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TECHNICAL MEMORANDUM

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Project No.: 941-80-23-32
SENT VIA: EMAIL

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FROM: Garrett Rapp, PE, RCE #86007

REVIEWED BY: Andy Malone, PG, PG #8700

SUBJECT: Workplan for Development of a Storage and Recovery Master Plan

BACKGROUND AND OBJECTIVES

During the development of the 2020 Optimum Basin Management Program Update (2020 OBMPU),[1] the Chino Basin Watermaster (Watermaster) stakeholders identified several management activities necessary to achieve the goals of the 2020 OBMPU. One of these activities, Activity B, was to "develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality." Activity B falls under Program Element (PE) 9 of the 2020 OBMPU to *Develop and Implement Storage and Recovery Programs*.

Exhibit 7 of the 2020 OBMPU defined a multi-year scope of work to execute Activity B, which will culminate in the development of a guidance document for Storage and Recovery Programs referred to as the *Storage and Recovery Master Plan* (*SRMP*). Watermaster is initiating Activity B and the development of the *SRMP* in FY 2023/24. This technical memorandum (TM) documents (1) the background and activities preceding the development of the *SRMP*, (2) the objectives of the *SRMP*, and (3) the scope and schedule of the *SRMP* development process.

Storage and Recovery Programs in the Chino Basin

The Judgment recognized the significant volume of unused storage space in the Chino Basin that could be used by a person or entity to store water for subsequent beneficial use.[2] The Judgment requires that Watermaster control and regulate the use of this storage capacity to protect all stored water and Safe Yield.[3] The Judgment requires that all agreements to store Supplemental Water by their terms preclude operations which will have a substantial adverse impact to other groundwater pumpers.[4] The Judgment prioritizes the

[1] 2020 OBMPU Final Report

[2] See Paragraph 11 of the 2012 Restated Judgment

[3] Ibid.

[4] Ibid., Paragraph 28

use of storage space by the parties (i.e., Local Storage) over the use of storage space for the export of stored water.[5]

The Peace Agreement[6] defines a Storage and Recovery Program as the use of available storage capacity in the Chino Basin by any person to store supplemental water in the basin and have the right to export the stored water for use outside the basin, subject to Watermaster's direction and control pursuant to a storage and recovery agreement.

The 2000 OBMP included PE 9 to encourage the development of Storage and Recovery Programs for the benefit of the parties and the basin. The Implementation Plan for the 2000 OBMP directed Watermaster to (1) prioritize its efforts to regulate and condition Storage and Recovery Programs for the mutual benefit of the parties and (2) give priority to proposed Storage and Recovery Programs that provide broad mutual benefits to the parties.

Watermaster, the IEUA, and the parties have tried to develop and implement Storage and Recovery Programs since the development of the 2000 OBMP, its Implementation Plan, and the commencement of the Peace Agreement in 2000. These entities initially issued a request for proposals, declaring that the Chino Basin was ready to develop Storage and Recovery Programs with water agencies outside the basin. Few proposals were received, and the submitted proposals did not provide the benefits desired by the parties.

The only storage and recovery agreement to date was approved by Watermaster in 2004 to facilitate the Dry-Year-Yield Program (DYYP) of the Metropolitan Water District of Southern California (MWD). MWD coordinated with its member agencies, the Inland Empire Utilities Agency (IEUA) and Three Valleys Municipal Water District (TVMWD), and local Appropriative Pool agencies, to store about 100,000 acre-feet (af) of supplemental water in the basin. The MWD pledged $27.5 million for design and construction of DYYP facilities that parties would own and could use for any purpose, so long as the use did not interfere with the DYYP. In addition to deferring water cost, paying operation and maintenance costs attributable to the DYYP, and electrical costs of pumping, the MWD also agreed to pay an administrative fee to offset Watermaster's costs to administer the DYYP. The storage and recovery agreement that authorizes the DYYP will expire in 2028.

Evaluating the Use of Storage in the Chino Basin

Water held in Chino Basin storage accounts is collectively referred to as Managed Storage, which includes all water in Carryover,[7] Local Storage (including Excess Carryover[8] and Supplemental Water stored by the parties), and Supplemental Water stored by entities engaging in Storage and Recovery Programs. To fulfill its role in managing storage in the Chino Basin, Watermaster has performed evaluations and set criteria for the use of Managed Storage.

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[5] Ibid., Paragraph 12

[6] Peace Agreement

[7] "Carry-Over Water" means the un-Produced water in any year that may accrue to a member of the Non-Agricultural Pool or the Appropriative Pool and that is Produced first each subsequent Fiscal Year or stored as Excess Carry-Over. (Judgment Exhibit G ¶ 7; Judgment Exhibit H ¶ 12.)

[8] "Excess Carry-Over Water" means Carry-Over Water which in aggregate quantities exceeds a party's share of Safe Yield in the case of the Non-Agricultural Pool, or the assigned share of Operating Safe Yield in the case of the Appropriative Pool, in any year. (Judgment Exhibit G ¶ 7; Judgment Exhibit H ¶ 12.)

In 2000, a storage management plan was included in the OBMP which required that groundwater production, replenishment, recharge, and storage be managed such that the volume in Managed Storage remains within the Safe Storage Capacity (SSC) of the Chino Basin. The SSC is the maximum volume of storage space in the basin that can be used for Managed Storage. The initial estimate of SSC in the 2000 OBMP storage management plan was 500,000 af.

In 2017, an Addendum to the Peace II Subsequent Environmental Impact Report temporarily raised the SSC to 600,000 af through June 30, 2021. In addition, technical work was initiated to prepare the Storage Framework Investigation (2018 SFI)[9] which supported an update to the OBMP storage management plan, called the 2020 Storage Management Plan (2020 SMP).[10] The 2018 SFI also provided information to support the development of prospective Storage and Recovery Programs. Specifically, the 2018 SFI: (1) simulated the hydrologic impacts of the use of progressively larger volumes of Managed Storage including prospective Storage and Recovery Programs; (2) evaluated the potential Material Physical Injury (MPI) and other management challenges (if any) due to Storage and Recovery Programs; and (3) described potential facilities and operating concepts that, if implemented, would minimize potential MPI and other management challenges (if any).

In 2020 and 2021, based on the 2020 SMP and the updated groundwater model and planning information that was generated during the 2020 Safe Yield Recalculation,[11] Watermaster evaluated the Local Storage Limitation Solution (LSLS)[12] to further increase the SSC of the basin. The LSLS defined the use of Managed Storage up to 700,000 af for fiscal year (FY) 2022 through 2030, and then decreasing to 620,000 af through FY 2035. Absent this revision to the SSC, the parties and the DYYP (or prospective future Storage and Recovery Programs) would have been limited to using 500,000 af of storage space beginning on July 1, 2021. The LSLS was evaluated using the 2020 Chino Valley Model (2020 CVM)[13] based on the metrics developed in the 2018 SFI. The use of Managed Storage defined by the LSLS was not projected to cause MPI or adverse impacts in the basin. IEUA used this evaluation to support the development of a second addendum to the Peace II Subsequent Environmental Impact Report to increase the SSC to 700,000 af until June 30, 2030, and then decreasing to 620,000 af from July 1, 2030 through June 30, 2035. The second addendum was certified in 2021, and the Court ordered the implementation of the LSLS and the increase of the SSC in July 2021.[14] Any future uses of storage (whether to be used locally by the parties or for Storage and Recovery Programs) that exceed the SSC would require mitigation.

In 2023, the 2018 SFI Report was updated using the 2020 CVM to support the Programmatic Environmental Impact Report for the 2020 OBMPU (2023 SFI Report).[15] The 2023 SFI Report refined the findings of the 2018 SFI based on the 2020 Chino Valley Model and resulted in similar conclusions regarding the impact of Storage and Recovery Programs on the Chino Basin. Other prior work has been performed to support potential Storage and Recovery Programs, such as the Chino Basin Water Bank and the Inland Empire Utilities Agency's

[9] 2018 Storage Framework Investigation Report

[10] The 2020 SMP can be found as Appendix E of the 2020 OBMPU.

[11] 2020 Safe Yield Recalculation Report

[12] Evaluation of the Local Storage Limitation Solution Report

[13] The 2020 Chino Valley Model is Watermaster's current groundwater simulation model, which was developed for the 2020 Safe Yield Recalculation.

[14] Notice of Order Re: Motion Regarding Implementation of the Local Storage Limitation Solution

[15] West Yost. 2023 Storage Framework Investigation. Prepared for the Chino Basin Watermaster, May 2023.

Chino Basin Program. These historical evaluations of the use of storage in the Chino Basin will be used to inform the development of the *SRMP*.

Program Element 9 and Activity B of the 2020 OBMPU

During the development of the 2020 OBMPU, the parties expressed a desire to implement optimized Storage and Recovery Programs that avoid potential MPI and provide broad mutual benefits to meet the goals of the 2020 OBMPU, such as:

1. **Increase water-supply reliability**. Imported water is stored in the basin during times of imported-water surplus and can be recovered during times of water-supply shortage (e.g., prolonged drought, imported water shortages/outages) to supplement local water supplies.
2. **Protect or enhance Safe Yield**. The operation of Storage and Recovery Programs needs to be implemented in a manner to minimize reductions, or potentially increase, the net recharge to the basin.
3. **Improve water quality**. Recovery operations could be programmed to occur in areas of impaired water quality, thereby removing groundwater contaminants. This would require groundwater treatment facilities. Supplemental water recharge may also improve groundwater quality.
4. **Reduce the cost of OBMP implementation**. Leave-behind water, revenue, credits, investment in facilities, external funding, or other contributions produced by a Storage and Recovery Program can be used to offset Watermaster assessments and provide other benefits.

These goals help guide the development of Activity B of the 2020 OBMPU, which is to "develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality." Activity B falls under PE 9 of the 2020 OBMPU to *Develop and Implement Storage and Recovery Programs*. To achieve the objectives of PE 9, Watermaster must document the basis by which it will review, condition, and approve applications for Storage and Recovery Programs in a manner that is predictable, uniform, and consistent with the Peace Agreement and the 2020 SMP. The 2020 OBMPU recommended the development of the *Storage and Recovery Master Plan*[16] as the most efficient way to meet these obligations.

Objectives of the Storage and Recovery Master Plan

The objectives of the *SRMP* are to (1) support the development of the criteria for optimized Storage and Recovery Programs, (2) assist Watermaster in soliciting storing partners and Storage and Recovery Program proposals, (3) assist Watermaster in prioritizing and selecting Storage and Recovery Program proposals, (4) support applications for funding, and (5) support Watermaster approvals and conditions for Storage and Recovery Programs.

Storage and Recovery Program Applications Prior to Completion of the Storage and Recovery Master Plan

Development of the *SRMP* does not prevent agencies from applying for a storage and recovery agreement with Watermaster. If an application for a storage and recovery agreement is received by Watermaster

[16] This is also referenced as the *Storage and Recovery Program Master Plan.*

before the completion of the *SRMP*, then Watermaster will evaluate the proposed Storage and Recovery Program using its existing frameworks, tools, and evaluation criteria for MPI.[17]

SCOPE OF WORK FOR DEVELOPING A STORAGE AND RECOVERY MASTER PLAN

The scope of work to develop the *SRMP* includes following four tasks:

- **Task 1** – Convene the Storage and Recovery Master Plan Committee and articulate/refine the program objectives
- **Task 2** – Develop conceptual alternatives for Storage and Recovery Programs at various scales
- **Task 3** – Describe and evaluate reconnaissance-level facility plans and costs for the Storage and Recovery Program alternatives
- **Task 4** – Prepare the *SRMP*

Prior work has been performed for the 2023 Storage Framework Investigation and the Chino Basin Program. These past efforts will be leveraged after Watermaster completes Task 1. In addition, multiple concurrent efforts can and will be leveraged to assist this work (e.g., the 2025 Safe Yield Reevaluation). At the end of Task 4, Watermaster and the parties will have a master plan for Storage and Recovery Programs, know what is reasonably possible, know what is a "stretch" program, and know how to subsequently implement the *SRMP*.

The scope of work described below for Task 1 is a necessary first step. The precise scope and level of effort required to perform Tasks 2 through 4 will depend on the outcomes of Task 1. Tasks 2 through 4 are generally described below, but the cost to perform these tasks is not estimated herein. The precise scope of work for Tasks 2 through 4 will be developed in detail as part of Task 1 and will be included in future Watermaster budgets.

Task 1 – Convene the Storage and Recovery Program Committee, define objectives, and refine scope of work

In this task, the Storage and Recovery Master Plan Committee (Committee) will be convened. The Committee should comprise party representatives who are willing to commit to and engage throughout the multi-year scope of work to prepare the *SRMP*. The ideal makeup of the Committee would be party representatives who have experience in (1) reviewing prior proposed Storage and Recovery Programs in the Chino Basin (e.g., DYYP, Chino Basin Water Bank), (2) water supply planning, and/or (3) water conveyance infrastructure. Engagement and continuity of the Committee will ensure timely and pertinent input on interim deliverables and that the *SRMP* development will be cost-effective and serve the needs of the parties. The Committee's initial task is to provide feedback and input on the objectives and desired benefits of Storage and Recovery Programs and develop the scope of work to prepare a *Storage and Recovery Program Master Plan*. To execute this task, the Committee will address the following questions:

1. Why do the parties want to conduct Storage and Recovery Programs? What are the parties' objectives for Storage and Recovery Programs?
2. What were the obstacles to implementing Storage and Recovery Programs in the past, what are the current obstacles, and how we can overcome them in the future?

[17] Watermaster's current processes incorporate the provisions of Peace Agreement section 5.2(c).

3. What are the benefits desired by the parties and how should they be quantified?

Two Committee meetings will be conducted (1) to establish the Committee and define its roles and responsibilities, (2) to define the objectives of the *SRMP* and any impediments to its development, (3) to define a set of mutual benefits that are desired from Storage and Recovery Programs, and (4) to develop the preliminary scope, cost, and schedule for the work (Tasks 2 through 4 below) to develop the *SRMP*.

Task 2 – Issue request for interest and develop conceptual alternatives for Storage and Recovery Programs at various scales

The objective of this task is to issue a request for interest from external agencies, gather information from external agencies on potential Storage and Recovery Program concepts, and describe a set of conceptual alternatives for Storage and Recovery Programs at various scales that will achieve the objectives defined in Task 1. The set of conceptual alternatives will be described and evaluated in greater detail in Task 3.

Watermaster will work with the Committee to prepare an informal request for interest (RFI) document based on the results of Task 1. The RFI will be distributed to agencies that may have an interest in implementing a Storage and Recovery Program in the Chino Basin in the future. The intent of the RFI is to (1) begin a dialog with potentially interested agencies, (2) understand the characteristics and scale of potential Storage and Recovery Programs, and (3) inform the Committee's development of the *SRMP*.

The responses to the RFI will inform the Committee's exploration of the following questions:

1. What are the potential source waters for Storage and Recovery Programs in the Chino Basin? What is the availability and what are the volumes of these potential source waters?
2. What entities are interested in obtaining water from a Storage and Recovery Program? How would they take delivery of the stored water?
3. How could put and take operations be performed to match the availability of the source waters with the demand for the stored water and be consistent with the 2025 update to the 2020 SMP (2025 SMP)?

Three Committee meetings will be needed to review the draft RFI, answer the above questions, describe various conceptual alternatives for Storage and Recovery Programs, and evaluate and select a set of these alternatives for further development, evaluation, and ranking in Task 3. Work involved in this task will likely include:

- Collecting, compiling, and reviewing existing and new information, including responses to the RFI
- Identifying potential source waters for Storage and Recovery Programs in the Chino Basin
- Characterizing the availability and volumes of these potential source waters
- Identifying the entities that would be interested in obtaining water from a Storage and Recovery Programs
- Characterizing how the entities would take delivery of the stored water
- Identifying and characterizing institutional challenges to program implementation
- Developing planning criteria to formulate and rank the conceptual Storage and Recovery Program alternatives

- Describing several conceptual alternatives for Storage and Recovery Programs of various scales
- Selecting a set of alternatives for further development, evaluation, and ranking in Task 3

Each alternative will describe, at a conceptual level, the operating parameters for put and take operations in the Chino Basin that match the available source waters with the demand for stored water. The alternatives must be consistent with Watermaster's 2020 SMP and the objectives for Storage and Recovery Programs defined in Task 1.

Task 3 – Describe and evaluate reconnaissance-level facility plans and costs for Storage and Recovery Program alternatives

The objective of this task is to describe and evaluate reconnaissance-level facility plans, operational plans, and cost opinions to implement the various Storage and Recovery Program alternatives described in Task 2. To execute this task, the Committee will need to answer the following questions:

1. How can existing infrastructure be used to perform put and take operations conceptualized in Task 2? Are new facilities required? What are the capital and operations and maintenance (O&M) costs associated with the use of existing and new facilities?
2. What are the practical alternatives for implementing Storage and Recovery Programs?

Up to two Committee meetings will be needed to answer these questions and to describe, evaluate, and rank the various Storage and Recovery Program alternatives.

For each alternative, sub-alternatives may be developed to use varying combinations of existing and new facilities. Potential implementation barriers will be described. Capital and O&M cost opinions will be prepared for each alternative, utilizing criteria developed in Task 2.

To characterize the performance of the Storage and Recovery Program alternatives: (1) Watermaster's groundwater model will be utilized to estimate the physical response of the basin and to assess the potential for MPI, and (2) the benefits of the Storage and Recovery Program will be quantified and assessed. Each alternative will be ranked using this and any other criteria developed in Task 2.

Watermaster is currently updating its groundwater model to implement the 2022 Safe Yield Reset methodology (2022 SYRM) and reevaluate the Safe Yield by June 30, 2025 (2025 Safe Yield Reevaluation). Implementing the 2022 SYRM will result in an ensemble of calibrated models that represent various configurations of aquifer properties and projection scenarios (i.e., different estimates of future water demands, supply plans, and hydrology). This model ensemble will not include Storage and Recovery Programs if the operations are not precisely defined. Task 3 will be dependent on the use of one or more models of the model ensemble to evaluate the hydrologic impacts of Storage and Recovery Program alternatives. The Committee will define how and/or which models will be used to evaluate the Storage and Recovery Program alternatives in Task 3. The Committee may choose to solicit input from outside groundwater modeling experts to provide pertinent review and feedback on Watermaster's groundwater-model simulations of the Storage and Recovery Program alternatives.

Task 4 – Prepare Storage and Recovery Program Master Plan

The objective of this task is to prepare a *Storage and Recovery Program Master Plan* that will enable the parties and other potential storing partners: (1) to reference a common set of objectives for Storage and

Recovery Programs and align the objectives with requirements in grant applications and other funding opportunities, (2) to assess the potential for implementing Storage and Recovery Programs in the Chino Basin at various scales, (3) to solicit interest in participation in Storage and Recovery Programs, and (4) to develop Storage and Recovery Programs that are consistent with the *2020 Storage Management Plan*.

The plan will describe the results and recommendations of Tasks 1 through 3 and will include a discussion of the institutional arrangements required to implement Storage and Recovery Programs in the Chino Basin. Two Committee meetings will be needed (1) to finalize the discussion on what was learned in prior tasks, (2) to provide feedback and input on the recommendations, and (3) to review, revise, and finalize the *SRMP*.

Follow-on Work

After the publication of the *SRMP*, Watermaster will prepare and distribute a formal Request for Proposals (RFP) for Storage and Recovery Programs. This RFP will leverage the *SRMP* and solicit proposals for Storage and Recovery Programs from agencies. The timeline beyond the issuance of the RFP is to be determined.

SCHEDULE AND NEXT STEPS

Table 1 shows the anticipated schedule to develop the *SRMP*. The kick-off meeting for Task 1 will take place on November 15, 2023. Future Committee meetings will take place quarterly until the *SRMP* is finalized in Fall 2025, except for the first two quarters of 2025 where no meetings will occur to enable the timely completion of the 2025 Safe Yield Reevaluation.

Table 1. Schedule for SRMP Committee Meetings

Task	2023 Q4	2024 Q1	2024 Q2	2024 Q3	2024 Q4	2025 Q1	2025 Q2	2025 Q3	2025 Q4
1 - Convene the SRMP Committee, define objectives, and refine scope of work									
2 - Issue RFI, define conceptual alternatives for Storage and Recovery Programs at various scales									
3 - Describe and evaluate reconnaissance-level facility plans and costs for Storage and Recovery Program alternatives									
4 - Prepare Storage and Recovery Program Master Plan									

= one meeting = two meetings

This schedule considers several of Watermaster's concurrent efforts, including:

- **2025 Safe Yield Reevaluation:** The 2025 Safe Yield Reevaluation was initiated in FY 2022/23 and must be completed by June 30, 2025. This effort includes the update of Watermaster's groundwater model, which will be completed in spring of 2025. Watermaster's model update

must be complete before the completion of Task 3, as Task 3 includes the use of the groundwater model to evaluate the effects of the Storage and Recovery Program alternatives.

- **2025 SMP:** The 2020 SMP will be updated with the current planning information and results from the groundwater model that is updated for the 2025 Safe Yield Reevaluation. The 2025 SMP is due to be completed by October 2025. The *SRMP* must be consistent with the 2025 SMP; therefore, some content of the *SRMP* will be dependent on the findings and recommendations of the 2025 SMP. To the extent practical, these two documents will be developed concurrently.
- **Regional Reliability Study:** The objective of the Regional Reliability Study is to compile all planning information from the Chino Basin parties to (1) determine future aggregate supplies, demands, and any gaps between supplies and demands, (2) quantify the reliability of the parties' water supplies, and to (3) make recommendations to address any perceived deficiencies in the regional water supplies. The planning information compiled for this effort may be incorporated into one or more Storage and Recovery Program alternatives and/or guide the design of optimal Storage and Recovery Programs. The Regional Reliability Study will be developed concurrently with the 2025 Safe Yield Reevaluation to maintain consistency in the planning information used in these investigations.
- **Water Quality Management Plan (WQMP):** The objective of the WQMP is to address current and future water quality issues and protect beneficial uses of Chino Basin groundwater. The development of the WQMP will serve as a proactive basin-wide approach to address regional water quality challenges and identify potential opportunities for multi-benefit regional solutions, which a Storage and Recovery Program could facilitate. The final WQMP is not planned to be completed until 2026; however, any intermediate findings will be incorporated into the *SRMP* as appropriate.

Next Steps

This TM is intended to inform the parties and prospective Committee members of the background, scope, and schedule of the development of the *SRMP* prior to the Committee kick-off meeting on November 15, 2023. All parties and interested stakeholders are invited to the Committee kick-off meeting. Watermaster requests that the parties and prospective Committee members review this TM and come prepared with questions, comments, and suggestions.