2020 OBMP UPDATE REPORT

DRAFT

November 22, 2019

To: Chino Basin Watermaster Stakeholders

From: Watermaster 2020 OBMP Update Team

Subject: 2020 Optimum Basin Management Program Update Report

Date: November 22, 2019

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1.0 Introduction and Background

In September 2018, the Chino Basin Watermaster (Watermaster) initiated the process to update its Optimum Basin Management Program (OBMP) and the associated Implementation Plan. The purpose of this *2020 Optimum Basin Management Program Update Report* (2020 OBMP Update Report) is to document the stakeholder process to update the OBMP and describe the recommended 2020 OBMP management plan. The management plan will form the foundation for Watermaster and the Chino Basin Judgment Parties (hereafter, Parties[1]) to develop a final implementation plan (the 2020 OBMP Implementation Plan) and the agreements necessary to implement it.

A detailed description of the development of the 2000 OBMP and the rationale for and process to prepare the 2020 OBMP Update was described in a white paper prepared for the stakeholders: *White Paper – 2020 Update to Chino Basin Optimum Basin Management Program* (OBMP White Paper). The OBMP White Paper is included herein as Appendix A.

1.1 History of the OBMP and its Implementation

The Chino Basin Judgment invested Watermaster with the discretionary authority to develop an OBMP for the Chino Basin, including both water quantity and quality considerations. Paragraph 41 (within the Physical Solution), states:

> 41. Watermaster Control. Watermaster, with the advice of the Advisory and Pool Committees, is granted discretionary powers in order to develop an optimum basin management program for Chino Basin, including both water quantity and quality considerations. Withdrawals and supplemental water replenishment of Basin Water, and the full utilization of the water resources of Chino Basin, must be subject to procedures established by and administered through Watermaster with the advice and assistance of the Advisory and Pool Committees composted of the affected producers. Both the quantity and quality of said water resources may thereby be preserved and the beneficial utilization of the Basin maximized. (Pgs. 19-20 of the Restated Judgment)

1.1.1 The OBMP and the Peace Agreement

Watermaster, at the direction of the Court, began developing the OBMP in 1998 and completed it in July 2000. The OBMP was developed in a collaborative public process that identified the needs and wants of all stakeholders, described the physical state of the groundwater basin, defined a set of management goals, characterized impediments to those goals, and developed a series of actions that could be taken to remove the impediments and achieve the management goals. This work was documented in the *Optimum Basin Management Program – Phase I Report* (OBMP Phase 1 Report).[2]

The four goals of the 2000 OBMP included:

> *Goal 1 – Enhance Basin Water Supplies*
>
> *Goal 2 – Protect and Enhance Water Quality*

[1] Defined terms in the Court Approved Management Agreements will appear with the first letter of each word capitalized.

[2] WEI. (1999). *Optimum Basin Management Program – Phase I Report*. Prepared for the Chino Basin Watermaster. August 19, 1999. http://www.cbwm.org/docs/engdocs/OBMP%20-%20Phase%20I%20(Revised%20DigDoc).pdf

Goal 3 – Enhance Management of the Basin

Goal 4 – Equitably Finance the OBMP

The actions defined by the stakeholders to remove impediments to the OBMP goals were logically grouped into sets of coordinated activities called Program Elements (PEs), each of which included a list of implementation actions and an implementation schedule. The nine PEs defined in the 2000 OBMP included:

PE 1 – Develop and Implement Comprehensive Monitoring Program. The objectives of the comprehensive monitoring program are to collect the data necessary to support the implementation of the other eight PEs and periodic updates to the *State of the Basin Report*.[3]

PE 2 – Develop and Implement Comprehensive Recharge Program. The objectives of the comprehensive recharge program include increasing stormwater recharge to offset the recharge lost due to channel lining, to increase Safe Yield, and to ensure that there will be enough supplemental water recharge capacity available to Watermaster to meet its Replenishment Obligations.

PE 3 – Develop and Implement a Water Supply Plan for Impaired Areas. The objective of this program is to maintain and enhance Safe Yield with a groundwater desalting program that is designed to replace declining agricultural groundwater pumping in the southern part of the basin with new pumping to meet increasing municipal water demands in the same area, to minimize groundwater outflow to the Santa Ana River, and to increase Santa Ana River recharge into the basin.

PE 4 – Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1. The objectives of this land subsidence management program are to characterize the spatial and temporal occurrence of land subsidence, to identify its causes, and, where appropriate, to develop and implement a program to minimize or stop land subsidence.

PE 5 – Develop and Implement Regional Supplemental Water Program. The objective of this program is to improve the regional conveyance and availability of imported and recycled waters throughout the basin.

PE 6 – Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management. The objectives of this water quality management program are to identify water quality trends in the basin and the impact of the OBMP implementation on them, to determine whether point and non-point contamination sources are being addressed by water quality regulators, and to collaborate with water-quality regulators to identify and facilitate the cleanup of soil and groundwater contamination.

PE 7 – Develop and Implement Salt Management Plan. The objectives of this salinity management program are to characterize current and future salt and nutrient conditions in the basin and to develop and implement a plan to manage them.

[3] See for example: WEI (2019). *Optimum Basin Management Program 2018 State of the Basin Report*. Prepared for the Chino Basin Watermaster. June 2018. http://cbwm.org/docs/engdocs/State_of_the_Basin_Reports/SOB%202018/2018%20State%20of%20the%20Basin%20Report.pdf

PE 8 – Develop and Implement Groundwater Storage Management Program. The objectives of this storage program are to implement and periodically update a storage management plan that prevents overdraft, protects water quality, and ensures equity among the Parties, and to periodically recalculate Safe Yield. This PE explicitly defined the storage management plan, including a "Safe Storage Capacity" for the managed storage of 500,000 acre-feet (af)–inclusive of Local and Supplemental Storage and Storage and Recovery Programs.

PE 9 – Develop and Implement Storage and Recovery Programs. The objectives of the conjunctive use program are to develop Storage and Recovery Programs that will provide broad mutual benefit to the Parties and ensure that Basin Water and storage capacity are put to maximum beneficial use while causing no Material Physical Injury (MPI).

The PEs and their associated implementation actions were incorporated into a recommended management plan. The Parties used the management plan as the basis for developing the OBMP Implementation Plan and an agreement (the Peace Agreement) to implement it. The OBMP Implementation Plan is Exhibit B to the Peace Agreement. The Peace Agreement was reviewed in a programmatic environmental impact report (PEIR) that was certified by the Inland Empire Utilities Agency (IEUA) in July 2000.

The Parties entered into the Peace Agreement in June 2000. Under Resolution 2000-05,[4] Watermaster adopted the goals and plans of the OBMP Phase 1 Report and agreed to proceed in accordance with the Peace Agreement and the OBMP Implementation Plan. Following a July 2000 hearing, the Court directed Watermaster to proceed in a manner consistent with the Peace Agreement in order to implement the OBMP and received and filed the PEIR.

For the purposes of the discussions in this report, the term "OBMP" refers to the collective programs implemented by Watermaster and others (e.g. IEUA, Chino Basin Desalter Authority [CDA], etc.) pursuant to the Peace Agreements, the OBMP Implementation Plan, the PEIR, and any amendments to these documents.

1.1.2 2007 Supplement to the OBMP Implementation Plan and the Peace II Agreement

The work to develop the OBMP determined that the groundwater production of the Chino Basin Desalters would ultimately need to be 40,000 acre-feet per year (afy) to accomplish the goals of the OBMP. The Chino I Desalter production capacity prior to the Peace Agreement was 8 million gallons per day (mgd; 9,000 afy). The Peace Agreement provided for the expansion of the Chino I Desalter to up to 14 mgd (15,700 afy) and the construction of the Chino II Desalter, with a production capacity of 10 mgd. The Peace Agreement required a minimum combined Desalter production capacity of 20 mgd (22,400 afy) and it committed the Parties to developing expansion and funding plans for the remaining capacity within five years of approval of the Peace Agreement. The Parties developed the Peace II Agreement, which included provisions to expand the desalting capacity such that groundwater production reaches 40,000 afy. The

[4] Chino Basin Watermaster. (2002). *Twenty Fourth Annual Report Fiscal Year 2000-2001*; Appendix O http://www.cbwm.org/docs/annualrep/24th%20Annual%20Report%20-%20Approved.pdf

Peace II Agreement introduced Re-operation[5] to achieve Hydraulic Control[6] of the Chino Basin and maintain Safe Yield. Hydraulic Control is both a goal of the OBMP and a requirement of the maximum-benefit salt-and-nutrient management plan (maximum benefit SNMP) that was developed by Watermaster and the IEUA under PE 7 to enable the expansion of recycled water recharge and reuse throughout the basin under PEs 2 and 5.

The Parties executed the Peace II Agreement in 2007, which included a supplement to the OBMP Implementation Plan to expand the Chino Basin Desalters to 40,000 afy of groundwater pumping, to incorporate Re-operation and Hydraulic Control, and to resolve other issues. There were no changes to the storage management plan in the OBMP Implementation Plan.

The IEUA Board certified a supplemental environmental impact report (SEIR) for the Peace II Agreement in 2010.

1.1.3 2017 Addendum to the 2010 Peace II SEIR

In 2016, Watermaster identified the need to update the storage management plan in the OBMP Implementation Plan because the total amount of water in managed storage accounts was projected to exceed the Safe Storage Capacity (SSC) limit of 500,000 af defined in the 2000 OBMP. In 2017, the IEUA adopted an addendum to the SEIR to provide a "temporary increase in the Safe Storage Capacity from 500,000 af to 600,000 af for the period of July 1, 2017 through June 30, 2021 […] until a comprehensive re-evaluation of the Safe Storage Capacity value/concept can be completed before June 30, 2021."[7] The addendum was supported with engineering work that demonstrated that this temporary increase in SSC would not cause MPI or loss of Hydraulic Control.

1.1.4 Grant Funding for OBMP Implementation

The OBMP provided the certainty necessary for Watermaster, the IEUA, the Parties, and regulators to mobilize for rapid implementation of the OBMP PEs as well as to attract significant outside funding for the design and construction of facilities. The following are a few examples:

- Under PE 2, having recharge master plans (RMPs) that clearly defined the financial and water-supply benefits of the projects enabled the IEUA to obtain about $40 million in grant funding and $16 million in low-interest loans to construct the recharge improvements recommended in the 2001 RMP and 2013 RMP Update, covering about 70 percent of the total capital costs.
- In support of PE 3, Watermaster and the IEUA successfully obtained about $142 million in grants for the design and construction of the Chino Basin Desalters, including Desalter I expansion, Desalter II, the Chino Creek wellfield, and the current Desalter II expansion to incorporate

[5] Re-operation is the controlled overdraft of the basin by the managed withdrawal of groundwater pumping for the Chino Basin Desalters and the potential increase in the cumulative un-replenished pumping from the 200,000 acre-feet authorized by paragraph 3 of the Engineering Appendix Exhibit I to the Judgment, to 600,000 acre-feet for the express purpose of securing and maintaining Hydraulic Control as a component of the Physical Solution.

[6] Hydraulic Control is the elimination of groundwater discharge from the Chino-North Groundwater Management Zone to the Santa Ana River or its reduction to less than 1,000 afy.

[7] Tom Dodson & Associates. (2017). *Addendum No. 1 to the Optimum Basin Management Program Project*. Page 2.

treatment of point-source contamination associated with the South Archibald trichloroethene (TCE) plume. This funding has covered about 45 percent of the total capital costs of these facilities.

- In support of PEs 2 and 5, the IEUA successfully obtained about $64 million in grants and $115 million in low-interest loans for the construction of the recycled water distribution system, covering about 70 percent of the total capital costs.

In total, Watermaster and the IEUA have obtained over $230 million in grant funding and over $130 million in low-interest loans to implement the OBMP.

1.2 Need for the 2020 OBMP Update

The current OBMP contains a set of management programs that improve the reliability and long-term sustainability of the Chino Basin and the water supply reliability of the Judgment Parties. The framework for developing the OBMP—including the goals of the Parties, the hydrologic understanding of the basin, the institutional and regulatory environment, an assessment of the impediments to achieving the Parties' goals, and the actions required to remove the impediments and achieve the goals—were all based on 1998-1999 conditions.

As of 2019, many of the projects and management programs envisioned in the 2000 OBMP have been implemented; though some have not. The understanding of the hydrology and hydrogeology of the Chino Basin has improved since 2000, and new water-management issues have been identified. The strategic drivers and trends that shaped the goals and activities of the OBMP in the late 1990s have since changed. And, there are several drivers and trends in today's water management space that may challenge the ability of the Parties to protect their collective interests in the Chino Basin and their water supply reliability.

Exhibit 1 characterizes the drivers and trends shaping water management and their basin management implications for the Parties. "Drivers" are external forces that cause changes in the Chino Basin water space, such as climate change, regulations, and funding. Grouped under each driver are expected trends that emanate from that driver. For example, trends associated with climate change include reduced groundwater recharge, increased evaporation, and reduced imported water supply. The relationship of the drivers/trends to the management implications are shown by arcs that connect trends to implications. For example, a management implication of reduced groundwater recharge is the reduction of the Chino Basin Safe Yield.

The drivers, trends, and implications were first identified in the OBMP White Paper and served as the initial rationale for recommending an update to the OBMP. Figure 1 represents the final characterization of the drivers, trends, and implications, based on stakeholder input during the process to update the OBMP. The basin management implications that form the stakeholders' rationale for the 2020 OBMP Update are:

- Reductions in Chino Basin Safe Yield
- Reduced imported water availability and increased cost
- Imported water quality degradation
- Chino Basin water quality degradation
- Inability to pump groundwater with existing infrastructure
- Increased cost of groundwater use
- Recycled water quality degradation
- Reduced recycled water availability and increased cost
- Increased cost of Basin Plan compliance

Additionally, the PEIR and SEIR for the OBMP are nineteen and nine years old, respectively. Knowledge of the basin's characteristics has improved since these documents were adopted, water management challenges have intensified, and environmental considerations have changed. An updated PEIR will better support decision-making, investment, and grant applications for ongoing and new management actions under the OBMP.

Finally, it is anticipated that it will become increasingly difficult to secure grants and low-interest loans due to increased competition in the future. Most grant and low-interest loan programs require, or heavily favor, projects that are within watersheds and groundwater basins with adopted integrated regional management plans, groundwater sustainability plans, or their equivalents. The 2020 OBMP Update is equivalent to a regional water resources and groundwater management plan that, in addition to allowing the implementation of the Physical Solution, will enable the stakeholders to be competitive in applying for grants and low-interest loans.

For these reasons, Watermaster and the Parties need to update the OBMP and its Implementation Plan, and perform the CEQA process, to set the framework for the next 20 years of basin-management activities.

1.3 Stakeholder Process for the 2020 OBMP Update

The 2020 OBMP Update was facilitated using a collaborative stakeholder process like that employed for the development of the 2000 OBMP. Throughout 2019, Watermaster held a series of public listening sessions to support the development of the 2020 OBMP Update. The purpose of the listening sessions was to obtain information, ideas, and feedback from the stakeholders to define their issues, needs, and wants; their collective goals for the 2020 OBMP Update; impediments to achieving the goals; the management actions required to remove the impediments; and a proposed plan to implement the management actions.

Watermaster established an OBMP Update Team to facilitate the stakeholder process, composed of Watermaster staff, Watermaster legal counsel, engineers and scientists from Wildermuth Environmental Inc. (WEI; Watermaster's engineering consultant), and IEUA staff. The OBMP Update Team provided key information prior to and during each listening session to enable the stakeholders to provide their input on each topic discussed. The objectives were to communicate the process for updating the OBMP, to ensure that the ideas and opinions of every stakeholder were heard, to present the information that will be considered for inclusion in the OBMP Update, and to ensure the stakeholder feedback is captured correctly.

The OBMP Update Team held eight listening sessions on the following dates:

- Listening Session 1: January 15, 2019
- Listening Session 2: February 12, 2019
- Listening Session 3: March 21, 2019
- Listening Session 4: May 16, 2019
- Listening Session 5: July 31, 2019
- Listening Session 6: September 11, 2019
- Listening Session 7: October 17, 2019
- Listening Session 8: December 11, 2019

The objectives of the first four listening sessions were (1) to confirm the need to update the OBMP; (2) to identify the issues, needs, and wants of the stakeholders; (3) to define goals for the 2020 OBMP Update; and (4) to identify new and revised activities that could be included in the 2020 OBMP Update to remove

impediments to achieving the 2020 OBMP Update goals. The *2020 OBMP Scoping Report* (Scoping Report) summarized and integrated the work products of these four listening sessions and described the recommended scope of work to implement each of the "2020 OBMP Update Activities" defined by the stakeholders. The final Scoping Report, including responses to stakeholder comments, is included herein as Appendix B and is discussed further in Section 2.2 of this report.

The objectives of Listening Sessions 5 and 6 were to present and obtain feedback on the scopes of work described in Section 3 of the Scoping Report. The objective of Listening Session 7 was to present and obtain feedback on the integration of the 2020 OBMP Update Activities defined in the Scoping Report with the 2000 OBMP PEs. The objectives of Listening Session 8 were to present and obtain feedback on the recommended 2020 OBMP management plan documented in the *Draft 2020 OBMP Update Report* and to begin discussions on the 2020 OBMP Implementation Plan and implementation agreements.

Appendix C to this report documents the stakeholder attendance at the listening sessions. All documents related to the 2020 OBMP Update, including meeting materials from the listening sessions and report deliverables, are available on the Watermaster's website.[8]

1.4 Organization and Use of this Report

This *2020 OBMP Update Report* describes the 2020 OBMP Update process (Section 1), the OBMP goals and new activities for the 2020 OBMP Update (Section 2), the status of the OBMP PEs and ongoing activities within them (Section 3), and the recommended 2020 OBMP management plan – inclusive of ongoing and new activities (Section 4). The management plan in Section 4 will form the foundation for the Parties to develop a final implementation plan (2020 OBMP Implementation Plan) and the agreements necessary to implement it. Exhibit 2 shows the parallels between the 2000 and 2020 documentation and the subsequent processes to develop implementation plans and agreements for approval by the Court and environmental review under CEQA.

Implementation of the management plan described in Section 4 may or may not result in the construction of new projects, and nothing in this document obligates Watermaster or the Parties to implement the optimization recommendations. However, some of the implementation actions included in the management plan are required by Watermaster to administer the Physical Solution or comply with other Watermaster or regulatory requirements. These required implementation actions may or may not result in the development and implementation of projects.

[8] http://www.cbwm.org/OBMPU.htm

2.0 2020 OBMP Goals and Activities

2.1 OBMP Goals

The issues, needs, and wants of the stakeholders form the basis of the management goals of the 2020 OBMP Update and inform the identification of impediments to the goals as well as the action items to remove the impediments. Through the listening session process, 57 unique needs and wants were identified by the stakeholders. The classes of identified issues were effectively the same as the implications for basin management defined in Exhibit 1. Exhibit 3 is a matrix, summarizing the needs and wants of the stakeholders, organized by basin management issue (rows) and showing attribution to stakeholders that share each need/want (columns).

Through the assessment of basin management issues, needs, and wants, the stakeholders concluded that the goals defined in the 2000 OBMP are still relevant today. The Parties' intent for each goal of the 2020 OBMP Update, as documented in the Scoping Report, are:

> ***Goal No. 1 - Enhance Basin Water Supplies.*** The intent of this goal is to increase the water supplies available for Chino Basin Parties and improve water supply reliability. This goal applies to Chino Basin groundwater and all other sources of water available for beneficial use.
>
> ***Goal No.2 - Protect and Enhance Water Quality.*** The intent of this goal is to ensure the protection of the long-term beneficial uses of Chino Basin groundwater.
>
> ***Goal No.3 - Enhance Management of the Basin.*** The intent of this goal is to encourage sustainable management of the Chino Basin to avoid Material Physical Injury, promote local control, and improve water-supply reliability for the benefit of all Chino Basin Parties.
>
> ***Goal No. 4 - Equitably Finance the OBMP***. The intent of this goal is to identify and use efficient and equitable methods to fund OBMP implementation.

The far right-hand column in Exhibit 3 illustrates the nexus of the OBMP goals to the needs and wants of the Parties.

2.2 New Activities to Achieve the Goals of the 2020 OBMP Update

There are physical, institutional, and financial impediments to achieving the 2020 OBMP goals. The issues, needs, and wants of the stakeholders shown in Exhibit 3 recognize these impediments. The stakeholders identified and described 12 activities that, if implemented, would address their issues, needs, and wants. The 12 activities, as initially defined by the stakeholders, are listed in Exhibit 4 (the activities are identified by the letters A through L). Exhibit 3 illustrates which of the 12 activities the stakeholders believe have the potential to address each of their needs and wants. 55 of the 57 needs and wants were identified as addressed by one or more of the proposed activities.

Exhibit 5 illustrates the nexus of the OBMP goals, the impediments to achieving these goals, the stakeholder-defined activities to remove the impediments, and the potential outcomes (i.e. the implications) of implementing each activity. Exhibit 5 also shows the nexus of each activity to addressing the issues, needs, and wants of the stakeholders, categorized by basin management issues. In the process of describing the nexus of the goals and activities shown in Exhibit 5, it was identified that some of the activities in Exhibit 4 are related enough to be combined into a single management activity. Nine of the activities (A, B, C, D, E, F, G, K, and L) were combined into seven basin management activities. The remaining three activities (H, I, and J) were identified as actions that could either be accomplished by

incorporating them into the scopes of work of every activity or were more appropriate for inclusion within an implementation agreement.[9]

The seven basin management activities described in the Scoping Report are:[10]

Activity A – Increase the capacity to store and recharge storm and supplemental water

Activity B – Develop, implement, and optimize Storage and Recovery Programs

Activity CG – Identify and implement regional conveyance and treatment projects/programs and optimize the use of all water supply sources

Activity D – Maximize the reuse of recycled water produced by the IEUA and others

Activity EF – Develop and implement a groundwater-quality management plan to address contaminants of emerging concern

Activity K – Develop a management strategy within the maximum-benefit salt and nutrient management plan to ensure compliance with recycled water recharge dilution requirements.

Activity L – Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance requirements

The Scoping Report described each of the seven activities at the detail required to define a scope of work to implement them. The potential outcomes described in Exhibit 5 provided the basis for the scope of each activity. For each activity, the Scoping Report includes: a description of the activity, the need and function of the activity—including supporting technical demonstrations, the activity's relationship to the OBMP PEs, a recommended scope of work to perform the activity to achieve the desired outcomes, a preliminary schedule for implementing the tasks within the scopes of work, and a budget-level cost estimate to implement the initial tasks that could reasonably be estimated.

Each activity is a management process to optimize some aspect of basin management, such as water quality (EF, K) or managed recharge (A). Thus, the scope of work for each activity represents the methodical process to characterize and analyze the basin management challenge (including technical data and institutional information), to define potential management alternatives, and to select the optimum management solution(s). Each management process is generally composed of four phases:

(1) Scoping (S) – In this phase, the stakeholders convene to precisely articulate the objectives of the management process and refine the scope of work, cost, and schedule to execute it.

(2) Evaluate the need for projects or other management solutions (PN) – In this phase, available and/or new data and information are compiled and analyzed to characterize and demonstrate the need for management programs or projects to achieve the stakeholder objectives defined in the scoping phase.

(3) Define and evaluate management alternatives (PE) – The evaluation phase includes the following generalized steps: develop planning, screening, and evaluation criteria; identify the potential program or project alternatives; develop reconnaissance-level engineering design and operating plans for project alternatives; develop an engineering cost opinion for each alternative; describe

[9] See the *2020 OBMP Scoping Report* (included herein as Appendix B) for more details on how Activities H, I, and J can be incorporated in the activity scopes of work and/or the 2020 OBMP Implementation Plan agreement(s).

[10] The activity names listed here have been simplified from the original descriptions defined by the stakeholders and shown in Exhibit 4.

how each alternative could be implemented and financed; evaluate alternatives based on the evaluation criteria; and select the preferred program or project alternative.

(4) Implementation (I) – In this phase, the preferred program or project alternative is implemented subject to developing the necessary agreements between participating Parties. If a project is identified, implementation also includes: preparing the preliminary design of the recommended alternative, preparing the environmental documentation that will tier-off the 2020 OBMP Update PEIR, preparing a financial plan for constructing the recommended alternative, preparing final design of the recommended alternative, acquiring permits for constructing and operating the recommended alternative, and constructing the recommended alternative.

The end of each phase represents a check in point where the scope of work can be adapted to deal with changed conditions or an off-ramp where a go-no-go decision can be made to continue with the next phase of the management process. Thus, activities may or may not result in the design and implementation of projects.

Exhibits 6 through 12 summarize the key features of each of the seven activities described in detail in the Scoping Report. For each activity, the exhibit summarizes the need and objectives, the scope of work, and a general implementation schedule with go-no-go decision points identified. The scopes of work are divided into tasks, and for each task, the following are identified: the corresponding management process phase (S, PN, PE, I), the expected outcomes, Watermaster's role in implementing the task (if any), and whether Watermaster deems the outcomes as required to administer the Physical Solution or comply with other Watermaster or regulatory requirements.

Implementation of the management processes characterized in Exhibits 6 through 12 may or may not result in the construction of new projects, and nothing in this document obligates Watermaster or the Parties to implement the scopes as described. In activity implementation, for those outcomes that are deemed necessary for Watermaster, Watermaster will provide for the opportunity to revise the scopes of work and cost in the scoping phase. Any revisions will be subject to the discretion of Watermaster to ensure that the final scope of work achieves the required outcomes.

The following sections summarize the objectives of the seven 2020 OBMP Update Activities and identify the new implementation actions that are recommended for inclusion in the 2020 OBMP Update.

2.2.1 Activity A – Increase the capacity to store and recharge storm and supplemental water

The stakeholders have identified a lost opportunity for stormwater recharge in the basin and a limitation of Watermaster and the IEUA's existing economic selection criteria for new recharge projects. The use of the existing criteria resulted in a recommendation in the 2018 RMP Update (RMPU) that no new recharge projects be implemented. Thus, the Activity A objectives are (1) to maximize stormwater capture pursuant to Watermaster's diversion permits,[11] (2) to promote the long-term balance of recharge and discharge, (3) to ensure sufficient supplemental water recharge capacity for future replenishment, (4) to reduce dependence on imported water by maintaining or enhancing Safe Yield, (5) to improve water quality, and (6) to ensure a supply of dilution water to comply with recycled water recharge permit requirements. For

[11] Watermaster holds three permits with the State Water Resources Control Board (State Board) for the diversion and recharge of stormwater in trust for the Parties. The San Bernardino County Flood Control District (SBCFCD) is a co-permittee for two of these permits, 19895 and 20753. Each permit defines a maximum diversion limit and the period over which diversions are allowed to occur each year (diversion season): (1) Permit 19895 has a diversion limit of 15,000 acre-feet (af) from November 1 to April 30, (2) Permit 20753 has a diversion limit of 27,000 af from October 1 to May 1, and (3) Permit 21225 has a diversion limit of 68,500 af from January 1 to December 31.

the remainder of this report, the term "recharge" is inclusive of diverting, storing, and recharging storm and supplemental waters.

The Scoping Report identified that based on the alignment of the scope of work to achieve the outcomes of Activity A with those of the RMPU process, implemented through OBMP PE 2, the outcomes of Activity A can be accomplished as part of the existing RMPU process, which is updated at least every five years as required by the Court. Thus, implementation of the scope of work characterized in the Scoping Report and summarized in Exhibit 6 will result in the completion of the required 2023 RMPU, including obtaining consensus on its objectives, developing an implementation and financing plan, preparing the report, and implementing recharge projects. These outcomes are required by Watermaster to ensure that the yield of the basin is maintained and that the supplemental recharge capacity is sufficient to meet Replenishment Obligations. Although not required, the next (or a future) RMPU process could accomplish the objectives of Activity A by updating the project selection criteria and considering projects that will meet other needs of the Parties, such as providing additional recharge capacity for Storage and Recovery Programs or addressing pumping sustainability issues.

Based on the scope of work and alignment with the existing PE 2 implementation actions, there are no new implementation actions recommended for inclusion in the 2020 OBMP Update to accomplish Activity A.

2.2.2 Activity B - Develop, implement, and optimize Storage and Recovery Programs

Section 5.2 of the Peace Agreement states that "Watermaster shall prioritize its efforts to regulate and condition the Storage and Recovery of water developed in a Storage and Recovery Program for the mutual benefit of the Parties to the Judgment and give first priority to Storage and Recovery Programs that provide broad mutual benefits." For this and other reasons, the Parties desire to develop "optimized" Storage and Recovery Programs that avoid potential MPI and provide broad benefits, such as increased water-supply reliability, protected or enhanced Safe Yield, improvements to water quality, and reduced cost of OBMP implementation.

The objective of Activity B is to prepare a Storage and Recovery Program guidance document in a collaborative setting that clearly articulates the specific objectives of the Parties and the required benefits to be realized from Storage and Recovery Programs. Implementation of the scope of work described in the Scoping Report and summarized in Exhibit 7 will result in: (1) consensus on the objectives and desired benefits of Storage and Recovery programs, (2) conceptual descriptions of various types of Storage and Recovery programs that achieve the defined objectives and benefits and are consistent with the *2020 Storage Management Plan*, (3) reconnaissance-level project designs and operating plans and the costs of the Storage and Recovery Program alternatives, and (4) the development of a *Storage and Recovery Program Master Plan* that will support the design of Storage and Recovery Programs that are consistent with the *2020 Storage Management Plan* and the Peace Agreement. Watermaster deems the development of a *Storage and Recovery Program Master Plan* a necessary outcome so that Watermaster is able to review, condition, and approve Storage and Recovery Program applications in a manner that is consistent with the Peace Agreement.

Based on the scope of work, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity B are:

- Develop a *Storage and Recovery Master Plan* to support the design of optimized Storage and Recovery Programs that are consistent with the 2020 Storage Management Plan and to provide the Watermaster with criteria to review, condition, and approve applications in a manner that is consistent with the Judgment and the Peace Agreement.

2.2.3 Activity CG - Identify and implement regional conveyance and treatment projects/programs and optimize the use of all water supply sources

The stakeholders have identified basin management challenges, such as land subsidence and poor water quality, that could limit their ability to fully exercise their pumping rights using existing infrastructure. Thus, the Activity CG objectives are to optimize the use of all sources of water available to the Parties to meet their demands despite these basin management challenges and to potentially help mitigate these challenges. Implementation of the scope of work characterized in the Scoping Report and summarized in Exhibit 8 will result in (1) a plan that describes the universe of water reliability concerns of the Parties, the opportunities and limitations of existing/planned infrastructure to meet the reliability goals, conceptual project designs and operating plans, and the costs of the reliability alternatives; and (2) implementation of the selected reliability project(s). As identified in the Scoping Report, the Activity CG scope of work is effectively the same as the IEUA's existing Integrated Water Resources Plan (IRP) process that addresses water supply reliability for its member agencies. Activity CG is an expansion that would address the water supply reliability concerns of all Parties to the Judgment. Currently, IEUA is preparing its 2020 IRP and other related planning efforts with its member agencies, which could be expanded by others to include neighboring agencies including Three Valleys Municipal Water District (TVMWD), Western Municipal Water District (WMWD), or others. To create a coordinated planning effort, any of these agencies could lead and coordinate the collaborative regional effort on behalf of the Parties.

Although this activity optimizes the management of all water supplies in the Chino Basin, Watermaster does not deem these outcomes necessary for administration of the Physical Solution or compliance with other Watermaster or regulatory requirements.

Based on the scope of work, and considering its overlap with IEUA planning efforts, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity CG are:

- The IEUA, the TVMWD, the WMWD, and/or other Party acting as a coordinating agency will establish and/or expand integrated water resources planning efforts to address water supply reliability for all Watermaster Parties.
- Watermaster will support the IEUA, TVMWD, WMWD, and/or others in their efforts to improve water supply reliability to ensure those efforts are integrated with Watermaster's groundwater management efforts.

2.2.4 Activity D - Maximize the reuse of recycled water produced by the IEUA and others

The objective of Activity D is to maximize the reuse of recycled water produced by the IEUA and other publicly owned treatment works (POTWs) in proximity to the Chino Basin to meet future demands and improve local water-supply reliability, especially during dry periods. Expanded reuse activities could include direct non-potable reuse (landscape irrigation or industrial uses), artificial recharge by spreading and/or injection (indirect potable reuse), and direct potable reuse. Increasing recycled water reuse is an integral part of the OBMP goal to enhance water supplies. The direct use of recycled water increases the availability of native and imported waters for higher-priority beneficial uses. And, the Judgment states that Watermaster shall give high priority to maximizing the beneficial use of recycled water for replenishment purposes (Judgment ¶ 49(a)). Implementation of the scope of work characterized in the Scoping Report and summarized in Exhibit 9 will result in (1) a plan that describes the objectives for optimizing and maximizing recycled water reuse, the demand and opportunities for increased recycled water reuse, the impacts of recycled water reuse and required mitigation, conceptual project designs and operating plans, and the costs of the reuse project alternatives; and (2) implementation of the selected recycled water reuse project(s).

As identified in the Scoping Report, the scope of work is similar to the IEUA's existing planning efforts for the IRP and Chino Basin Program (CBP) on behalf of its member agencies. These efforts, or similar future efforts, could be expanded by others to include neighboring agencies, including the TVMWD, the WMWD, or others. To create a coordinated planning effort, any of these agencies could lead and coordinate the collaborative regional effort to maximize recycled water reuse on behalf of the Parties.

Although this activity maximizes the management of recycled water supplies in the Chino Basin, Watermaster does not deem these outcomes necessary for administration of the Physical Solution or compliance with other Watermaster or regulatory requirements. However, any expansion of recycled water reuse would be subject to Watermaster review to ensure compliance with the maximum benefit SNMP.

Based on the scope of work, and considering its overlap with IEUA planning efforts, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity D are:

- IEUA, the TVMWD, the WMWD, and/or other Party acting as a coordinating agency will expand future recycled water reuse planning efforts to maximize the reuse of all available sources of recycled water.
- Watermaster will support the IEUA, TVMWD, WMWD, and/or others in their efforts to maximize recycled water reuse to ensure these efforts are integrated with Watermaster's groundwater and salinity management efforts.

2.2.5 Activity EF - Develop and implement a groundwater-quality management plan to address contaminants of emerging concern

Groundwater contaminants are present across the Chino Basin, new contaminants are being discovered, and water-quality regulations are evolving and becoming more restrictive. These trends threaten to limit the beneficial use of groundwater and increase the cost of the water supply. The objectives of Activity EF are to characterize the water-quality challenges across the Chino Basin and identify the most efficient means to address these challenges, including the potential for multi-benefit collaborative projects to ensure that groundwater is put to beneficial use. Implementation of the scope of work described in the Scoping Report and summarized in Exhibit 10 will result in (1) the development and implementation of initial and long-term emerging contaminants monitoring plans, (2) a water-quality assessment of the Chino Basin that characterizes the need for a groundwater-quality management plan, and (3) the development and implementation of a *Groundwater-Quality Management Plan*. The *Groundwater-Quality Management Plan* would document the most current water-quality assessment, the long-term monitoring and analysis plan, the reconnaissance-level engineering designs and operating plans for alternative water quality improvement projects, the selected project(s) for implementation, and an implementation plan.

As previously noted, the Judgment provides Watermaster the discretion to develop an OBMP that includes both water quantity and water quality considerations. A *Groundwater-Quality Management Plan* would provide the Parties with the comprehensive data and information, including best practices for monitoring, required to understand and manage the future water-quality challenges that could impact the Parties' ability to fully utilize their pumping rights. Hence, Watermaster deems the outcomes of Activity EF as required for administration of the Physical Solution.

Based on the scope of work, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity EF are:

- Develop and implement an initial emerging contaminants monitoring plan.

- Prepare a water quality assessment of the Chino Basin to evaluate the need for a Groundwater Quality Management Plan.
- Develop and implement a long-term emerging contaminants monitoring plan.
- Develop and implement a Groundwater Quality Management Plan.

2.2.6 Activity K - Develop a management strategy within the maximum-benefit salt and nutrient management plan to ensure compliance with recycled water recharge dilution requirements

Watermaster and the IEUA are co-permittees for the Chino Basin maximum-benefit SNMP incorporated in the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan). The maximum-benefit SNMP was developed pursuant to PE 7 (see Section 3.2.7 for additional details) to enable the recharge and reuse of recycled water planned in PEs 2 and 5. It defines the management actions that Watermaster and IEUA must take to manage total dissolved solids (TDS) and nitrate concentrations in Chino Basin groundwater and in the IEUA's recycled water and the TDS and nitrate concentration limitations for recycled water reuse activities. The objective of Activity K is to determine if compliance with the recycled water recharge dilution requirements defined in Watermaster and the IEUA's maximum-benefit SNMP can be achieved under existing management plans and, if not, to develop a plan to achieve compliance. Implementation of the scope of work described in the Scoping Report and summarized in Exhibit 11 will result in (1) the periodic characterization and understanding of the ability to comply with the TDS and nitrate dilution requirements in the short- and long-term; and if non-compliance is projected, (2) a plan that describes the conceptual designs, operating plans, and costs of alternative salt-offset programs or projects, and (3) implementation of the selected salt-offset program or projects. Because the maximum-benefit SNMP is an explicit requirement of Basin Plan, these are required outcomes for Watermaster and the IEUA to continue the recycled water recharge program.

Based on the scope of work, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity K are:

- Periodically prepare TDS and nitrate concentration projections to evaluate compliance with the maximum benefit SNMP dilution requirements, and, if necessary, based on the outcome of the evaluation, prepare a plan and schedule to implement a salt-offset compliance strategy.

2.2.7 Activity L – Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance requirements

Watermaster conducts data-collection programs and prepares reports and data deliverables to comply with regulations, to fulfill its obligations under its agreements and Court orders, to comply with its requirements under CEQA, and to assess the performance of OBMP Implementation. The objective of Activity L is to refine the monitoring and reporting requirements of Watermaster to ensure that the objectives of each requirement are being met efficiently at a minimum cost. Implementation of the Activity L scope of work described in the Scoping Report and summarized in Exhibit 12 will result in (1) the comprehensive review of all monitoring/reporting programs in an open stakeholder process, (2) the development and periodic update of an *OBMP Monitoring and Reporting Work Plan*, and (3) potential revisions to Watermaster's non-discretionary monitoring and reporting programs. Watermaster is required to implement the monitoring and reporting programs to comply with the Judgment and other regulations and obligations; however, these specific outcomes are not required.

Based on the scope of work, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity L are:

- Perform review and update of Watermaster's regulatory and Court-ordered monitoring and reporting programs and document them in a work plan: *OBMP Monitoring and Reporting Work Plan*.
- Perform periodic review and update of *the OBMP Monitoring and Reporting Work Plan* and modify the monitoring and reporting programs, as appropriate.

If the above implementation actions are not initiated by the Parties, Watermaster staff and the Watermaster engineer would continue their existing process to periodically review and refine Watermaster's monitoring and reporting efforts to meet all requirements and achieve efficiencies.

3.0 Integration of the 2020 OBMP Update Activities with the 2000 OBMP Program Elements

3.1 Nexus of the 2020 OBMP Update Activities to the 2000 OBMP Program Elements

Through the process of defining the scopes of work to achieve the desired outcomes of the 2020 OBMP Update Activities, it became apparent that the 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. Exhibit 13 is a matrix that demonstrates the nexus between the PEs (rows) and the activities (columns) based the PE objectives (listed in Section 1.1 herein) and the objectives of the 2020 OBMP Update Activities (described in Section 2.2 herein). The matrix is symbolized with anchors and dots. Anchors indicate a direct relationship between an activity and a PE (i.e. the activity and the PE have similar or identical objectives and thus the activity can be integrated into the existing PE). Dots indicate an indirect relationship between an activity and a PE (i.e. the activity has the potential to provide benefits to PEs).

Based on this finding, the nine PEs defined in the 2000 OBMP will be retained for the 2020 OBMP Update. Each of the seven activities, and the associated implementation actions, was mapped to the PE to which it is anchored in Exhibit 13. Based on the need for ongoing activities under the exiting PE and the new activities defined by the stakeholders, the implementation actions were modernized and updated.

3.2 OBMP Program Elements – Progress and Ongoing Management Actions

For each of the nine PEs, this section describes the objectives and implementation actions of the PE as established in 2000, implementation progress since 2000, and ongoing management activities, including the new actions to be incorporated in the 2020 OBMP, as identified in Section 2.2 of this report.

3.2.1 Program Element 1. Develop and Implement Comprehensive Monitoring Program

The 2000 OBMP included PE 1—*Develop and Implement Comprehensive Monitoring Program* —to provide the information necessary to support the implementation of all other OBMP PEs and to evaluate their performance. The types of monitoring programs called for by PE 1 in the OBMP included:

- Groundwater-level monitoring
- Groundwater-quality monitoring
- Groundwater-production monitoring
- Surface-water discharge and quality monitoring (including managed artificial recharge)
- Ground-level monitoring
- Well construction, abandonment, and destruction

The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table 1 below. Each implementation action in Table 1 is categorized as a one-time or ongoing action, and the right-most column of the table indicates if the action was implemented.

Table 1. Program Element 1 – Implementation Actions Defined in the 2000 OBMP*

Implementation Actions and Schedule	One-time/ Ongoing	Implemented?
Years 1 through 3		
*Perform initial tasks to survey sites and design and set up all long-term monitoring programs for groundwater level, groundwater quality, ground level, surface water, and recharge monitoring programs.	One-time	✓
Complete initial meter installation program for overlying agricultural pool.	One-time	✓
Develop agreements with county and state agencies regarding notification of new well drilling. Well construction and related information will be requested as new wells are constructed. Prepare and update a list of abandoned wells and coordinate with the counties to ensure that abandoned wells are destroyed properly.	One-time	✓
Years 4 through 50		
*Start and continue all groundwater level, groundwater production, groundwater quality, ground level (including remote sensing), surface water, and well construction/destruction monitoring programs. Key wells should be relocated as necessary.	Ongoing	✓

**Note: Actions marked with "*" are combined from multiple actions in the OBMP Implementation Plan.*

3.2.1.1 Implementation Progress since 2000

Watermaster began implementing its monitoring programs as part of the development of the OBMP. Pursuant to the OBMP Implementation Plan, long-term plans for monitoring groundwater production, groundwater level, groundwater quality, ground level (including remote sensing), surface water, and well construction/destruction monitoring programs have been developed, implemented, and updated as necessary.

The monitoring programs have evolved over time to ensure that the data and information acquired not only meet the OBMP requirements, but also other regulatory requirements and Watermaster obligations under agreements, Court orders, and CEQA. In some instances, the monitoring programs were expanded to satisfy new basin-management initiatives and regulations. In other instances, the scope of the monitoring programs has been reduced with periodic reevaluation and redesign to achieve the monitoring objectives at reduced cost. Table 2 below is a list of each Watermaster monitoring and reporting requirement and the entities that require the monitoring and reporting. The Scoping Report provides a comprehensive overview of the status of the monitoring programs as of 2018.

Watermaster developed a centralized environmental database to store, manage, and visualize its datasets. Data management includes a detailed quality assurance and quality control protocol. The database and the database-management procedures ensure the quality and accuracy of the data, allow for efficient data exploration and analysis, and include standardized reports and data exports in formats for regulatory data deliverables or further analysis (e.g. creation of model input files).

Table 2. Watermaster Monitoring and Reporting Requirements

Monitoring and Reporting Requirement	Requiring Entity					
	Court	State Board	Regional Board	California DFW	California DWR	CEQA
Water Rights Compliance Annual Reports		X		X		
SGMA Annual Report for Adjudicated Basins					X	
Biannual Evaluation of the Cumulative Effect of Transfers	X					
Biannual Evaluation of the Balance of Recharge and Discharge	X					
Annual Finding of Substantial Compliance with the Recharge Master Plan	X					
Annual Report of Compliance with SB 88 and SWRCB Regulations for Measurement and Reporting of Diverted Surface Water		X				
Safe Yield Recalculation	X					
Recharge Master Plan Update (RMPU)	X					
State of the Basin Report	X					
California Statewide Groundwater Elevation Monitoring Program (CASGEM)					X	
Chino Basin Maximum Benefit Annual Report			X			
Annual Report of the Prado Basin Habitat Sustainability Committee						X
Water Recycling Requirements for the Chino Basin Recycled Water Groundwater Recharge Program			X			
Annual Report of the Ground-Level Monitoring Committee	X					
OBMP Semi-Annual Status Reports	X					

3.2.1.2 Ongoing implementation actions for the 2020 OBMP

The following summarizes each of the Watermaster's monitoring and data-collection programs that need to continue to be implemented to satisfy the requirements of the OBMP and the other requirements summarized in Table 2 above. Section 4.1 of this report summarizes the 2020 OBMP Management Plan for PE 1.

Groundwater-production monitoring. Watermaster uses groundwater-production data to quantify and levy assessments pursuant to the Judgment. Estimates of production are also essential inputs to recalibrate Watermaster's groundwater flow model, which is used to inform the recalculation of Safe

Yield, evaluate the state of Hydraulic Control, perform MPI evaluations, and support many other Watermaster initiatives. Members of the Appropriative and Overlying Non-Agricultural Pools and CDA record their own meter data and submit them to Watermaster. For Agricultural Pool wells, Watermaster performs a field program to install totalizing flow meters, repair or replace broken meters, and visit the wells quarterly to record the metered data. Watermaster has determined that for some Agricultural Pool wells it is not practical to repair, replace or install new meters. In these cases, Watermaster applies a water-duty based method to estimate production on an annual basis.

Groundwater-level monitoring. Watermaster's groundwater-level monitoring program supports many Watermaster management functions, including: groundwater model development and recalibration, periodic recalculations of Safe Yield, evaluating the cumulative impacts of transfers and the balance of recharge and discharge, subsidence management, MPI evaluations, estimation of storage change, other scientific demonstrations required for groundwater management, and many regulatory requirements, such as the demonstration of Hydraulic Control, the triennial recomputation of ambient water quality, and Prado Basin habitat sustainability. The monitoring program includes field monitoring programs implemented by Watermaster staff at private wells and monitoring wells, and cooperative programs to compile and store data from well owners and other entities managing monitoring programs, including municipal water agencies, private water companies, the California Department of Toxic Substance Control (DTSC), the County of San Bernardino, and various private consulting firms. To continue to support assessments of Hydraulic Control, and other analyses, it is anticipated that new monitoring wells will need to be constructed to replace the currently monitored private wells that will be lost as land is converted from agricultural uses to urban uses.

Groundwater-quality monitoring. Watermaster's groundwater-quality monitoring program supports many Watermaster management and regulatory-compliance functions, including: compliance with the maximum benefit SNMP, characterization of non-point source contamination and plumes associated with point-source discharges, support for ground-water modeling, characterization of groundwater/surface-water interactions in the Prado Basin area, and characterization of basin-wide trends in groundwater quality as part of the Watermaster's biennial State of the Basin report. The monitoring program includes field monitoring programs implemented by Watermaster staff at private wells and monitoring wells, and cooperative programs to compile and store data from well owners and other entities managing monitoring programs (see examples noted for groundwater-level monitoring). To continue to support the triennial ambient water quality recomputation, and other analyses, it is anticipated that new monitoring wells will need to be constructed to replace the currently monitored private wells that will be lost as land is converted from agricultural uses to urban uses.

Surface-water and climate monitoring. Watermaster's surface-water and climate monitoring program supports many Watermaster management functions, including: groundwater model development and recalibration, periodic recalculations of Safe Yield, evaluating the cumulative impacts of transfers and the balance of recharge and discharge, MPI evaluations, recharge master planning, evaluating Prado Basin habitat sustainability, and evaluating compliance with the SWRCB diversion permits, the maximum benefit SNMP, and the recycled-water recharge permits. Most of the datasets are collected from publicly available sources, including POTW discharge data, USGS stream gaging station data, and precipitation and temperature data measured at public weather stations or downloaded from spatially gridded datasets. Chino Basin stormwater, imported water, and recycled water recharge data are collected by the IEUA and shared with Watermaster. Watermaster staff also performs field surface water monitoring of the Santa Ana River in compliance with the maximum-benefit SNMP.

Ground-level monitoring. Watermaster's ground-level monitoring program is conducted pursuant to the *Chino Basin Subsidence Management Plan*. The ground-level monitoring program consists of high-

frequency, groundwater level monitoring at wells, monitoring of the vertical component of aquifer system compression and expansion at Watermaster extensometer facilities, and measurement of horizontal ground-surface deformation across areas that are experiencing differential land subsidence by electronic distance measurements (EDMs) to understand the potential threats and locations of ground fissuring.

Biological monitoring. Watermaster's biological monitoring program is conducted pursuant to the adaptive monitoring program (AMP) for the Prado Basin Habitat Sustainability Program (PBHSP). The objective of the PBHSP is to ensure that the groundwater-dependent ecosystem in Prado Basin will not incur unforeseeable significant adverse impacts due to implementation of the Peace II Agreement. The monitoring program produces a time series of data and information on the extent and quality of the riparian habitat in the Prado Basin over a historical period that includes both pre- and post-Peace II implementation. Two types of monitoring and assessment are performed: regional and site-specific. Regional monitoring and assessment of the riparian habitat is performed by mapping the extent and quality of riparian habitat over time using multi-spectral remote-sensing data and air photos. Site-specific monitoring performed in the Prado Basin includes field vegetation surveys and seasonal ground-based photo monitoring.

Water-supply and water-use monitoring. Watermaster compiles water supply and water-use data from the Parties to support two required reporting efforts: the Watermaster Annual Report to the Court and annual reporting requirements for adjudicated basins pursuant to the Sustainable Groundwater Management Act (SGMA). The data are also used to support calibration of Watermaster's surface water and groundwater models. Monthly water use volumes for supply sources other than Chino Basin groundwater are collected from the Parties; this includes groundwater from other basins, recycled water, imported water, and native surface water.

Planning information. Watermaster periodically collects and compiles information on the Parties' best estimates of their future demands and associated water supply plans. The data are used for future planning investigations that require the use of Watermaster's surface and groundwater models, such as Safe Yield recalculations and RMP updates. These data include:

- Water demands and water-supply plans of the Watermaster Parties:
  i. Projected total water demand
  ii. Projected amount of each water supply by source to meet the projected water demand
  iii. Monthly distribution of water supplies used to meet the demand
  iv. Projected groundwater pumping at each existing well and future planned wells
  v. Groundwater pumping schedules (i.e. well use priorities and capacities)
  vi. Pumping capacities, required pumping combinations, and sustainable pumping levels (pumping sustainability metric) at each well
- Assumptions for how:
  i. Managed storage will be used to meet Replenishment Obligations
  ii. Lands currently in agricultural uses will be converted to urban uses
  iii. Additional potential conservation above that currently required for new land development
- Future projections of location and magnitude of stormwater and supplemental water recharge

Well construction, abandonment, and destruction. Watermaster maintains a database on wells in the basin and performs periodic well inspections. Sometimes, Watermaster staff identifies a new well while implementing its monitoring programs. Well owners must obtain permits from the appropriate county

and state agencies to drill a well and to put the well in use. Watermaster has developed cooperative agreements with the State Water Board's Division of Division Water (DDW) and the Counties of Los Angeles, Orange, Riverside, and San Bernardino to ensure that the appropriate entities know that a new well has been constructed. Watermaster staff makes best efforts to obtain well design information, lithologic and geophysical logs, groundwater level and quality data, and aquifer stress test data.

The presence of abandoned wells is a threat to groundwater supply and a physical hazard. Watermaster staff periodically reviews its database, makes appropriate inspections, consults with well owners, maintains a list of abandoned wells in the Chino Basin, and provides this list to the counties for follow-up and enforcement. The owners of the abandoned wells are requested to properly destroy their wells following the ordinances developed by the county in which they are located.

3.2.2 Program Element 2. Develop and Implement Comprehensive Recharge Program

The 2000 OBMP included PE 2–*Develop and Implement Comprehensive Recharge Program*—to reverse the loss of yield caused by urbanization and the concrete lining of natural streams overlying the Chino Basin. PE 2 is also meant to ensure that there will be enough supplemental water recharge capacity available to Watermaster to meet Replenishment Obligations.

The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table 3 below. Each implementation action in Table 3 is categorized as a one-time or ongoing action, and the right-most column of the table indicates if the action was implemented.

Table 3. Program Element 2 – Implementation Actions Defined in the 2000 OBMP

Implementation Action	One-time/ Ongoing	Implemented?
Years 1 through 3		
Watermaster advisory committee will form an ad-hoc committee to coordinate with CBWCD and SBCFCD.	One-time	✓
Implement all high priority recharge projects that involve only re-operation of existing recharge/flood control facilities.	One-time	✓
Complete the RMP.	One-time	✓
Complete design and construction of early action recharge projects identified in the first year of the implementation of the OBMP.	One-time	✓
Years 4 through 50		
By year 5 implement all high priority projects that involve construction and re-operation at existing facilities.	One-time	✓
Implement all other recharge projects based on need and available resources.	Ongoing	✓
Update the comprehensive recharge program every five years.	Ongoing	✓

3.2.2.1 Implementation Progress since 2000

The objectives and scope of each RMPU are defined at the beginning of each update and are derived from several guiding documents: the Peace Agreement, the Peace II Agreement, and the Special Referee's

December 2007 Report. Pursuant to these guiding documents, the general objectives of the RMPU are to ensure there is enough recharge capacity and supplemental water available to meet future replenishment requirements, to balance the recharge and discharge in every area and subarea, to maximize the recharge of recycled and storm waters where feasible, and to protect or enhance Safe Yield. To meet these objectives, the RMPUs must consider and address recharge requirement projections, the availability of storm and supplemental waters for recharge and replenishment, and the physical means to satisfy these recharge projections. To the extent that new or modified facilities are required to meet the objectives, the RMPUs include a schedule for the planning, design, and construction of recharge improvements. The 2001 Recharge Master Plan and subsequent RMPUs (2010, 2013, and 2018) were developed in open and transparent planning processes that were convened by Watermaster through an ad-hoc committee. As part of the *2013 Amendment to the 2010 RMPU* (2013 RMPU), the RMPU Steering Committee, now referred to as the Recharge Investigations and Projects Committee (RIPComm), was created to assist Watermaster and the IEUA in preparing RMPUs. The RIPComm is open to all interested stakeholders and meets regularly through the development of RMPUs. The outcomes of the 2001 Recharge Master Plan and subsequent RMPUs (2010, 2013, and 2018) are summarized below:

- 2001 Recharge Master Plan: Watermaster, in collaboration with the IEUA, constructed the first set of recharge facilities to exercise its rights pursuant to its diversion permits, increasing average annual stormwater recharge by about 9,500 afy. As part of this work, Watermaster and the IEUA modified seventeen existing flood retention facilities to increase diversion rates, conservation storage, and recharge, and constructed two new recharge facilities. The cost of these recharge improvements was about $60 million. The IEUA and Watermaster paid for about half of this cost, while the other half was funded through Proposition 13 grants and other grant programs.
- 2010 RMPU and 2013 Update: As of this writing, Watermaster and the IEUA are completing the final design/construction of five of the recommended 2013 RMPU facilities, and they should be online in 2021. These facilities are expected to increase stormwater recharge by about 4,700 afy.[12]
- 2018 RMPU: The 2018 RMPU did not recommend any new recharge projects. One of the findings of the 2018 recharge master plan update was that Watermaster has enough supplemental water recharge capacity to it meet its Replenishment Obligations via wet-water recharge through 2050.

Upon completion of the 2013 RMPU facilities, the annual average stormwater recharge performed pursuant its diversion permits is expected to be about 14,950 afy.[13] Thus, in the first 20 years of OBMP implementation, stormwater recharge will have increased by about 14,150 afy, and supplemental water recharge capacity will have increased by 27,600 afy. And, the IEUA has increased the recharge of recycled water from about 500 afy in 2000 to about 16,000 afy in 2018. The next RMPU must be completed and submitted to the Court by October 2023.

3.2.2.2 Ongoing implementation actions for the 2020 OBMP

The RMPU process is an ongoing requirement of the 2000 OBMP Implementation Plan. The next RMPU is due to the Court by October 2023 and must be updated no less frequently than every five years thereafter. As identified in Activity A, the Parties have expressed interest in maximizing the recharge of recycled, imported, and storm waters where feasible. Although meeting these objectives is not a requirement for

[12] Note that Watermaster completed its 2018 RMPU in October 2018, but no projects were selected for implementation.

[13] WEI (2018). Recharge Master Plan Update. September 2018. http://www.cbwm.org/docs/engdocs/2018%20RMPU/20180914_2018_RMPU_final.pdf

the RMPU, the next (or a future) RMP process could accomplish the objectives of Activity A by considering projects that will meet other needs of the Parties, such as providing additional recharge capacity for Storage and Recovery Programs or addressing pumping sustainability issues. As summarized below and described in further detail in the Scoping Report, there are opportunities and challenges for increasing these efforts in the future:

- The theoretical average annual stormwater discharge available for diversion under the existing water rights permits is about 74,000 afy (ranging from 21,400 to 110,500 afy for the combined permitted diversions) and the annual average stormwater recharge performed pursuant to these permits is expected to be about 14,950 afy. The difference between these two values, about 60,000 afy, is a lost opportunity for stormwater recharge. Improvements to existing facilities and operations and/or new facilities are required to achieve the stormwater recharge potential.
- New recharge facilities and/or improvements to existing facilities may be needed if Parties want to increase supplemental water recharge.
- Based on Watermaster and the IEUA's existing economic selection criteria (projects are selected for implementation only if the melded unit cost of stormwater recharge resulting from the projects is less than the avoided unit cost of purchasing imported water from the Metropolitan Water District of Southern California [Metropolitan]), no new recharge projects were recommended for implementation in the 2018 RMPU. If the Parties desire to develop a list of projects that will increase recharge in the basin, the economic criteria for selecting projects needs to be reevaluated.
- Finally, the criteria on how and where to conduct recharge needs to be updated to more effectively address existing basin management issues, including: land subsidence, maintaining Hydraulic Control, and pumping sustainability. Historically, Watermaster has attempted to manage the recharge of storm and supplemental water to promote the balance of recharge and discharge. This method of managing recharge does not specifically address current basin management issues, such as existing land subsidence in Management Zone 1 (MZ-1) and parts of MZ-2 and pumping sustainability issues in the Jurupa Community Services District (JCSD) and CDA well fields. There is a need to define additional criteria on how and where to conduct recharge to better address existing basin management issues.

Thus, during the scoping phase of the next RMPU, the Parties should determine if the economic and physical criteria for project evaluation should be revaluated to accomplish Activity A.

Section 4.2 of this report summarizes the 2020 OBMP Management Plan for PE 2.

3.2.3 Program Element 3. Develop and Implement a Water Supply Plan for Impaired Areas

The 2000 OBMP included PE 3—*Develop and Implement a Water Supply Plan for Impaired Areas*—to maintain and enhance Safe Yield and maximize beneficial uses of groundwater. The OBMP recognized that urban land uses would ultimately replace agricultural land uses, which had been the primary land use in the southern portion of the basin throughout the 20th century, and that if municipal pumping did not replace agricultural pumping, groundwater levels would rise and discharge to the Santa Ana River. The potential consequences would be the loss of Safe Yield and the outflow of high-TDS and -nitrate groundwater from the Chino Basin to the Santa Ana River—the latter of which could impair downstream beneficial uses in Orange County. The OBMP estimated that to maintain the Safe Yield, approximately 40,000 afy of groundwater would need to be produced to replace Agricultural Pool pumping in the southern part of the basin. The Chino Basin Desalters were identified as the optimal multi-benefit project to replace the expected decrease in agricultural production to maintain or enhance Safe Yield, to pump

and treat high-salinity groundwater in support of PE 7, to meet growing municipal demands in support of PE 5, and to protect the beneficial uses of the Santa Ana River. Additionally, PE 6 envisioned that the Chino Basin Desalters could also be used to clean up the volatile organic compound (VOC) plumes that would eventually be intercepted by the Desalter wells.

The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table 4 below. Each implementation action in Table 4 is categorized as a one-time or ongoing action, and the right-most column of the table indicates if the action was implemented.

Table 4. Program Element 3 – Implementation Actions Defined in the 2000 OBMP

Implementation Action	One-time/ Ongoing	Implemented?
Years 1 through 3		
Complete the Water Facilities Plan Report for the Expansion of the Chino I Desalter and the construction of the Chino II Desalter. It should be noted that this action is entirely consistent with the OBMP, and is being taken prior to completion of the OBMP.	One-time	✓
Start expansion of the Chino I Desalter and the construction of the Chino II Desalter in early 2001.	One-time	✓
Years 4 through 50		
Complete construction and start up of the expanded Chino I and new Chino II Desalters.	One-time	✓
Watermaster, IEUA and WMWD will periodically review the Regional Water Supply Plan and the need for new Desalter capacity in the southern water-quality impaired part of the Basin, and initiate the construction of new Desalter capacity as determined by Watermaster. Expansion of the Desalter capacity will occur as agricultural production in the southern water-quality impaired part of the basin declines.	Ongoing	✓

3.2.3.1 Implementation Progress since 2000

The OBMP established that desalter production would ultimately need to be increased to 40,000 afy to protect Safe Yield. The Peace Agreement provided for the expansion of the Chino I Desalter to a design capacity of up to 14 mgd (15,700 afy) and the construction of the Chino II Desalter, with a capacity of 10 mgd. The Parties executed the Peace II Agreement in 2007, which included a supplement to the OBMP Implementation Plan to expand the Chino Desalter pumping to 40,000 afy (36 mgd) and introduce Re-operation.

The construction and operation of the Chino Basin Desalters also became a fundamental component of the Chino Basin maximum-benefit SNMP developed pursuant to PE 7.[14] Watermaster and the IEUA are jointly responsible for the implementation of the maximum benefit SNMP, which enables the recycled-water reuse and recharge programs in the Chino Basin in support of PEs 2 and 5. The SNMP includes nine "maximum-benefit commitments." One commitment is the achievement and attainment of Hydraulic

[14] Refer to Section 3.2.7 of this report for a complete overview of the maximum-benefit SNMP.

Control to limit groundwater outflow from the Chino-North Groundwater Management Zone (GMZ) to *de minimis* levels to protect downstream beneficial uses. Hydraulic Control is also necessary to maximize the Safe Yield. The operation of the Chino Basin Desalters is necessary to attain Hydraulic Control. Three of the nine maximum-benefit commitments are related to the design and construction of the Chino Basin Desalters.

As of the writing of this report, there are 31 Chino Desalter wells with the capacity to pump about 34 mgd (37,600 afy) of brackish groundwater from the southern portion of the Chino Basin, though not all wells are currently in operation. Pumped groundwater is conveyed to two treatment facilities (the Chino-I and Chino-II Desalters) that treat the groundwater with reverse osmosis and ion exchange. The treated water is then delivered to a conveyance system that serves the CDA's member agencies. The brine created in the treatment process is discharged to the Inland Empire Brine Line. Over the last five years, total desalter production has ranged from about 28,100 to 30,000 afy, averaging 29,200 afy. The following describes the history of the expansion of the Chino Basin Desalters:

- The Chino-I Desalter, which included 11 production wells, began operating in 2000 with a design capacity of 8 million gallons per day (mgd; about 9,000 afy).
- In 2005, the Chino-I Desalter capacity was expanded to 14 mgd (about 16,000 afy) with the construction of three additional wells.
- The Chino-II Desalter, which included eight production wells, began operating in June 2006 with a design capacity of 15 mgd (about 17,000 afy).
- In 2012, the CDA completed construction of the Chino Creek Well Field (CCWF) in the western portion of the basin which added five wells and additional capacity of about 1.3 mgd (1,500 afy) to the Chino-I Desalter; four of these wells began pumping between 2014 and 2016.
- In 2015, two additional Chino-II Desalter wells were constructed, and pumping began in 2018. These two wells, plus one additional well that is planned for construction, are part of the final expansion of the Chino Basin Desalters to meet the 40,000 afy pumping requirement of the OBMP, Peace Agreements, and maximum benefit SNMP. This final expansion is expected to be completed by 2021.

The Chino Basin Desalters are also being used to support the clean-up of point-source contamination in the southern Chino Basin:

- Two of the Chino-II Desalter expansion wells and CDA Well I-11 will be pumped to capture groundwater contaminants from the South Archibald plume. The Chino-II Desalter, which will be modified to treat the volatile organic compounds (VOCs) associated with the plume (see Section 3.2.6).
- The use of two of the CCWF wells is being evaluated for use as part of the remediation solution for the Chino Airport plume; however, the evaluation of the remediation alternatives is ongoing (see Section 3.2.6).

3.2.3.2 Ongoing implementation actions for the 2020 OBMP

The capacity to pump the Chino Basin Desalter goal of 40,000 afy is expected to be achieved by 2021. Operation at this capacity, once all agricultural land uses have converted to urban uses, would fulfill the objectives of PE 3. As previously noted, the operation of the Chino Basin Desalters is necessary to attain Hydraulic Control, which is a regulatory requirement of the maximum benefit SNMP. Thus, the ongoing

implementation actions for the 2020 OBMP related to the operation of the Chino Basin Desalters are included under PE 7 (see Sections 3.2.7 and 4.7).

3.2.4 Program Element 4. Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1

The 2000 OBMP included PE 4—*Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1*—to characterize land subsidence spatially and temporarily, identify its causes, and, where appropriate, develop and implement a program to manage it. The 2000 OBMP identified pumping-induced decline of groundwater levels and subsequent aquifer-system compaction as the most likely cause of the land subsidence and ground fissuring observed in the southwestern portion of MZ-1 in the early 1990s. PE 4 recognized that the occurrence of land subsidence and ground fissuring in MZ-1 is not acceptable and should be reduced to tolerable levels or stopped.

PE 4 called for the development and implementation of an interim management plan 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, and formulate a long-term management plan to prevent future subsidence and fissuring or reduce it to tolerable levels.

The implementation actions for PE 4 that were incorporated into the 2000 OBMP Implementation Plan are summarized in Table 5 below. Each implementation action in Table 5 is categorized as a one-time or ongoing action and the right-most column of the table indicates if the action was implemented.

Table 5. Program Element 4 – Implementation Actions Defined in the 2000 OBMP

Implementation Action	One-time/ Ongoing	Implemented?
Years 1 through 5		
Arrange for the physical recharge of 6,500 afy of Supplemental Water at MZ1 spreading facilities. Evaluate for the continued need after FY2004-05.	Ongoing	✓
Convene a MZ1 technical committee to develop a recommended interim management plan to minimize subsidence while data is collected and a long-term subsidence management plan is developed.	One time	✓
Implement the interim management plan, including appropriate monitoring, annual assessment of data from monitoring programs, and modification of monitoring programs, if necessary.	One time	✓
Develop a long-term subsidence management plan.	One time	✓
Implement the long-term subsidence management plan and adapt if necessary.	Ongoing	✓
Years 6 through 50		
Assess data from the monitoring program every three years and modify the subsidence management plan, if necessary.	Ongoing	✓
Implement the long-term subsidence management plan and adapt if necessary.	Ongoing	✓

3.2.4.1 Implementation Progress since 2000

Supplemental Water Recharge

Since the development of the OBMP, Watermaster has exercised best efforts to arrange for the physical recharge of 6,500 afy of supplemental water at the MZ-1 spreading facilities. And, pursuant to the Peace II Agreement, Watermaster committed to continue the physical recharge of at least 6,500 afy of supplemental water as an annual average through the term of the Peace Agreement.

Subsidence Management Plan

From 2001 to 2005, Watermaster developed, coordinated, and conducted the *MZ-1 Interim Monitoring Program* (IMP)[15] under the guidance of the MZ-1 Technical Committee. The MZ-1 Technical Committee was comprised of representatives from all major MZ-1 producers and their technical consultants, including the Agricultural Pool; the Cities of Chino, Chino Hills, Ontario, Pomona, and Upland; the Monte Vista Water District; the Golden State Water Company; and the California Institution for Men (CIM).

The IMP consisted of three main monitoring elements for use in analyzing subsidence: ground-level surveys, remote-sensing (InSAR), and aquifer-system monitoring. The ground-level surveys and InSAR analyses were used to characterize vertical ground motion. Aquifer-system monitoring of hydraulic and mechanical changes within the aquifer-system was used to characterize the causes of aquifer-system deformation.

The IMP was implemented in two phases: the Reconnaissance Phase and the Comprehensive Phase.

1. The Reconnaissance Phase consisted of constructing 11 piezometers screened at various depths at Rubin S. Ayala Park (Ayala Park) in the City of Chino and installing pressure transducer data-loggers in nearby pumping wells and monitoring wells to measure hydraulic head. Following installation of the monitoring network, several months of aquifer-system monitoring and testing were conducted. Testing included aquifer-system stress tests at pumping wells in the area.
2. The Comprehensive Phase consisted of constructing a dual-borehole pipe extensometer at Ayala Park (Ayala Park Extensometer), near the area of historical fissuring. Following installation of the Ayala Park Extensometer, two aquifer-system stress tests were conducted, followed by passive aquifer-system monitoring.

The IMP provided enough information for Watermaster to develop "Guidance Criteria" for the MZ-1 Parties that, if followed, would minimize the potential for subsidence and fissuring in the investigation area. The methods, results, and conclusions of the IMP, including the Guidance Criteria, were described in detail in the *MZ-1 Summary Report*.[16] The Guidance Criteria formed the basis for the long-term management plan, documented as the *MZ-1 Subsidence Management Plan* (MZ-1 Plan),[17] which was prepared under the guidance of the MZ-1 Technical Committee. To minimize the potential for future subsidence and fissuring in the Managed Area, the MZ-1 Plan recommended that the MZ-1 Parties manage

[15] Chino Basin Watermaster. (2003). *Optimum Basin Management Program, Management Zone 1 Interim Monitoring Program*. Prepared by Wildermuth Environmental, Inc. January 8, 2003.

[16] Chino Basin Watermaster. (2006). *Optimum Basin Management Program, Management Zone 1 Interim Monitoring Program, MZ-1 Summary Report*. Prepared by Wildermuth Environmental, Inc. February, 2006. http://www.cbwm.org/docs/engdocs/Land%20Subsidence/20071017_MZ1_Plan%20--%20Appendix_A_MZ1_SummaryReport_20060226.pdf

[17] Chino Basin Watermaster. (2007). *Chino Basin Optimum Basin Management Program, Management Zone 1 Subsidence Management Plan*. October, 2007. http://www.cbwm.org/docs/engdocs/Land%20Subsidence/20071017_MZ1_Plan.pdf

their groundwater pumping pursuant to the Guidance Criteria. The MZ-1 Plan was approved by the Watermaster Board in October 2007 and the Court in November 2017.

Implementation of the MZ-1 Plan began in 2008. The MZ-1 Plan called for the continuation of monitoring, data analysis, annual reporting, and adjustments to the MZ-1 Plan, as warranted by the data. Additionally, the MZ-1 Plan expanded monitoring of the aquifer-system and land subsidence into other areas of the Chino Basin where the IMP indicated concerns for future subsidence and ground fissuring. These so-called "Areas of Subsidence Concern" are: Central MZ-1, Northwest MZ-1, Northeast Area, and Southeast Area.

The MZ-1 Plan described the following potential expanded investigation: (1) more intensive monitoring of horizontal strain across the zone of historical ground fissuring to assist in developing management strategies related to fissuring, (2) injection feasibility studies within the Managed Area, (3) additional pumping tests to refine the Guidance Criteria, (4) computer-simulation modeling of groundwater flow and subsidence, and (5) the development of alternative pumping plans for the MZ-1 Parties affected by the MZ-1 Plan. The MZ-1 Technical Committee (now called the Ground-Level Monitoring Committee or GLMC) discussed these potential future efforts, and if deemed prudent and necessary, they were recommended to Watermaster for implementation. Watermaster and the MZ-1 Parties have performed work to implement (1), (2), and (4) above, but have not performed work on (3) and (5).

The MZ-1 Plan stated that if data from existing monitoring efforts in the Areas of Subsidence Concern indicate the potential for adverse impacts due to subsidence, Watermaster would revise the plan to avoid those adverse impacts. The 2014 Annual Report of the GLMC[18] recommended that the MZ-1 Plan be updated to better describe Watermaster's land subsidence efforts and obligations, including areas outside of MZ-1. As such, the update included a name change to the *2015 Chino Basin Subsidence Management Plan* (Subsidence Management Plan)[19] and a recommendation to develop a subsidence management plan for Northwest MZ-1. Land subsidence in Northwest MZ-1 was first identified as a concern in 2006 in the MZ-1 Summary Report and again in 2007 in the MZ-1 Plan. Since then, Watermaster has been monitoring vertical ground motion in this area via InSAR and groundwater levels with pressure transducers at selected wells.

Of particular concern is that subsidence across the San Jose Fault in Northwest MZ-1 has occurred in a pattern of concentrated differential subsidence—the same pattern of differential subsidence that occurred in the Managed Area during the time of ground fissuring. Ground fissuring is the main subsidence-related threat to infrastructure. Because of the threat for ground fissuring, Watermaster increased monitoring efforts in Northwest MZ-1 beginning in FY 2012/13 to include ground elevation surveys and EDMs to monitor ground motion and the potential for fissuring.

In 2015, the GLMC developed the *Work Plan to Develop a Subsidence Management Plan for the Northwest MZ-1 Area* (Work Plan).[20] The Work Plan is an ongoing Watermaster effort and includes a description of a

[18] WEI. (2015). *2014 Annual Report of the Ground-Level Monitoring Committee*. July 2015. http://www.cbwm.org/docs/engdocs/2014%20Final%20Report%20-%20Ground%20Level%20Monitoring%20Committee/Final_2014_Annual%20Report_July2015.pdf

[19] Chino Basin Watermaster. (2015). *Chino Basin Subsidence Management Plan.* July 23, 2015. http://www.cbwm.org/docs/engdocs/Land%20Subsidence/20150724%20-%20Chino%20Basin%20Subsidence%20Management%20Plan%202015/FINAL_2015_CBSMP.pdf

[20] Chino Basin Watermaster. (2015). *Work Plan, Develop a Subsidence-Management Plan for the Northwest MZ-1 Area.* July 23, 2015. http://www.cbwm.org/docs/engdocs/Land%20Subsidence/20150724%20-%20Chino%20Basin%20Subsidence%20Management%20Plan%202015/FINAL_CBSMP_Appendix_B.pdf

multi-year scope-of-work, a cost estimate, and an implementation schedule. The Work Plan was included in the Subsidence Management Plan as Appendix B. Implementation of the Work Plan began in 2015.

Pursuant to the Subsidence Management Plan, each year, Watermaster has produced the *Annual Report of the GLMC* that contains the results of ongoing monitoring efforts, interpretations of the data, and recommended adjustments to the Subsidence Management Plan, if any. The annual report includes the results and interpretations for the data collected during the prior year as well as recommendations for Watermaster's ground-level monitoring program for the subsequent fiscal year. The Watermaster publishes the annual reports on its website. The most recent annual report was finalized in October 2019.

3.2.4.2 Ongoing implementation actions for the 2020 OBMP

Supplemental Water Recharge

Pursuant to the Peace II Agreement, Watermaster will continue to arrange for the physical recharge of at least 6,500 afy of Supplemental Water in MZ-1 as an annual average through the term of the Peace Agreement.

Subsidence Management Plan

The Chino Basin will always be susceptible to the future occurrence of land subsidence and ground fissuring, so Watermaster will continue to implement the Subsidence Management Plan pursuant to PE 4, which includes:

- Conducting the ground-level monitoring program pursuant to the Subsidence Management Plan and the recommendations of the GLMC (The monitoring program includes the monitoring of groundwater pumping, recharge, groundwater levels, aquifer-system deformation, and vertical and horizontal ground motion across the western portion of the Chino Basin. The then-current description of the ground-level monitoring program is always included in each Annual Report of the GLMC [third bullet below]).
- Convening the GLMC annually to review and interpret the data from the ground-level monitoring program.
- Preparing annual reports of the GLMC that include recommendations for changes to the monitoring program (The annual report describes recommended activities for the monitoring program for the future fiscal year[s] in the form of a proposed scope-of-work, schedule, and budget. The recommended scope-of-work, schedule, and budget is run through Watermaster's budgeting process for revisions [if needed] and approval. The final scope-of-work, schedule, and budget for the upcoming fiscal year is included in the final annual report.)
- A key element of the Subsidence Management Plan is the verification of its protective nature against land subsidence and ground fissuring in the Chino Basin. This verification is accomplished through continued monitoring, testing, and reporting by the GLMC (as described above), and revision of the Subsidence Management Plan when appropriate. In this sense, the Subsidence Management Plan is adaptive. (The process of annual data analysis and reporting includes the evaluation of the effectiveness of the Subsidence Management Plan to minimize or stop land subsidence and ground fissuring and, if warranted by the data, a recommendation to update the Subsidence Management Plan. The GLMC will make these recommendations within its annual reports and prepare a draft revised Subsidence Management Plan that will be run through the Watermaster process for revisions and/or approval. Upon Watermaster Board approval, the revised Subsidence Management Plan will be submitted to the Court.)

3.2.5 Program Element 5. Develop and Implement Regional Supplemental Water Program

The 2000 OBMP included PE 5—*Develop and Implement Regional Supplemental Water Program*—to improve regional conveyance and the availability of imported and recycled waters throughout the basin. The OBMP recognized that water demands of the Parties would increase. The demand projections at the time estimated that water demands would reach 348,000 afy by 2000 and increase to 418,000 afy by 2020. The increase was assumed to be driven by municipal and industrial demands. Agriculture demands were expected to decrease from about 48,000 afy in 2000 to 8,000 afy by 2020. The OBMP also recognized the limitations to the traditional supplies, such as imported water from Metropolitan, and the need to find alternative supplies such as recycled water.

The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table 6 below. Each implementation action in Table 6 is categorized as a one-time or ongoing action and the right-most column of the table indicates if the action was implemented.

Table 6. Program Element 5 – Implementation Actions Defined in the 2000 OBMP

Implementation Action	One-time/ Ongoing	Implemented?
Years 4 through 50		
IEUA will construct recycled water facilities to meet the demand for recycled water and for replenishment.	Ongoing	✓

It should be noted that early in the development of the PE 5 implementation plan, the stakeholders discussed the development of a regional water facilities plan that, when implemented, would enable the Parties to maximize the use of imported water in years when Metropolitan has surplus water and to be able to rely completely on local supplies during years when Metropolitan supplies are low or completely interrupted due to planned or catastrophic outages. This plan involved the construction of new wells and groundwater treatment and regional conveyance improvements; the water produced in this plan would be used exclusively by the Parties. The stakeholders ultimately did not include this plan in the 2000 OBMP Implementation Plan, preferring at that time to focus on expanding groundwater desalting in the lower Chino Basin (PE 3), increasing stormwater recharge (PE 2), and implementing a large-scale recycled water program to maximize its reuse (PEs 2 and 5).

3.2.5.1 Implementation Progress since 2000

Although the water demands of the Parties increased at a slower rate than projected when the OBMP was developed, Watermaster and the IEUA have aggressively pursued programs to improve water supply reliability through the implementation of PEs 2, 3, and 5. Since 2000, the IEUA has constructed and operated a recycled water conveyance system throughout the basin, enabling it to provide recycled water to its member agencies. The IEUA owns and operates four wastewater treatment facilities: Regional Plant No. 1 (RP-1), Regional Plant No. 4 (RP-4), Regional Plant No. 5 (RP-5), and the Carbon Canyon Water Reclamation Facility (CCWRF). Recycled water produced by these plants is used for direct uses, groundwater recharge, and discharged to Chino Creek or Cucamonga Creek, which are tributaries to the Santa Ana River. Historically, the IEUA's operating plan has prioritized the use of recycled water as follows: (1) to meet the IEUA's discharge obligation to the Santa Ana River (17,000 afy), (2) to meet direct reuse demands for recycled water, and (3) to recharge the remaining recycled water.

Although recycled water had been reused since the 1970s, the growth of the IEUA's recycled water reuse programs started in 1997, and in 2005 the OBMP enabled the IEUA's recycled water reuse program to be

aggressively expanded. When the OBMP was completed in 2000, the IEUA was recharging about 500 afy of recycled water and utilizing about 3,200 afy for non-potable direct uses. The incorporation of Watermaster and the IEUA's maximum benefit SNMP into the Basin Plan in 2004 triggered the ability to rapidly increase recycled water reuse. Over the last five years, the annual direct reuse of recycled water ranged from 17,000 afy to 24,600 afy and averaged 20,600 afy. And, the annual recycled water recharge ranged from 10,800 to 13,900 afy and averaged 13,000 afy.

The recycled water provided by the IEUA has replaced a like amount of groundwater and imported water that would have otherwise been used for non-potable purposes. Much of the post-2000 increase in supplemental water storage in the Chino Basin is attributable to the increased availability and recharge of recycled water.

3.2.5.2 Ongoing implementation actions for the 2020 OBMP

Recycled Water Reuse

The IEUA is continuing to expand its recycled-water distribution system and recharge facilities throughout the Chino Basin for direct non-potable uses and recharge. Growth is still occurring in the Chino Basin and will result in additional wastewater flows to the IEUA's treatment plants. Much of this supply will be used to meet increasing non-potable demands as the currently remaining agricultural land uses convert to urban uses.

The IEUA is currently performing planning efforts for the CBP, which is a large Storage and Recovery Program to provide for regional, dry-year water supplies and associated infrastructure. The CBP was conditionally awarded approximately $207 million of Proposition 1 Water Storage Investment Program funding. Over its 25-year project life, the CBP would increase recycled water recharge in the Chino Basin by 15,000 afy, and during dry years, the water in storage would subsequently be recovered and pumped into Metropolitan's system for use in Southern California in lieu of imported water from the State Water Project. The planned sources of recycled water for the CBP are currently being evaluated by the IEUA, but it is certain additional supplies beyond those produced by the IEUA will be needed. Thus, the objective to maximize the reuse of recycled water produced by the IEUA and others as envisioned by Activity D is currently being pursued by the IEUA on behalf of the Parties and with the support of Watermaster and other regional entities.

As part of the CBP, the IEUA, together with regional agencies, is developing a significant body of work to evaluate opportunities to acquire the surplus recycled water supplies needed for the CBP. The CBP is still undergoing planning and evaluation, and its implementation is not certain. If the CBP is not implemented, the significant body of work developed by the IEUA can be leveraged to support future planning efforts to maximize recycled water reuse in a manner that is consistent with the Judgment and the maximum-benefit SNMP.

Water Reliability

In addition to the efforts to maximize recycled water reuse, the IEUA and its member agencies are currently preparing the 2020 IRP, which will serve as a regional implementation strategy for long-term water resources management within the IEUA's service area. The objective of the IRP is to identify the facilities needed to ensure that the IEUA's water supplies over the next 25 years are reliable, cost-effective, and environmentally responsible.

As described in the Scoping Report, the total water demand of the Chino Basin Parties is projected to grow from about 290,000 afy in 2015 to about 420,000 afy by 2040, an increase of about 130,000 afy. The projected growth in water demand by the Appropriative Pool Parties drives the increase in aggregate

water demand as some Appropriative Pool Parties are projected to serve new urban water demands created by the conversion of agricultural and vacant land uses to urban uses, a similar challenge observed during the development of PEs 3 and 5 in the 2000 OBMP. Table 7 below shows the historical (2015) and projected aggregate water demand and supply plan for all Parties by water source.

Table 7. Aggregate Water Supply Plan for Watermaster Parties: 2015 to 2040[21]

Water Source	2015 (Actual)	2020	2025	2030	2035	2040
Volume (af)						
Chino Basin Groundwater	147,238	145,904	153,804	157,716	168,987	176,652
Non-Chino Basin Groundwater	51,398	55,755	63,441	64,999	66,691	68,483
Local Surface Water	8,108	15,932	15,932	18,953	18,953	18,953
Imported Water from Metropolitan	53,784	86,524	93,738	100,196	102,166	109,492
Other Imported Water	8,861	9,484	10,095	10,975	11,000	11,000
Recycled Water for Direct Reuse	20,903	24,008	24,285	26,583	29,836	33,223
Total	**290,292**	**337,607**	**361,295**	**379,422**	**397,633**	**417,803**
Percentage						
Chino Basin Groundwater	51%	43%	43%	42%	42%	42%
Non-Chino Basin Groundwater	18%	17%	18%	17%	17%	16%
Local Surface Water	3%	5%	4%	5%	5%	5%
Imported Water from Metropolitan	19%	26%	26%	26%	26%	26%
Other Imported Water	3%	3%	3%	3%	3%	3%
Recycled Water for Direct Reuse	7%	7%	7%	7%	8%	8%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Each of the water sources available to the Chino Basin Parties listed has its limitations:

- The ability to produce groundwater from the Chino Basin is limited by current basin management issues, such as ongoing land subsidence in MZ-1 and parts of MZ-2, pumping sustainability issues in the JCSD and CDA well field areas, and water quality.
- The challenges to imported water include reliability of its supply and infrastructure and the local capacity to treat it for municipal supply
- The reliability of non-Chino Basin groundwater depends on water quality, water rights, and infrastructure to convey it to a Parties' water systems.
- The reliability of local surface water depends on the hydrologic characteristics of the individual supplies, water quality, water rights, and infrastructure to convey it from points of diversion to a Party's water system.

[21] Sourced from: WEI. (2018). *Storage Framework Investigation*. October 2018; revised January 2019. https://cbwm.syncedtool.com/shares/folder/9abb162877b999/?folder_id=1429

- The challenges to maximizing the reuse of recycled water include: the timing of recycled water availability and complying with the maximum benefit SNMP and water quality regulations.

In addition to the challenges to specific water sources, climate change is likely to result in higher temperatures, longer dry periods, and shorter more intense wet periods, which can ultimately affect the availability and management of all water supply sources. For example, shorter more intense precipitation periods are expected to result in reduced recharge, and longer dry periods are expected to result in reduced imported water supplies (as occurred with State Water Project supplies in the recent drought from 2013 to 2016). And, many of the challenges are interrelated and compounding. For example, the reliability of imported water (and other non-groundwater supplies) not only affects the imported water supply but also the groundwater supplies that are dependent on imported water for blending.

As previously mentioned, the IEUA is currently developing the 2020 IRP, which will serve as a foundational regional implementation strategy for long-term water resources management within IEUA's service area and can be expanded by the Chino Basin Parties for the benefit of the region. Although the TVMWD and WMWD member agencies and Watermaster are participants in the development in the 2020 IRP, the current planning effort could be expanded to address regional reliability and to enhance integration with Watermaster's groundwater management efforts.

3.2.6 Program Element 6. Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management

The 2000 OBMP included PE 6—*Develop and Implement Cooperative Programs with the Regional Board and other Agencies to Improve Basin Management*—to assess water quality trends in the basin, to evaluate the impact of OBMP implementation on water quality, to determine whether point and non-point contamination sources are being addressed by water quality regulators, and to collaborate with water quality regulators to identify and facilitate the cleanup of soil and groundwater contamination.

The implementation actions for PE 6 incorporated into the 2000 OBMP Implementation Plan are summarized in Table 8 below. Each implementation action in Table 8 is categorized as a one-time or ongoing action and the right-most column of the table indicates if the action was implemented.

Table 8. Program Element 6 – Implementation Actions Defined in the 2000 OBMP

Implementation Action	One-time/ Ongoing	Implemented?
Years 1 through 3		
Watermaster will form an ad hoc committee, hereafter water quality committee. The schedule and frequency of the meeting will be developed with the Regional Board during the first year of OBMP implementation.	Both	✓
Watermaster will refine its monitoring efforts to support the detection and quantification of water quality anomalies. This may require additional budgeting for analytical staff/support.	One-time	✓
If necessary, Watermaster will conduct investigation to assist the Regional Board in accomplishing mutually beneficial objectives.	Ongoing	✓
Watermaster will seek funding from outside sources to accelerate detection and cleanup efforts.	Ongoing	✓
Years 4 through 50		
Continue monitoring coordination efforts with the Regional Board.	Ongoing	✓
Annually update priority list and schedule for cleaning up known water quality anomalies.	Ongoing	
Continue to seek funding from outside sources to accelerate cleanup efforts.	Ongoing	✓
Implement projects of mutual interest.	Ongoing	✓

3.2.6.1 Implementation Progress since 2000

During the development of the OBMP, Watermaster was conducting a multi-year comprehensive basin-wide water quality monitoring program (from 1999-2001) to sample every well possible to support the development and implementation of the OBMP. The comprehensive water quality monitoring program included collecting data from all Appropriators and cooperators in the Chino Basin and adjacent basins and performing monitoring at all private wells in the southern portion of the basin. During this time, Watermaster performed monitoring at 602 private wells. Data from this comprehensive water quality monitoring program established a baseline on the state of groundwater quality at the start of OBMP implementation. These data also became the foundation for achieving the objectives of PE 6: to assess water quality trends in the basin, to evaluate the impact of OBMP implementation on water quality, and to determine whether point and non-point contamination sources are being addressed by water quality regulators. Since 2000, Watermaster's groundwater quality monitoring efforts have continued in alignment with the Groundwater Quality Monitoring Program described in PE 1 and have been periodically refined as needed to support the detection and quantification of water quality anomalies and contaminants of concern, such as perchlorate, hexavalent chromium, and 1,2,3-trichloroethene (1,2,3-TCP). Watermaster has regularly assessed groundwater quality in the Chino Basin using data compiled

through its own monitoring at private production wells and dedicated monitoring wells and the monitoring efforts of others. Watermaster reports on water quality trends and findings in several reports, including the State of the Basin Reports, which are prepared and submitted to the Court every two years.

In 2003, the Water Quality Committee was convened to coordinate many of the activities performed under PE 6. The Committee met intermittently through 2010. The main activities of the Water Quality Committee included investigations to characterize and address point and non-point sources of groundwater contamination in the Chino Basin and collaboration with the Santa Ana Regional Water Quality Control Board (Regional Board) in its efforts to facilitate the cleanup of groundwater contamination. Some of the significant groundwater quality investigations performed under the guidance of the committee included: the characterization of groundwater contamination in MZ-3 near the former Kaiser Steel Mill and Alumax facilities, tracking studies on the source and extent of the Chino Airport plume, the identification of sources and responsible Parties for the South Archibald plumes, and the identification of the sources of legacy perchlorate contamination in groundwater throughout the basin. The investigations were coordinated through the Water Quality Committee for the Chino Airport and South Archibald plumes and contributed to the definitive identification of responsible Parties and the issuance of cleanup and abatement orders by the Regional Board.

Since 2010, Watermaster has continued to perform monitoring for contaminants related to point-source and non-point source contamination, to assist the Regional Board with the investigation and regulation of point source contaminant sites in the Chino Basin, and to prepare status reports on the monitoring and remediation of point-source contaminant sites in the basin. Periodic status reports have been prepared for: the Chino Airport and South Archibald plumes[22] and the General Electric (GE) Test Cell plume, the GE Flatiron plume, the former Kaiser Steel Mill Facility plume, the CIM plume, the Stringfellow plume, and the Milliken Landfill plume. Updated delineations of the spatial extent of the plumes in the Chino Basin are prepared every two years by Watermaster and are included in the plume status reports and biennial State of the Basin Reports.

Currently, the responsible Parties for the Chino Airport plume and South Archibald plume are initiating remedial strategies that include the use of the Chino Basin Desalters for pumping and treating the contaminated groundwater associated with these plumes. This use of the Chino Basin Desalters as a mutually beneficial project was recognized in the OBMP Implementation Plan as a potential management strategy and provides cost sharing benefits to all involved Parties. Additionally, the CDA and IEUA have acquired over $85 million in federal and state grant funds for the Chino Basin Desalter Phase III expansion project that is planned to be used for portions of the remediation of the Chino Airport and South Archibald plumes.

3.2.6.2 Ongoing implementation actions for the 2020 OBMP

Pursuant to the PE 6 implementation plan, Watermaster will continue to perform the following to ensure that point-source contamination is being adequately addressed: monitor water quality at monitoring wells and private wells within the basin and collect data from others to support the quantification of point-source contaminant plumes, prepare updated delineations of the plume extents for the biennial State of the Basin Reports, and track and report on the status of remediation in the recurrent plume status reports and other ad-hoc investigations as needed to support the Regional Board in their efforts to address

[22] Status reports for the Chino Airport and South Archibald plumes were prepared monthly in 2013; quarterly from 2014-2017; and semi-annually effective in 2018. Status reports for the other plumes and sites are prepared annually effective 2018.

groundwater contamination. Watermaster will also continue to support the Regional Board or other Parties to identify and implement mutually beneficial projects for addressing groundwater contamination cleanup and identify outside sources to finance the cleanup efforts, such as the funds awarded for the Chino Desalter expansion project. Watermaster will continue to characterize and report on water-quality since OBMP implementation in the biennial State of the Basin Reports using data collected for the PE 1 Groundwater Quality Monitoring Program.

While PE 6 in the 2000 OBMP Implementation Plan provides a strategy to support the Regional Board in its efforts to address groundwater contamination cleanup in the Chino Basin, there are emerging contaminants with regulatory water quality standards set by the DDW that can impact the beneficial uses of groundwater. As described in the Scoping Report for Activity EF, there are contaminants in groundwater that limit its direct use for drinking water supply. And, the enforceable drinking water standards developed by the DDW are continuously evolving and becoming more stringent as laboratory analytical technologies to detect contaminants are advancing. Hence, it is likely that new contaminants will be identified and regulated. The *Groundwater Quality Management Plan* envisioned for Activity EF is a refinement on PE 6 from the 2000 OBMP in that it is a proactive and basin-wide approach to address emerging contaminants to prepare the Parties for addressing compliance with new and increasingly stringent drinking water regulations, defined by the DDW.

3.2.7 Program Element 7. Develop and Implement Salt Management Plan

The 2000 OBMP included PE 7—*Develop and Implement Salt Management Plan*—to characterize current and future salt and nutrient conditions in the basin and to subsequently develop and implement a plan to manage them. Such a management strategy was necessary to address historical salt and nutrient accumulation from agricultural operations and to support the aggressive expansion of recycled water recharge and reuse envisioned in PEs 2 and 5.

The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table 9 below. Each implementation action in Table 9 is categorized as a one-time or ongoing action, and the right-most column of the table indicates if the action was implemented.

Table 9. Program Element 7 – Implementation Actions Defined in the 2000 OBMP

Implementation Action	One-time/ Ongoing	Implemented?
Years 1 through 3		
Develop salt budget goals, develop the salt budget tool and review all the OBMP actions.	One-time	✓
Watermaster will continue to monitor the nitrogen and salt management activities within the basin.	Ongoing	✓
Years 4 through 50		
As part of periodic updates of the OBMP, re-compute the salt budget using the salt budget tool. The salt budget tool will be used to reassess future OBMP actions to ensure the salt management goals are attained.	Ongoing	✓
Watermaster will continue to monitor the nitrogen and salt management activities within the basin.	Ongoing	✓

3.2.7.1 Implementation Progress since 2000

In 2002, recognizing that implementing the recycled water reuse program would require large-scale treatment and mitigation of salt loading under the then-current antidegradation objectives for TDS and nitrate defined in the Basin Plan, Watermaster and the IEUA petitioned the Regional Board to establish a maximum-benefit-based SNMP that involved (1) increasing the TDS and nitrate objectives for the Chino-North GMZ[23] to numerically higher values to enable maximization of recycled water reuse and (2) committing to a program of salt and nutrient management activities and projects ("maximum benefit commitments") that ensure the protection of beneficial uses of the Chino-North GMZ and downgradient waters (the Santa Ana River and the Orange County GMZ). The technical work performed to support the maximum-benefit SNMP proposal included the development and use of an analytical salt budget tool to project future TDS and nitrate concentrations in the Chino-North GMZ with and without the maximum-benefit SNMP. The maximum-benefit SNMP was incorporated into the Basin Plan by the Regional Board in January 2004.

Implementation of the maximum-benefit SNMP is a regulatory requirement of the Basin Plan. The requirement is also incorporated into Watermaster and the IEUA's recycled water recharge program permit (R8-2007-0039) and the IEUA's recycled water discharge and direct reuse permit (R8-2015-0021; NPDES No. CA 8000409). There are nine maximum-benefit commitments included in the Basin Plan and recycled water permits:

1. The development and implementation of a surface-water monitoring program
2. The development and implementation of a groundwater monitoring program
3. The expansion of the Chino-I Desalter to 10 mgd and the construction of the Chino-II Desalter with a design capacity of 10 mgd
4. The additional expansion of desalter capacity to a total capacity of 40 mgd pursuant to the OBMP and the Peace Agreement
5. The construction 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 milligrams per liter (mgl) for TDS and 8 mgl for total inorganic nitrogen (TIN)
7. The management of the basin-wide, volume-weighted TDS and nitrate concentrations of artificial recycled, storm, and imported waters to concentrations that are less than or equal to the maximum-benefit objectives as a five-year rolling average
8. The achievement and maintenance of the Hydraulic Control of groundwater outflow from the Chino Basin, specifically from the Chino-North GMZ, to protect the water quality of the Santa Ana River and downstream beneficial uses
9. The triennial recalculation of ambient TDS and nitrate concentrations of the Chino Basin GMZs

These commitments are all activities that were planned to be implemented under the OBMP through implementation actions within PEs 1, 2, 3, 5, and 7.

[23] The Chino-North GMZ has a maximum-benefit TDS objective of 420 mgl and is a combination of the Chino-1, Chino-2, and Chino-3 antidegradation GMZs that have lower TDS objectives, ranging from 250 to 280 mgl.

Watermaster and the IEUA are also required to prepare an annual report to the Regional Board on the status of implementation of the maximum-benefit commitments, including reporting of annual data collected through the monitoring program and assessments of compliance with the groundwater and recycled water-quality limits defined in the SNMP. If the maximum-benefit commitments are not implemented to the Regional Board's satisfaction, the antidegradation objectives would apply for regulatory purposes. The application of the antidegradation objectives would result in a finding of no assimilative capacity for TDS and nitrate in the Chino-North GMZ, and the Regional Board would require mitigation for all recycled water discharges to Chino-North that exceeded the antidegradation objectives retroactively to January 1, 2004. The retroactive mitigation for past discharges would be required to be completed within a ten-year period, following the Regional Board's finding that the maximum-benefit commitments were not met.

Watermaster has prepared and submitted annual reports to the Regional Board every year since 2005. As of the most recent annual report for CY 2018, Watermaster and the IEUA remain in compliance with all requirements of the maximum-benefit commitments.[24] A more detailed summary of the commitments and progress towards implementation is provided in Exhibit 14.

3.2.7.2 Ongoing implementation actions for the 2020 OBMP

Compliance with the maximum benefit commitments is an ongoing requirement of the Basin Plan. The ongoing actions to implement the maximum-benefit SNMP as currently defined in the basin, and thus PE 7, will include:

- Continue implementation of the surface and groundwater monitoring programs.
- Complete the expansion of the Chino Basin Desalter pumping capacity to 40,000 afy (expected in 2020).
- Maintain Hydraulic Control of the Chino-North GMZ through operation of the Chino Basin Desalters and other means, as necessary.
- Continue the storm and imported water recharge program to comply with recycled water recharge dilution requirements.
- Periodically analyze and report groundwater, surface water, and recycled water quality data to assess compliance with the metrics established in the maximum-benefit SNMP.
- Construct treatment and/or salt-offset facilities *if* one or more of the compliance metrics is exceeded.

There are three water-quality limitations and associated compliance metrics established in the maximum-benefit SNMP. When these metrics are exceeded, Watermaster and the IEUA must develop a plan and schedule to achieve compliance. The limitations, compliance metrics, and compliance actions are summarized in Exhibit 15.

The management actions for achieving compliance with the metrics once they are exceeded could include, but are not limited to: desalting recycled water to reduce TDS concentrations, increasing the recharge of low-TDS supply sources (storm or imported waters), or additional desalting of high-TDS groundwater as a salt offset.

With the exception of the ambient nitrate concentration of the Chino-North GMZ, which has exceeded the objective of 5.0 mgl since it was established in 2004, none of the other TDS and nitrate limitations

[24] WEI. (2019). *Optimum Basin Management Program Chino Basin Maximum Benefit Annual Report 2018*. April 2019.

have been exceeded. That said, the ambient TDS and nitrate concentrations in the Chino-North GMZ continue to increase due to legacy agricultural activities, recycled water reuse, and current irrigation practices. The current ambient TDS and nitrate concentrations are 360 and 10.3 mgl, respectively. Based on the rate of increase of the ambient TDS concentration since 1997, which has been about three mgl per year, the maximum-benefit objective of 420 mgl is not expected to be exceeded until about 2035.

More recently, the TDS concentration of recycled water has approached the compliance metric defined in commitment number 6. During the 2012 to 2016 drought, the 12-month running-average IEUA agency-wide TDS concentration in recycled water approached the 545 mgl action limit that would require the IEUA and Watermaster to submit a water-quality improvement plan and schedule. In analyzing the available data, the IEUA determined that the primary drivers for the increasing recycled water TDS concentration were the increase in the TDS concentration of the water supplies used by its member agencies and an increase of the TDS waste increment due to indoor water conservation. Similarly, drought conditions also threaten the ability to comply with the recycled water recharge dilution requirements. During drought conditions there is: a reduction in the amount of high-quality stormwater recharge, limited or no availability of imported water for recharge, an increase in the TDS concentrations of imported water, and a concomitant increase in the TDS concentrations of the recycled water. Not only are the two primary sources of low-TDS recharge water less available during drought periods, but the source water quality of municipal water supplies is also higher in TDS due to increases in imported water TDS and indoor water conservation practices. A more detailed discussion of this issue is provided in the Scoping Report. The Scoping Report discussion demonstrated the meaningful impact that drought has on compliance with the various recycled water quality metrics and indicates that climate change, which is expected to result in longer drier droughts, could potentially threaten future compliance with the limits.

Although the 12-month running-average IEUA agency-wide TDS concentration declined from the 2015 peak before reaching the 545 mgl action limit, it was an important indicator that the TDS concentration of recycled water is likely to approach or exceed the recycled water action limit during the next prolonged dry period and trigger the planning for recycled water quality improvements. In May 2017, recognizing the potential cost of implementing recycled water quality improvements for what might be only short-term exceedances of the action limit, Watermaster and the IEUA petitioned the Regional Board to consider updating the maximum-benefit SNMP to incorporate a revised compliance metric for recycled water TDS and nitrate specifically to allow a longer-term averaging period. The Regional Board agreed that an evaluation of the recycled water compliance metric is warranted and directed Watermaster and the IEUA to develop a technical scope of work to demonstrate the potential impacts of the revised compliance metric.

The primary objectives of the technical work to support the maximum-benefit SNMP and permit updates are: to develop and use an updated groundwater solute-transport model to evaluate the TDS and nitrate concentrations of the Chino Basin (e.g. a new salt-budget tool), to define alternative salinity management scenarios, and to project the future TDS and nitrate concentrations in the Chino Basin for each scenario. The results will be used to work with the Regional Board to develop a regulatory compliance strategy that potentially includes a new compliance metric based on a longer-term averaging period for recycled water TDS, contingent on the ongoing modeling and analysis efforts. The regulatory compliance strategy can also address any projected challenges in complying with the recycled water dilution requirements. The work began in September 2017 and is expected to be completed in 2020.

The Regional Board has indicated that in accepting any proposal to modify the recycled water compliance metrics, it will require Watermaster and the IEUA to add a new maximum-benefit commitment to the Basin Plan that involves updating the TDS and nitrate projections every five years. Thus, the need for the

proactive planning to achieve compliance, as envisioned by Activity K, is a required ongoing activity under PE 7 and the maximum-benefit SNMP.

3.2.8 Program Element 8. Develop and Implement Groundwater Storage Management Program *and* Program Element 9. Develop and Implement Storage and Recovery Programs

The Judgment recognized the existence of unused storage space within the Chino Basin that could be used to store water for subsequent beneficial use. The Judgment requires that the use of such storage capacity be undertaken only under Watermaster control and regulation to protect all stored water, to protect Safe Yield, and to avoid adverse impacts to groundwater pumpers. The Judgment prioritizes the use of storage space by the Parties over the use of storage space for the export of stored water.

The 2000 OBMP included two PEs to address the management and use of storage space:

> *Program Element 8. Develop and Implement Groundwater Storage Management Program*
>
> *Program Element 9. Develop and Implement Storage and Recovery Programs*

The objectives of PE 8 are (1) to develop and implement a storage management plan that prevents overdraft, protects water quality, and ensures equity among the Parties, and (2) to periodically recalculate Safe Yield. The objective of PE 9 is to develop Storage and Recovery Programs that benefit all Parties in the basin and ensure that basin waters and storage capacity are put to maximum beneficial use without causing MPI to any producer or the basin.

The OBMP storage management plan in PE 8 consists of managing groundwater production, replenishment, recharge, and storage such that total storage within the basin ranges from a low of 5,300,000 af to a high of 5,800,000 af. The following definitions are included in the OBMP Implementation Plan to describe the storage management plan:

- Operational Storage Requirement (OSR) is the storage or volume in the Chino Basin that is necessary to maintain the Safe Yield. The OSR was estimated in the development of the OBMP to be about 5.3 million af.[25]
- Safe Storage is an estimate of the maximum amount of storage space in the basin that can be used and not cause significant water-quality and/or high-groundwater related problems. Safe Storage was estimated in the development of the OBMP to be about 5.8 million af.
- SSC is the difference between Safe Storage and the OSR and is the storage space that can be safely used by producers and Watermaster for storage programs. Based on the above, the SSC is about 500,000 af, including water in existing storage accounts. The allocation and use of storage space in excess of the SSC will preemptively require mitigation; that is, mitigation must be defined and resources committed to mitigation prior to its allocation and use.

The Peace Agreement describes the actions, programs, and procedures Watermaster will take in performance of Storage and Recovery Programs (Section 5.2).

The implementation plan for PEs 8 and 9 were combined in the OBMP Implementation Plan. The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table

[25] This storage value was set as the estimated storage in the basin in 1997. See Page 2-11 of the OBMP Phase 1 Report.

10 below. Each implementation action is categorized as a one-time or ongoing action and the right-most column of the table indicates if the action was implemented.

Table 10. Program Elements 8 and 9 – Implementation Actions Defined in the 2000 OBMP

Implementation Action	One-time/ Ongoing	Implemented?
Years 1 through 3		
Evaluate the need to modify Watermaster UGRR regarding storage management plans and procedures.	One-time	✓
Determine the operational storage requirement and safe storage.	One-time	✓
Years 4 through 50		
Start assessing losses at 2% per year in year 2005. This amount will be subject to modification in future years.	Ongoing	✓
In year 2010/11 and every ten years thereafter, compute Safe Yield and storage loss rate for prior ten-year period, and reset Safe Yield and storage loss rates for the next ten-year period. Reassess storage management plan and modify Watermaster UGRR, if needed.	Ongoing	✓

3.2.8.1 Implementation progress since 2000 and ongoing implementation actions for the 2020 OBMP

Storage Agreements and Existing Managed Storage

Watermaster has developed rules and regulations, standard storage agreements, and related forms pursuant to the Judgment and Peace Agreement. There are three types of storage agreements that result in three types of storage accounts: Excess Carryover, Local Supplemental, and Storage and Recovery. An Excess Carryover account includes a Party's unproduced rights in the Safe Yield (Safe Yield for Overlying Non-Agricultural Pool Parties and Operating Safe Yield for Appropriative Pool Parties) and Basin Water acquired from other Parties through transfers. A local supplemental water account includes imported and recycled water that is recharged by a Party and similar water acquired from other Parties. A Storage and Recovery account includes supplemental water and is intended to produce a "broad and mutual benefit to the Parties to the Judgment." In evaluating applications for storage agreements, Watermaster conducts an investigation to determine if the water stored and recovered under a proposed storage agreement will cause potential MPI to a Party or the basin. If Watermaster determines that implementation of the proposed storage agreement will cause potential MPI, the applicant revises its application so there is no MPI, or Watermaster imposes conditions in the storage agreement to ensure there is no MPI. Watermaster cannot approve a storage agreement that will result in MPI.

The Parties, amongst themselves, are actively involved in water transfers of annual unproduced rights in the Safe Yield and water in their storage accounts. Watermaster has an application and review process for transfers that is similar to the storage agreement application process. Transfers are one way that the Parties recover water held in storage accounts.

A final SSC of 500,000 af was established in the OBMP Implementation Plan. The water occupying the SSC includes Carryover, and water stored in Excess Carryover and Local Supplemental Storage accounts. Water stored for Storage and Recovery Programs also occupies space in the SSC. Water in Carryover, Excess Carryover, local supplemental, and Storage and Recovery accounts are referred to collectively as "managed storage."

Watermaster tracks the puts, takes, losses, and end of year storage totals for all of these storage accounts, and reports on this accounting in the annual assessment process. Starting in 2005, pursuant to the Peace Agreement and OBMP IP, Watermaster began assessing losses in stored water at a rate of two percent per year. In February 2016, Watermaster changed the loss rate to 0.07 percent per year, based on the estimated groundwater discharge from the Chino-North GMZ to the Santa Ana River (a finding of the Safe Yield recalculation).

The only active Storage and Recovery Program in the basin is the Metropolitan Dry-Year Yield Program (DYYP). The DYYP can store up to 100,000 af with maximum puts of 25,000 afy and maximum takes of 33,000 afy. The DYYP Storage and Recovery agreement provides that puts and takes can exceed these values if agreed to by Watermaster (as was done in fiscal years 2018 and 2009, respectively). The agreement that authorizes the DYYP will expire in 2028.

Exhibit 16 summarizes the amount of water in managed storage by the Parties and for the DYYP. The total volume of water in managed storage as of June 30, 2019 was about 549,200 af, which includes about 46,000 af stored in the DYYP account. As previously stated, and described below, in 2017, the IEUA adopted an addendum to the Peace II SEIR that provided a temporary increase in the SSC to 600,000 af through June 30, 2021 and required Watermaster to update the storage management plan.

Safe Yield Reset

Starting in 2011, Watermaster began the technical effort to recalculate the Safe Yield of the basin, which at that time was set at 140,000 afy. This work involved updating the hydrogeologic conceptual model of the basin, updating the historical hydrology, updating and recalibrating numerical models that simulate the surface and groundwater hydrology of the Chino Basin area, and projecting the surface and groundwater response of the basin to future management plans that included storage management. Watermaster's methodology for calculating Safe Yield was approved by the Court in April 2017.

This work is documented in *2013 Chino Basin Groundwater Model Update and Recalculation of Safe Yield Pursuant to the Peace Agreement*[26] (hereafter, Safe Yield report). The results of that work yielded a reassessment of the hydrology of the basin from 1961 through 2011 and projections of basin hydrology through 2050, based on the best available planning information. And, based on the investigation results in the Safe Yield report, the Safe Yield was estimated to be 135,000 afy for the period 2011 to 2020.

The conclusions of the Safe Yield report related to storage management were:

- On July 1, 2000, the total water in storage in the basin was about 5,935,000 af, inclusive of about 236,000 af of managed storage. This is about 635,000 af greater than the OSR of 5,300,000 af that was established in the OBMP Implementation Plan.
- Managed storage was projected to increase from 487,000 af in 2016 to about 663,000 af by 2030 (exceeding the SSC by 163,000 af) and decline thereafter to zero af by 2051. Managed storage was projected to be used to meet future Replenishment Obligations.
- Total storage was projected to fall below the OSR of 5.3 million af in 2041.

[26] WEI. (2015). *2013 Chino Basin Groundwater Model Update and Recalculation of Safe Yield Pursuant to the Peace Agreement.* October 2015. http://www.cbwm.org/docs/engdocs/WEI%202013%20CBWM%20Recalculation%20Model%20Update/20151005_WEI_2013_CBWM_Recal_Model_Final_low.pdf

Based on these findings, Watermaster conducted an investigation to determine if the use of managed storage up to 663,000 af would cause potential MPI and concluded it would not. Subsequently, the IEUA adopted an addendum to the Peace II SEIR to temporarily increase the SSC to 600,000 through June 30, 2021 to enable Watermaster and the Judgment Parties to update the OBMP storage management plan.

The next effort to recalculate Safe Yield is currently underway, and Watermaster is using the same Court-approved methodology used in the Safe Yield report to recalculate Safe Yield for the period FY 2020/21 to FY2030/31.

2020 Storage Management Plan

The 2000 OBMP storage management plan is based on fixed storage volumes (e.g. the OSR and the Safe Storage), and its technical basis is not supported by new information available after the storage management plan was first developed. Review of the new information developed pursuant to the OBMP since 1999 indicates that it is possible to expand the SSC to enable greater use of storage space. This new information includes: an updated hydrogeologic conceptual model; 20 years of intensive monitoring of basin operations (not available in 1999), including monitoring the basin response as managed storage approached the SSC of 500,000 af; and groundwater model-based projections of the basin response to future management plans where the managed storage exceeded 500,000 af. Re-operation, which over time will reduce the amount of Basin Water in storage by 400,000 af, was not accounted for in the 2000 OBMP storage management plan.

New information developed since 1999 suggests that the use of managed storage to meet future desalter and other Replenishment Obligations could cause potential MPI and other adverse impacts: it has the potential to exacerbate land subsidence and pumping sustainability challenges, impact net recharge and Safe Yield, increase groundwater discharge through the CCWF and cause a loss of Hydraulic Control, and change the direction and speed of the contaminant plumes. Thus, Watermaster initiated a process to update the OBMP storage management plan to enable increased storage by the Parties and to include features that will ensure there is no MPI to a Party or the basin caused by the conjunctive-use activities of the Parties and Storage and Recovery Programs.

The *Storage Framework Investigation* (SFI) was completed in 2018 to the provide technical information required to update the storage management plan.[27] In the SFI, future projections of the use of managed storage were estimated and evaluated for potential MPI. The SFI projected that MPI and other adverse impacts could occur due to the implementation of prospective Storage and Recovery Programs and described potential facilities and operating concepts that, if implemented, would minimize potential MPI. The results of the SFI, together with the *Final 2020 Storage Management Plan White Paper,* [28] were used to inform the development of the *2020 Storage Management Plan* (SMP).

The Watermaster completed the 2020 SMP in February 2020, and it is included herein as Appendix D. The 2020 SMP includes the following provisions regarding the use of storage space in the basin:

- An aggregate amount of 800,000 af is reserved for the Parties' conjunctive-use operations (includes Carryover, Excess Carryover, and local supplemental accounts) and Metropolitan's DYYP. This amount is referred to as the "First Managed Storage Band" (FMSB).

[27] WEI. (2018). *Storage Framework Investigation – Final Report*. Prepared for the Chino Basin Watermaster. October 2018.

[28] WEI. (2019). *Final 2020 Storage Management Plan White Paper*. Prepared for the Chino Basin Watermaster. July 2019.

- The managed storage space between 800,000 and 1,000,000 af is reserved for Storage and Recovery Programs.
    - Storage and Recovery Programs that utilize the managed storage space above 800,000 af will be required to mitigate potential MPI and other adverse impacts as if the 800,000 af in the FMSB is fully used.
    - Renewal or extension of the DYYP agreement will require the DYYP to use storage space above the 800,000 af of the FMSB.

The 2020 SMP includes the following provisions specific to the Parties and Storage and Recovery Program:

- Watermaster will prioritize the use of spreading basins to satisfy Watermaster's recharge and Replenishment Obligations over the use of spreading basins for other uses.
- With regard to the storage management activities of the Parties:
    - Watermaster acknowledges transfers or leases of water rights and water held in managed storage (hereafter transfers) from Parties that are situated such that they pump groundwater outside of MZ-1 to Parties that pump in MZ-1 have the potential to cause potential MPI.
    - The reduction in net recharge caused by storage in the FMSB is an adverse impact, and Watermaster considers this adverse impact to be mitigated by the prospective calculation of Safe Yield.
- With regard to the Storage and Recovery Programs:
    - Puts and takes should be prioritized to occur in MZ-2 and MZ-3 to avoid new land subsidence and interfering with land subsidence management in MZ-1, to minimize pumping sustainability challenges, to minimize the impact of Storage and Recovery operations on solvent plumes, to preserve the state of Hydraulic Control, and to take advantage of the larger and more useful storage space in MZ-2 and MZ-3.
    - Watermaster will evaluate Storage and Recovery Programs to ensure that Hydraulic Control impacts due to a Storage and Recovery Program will be mitigated. The Storage and Recovery Program applicants must develop mitigation measures acceptable to Watermaster and include them in the Storage and Recovery Program agreements. Watermaster will periodically review and update the evaluation to require, as necessary, changes in the Storage and Recovery Program agreements to mitigate impacts on Hydraulic Control.
    - Watermaster will evaluate Storage and Recovery Program impacts, assess MPI and other adverse impacts (including, but not limited to land subsidence, pumping sustainability, reductions in Safe Yield, water-quality impacts, shallow groundwater, and liquefaction), and define mitigation requirements. The Storage and Recovery Program applicants must develop mitigation measures acceptable to Watermaster and include them in the Storage and Recovery Program agreements.
    - Watermaster will periodically review current and projected basin conditions and compare this information to the projected basin conditions prepared in the evaluation of the Storage and Recovery Program applications; compare the projected Storage and Recovery Program operations to actual Storage and Recovery Program operations; make findings regarding the efficacy of related mitigation of MPI and

other adverse impact requirements and measures in the Storage and Recovery Program storage agreements; and based on its review and findings, require changes in the Storage and Recovery Program agreements to mitigate MPI and adverse impacts.

- Watermaster will modify the existing *Form 8 Local Storage Agreements* to be consistent with an "evergreen agreement" paradigm and establish that the evergreen agreements will be valid for the duration of the Peace Agreement and will be automatically adjusted upon Watermaster's approval of each subsequent Assessment Package so long as the cumulative amount of water in storage is less than the quantity reserved for the Parties' conjunctive-use operations and Metropolitan's DYYP (cumulatively, the FMSB) and Watermaster has made no finding that MPI is threatened to occur as a result of the increase in the quantity of water in storage.
- Watermaster will periodically review and update the SMP at a frequency of no less than a once every five years, when the Safe Yield is recalculated, when it determines a review and update is warranted based new information and/or the needs of the Parties or the basin, and at least five years before the aggregate amount of managed storage by the Parties is projected to fall below 340,000 af.

4.0 2020 OBMP Update Management Plan

This section describes the recommended 2020 OBMP management plan for each of the nine PEs. The management plan is based on the ongoing activities of each PE described in Section 3 and includes the new implementation actions listed in Section 2 for each of the OBMP Update Activities. For each management plan, the implementation action items are assigned a general schedule over a 20-year implementation period, and the actions are characterized as one-time or ongoing. Additionally, for each PE, the entities responsible for implementation of the PE management actions are identified.

4.1 Program Element 1. Develop and Implement Comprehensive Monitoring Program

The objective of PE 1 is to collect the data and information necessary to support the implementation of all other OBMP PEs and to satisfy other regulations and Watermaster's obligations under its agreements, Court orders, and CEQA. Watermaster is responsible for the implementation of PE 1. The implementation actions and general schedule for implementation are summarized in Table 11 below.

Table 11. Program Element 1 – 2020 OBMP Management Plan

Implementation Action	One-time/ Ongoing
Years 1 through 3	
Watermaster will continue to conduct the required monitoring and reporting programs, including collection of: groundwater production, groundwater level, groundwater quality, ground level, surface water, climate, water supply planning, biological, and well construction/destruction monitoring data.	Ongoing
Perform review and update of Watermaster's regulatory and Court-ordered monitoring and reporting programs and document in a work plan: *OBMP Monitoring and Reporting Work Plan.*	One-time
Years 4 through 20	
Watermaster will continue to conduct the required monitoring and reporting programs pursuant to the *OBMP Monitoring and Reporting Work Plan* (or other guidance documents developed by Watermaster).	Ongoing
Perform periodic review and update of the *OBMP Monitoring and Reporting Work Plan* (or other guidance documents developed by Watermaster) and modify the monitoring and reporting programs, as appropriate.	Ongoing

4.2 Program Element 2. Develop and Implement Comprehensive Recharge Program

The objectives of PE 2 are to increase stormwater recharge to offset the recharge lost due to channel lining, to ensure there will be enough supplemental water recharge capacity available to Watermaster to replenish overdraft, and to maximize the recharge of recycled and supplemental waters to protect or enhance Safe Yield.

Watermaster, the IEUA, the Chino Basin Water Conservation District, and the SBCFCD are partners in conducting recharge in the Chino Basin and are jointly responsible for the implementation of PE 2. The implementation actions and general schedule for implementation are summarized in Table 12 below.

Table 12. Program Element 2 – 2020 OBMP Management Plan

Implementation Action	One-time/ Ongoing
Years 1 through 3	
Continue to convene the Recharge Investigations and Projects Committee.	Ongoing
Complete the 2023 Recharge Master Plan Update (RMPU).	One-time
Years 4 through 20	
Implement recharge projects based on need and available resources.	Ongoing
Continue to convene the Recharge Investigations and Projects Committee.	Ongoing
Update the RMPU no less than every five years (2028, 2033, 2038).	Ongoing

4.3 Program Element 3. Develop and Implement a Water Supply Plan for Impaired Areas

The objectives of PE 3 in the 2000 OBMP were to maintain and enhance Safe Yield and maximize beneficial uses of groundwater by constructing and operating the Chino Basin Desalters at an ultimate capacity of 40,000 afy. As described in Section 3.2.3, the final facilities to reach the ultimate capacity of 40,000 afy are under construction and are expected to be completed by 2021. Operation at this capacity, once all agricultural land uses have converted to urban uses, will fulfill the objectives of PE 3. Because the operation of the Chino Basin Desalters is necessary to attain Hydraulic Control, which is a regulatory requirement of the maximum benefit SNMP under PE 7, the implementation actions related to the ongoing operation of the Chino Basin Desalters are contained in PE 7. Thus, there are no separate implementation actions for PE 3 for the 2020 OBMP Update.

4.4 Program Element 4. Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1

The objective of PE 4 is to reduce or stop the occurrence of land subsidence and prevent ground fissuring in the Chino Basin or reduce it to tolerable levels. PE 4 achieves this objective by implementing the Watermaster's Subsidence Management Plan and updating the plan as warranted by data, analyses, and interpretations. Watermaster is responsible for the implementation of PE 4 with guidance from the GLMC.

The implementation actions for PE 4 and the general schedule for implementation are summarized in Table 13 below.

Table 13. Program Element 4 – 2020 OBMP Management Plan

Implementation Action	One-time/ Ongoing
Years 1 through 20	
Implement Watermaster's Subsidence Management Plan, and adapt it as necessary.	Ongoing
Watermaster will arrange for the physical recharge of at least 6,500 afy of Supplemental Water in MZ-1 as an annual average. Watermaster may re-evaluate the minimum annual quantity of Supplemental Water recharge in MZ-1 and may increase this quantity through the term of the Peace Agreement.	Ongoing

4.5 Program Element 5. Develop and Implement Regional Supplemental Water Program

The objective of this PE is to improve the regional conveyance and availability of imported and recycled waters throughout the basin. This is a basin-wide activity that involves the Parties, the IEUA, the TVMWD, and the WMWD. IEUA will continue to lead the efforts to maximize the reuse of IEUA recycled water in the Chino Basin. There are other current and forthcoming water supply reliability planning efforts by the IEUA, the Parties, and neighboring agencies that provide a prime opportunity to expand coordination and leverage the efforts for broad, regional benefit. Currently, the IEUA is preparing the 2020 IRP and conducting other related planning efforts with its member agencies. This effort could be expanded by neighboring agencies, including the TVMWD, the WMWD, or other Parties. Any of these agencies could lead and coordinate the collaborative, regional planning effort on behalf of the Parties. Watermaster would participate in the planning efforts, to ensure that any water supply or recycled water projects that are recommended for implementation are integrated with its groundwater management planning efforts and are consistent with the Judgment, Peace Agreements and other agreements, the Watermaster Rules and Regulations.

The implementation actions and general schedule for implementation are summarized in Table 14 below. Each action is categorized as one-time or ongoing.

Table 14. Program Element 5 – 2020 OBMP Management Plan

Implementation Action	One-time/ Ongoing
Years 1 through 20	
The IEUA will maximize the reuse of its recycled water in the Chino Basin.	Ongoing
The IEUA, the TVMWD, the WMWD, and/or other Party acting as a coordinating agency will establish or expand future recycled water planning efforts to maximize the reuse of all available sources of recycled water.	Ongoing
Watermaster will support the IEUA, the TVMWD, the WMWD, and/or others in their efforts to maximize recycled water reuse to ensure these efforts are integrated with Watermaster's groundwater and salinity management efforts.	Ongoing
The IEUA, the TVMWD, the WMWD, and/or other Party acting as a coordinating agency will establish or expand future integrated water resources planning efforts to address water supply reliability for all Watermaster Parties.	Ongoing
Watermaster will support the IEUA, the TVMWD, the WMWD, and/or others in their efforts to improve water supply reliability to ensure those efforts are integrated with Watermaster's groundwater management efforts.	Ongoing

4.6 Program Element 6. Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management

The objectives of PE 6 are to perform routine and coordinated water quality monitoring to characterize water quality in the Chino Basin so that there is adequate information to ensure that contamination sources are being addressed by water quality regulators and to help address compliance with new and increasingly stringent drinking water regulations for emerging contaminants established by the DDW.

The implementation actions and general schedule for implementation are summarized in Table 15 below.

Table 15. Program Element 6 – 2020 OBMP Management Plan

Implementation Action	One-time/ Ongoing
Years 1 through 3	
Re-convene the water quality committee and meet periodically to update groundwater quality management priorities.	Ongoing
Develop and implement an initial emerging contaminants monitoring plan.	One-time
Prepare a water quality assessment of the Chino Basin to evaluate the need for a Groundwater Quality Management Plan and prepare a long-term emerging contaminants monitoring plan.	One-time
Continue to support the Parties in identifying funding from outside sources to finance cleanup efforts.	Ongoing
Years 4 through 20	
Develop and implement a Groundwater Quality Management Plan and periodically update it.	Ongoing
Implement long-term emerging contaminants monitoring plan.	One-time
Continue to conduct investigations to assist the Parties and/or the Regional Board in accomplishing mutually beneficial objectives as needed.	Ongoing
Implement projects of mutual interest.	Ongoing

Watermaster will convene the Water Quality Committee and lead the stakeholder process to achieve the implementation actions for PE 6, including the development and implementation of a Groundwater Quality Management Plan and perform the initial and long-term water-quality monitoring at the monitoring and private wells sampled by Watermaster pursuant to PE 1.

Projects of mutual interest will be implemented pursuant to agreements among the implementing Parties with Watermaster support, as needed.

4.7 Program Element 7. Develop and Implement Salt Management Plan

The objective of PE 7 is to implement, and periodically update, the maximum-benefit SNMP. The SNMP is a management program to monitor, characterize, and manage current and future salt and nutrient conditions in the Chino Basin. The maximum-benefit SNMP enables the implementation of the recycled water recharge program in PE 2 and the direct reuse of recycled water in PE 5.

Watermaster and the IEUA are co-permittees for the maximum-benefit SNMP and the recycled water recharge program and will be jointly responsible for implementation of PE 7. The implementation actions and general schedule for implementation are summarized in Table 16 below.

Table 16. Program Element 7 – 2020 OBMP Management Plan

Implementation Action	One-time/ Ongoing
Years 1 through 3	
Complete the 2020 update of TDS and nitrate projections to evaluate compliance with maximum benefit salt and nutrient management plan, and, if necessary, based on the outcome, prepare a plan and schedule to implement a salt offset compliance strategy.	One-time
Continue to implement the maximum-benefit salt and nutrient management plan pursuant to the Basin Plan, including: • Implement monitoring program and reporting requirements • Maintain Hydraulic Control through operation of the Chino Basin Desalters and other means, as necessary • Increase and maintain desalter pumping at 40,000 afy • Continue storm and imported water recharge program to comply with recycled water recharge dilution requirements • Comply with recycled water TDS and TIN limitations • Compute ambient water quality every three years • Construct treatment and/or salt-offset facilities *if* one or more of the compliance limits are exceeded	Ongoing
Years 4 through 20	
Continue to implement the maximum-benefit salt and nutrient management plan pursuant to the Basin Plan, and any amendments thereto.	Ongoing
Starting in 2025 and every five years thereafter, update water quality projections to evaluate compliance with the maximum-benefit salt and nutrient management plan.	Ongoing

4.8 Program Element 8. Develop and Implement Groundwater Storage Program *and* Program Element 9. Develop and Implement Conjunctive Use Program

The objectives of PEs 8 and 9 are to:

- Implement, and periodically update, a storage management plan that: (1) is based on the most current information and knowledge of the basin, (2) prevents unauthorized overdraft, (3) prioritizes the use of storage space to meet the needs and requirements of the lands overlying the Chino Basin and of the Parties over the use of storage space to store water for export.
- Support the development and implementation of Storage and Recovery Programs in the Chino Basin that provide defined benefits to the Parties and the basin.

Watermaster is responsible for the implementation of PEs 8 and 9. The implementation actions and general schedule for implementation are summarized in Table 17 below.

Table 17. Program Elements 8 and 9 – 2020 OBMP Management Plan

Implementation Action	One-time/ Ongoing
Years 1 through 3	
Complete and submit to the Court the 2020 Safe Yield Recalculation.	One-time
Complete and submit to the Court the 2020 Storage Management Plan.	One-time
Develop a *Storage and Recovery Master Plan* to support the design of optimized Storage and Recovery Programs that are consistent with the 2020 Storage Management Plan and provide the Watermaster with criteria to review, condition, and approve applications in a manner that is consistent with the Judgment and the Peace Agreement.	One-time
Assess losses from storage accounts based on the findings of the 2020 Safe Yield Recalculation.	Ongoing
Years 4 through 20	
Update the Storage Management Plan in 2025 and every five years thereafter and when: • the Safe Yield is recalculated, • Watermaster determines a review and update is warranted based new information and/or the needs of the Parties or the basin, and • at least five years before the aggregate amount of managed storage by the Parties is projected to fall below 340,000 af	Ongoing
Perform Safe Yield recalculation every 10 years (2030, 2040).	Ongoing
Update the storage loss rate following each recalculation of Safe Yield (2030, 2040) and during periodic updates of the SMP.	Ongoing

Exhibit 1 – Drivers and Trends and Their Implications
2020 OBMP Update

Drivers

- Climate Change
- Vulnerability of Infrastructure
- Legislation, Regulation, and Agreements
- Salt and Nutrient Management
- Outside Interest in Chino Basin Operations
- Growth
- Funding
- Scientific and Technologic Improvements

Trends

- Reduced Recharge
- Increased Evaporation
- Reduced Imported Water Supply
- Increased Risk of Long Term Outages Due to Repair or Catastrophic Shutdown
- SGMA
- Conservation
- Water Quality
- Waters of the US
- California Water Fix
- Expiring Agreements
- TDS Increases in the Basin
- TDS Increases in SWP Water During Drought
- More Restrictive Environmental Regulations
- Public Trust Litigation
- Other Outside Entities: NGO's, SAR Water Rights, Resource Agencies
- Potential New or Outside Partnerships
- Reduced Recycled Water Discharge to Santa Ana River
- Land Use Change/ Urbanization
- Reduced Recharge
- Accumulation of Debt
- Interest Rates
- Competition
- Laboratory Detection Limits
- Health Impacts of Chemicals and Pathogens
- Treatment Technologies
- Renewable Energy
- Sensor Technology
- Transparency

Implications

- Reduced Recycled Water Availability and Increased Cost
- Reduced Imported Water Availability and Increased Cost
- Inability to Pump Groundwater with Existing Infrastructure
- Imported Water Quality Degradation
- Chino Basin Water Quality Degradation
- Increased Cost of Groundwater Use
- Reductions in Chino Basin Safe Yield
- Recycled Water Quality Degradation
- Increased Cost of Basin Plan Compliance

Exhibit 2
Comparison of the 2000 and 2020 OBMP Process

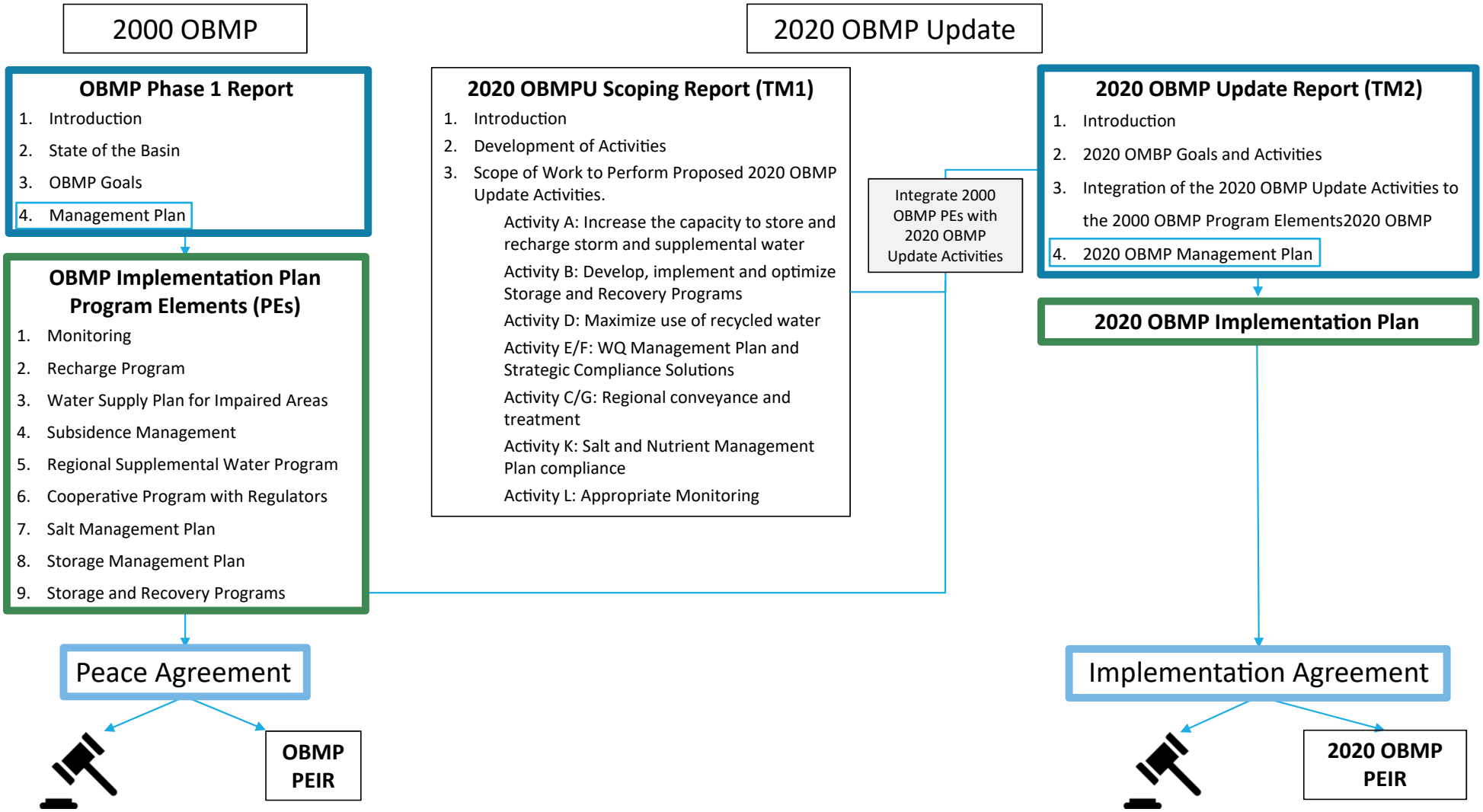

Exhibit 3
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others						Addressed by Activities in Table 3*	Alignment with 2000 OBMP Goals
	Appropriative										Agricultural			Overlying Non-Ag								
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA		IEUA	TVMWD	WMWD	Metropolitan	CBWCD	CDA		
Reductions in Chino Basin Safe Yield																						
Develop a storage management plan to optimize the use of unused storage space in the basin, avoid undesirable results, and encourage Storage and Recovery Programs	●	●		●	●			●	●	●	●		●		●		●				B, C	1, 2, 3
Design storage management and storage & recovery programs that maintain or enhance Safe Yield	●	●						●	●	●			●		●		●			●	B, C	1, 3
Maintain or enhance the Safe Yield of the basin without causing undesirable results	●	●		●	●			●	●	●	●				●		●			●	B, D	1, 3
Manage the basin Safe Yield for the long-term viability and reliability of groundwater supply	●	●						●	●	●	●			●			●	●		●	A, B, C	1, 3
Reassess the frequency of the Safe Yield recalculation	●				●												●				I	3
Continue to model and track Safe Yield, but utilize other management strategies to address a decline.																	●				B	1, 3
Develop recharge programs that maintain or enhance Safe Yield	●	●					●	●	●	●					●		●			●	A, B	1, 3
Develop more facilities to capture, store, and recharge water	●	●					●			●	●				●		●				A, B, D	1, 2
Enhance recharge in northeast MZ-3	●		●						●								●				A, C	1, 3
Maximize use of existing recharge facilities	●	●						●	●	●											A, C, F, G	3
Establish incentives to encourage recharge of high-quality imported water	●		●																		H, I	2, 3
Develop an OBMP Update that is consistent with the Physical Solution and allows access to the basin for users to meet their requirements	●	●				●		●													C, E	3
Engage with regional water management planning efforts in the Upper Santa Ana River Watershed that have the potential to impact Chino Basin operations or Safe Yield	●														●		●			●	I, D	3

Exhibit 3
Issues, Needs and Wants of the Chino Basin Stakeholders

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Inability to Pump Groundwater with Existing Infrastructure																						
Pursue collaborative, regional partnerships to implement regional solutions to water management challenges	●			●	●			●							●	●	●	●	●	●	B, E, F, G, I	3
Ensure that sufficient, reliable water supplies will be available to meet current and future water demands	●	●	●	●			●	●	●	●	●				●	●	●	●	●		A, B, D, G	1, 3
Develop conjunctive use agreements that provide certainty in the ability to perform during put and take years by clearly defining facilities/infrastructure and operating plans, and that leverage the lessons learned from obstacles encountered during the implementation of the current Dry Year Yield program	●						●	●	●						●		●	●			B, G, I	1, 2, 3
Develop management strategies that enable the Parties to produce or leverage their respective water rights that may be impacted by physical basin challenges like land subsidence or water quality	●						●	●							●		●				A, C, D, E, F, G, I	3
Design storage management and storage & recovery programs to raise funding to build infrastructure	●			●											●		●				B, D, I, J	3, 4
Develop process to support/facilitate project implementation	●																				F, H, J	4
Design subsidence management plans to allow flexibility in the location and volume of groundwater production in MZ-1 and MZ-2	●						●	●		●				●	●						A, C, G	3

Exhibit 3
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want/Unspecified

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Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others						Addressed by Activities in Table 3*	Alignment with 2000 OBMP Goals
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Increased Cost of Groundwater Use																						
Seek supplemental financial resources to support the implementation of the OBMP Update	●	●		●			●	●	●	●					●	●	●		●		D, F, G, I, J	4
Develop regional partnerships to help reduce costs	●			●			●	●	●						●	●	●			●	F, G, I, J	4
Monetize agencies' unused water rights for equitable balance of basin assets			●																		G, H	4
Decrease Watermaster assessment costs	●				●			●													I, J	4
Support to develop a justification for increases in water rates and developer fees to invest in needed water infrastructure	●	●							●								●				F, G, H	
Develop an equitable distribution of costs/benefits of the OBMP	●	●		●		●	●	●	●	●				●	●						H, J	4
Watermaster assessments for implementation of the OBMP should be allocated based on benefits received	●				●																H	4
Continue or enhance incentives to pump groundwater from the Chino Basin			●																		G, I	3, 4
Improve flexibility for Parties to execute water rights transfers														●							G, I	4

Exhibit 3
Issues, Needs and Wants of the Chino Basin Stakeholders

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	Appropriative										Agricultural			Overlying Non-Ag							Addressed by Activities in Table 3*	Alignment with 2000 OBMP Goals
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Chino Basin Water Quality Degradation																						
Develop a water quality management plan to ensure ability to produce groundwater rights	●	●		●			●	●	●	●				●	●		●	●			E, F, G, J	2, 3
Develop regional infrastructure to address water quality contamination and treatment				●	●			●													A, B, C, E, F, G, I, J	2
Plan for and be prepared for new drinking water quality regulations that may result in an increase in groundwater treatment and costs	●	●	●	●			●	●	●	●					●		●				E, F	2
Be more proactive and engaged in the process to develop new drinking water quality regulations								●													A, B, D, E, G, J	2
Recycled Water Quality Degradation																						
Maintain compliance with recycled water and dilution requirements pursuant to the Chino Basin groundwater recharge permit		●					●	●	●	●				●	●						A, B, D, E, G, J	2
Increased Cost of Basin Plan Compliance																						
Develop management strategy to ensure sufficient supplies to blend with recycled water and comply with Salt and Nutrient Management Plan	●	●									●				●		●				G, K	2
Perform the minimum amount of monitoring/reporting that is required for basin management and regulatory compliance	●			●			●	●													L	3, 4

Exhibit 3
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want/Unspecified

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	Appropriative										Agricultural			Overlying Non-Ag							Addressed by Activities in Table 3*	Alignment with 2000 OBMP Goals
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA		IEUA	TVMWD	WMWD	Metropolitan	CBWCD	CDA		
Reduced Recycled Water Availability and Increased Cost																						
Fully utilize IEUA recycled water resources		●		●			●	●		●					●						A, D, E, F, G	1
Maximize the use of recycled water for direct use or recharge	●	●		●			●	●	●	●					●						A, D, E, F, G	1
Evaluate the potential for direct potable reuse of recycled water	●								●						●						D, E, F	1
Develop alternative management strategies to comply with the recycled water discharge obligations to the Santa Ana River	●	●		●			●	●		●					●		●				D, E, F	1, 3
Utilize non-IEUA sources of recycled water that are not being put to beneficial use	●	●					●	●	●	●					●		●				D, E, F	1
Other																						
Coordinate timing of agreements, grants, etc. to ensure implementation of the OBMP Update	●							●	●	●					●	●	●				F, G, H, I, J	
Improve communication between the Parties	●			●				●						●	●		●				F, H, I	
Educate elected officials and decision makers on the need and urgency to address the water management challenges	●	●							●						●	●	●				F, G, H, I, J	
Consider a long-term planning horizon of up to 50 years	●								●	●					●						F, G, H, I, J	3

Exhibit 3
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want/Unspecified

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Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others						Addressed by Activities in Table 3*	Alignment with 2000 OBMP Goals
	Appropriative										Agricultural			Overlying Non-Ag								
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA		IEUA	TVMWD	WMWD	Metropolitan	CBWCD	CDA		
Reduced Imported Water Availability and Increased Cost																						
Ensure that there is a reliable local water supply to replace imported water during shut down of imported water delivery infrastructure for maintenance and longer-term emergency outages	●	●	●	●			●	●	●	●					●	●	●	●			B, C, G	1, 3
Identify and utilize new sources of supplemental water	●	●		●			●	●	●	●					●	●	●				A, B	1, 3
Construct inter-basin and intra-basin connections for the benefit of regional water supply and conjunctive use	●	●		●			●	●	●			●			●	●	●	●			C, G	1, 3
Understand how imported water reliability from Metropolitan Water District will be affected with and without the California Water Fix	●							●	●						●	●	●				-	1, 3
Develop management strategies that ensure Parties will meet future Chino Basin Desalter Replenishment Obligation and have the money to fund it	●	●		●			●		●								●			●	H, I, J	3
Increase water-supply reliability at the lowest possible cost	●			●			●	●				●		●	●		●				A, B, D, J	3
Need a better understanding of the water management plans of the Parties to be able to better plan for imported water needs and to assure reliability of Metropolitan Water District water supply	●			●					●			●			●	●	●	●			A	3
Analyze water management scenarios that plan for unexpected challenges and emergencies	●							●	●	●					●	●	●				E, G	3
Ensure that sufficient supplemental water supplies will be available to meet future replenishment requirements							●		●	●		●			●					●	A	1, 3
Despite the best efforts of the Parties to decrease reliance on imported water, the cost of the total water supply continues to increase	●																				-	3
Use more recycled water for Replenishment Obligation	●			●			●		●								●				A, D, E, F	3
Continue to build collaborative programs between the Metropolitan Water District and Chino Basin	●						●	●	●						●		●	●			B, I	3

Exhibit 4

Activities for Consideration in the 2020 OBMP Update

ID	Activity
A	Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge
B	Develop, implement, and optimize Storage-and-Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality.
C	Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence.
D	Maximize the reuse of recycled water produced by IEUA and others
E	Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses
F	Develop strategic regulatory-compliance solutions to comply with new and evolving drinking water standards that achieve multiple benefits in managing water quality
G	Optimize the use of all sources of water supply by improving the ability to move water across the basin and amongst stakeholders, prioritizing the use of existing infrastructure.
H	Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements
I	Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement
J	Continue to identify and pursue low-interest loans and grants or other external funding sources to support the implementation of the OBMP Update
K	Develop management strategy within the Salt and Nutrient Management Plan to ensure ability to comply with dilution requirements for recycled water recharge
L	Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance

Exhibit 5
OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders

Impediments	Activities to Remove Impediments	Potential Outcomes of Activities	Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities							
			Reductions in Chino Basin Safe Yield	Inability to Pump Groundwater with Existing Infrastructure	Increased Cost of Groundwater Use	Chino Basin Water Quality Degradation	Recycled Water Quality Degradation	Increased Cost of Basin Plan Compliance	Reduced Recycled Water Availability and Increased Cost	Reduced Imported Water Availability and Increased Cost
Goal 1 - Enhance Basin Water Supplies										
1a • Not all of the stormwater runoff available to the Chino Basin is diverted and recharged; failure to divert and recharge stormwater is a permanently lost opportunity. • The existing methodology to select recharge projects for implementation is based on the cost of imported water. There are currently no known projects with a unit cost lower than the cost of imported water, hindering expansion of stormwater capture and recharge • Pumping capacity in some areas of the basin is limited due to low groundwater levels, land subsidence, and water quality	A Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge	• Increases recharge of high-quality stormwater that will: • protect/enhance the Safe Yield, • improve water quality, • reduce dependence on imported water, • increase pumping capacity in areas of low groundwater levels and areas of subsidence concern, and • provide new supply of blending water to support the recycled-water recharge program. • Provides additional supplemental-water recharge capacity for replenishment and implementation of Storage and Recovery Programs. • Provides additional surface water storage capacity. • Revised economic criteria for selecting recharge projects for implementation.	✓	✓	✓	✓	✓	✓		✓

Exhibit 5
OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders

Impediments	Activities to Remove Impediments	Potential Outcomes of Activities	Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities							
			Reductions in Chino Basin Safe Yield	Inability to Pump Groundwater with Existing Infrastructure	Increased Cost of Groundwater Use	Chino Basin Water Quality Degradation	Recycled Water Quality Degradation	Increased Cost of Basin Plan Compliance	Reduced Recycled Water Availability and Increased Cost	Reduced Imported Water Availability and Increased Cost
Goal 1 - Enhance Basin Water Supplies										
1b • There is a surplus of recycled water potentially available to the Chino Basin Parties that is not being put to beneficial use. • Existing infrastructure limits the expansion or reuse and recharge of recycled water in the Chino Basin. • Existing requirements to discharge recycled water to the Santa Ana River limit the amount of IEUA recycled water available for reuse and recharge •The Department of Drinking Water and the Regional Board blending requirements for recycled water recharge could limit expanded recharge opportunities	D Maximize the reuse of recycled water produced by IEUA and others	• Results in a new, consistent volume of in-lieu and/or wet water recharge that will: • protect/enhance the Safe Yield, • reduce dependence on imported water, • improve water-supply reliability, especially during dry periods, and • increase pumping capacity in areas of low groundwater levels and areas of subsidence concern. • Identify additional sources of water to satisfy IEUA discharge requirements pursuant to the Santa Ana River Judgment.	✓	✓					✓	✓

Exhibit 5
OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders

Impediments	Activities to Remove Impediments	Potential Outcomes of Activities	Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities							
			Reductions in Chino Basin Safe Yield	Inability to Pump Groundwater with Existing Infrastructure	Increased Cost of Groundwater Use	Chino Basin Water Quality Degradation	Recycled Water Quality Degradation	Increased Cost of Basin Plan Compliance	Reduced Recycled Water Availability and Increased Cost	Reduced Imported Water Availability and Increased Cost
Goal 2 - Protect and Enhance Water Quality										
2a • Areas of the basin are contaminated with VOCs, nitrate, perchlorate and other contaminants of emerging concern (CECs). • Water-quality regulations are evolving and becoming more restrictive, which limits the beneficial uses of groundwater. • Groundwater treatment may be necessary to meet beneficial uses, but can be expensive to build and operate. • The basin is hydrologically closed, which causes accumulation and concentration of salts, nutrients, and other contaminants. • Some stored water in the Chino Basin cannot be used due to water quality and insufficient treatment capacity • Recharge sources may contribute CECs to the groundwater basin	E Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses	• Proactively addresses new and near-future drinking water regulations. • Enables the Parties to make informed decisions on infrastructure improvements for water-quality management and regulatory compliance. • Removes groundwater contaminants from the Chino Basin and thereby improves groundwater quality. • Enables the Parties to produce or leverage their water rights that may be constrained by water quality. • Ensures that groundwater is pumped and thereby protects/enhances the Safe Yield.	✓	✓	✓	✓				✓
	F Develop strategic regulatory-compliance solutions to comply with new and evolving drinking water standards that achieve multiple benefits in managing water quality									
2b • Water-quality regulations are evolving and generally becoming more stringent, which could limit the reuse and recharge of recycled water.	K Develop management strategy within the Salt and Nutrient Management Plan to ensure ability to comply with dilution requirements for recycled water recharge	• Enables the continued and expanded recharge of recycled water, which will: • protect water quality, • improve water-supply reliability, especially during dry periods, and • protect/enhance the Safe Yield.	✓			✓	✓	✓		✓

Exhibit 5
OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders

Impediments	Activities to Remove Impediments	Potential Outcomes of Activities	Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities							
			Reductions in Chino Basin Safe Yield	Inability to Pump Groundwater with Existing Infrastructure	Increased Cost of Groundwater Use	Chino Basin Water Quality Degradation	Recycled Water Quality Degradation	Increased Cost of Basin Plan Compliance	Reduced Recycled Water Availability and Increased Cost	Reduced Imported Water Availability and Increased Cost
Goal 3 - Enhance Management of the Basin										
3a • Existing infrastructure (pumping and treatment capacity and conveyance) is insufficient to conduct puts and takes under proposed storage programs. • There is unused storage space in the Basin the use of which is constrained by the storage limits defined in existing CEQA documentation. • Watermaster's current storage management plan is not optimized to protect/enhance basin yield, improve water quality, avoid new land subsidence, ensure balance of recharge and discharge, maintain Hydraulic Control, etc. • Storage and recovery operations could be limited by contaminant plumes or other CECs in groundwater	B Develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality.	• Storage programs that protect/enhance basin yield, improve water quality, avoid new land subsidence, ensure balance of recharge and discharge, maintain Hydraulic Control, etc. • New regional infrastructure to optimize put and take operations • Leverages unused storage space in the Basin. • Reduces reliance on imported water, especially during dry periods. • Potentially provides outside funding sources to implement the OBMP Update. • Improves water quality through the recharge of high quality water.	✓	✓	✓	✓				✓

Exhibit 5
OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders

Impediments	Activities to Remove Impediments	Potential Outcomes of Activities	Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities							
			Reductions in Chino Basin Safe Yield	Inability to Pump Groundwater with Existing Infrastructure	Increased Cost of Groundwater Use	Chino Basin Water Quality Degradation	Recycled Water Quality Degradation	Increased Cost of Basin Plan Compliance	Reduced Recycled Water Availability and Increased Cost	Reduced Imported Water Availability and Increased Cost
Goal 3 - Enhance Management of the Basin										
3b • Land subsidence in northwest MZ1 may limit the ability for Parties to pump their respective rights in this area. • Poor water quality and increasingly restricting water quality regulations limits the ability for some Parties to pump their respective rights. • Low groundwater levels impact pumping capacity	C Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence.	• Enables producers in MZ1 and MZ2 to obtain water through regional conveyance, which supports management of groundwater levels to reduce the potential for subsidence and ground fissuring. • Enables the Parties to increase production in areas currently constrained by poor water quality. • Removes groundwater contaminants from the Chino Basin and thereby improves water quality. • Protects/enhances the Safe Yield. • Maximizes the use of existing infrastructure, which will minimize costs. • Provides infrastructure that can also be used to implement Storage and Recovery Programs.	✓	✓	✓	✓				✓
	G Optimize the use of all sources of water supply by improving the ability to move water across the basin and amongst stakeholders, prioritizing the use of existing infrastructure.									
3c • Watermaster needs information to comply with regulations and its obligations under its agreements and Court orders, yet financial resources to collect this information are limited.	L Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance	• Ensures full compliance with regulatory requirements. • Ensures full support of basin management initiatives. • Enables Parties to monitor the performance of the OBMP Update. • Continual review and revision of requirements and monitoring program to ensure cost efficiency	✓	✓	✓	✓	✓	✓	✓	✓

Exhibit 5
OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders

Impediments	Activities to Remove Impediments	Potential Outcomes of Activities	Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities							
			Reductions in Chino Basin Safe Yield	Inability to Pump Groundwater with Existing Infrastructure	Increased Cost of Groundwater Use	Chino Basin Water Quality Degradation	Recycled Water Quality Degradation	Increased Cost of Basin Plan Compliance	Reduced Recycled Water Availability and Increased Cost	Reduced Imported Water Availability and Increased Cost
Goal 4 - Equitably Finance the OBMP										
4a • The distribution of benefits associated with the OBMP Update is not defined. • Funding needed for the OBMP implementation activities of the Watermaster is not projected beyond the current year budget, which limits Parties ability to plan required funding for the future. • There is currently no formal process to evaluate and adapt the OBMP implementation plan, schedule and cost.	H Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements	• Provides transparency as to the benefits of the OBMP Update activities • Identifies Watermaster roles and costs to the Parties • Formal process to revisit implementation plan and adjust priorities and schedule as necessary to address changed conditions • Periodic updates of cost projections for OBMP implementation needed to plan financial resources. • Improves readiness to apply for grants as they become available • Improves the likelihood that the OBMP will be implemented.			✓			✓	✓	✓
4b • Limited financial resources constraint the implementation of the OBMP. • Future reliability of grant funding is uncertain	I Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement	• Lowers the cost of OBMP implementation. • Improves the likelihood that the OBMP will be implemented.			✓			✓	✓	✓
	J Continue to identify and pursue low-interest loans and grants or other external funding sources to support the implementation of the OBMP Update				✓			✓	✓	✓

Exhibit 6

2020 OBMP Update - Activity A:

Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental waters, particularly in areas of the basin that will promote the long-term balance of recharge and discharge

Need and Objectives: The objectives of Activity A are (1) to maximize stormwater capture pursuant to Watermaster's diversion permits, (2) to promote the long-term balance of recharge and discharge, (3) to ensure sufficient supplemental water recharge capacity for future replenishment, (4) to reduce dependence on imported water by maintaining or enhancing Safe Yield, (5) to improve water quality, and (6) to ensure a supply of dilution water to comply with recycled water recharge permit requirements. Based on the alignment of the objectives of Activity A with those of the RMPU, Activity A can be accomplished through the existing RMPU process.

Phase	Task	Outcomes	Watermaster Role	Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ?
S	1 – Define objectives and refine scope of work	Consensus on objectives of 2023 RMPU	Convene committee	Yes
PN	2 – Develop planning, screening, and evaluation criteria	New criteria for selecting projects	Technical support role	Yes
PAE	3 – Describe recharge enhancement opportunities 4 – Develop reconnaissance-level engineering design and operating plan	Conceptual design, operating plans, and costs of recharge alternatives Project implementation and financing plan	Technical support role	Yes
I	5 – Plan, design, and construct selected recharge projects	New recharge projects	Technical support role	Yes, to the extent that additional recharge capacity is needed

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

Activity Implementation Schedule and Go/No-Go Decision Points

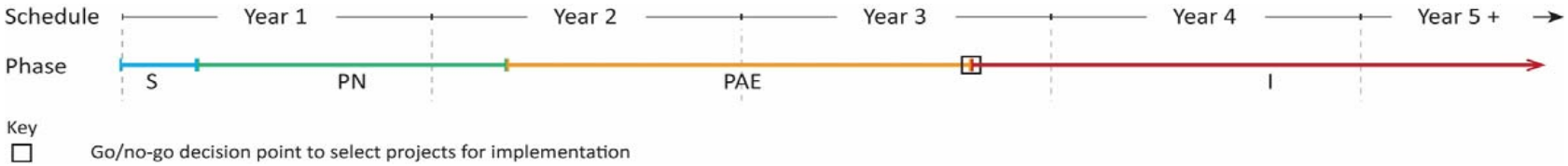

Exhibit 7

2020 OBMP Update - Activity B

Develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality

Need and Objectives: The parties desire to develop and implement "optimized" Storage and Recovery Programs that avoid potential MPI and provide broad benefits, such as increased water-supply reliability, protected or enhanced Safe Yield, improvements to water quality, and reduced cost for OBMP implementation. The objectives of Activity B are to prepare a *Storage and Recovery Master Plan* in a collaborative setting that clearly articulates the specific objectives of the parties and the required benefits to be realized from storage and recovery programs. The master plan will assist the parties and their storing partners to select and implement Storage and Recovery Programs that achieve the their objectives and the desired benefits.

Phase*	Task	Outcomes	Watermaster Role	Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ?
S	1 – Convene the Storage and Recovery Program Committee, define objectives, and refine scope of work	Consensus on objectives and desired benefits of Storage and Recovery Programs	Convene committee	Yes. While there is no requirement to optimize Storage and Recovery Programs, the Watermaster is required to evaluate Storage and Recovery Programs for potential MPI, compel mitigation, if necessary, and prioritize approval of Storage and Recovery Programs that provide broad mutual benefits to the parties. This is the most efficient process that enables Watermaster to perform this role.
PN	2 – Develop conceptual alternatives for Storage and Recovery Programs at various scales	Conceptual descriptions of various types of Storage and Recovery Programs that achieve the objectives defined in Task 1	Assist in the development and documentation of conceptual alternatives	
PAE	3 – Describe and evaluate reconnaissance-level facility plans and costs for Storage and Recovery Program alternatives	Conceptual design, operating plans, and costs for various Storage and Recovery Program alternatives	Assist in development of alternatives Groundwater modeling to estimate basin response	
I	4 – Prepare *Storage and Recovery Program Master Plan*	*Storage and Recovery Program Master Plan* that will support Storage and Recovery Program selection, solicitation of storing partners, applications for funding, and Watermaster approvals	Prepare draft and final master plan	

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

Activity Implementation Schedule and Go/No-Go Decision Points

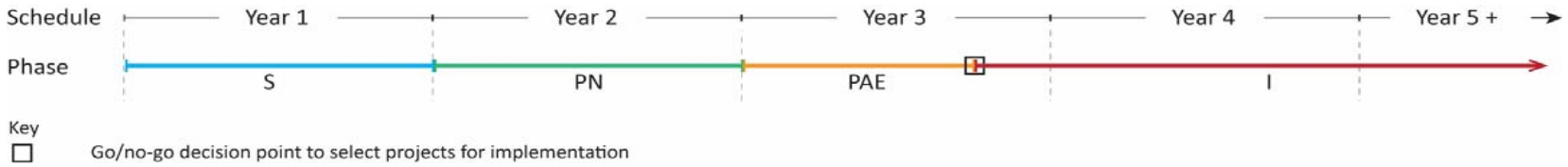

Exhibit 8

2020 OBMP Update - Activity CG:

Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence AND Optimize the use of all sources of water supply by improving the ability to move water across the basin and amongst stakeholders, prioritizing the use of existing infrastructure

Need and Objectives: The parties have identified that there are basin management challenges, such as land subsidence and poor water quality, that could limit their ability to exercise their pumping rights using existing infrastructure. Additionally, there are numerous challenges to the reliability of the non-Chino Basin groundwater water supplies available to the Chino Basin parties and the infrastructure that deliver them. The objectives of Activity CG is to optimize the use of all sources of water available to the parties to meet their demands despite these challenges and potentially help mitigate them.

Phase	Task	Outcomes	Watermaster Role	Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ?
S	1 - Form the Water Supply Reliability Committee, define objectives, and refine scope	Mutual understanding of the universe of water reliability concerns of parties	Work with IEUA or other activity lead	No
PN	2 - Characterize water demands, water supply plans, and existing/planned infrastructure and its limitations	Identify opportunities and limitations in the existing/planned infrastructure to meet reliability goals defined in Task 1	Work with IEUA or other activity lead	No
PAE	3 – Develop planning, screening, and evaluation criteria 4 – Identify and describe water supply reliability opportunities 5 – Develop reconnaissance-level engineering design and operating plan	Conceptual design, operating plans, and costs of reliability alternatives Project implementation and financing plan	Work with IEUA or other activity lead	No
I	6 – Plan, design, and build water reliability projects	New water reliability projects	None	No

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

Activity Implementation Schedule and Go/No-Go Decision Points

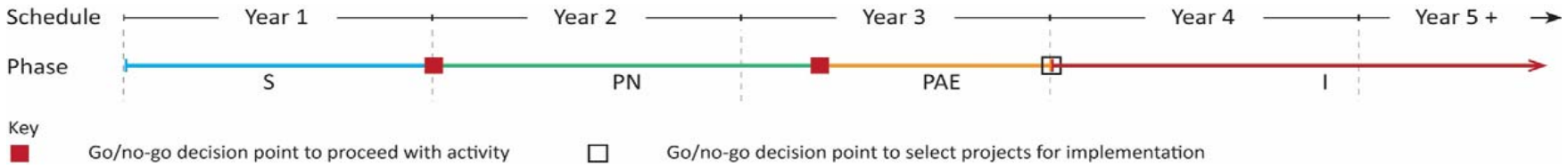

Exhibit 9

2020 OBMP Update - Activity D:

Maximize the reuse of recycled water produced by IEUA and others

Need and Objectives: The objective is to maximize the reuse of recycled water produced by the IEUA and other publicly owned treatment works (POTWs) in proximity to the Chino Basin to meet future demands and improve local water-supply reliability, especially during dry periods. Expanded reuse activities could include direct non-potable reuse (landscape irrigation or industrial uses), groundwater recharge (indirect potable reuse), and direct potable reuse. Increasing recycled water reuse is an integral part of the OBMP's goal to enhance water supplies. The direct use of recycled water increases the availability of native and imported waters for higher-priority beneficial uses.

Phase	Task	Outcomes	Watermaster Role	Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ?
S	1 – Convene Recycled Water Projects Committee, define objectives and refine scope of work	Consensus on the objectives for optimizing and maximizing recycled water reuse	Work with IEUA or other activity lead	No
PN	2 – Characterize the availability of all recycled water supplies and demands	Understanding of demand and opportunities for increased recycled water reuse	Work with IEUA or other activity lead	No
PAE	3 – Develop planning, screening, and evaluation criteria 4 – Identify and describe potential projects for evaluation 5 – Conduct a reconnaissance-level study for the proposed projects	Conceptual design, operating plans, and costs of reuse projects Characterization of SNMP impacts of reuse projects Project implementation and financing plan	Work with IEUA or other activity lead	No
I	6 – Plan, design, and construct selected projects	New recycled water reuse projects	None	No

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

Activity Implementation Schedule and Go/No-Go Decision Points

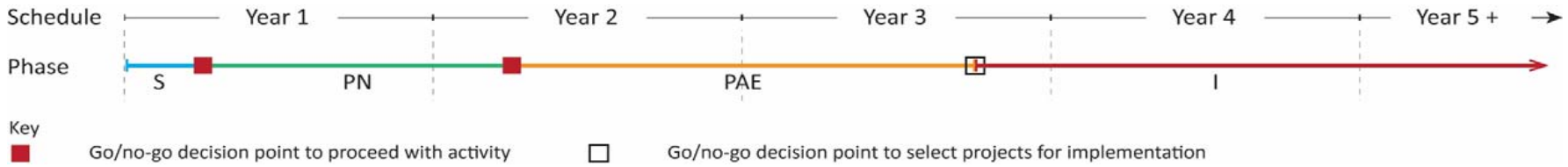

Exhibit 10

2020 OBMP Update - Activity EF

Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses AND
Develop strategic regulatory-compliance solutions that achieve multiple benefits in managing water quality

Need and Objectives: Groundwater contaminants are present across the Chino Basin, new contaminants are being discovered, and water-quality regulations are evolving and becoming more restrictive. These trends are limiting the beneficial use of groundwater and increasing the cost of the water supply. The objectives of Activity EF are to characterize the water-quality challenges across the Chino Basin and identify the most efficient means to address the water-quality challenges, including the potential for multi-benefit collaborative projects, to ensure that groundwater can be put to beneficial use.

Phase*	Task	Outcomes	Watermaster Role	Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ?
S	1 - Convene the Water Quality Committee, define objectives, and refine scope of work	Mutual understanding of the universe of water quality concerns of parties	Convene committee	Yes
PN	2 - Develop and implement an initial emerging-contaminants monitoring plan	Data	Prepare monitoring plan; collect and compile data	Yes
PN	3 – Perform a water quality assessment and prepare a scope to develop and implement a *Groundwater Quality Management Plan*	Understanding of scale of problem; scope/cost to evaluate project alternatives; long-term monitoring plan	Perform characterization	Yes
PAE	4 – Develop planning, screening, and evaluation criteria 5 – Identify and describe potential projects for evaluation 6 – Conduct a reconnaissance-level study for the proposed projects 7 – Prepare the *Groundwater Quality Management Plan*	Conceptual design and operating plans for project alternatives Understanding of cost to manage Chino Basin groundwater quality with and without collaborative projects Management plan to document project implementation plan and supporting info	Technical support role to evaluate project alternatives and characterize potential for MPI (if necessary) Technical support role to prepare the *Groundwater Quality Management Plan*	Yes
I	8 – Plan, design, and build water quality management projects	New groundwater quality improvement projects	None	No

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

Activity Implementation Schedule and Go/No-Go Decision Points

Key

☐ Go/no-go decision point to select projects for implementation

Exhibit 11

2020 OBMP Update - Activity K:

Develop a management strategy within the salt and nutrient management plan to ensure the ability to comply with the dilution requirements for recycled water recharge

Need and Objectives: The Watermaster and IEUA implement a recycled water recharge program to improve supply reliability. The Maximum Benefit SNMP requires that the recharge be diluted with other sources of low-salinity water to comply with Basin Plan Objectives. If sufficient dilution supplies are not available to comply with the dilution metric, treatment of recycled water, or other salt offset program will be required by the Regional Board. The objective of this activity is to determine if compliance with the Maximum Benefit SNMP recycled water recharge dilution requirements can be achieved under existing management plans, and if not, to develop a plan to achieve compliance.

Phase	Task	Outcomes	Watermaster Role	Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ?
S/PN	1 – Prepare projection to evaluate compliance with recycled water dilution requirements 5 – Periodically reevaluate compliance with dilution requirements	Understanding of ability to comply with the TDS and nitrate dilution requirements in the SNMP (near-term and long-term)	Perform technical work in collaboration with IEUA	Yes
PAE	2 – Identify alternative compliance strategies 3 – Evaluate alternative compliance strategies	Conceptual design, operating plans, and costs of project alternatives Report to document compliance plan and supporting info	Technical support role to IEUA to evaluate hydrogeologic impacts of project alternatives	Yes
I	4 – Implement the selected compliance strategy	Compliance project (or other compliance action)	Level of support depends on the compliance action	Yes

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Activity Implementation Schedule and Go/No-Go Decision Points

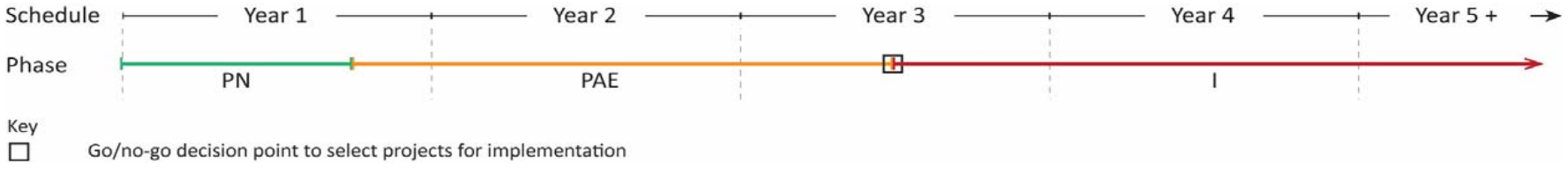

Exhibit 12

2020 OBMP Update - Activity L

Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance

Need and Objectives: Watermaster conducts data-collection programs and prepares reports and data deliverables to comply with regulations, to fulfill its obligations under its agreements and Court orders, to comply with its requirements under CEQA, and to assess the performance of the evolving OBMP IP, including the 2020 OBMP Update. These monitoring and reporting efforts are described in the Scoping Report, and will need to continue. The objective of Activity L is to refine the monitoring and reporting requirements of Watermaster to ensure that the objectives of each requirement are being met efficiently at a minimum cost.

Phase*	Task	Outcomes	Watermaster Role	Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements?
S, PN	1 – Convene Monitoring and Reporting Committee and prepare the *Monitoring and Reporting Work Plan*	Understanding of all monitoring/reporting programs *Monitoring and Reporting Work Plan* *Recommended Revisions to Watermaster's Non-Discretionary Monitoring and Reporting Programs*	Convene committee Prepare work plan	No, however, monitoring and reporting are required to implement the Judgment and comply with regulations and Watermaster obligations. Since the beginning of OBMP implementation, Watermaster staff and engineer have continually refined the monitoring and reporting efforts to meet all requirements and achieve efficiencies and will continue to do so. This activity continues these refinement efforts in closer collaboration with the parties.
I	2 – Implement recommendations in *Monitoring and Reporting Work Plan*	Revisions to Watermaster's non-discretionary monitoring and reporting programs Future updates to the *Monitoring and Reporting Work Plan*	Perform technical demonstrations to gain approval for revisions to the monitoring/reporting program Update work plan, when necessary	
PN, I	3 – (recurring future task) – Bi-Annual review of scope of work and cost to implement the *Monitoring and Reporting Work Plan* in the subsequent fiscal year	Update to *Monitoring and Reporting Work Plan* A scope of work and budget for the subsequent fiscal year	Update the work plan Prepare scope and budget recommendation for subsequent year	

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

Activity Implementation Schedule and Go/No-Go Decision Points

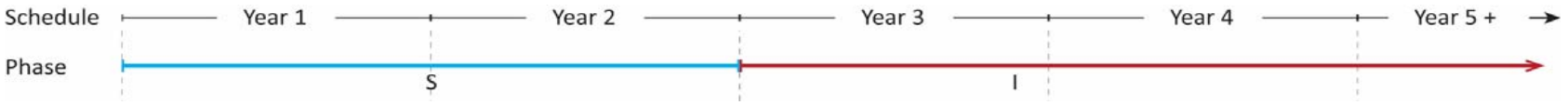

Exhibit 13
Nexus of the 2020 OBMP Update Activities to the 2000 OBMP Program Elements

2000 OBMP Program Elements (PEs)	2020 OBMP Update Activities						
	A - Increase Recharge	**B** - Optimize Storage and Recovery	**CG** - Regional Conveyance	**D** - Maximize RW Reuse	**EF** - Water Quality Mgmt.	**K** - Plan for SNMP Dilution Compliance	**L** - Monitoring
1 - Monitoring							⚓
2 - Recharge Program	⚓	●					●
3 - Impaired Areas		●			●	●	●
4 - Subsidence Mgmt.	●	●	●				●
5 - Supplemental Water		●	⚓	⚓	●		●
6 - Water Quality	●	●	●	●	⚓	●	●
7 - SNMP				●		⚓	●
8 – Storage Mgmt. Plan		●					●
9 – S&R Programs	●	⚓	●				●

⚓ Direct relationship between an activity and a PE (i.e. the activity and the PE have similar or identical objectives and thus the activity can be integrated into the existing PE)

● Indirect relationship between an activity and a PE (i.e. the activity has the potential to provide benefits to PEs)

Exhibit 14
Status of Compliance with the Chino Basin Maximum-Benefit Commitments

Description of Commitment	Compliance Date – as soon as possible, but no later than	Status of Compliance
1. Surface Water Monitoring Program[1] a. Submit draft Monitoring Program to Regional Board b. Implement Monitoring Program c. Submit Draft Revised Monitoring Program to Regional Board d. Implement Revised Monitoring Program e. Submit Draft Revised Monitoring Program(s) (subsequent to that required in "c", above) to Regional Board f. Implement Revised Monitoring Program(s) g. Annual data report submittal	a. January 23, 2005 b. Within 30 days from the date of Regional Board approval of the monitoring plan c. 15 days from 2012 Basin Plan Amendment (BPA) approval d. Upon Regional Board approval e. Upon notification of the need to do so from the Regional Board Executive Officer and in accordance with the schedule prescribed by the Executive Officer f. Upon Regional Board approval g. April 15th	a. Draft work plan submitted to the Regional Board on January 23, 2005 b. Monitoring plan initiated prior to Regional Board approval c. Draft work plan submitted to the Regional Board on February 16, 2012, six days after 2012 BPA approval d. Revised monitoring program began in December 2012 after the BPA was approved by the Office of Administrative Law on December 6, 2012 e. No revisions requested by the Regional Board f. n/a g. All annual reports submitted by April 15 of each year since 2006
2. Groundwater Monitoring Program[1] a. Submit Draft Monitoring Program to Regional Board b. Implement Monitoring Program c. Plan and schedule for demonstrating Hydraulic Control	a. January 23, 2005 b. Within 30 days from the date of Regional Board approval of the monitoring plan c. By December 31, 2013	a. Draft monitoring plan submitted to Regional Board on January 23, 2005 b. Monitoring program initiated prior to Regional Board approval c. Plan and schedule for demonstrating Hydraulic Control submitted in the 2014 Work Plan to the Regional Board on December 23, 2013

[1] The commitments related to surface water and groundwater monitoring were revised by a Basin Plan amendment approved by the Regional Board on February 10, 2012. The commitments and status of compliance shown in this table reflect the amended commitments for surface water and groundwater monitoring.

Exhibit 14
Status of Compliance with the Chino Basin Maximum-Benefit Commitments

Description of Commitment	Compliance Date – as soon as possible, but no later than	Status of Compliance
d. Implement Hydraulic Control demonstration e. Submit Draft Revised Monitoring Program(s) (subsequent to that required in "a", above) to Regional Board f. Implement revised monitoring plans (s) g. Annual data report submittal	d. Upon Regional Board approval e. Upon notification of the need to do so from the Regional Board Executive Officer and in accordance with the schedule prescribed by the Executive Officer f. Upon Regional Board approval g. April 15th	d. Hydraulic Control demonstration reported in all annual reports e. No revisions requested by Regional Board f. n/a g. All annual reports submitted by April 15 of each year
3. Chino Desalters a. Chino-I Desalter expansion to 10 mgd b. Chino-II Desalter construction to 10 mgd capacity	a. Prior to the recharge of recycled water b. Recharge of recycled water allowed once award of contract and notice to proceed issued for construction of desalter treatment plant	a. Chino-I Desalter expansion to about 14 mgd was completed in April 2005 and operation began in October 2005; recycled water recharge began in July 2005. b. Contract for Chino-II Desalter awarded in early 2005; construction was completed to a capacity of 15 mgd, and the facility went online in June 2006.
4. Submittal of future desalters plan and schedule	October 1, 2005 Implement plan and schedule upon Regional Board approval	Several plans for desalter expansion have been submitted to the Regional Board since 2005. The capacity of the constructed desalter wells in 2015 was about 27 mgd (about 30,000 afy). Watermaster and the IEUA submitted a plan to the Regional Board on June 30, 2015 to construct three additional wells to achieve the ultimate capacity of 36 mgd (40,000 afy), per the Peace and Peace II Agreements. The first two wells are constructed and began operating in 2018. The construction of the the third well is anticipated to begin in late 2019.

Exhibit 14
Status of Compliance with the Chino Basin Maximum-Benefit Commitments

Description of Commitment	Compliance Date – as soon as possible, but no later than	Status of Compliance
5. Recharge facilities (17) built and in operation	June 30, 2005	Watermaster and the IEUA partnered with the San Bernardino County Flood Control District and the Chino Basin Water Conservation District for completion of the Chino Basin Facilities Improvement Program to construct and/or improve eighteen recharge sites. There are currently 17 basins in the Chino Basin Groundwater Recharge Program.
6. Submittal of IEUA wastewater quality improvement plan and schedule	60 days after agency-wide, 12-month running average effluent TDS quality equals or exceeds 545 mgl for 3 consecutive months, or after agency-wide, 12-month running average TIN equals or exceeds 8 mgl in any month Implement plan and schedule upon approval by Regional Board	These threshold events have not occurred; therefore, a wastewater quality improvement plan has not been submitted
7. Recycled water will be blended with other recharge sources such that the volume-weighted, 5-year running average TDS and nitrate-nitrogen concentrations of recharge are equal to or less than the maximum benefit water quality objectives. a. Submit a report that documents the location, amount of recharge, and TDS and nitrogen quality of storm water recharge before the OBMP recharge improvements were constructed and what is projected to occur after the recharge improvements are completed.	Compliance must be achieved by the end of the 5th year after initiation of recycled water recharge operations. a. Prior to initiation of recycled water recharge	a. No documentation of water quality data or quantity for storm water prior to OBMP initiation exists. Storm water has been monitored for flow, TDS, and nitrogen since 2005.

Exhibit 14
Status of Compliance with the Chino Basin Maximum-Benefit Commitments

Description of Commitment	Compliance Date – as soon as possible, but no later than	Status of Compliance
b. Submit documentation of the amount and TDS and nitrogen quality of all sources of recharge and recharge locations. For storm water recharge used for blending, submit documentation that the recharge is the result of OBMP enhanced recharge facilities.	b. Annually, by April 15th, after initiation of construction of basins/other facilities to support enhanced storm water recharge	b. The volume-weighted, 5-year running average TDS and nitrate-nitrogen concentrations of Chino Basin recharge are less than the maximum-benefit water quality objectives
8. Hydraulic Control Failure a. Plan and schedule to correct loss of Hydraulic Control b. Achievement and maintenance of Hydraulic Control c. Mitigation plan for temporary failure to achieve/maintain Hydraulic Control	a. 60 days from Regional Board finding that Hydraulic Control is not being maintained b. In accordance with plan and schedule approved by the Regional Board c. By January 23, 2005	a. No mitigation plan and schedule for the loss of Hydraulic Control has been requested. b. Hydraulic Control has been achieved to the east of Chino-I Desalter Well 20. Groundwater model estimates published in 2015 indicate that production at the CCWF will achieve Hydraulic Control in the west to *de minimis* levels (<1,000 afy of groundwater flow past the CCWF well field to the Prado Basin Management Zone). Full production at the CCWF was achieved in 2016. Watermaster and the IEUA submitted a plan on June 30, 2015 to the Regional Board to construct three additional wells to achieve the ultimate Desalter capacity of 40,000 afy. Construction of two wells is completed and they began operating in 2018. Construction of the third well is anticipated to begin in late 2019.

Exhibit 14
Status of Compliance with the Chino Basin Maximum-Benefit Commitments

Description of Commitment	Compliance Date – as soon as possible, but no later than	Status of Compliance
		c. Plan submitted to the Regional Board on March 3, 2005. No mitigation action has been triggered.
9. Ambient groundwater quality determination	July 1, 2005 and every three years thereafter	Watermaster and the IEUA have participated in the regional triennial ambient water quality determinations coordinated through Basin Monitoring Program Task Force, administered through the Santa Ana Watershed Project Authority. Watermaster and the IEUA provide their fair share of funds and substantial groundwater data for this effort.

Exhibit 15
Limitations, Compliance Metrics, and Compliance Actions for the Chino Basin Maximum-Benefit Commitments

Source Waters with Water Quality Limitations in the Chino Basin SNMP	Water Quality Limitation	Compliance Metric	Action Limit	Required Compliance Action when Compliance Metric Exceeds the Action Limit
IEUA Recycled Water (Commitment 6)	TDS: 550 mgl	The agency-wide, 12-month running-average concentration	When the compliance metric exceeds 545 mgl for three consecutive months	Submit to the Regional Board for approval a plan and schedule to comply with the water quality limitations within 60 days.
	TIN: 8 mgl		When the compliance metric exceeds 8 mgl in any month	
Combined water sources used for managed recharge: storm, imported and recycled waters (Commitment 7)	TDS: 420 mgl Nitrate: 5 mgl	The five-year, volume-weighted running-average concentration of all sources of managed recharge	TDS: 420 mgl Nitrate: 5 mgl	Prepare a salt offset plan to mitigate salt loading from recharge greater than 420 mgl. Offsets could include desalting of recycled water or groundwater, or increased recharge of low-TDS waters.
Groundwater (Commitment 9)	TDS: 420 mgl	The volume-weighted concentration of groundwater in the Chino North GMZ (computed every three years)	TDS: 420 mgl	Reduce the TDS concentration of IEUA recycled water to comply with the maximum-benefit TDS objective or prepare a salt offset plan to mitigate loading from the use of recycled water than 420 mgl.
	Nitrate: 5 mgl		n/a	This action limit was already exceeded when the objective was established. So long as all other maximum benefit commitments are met, no compliance action is required.

Exhibit 16

Ending Balances in Managed Storage in the Chino Basin[1]

(af)

Fiscal Year ending June 30	Appropriative Pool				Overlying Non-Agricultural Pool			Total Managed Storage by Parties	Dry Year Yield Program Storage	Total Managed Storage
	Carryover	Excess Carryover	Local Supplemental Storage	Subtotal	Carryover	Excess Carryover	Subtotal			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (7) + (4)	(9)	(10) = (9) + (8)
2000	28,911	170,342		199,253	6,541	31,031	37,572	236,825	0	236,825
2001	15,940	77,907	92,813	186,660	5,301	32,330	37,631	224,291	0	224,291
2002	13,521	70,103	87,801	171,425	5,285	33,727	39,012	210,437	0	210,437
2003	18,656	71,329	81,180	171,165	6,743	36,850	43,593	214,758	7,738	222,496
2004	21,204	70,503	80,963	172,670	7,177	40,881	48,058	220,728	26,300	247,028
2005	21,289	76,080	88,849	186,218	7,227	45,888	53,115	239,333	38,754	278,087
2006	32,062	56,062	86,170	174,294	7,227	49,178	56,405	230,699	58,653	289,352
2007	34,552	50,895	83,184	168,631	7,084	51,476	58,560	227,191	77,116	304,307
2008	41,626	83,962	81,520	207,108	6,819	45,248	52,067	259,175	74,877	334,052
2009	42,795	101,908	79,890	224,593	6,672	46,600	53,272	277,865	34,494	312,359
2010	41,263	120,897	90,133	252,293	6,934	47,732	54,666	306,959	8,543	315,502
2011	41,412	146,074	98,080	285,566	6,959	49,343	56,302	341,868	0	341,868
2012	42,614	209,981	116,138	368,733	6,914	13,993	20,907	389,640	0	389,640
2013	39,413	225,068	116,378	380,859	7,073	15,473	22,546	403,405	0	403,405
2014	41,708	224,496	123,484	389,688	6,478	12,812	19,290	408,978	0	408,978
2015	40,092	239,517	127,994	407,603	6,823	12,225	19,048	426,651	0	426,651
2016	39,733	248,013	131,522	419,267	7,195	9,949	17,144	436,411	0	436,411
2017	38,340	260,682	143,552	442,575	7,226	8,292	15,519	458,093	6,315	464,408
2018	34,582	254,221	155,018	443,821	7,198	10,775	17,973	461,795	41,380	503,174
2019	38,605	279,033	166,406	484,044	7,227	12,004	19,231	503,275	45,969	549,244

1 -- WEI. (2019). Draft Storage Management Plan.