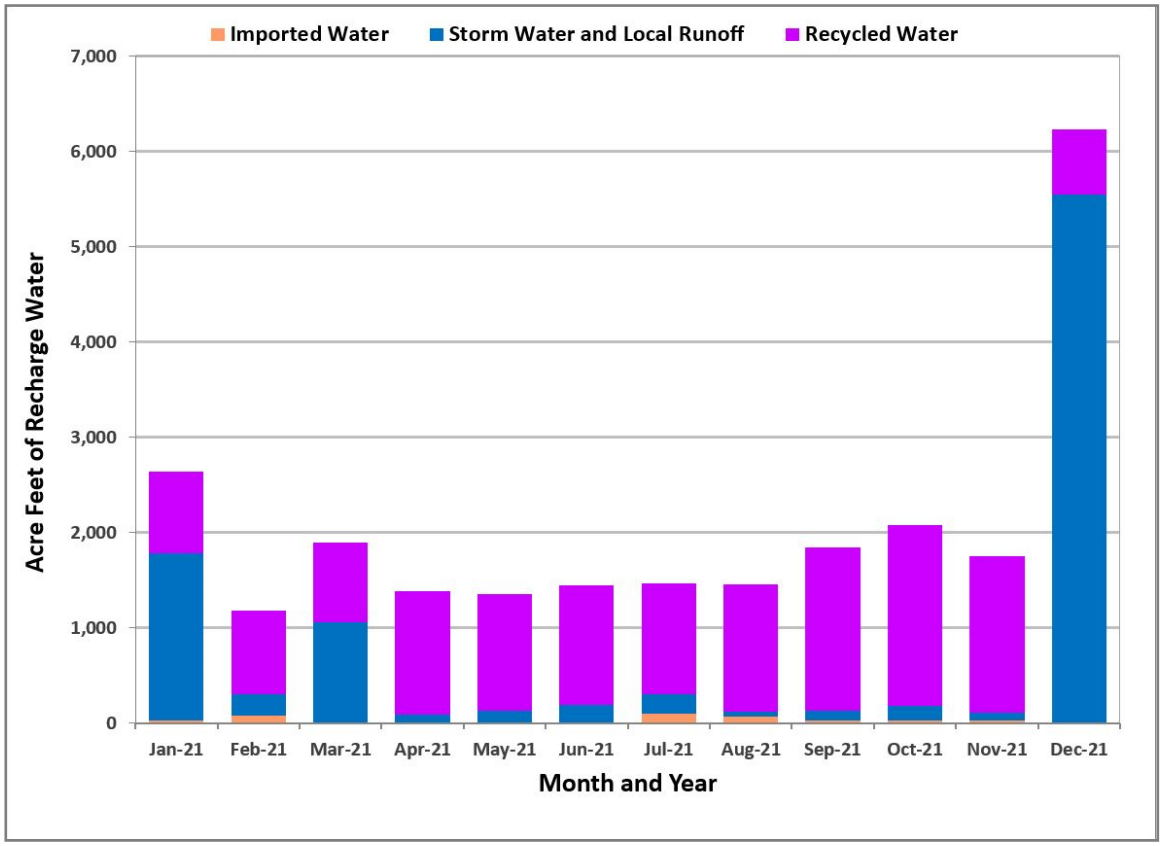
- Continued high-resolution water-level monitoring at wells within the MZ-1 Managed Area and within the Areas of Subsidence Concern. All monitoring equipment was inspected at least quarterly and was repaired and/or replaced as necessary. The data collected were checked and analyzed to assess the functionality of the monitoring equipment and for compliance with the Chino Basin Subsidence Management Plan.
- Performed monthly routine maintenance, data collection, and verification at the Ayala Park and Chino Creek extensometer facilities.
- Continued implementation of the Work Plan:
    - Collected, processed, and checked groundwater level data and production data from wells in Northwest MZ-1 on a monthly basis.
    - Collected, processed, and checked groundwater level data and aquifer-system deformation data from the Pomona extensometer facility (PX).

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

- Published a technical memorandum on the construction and calibration of one-dimensional (1D) compaction models that simulate aquifer-system deformation at the MVWD-28 and PX locations. The calibration results were used to estimate the hydraulic and mechanical properties of the aquifer-system and the pre-consolidation stress(es) that will be used to support additional modeling work in Northwest MZ-1.

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; ensuring a balance of recharge and discharge in the Chino Basin management zones; and ensuring 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 Program Element 2 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 18 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 about 56,600 acre-feet per year, and the in-lieu supplemental water recharge capacity ranges from 17,700 to 49,900 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 5,500 acre-feet per year. The current total supplemental water recharge capacity ranges from 90,310 to 118,310 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

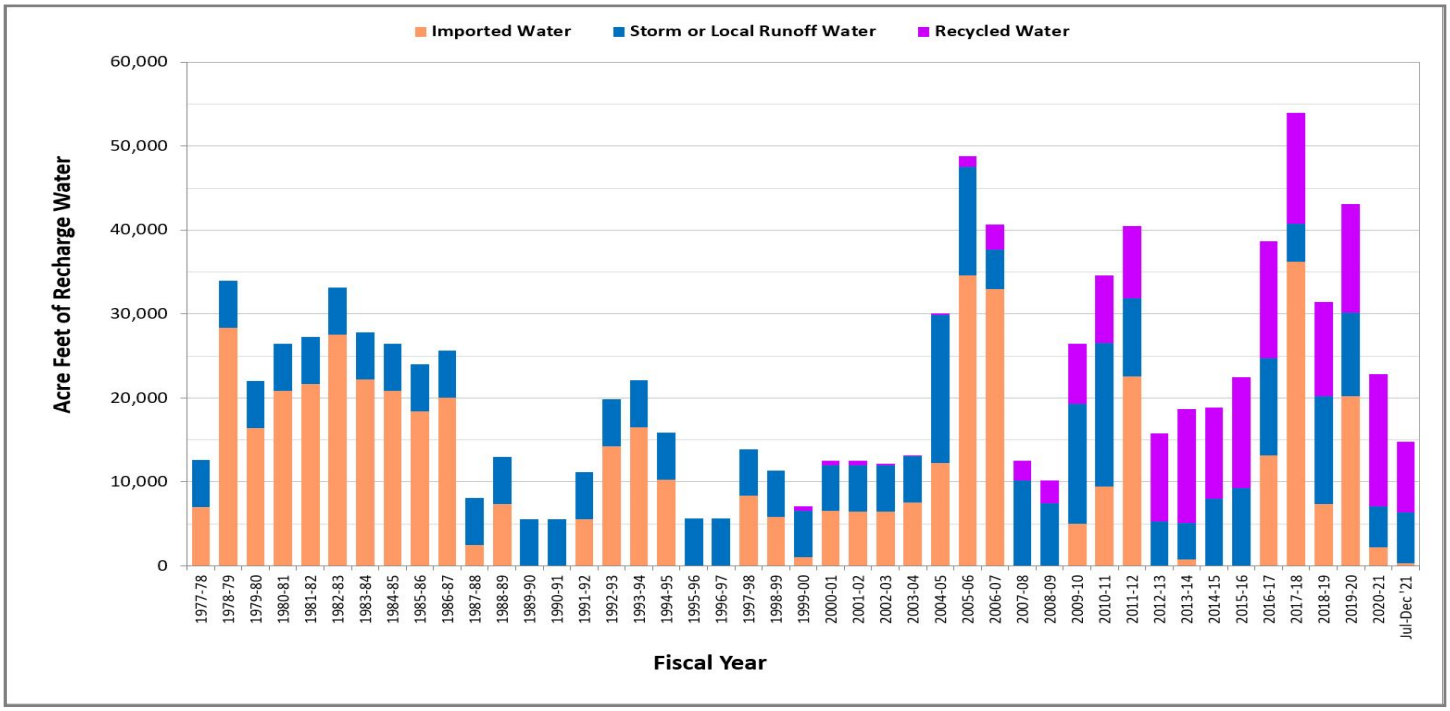
[1]The modifier "wet" means actual physical water is being recharged in spreading basins as opposed to the dedication of water from storage or in-lieu recharge.

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

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."

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.



In September 2018, Watermaster completed the 2018 Recharge Master Plan Update (2018 RMPU) and submitted it to the Court in October 2018. On December 28, 2018, the Court approved the 2018 RMPU. The next Recharge Master Plan Update will be completed no later than October 2023.

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. Construction of the San Sevaine Basin improvements was completed in September 2018 and the construction of the Victoria Basin improvements was completed in December 2018. During this reporting period, construction started for the Wineville/Jurupa/RP3 Basin projects, and the construction work for the Lower Day project continued and is near completion. The required permits are being obtained for the Montclair Basins project and construction is expected to start in April 2022.

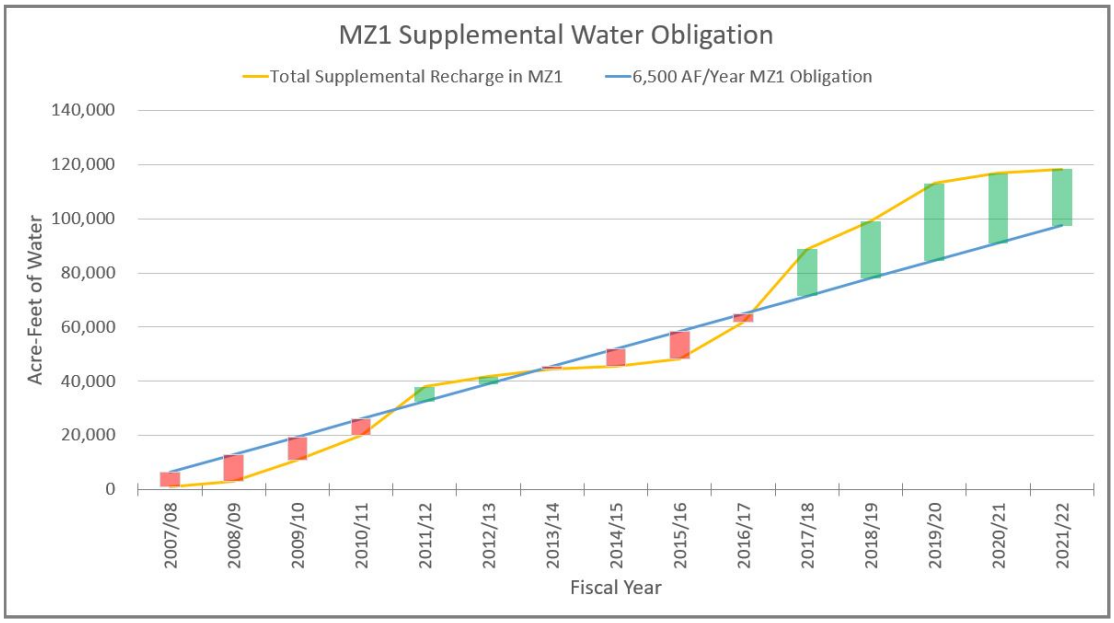
Additionally, Watermaster and the IEUA continue to collaborate in the development of projects outside of the 2013 RMPU effort that will increase and/or facilitate stormwater and supplemental water recharge and have jointly funded these projects, including monitoring upgrades and habitat conservation. During this reporting period, no projects were completed.

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

The Recharge Investigation and Projects Committee met twice during this reporting period 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 2021), the IEUA projects that dilution requirements will be met through 2030 even if no imported water is available for dilution.

Recharge Activities. During this reporting period, ongoing recycled water recharge occurred in the Brooks, 8th Street, 7th Street, Ely, Turner, Victoria, San Sevaine, Hickory, Banana, RP-3, and Declez Basins; stormwater was recharged at 18 recharge basins across all Chino Basin management zones; and imported water was recharged at the Turner Basins. From July 1 through December 31, 2021, Watermaster and the IEUA recharged a total of 14,825 acre-feet of water: 6,132 acre-feet of stormwater, 8,420 acre-feet of recycled water, and 273 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 December 31, 2021 was approximately 118,339 acre-feet, which is about 20,839 acre-feet more than the 97,500 acre-feet required by June 30, 2022 (annual requirement of 6,500 acre-feet). The amount of supplemental water recharged into MZ-1 during the reporting period was approximately 1,529 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.

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)

The Chino I Desalter Expansion and the Chino II Desalter facilities were completed in February 2006, bringing the total Chino Desalter capacity to 29 million gallons per day (MGD) (32,480 acre-feet per year). Development and planning continued between the CDA and Watermaster to expand the production and treatment capacity of the Chino Desalters by about 10 MGD. More than $77 million in grant funds were secured toward this expansion. As currently configured, the Chino I Desalter produces about 15,500 acre-feet of groundwater per year (13.8 MGD) at 14 wells (I-1 through I-11, and I-13 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 24,500 acre-feet of groundwater per year (21.8 MGD) at eleven wells (II-1 through II-4 and II-6 through II-12). This water is treated through ion exchange and/or reverse osmosis.

The most recently completed expansion project includes adding three desalter wells (Wells II-10, II-11, and II-12) to Chino II Desalter. These wells provide additional raw water to the Chino II Desalter 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 will also be utilized as part of the remediation action plan to clean up the South Archibald Plume (see the Program Element 6 update in this status report). Construction of wells II-10 and II-11 was completed in late 2015, equipping of the wells was completed in August 2018, and production at the wells commenced soon after.

Construction of well II-12 was completed in November 2020. During this reporting period the construction of a dedicated pipeline to convey groundwater from wells II-12, II-10, II-11, and the existing I-11 to the Chino II Desalter was completed, and well II-12 began pumping in August 2021.

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 (Managed Area), 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.

WM Admin Staff Getting Updated on MZ-1 Ground-Level Monitoring

From 2001-2005, Watermaster developed, coordinated, and conducted an IMP under the guidance of the MZ-1 Technical Committee (referred to now as the Ground-Level Monitoring Committee or GLMC). 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 list 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 Program Element 1 update, see pages 5 thru 6 of this report).

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,* and a *Work Plan to Develop the Subsidence Management Plan for Northwest MZ-1* (Work Plan) as an appendix. The Chino Basin Subsidence Management Plan and the Work Plan were adopted through the Watermaster Pool process in July 2015.

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

The data, analysis, and reports generated through the implementation of the MZ-1 Plan, Chino Basin Subsidence Management Plan, and Work Plan are reviewed and discussed by the 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:

- Finalized the report: *2020/21 Annual Report of the Ground-Level Monitoring Committee* and submitted the report to the GLMC in November 2021.

Two GLMC meetings were conducted during the reporting period. The meeting agendas included:

- October 21, 2021
    - Review and discuss construction and calibration results for the 1D compaction models at the MVWD-28 and PX sites.
- December 2, 2021
    - Review comments from the GLMC on the draft technical memorandum summarizing the construction and calibration results for the 1D compaction models at the MVWD-28 and PX sites and a recommendation for the using the 1D models to simulate the potential for future subsidence.

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 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 Chino Basin contaminant plumes. 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 regarding the South Archibald Trichloroethene (TCE) Plume in the southern portion of the Chino Basin. 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 as 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 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."

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)

Under the Regional Board's oversight, the ABGL Parties and/or the RP-1 Parties conducted sampling at private residential wells and taps approximately every two years (2007-2008, 2009, 2011, 2013-2014) in the region where groundwater is potentially contaminated with TCE. By 2014, all private wells and/or taps in the region 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 or tap water contains TCE at or above 80% of the MCL for TCE. Residents who declined tank systems are being provided bottled water. Watermaster also samples for water quality at private 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. Watermaster completed its most recent characterization of the plume in June 2021 for the *2020 State of the Basin* Report. In October of this reporting period, Watermaster prepared a semi-annual status report on the South Archibald Plume for Watermaster Parties.

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 evaluated alternatives to accomplish these objectives. In November 2015, a revised Draft Feasibility Study, Remedial Action Plan, 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 Remedial Action Plan. 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 CDA production wells and facilities. The RP-1 Parties reached a Joint Facility Development Agreement with the CDA for the implementation of a project designed in part to remediate the South Archibald Plume. The proposed project, termed the Chino Basin Improvement and Groundwater Clean-up Project, includes the operation of three new CDA desalter wells (II-10, II-11, and II-12) and a dedicated pipeline connecting the three wells and the existing CDA well I-11 to the Desalter II treatment facility. Construction of two of the three wells (II-10 and II-11) were completed and became operational in 2018. The construction of well II-12 was completed in November 2020. In the first half of 2021, the RP-1 Parties and the CDA submitted the final *Monitoring and Reporting Plan for the Chino Basin Improvement and Groundwater Clean-up Project* to the Regional Board and completed the construction of five multi-depth monitoring wells at two locations in the South Archibald Plume (II-MW-4 and II-MW-5). During this reporting period, the CDA completed the equipping of well II-12, the modification to the decarbonator, and the construction of the raw water pipeline, and the project became operational in August of 2021.

The domestic water supply alternative for the 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 Cities of Ontario and Upland have assumed responsibility for implementing the domestic water supply alternative. In February 2017, the Cities of Ontario and Upland submitted the Domestic Water Supply Work Plan to the Regional Board to outline the approach to monitoring and supplying alternative water supplies for affected residences. The City of Ontario has conducted six annual water supply sampling events at private residences pursuant to the Domestic Water Supply Plan and prepared annual monitoring reports of the results. The most recent annual monitoring occurred during this reporting period and the annual report was submitted to the Regional Board in December 2021.

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 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, 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. At the conclusion of this 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. In January 2017, 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 Chino Airport on

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)

June 6, 2017, and it was approved by the Regional Board on June 7, 2017. On December 18, 2017, the County submitted the *Draft Interim Remedial Action Plan* for public review and comment through April 2018. The preferred remediation alternative is a groundwater pump-and-treat system to provide hydraulic containment and treatment of both the West and the East Plumes, originating from Chino Airport. The system consists of ten extraction wells that combined will produce approximately 900 gallons per minute of groundwater for treatment using granular activated carbon (GAC). The system will also treat groundwater from CDA wells I-1 through I-4 and I-16 through I-18. 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. Currently the County is in discussions with the CDA to discharge the treated water from the extraction system to the CDA's influent pipeline.

In late 2018, Watermaster used the Chino Basin groundwater flow model to analyze how increased groundwater production for the remedial solution from the ten new County well clusters and CDA wells will affect groundwater levels within the vicinity. Watermaster has commitments to this area to maintain Hydraulic Control and to avoid impacts to the groundwater dependent habitat in the Prado Basin. Watermaster completed the modeling and prepared a technical memorandum to describe the results, which concluded operation of the remedial solution would improve Hydraulic Control in this area.

In 2018, the County constructed five extraction wells and 12 nearby piezometers and conducted aquifer pumping tests at these wells. In 2019 and 2020, the County constructed 14 new monitoring wells at six locations to assist with the delineation of the plume. In May 2021, the County submitted the *Work Plan for Installation of Piezometers for Riparian Area Monitoring* for six piezometers at four locations to monitoring the groundwater levels near riparian habitat along Chino Creek to monitor the impact of Chino Airport groundwater remedial solution on groundwater elevations near riparian habitat in the area. During this reporting period, the Regional Board issued a letter of concurrence with the Work Plan for the installation of wells for monitoring potential impacts to the riparian habitat and work began to construct the wells. In December of 2021 the County submitted a *Final Preliminary Well Design Report* to the Regional Board for the additional extraction wells at eight locations for the remedial solution.

The County conducts quarterly and/or annual monitoring events at all 89 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. Watermaster also 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. Watermaster completed its most recent characterization of the plume in June 2021 for the *2020 Chino Basin OBMP State of the Basin* Report. In October of this reporting period, Watermaster prepared a semi-annual status report on the Chino Airport Plume for Watermaster Parties. And, the County submitted, to the Regional Board, *a Semiannual Groundwater Monitoring Report Winter and Spring 2021 Chino Airport Groundwater Assessment, San Bernardino County, California.*

Other Water Quality Issues

Watermaster continues to track the 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. In October of this reporting period, Watermaster prepared annual status reports for the GE Test Cell, GE Flatiron, Milliken Landfill, California Institution for Men, Stringfellow Plumes, and the former Kaiser Steel Mill site.

Watermaster completed the most current delineations of the extent of the VOC plumes in June 2021 for the GE Test Cell, GE Flatiron, Milliken Landfill, and so-called Pomona VOC Plumes as part of the *2020 Chino Basin OBMP 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 TDS and nitrogen (N) management plan. The Basin Plan amendment includes both "antidegradation" and "maximum benefit" objectives for TDS and nitrate-N (nitrate) for the Chino-North and Cucamonga groundwater management zones (GMZs). The maximum benefit objectives allow for recycled water reuse and recharge of recycled water and imported water without mitigation; these activities are an integral part of the OBMP. The application of the maximum-benefit objectives is contingent on the implementation of specific projects and requirements termed the maximum-benefit commitments by Watermaster and IEUA. The status of compliance with each commitment is reported to the Regional Board annually in April. The nine maximum-benefit commitments include:

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

1. The implementation of a surface water monitoring program.
2. The implementation of a groundwater monitoring program.
3. The expansion of the Chino-I Desalter to a capacity of 10 MGD and the construction of the Chino-II Desalter with a design capacity of 10 MGD.
4. The additional expansion of desalter capacity (20 MGD) pursuant to the OBMP and the Peace Agreement (tied to the IEUA's agency-wide effluent concentration).
5. The completion of the recharge facilities included in the Chino Basin Facilities Improvement Program.
6. The management of recycled water quality to ensure that the IEUA agency-wide, 12-month running average wastewater effluent quality does not exceed 550 mgl and 8 mgl for TDS and TIN, respectively.
7. The management of basin-wide, volume-weighted TDS and nitrogen concentrations in artificial recharge to less than or equal to the maximum-benefit objectives.
8. The achievement and maintenance of the "hydraulic control" of groundwater outflow from the Chino Basin, specifically from Chino-North, to protect Santa Ana River water quality and downstream beneficial uses.
9. The determination of ambient TDS and nitrate concentrations of Chino Basin groundwater every three years.

Monitoring Programs. Pursuant to the maximum-benefit commitment number 1 and 2, Watermaster and the IEUA submitted a surface water and groundwater monitoring program work plan to the Regional Board in May 2004. On April 15, 2005, the Regional Board adopted resolution R8-2005-0064, approving Watermaster and the IEUA's surface and groundwater monitoring programs (2005 Work Plan). These monitoring programs were implemented pursuant to the 2005 Work Plan from 2004 to 2012. On February 12, 2012, the Regional Board adopted an amendment to the Basin Plan to remove all references to the specific monitoring locations and sampling frequencies required for groundwater and surface water monitoring. The Basin Plan amendment allows the monitoring programs to be modified over time, subject to the approval of the Executive Officer of the Regional Board. On December 6, 2012, the State Office of Administrative Law finalized the approval of the Basin Plan amendment. In place of specific monitoring requirements, the Basin Plan amendment required that Watermaster and the IEUA submit (i) a new surface water monitoring program work plan by February 25, 2012 and (ii) a new groundwater monitoring program work plan by December 31, 2013 to the Regional Board for approval. Pursuant to (i), Watermaster and the IEUA submitted the *2012 Hydraulic Control Monitoring Program Work Plan* which was approved by the Regional Board in March 2012. Pursuant to (ii), Watermaster and the IEUA submitted the *2014 Maximum-Benefit Monitoring Program Work Plan* (2014 Work Plan) which was approved by the Regional Board in April 2014. The 2014 Workplan describes: the questions to be answered by the monitoring program, the methods that will be employed to address each question, the monitoring and data collection that will be performed to implement the methods, and a reporting schedule. The monitoring pursuant to the 2014 Work Plan 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 for details).

Hydraulic Control and Chino Desalters. Pursuant to maximum-benefit commitment number 8, to achieve and maintain Hydraulic Control, Watermaster and the IEUA constructed desalter wells and expanded the desalter capacity (maximum-benefit commitments number 3 and 4) to increase desalter production in the southern portion of the Chino Basin. The Chino Basin Desalters are designed to replace the diminishing agricultural production that previously prevented the outflow of high TDS and nitrate groundwater to the Santa Ana River and the Prado Basin surface water management zone (PBMZ). Hydraulic Control is defined by the Basin Plan as the elimination of groundwater discharge from the Chino-North GMZ to the Santa Ana River controlling the discharge to a *de minimis* level. Pursuant to commitment number 8, Watermaster and the IEUA submitted a mitigation plan to the Regional Board in March 2005. This plan demonstrated how Watermaster and the IEUA would address the mitigation for any temporary loss of hydraulic control. In October 2011, the Regional Board defined the *de minimis* discharge of groundwater from the Chino-North GMZ to the PBMZ as less than 1,000 acre-feet per year. Watermaster and the IEUA have demonstrated that complete Hydraulic Control has been achieved at and east of Chino-I Desalter Well 20. The construction and operation of the CCWF (see Program Element 5), which began in 2010, is intended to achieve Hydraulic Control, per the definition above, at the area west of Chino-I Desalter Well 5. Watermaster and the IEUA recalibrate the Chino Basin groundwater-flow model every five years to estimate groundwater discharge from the Chino-North GMZ to the PBMZ (i.e., annual underflow past the CCWF) to determine whether Hydraulic Control has been achieved.

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

In February 2016, the CCWF commenced full-scale operation with production at wells I-16, I-17, I-20, and I-21 to achieve and maintain Hydraulic Control at the area west of Chino-I Desalter Well 5. Production at the CCWF has decreased since 2017 as a result of the new maximum contaminant level (MCL) for 1,2,3-TCP, which required the temporary cessation of operation at Well I-17. In 2020, the Chino Basin groundwater-flow model was used to estimate the historical (2004-2018) and projected (2019-2050) volume of groundwater discharge past the CCWF under revised pumping conditions at the CCWF. The model results indicate that both the estimated historical and projected discharge past the CCWF area is always below the *de minimis* threshold level of 1,000 acre-feet per year. The model assumes an annual average pumping volume at the CCWF of 992 acre-feet from fiscal year 2019 through fiscal year 2050.

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 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 (acre-feet per year). On June 30, 2015, Watermaster and the IEUA submitted a final plan and schedule for the construction and operation of three new desalter wells (II-10, II-11, and II-12). Well II-10 and II-11 were constructed and began operation in mid-2018, and Well II-12 was constructed in 2020 and began operation in mid-2021. The CDA facilities officially reached the pumping capacity necessary to meet the 40,000 acre-feet per year required for hydraulic control In June 2020. This pumping capacity was achieved without the inclusion of Well II-12, which was part of the final expansion plan designed to meet the 40,000 acre-feet per year. A full status report on the desalter expansion facilities is described in Program Element 3.

During this reporting period, Watermaster is working with the Regional Board to formally update (i) the definition of the minimum pumping required at the CCWF to maintain Hydraulic Control based on the latest Watermaster modeling and (ii) mitigation plan based on the new pumping condition at the CCWF.

Recycled Water Recharge. Pursuant to the maximum-benefit commitment number 5, Watermaster and the IEUA completed the construction of the recharge facilities and began artificial recharge of stormwater and recycled water in the Chino Basin in 2005. Additionally, pursuant to maximum-benefit commitment number 7, Watermaster and the IEUA limit recycled water for artificial recharge to the amount that can be blended on a volume-weighted basis with other sources of recharge to achieve five-year running average concentrations of no more than the maximum-benefit objectives (420 mgl for TDS and 5 mgl for nitrate). This data is compiled and analyzed in April of 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. Since recycled water recharge began in July 2005, the five-year volume-weighted running average TDS and nitrate concentrations have never exceeded the maximum-benefit objectives. As of December 2021, the five-year volume-weighted running average TDS and nitrate concentrations of these three recharge sources were 264 and 1.5 mgl, respectively.

Recycled Water Quality. Pursuant to the maximum-benefit commitment number 6, Watermaster and the IEUA manage the recycled water quality to ensure that the agency-wide, 12-month running average wastewater effluent quality does not exceed the permit limits of 550 mgl and 8 mgl for TDS and total inorganic nitrogen (TIN), respectively. Additionally, Watermaster and the IEUA must submit a plan and schedule to the Regional Board for the implementation of measures to ensure long-term compliance with these permit limits when either the 12-month running average IEUA agency-wide effluent TDS concentration exceeds 545 mgl for three consecutive months or the TIN concentration exceeds 8 mgl in any one month (action limits). The IEUA calculates and reports the 12-month running average agency-wide effluent TDS and TIN concentrations in the *Groundwater Recharge Program Quarterly Monitoring Reports*.

Since the initiation of recycled water recharge in July 2005, the 12-month running average TDS and TIN concentrations have ranged between 456 and 534 mgl and 3.8 and 7.6 mgl, respectively, and have never exceeded the permit limits. During the statewide drought in mid-2015, a historical high 12-month running average IEUA agency-wide effluent TDS concentration of 534 mgl was calculated for three consecutive months: June, July, and August. This 12-month running average IEUA agency-wide effluent TDS concentration of 534 mgl was only 11 mgl below the action limit. The 12-month running average agency-wide TDS concentration has decreased since mid-2015. As of December 202**1**, the 12-month running average IEUA agency-wide effluent TDS concentration was 4**94** mgl.

Through analysis of water supply and wastewater data, Watermaster and the IEUA concluded that drought conditions have a meaningful impact on the short-term TDS concentration of the water supplies available to IEUA agencies and that future droughts similar to the 2012-2016 period could lead to short-term exceedances of the 12-month running average IEUA agency-wide effluent TDS concentration. For this reason, in October 2016, Watermaster and the IEUA petitioned the Regional Board to consider modifying

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

the TDS compliance metric for recycled water to a longer-term averaging period. The Regional Board agreed that an evaluation of the compliance metric was warranted and directed Watermaster and the IEUA to develop a technical scope of work to support the adoption of a longer-term averaging period for incorporation into the Basin Plan. The proposed technical scope of work to support a Basin Plan amendment to revise the recycled water compliance metric was submitted to the Regional Board in May 2017. The proposed scope of work which was approved by the Regional Board includes the following tasks:

- Develop numerical modeling tools (R4, Hydrus 2D, MODFLOW, MT3D) to evaluate the projected TDS and nitrate concentrations of the Chino Basin.
- Define a baseline (status-quo) scenario and evaluate it with the new modeling tools.
- Define salinity management planning scenarios and evaluate them with the new modeling tools to compare the projected TDS and nitrate concentrations against the baseline scenario.
- Use the results to develop a draft regulatory compliance strategy that includes a longer-term average period for recycled water TDS concentrations.
- Collaborate with the Regional Board to review and finalize the regulatory strategy.
- Support the Regional Board in the preparation of a Basin Plan amendment upon approval of the regulatory strategy.

Watermaster and the IEUA began implementing the scope of work in July 2017 and have been working collaboratively with Regional Board staff to review interim work products and address new technical questions that have arisen. Watermaster and the IEUA prepared an administrative draft memorandum *Salinity Management Scenarios to Evaluate for the Basin Plan Amendment to Support a Revised Total Dissolved Solids (TDS) Recycled Water Compliance Metric for IEUA,* began preparing the technical report documenting the modeling work completed to date, and conducted two project status and technical review meetings with the Regional Board on October 6, 2020 and November 10, 2020.

During this reporting period, Watermaster prepared and submitted the draft technical report to the Regional Board in December 2021.

Ambient Groundwater Quality. Pursuant to the maximum-benefit commitment number 9, Watermaster and the IEUA recompute ambient TDS and nitrate concentrations for the Chino Basin and Cucamonga GMZs every three years (due by June 30). The re-computation 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 (SAWPA) Basin Monitoring Program Task Force (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 1999 to 2018 was completed in July 2020.

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 stakeholders. 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 is the only Storage and Recovery Program that is being implemented in the Chino Basin. 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. Another DYY cycle began in June 2017. By June 30, 2021, the volume of groundwater in the DYY program account was 22,990 acre-feet.

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 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.

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

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 began in 2011 and after significant technical and legal process, on April 28, 2017, the Court issued a final order (2017 Court Order), resetting the Safe Yield to 135,000 acre-feet per year effective July 1, 2010.

In July 2018, Watermaster's Engineer began the technical work necessary for the Safe Yield recalculation for 2020 pursuant to the OBMP Implementation Plan utilizing the approved methodology in the 2017 Court Order. Watermaster's Engineer updated and recalibrated the groundwater-flow model of the basin and completed the technical analysis to estimate net recharge and Safe Yield in early 2020. After substantial technical process and stakeholder engagement, the final 2020 Safe Yield Recalculation report was submitted to Watermaster on May 14, 2020. Based on the final report, the Watermaster Board adopted recommendations to the Court to update the Safe Yield for the period 2021 through 2030 to 131,000 acre-feet per year. Watermaster legal counsel filed a brief that included the Board approved Watermaster's recommendations regarding the Safe Yield reset. In July 2020, the Court approved Watermaster's recommendation and reset the Safe Yield to 131,000 acre-feet per year for the period commencing on July 1, 2020 and ending on June 30, 2030.

The 2017 Court Order requires that the Safe Yield be reevaluated again no later than June 30, 2025 and provides support for the ongoing improvement of the process to recalculate the Safe Yield. More specifically, the 2017 Court Order: 1) allows for supplementation of the current Safe Yield Reset methodology and 2) requires annual collection and evaluation of data regarding cultural conditions of the Chino Basin. The annual data collection and evaluation process includes determining whether "there has been or will be a material change from existing and projected conditions or threatened undesirable results" as compared to the conditions evaluated in the current Safe Yield recalculation study. If evaluation of the data suggests that any of these criteria are met, then Watermaster's Engineer is required to undertake "a more significant evaluation" to model the impacts of the existing and projected cultural conditions on the Chino Basin. During the reporting period, Watermaster's Engineer began work to supplement the current Safe Yield Reset methodology to address comments received during the peer review process of the 2020 Safe Yield recalculation regarding uncertainty in the groundwater model and the data used in future projections. Watermaster's Engineer also began to collect and evaluate data on current and projected cultural conditions in the Chino Basin pursuant to the 2017 Court Order.

Groundwater Storage Management

Addendum to PEIR. The OBMP storage management plan was temporarily revised in March 2017. 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. (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. (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 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 must be committed to mitigation prior to allocation and use.

Water occupying the Safe Storage Capacity includes Local Storage Account Water, Carryover Water, and water 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.

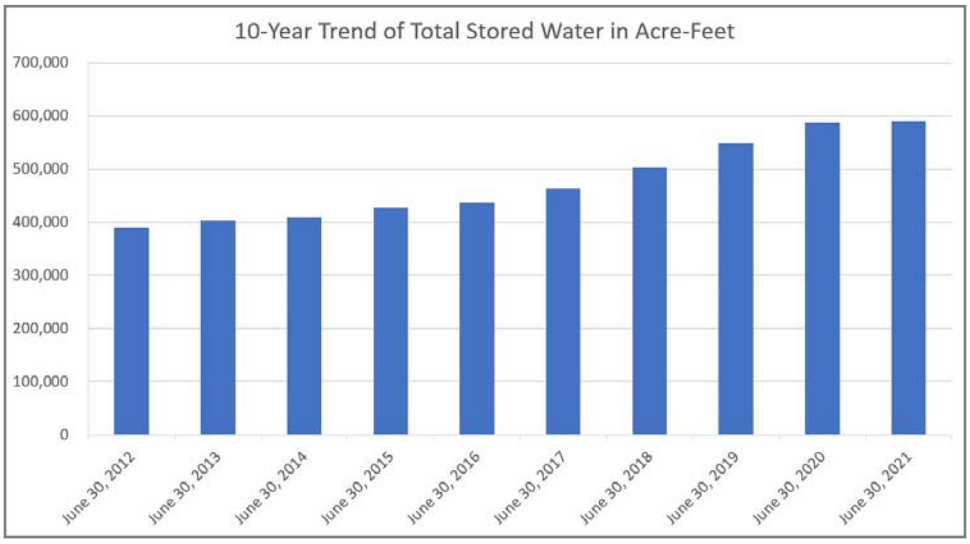
Subsequent to the OBMP PEIR, Watermaster and the Watermaster Parties developed revisions to the OBMP based on: new monitoring and borehole data collected since 1998, an improved hydrogeologic conceptualization of the basin, new numerical models that have improved the understanding of basin hydrology 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

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

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 5.9 million acre-feet[1].

The Peace II Agreement was negotiated by the Watermaster 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 for the Peace II Agreement in 2010.

There is a significant difference in what is known today regarding storage management and basin conditions compared to 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. On March 15, 2017, 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. This temporary increase in Safe Storage Capacity was found to not cause material physical injury (MPI) and/or loss of Hydraulic Control, and it provided Watermaster, with assistance from the parties, time to develop a new storage management plan and agreements to implement it.



Total Stored Water Balance Across All Managed Storage Accounts As Of June 30, 2021

2020 Storage Management Plan. During the period June through December 2019, Watermaster staff and consultants conducted a process with the Watermaster parties and Board to develop the 2020 Storage Management Plan (2020 SMP) that would update the SMP currently included in the OBMP implementation plan. In that effort, Watermaster prepared a white paper that outlined the need and requirements of the 2020 SMP and presented it to the Watermaster Parties and other interested stakeholders in June 2019. This work built upon the findings of the 2018 Storage Framework Investigation, where Watermaster staff evaluated the use of storage space in the range of 700,000 acre-feet to 1,000,000 acre-feet for potential Storage and Recovery programs. Watermaster and its Engineer published a final SMP report on December 19, 2019. This report was included in the 2020 OBMP Update Report, which the Watermaster Board adopted in full in October 2020. The SMP will be incorporated into the implementation plan for the 2020 OBMP Update.

Local Storage Limitation Solution. The temporary increase in Safe Storage Capacity to 600,000 acre-feet was set to expire on June 30, 2021, after which it would have declined to 500,000 acre-feet absent a new Court-approved storage agreement. At the end of Production Year 2020, the total volume of Managed Storage was about 588,000 acre-feet. Anticipating the expiration of the temporary increase in Safe Storage, Watermaster Parties recommended that environmental documentation and analysis be developed to cover the use of Managed Storage above 500,000 acre-feet beyond June 30, 2021. The Parties' projected behavior and the operations of the DYY program were called the Local Storage Limitation Solution (LSLS). During fiscal year 2020/21, Watermaster's Engineer completed an investigation to assess the potential MPI for the LSLS using the updated groundwater-flow model that was used to recalculate the Safe Yield. The conclusions of the investigation were that there would be no unmitigable significant adverse impacts attributable to the LSLS. This work supported CEQA documentation to increase the Safe Storage Capacity after June 30, 2021. The LSLS allows the Safe Storage Capacity to increase to up to 700,000 acre-feet through June 30, 2030, and up to 620,000 acre-feet from July 1, 2030 through June 30, 2035. The CEQA documentation formed Addendum No. 2 to the OBMP PEIR, which was adopted by the IEUA Board on March 17, 2021. The Court granted Watermaster's motion to implement the LSLS, which became effective on July 1, 2021.

[1]The most recent modeling of the Chino Basin estimates the total water in storage to be about 12 million acre-feet.

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

2020 OBMP Update

OBMP implementation began in 2000. By 2019, many of the projects and management programs envisioned in the 2000 OBMP have been implemented. The understanding of the hydrology and hydrogeology of the Chino Basin has improved since 2000, and new water-management issues have been identified that necessitate that the OBMP be adapted to protect the collective interests of the Watermaster Parties and their water supply reliability. For these reasons, the Watermaster Parties prepared a 2020 OBMP Update to set the framework for the next 20 years of basin-management activities.

During 2019, Watermaster convened a collaborative stakeholder process to prepare the 2020 OBMP Update, similar to that the process employed for the development of the 2000 OBMP. A series of eight stakeholder "Listening Sessions" were held by the Watermaster to obtain information, ideas, and feedback from the Chino Basin stakeholders to define their issues needs and wants, their collective goals for the 2020 OBMP Update, the impediments to achieving the goals, and the management actions required to remove the impediments.

The final 2020 OBMP Scoping Report (Scoping Report) was published in November 2019 to document the results of the first four Listening Sessions. The Scoping Report summarized (1) the need to update the OBMP, (2) the issues, needs, and wants of the stakeholders, (3) the goals for the 2020 OBMP Update, and (4) the recommended scope of work to implement seven stakeholder-defined basin-management activities that could be included in the 2020 OBMP Update.

Through the listening session process, it became apparent that the 2000 OBMP goals remain unchanged, and the nine Program Elements (PEs) defined in the 2000 OBMP are still relevant today as the overarching program elements of a basin management program. Each of the seven activities in the Scoping Report had objectives and tasks that were directly related to one or more of the 2000 OBMP PEs. Based on this finding, the nine PEs defined in the 2000 OBMP were retained for the 2020 OBMP Update. Each of the seven activities were mapped to one of the existing PEs.

In January 2020, the Watermaster published the 2020 OBMP Update Report, which described: (1) the 2020 OBMP Update process; (2) the OBMP goals and new activities for the 2020 OBMP Update; (3) the status of the OBMP PEs and ongoing activities within them; and (4) the recommended 2020 OBMP management plan – inclusive of ongoing and new activities. The management plan will form the foundation for the Watermaster Parties to develop a 2020 OBMP Implementation Plan and the agreements necessary to implement it. After several workshops and comprehensive review and comments by Watermaster Parties, the final 2020 OBMP Update Report was adopted by the Watermaster Board on October 22, 2020.

Additionally, in January 2020, the Watermaster and IEUA (as the lead agency) began preparing a new environmental documentation (PEIR) to support the OBMP Update. The updated PEIR will support decision-making, investment, and grant applications for ongoing and new management actions under the OBMP. Based on input from the Parties, the certification of the PEIR was postponed to a later time.

In March 2020, Watermaster convened a series of "Drafting Sessions" with the Watermaster Parties to develop a 2020 OBMP Implementation Plan Update and an agreement to implement it. Due to the COVID-19 Pandemic, the Chino Basin parties requested that the Drafting Sessions be put on hold. The Parties decided that the immediate focus for 2020 OBMP implementation would be related to storage management and the LSLS (see above). All other OBMPU implementation activities are being deferred for the time being.